NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

BUDGET ESTIMATES

FISCAL YEAR 2020

CONGRESSIONAL SUBMISSION

PRIVILEGED

The information contained herein must not be disclosed outside the Agency until made public by the President or by the Congress.

Budget Estimates, Fiscal Year 2020
Congressional Submission

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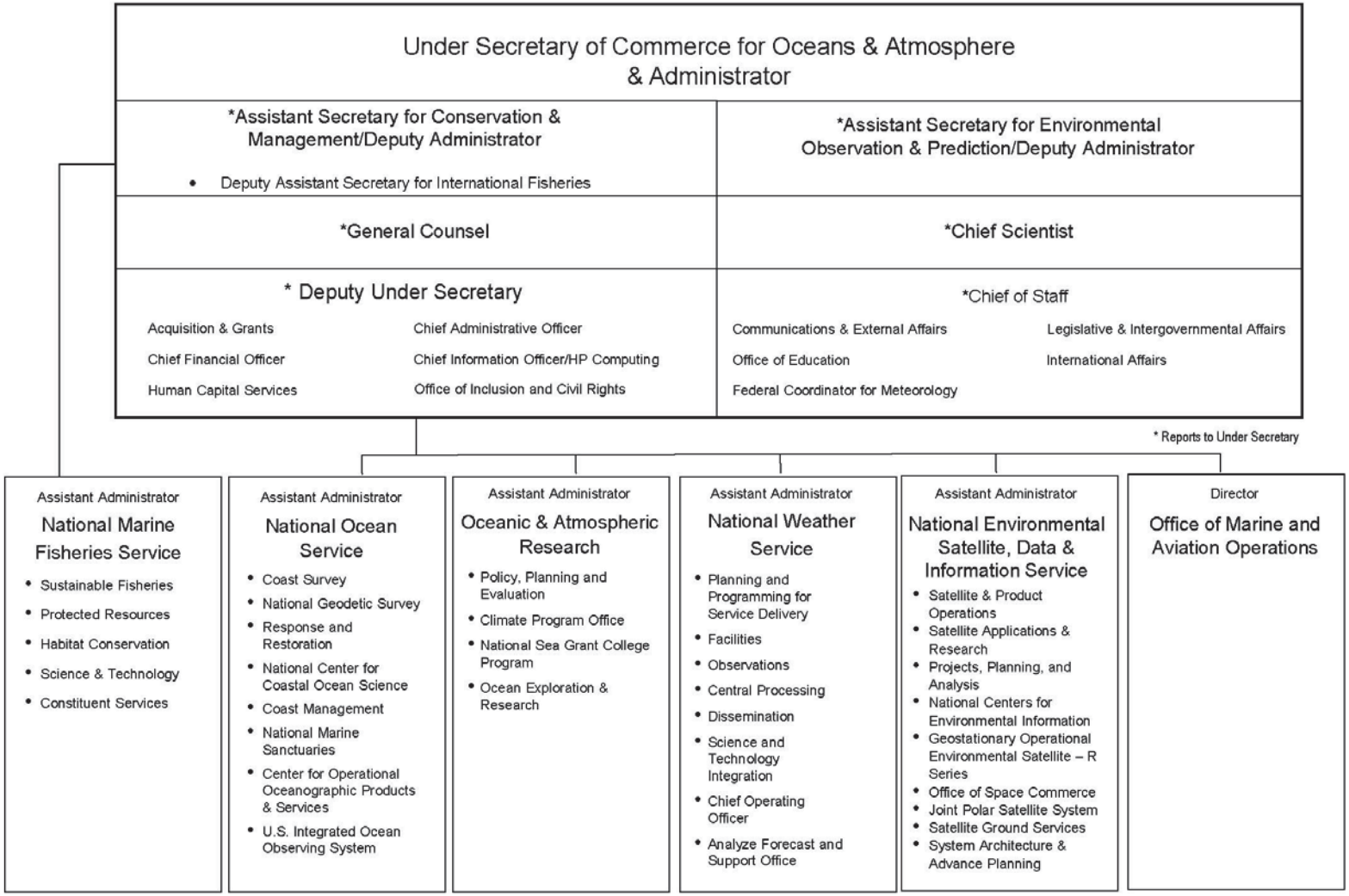
Current Organizational Chart

U.S. DEPARTMENT OF COMMERCE

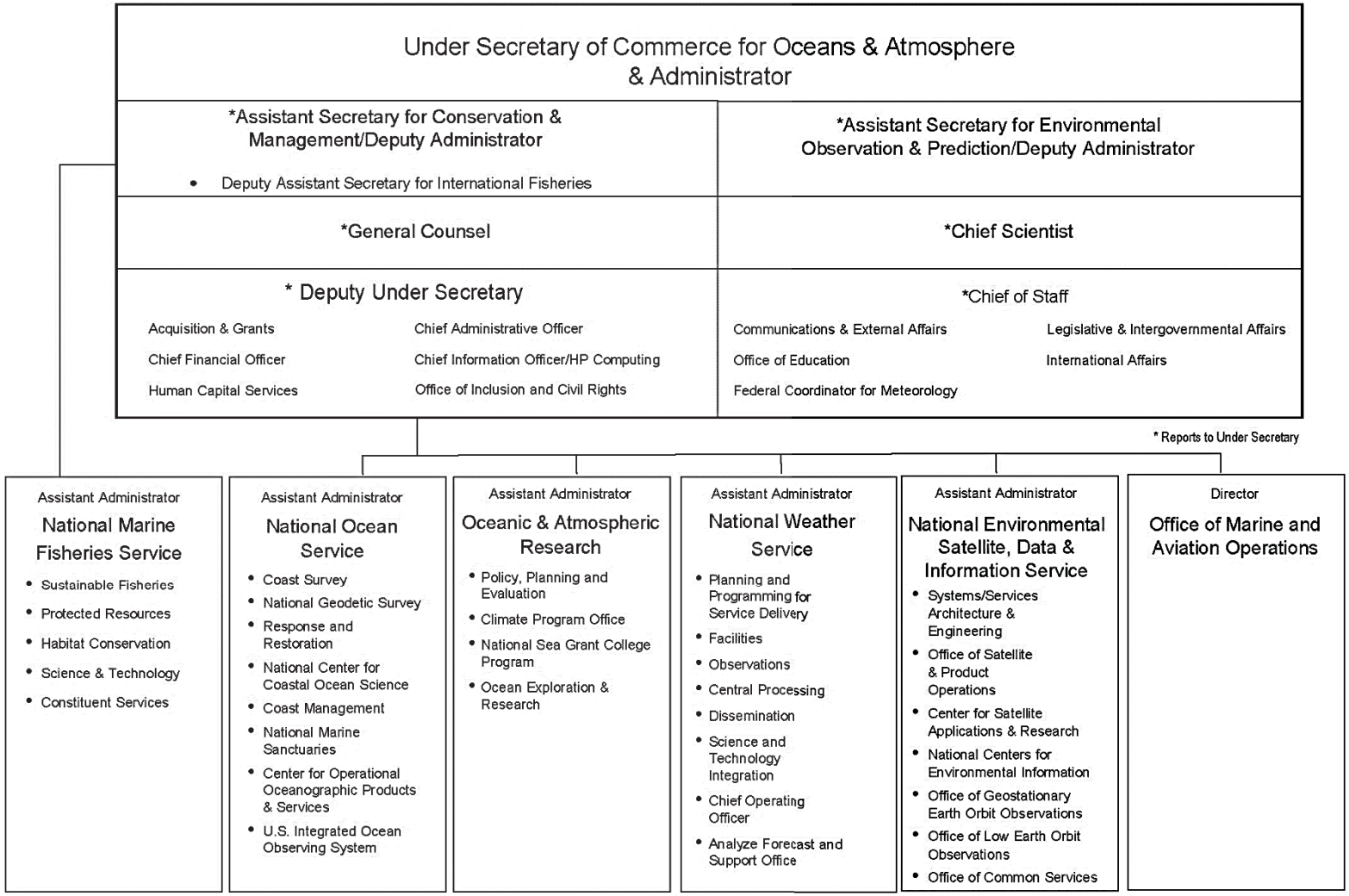
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION



Proposed Organizational Chart

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION



EXECUTIVE SUMMARY

For Fiscal Year (FY) 2020, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of $4,466,465,000 in discretionary appropriations, a decrease of $967,833,000 from the FY 2019 Enacted level. This budget supports NOAA's goals of reducing the impacts of extreme weather and water events to save lives and protect property by implementing Public Law 115-25, Weather Research and Forecasting Innovation Act of 2017 and Public Law 115-423, National Integrated Drought Information System (NIDIS) Reauthorization Act of 2018, and maximizing the economic contributions of our ocean and coastal resources. Further, the FY 2020 budget advances space innovation through new approaches to NOAA satellite missions and provides for mission support activities essential to accomplishing all NOAA missions.

NOAA saves lives and property through accurate weather forecasts. The greatest opportunity for improving these forecasts is in the transition of research findings into the operational forecast. To support this transition to operations, NOAA's FY 2020 budget requests an increase of $12,320,000 to support the Earth Prediction Innovation Center (EPIC) at a total of $15,000,000. With these funds, NOAA will shepherd promising weather research from the American Weather Enterprise, into operations through testing, demonstrating, and important external partnerships. EPIC will serve as NOAA's core research-to-operations (R2O) center and assemble and gather leading scientists and engineers, to allow for ease of collaboration among scientists, as well as adequate engagement with the broader scientific and software engineering community, including academia and the private sector. This will allow EPIC to serve as NOAA's R2O pipeline.

NOAA's FY 2020 budget recognizes the potential of increased partnerships to maximize outcomes that support the Blue Economy. NOAA will increase support for the interagency National Oceanographic Partnership Program (NOPP) by establishing a stable dedicated funding source, $5,000,000, that can be used to leverage other NOAA programs to use this extramural, competitively-awarded partnership-based research program. NOPP was established by Public Law 104-201 of September 23, 1996, to "coordinate and strengthen national oceanographic efforts by identifying and carrying out partnerships among Federal agencies, academia, industry, and other members of the oceanographic scientific community in the areas of data, resources, education, and communication." With an increasing amount of research and development spending occurring within the private sector relative to the federal government, NOPP is a unique catalyst for participation by industry and non-governmental organizations and industry in federal ocean research and education projects. NOAA's FY 2020 budget also invests $4,000,000 in ocean data portals to implement Executive Order 13840, Ocean Policy to Advance the Economic, Security, and Environmental Interest of the United States (June 2018) through improved access to credible marine data and information. The budget includes funds for permitting capacity to reduce the burden on the regulated community by providing timelier, consistent, and clear consultations and authorizations.

NOAA's FY 2020 budget also continues investments in domestic seafood production and competitiveness by supporting marine aquaculture and commercial fisheries to reduce the seafood trade deficit. Currently, the U.S. imports more than 85 percent of its seafood, of which over half is from foreign-produced aquaculture. This reliance on foreign imports moves potential seafood jobs

overseas where environmental protection laws are less stringent. There is substantial untapped potential to increase marine aquaculture production in the U.S. with the second largest Exclusive Economic Zone (EEZ) in the world, yet ranks 17th in global aquaculture production.[1] NOAA's FY 2020 budget invests funds to increase the capacity of science to advance research addressing key industry bottlenecks (and science to support permitting and management decisions. The budget also includes funding to support deregulatory changes to reduce the burden on commercial and recreational fishermen. Regarding imports, NOAA is investing $1,593,000 for enforcement and seafood import monitoring to enforce fishing seafood fraud and traceability. This helps the monitoring of certain seafood products to prevent illegal, unreported, and unregulated and/or misrepresented seafood from entering U.S. commerce.

The FY 2020 Budget ensures continuity of critical environmental data, while expanding NOAA's space commerce and partner engagement. This budget begins implementation of the NOAA Satellite Observing System and Architecture (NSOSA). NSOSA analyzed various innovative approaches to better meet NOAA's mission requirements, with greater flexibility and responsiveness to evolving technologies, along with new business relationships with the private sector. Codified in the National Integrated Drought Information System (NIDIS) Reauthorization Act of 2018, NOAA's space innovation initiative, based on NSOSA, will inform decisions on the next generation of satellite architecture required to meet NOAA's weather forecasting mission. The FY 2020 Budget showcases NOAA's initial steps to implement NSOSA through greater use of new technologies, smaller satellites, and partnerships to meet its mission requirements. Specific investments in this budget include: $2,268,000 for new joint ventures with NASA, other agencies, and the commercial sector; $10,000,000 to explore new approaches to providing observations from geostationary orbits; and $5,000,000 for operational purchases of commercial data from the private sector.

NOAA will invest $4,000,000 to establish its first corporate pool of standardized, centrally maintained, and mission ready Unmanned Systems (UxS) for a wide variety of observations. A centralized program will enable NOAA to take full advantage of available UxS technologies, avoid duplication across NOAA programs, and ensure alignment with NOAA's fleet of ships and aircraft and consistency with NOAA's priorities. Among investments needing to support and secure NOAA operations, NOAA will invest $4,972,000 to improve cybersecurity capacity and $2,417,000 to upgrade and sustain the agency's aging financial system, the Commerce Business System. For NOAA's Education programs, the FY 2020 Budget supports core education coordination and outreach activities. Lastly, NOAA invests in headquarters consolidation in the National Capital Region in Silver Spring, MD for the workforce improvements and long-term savings it provides the agency.

NOAA's Office of Marine and Aviation Operations (OMAO) is requesting $75.0 million in FY 2020 for its ongoing fleet recapitalization efforts to acquire Class A, B, and C vessels. Without recapitalization, the NOAA Fleet will be reduced to half its current size by 2028. NOAA currently has 16 ships.

[1] FAO. 2016. The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all. Rome. p. 29.

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Increases

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NOS-53	ORF	NOS	Regional Ocean Data Portals	0	4,000
NMFS-85	ORF	NMFS	Enforcement and Seafood Import Monitoring	9	1,593
OAR-59	ORF	OAR	Earth Prediction Innovation Center	1	12,320
OAR-110	ORF	OAR	National Oceanographic Partnership Program	1	5,000
NWS-61	ORF	NWS	Support Impact-based Decision Support Services and IT Security	0	4,860
NWS-28	ORF	NWS	NOAA Ship Observation Data Buy	0	2,200
NWS-96	ORF	NWS	Establish National Weather Service Pilots	0	2,000
NWS-99	ORF	NWS	Collaborative Science, Technology, and Applied Research Contracts	0	1,293
NWS-42	ORF	NWS	Improve System Support Capabilities	0	704
NWS-81	ORF	NWS	Support Operations and Maintenance of Integrated Dissemination Program System	0	223
NESDIS-99	PAC	NESDIS	Geostationary and Extended Orbits	0	10,000
NESDIS-77	PAC	NESDIS	Metop Second Generation	0	9,339
NESDIS-103	PAC	NESDIS	Commercial Data Purchase	0	5,000
NESDIS-95	PAC	NESDIS	Joint Venture Partnership	0	2,268
MS-26	ORF	MS	Improve Cybersecurity Capabilities	0	4.972
MS-40	PAC	MS	Judgment Fund Repayment	0	4,000
MS-23	ORF	MS	Commerce Business System	0	2,417
MS-20	ORF	MS	SSMC Consolidation	0	2,000
MS-42	PAC	MS	Facilities Analysis and Planning	0	998

Exhibit 4A

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
OMAO-24	ORF	OMAO	Unmanned Systems Operations	10	4,000
OMAO-12	ORF	OMAO	Increase Marine Operations and Maintenance	0	199
N/A	ORF	MS	Increase (non-narrative)	0	739
	Subtotal, Increases			21	80,125

Decreases

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NOS-26	ORF	NOS	Reduce Integrated Ocean Observing System Regional Observation Grants	0	(19,056)
NOS-24	ORF	NOS	Hydrographic Survey Priorities/Contracts	0	(5,051)
NOS-72	ORF	NOS	Eliminate Telepresence Research Grants	0	(3,500)
NOS-56	ORF	NOS	Eliminate Funding support for Integrated Water Prediction	0	(2,576)
NOS-65	ORF	NOS	Reduce funding for Innovative Coral Reef Restoration Initiatives	0	(1,572)
NOS-14	ORF	NOS	Reduce funding for repair/replacement Coastal Observing Assets	0	(1,500)
NOS-70	ORF	NOS	Eliminate Research Grants for Monuments	0	(1,000)
NOS-16	ORF	NOS	Reduce Funding for Coastal Mapping Program	0	(500)
NOS-80	PAC	NOS	Reduce Marine Sanctuaries Construction	0	(459)
NMFS-63	ORF	NMFS	Northeast Fishery Observers	0	(10,300)
NMFS-57	ORF	NMFS	Reef Fish Stock Assessments	0	(7,486)
NMFS-72	ORF	NMFS	Genetic Stock Identification and Pacific Salmon Treaty	0	(5,520)
NMFS-67	ORF	NMFS	National Catch Share Program	0	(4,147)

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Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NMFS-48	ORF	NMFS	NMFS Facilities	0	(4,000)
NMFS-74	ORF	NMFS	Interstate Fishery Management Commissions	0	(3,663)
NMFS-98	ORF	NMFS	Essential Fish Habitat Consultations	0	(3,000)
NMFS-60	ORF	NMFS	Cooperative Research Program	0	(2,980)
NMFS-13	ORF	NMFS	ESA/MMPA Permitting Capacity	0	(2,599)
NMFS-69	ORF	NMFS	Aquaculture	0	(2,118)
NMFS-51	ORF	NMFS	Northeast Groundfish Research	0	(2,000)
NMFS-23	ORF	NMFS	Hatchery Genetic Management Plans	0	(2,000)
NMFS-65	ORF	NMFS	Seafood Import Monitoring Program Implementation	0	(1,200)
NMFS-20	ORF	NMFS	Species Recovery Grants	0	(1,009)
NMFS-18	ORF	NMFS	Right Whale Recovery	0	(1,000)
OAR-98	ORF	OAR	Ocean Exploration Decrease	0	(22,449)
OAR-72	ORF	OAR	Joint Technology Transfer Initiative (JTTI) Decrease	0	(17,000)
OAR-104	ORF	OAR	Sustained Ocean Observation and Monitoring Decrease	0	(6,007)
OAR-70	ORF	OAR	Weather Research Decrease	0	(4,863)
OAR-57	ORF	OAR	Weather & Air Chemistry Research Labs & CIs Decrease	0	(4,762)
OAR-101	ORF	OAR	Integrated Ocean Acidification Decrease	0	(3,994)
OAR-92	ORF	OAR	Ocean Laboratories and Cooperative Institutes Decrease	0	(2,594)
OAR-21	ORF	OAR	Climate Laboratories and Cooperative Institutes Decrease	0	(498)
NWS-53	ORF	NWS	NWS Workforce Savings	(248)	(15,000)

Exhibit 4A

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NWS-17	ORF	NWS	Reduce Surface Observations	0	(12,500)
NWS-57	ORF	NWS	Reduce Tsunami Warning Program	(25)	(11,000)
NWS-35	ORF	NWS	Establishment of Regional Enterprise Application Development and Integration Teams	(74)	(10,100)
NWS-71	ORF	NWS	Reduce Deferred Maintenance Support	0	(8,000)
NWS-117	PAC	NWS	Eliminate Integrated Water Prediction High Performance Computing	0	(4,172)
NWS-120	ORF	NWS	Reduce Research and Development High Performance Computing	0	(4,000)
NWS-110	PAC	NWS	Reduce Service Life Extension Program for Automated Surface Observing System	0	(2,500)
NWS-107	PAC	NWS	Reduce Service Life Extension Program for Next Generation Weather Radar	0	(2,379)
NWS-26	ORF	NWS	Reduce Upper Air Observations	0	(2,271)
NWS-90	ORF	NWS	Reduce Investment in Numerical Weather Prediction Modeling	0	(2,101)
NWS-39	ORF	NWS	Slow Advanced Hydrologic Prediction System Expansion	0	(2,000)
NWS-73	ORF	NWS	Reduction to Office of Water Prediction Center Staffing Support	0	(1,500)
NWS-20	ORF	NWS	Reduce Marine Observations	0	(1,500)
NWS-23	ORF	NWS	Reduce Marine Observations Tropical Atmosphere Ocean Platform	0	(1,300)
NWS-67	ORF	NWS	Consolidate Climate Prediction Center/Weather Prediction Center Functions	(8)	(1,200)
NESDIS-62	PAC	NESDIS	GOES-R Planned Decrease	0	(104,324)
NESDIS-68	PAC	NESDIS	Polar Weather Satellites Planned Decrease	0	(102,953)
NESDIS-80	PAC	NESDIS	Cooperative Data and Rescue Services	0	(11,689)
NESDIS-74	PAC	NESDIS	Metop Planned Decrease	0	(9,339)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NESDIS-92	PAC	NESDIS	Commercial Weather Data Pilot	0	(3,000)
NESDIS-89	PAC	NESDIS	Common Products and Services	0	(2,816)
NESDIS-84	PAC	NESDIS	Space Weather Decrease	3	(1,400)
OMAO-36	PAC	OMAO	Progressive Lifecycle Maintenance	0	(7,678)
OMAO-15	ORF	OMAO	Unmanned Surface Vehicles	0	(2,000)
OMAO-20	ORF	OMAO	Atmospheric Rivers	0	(1,000)
N/A	ORF	NOS	Decrease (non-narrative)	0	(1,814)
N/A	ORF	NMFS	Decrease (non-narrative)	0	(15,034)
N/A	ORF	NWS	Decrease (non-narrative)	0	(6,350)
N/A	ORF	NESDIS	Decrease (non-narrative)	0	(4,913)
N/A	ORF	MS	Decrease (non-narrative)	0	(157)
N/A	ORF	OMAO	Decrease (non-narrative)	0	(126)
N/A	PAC	NWS	Decrease (non-narrative)	0	(977)
N/A	PAC	NESDIS	Decrease (non-narrative)	0	(1,421)
	Subtotal, Decreases			(352)	(508,837)

Terminations

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NOS-59	ORF	NOS	Eliminate Coastal Zone Management Grants	0	(75,500)
NOS-62	ORF	NOS	Eliminate Federal Funding Support for the Title IX Fund	0	(30,000)

Exhibit 4A

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
NOS-67	ORF	NOS	Eliminate Federal Funding Support for NERRS	0	(27,000)
NOS-35	ORF	NOS	Terminate National Centers for Coastal Ocean Science	(94)	(23,664)
NOS-41	ORF	NOS	Eliminate NCCOS competitive funding support for research on ecological threats	0	(18,000)
NOS-21	ORF	NOS	Regional Geospatial Modeling Grants	0	(8,000)
NOS-19	ORF	NOS	Eliminate Single Year Grant to Joint Ocean and Coastal Mapping Center	0	(2,000)
NOS-78	PAC	NOS	Eliminate Federal Funding Support for NERRS	0	(1,900)
NMFS-108	PCSRF	NMFS	Pacific Coastal Salmon Recovery Fund	(2)	(65,000)
NMFS-89	ORF	NMFS	Cooperative Enforcement Program	0	(18,279)
NMFS-117	FDAF	NMFS	Fisheries Disaster Assistance	0	(15,000)
NMFS-100	ORF	NMFS	Fisheries Habitat Grants	0	(14,880)
NMFS-15	ORF	NMFS	Prescott Grant Program	0	(4,000)
NMFS-76	ORF	NMFS	Interjurisdictional Fisheries Grants	(2)	(3,365)
NMFS-53	ORF	NMFS	Antarctic Research	(12)	(2,967)
OAR-94	ORF	OAR	National Sea Grant College Program Termination	(18)	(80,071)
OAR-34	ORF	OAR	Climate Competitive Research PPA Elimination	(15)	(40,048)
OAR-29	ORF	OAR	Eliminate Climate Competitive Research Funding	(10)	(20,760)
OAR-122	ORF	OAR	Mississippi State Partnership Termination	0	(15,000)
OAR-107	ORF	OAR	Oceanographic Research Partnership Program	0	(5,500)
OAR-50	ORF	OAR	Unmanned Aircraft Systems Program Office Closure	(3)	(5,397)
OAR-54	ORF	OAR	Vortex-Southeast Termination	0	(4,966)

Exhibit 4A

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(By Budget Program, Largest to Smallest)

Page No In CJ	Appropriations	Budget Program	Title of Increase	Positions	Budget Authority
OAR-46	ORF	OAR	Air Resources Laboratory Closure	(35)	(4,843)
OAR-26	ORF	OAR	Arctic Research Elimination	0	(3,745)
OAR-86	ORF	OAR	Autonomous Underwater Vehicle Demonstration Testbed Termination	0	(3,000)
OAR-64	ORF	OAR	Airborne Phased Array Radar (APAR) Termination	0	(2,600)
OAR-67	ORF	OAR	Infrasonic Weather Monitoring Research Termination	0	(2,000)
OAR-23	ORF	OAR	Arctic Research Elimination	0	(1,940)
OAR-89	ORF	OAR	Genomics Termination	0	(1,880)
NWS-130	PAC	NWS	Completion of WFO/RFO Slidell Office and Radar Relocation	0	(10,366)
NWS-92	ORF	NWS	Terminate Hydrology and Additional Water Resources	0	(6,000)
NWS-94	ORF	NWS	Terminate COASTAL Act	0	(5,000)
NWS-64	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,806)
NWS-101	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,000)
NESDIS-45	ORF	NESDIS	Regional Climate Centers Termination	0	(3,650)
MS-30	ORF	MS	NOAA Office of Education Grants	(7)	(20,006)
MS-44	PAC	MS	National Marine Fisheries Service Facilities Initiative	0	(25,000)
MS-35	ORF	MS	NOAA Bay-Watershed Education and Training (B-WET) Regional Program	(4)	(7,500)
	Subtotal, Terminations			(202)	(581,633)

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Department of Commerce
National Oceanic and Atmospheric Administration
Headquarters Administrative Costs
(Dollar amounts in thousands)

In FY 2020, NOAA's Line/Staff Office Headquarters will use $343,981,963.5 and 1,243.9 FTE to support general management activities, financial and budgeting, and IT-related expenses, as well as to support facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the GSA. Specifically, NOAA's Line/Staff Office Headquarters will use administrative funds to support the following:

Headquarters Administrative Support Type	Description	NOS Amount	NOS FTE	NMFS Amount	NMFS FTE	OAR Amount	OAR FTE	NWS Amount	NWS FTE	NESDIS Amount	NESDIS FTE	MS Amount	MS FTE	OMAO Amount	OMAO FTE	Total Amount	Total FTE
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	$11,153,200	39.5	$12,116,025	38.6	$6,404,512	22.0	$13,817,097	62	$11,003,797	38.8	$28,505,000	126	$2,201,315	11	**85200945.03**	**337.82**
Budget & Finance	Includes Budget, Finance and Accounting	$3,507,000	15.0	$9,016,133	27.8	$3,645,034	16.8	$6,478,846	27	$5,894,391	24.8	$49,905,000	189	$2,769,280	15	**81215683.61**	**315.32**
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$2,116,500	2.0	$2,104,067	6.5	$2,972,726	8.3	$7,412,158	20	$2,156,648	9.4	$38,873,000	134	$845,553	0	**56480652.85**	**180.13**
Human Resources	All HR services, including Equal Employment Opportunity	$1,099,400	4.0	$2,742,317	12.7	$1,361,721	9.0	$5,839,259	31	$3,798,115	11.5	$21,885,000	90	$544,387	3	**37270199.44**	**161.24**
Acquisitions and Grants	Contracts, grants and procurement implementation	$330,200	2.0	$1,164,201	6.2	$2,000,000	0.0	$0	0	$563,231	3	$16,375,000	65	$0	0	**20432632.3**	**76.16**
Information Technology	Includes IT-related expenses and other CIO related activities	$8,184,000	12.0	$7,906,005	19.6	$1,818,536	5.0	$5,927,862	20	$11,369,941	28.6	$26,755,000	85	$1,420,506	3	**63381850.25**	**173.18**
Total		**26,390,300.0**	**74.5**	**35,048,748.6**	**111.3**	**18,202,529.0**	**61.0**	**39,475,222.0**	**160.0**	**34,786,123.0**	**116.1**	**182,298,000.0**	**689.0**	**7,781,040.9**	**32.0**	**343,981,963.5**	**1,243.9**

*Amounts above do not include NOAA's Direct Bill

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Department of Commerce
National Oceanic and Atmospheric Administration
Research and Development Costs
(Dollar amounts in thousands)

The NOAA FY 2020 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities.

The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - developed NOAA's most recent Five-Year Research and Development Plan (FY 2013-2017). This plan guides NOAA's R&D activities and provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities.

NOAA requests $459 million for investments (excluding equipment and facilities) in R&D in the FY 2020 Budget. The distribution by line offices is provided in the table below.

Line Office	Research	Development	Total R&D (excluding Equipment and Facilities)	Equipment and Facilities	Total R&D with Equipment and Facilities
NOS	$29,729	$24,400	$54,129	$0	$54,129
NMFS	$41,871	$13,545	$55,416	$0	$55,416
OAR	$249,207	$54,518	$303,725	$31,524	$335,249
NWS	$3,628	$13,889	$17,517	$780	$18,297
NESDIS	$27,830	$0	$27,830	$0	$27,830
OMAO	$0	$0	$0	$160,303	$160,303
Total	**$352,265**	**$106,352**	**$458,617**	**$192,607**	**$651,224**

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Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 TRANSFER SUMMARY TABLE
(Dollar amounts in thousands)
(Grouped by Title of Transfer, Largest to Smallest)

Page No In CJ	Budget Program	Appropriations	Title of Transfer	Positions	Budget Authority
NWS-2	NWS	ORF	Dissemination Transfer (To ORF)	0	25,000
NWS-2	NWS	PAC	Dissemination Transfer (From PAC)	0	(25,000)
NESDIS-16	NESDIS	ORF	JPSS Operational Phase Transfer (To ORF)	0	20,000
NESDIS-16	NESDIS	PAC	JPSS Operational Phase Transfer (From PAC)	0	(20,000)
OAR-2	OAR	ORF	Climate Research Transfer (To Climate Research Laboratories and Cooperative Institutes)	29	14,331
OAR-2	OAR	ORF	Climate Research Transfer (From Climate Competitive Research)	(29)	(14,331)
OAR-2	OAR	ORF	Climate Research Transfer (To U.S. Weather Research Program)	0	5,676
OAR-2	OAR	ORF	Climate Research Transfer (From Climate Competitive Research)	0	(5,676)
NWS-3	NWS	ORF	National Ice Center (NIC) Transfer (To NWS)	5	2,941
			Observations	*[0]*	*[1,520]*
			Central Processing	*[0]*	*[90]*
			Analyze, Forecast, and Support	*[5]*	*[1,331]*
NESDIS-14	NESDIS	ORF	National Ice Center (NIC) Transfer (From NESDIS)	(5)	(2,941)
OAR-3	OAR	ORF	Transfer of Joint Center for Satellite Data Assimilation (To OAR)	0	2,680
NESDIS-15	NESDIS	ORF	Transfer of Joint Center for Satellite Data Assimilation (From NESDIS)	0	(2,680)
NESDIS-16	NESDIS	ORF	Metop-C Operational Phase Transfer (To ORF)	0	2,500
NESDIS-16	NESDIS	PAC	Metop-C Operational Phase Transfer (From PAC)	0	(2,500)
NESDIS-15	NESDIS	ORF	Office of Space Commerce Transfer to DOC (From ORF)	(5)	(1,800)
NESDIS-15	NESDIS	ORF	Commercial Remote Sensing and Regulatory Affairs Transfer to DOC (From ORF)	(6)	(1,800)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2020 TRANSFER SUMMARY TABLE
(Dollar amounts in thousands)
(Grouped by Title of Transfer, Largest to Smallest)

Page No In CJ	Budget Program	Appropriations	Title of Transfer	Positions	Budget Authority
OMAO-3	OMAO	ORF	Unmanned Aviation Systems Transfer (To Unmanned Systems Operations)	0	665
OMAO-3	OMAO	ORF	Unmanned Aviation Systems Transfer (From Aviation Operations and Aircraft Services)	0	(665)
		Total, Transfers		(11)	(3,600)

*The amounts transferred from NESDIS Office of Space Commerce and Commercial Remote Sensing and Regulatory Affairs are transferred to DOC Operations and Administration.

NATIONAL OCEAN SERVICE
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Navigation, Observations and Positioning																
Navigation, Observations and Positioning	539	536	156,467	0	0	2,321	0	539	536	158,788	0	0	(12,396)	539	536	146,392
Hydrographic Survey Priorities/Contracts	13	13	32,000	0	0	0	0	13	13	32,000	0	0	(5,051)	13	13	26,949
IOOS Regional Observations	0	0	38,500	0	0	0	0	0	0	38,500	0	0	(19,056)	0	0	19,444
Total, Navigation, Observations and Positioning	**552**	**549**	**226,967**	**0**	**0**	**2,321**	**0**	**552**	**549**	**229,288**	**0**	**0**	**(36,503)**	**552**	**549**	**192,785**
Coastal Science and Assessment																
Coastal Science, Assessment, Response and Restoration	253	247	77,500	0	0	1,153	0	253	247	78,653	(94)	(47)	(24,255)	159	200	54,398
Competitive Research	0	0	18,000	0	0	0	0	0	0	18,000	0	0	(18,000)	0	0	0
Total, Coastal Science and Assessment	**253**	**247**	**95,500**	**0**	**0**	**1,153**	**0**	**253**	**247**	**96,653**	**(94)**	**(47)**	**(42,255)**	**159**	**200**	**54,398**
Ocean and Coastal Management and Services																
Coastal Zone Management and Services	118	116	43,500	0	0	539	0	118	116	44,039	0	0	937	118	116	44,976
Coastal Management Grants	0	0	75,500	0	0	0	0	0	0	75,500	0	0	(75,500)	0	0	0
Title IX Fund	0	0	30,000	0	0	0	0	0	0	30,000	0	0	(30,000)	0	0	0
Coral Reef Program	19	19	27,600	0	0	79	0	19	19	27,679	0	0	(1,572)	19	19	26,107
National Estuarine Research Reserve System	0	0	27,000	0	0	0	0	0	0	27,000	0	0	(27,000)	0	0	0
Sanctuaries and Marine Protected Areas	177	174	55,500	0	0	779	0	177	174	56,279	0	0	(4,840)	177	174	51,439
Total, Ocean and Coastal Management and Services	**314**	**309**	**259,100**	**0**	**0**	**1,397**	**0**	**314**	**309**	**260,497**	**0**	**0**	**(137,975)**	**314**	**309**	**122,522**
Total, NOS - Discretionary ORF	**1,119**	**1,105**	**581,567**	**0**	**0**	**4,871**	**0**	**1,119**	**1,105**	**586,438**	**(94)**	**(47)**	**(216,733)**	**1,025**	**1,058**	**369,705**
Total, NOS - Discretionary PAC	0	0	3,900	0	0	0	0	0	0	3,900	0	0	(2,359)	0	0	1,541
Total, NOS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NOS	**1,119**	**1,105**	**585,467**	**0**	**0**	**4,871**	**0**	**1,119**	**1,105**	**590,338**	**(94)**	**(47)**	**(219,092)**	**1,025**	**1,058**	**371,246**
Total, NOS - Mandatory Accounts	16	16	30,965	0	0	0	(10,660)	16	16	20,305	0	0	0	16	16	20,305
GRAND TOTAL NOS	**1,135**	**1,121**	**616,432**	**0**	**0**	**4,871**	**(10,660)**	**1,135**	**1,121**	**610,643**	**(94)**	**(47)**	**(219,092)**	**1,041**	**1,074**	**391,551**

NATIONAL MARINE FISHERIES SERVICE
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Protected Resources Science and Management																
Marine Mammals, Sea Turtles, and Other Species	490	466	118,348	0	0	1,760	0	490	466	120,108	0	0	(7,599)	490	466	112,509
Species Recovery Grants	3	3	7,000	0	0	5	0	3	3	7,005	0	0	(1,009)	3	3	5,996
Atlantic Salmon	23	22	6,500	0	0	85	0	23	22	6,585	0	0	(315)	23	22	6,270
Pacific Salmon	338	322	65,000	0	0	1,314	0	338	322	66,314	0	0	(4,573)	338	322	61,741
Total, Protected Resources Science and Management	**854**	**813**	**196,848**	**0**	**0**	**3,164**	**0**	**854**	**813**	**200,012**	**0**	**0**	**(13,496)**	**854**	**813**	**186,516**
Fisheries Science and Management																
Fisheries and Ecosystem Science Programs and Services	625	595	147,107	0	0	2,304	0	625	595	149,411	(12)	(12)	(13,818)	613	583	135,593
Fisheries Data Collections, Surveys, and Assessments	480	457	168,086	0	0	1,866	0	480	457	169,952			(12,296)	480	457	157,656
Observers and Training	158	150	53,955	0	0	475	0	158	150	54,430			(10,383)	158	150	44,047
Fisheries Management Programs and Services	466	444	121,116	0	0	1,757	0	466	444	122,873			(9,220)	466	444	113,653
Aquaculture	28	27	15,000	0	0	123	0	28	27	15,123			(2,118)	28	27	13,005
Salmon Management Activities	33	31	37,000	0	0	118	0	33	31	37,118			(5,520)	33	31	31,598
Regional Councils and Fisheries Commissions	13	12	40,175	0	0	1,280	0	13	12	41,455			(3,802)	13	12	37,653
Interjurisdictional Fisheries Grants	2	2	3,365	0	0	0	0	2	2	3,365	(2)	(2)	(3,365)	0	0	0
Total, Fisheries Science and Management	**1,805**	**1,718**	**585,804**	**0**	**0**	**7,923**	**0**	**1,805**	**1,718**	**593,727**	**(14)**	**(14)**	**(60,522)**	**1,791**	**1,704**	**533,205**
Enforcement																
Enforcement	244	232	69,796	0	0	962	0	244	232	70,758	9	7	(16,686)	253	239	54,072
Total, Enforcement	**244**	**232**	**69,796**	**0**	**0**	**962**	**0**	**244**	**232**	**70,758**	**9**	**7**	**(16,686)**	**253**	**239**	**54,072**
Habitat Conservation and Restoration																
Habitat Conservation and Restoration	167	158	56,384	0	0	741	0	167	158	57,125	0	0	(19,250)	167	158	37,875
Subtotal, Habitat Conservation & Restoration	**167**	**158**	**56,384**	**0**	**0**	**741**	**0**	**167**	**158**	**57,125**	**0**	**0**	**(19,250)**	**167**	**158**	**37,875**
Total, NMFS - Discretionary ORF	**3,070**	**2,921**	**908,832**	**0**	**0**	**12,790**	**0**	**3,070**	**2,921**	**921,622**	**(5)**	**(7)**	**(109,954)**	**3,065**	**2,914**	**811,668**
Total, NMFS - Discretionary PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, NMFS - Other Discretionary Accounts	2	2	80,349	0	0	0	0	2	2	80,349	(2)	(2)	(80,000)	0	0	349
Discretionary Total - NMFS	**3,072**	**2,923**	**989,181**	**0**	**0**	**12,790**	**0**	**3,072**	**2,923**	**1,001,971**	**(7)**	**(9)**	**(189,954)**	**3,065**	**2,914**	**812,017**
Total, NMFS - Mandatory Accounts	43	43	38,267	(3)	(3)	0	(7,614)	40	40	30,653	0	0	0	40	40	30,653
GRAND TOTAL NMFS	**3,115**	**2,966**	**1,027,448**	**(3)**	**(3)**	**12,790**	**(7,614)**	**3,112**	**2,963**	**1,032,624**	**(7)**	**(9)**	**(189,954)**	**3,105**	**2,954**	**842,670**

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Climate Research																
Laboratories & Cooperative Institutes	236	227	61,000	43	43	1,070	14,331	279	270	76,401	0	0	(2,438)	279	270	73,963
Regional Climate Data & Information	28	27	38,000	(14)	(14)	51	0	14	13	38,051	(10)	(10)	(24,505)	4	3	13,546
Climate Competitive Research	44	43	60,000	(29)	(29)	55	(20,007)	15	14	40,048	(15)	(14)	(40,048)	0	0	0
Total, Climate Research	**308**	**297**	**159,000**	**0**	**0**	**1,176**	**(5,676)**	**308**	**297**	**154,500**	**(25)**	**(24)**	**(66,991)**	**283**	**273**	**87,509**
Weather & Air Chemistry Research																
Laboratories & Cooperative Institutes																
Laboratories & Cooperative Institutes	252	227	85,758	0	0	900	0	252	227	86,658	(38)	(37)	(19,968)	214	190	66,690
Subtotal, Laboratories & Cooperative Institutes	**252**	**227**	**85,758**	**0**	**0**	**900**	**0**	**252**	**227**	**86,658**	**(38)**	**(37)**	**(19,968)**	**214**	**190**	**66,690**
Weather & Air Chemistry Research Programs																
U.S. Weather Research Program (USWRP)	6	6	17,000	0	0	24	8,356	6	6	25,380	1	1	2,857	7	7	28,237
Tornado Severe Storm Research / Phased Array Radar	3	3	12,622	0	0	12	0	3	3	12,634	0	0	0	3	3	12,634
Joint Technology Transfer Initiative	1	1	20,000	0	0	4	0	1	1	20,004	0	0	(17,000)	1	1	3,004
Subtotal, Weather & Air Chemistry Research Programs	**10**	**10**	**49,622**	**0**	**0**	**40**	**8,356**	**10**	**10**	**58,018**	**1**	**1**	**(14,143)**	**11**	**11**	**43,875**
Total, Weather & Air Chemistry Research	**262**	**237**	**135,380**	**0**	**0**	**940**	**8,356**	**262**	**237**	**144,676**	**(37)**	**(36)**	**(34,111)**	**225**	**201**	**110,565**
Ocean, Coastal, and Great Lakes Research																
Laboratories & Cooperative Institutes																
Laboratories & Cooperative Institutes	124	118	36,000	0	0	467	0	124	118	36,467	0	0	(7,474)	124	118	28,993
Subtotal, Laboratories & Cooperative Institutes	**124**	**118**	**36,000**	**0**	**0**	**467**	**0**	**124**	**118**	**36,467**	**0**	**0**	**(7,474)**	**124**	**118**	**28,993**

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
National Sea Grant College Program																
National Sea Grant College Program Base	17	17	68,000	0	0	67	0	17	17	68,067	(17)	(17)	(68,067)	0	0	0
Marine Aquaculture Program	1	1	12,000	0	0	4	0	1	1	12,004	(1)	(1)	(12,004)	0	0	0
Subtotal, National Sea Grant College Program	**18**	**18**	**80,000**	**0**	**0**	**71**	**0**	**18**	**18**	**80,071**	**(18)**	**(18)**	**(80,071)**	**0**	**0**	**0**
Ocean Exploration and Research	23	22	42,000	0	0	87	0	23	22	42,087	0	0	(22,449)	23	22	19,638
Integrated Ocean Acidification	17	16	12,000	0	0	63	0	17	16	12,063	0	0	(3,994)	17	16	8,069
Sustained Ocean Observations and Monitoring	39	37	43,000	0	0	147	0	39	37	43,147	0	0	(6,007)	39	37	37,140
Oceans, Coastal and Great Lakes Joint Technology Transfer Initiative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oceanographic Research Partnership Program	0	0	5,500	0	0	0	0	0	0	5,500	0	0	(5,500)	0	0	0
National Oceanographic Partnership Program	0	0	0	0	0	0	0	0	0	0	1	1	5,000	1	1	5,000
Total, Ocean, Coastal, & Great Lakes Research	**221**	**211**	**218,500**	**0**	**0**	**835**	**0**	**221**	**211**	**219,335**	**(17)**	**(17)**	**(120,495)**	**204**	**194**	**98,840**
Innovative Research & Technology																
High Performance Computing Initiatives	15	14	12,180	0	0	55	0	15	14	12,235	0	0	0	15	14	12,235
Total, Innovative Research & Technology	**15**	**14**	**12,180**	**0**	**0**	**55**	**0**	**15**	**14**	**12,235**	**0**	**0**	**0**	**15**	**14**	**12,235**
Total, OAR - Discretionary ORF	**806**	**759**	**525,060**	**0**	**0**	**3,006**	**2,680**	**806**	**759**	**530,746**	**(79)**	**(77)**	**(221,597)**	**727**	**682**	**309,149**
Total, OAR - Discretionary PAC	0	0	41,000	0	0	0	0	0	0	41,000	0	0	(15,000)	0	0	26,000
Total, OAR - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - OAR	**806**	**759**	**566,060**	**0**	**0**	**3,006**	**2,680**	**806**	**759**	**571,746**	**(79)**	**(77)**	**(236,597)**	**727**	**682**	**335,149**

NATIONAL WEATHER SERVICE
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Observations	793	739	224,363	0	0	2,838	1,520	793	739	228,721			(17,022)	793	739	211,699
Central Processing	242	257	97,890	0	0	1,113	90	242	257	99,093	(74)	(74)	(12,229)	168	183	86,864
Analyze, Forecast and Support	3,060	2,843	505,438	5	5	11,452	1,331	3,065	2,848	518,221	(281)	(143)	(35,185)	2,784	2,705	483,036
Dissemination	91	83	50,028	0	0	454	25,000	91	83	75,482			(389)	91	83	75,093
Science and Technology Integration	461	438	143,000	0	0	2,129	0	461	438	145,129			(12,523)	461	438	132,606
Total, NWS - Discretionary ORF	**4,647**	**4,360**	**1,020,719**	**5**	**5**	**17,986**	**27,941**	**4,652**	**4,365**	**1,066,646**	**(355)**	**(217)**	**(77,348)**	**4,297**	**4,148**	**989,298**
Total, NWS - Discretionary PAC	27	26	141,890	0	0	0	(25,000)	27	26	116,890	0	0	(24,314)	27	26	92,576
Total, NWS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NWS	**4,674**	**4,386**	**1,162,609**	**5**	**5**	**17,986**	**2,941**	**4,679**	**4,391**	**1,183,536**	**(355)**	**(217)**	**(101,662)**	**4,324**	**4,174**	**1,081,874**

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Environmental Satellite Observing Systems																
Office of Satellite and Product Operations (OSPO)																
Office of Satellite and Product Operations	295	259	146,924	8	8	1,600	41,484	303	267	190,008	0	0	(3,218)	303	267	186,790
Subtotal, Office of Satellite and Product Operations (OSPO)	**295**	**259**	**146,924**	**8**	**8**	**1,600**	**41,484**	**303**	**267**	**190,008**	**0**	**0**	**(3,218)**	**303**	**267**	**186,790**
Product Development, Readiness & Application																
Product Development, Readiness & Application	84	72	31,000			114	(2,680)	84	72	28,434	0	0	(702)	84	72	27,732
Subtotal, Product Development, Readiness & Application	**84**	**72**	**31,000**	**0**	**0**	**114**	**(2,680)**	**84**	**72**	**28,434**	**0**	**0**	**(702)**	**84**	**72**	**27,732**
Commercial Remote Sensing Regulatory Affairs	6	6	1,800	(6)	(6)	0	(1,800)	0	0	0	0	0	0	0	0	0
Office of Space Commerce	5	3	1,800	(5)	(3)	0	(1,800)	0	0	0	0	0	0	0	0	0
Group on Earth Observations (GEO)	0	0	500	0	0	0	0	0	0	500	0	0	0	0	0	500
Total, Environmental Satellite Observing Systems	**390**	**340**	**182,024**	**(3)**	**(1)**	**1,714**	**35,204**	**387**	**339**	**218,942**	**0**	**0**	**(3,920)**	**387**	**339**	**215,022**
National Centers for Environmental Information																
National Centers for Environmental Information	200	187	60,642	0	0	571	0	200	187	61,213	0	0	(4,643)	200	187	56,570
Total, National Centers for Environmental Information	**200**	**187**	**60,642**	**0**	**0**	**571**	**0**	**200**	**187**	**61,213**	**0**	**0**	**(4,643)**	**200**	**187**	**56,570**
Total, NESDIS - Discretionary ORF	**590**	**527**	**242,666**	**(3)**	**(1)**	**2,285**	**35,204**	**587**	**526**	**280,155**	**0**	**0**	**(8,563)**	**587**	**526**	**271,592**
Total, NESDIS - Discretionary PAC	290	263	1,455,879	(13)	(13)	0	(44,425)	277	250	1,411,454	3	2	(210,335)	280	252	1,201,119
Total, NESDIS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NESDIS	**880**	**790**	**1,698,545**	**(16)**	**(14)**	**2,285**	**(9,221)**	**864**	**776**	**1,691,609**	**3**	**2**	**(218,898)**	**867**	**778**	**1,472,711**

MISSION SUPPORT
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Executive Leadership	127	119	27,078	0	0	488	0	127	119	27,566	0	0	739	127	119	28,305
Mission Services and Management	600	563	148,000	0	0	2,452	0	600	563	150,452	0	0	4,260	600	563	154,712
IT Security	14	14	10,050	0	0	57	0	14	14	10,107	0	0	4,972	14	14	15,079
Payment to the DOC Working Capital Fund	0	0	53,585	0	0	2,358	6,127	0	0	62,070	0	0	0	0	0	62,070
Office of Education	18	18	28,500	0	0	45	0	18	18	28,545	(11)	(11)	(27,506)	7	7	1,039
Total, MS - Discretionary ORF	**759**	**714**	**267,213**	**0**	**0**	**5,400**	**6,127**	**759**	**714**	**278,740**	**(11)**	**(11)**	**(17,535)**	**748**	**703**	**261,205**
Total, MS - Discretionary PAC	0	0	25,000	0	0	0	0	0	0	25,000	0	0	(20,002)	0	0	4,998
Total, MS - Other Discretionary Accounts																
Discretionary Total - MS	**759**	**714**	**292,213**	**0**	**0**	**5,400**	**6,127**	**759**	**714**	**303,740**	**(11)**	**(11)**	**(37,537)**	**748**	**703**	**266,203**
Total, MS - Mandatory Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL MS	**759**	**714**	**292,213**	**0**	**0**	**5,400**	**6,127**	**759**	**714**	**303,740**	**(11)**	**(11)**	**(37,537)**	**748**	**703**	**266,203**

OFFICE OF MARINE AND AVIATION OPERATIONS
Direct Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Marine Operations and Maintenance	869	840	190,670	0	0	3,553	0	869	840	194,223			(1,801)	869	840	192,422
Aviation Operations and Aircraft Services	127	122	35,750	0	0	627	(665)	127	122	35,712			(1,126)	127	122	34,586
Unmanned System Operations	0	0	0	0	0	0	665	0	0	665	10	8	4,000	10	8	4,665
Total, OMAO - Discretionary ORF	**996**	**962**	**226,420**	**0**	**0**	**4,180**	**0**	**996**	**962**	**230,600**	**10**	**8**	**1,073**	**1,006**	**970**	**231,673**
Total, OMAO - Discretionary PAC	11	11	99,378	0	0	0	0	11	11	99,378	0	0	(7,678)	11	11	91,700
Total, OMAO - Other Discretionary Accounts	0	0	1,449	0	0	0	48	0	0	1,497	0	0	0	0	0	1,497
Discretionary Total - OMAO	**1,007**	**973**	**327,247**	**0**	**0**	**4,180**	**48**	**1,007**	**973**	**331,475**	**10**	**8**	**(6,605)**	**1,017**	**981**	**324,870**
Total, OMAO - Mandatory Accounts	0	0	30,075	0	0	0	0	0	0	30,075	0	0	0	0	0	30,075
GRAND TOTAL OMAO	**1,007**	**973**	**357,322**	**0**	**0**	**4,180**	**48**	**1,007**	**973**	**361,550**	**10**	**8**	**(6,605)**	**1,017**	**981**	**354,945**

ORF SUMMARY
LINE OFFICE DIRECT DISCRETIONARY OBLIGATIONS
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
National Ocean Service	1,119	1,105	581,567	0	0	4,871	0	1,119	1,105	586,438	(94)	(47)	(216,733)	1,025	1,058	369,705
National Marine Fisheries Service	3,070	2,921	908,832	0	0	12,790	0	3,070	2,921	921,622	(5)	(7)	(109,954)	3,065	2,914	811,668
Office of Oceanic and Atmospheric Research	806	759	525,060	0	0	3,006	2,680	806	759	530,746	(79)	(77)	(221,597)	727	682	309,149
National Weather Service	4,647	4,360	1,020,719	5	5	17,986	27,941	4,652	4,365	1,066,646	(355)	(217)	(77,348)	4,297	4,148	989,298
National Environmental Satellite, Data and Information Service	590	527	242,666	(3)	(1)	2,285	35,204	587	526	280,155	0	0	(8,563)	587	526	271,592
Mission Support	759	714	267,213	0	0	5,400	6,127	759	714	278,740	(11)	(11)	(17,535)	748	703	261,205
Office of Marine and Aviation Operations	996	962	226,420	0	0	4,180	0	996	962	230,600	10	8	1,073	1,006	970	231,673
SUBTOTAL LO DIRECT DISCRETIONARY ORF OBLIGATIONS	**11,987**	**11,348**	**3,772,477**	**2**	**4**	**50,518**	**71,952**	**11,989**	**11,352**	**3,894,947**	**(534)**	**(351)**	**(650,657)**	**11,455**	**11,001**	**3,244,290**

ORF ADJUSTMENTS
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
SUBTOTAL ORF DIRECT OBLIGATIONS	**11,987**	**11,348**	**3,772,477**	**2**	**4**	**50,518**	**71,952**	**11,989**	**11,352**	**3,894,947**	**(534)**	**(351)**	**(650,657)**	**11,455**	**11,001**	**3,244,290**
FINANCING																
Deobligations	0	0	(17,500)	0	0	0	(10,000)	0	0	(27,500)	0	0	0	0	0	(27,500)
Unobligated Balance, SOY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rescission	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ORF Financing	**0**	**0**	**(17,500)**	**0**	**0**	**0**	**(10,000)**	**0**	**0**	**(27,500)**	**0**	**0**	**0**	**0**	**0**	**(27,500)**
SUBTOTAL ORF BUDGET AUTHORITY	**11,987**	**11,348**	**3,754,977**	**2**	**4**	**50,518**	**61,952**	**11,989**	**11,352**	**3,867,447**	**(534)**	**(351)**	**(650,657)**	**11,455**	**11,001**	**3,216,790**
TRANSFERS																
Transfer from ORF to PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from P&D to ORF	0	0	(157,980)	0	0	0	(427)	0	0	(158,407)	0	0	0	0	0	(158,407)
Rescission	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ORF Transfers	**0**	**0**	**(157,980)**	**0**	**0**	**0**	**(427)**	**0**	**0**	**(158,407)**	**0**	**0**	**0**	**0**	**0**	**(158,407)**
SUBTOTAL ORF APPROPRIATION	**11,987**	**11,348**	**3,596,997**	**2**	**4**	**50,518**	**61,525**	**11,989**	**11,352**	**3,709,040**	**(534)**	**(351)**	**(650,657)**	**11,455**	**11,001**	**3,058,383**

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
Direct Discretionary Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
NOS																
Construction																
National Estuarine Research Reserve Construction (NERRS)	0	0	1,900	0	0	0	0	0	0	1,900	0	0	(1,900)	0	0	0
Marine Sanctuaries Construction Base	0	0	2,000	0	0	0	0	0	0	2,000	0	0	(459)	0	0	1,541
Subtotal, NOS Construction	**0**	**0**	**3,900**	**0**	**0**	**0**	**0**	**0**	**0**	**3,900**	**0**	**0**	**(2,359)**	**0**	**0**	**1,541**
Total, NOS - PAC	**0**	**0**	**3,900**	**0**	**0**	**0**	**0**	**0**	**0**	**3,900**	**0**	**0**	**(2,359)**	**0**	**0**	**1,541**
Total, NMFS - PAC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
OAR																
Systems Acquisition																
Research Supercomputing/ CCRI	0	0	41,000	0	0	0	0	0	0	41,000	0	0	(15,000)	0	0	26,000
Subtotal, OAR Systems Acquisition	**0**	**0**	**41,000**	**0**	**0**	**0**	**0**	**0**	**0**	**41,000**	**0**	**0**	**(15,000)**	**0**	**0**	**26,000**
Total, OAR - PAC	**0**	**0**	**41,000**	**0**	**0**	**0**	**0**	**0**	**0**	**41,000**	**0**	**0**	**(15,000)**	**0**	**0**	**26,000**
NWS																
Systems Acquisition																
Observations	0	0	21,129	0	0	0	0	0	0	21,129	0	0	(4,879)	0	0	16,250
Central Processing	27	26	66,761	0	0	0	0	27	26	66,761	0	0	(8,622)	27	26	58,139
Dissemination	0	0	35,000	0	0	0	(25,000)	0	0	10,000	0	0	(447)	0	0	9,553
Subtotal, NWS Systems Acquisition	**27**	**26**	**122,890**	**0**	**0**	**0**	**(25,000)**	**27**	**26**	**97,890**	**0**	**0**	**(13,948)**	**27**	**26**	**83,942**
Construction																
Facilities Construction and Major Repairs	0	0	19,000	0	0	0	0	0	0	19,000	0	0	(10,366)	0	0	8,634
Subtotal, NWS Construction	**0**	**0**	**19,000**	**0**	**0**	**0**	**0**	**0**	**0**	**19,000**	**0**	**0**	**(10,366)**	**0**	**0**	**8,634**
Total, NWS - PAC	**27**	**26**	**141,890**	**0**	**0**	**0**	**(25,000)**	**27**	**26**	**116,890**	**0**	**0**	**(24,314)**	**27**	**26**	**92,576**

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
Direct Discretionary Obligations
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
NESDIS																
Systems Acquisition																
Geostationary Systems - R	59	59	408,380			0		59	59	408,380	0	0	(104,324)	59	59	304,056
Joint Polar Satellite System (JPSS)	65	60	548,035	(65)	(60)	0	(548,035)	0	0	0	0	0	0	0	0	0
Polar Follow On	29	24	329,956	(29)	(24)	0	(329,956)	0	0	0	0	0	0	0	0	0
Polar Weather Satellites	0	0	0	94	84	0	857,991	94	84	857,991	0	0	(102,953)	94	84	755,038
Cooperative Data and Rescue Services (CDARS)	0	0	26,539			0	0	0	0	26,539	0	0	(11,689)	0	0	14,850
Space Weather Follow On	2	2	27,000	0	0	0	0	2	2	27,000	3	2	(1,400)	5	4	25,600
COSMIC 2/GNSS RO	2	1	5,892	(2)	(1)	0	(5,892)	0	0	0	0	0	0	0	0	0
Satellite Ground Services	86	78	58,000	(86)	(78)	0	(58,000)	0	0	0	0	0	0	0	0	0
System Architecture and Advanced Planning	12	10	4,929	(12)	(10)	0	(4,929)	0	0	0	0	0	0	0	0	0
Projects, Planning and Analysis	35	29	40,000	(35)	(29)	0	(40,000)	0	0	0	0	0	0	0	0	0
Commercial Weather Data Pilot	0	0	6,000			0	(6,000)	0	0	0	0	0	0	0	0	0
Low Earth Orbit (LEO)	0	0	0	40	35	0	34,623	40	35	34,623	0	0	(1,421)	40	35	33,202
Geostationary Earth Orbit (GEO)	0	0	0	40	36	0	25,219	40	36	25,219	0	0	(2,816)	40	36	22,403
Systems Architecure and Engineering (SAE)	0	0	0	42	34	0	30,554	42	34	30,554	0	0	14,268	42	34	44,822
Subtotal, NESDIS Systems Acquisition	**290**	**263**	**1,454,731**	**(13)**	**(13)**	**0**	**(44,425)**	**277**	**250**	**1,410,306**	**3**	**2**	**(210,335)**	**280**	**252**	**1,199,971**
Construction																
Satellite CDA Facility	0	0	2,450	0	0	0	0	0	0	2,450	0	0	0	0	0	2,450
Subtotal, NESDIS Construction	**0**	**0**	**2,450**	**0**	**0**	**0**	**0**	**0**	**0**	**2,450**	**0**	**0**	**0**	**0**	**0**	**2,450**
Transfer to OIG	**0**	**0**	**(1,302)**	**0**	**0**	**0**	**0**	**0**	**0**	**(1,302)**	**0**	**0**	**0**	**0**	**0**	**(1,302)**
Total, NESDIS - PAC	**290**	**263**	**1,455,879**	**(13)**	**(13)**	**0**	**(44,425)**	**277**	**250**	**1,411,454**	**3**	**2**	**(210,335)**	**280**	**252**	**1,201,119**
Mission Support																
Construction																
NOAA Construction	0	0	25,000	0	0	0	0	0	0	25,000	0	0	(20,002)	0	0	4,998
Subtotal, Mission Support Construction	**0**	**0**	**25,000**	**0**	**0**	**0**	**0**	**0**	**0**	**25,000**	**0**	**0**	**(20,002)**	**0**	**0**	**4,998**
Total, Mission Support - PAC	**0**	**0**	**25,000**	**0**	**0**	**0**	**0**	**0**	**0**	**25,000**	**0**	**0**	**(20,002)**	**0**	**0**	**4,998**
OMAO																
Marine and Aviation Capital Investments																
Platform Capital Improvements & Tech Infusion	4	4	24,378	0	0	0	0	4	4	24,378			(7,678)	4	4	16,700
Vessel Recapitalization	7	7	75,000	0	0	0	0	7	7	75,000	0	0	0	7	7	75,000
Aircraft Recapitalization	0	0	0	0	0	0	0	0	0	0			0	0	0	0
Subtotal, Marine and Aviation Capital Investments	**11**	**11**	**99,378**	**0**	**0**	**0**	**0**	**11**	**11**	**99,378**	**0**	**0**	**(7,678)**	**11**	**11**	**91,700**
Total, OMAO - PAC	**11**	**11**	**99,378**	**0**	**0**	**0**	**0**	**11**	**11**	**99,378**	**0**	**0**	**(7,678)**	**11**	**11**	**91,700**
GRAND TOTAL PAC DISCRETIONARY OBLIGATIONS	**328**	**300**	**1,767,047**	**(13)**	**(13)**	**0**	**(69,425)**	**315**	**287**	**1,697,622**	**3**	**2**	**(279,688)**	**318**	**289**	**1,417,934**

PAC ADJUSTMENTS
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
SUBTOTAL PAC DIRECT OBLIGATIONS	**328**	**300**	**1,767,047**	**(13)**	**(13)**	**0**	**(69,425)**	**315**	**287**	**1,697,622**	**3**	**2**	**(279,688)**	**318**	**289**	**1,417,934**
FINANCING																
Deobligations	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	(13,000)
Rescission	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total PAC Financing	**0**	**0**	**(13,000)**	**0**	**0**	**0**	**0**	**0**	**0**	**(13,000)**	**0**	**0**	**0**	**0**	**0**	**(13,000)**
SUBTOTAL PAC BUDGET AUTHORITY	**328**	**300**	**1,754,047**	**(13)**	**(13)**	**0**	**(69,425)**	**315**	**287**	**1,684,622**	**3**	**2**	**(279,688)**	**318**	**289**	**1,404,934**
TRANSFERS																
Transfer from ORF to PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer to OIG	0	0	1,302	0	0	0	0	0	0	1,302	0	0	0	0	0	1,302
Unobligated balance, Rescission	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total PAC Transfers	**0**	**0**	**1,302**	**0**	**0**	**0**	**0**	**0**	**0**	**1,302**	**0**	**0**	**0**	**0**	**0**	**1,302**
SUBTOTAL PAC APPROPRIATION	**328**	**300**	**1,755,349**	**(13)**	**(13)**	**0**	**(69,425)**	**315**	**287**	**1,685,924**	**3**	**2**	**(279,688)**	**318**	**289**	**1,406,236**

OTHER ACCOUNTS DISCRETIONARY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
NMFS																
Fishermen's Contingency Fund Obligations	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	349
Fishermen's Contingency Fund Budget Authority	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	349
Fishermen's Contingency Fund Appropriations	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	349
Foreign Fishing Observer Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign Fishing Observer Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign Fishing Observer Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	0	0	(157,980)	0	0	0	(427)	0	0	(158,407)	0	0	0	0	0	(158,407)
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund Obligations	2	2	65,000	0	0	0	0	2	2	65,000	(2)	(2)	(65,000)	0	0	0
Pacific Coastal Salmon Recovery Fund Budget Authority	2	2	65,000	0	0	0	0	2	2	65,000	(2)	(2)	(65,000)	0	0	0
Pacific Coastal Salmon Recovery Fund Appropriation	2	2	65,000	0	0	0	0	2	2	65,000	(2)	(2)	(65,000)	0	0	0
Marine Mammal Unusual Mortality Event Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Disaster Assistance Fund Obligations	0	0	15,000	0	0	0	0	0	0	15,000	0	0	(15,000)	0	0	0
Fisheries Disaster Assistance Fund Budget Authority	0	0	15,000	0	0	0	0	0	0	15,000	0	0	(15,000)	0	0	0
Fisheries Disaster Assistance Fund Appropriation	0	0	15,000	0	0	0	0	0	0	15,000	0	0	(15,000)	0	0	0
Subtotal, NMFS Other Discretionary Direct Obligations	**2**	**2**	**80,349**	**0**	**0**	**0**	**0**	**2**	**2**	**80,349**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**349**
Subtotal, NMFS Other Discretionary Budget Authority	**2**	**2**	**(77,631)**	**0**	**0**	**0**	**(427)**	**2**	**2**	**(78,058)**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**(158,058)**
Subtotal, NMFS Other Discretionary Appropriation	**2**	**2**	**80,349**	**0**	**0**	**0**	**0**	**2**	**2**	**80,349**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**349**
OMAO																
Medicare Eligible Retiree Healthcare Fund Obligations	0	0	1,449	0	0	0	48	0	0	1,497	0	0	0	0	0	1,497
Medicare Eligible Retiree Healthcare Fund Budget Authority	0	0	1,603	0	0	0	(106)	0	0	1,497	0	0	0	0	0	1,497
Medicare Eligible Retiree Healthcare Fund Appropriation	0	0	1,603	0	0	0	(106)	0	0	1,497	0	0	0	0	0	1,497
Subtotal, OMAO Other Discretionary Direct Obligations	**0**	**0**	**1,449**	**0**	**0**	**0**	**48**	**0**	**0**	**1,497**	**0**	**0**	**0**	**0**	**0**	**1,497**
Subtotal, OMAO Other Discretionary Budget Authority	**0**	**0**	**1,603**	**0**	**0**	**0**	**(106)**	**0**	**0**	**1,497**	**0**	**0**	**0**	**0**	**0**	**1,497**
Subtotal, OMAO Other Discretionary Appropriation	**0**	**0**	**1,603**	**0**	**0**	**0**	**(106)**	**0**	**0**	**1,497**	**0**	**0**	**0**	**0**	**0**	**1,497**
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	**2**	**2**	**81,798**	**0**	**0**	**0**	**48**	**2**	**2**	**81,846**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**1,846**
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	**2**	**2**	**(76,028)**	**0**	**0**	**0**	**(533)**	**2**	**2**	**(76,561)**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**(156,561)**
TOTAL, OTHER DISCRETIONARY APPROPRIATION	**2**	**2**	**81,952**	**0**	**0**	**0**	**(106)**	**2**	**2**	**81,846**	**(2)**	**(2)**	**(80,000)**	**0**	**0**	**1,846**

GRAND TOTAL SUMMARY DISCRETIONARY APPROPRIATIONS
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Operations, Research, and Facilities	11,987	11,348	3,596,997	2	4	50,518	61,525	11,989	11,352	3,709,040	(534)	(351)	(650,657)	11,455	11,001	3,058,383
Procurement, Acquisition, and Construction	328	300	1,755,349	(13)	(13)	0	(69,425)	315	287	1,685,924	3	2	(279,688)	318	289	1,406,236
Fisherman's Contingency Fund	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	349
Pacific Coastal Salmon Recovery Fund	2	2	65,000	0	0	0	0	2	2	65,000	(2)	(2)	(65,000)	0	0	0
Fisheries Disaster Assistance Fund	0	0	15,000	0	0	0	0	0	0	15,000	0	0	(15,000)	0	0	0
Marine Mammal Unusual Mortality Event Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medicare Eligible Retiree Health Care Fund	0	0	1,603	0	0	0	(106)	0	0	1,497	0	0	0	0	0	1,497
GRAND TOTAL DISCRETIONARY APPROPRIATION	**12,317**	**11,650**	**5,434,298**	**(11)**	**(9)**	**50,518**	**(8,006)**	**12,306**	**11,641**	**5,476,810**	**(533)**	**(351)**	**(1,010,345)**	**11,773**	**11,290**	**4,466,465**

SUMMARY OF DISCRETIONARY RESOURCES
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Direct Discretionary Obligations										0						
ORF Direct Obligations	11,987	11,348	3,772,477	2	4	50,518	71,952	11,989	11,352	3,894,947	(534)	(351)	(650,657)	11,455	11,001	3,244,290
PAC Direct Obligations	328	300	1,767,047	(13)	(13)	0	(69,425)	315	287	1,697,622	3	2	(279,688)	318	289	1,417,934
OTHER Direct Obligations	2	2	81,798	0	0	0	48	2	2	81,846	(2)	(2)	(80,000)	0	0	1,846
TOTAL Direct Discretionary Obligations	**12,317**	**11,650**	**5,621,322**	**(11)**	**(9)**	**50,518**	**2,575**	**12,306**	**11,641**	**5,674,415**	**(533)**	**(351)**	**(1,010,345)**	**11,773**	**11,290**	**4,664,070**
Discretionary Budget Authority																
ORF Budget Authority	11,987	11,348	3,754,977	2	4	50,518	61,952	11,989	11,352	3,867,447	(534)	(351)	(650,657)	11,455	11,001	3,216,790
PAC Budget Authority	328	300	1,754,047	(13)	(13)	0	(69,425)	315	287	1,684,622	3	2	(279,688)	318	289	1,404,934
OTHER Budget Authority	2	2	(76,028)	0	0	0	(533)	2	2	(76,561)	(2)	(2)	(80,000)	0	0	(156,561)
TOTAL Discretionary Budget Authority	**12,317**	**11,650**	**5,432,996**	**(11)**	**(9)**	**50,518**	**(8,006)**	**12,306**	**11,641**	**5,475,508**	**(533)**	**(351)**	**(1,010,345)**	**11,773**	**11,290**	**4,465,163**
Discretionary Appropriations																
ORF Appropriation	11,987	11,348	3,596,997	2	4	50,518	61,525	11,989	11,352	3,709,040	(534)	(351)	(650,657)	11,455	11,001	3,058,383
PAC Appropriation	328	300	1,755,349	(13)	(13)	0	(69,425)	315	287	1,685,924	3	2	(279,688)	318	289	1,406,236
OTHER Appropriation	2	2	81,952	0	0	0	(106)	2	2	81,846	(2)	(2)	(80,000)	0	0	1,846
TOTAL Discretionary Appropriation	**12,317**	**11,650**	**5,434,298**	**(11)**	**(9)**	**50,518**	**(8,006)**	**12,306**	**11,641**	**5,476,810**	**(533)**	**(351)**	**(1,010,345)**	**11,773**	**11,290**	**4,466,465**

OTHER ACCOUNTS MANDATORY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
NOS																
Damage Assessment and Restoration Revolving Fund Obligations	15	15	24,960	0	0	0	(8,992)	15	15	15,968	0	0	0	15	15	15,968
Damage Assessment and Restoration Revolving Fund Budget Authority	15	15	5,992	0	0	0	(24)	15	15	5,968	0	0	0	15	15	5,968
Damage Assessment and Restoration Revolving Fund Appropriation	15	15	0	0	0	0	0	15	15	0	0	0	0	15	15	0
Sanctuaries Enforcement Asset Forfeiture Fund Obligations	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Budget Authority	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Appropriation	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	120
Gulf Coast Ecosystem Restoration Fund Obligations	1	1	5,885	0	0	0	(1,668)	1	1	4,217	0	0	0	1	1	4,217
Gulf Coast Ecosystem Restoration Fund Budget Authority	1	1	0	0	0	0	0	1	1	0	0	0	0	1	1	0
Gulf Coast Ecosystem Restoration Fund Appropriation	1	1	0	0	0	0	0	1	1	0	0	0	0	1	1	0
Subtotal, NOS Other Mandatory Direct Obligations	**16**	**16**	**30,965**	**0**	**0**	**0**	**(10,660)**	**16**	**16**	**20,305**	**0**	**0**	**0**	**16**	**16**	**20,305**
Subtotal, NOS Other Mandatory Budget Authority	**16**	**16**	**6,112**	**0**	**0**	**0**	**(24)**	**16**	**16**	**6,088**	**0**	**0**	**0**	**16**	**16**	**6,088**
Subtotal, NOS Other Mandatory Appropriation	**16**	**16**	**120**	**0**	**0**	**0**	**0**	**16**	**16**	**120**	**0**	**0**	**0**	**16**	**16**	**120**
NMFS																
Promote and Develop Fisheries Obligations	3	3	426	(3)	(3)	0	(426)	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	3	3	158,406	(3)	(3)	0	1	0	0	158,407	0	0	0	0	0	158,407
Promote and Develop Fisheries Appropriation	3	3	0	(3)	(3)	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	0	0	8,083	0	0	0	(8,083)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	8,083	0	0	0	(8,083)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	8,083	0	0	0	(8,083)	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Improvement & Restoration Fund Obligations	0	0	6,563	0	0	0	686	0	0	7,249	0	0	0	0	0	7,249
Environmental Improvement & Restoration Fund Budget Authority	0	0	6,563	0	0	0	686	0	0	7,249	0	0	0	0	0	7,249
Environmental Improvement & Restoration Fund Appropriation	0	0	6,997	0	0	0	731	0	0	7,728	0	0	0	0	0	7,728
Limited Access System Administration Fund Obligations	40	40	14,741	0	0	0	246	40	40	14,987	0	0	0	40	40	14,987
Limited Access System Administration Fund Budget Authority	40	40	14,741	0	0	0	246	40	40	14,987	0	0	0	40	40	14,987
Limited Access System Administration Fund Appropriation	40	40	14,831	0	0	0	166	40	40	14,997	0	0	0	40	40	14,997

OTHER ACCOUNTS MANDATORY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
Western Pacific Sustainable Fisheries Fund Obligations	0	0	596	0	0	0	4	0	0	600	0	0	0	0	0	600
Western Pacific Sustainable Fisheries Fund Budget Authority	0	0	596	0	0	0	4	0	0	600	0	0	0	0	0	600
Western Pacific Sustainable Fisheries Fund Appropriation	0	0	600	0	0	0	0	0	0	600	0	0	0	0	0	600
Fisheries Enforcement Asset Forfeiture Fund Obligations	0	0	3,844	0	0	0	(27)	0	0	3,817	0	0	0	0	0	3,817
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	0	0	3,844	0	0	0	(27)	0	0	3,817	0	0	0	0	0	3,817
Fisheries Enforcement Asset Forfeiture Fund Appropriation	0	0	3,817	0	0	0	0	0	0	3,817	0	0	0	0	0	3,817
North Pacific Observer Fund Obligations	0	0	4,014	0	0	0	(14)	0	0	4,000	0	0	0	0	0	4,000
North Pacific Observer Fund Budget Authority	0	0	4,014	0	0	0	(14)	0	0	4,000	0	0	0	0	0	4,000
North Pacific Observer Fund Appropriation	0	0	4,000	0	0	0	0	0	0	4,000	0	0	0	0	0	4,000
Subtotal, NMFS Other Mandatory Direct Obligations	**43**	**43**	**38,267**	**(3)**	**(3)**	**0**	**(7,614)**	**40**	**40**	**30,653**	**0**	**0**	**0**	**40**	**40**	**30,653**
Subtotal, NMFS Other Mandatory Budget Authority	**43**	**43**	**196,247**	**(3)**	**(3)**	**0**	**(7,187)**	**40**	**40**	**189,060**	**0**	**0**	**0**	**40**	**40**	**189,060**
Subtotal, NMFS Other Mandatory Appropriation	**43**	**43**	**38,328**	**(3)**	**(3)**	**0**	**(7,186)**	**40**	**40**	**31,142**	**0**	**0**	**0**	**40**	**40**	**31,142**
MS																
Spectrum Efficient National Surveillance Radar (ORF) Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrum Efficient National Surveillance Radar (ORF) Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrum Efficient National Surveillance Radar (ORF) Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrum Pipeline (ORF) Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrum Pipeline (ORF) Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spectrum Pipeline (ORF) Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal, MS Other Mandatory Direct Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Subtotal, MS Other Mandatory Budget Authority	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Subtotal, MS Other Mandatory Appropriation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
OMAO																
NOAA Corps Commissioned Officers Retirement Obligations	0	0	30,075	0	0	0	0	0	0	30,075	0	0	0	0	0	30,075
NOAA Corps Commissioned Officers Retirement Budget Authority	0	0	30,075	0	0	0	0	0	0	30,075	0	0	0	0	0	30,075
NOAA Corps Commissioned Officers Retirement Appropriation	0	0	30,075	0	0	0	0	0	0	30,075	0	0	0	0	0	30,075
Subtotal, OMAO Other Mandatory Direct Obligations	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**30,075**
Subtotal, OMAO Other Mandatory Budget Authority	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**30,075**
Subtotal, OMAO Other Mandatory Appropriation	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**0**	**30,075**	**0**	**0**	**0**	**0**	**0**	**30,075**
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	**59**	**59**	**99,307**	**(3)**	**(3)**	**0**	**(18,274)**	**56**	**56**	**81,033**	**0**	**0**	**0**	**56**	**56**	**81,033**
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	**59**	**59**	**232,434**	**(3)**	**(3)**	**0**	**(7,211)**	**56**	**56**	**225,223**	**0**	**0**	**0**	**56**	**56**	**225,223**
TOTAL, OTHER MANDATORY APPROPRIATION	**59**	**59**	**68,523**	**(3)**	**(3)**	**0**	**(7,186)**	**56**	**56**	**61,337**	**0**	**0**	**0**	**56**	**56**	**61,337**

NOAA SUMMARY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
TOTAL Direct Obligations (Discretionary & Mandatory)	12,376	11,709	5,720,629	(14)	(12)	50,518	(15,699)	12,362	11,697	5,755,448	(533)	(351)	(1,010,345)	11,829	11,346	4,745,103
TOTAL Budget Authority (Discretionary & Mandatory)	12,376	11,709	5,665,430	(14)	(12)	50,518	(15,217)	12,362	11,697	5,700,731	(533)	(351)	(1,010,345)	11,829	11,346	4,690,386
TOTAL Appropriation (Discretionary & Mandatory)	12,376	11,709	5,502,821	(14)	(12)	50,518	(15,192)	12,362	11,697	5,538,147	(533)	(351)	(1,010,345)	11,829	11,346	4,527,802
Reimbursable Financing	502	481	242,000	0	0	0	0	502	481	242,000	0	0	0	502	481	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	**12,878**	**12,190**	**5,962,629**	**(14)**	**(12)**	**50,518**	**(15,699)**	**12,864**	**12,178**	**5,997,448**	**(533)**	**(351)**	**(1,010,345)**	**12,331**	**11,827**	**4,987,103**
Offsetting Receipts	0	0	(2,579)	0	0	0	(5,168)	0	0	(7,747)	0	0	0	0	0	(7,747)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	**12,878**	**12,190**	**5,960,050**	**(14)**	**(12)**	**50,518**	**(20,867)**	**12,864**	**12,178**	**5,989,701**	**(533)**	**(351)**	**(1,010,345)**	**12,331**	**11,827**	**4,979,356**

LINE OFFICE SUMMARY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
National Ocean Service																
ORF	1,119	1,105	581,567	0	0	4,871	0	1,119	1,105	586,438	(94)	(47)	(216,733)	1,025	1,058	369,705
PAC	0	0	3,900	0	0	0	0	0	0	3,900	0	0	(2,359)	0	0	1,541
OTHER	16	16	30,965	0	0	0	(10,660)	16	16	20,305	0	0	0	16	16	20,305
TOTAL, NOS	1,135	1,121	616,432	0	0	4,871	(10,660)	1,135	1,121	610,643	(94)	(47)	(219,092)	1,041	1,074	391,551
National Marine Fisheries Service																
ORF	3,070	2,921	908,832	0	0	12,790	0	3,070	2,921	921,622	(5)	(7)	(109,954)	3,065	2,914	811,668
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	45	45	118,616	(3)	(3)	0	(7,614)	42	42	111,002	(2)	(2)	(80,000)	40	40	31,002
TOTAL, NMFS	3,115	2,966	1,027,448	(3)	(3)	12,790	(7,614)	3,112	2,963	1,032,624	(7)	(9)	(189,954)	3,105	2,954	842,670
Oceanic and Atmospheric Research																
ORF	806	759	525,060	0	0	3,006	2,680	806	759	530,746	(79)	(77)	(221,597)	727	682	309,149
PAC	0	0	41,000	0	0	0	0	0	0	41,000	0	0	(15,000)	0	0	26,000
TOTAL, OAR	806	759	566,060	0	0	3,006	2,680	806	759	571,746	(79)	(77)	(236,597)	727	682	335,149
National Weather Service																
ORF	4,647	4,360	1,020,719	5	5	17,986	27,941	4,652	4,365	1,066,646	(355)	(217)	(77,348)	4,297	4,148	989,298
PAC	27	26	141,890	0	0	0	(25,000)	27	26	116,890	0	0	(24,314)	27	26	92,576
TOTAL, NWS	4,674	4,386	1,162,609	5	5	17,986	2,941	4,679	4,391	1,183,536	(355)	(217)	(101,662)	4,324	4,174	1,081,874
National Environmental Satellite, Data and Information Service																
ORF	590	527	242,666	(3)	(1)	2,285	35,204	587	526	280,155	0	0	(8,563)	587	526	271,592
PAC	290	263	1,455,879	(13)	(13)	0	(44,425)	277	250	1,411,454	3	2	(210,335)	280	252	1,201,119
TOTAL, NESDIS	880	790	1,698,545	(16)	(14)	2,285	(9,221)	864	776	1,691,609	3	2	(218,898)	867	778	1,472,711
Mission Support																
ORF	759	714	267,213	0	0	5,400	6,127	759	714	278,740	(11)	(11)	(17,535)	748	703	261,205
PAC	0	0	25,000	0	0	0	0	0	0	25,000	0	0	(20,002)	0	0	4,998
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL, Mission Support	759	714	292,213	0	0	5,400	6,127	759	714	303,740	(11)	(11)	(37,537)	748	703	266,203
Office of Marine and Aviation Operations																
ORF	996	962	226,420	0	0	4,180	0	996	962	230,600	10	8	1,073	1,006	970	231,673
PAC	11	11	99,378	0	0	0	0	11	11	99,378	0	0	(7,678)	11	11	91,700
OTHER	0	0	31,524	0	0	0	48	0	0	31,572	0	0	0	0	0	31,572
TOTAL, OMAO	1,007	973	357,322	0	0	4,180	48	1,007	973	361,550	10	8	(6,605)	1,017	981	354,945

LINE OFFICE SUMMARY
($ in Thousands)

FY 2020 Proposed Operating Plan	POS	FTE	FY 2019 Enacted	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2020 Base	POS	FTE	FY 2020 Program Changes	POS	FTE	FY 2020 Estimate
DIRECT DISCRETIONARY OBLIGATIONS																
ORF	11,987	11,348	3,772,477	2	4	50,518	71,952	11,989	11,352	3,894,947	(534)	(351)	(650,657)	11,455	11,001	3,244,290
PAC	328	300	1,767,047	(13)	(13)	0	(69,425)	315	287	1,697,622	3	2	(279,688)	318	289	1,417,934
OTHER	61	61	181,105	(3)	(3)	0	(18,226)	58	58	162,879	(2)	(2)	(80,000)	56	56	82,879
TOTAL, DIRECT DISCRETIONARY OBLIGATIONS	**12,376**	**11,709**	**5,720,629**	**(14)**	**(12)**	**50,518**	**(15,699)**	**12,362**	**11,697**	**5,755,448**	**(533)**	**(351)**	**(1,010,345)**	**11,829**	**11,346**	**4,745,103**
ORF Adjustments (Deobligations/Rescissions)	0	0	(17,500)	0	0	0	(10,000)	0	0	(27,500)	0	0	0	0	0	(27,500)
ORF Transfers	0	0	(157,980)	0	0	0	(427)	0	0	(158,407)	0	0	0	0	0	(158,407)
PAC Adjustments (Deobligations/Rescissions)	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	(13,000)
PAC Transfers	0	0	1,302	0	0	0	0	0	0	1,302	0	0	0	0	0	1,302
OTHER Discretionary Adjustments	0	0	154	0	0	0	(154)	0	0	0	0	0	0	0	0	0
Mandatory Accounts Excluded	(59)	(59)	(99,307)	3	3	0	18,274	(56)	(56)	(81,033)	0	0	0	(56)	(56)	(81,033)
TOTAL, DISCRETIONARY APPROPRIATIONS	**12,317**	**11,650**	**5,434,298**	**(11)**	**(9)**	**50,518**	**(8,006)**	**12,306**	**11,641**	**5,476,810**	**(533)**	**(351)**	**(1,010,345)**	**11,773**	**11,290**	**4,466,465**

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Appropriation Available, 2019	11,987	11,348	3,754,977	3,772,477
Plus: Adjustments to base	2	4	112,470	122,470
Less: Carryover	0	0	0	0
2020 Base	11,989	11,352	3,867,447	3,894,947
Less: 2020 Program Changes	(534)	(351)	(650,657)	(650,657)
2020 Estimate	11,455	11,001	3,216,790	3,244,290

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base Program		2020 Estimate		Increase/ (Decrease)	
Comparison by program		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	1,101	624,480	1,119	581,567	1,119	586,438	1,025	369,705	(94)	(216,733)
	FTE/OBL	1,094	579,591	1,105	581,567	1,105	586,438	1,058	369,705	(47)	(216,733)
National Marine Fisheries Service	Pos/BA	2,687	878,246	3,070	908,832	3,070	921,622	3,065	811,668	(5)	(109,954)
	FTE/OBL	2,670	884,504	2,921	908,832	2,921	921,622	2,914	811,668	(7)	(109,954)
Oceanic and Atmospheric Research	Pos/BA	649	528,393	806	525,060	806	530,746	727	309,149	(79)	(221,597)
	FTE/OBL	645	510,159	759	525,060	759	530,746	682	309,149	(77)	(221,597)
National Weather Service	Pos/BA	4,222	1,031,081	4,647	1,020,719	4,652	1,066,646	4,297	989,298	(355)	(77,348)
	FTE/OBL	4,195	1,006,842	4,360	1,020,719	4,365	1,066,646	4,148	989,298	(217)	(77,348)
National Environmental Satellite, Data, & Info Service	Pos/BA	470	243,698	590	242,666	587	280,155	587	271,592	0	(8,563)
	FTE/OBL	467	253,851	527	242,666	526	280,155	526	271,592	0	(8,563)
Mission Support	Pos/BA	690	270,348	759	267,213	759	278,740	748	261,205	(11)	(17,535)
	FTE/OBL	685	287,519	714	267,213	714	278,740	703	261,205	(11)	(17,535)
Office of Marine & Aviation Operations	Pos/BA	946	223,786	996	226,420	996	230,600	1,006	231,673	10	1,073
	FTE/OBL	940	224,073	962	226,420	962	230,600	970	231,673	8	1,073
Less Deobligations/Other	Pos/BA	0	3,858	0	(17,500)	0	(27,500)	0	(27,500)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	10,765	3,803,890	11,987	3,754,977	11,989	3,867,447	11,455	3,216,790	(534)	(650,657)
	FTE/OBL	10,696	3,746,539	11,348	3,772,477	11,352	3,894,947	11,001	3,244,290	(351)	(650,657)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base Program		2020 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	10,696	3,746,539	11,348	3,772,477	11,352	3,894,947	11,001	3,244,290	(351)	(650,657)
Total Obligations	**10,696**	**3,746,539**	**11,348**	**3,772,477**	**11,352**	**3,894,947**	**11,001**	**3,244,290**	**(351)**	**(650,657)**
Adjustments to Obligations:										
Deobligations/Prior Year Recov	0	(38,785)	0	(17,500)	0	0	0	0	0	0
Unobligated Balance, Adj SOY	0	(110,303)	0	0	0	(27,500)	0	(27,500)	0	0
Unobligated Balance, EOY	0	203,422	0	0	0	0	0	0	0	0
Unobligated Balance, Expiring	0	3,017	0	0	0	0	0	0	0	0
Total Budget Authority	**10,696**	**3,803,890**	**11,348**	**3,754,977**	**11,352**	**3,867,447**	**11,001**	**3,216,790**	**(351)**	**(650,657)**
Financing from Transfers and Other:										
Transfer from P&D to ORF	0	(144,000)	0	(157,980)	0	(158,407)	0	(158,407)	0	0
Transfer from PCSRF to ORF	0	(65)	0	0	0	0	0	0	0	0
Transfer from FDAF to ORF	0	(220)	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	(2,370)	0	0	0	0	0	0	0	0
Net Appropriation	**10,696**	**3,657,235**	**11,348**	**3,596,997**	**11,352**	**3,709,040**	**11,001**	**3,058,383**	**(351)**	**(650,657)**

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF REIMBURSABLE OBLIGATIONS
(Dollar Amounts in Thousands)

Comparison by program		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	12	27,752	12	24,000	12	24,000	12	24,000	0	0
	FTE/OBL	12	24,000	12	24,000	12	24,000	12	24,000	0	0
National Marine Fisheries Service	Pos/BA	235	63,599	257	95,000	257	95,000	257	95,000	0	0
	FTE/OBL	233	55,000	257	95,000	257	95,000	257	95,000	0	0
Oceanic and Atmospheric Research	Pos/BA	21	41,629	24	50,000	24	50,000	24	50,000	0	0
	FTE/OBL	21	36,000	24	50,000	24	50,000	24	50,000	0	0
National Weather Service	Pos/BA	168	64,756	160	44,000	160	44,000	160	44,000	0	0
	FTE/OBL	167	55,932	139	44,000	139	44,000	139	44,000	0	0
National Environmental Satellite, Data, and Information Service	Pos/BA	30	31,221	28	15,000	28	15,000	28	15,000	0	0
	FTE/OBL	30	27,000	28	15,000	28	15,000	28	15,000	0	0
Mission Support	Pos/BA	31	16,189	21	12,000	21	12,000	21	12,000	0	0
	FTE/OBL	31	14,000	21	12,000	21	12,000	21	12,000	0	0
Office of Marine and Aviation Operations	Pos/BA	0	0	0	2,000	0	2,000	0	2,000	0	0
	FTE/OBL	0	0	0	2,000	0	2,000	0	2,000	0	0
Total	Pos/BA	497	245,146	502	242,000	502	242,000	502	242,000	0	0
	FTE/OBL	494	211,932	481	242,000	481	242,000	481	242,000	0	0

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF FINANCING
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base Program	2020 Estimate	Increase/ (Decrease)
Direct Discretionary Obligation	3,746,539	3,772,477	3,894,947	3,244,290	(650,657)
Direct Mandatory Obligation	46,998	32,031	49,595	49,595	0
Reimbursable Obligation	211,932	242,000	242,000	242,000	0
Total Obligations	**4,005,469**	**4,046,508**	**4,186,542**	**3,535,885**	**(650,657)**
Adjustments and Obligations:					
Federal funds	(179,756)	(194,760)	(194,760)	(194,760)	0
Non-Federal Sources	(46,918)	(47,240)	(47,240)	(47,240)	0
Change Uncollected Customer Pmts from Fed.	(18,472)	0	0	0	0
Returned to Treasury	0	0	0	0	0
Deobligation/Recoveries	(38,851)	(17,500)	(27,500)	(27,500)	0
Unobligated balance adjusted, SOY (Direct Disc.)	(110,303)	0	0	0	0
Unobligated balance adjusted, SOY (Mand.)	(56,780)	(51,659)	(49,703)	(49,703)	0
Unobligated balance, transferred to other accounts	0	0	0	0	0
Unobligated balance, EOY (Direct Disc.)	203,422	0	0	0	0
Unobligated balance, EOY (Mand.)	51,659	0	0	0	0
Unobligated balance, deferred	0	49,703	30,183	30,183	0
Unobligated balance, Expiring Direct	3,017	0	0	0	0
Unobligated balance, SOY Reimbursable	(88,200)	0	0	0	0
Unobligated balance, EOY Reimbursable	121,414	0	0	0	0
Unobligated balance, Transferred	304	0	0	0	0
Total Budget Authority	**3,846,005**	**3,785,052**	**3,897,522**	**3,246,865**	**(650,657)**
Financing from Tranfers and Other:					
Transfer from P&D to ORF	(144,000)	(157,980)	(158,407)	(158,407)	0
Transfer from PCSRF to ORF	(65)	0	0	0	0
NOAA Corps Retirement Pay (Mand)	(30,102)	(30,075)	(30,075)	(30,075)	0
Spectrum Relocation Fund (Mand)	(12,013)	0	0	0	0
Transfer from FDAF to ORF	(220)	0	0	0	0
Transfer from PAC to ORF	(2,370)	0	0	0	0
Transfer from ORF to PAC	0	0	0	0	0
Net Appropriation	**3,657,235**	**3,596,997**	**3,709,040**	**3,058,383**	**(650,657)**

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
ADJUSTMENTS TO BASE
(Dollar amounts in thousands)

	FTE	Amount
Transfers of Estimates	4	65,825
Adjustment		23,627
Financing		(27,500)
Other Changes		
2019 Pay raise		6,674
2020 Pay raise		402
Change in compensable days		5,598
Civil Service Retirement System (CSRS)		(1,185)
Federal Employee Retirement System (FERS)		27,689
Thrift Savings Plan		338
Federal Insurance Contribution Act (FICA) - OASDI		1,503
Health Insurance		1,087
Employees Compensation Fund		(285)
Per Diem		645
Mileage		73
Rental payments to GSA		2,656
Postage		13
Printing and reproduction		0
NARA Storage & Maintenance		(143)
PEPCO		7
Water		25
General Pricing Level Adjustment		0
Working Capital Fund		2,358
Federal Protective Service		2
Commerce Business System		270
Grants		1,245
Ship and Aircraft Fuel Costs		1,546
Subtotal, other changes		50,518
Total, adjustments to base	4	112,470

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Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase Decrease from 2020 Base
11.1	Full-time permanent compensation	1,088,925	1,133,567	1,145,930	1,110,884	(35,046)
11.3	Other than full-time permanent	6,564	6,445	6,470	6,283	(187)
11.5	Other personnel compensation	64,507	57,926	57,926	58,001	75
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	35,094	36,641	37,282	37,199	(83)
11.9	**Total personnel compensation**	1,195,090	1,234,579	1,247,608	1,212,367	(35,241)
12.1	Civilian personnel benefits	392,187	400,275	432,858	423,586	(9,272)
13	Benefits for former personnel	24,573	28,632	28,632	28,632	0
21	Travel and transportation of persons	45,742	43,581	44,191	43,320	(871)
22	Transportation of things	15,213	16,110	16,110	15,620	(490)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	86,107	83,879	86,425	84,924	(1,501)
23.2	Rental payments to others	30,731	31,482	31,482	30,226	(1,256)
23.3	Communications, utilities, and misc. charges	67,360	75,322	91,367	88,717	(2,650)
24	Printing and reproduction	4,104	3,211	3,211	2,406	(805)
25	Other contractual services					
25.1	Advisory and assistance services	240,677	210,785	210,175	181,992	(28,183)
25.2	Other services from non-Federal sources	625,321	590,319	626,041	530,894	(95,147)
25.3	Other goods and services from Federal sources	133,488	123,138	153,069	139,891	(13,178)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	14,923	23,200	23,200	27,468	4,268
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	97,794	99,636	101,180	91,979	(9,201)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	36,654	39,469	39,469	36,807	(2,662)
32	Lands and structures	520	521	521	521	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	782,949	807,672	808,917	354,449	(454,468)
42	Insurance claims and indemnities	5	19	19	19	0
43	Interest and dividends	98	66	66	66	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**3,793,537**	**3,811,897**	**3,944,542**	**3,293,885**	**(650,657)**
	Less Mandatory Obligations	**(46,998)**	**(39,420)**	**(49,595)**	**(49,595)**	**0**
	Total Discretionary Obligations	**3,746,539**	**3,772,477**	**3,894,947**	**3,244,290**	**(650,657)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	10.696	11,348	11,352	11,001	(351)
	Other than full-time permanent	0	0	0	0	0
	Total	10.696	11,348	11,352	11,001	(351)
	Authorized Positions:					
	Full-time permanent	10.765	11,987	11,989	11,455	(534)
	Other than full-time permanent	0	0	0	0	0
	Total	10.765	11,987	11,989	11,455	(534)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Ocean Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	125,156	125,108	126,178	122,134	(4,044)
11.3	Other than full-time permanent	892	983	986	986	0
11.5	Other personnel compensation	2,572	2,058	2,058	2,058	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	2,340	2,595	2,640	2,557	(83)
11.9	**Total personnel compensation**	130,961	130,744	131,862	127,735	(4,127)
12.1	Civilian personnel benefits	41,696	42,336	45,700	44,365	(1,335)
13	Benefits for former personnel	42	127	127	127	0
21	Travel and transportation of persons	6,868	7,449	7,557	6,902	(655)
22	Transportation of things	729	819	819	749	(70)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	11,864	12,072	12,350	12,350	0
23.2	Rental payments to others	2,210	2,299	2,299	2,299	0
23.3	Communications, utilities, and misc. charges	5,340	7,003	7,006	7,006	0
24	Printing and reproduction	464	401	401	386	(15)
25	Other contractual services					
25.1	Advisory and assistance services	69,189	45,705	45,705	42,565	(3,140)
25.2	Other services from non-Federal sources	76,562	82,779	82,779	61,157	(21,622)
25.3	Other goods and services from Federal sources	2,999	3,345	3,345	2,979	(366)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	76	1,081	1,081	1,081	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	6,617	6,012	6,012	3,710	(2,302)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Ocean Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease over 2020 Base
31	Equipment	3,480	4,087	4,087	3,801	(286)
32	Lands and structures	0	7	7	7	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	220,478	235,293	235,293	52,478	(182,815)
42	Insurance claims and indemnities	0	1	1	1	0
43	Interest and dividends	17	7	7	7	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**579,591**	**581,567**	**586,438**	**369,705**	**(216,733)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	1,094	1,105	1,105	1,058	(47)
	Other than full-time permanent	0	0	0	0	0
	Total	1,094	1,105	1,105	1,058	(47)
	Authorized Positions:					
	Full-time permanent	1,101	1,119	1,119	1,025	(94)
	Other than full-time permanent	0	0	0	0	0
	Total	1,101	1,119	1,119	1,025	(94)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Marine Fisheries Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	287,732	309,605	312,260	311,281	(979)
11.3	Other than full-time permanent	3,066	3,089	3,101	3,101	0
11.5	Other personnel compensation	8,813	7,329	7,329	7,445	116
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	1,329	1,559	1,586	1,586	0
11.9	**Total personnel compensation**	300,941	321,582	324,276	323,413	(863)
12.1	Civilian personnel benefits	102,740	104,192	112,330	112,080	(250)
13	Benefits for former personnel	183	167	167	167	0
21	Travel and transportation of persons	13,765	12,532	12,748	12,837	89
22	Transportation of things	2,370	2,762	2,762	2,711	(51)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	17,474	17,515	18,009	18,009	0
23.2	Rental payments to others	2,569	2,493	2,493	2,493	0
23.3	Communications, utilities, and misc. charges	14,253	17,839	17,842	17,872	30
24	Printing and reproduction	1,655	1,377	1,377	1,377	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	38,502	32,948	32,948	19,014	(13,934)
25.2	Other services from non-Federal sources	150,586	139,924	139,924	100,758	(39,166)
25.3	Other goods and services from Federal sources	12,937	12,341	12,341	6,121	(6,220)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	(51)	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	15,217	14,891	14,891	14,719	(172)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Marine Fisheries Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease over 2020 Base
31	Equipment	7,764	13,244	13,244	12,494	(750)
32	Lands and structures	194	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	203,387	215,008	216,253	167,586	(48,667)
42	Insurance claims and indemnities	2	9	9	9	0
43	Interest and dividends	16	9	9	9	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**884,504**	**908,832**	**921,622**	**811,668**	**(109,954)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	2,670	2,921	2,921	2,914	(7)
	Other than full-time permanent	0	0	0	0	0
	Total	2,670	2,921	, 2,921	2,914	(7)
	Authorized Positions:					
	Full-time permanent	2,687	3,070	3,070	3,065	(5)
	Other than full-time permanent	0	0	0	0	0
	Total	2,687	3,070	3,070	3,065	(5)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Office of Oceanic and Atmospheric Research
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	75,542	87,631	88,382	80,241	(8,141)
11.3	Other than full-time permanent	1,276	1,224	1,229	1,042	(187)
11.5	Other personnel compensation	1,431	1,108	1,108	1,099	(9)
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	904	920	940	940	0
11.9	**Total personnel compensation**	79,153	90,883	91,659	83,322	(8,337)
12.1	Civilian personnel benefits	24,342	25,903	27,770	25,269	(2,501)
13	Benefits for former personnel	24	28	28	28	0
21	Travel and transportation of persons	4,410	4,564	4,633	3,498	(1,135)
22	Transportation of things	1,357	1,208	1,208	1,041	(167)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	10,089	9,707	9,998	8,747	(1,251)
23.2	Rental payments to others	5,224	4,464	4,464	4,431	(33)
23.3	Communications, utilities, and misc. charges	4,965	3,717	3,720	3,024	(696)
24	Printing and reproduction	752	597	597	(184)	(781)
25	Other contractual services					
25.1	Advisory and assistance services	14,442	14,793	14,793	11,904	(2,889)
25.2	Other services from non-Federal sources	57,996	60,833	63,513	50,160	(13,353)
25.3	Other goods and services from Federal sources	7,360	5,387	5,387	2,359	(3,028)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	5,758	9,745	9,745	14,013	4,268
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	11,294	11,060	11,060	8,977	(2,083)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Office of Oceanic and Atmospheric Research
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease over 2020 Base
31	Equipment	7,639	7,110	7,110	5,515	(1,595)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	275,343	275,056	275,056	87,040	(188,016)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	12	6	6	6	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**510,159**	**525,060**	**530,746**	**309,149**	**(221,597)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	645	759	759	682	(77)
	Other than full-time permanent	0	0	0	0	0
	Total	645	759	759	682	(77)
	Authorized Positions:					
	Full-time permanent	649	806	806	727	(79)
	Other than full-time permanent	0	0	0	0	0
	Total	649	806	806	727	(79)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Weather Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	425,596	424,926	429,476	408,033	(21,443)
11.3	Other than full-time permanent	693	686	691	691	0
11.5	Other personnel compensation	32,451	28,890	28,890	28,890	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	639	653	668	668	0
11.9	**Total personnel compensation**	459,379	455,155	459,725	438,282	(21,443)
12.1	Civilian personnel benefits	160,652	162,705	176,316	171,319	(4,997)
13	Benefits for former personnel	373	205	205	205	0
21	Travel and transportation of persons	10,948	10,395	10,567	10,482	(85)
22	Transportation of things	8,230	8,256	8,256	7,961	(295)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	20,892	20,514	21,475	21,475	0
23.2	Rental payments to others	14,034	13,951	13,951	12,820	(1,131)
23.3	Communications, utilities, and misc. charges	31,596	31,568	47,571	45,564	(2,007)
24	Printing and reproduction	822	566	566	566	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	65,028	67,449	67,449	58,755	(8,694)
25.2	Other services from non-Federal sources	140,582	149,088	159,698	142,039	(17,659)
25.3	Other goods and services from Federal sources	7,457	9,412	9,412	5,412	(4,000)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	105	4,154	4,154	4,154	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	37,496	36,507	36,507	32,267	(4,240)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Weather Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	9,813	9,922	9,922	9,922	0
32	Lands and structures	327	515	515	515	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	39,087	40,334	40,334	27,537	(12,797)
42	Insurance claims and indemnities	2	9	9	9	0
43	Interest and dividends	17	16	16	16	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**1,006,842**	**1,020,719**	**1,066,646**	**989,298**	**(77,348)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	4,195	4,360	4,365	4,148	(217)
	Other than full-time permanent	0	0	0	0	0
	Total	4,195	4,360	4,365	4,148	(217)
	Authorized Positions:					
	Full-time permanent	4,222	4,647	4,652	4,297	(355)
	Other than full-time permanent	0	0	0	0	0
	Total	4,222	4,647	4,652	4,297	(355)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Environmental Satellite, Data and Information Service
SELECT ACTIVITIES BY OBJECT CLASS

(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	54,181	61,229	63,464	63,464	0
11.3	Other than full-time permanent	380	209	209	209	0
11.5	Other personnel compensation	4,180	3,995	3,995	3,995	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	389	440	445	445	0
11.9	**Total personnel compensation**	59,130	65,874	68,114	68,114	0
12.1	Civilian personnel benefits	17,978	18,517	20,696	20,696	0
13	Benefits for former personnel	28	11	11	11	0
21	Travel and transportation of persons	1,415	1,315	1,229	1,229	0
22	Transportation of things	355	141	141	141	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	14,904	14,716	14,909	14,909	0
23.2	Rental payments to others	441	613	613	613	0
23.3	Communications, utilities, and misc. charges	5,632	5,906	5,907	5,907	0
24	Printing and reproduction	229	85	85	85	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	22,857	19,997	19,387	19,387	0
25.2	Other services from non-Federal sources	84,413	71,184	88,169	79,606	(8,563)
25.3	Other goods and services from Federal sources	18,093	20,565	37,154	37,154	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	8,287	7,679	7,679	7,679	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,141	2,828	2,826	2,826	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
National Environmental Satellite, Data and Information Service
SELECT ACTIVITIES BY OBJECT CLASS

(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	3,256	1,576	1,576	1,576	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	13,682	11,653	11,653	11,653	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	11	8	8	8	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**253,851**	**242,666**	**280,155**	**271,592**	**(8,563)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	467	526	526	526	0
	Other than full-time permanent	0	0	0	0	0
	Total	467	526	526	526	0
	Authorized Positions:					
	Full-time permanent	470	589	587	587	0
	Other than full-time permanent	0	0	0	0	0
	Total	470	589	587	587	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Mission Support
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	76,994	81,000	81,695	80,325	(1,370)
11.3	Other than full-time permanent	217	227	227	227	0
11.5	Other personnel compensation	1,745	1,772	1,772	1,740	(32)
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	491	501	506	506	0
11.9	**Total personnel compensation**	79,448	83,500	84,200	82,798	(1,402)
12.1	Civilian personnel benefits	24,458	25,582	27,535	27,096	(439)
13	Benefits for former personnel	34	6	6	6	0
21	Travel and transportation of persons	2,165	1,727	1,761	1,621	(140)
22	Transportation of things	211	151	151	144	(7)
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	9,907	8,343	8,537	8,287	(250)
23.2	Rental payments to others	1,826	2,477	2,477	2,235	(242)
23.3	Communications, utilities, and misc. charges	1,629	4,327	4,359	4,341	(18)
24	Printing and reproduction	116	115	115	106	(9)
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	25,407	24,548	24,548	25,022	474
25.2	Other services from non-Federal sources	55,268	31,000	36,447	42,751	6,304
25.3	Other goods and services from Federal sources	73,499	61,655	74,997	75,433	436
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	749	540	540	540	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,015	2,328	2,328	2,289	(39)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Mission Support
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease over 2020 Base
31	Equipment	3,444	1,946	1,946	1,916	(30)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	28,067	28,305	28,305	6,132	(22,173)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	12	9	9	9	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**308,255**	**276,558**	**298,260**	**280,725**	**(17,535)**
	Less Mandatory Obligations	**(20,736)**	**(9,345)**	**(19,520)**	**(19,520)**	**0**
	Total Discretionary Obligations	**287,519**	**267,213**	**278,740**	**261,205**	**(17,535)**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	685	714	714	703	(11)
	Other than full-time permanent	0	0	0	0	0
	Total	685	714	714	703	(11)
	Authorized Positions:					
	Full-time permanent	690	759	759	748	(11)
	Other than full-time permanent	0	0	0	0	0
	Total	690	759	759	748	(11)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Office of Marine and Aviation Operations
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	43,723	44,069	44,476	45,407	931
11.3	Other than full-time permanent	38	27	27	27	0
11.5	Other personnel compensation	13,314	12,774	12,774	12,774	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	29,002	29,973	30,497	30,497	0
11.9	**Total personnel compensation**	86,077	86,842	87,773	88,704	931
12.1	Civilian personnel benefits	20,321	21,042	22,513	22,763	250
13	Benefits for former personnel	23,889	28,088	28,088	28,088	0
21	Travel and transportation of persons	6,170	5,599	5,696	6,751	1,055
22	Transportation of things	1,962	2,774	2,774	2,874	100
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	978	1,012	1,147	1,147	0
23.2	Rental payments to others	4,426	5,185	5,185	5,335	150
23.3	Communications, utilities, and misc. charges	3,947	4,963	4,963	5,004	41
24	Printing and reproduction	67	69	69	69	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	5,252	5,344	5,344	5,344	0
25.2	Other services from non-Federal sources	59,914	55,512	55,512	54,424	(1,088)
25.3	Other goods and services from Federal sources	11,143	10,433	10,433	10,433	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	(1)	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	22,014	26,012	27,558	27,193	(365)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
Office of Marine and Aviation Operations
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	1,259	1,585	1,585	1,584	(1)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,904	2,024	2,024	2,024	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	14	12	12	12	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**250,335**	**256,495**	**260,675**	**261,748**	**1,073**
	Less Mandatory Obligations	**(26,262)**	**(30,075)**	**(30,075)**	**(30,075)**	**0**
	Total Discretionary Obligations	**224,073**	**226,420**	**230,600**	**231,673**	**1,073**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	940	962	962	970	8
	Other than full-time permanent	0	0	0	0	0
	Total	940	962	962	970	8
	Authorized Positions:					
	Full-time permanent	946	996	996	1.006	10
	Other than full-time permanent	0	0	0	0	0
	Total	946	996	996	1.006	10

Department of Commerce
National Oceanic and Atmospheric Administration
ACTIVITY/SUBACTIVITY CHANGE CROSSWALK
Part 1 2020 Structure
(Dollar amounts in thousands)

Activity / Subactivity	2020 Direct Obligations*	Proposed Changes
National Environmental Satellite, Data and Information Service		
Systems Acquisition		
Satellite Ground Systems (SGS)	17,198	Move to Office of Satellite and Product Operations (OSPO)
Project Planning and Analysis (PPA)	4,727	Move to Office of Satellite and Product Operations (OSPO)

* The 2020 Proposed Budget Restructure is done at the FY 2019 Enacted funding level and does not include any transfers or program changes outlined in the 2020 President's Budget.

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Department of Commerce
National Oceanic and Atmospheric Administration
ACTIVITY/SUBACTIVITY CHANGE CROSSWALK
Part 2 2020 Structure
(Dollar amounts in thousands)

Activity / Subactivity	FY 2016 Spend Plan	FY 2017 Spend Plan	FY 2018 Spend Plan	FY 2019 Enacted	FY 2020 President's Budget
National Environmental Satellite, Data and Information Service					
Environmental Satellite Observing Systems					
Office of Satellite and Product Operations (OSPO)	100,293	130,823	131,480	146,924	186,790

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Appropriation Available, 2019	328	300	1,754,047	1,767,047
Less: Other adjustments to base	(13)	(13)	(69,425)	(69,425)
Less: Carryover	0	0	0	0
2020 Base	315	287	1,684,622	1,697,622
Less: 2020 Program Changes	3	2	(279,688)	(279,688)
2020 Estimate	318	289	1,404,934	1,417,934

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Comparison by activity/subactivity		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	0	4,563	0	3,900	0	3,900	0	1,541	0	(2,359)
	FTE/OBL	0	3,663	0	3,900	0	3,900	0	1,541	0	(2,359)
National Marine Fisheries Service	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Oceanic and Atmospheric Research	Pos/BA	1	65,767	0	41,000	0	41,000	0	26,000	0	(15,000)
	FTE/OBL	1	42,552	0	41,000	0	41,000	0	26,000	0	(15,000)
National Weather Service	Pos/BA	26	164,817	27	141,890	27	116,890	27	92,576	0	(24,314)
	FTE/OBL	26	120,010	26	141,890	26	116,890	26	92,576	0	(24,314)
National Environmental Satellite, Data, & Information Service	Pos/BA	283	1,847,824	290	1,455,879	277	1,411,454	280	1,201,119	3	(210,335)
	FTE/OBL	281	1,889,585	263	1,455,879	250	1,411,454	252	1,201,119	2	(210,335)
Mission Support	Pos/BA	1	31,846	0	25,000	0	25,000	0	4,998	0	(20,002)
	FTE/OBL	1	9,410	0	25,000	0	25,000	0	4,998	0	(20,002)
Office of Marine Aviation & Operations	Pos/BA	4	232,026	11	99,378	11	99,378	11	91,700	0	(7,678)
	FTE/OBL	4	160,174	11	99,378	11	99,378	11	91,700	0	(7,678)
Less Deobligations/Other	Pos/BA	0	19,401	0	(13,000)	0	(13,000)	0	(13,000)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	315	2,366,244	328	1,754,047	315	1,684,622	318	1,404,934	3	(279,688)
	FTE/OBL	313	2,225,394	300	1,767,047	287	1,697,622	289	1,417,934	2	(279,688)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	313	2,225,394	300	1,767,047	287	1,697,622	289	1,417,934	2	(279,688)
Total Obligations	313	2,225,394	300	1,767,047	287	1,697,622	289	1,417,934	2	(279,688)
Adjustments to Obligations:										
Deobligations/Prior Year Recoveries	0	(36,552)	0	(13,000)	0	(13,000)	0	(13,000)	0	0
Unobligated Balance, Adj SOY	0	(200,568)	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	358,304	0	0	0	0	0	0	0	0
Unobligated Balance, Expiring	0	265	0	0	0	0	0	0	0	0
Unobligated Balance, unapportioned	0	19,401	0	0	0	0	0	0	0	0
Total Budget Authority	313	2,366,244	300	1,754,047	287	1,684,622	289	1,404,934	2	(279,688)
Financing from Transfers and Other:										
Unoblig Balance Rescission Adj Appn	0	0	0	0	0	0	0	0	0	0
Transfer from ORF to PAC	0	0	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	2,370	0	0	0	0	0	0	0	0
Transfer to OIG	0	1,302	0	1,302	0	1,302	0	1,302	0	0
Net Appropriation	313	2,369,916	300	1,755,349	287	1,685,924	289	1,406,236	2	(279,688)

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF FINANCING
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base Program	2020 Estimate	Increase/Decrease from 2020 Base
Direct Discretionary Obligation	2,225,394	1,767,047	1,697,622	1,417,934	(279,688)
Direct Mandatory Obligation	69,133	65,770	32,601	32,601	0
Total Obligations	**2,294,527**	**1,832,817**	**1,730,223**	**1,450,535**	**(279,688)**
Adjustments and Obligations:					
Deobligations	(38,583)	(13,000)	(13,000)	(13,000)	0
Returned to Treasury	46	0	0	0	0
Unobligated balance, adj. SOY (Disc.)	(200,568)	0	0	0	0
Unobligated balance, adj. SOY (Mand.)	(179,711)	(112,563)	(46,793)	(46,793)	0
Unobligated balance, EOY (Disc.)	377,705	0	0	0	0
Unobligated balance, EOY (Mand.)	6,041	0	0	0	0
Unobligated balance, deferred	106,522	46,793	14,192	14,192	0
Unobligated balance, expiring EOY	265	0	0	0	0
Unobligated Balance, Rescission	0	0	0	0	0
Total Budget Authority	**2,366,244**	**1,754,047**	**1,684,622**	**1,404,934**	**(279,688)**
Financing from Transfers and Other:					
Transfer from PAC to ORF	2,370	0	0	0	0
Transfer from ORF to PAC	0	0	0	0	0
Transfer to OIG	1,302	1,302	1,302	1,302	0
Unobligated Balance, Rescission	0	0	0	0	0
Net Appropriation	**2,369,916**	**1,755,349**	**1,685,924**	**1,406,236**	**(279,688)**

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
ADJUSTMENTS TO BASE
(Dollar amounts in thousands)

	FTE	Amount
Transfers of Estimates	(13)	(69,425)
Adjustment		13,000
Financing		(13,000)
Total, adjustments to base	(13)	(69,425)

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Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11.1	Full-time permanent compensation	42,464	35,236	31,504	31,504	0
11.3	Other than full-time permanent	298	202	202	202	0
11.5	Other personnel compensation	1,977	1,653	1,653	1,653	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	23	0	0	0	0
11.9	**Total personnel compensation**	44,763	36,927	33,195	33,195	0
12.1	Civilian personnel benefits	18,157	18,193	16,706	16,706	0
13	Benefits for former personnel	19	2	2	2	0
21	Travel and transportation of persons	2,587	2,398	2,398	2,398	0
22	Transportation of things	282	285	285	285	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	6,008	5,980	5,980	5,980	0
23.2	Rental payments to others	232	31	31	31	0
23.3	Communications, utilities, and misc. charges	20,628	21,715	5,715	5,715	0
24	Printing and reproduction	468	426	426	426	0
25	Other contractual services					
25.1	Advisory and assistance services	284,943	133,093	128,093	128,093	0
25.2	Other services from non-Federal sources	237,743	256,404	212,310	149,302	(63,008)
25.3	Other goods and services from Federal sources	1,476,955	1,144,585	1,112,304	916,161	(196,143)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	18,168	21,006	21,006	21,006	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	6,366	15,612	15,612	12,612	(3,000)

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	114,515	114,752	114,752	114,574	(178)
32	Lands and structures	(615)	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	63,284	61,219	61,219	43,860	(17,359)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	23	26	26	26	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**2,294,527**	**1,832,817**	**1,730,223**	**1,450,535**	**(279,688)**
	Less Mandatory Obligations	**(69,133)**	**(65,770)**	**(32,601)**	**(32,601)**	**0**
	Total Discretionary Obligations	**2,225,394**	**1,767,047**	**1,697,622**	**1,417,934**	**(279,688))**
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	313	300	287	289	2
	Other than full-time permanent	0	0	0	0	0
	Total	313	300	287	289	2
	Authorized Positions:					
	Full-time permanent	315	328	315	318	3
	Other than full-time permanent	0	0	0	0	0
	Total	315	328	315	318	3

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
National Ocean Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	125	0	0	0	0
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	4	0	0	0	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	0	0	0	0	0
11.9	**Total personnel compensation**	130	0	0	0	0
12.1	Civilian personnel benefits	40	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	9	8	8	8	0
22	Transportation of things	1	1	1	1	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	22	20	20	20	0
23.2	Rental payments to others	3	6	6	6	0
23.3	Communications, utilities, and misc. charges	6	3	3	3	0
24	Printing and reproduction	3	0	0	0	0
25	Other contractual services					
25.1	Advisory and assistance services	169	43	43	43	0
25.2	Other services from non-Federal sources	1,820	1,280	1,280	1,280	0
25.3	Other goods and services from Federal sources	74	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	41	0	0	0	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
National Ocean Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	5	0	0	0	0
32	Lands and structures	(615)	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1,954	2,539	2,539	180	(2,359)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	**3,663**	**3,900**	3,900	1,541	(2,359)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	0	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	0	0	0	0	0
	Authorized Positions:					
	Full-time permanent	0	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	0	0	0	0	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Office of Oceanic and Atmospheric Research
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	60	0	0	0	0
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	1	0	0	0	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	0	0	0	0	0
11.9	**Total personnel compensation**	62	0	0	0	0
12.1	Civilian personnel benefits	19	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	8	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	10	0	0	0	0
23.2	Rental payments to others	91	0	0	0	0
23.3	Communications, utilities, and misc. charges	104	0	0	0	0
24	Printing and reproduction	2	0	0	0	0
25	Other contractual services					
25.1	Advisory and assistance services	9	0	0	0	0
25.2	Other services from non-Federal sources	6,050	0	0	0	0
25.3	Other goods and services from Federal sources	20,766	26,000	26,000	26,000	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	56	0	0	0	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Office of Oceanic and Atmospheric Research
SELECT ACTIVITIES BY OBJECT CLASS

(Dollar amounts in thousands)

	Object Class	2018 Estimate	2019 President's Budget	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	2,158	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	13,217	15,000	15,000	0	(15,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	42,552	41,000	41,000	26,000	(15,000)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	1	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	1	0	0	0	0
	Authorized Positions:					
	Full-time permanent	1	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	1	0	0	0	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
National Weather Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	5,772	1,974	1,974	1,974	0
11.3	Other than full-time permanent	86	86	86	86	0
11.5	Other personnel compensation	200	119	119	119	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	21	0	0	0	0
11.9	**Total personnel compensation**	6,079	2,179	2,179	2,179	0
12.1	Civilian personnel benefits	3,230	3,155	3,155	3,155	0
13	Benefits for former personnel	5	1	1	1	0
21	Travel and transportation of persons	630	795	795	795	0
22	Transportation of things	71	105	105	105	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	846	885	885	885	0
23.2	Rental payments to others	48	24	24	24	0
23.3	Communications, utilities, and misc. charges	19,313	19,790	3,790	3,790	0
24	Printing and reproduction	101	101	101	101	0
25	Other contractual services					
25.1	Advisory and assistance services	11,962	9,539	9,539	9,539	0
25.2	Other services from non-Federal sources	69,982	91,705	82,705	58,391	(24,314)
25.3	Other goods and services from Federal sources	742	1,502	1,502	1,502	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	93	52	52	52	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,761	4,003	4,003	4,003	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
National Weather Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	1,633	3,176	3,176	3,176	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,514	4,858	4,858	4,858	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	20	20	20	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	120,010	141,890	116,890	92,576	(24,314)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	26	26	26	26	0
	Other than full-time permanent	0	0	0	0	0
	Total	26	26	26	26	0
	Authorized Positions:					
	Full-time permanent	26	27	27	27	0
	Other than full-time permanent	0	0	0	0	0
	Total	26	27	27	27	0

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data and Information Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	35,768	32,799	29,067	29,067	0
11.3	Other than full-time permanent	207	116	116	116	0
11.5	Other personnel compensation	1,764	1,534	1,534	1,534	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	2	0	0	0	0
11.9	**Total personnel compensation**	37,741	34,449	30,717	30,717	0
12.1	Civilian personnel benefits	14,624	14,902	13,415	13,415	0
13	Benefits for former personnel	14	1	1	1	0
21	Travel and transportation of persons	1,748	1,529	1,529	1,529	0
22	Transportation of things	87	93	93	93	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	5,076	5,046	5,046	5,046	0
23.2	Rental payments to others	88	1	1	1	0
23.3	Communications, utilities, and misc. charges	1,188	1,912	1,912	1,912	0
24	Printing and reproduction	355	322	322	322	0
25	Other contractual services					
25.1	Advisory and assistance services	123,676	42,046	42,046	42,046	0
25.2	Other services from non-Federal sources	81,817	113,164	91,239	77,047	(14,192)
25.3	Other goods and services from Federal sources	1,449,899	1,078,529	1,061,248	865,105	(196,143)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	18,003	20,863	20,863	20,863	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,230	1,538	1,538	1,538	0

Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data and Information Service
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	108,433	102,664	102,664	102,664	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	44,592	38,822	38,822	38,822	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	16	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	1,889,585	1,455,879	1,411,454	1,201,119	(210,335)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	281	263	250	252	2
	Other than full-time permanent	0	0	0	0	0
	Total	281	263	250	252	2
	Authorized Positions:					
	Full-time permanent	283	290	277	280	3
	Other than full-time permanent	0	0	0	0	0
	Total	283	290	277	280	3

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Mission Support
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	211	0	0	0	0
11.3	Other than full-time permanent	2	0	0	0	0
11.5	Other personnel compensation	6	0	0	0	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	0	0	0	0	0
11.9	**Total personnel compensation**	219	0	0	0	0
12.1	Civilian personnel benefits	69	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	157	66	66	66	0
22	Transportation of things	86	86	86	86	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	35	29	29	29	0
23.2	Rental payments to others	1	0	0	0	0
23.3	Communications, utilities, and misc. charges	11	9	9	9	0
24	Printing and reproduction	5	4	4	4	0
25	Other contractual services					
25.1	Advisory and assistance services	6,948	6,465	1,465	1,465	0
25.2	Other services from non-Federal sources	64,493	37,098	23,929	3,927	(20,002)
25.3	Other goods and services from Federal sources	4,670	38,554	23,554	23,554	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	72	91	91	91	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	317	752	752	752	0

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Mission Support
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	1,451	7,612	7,612	7,612	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	5	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	4	6	6	6	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	78,543	90,770	57,601	37,599	(20,002)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	0	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	0	0	0	0	0
	Authorized Positions:					
	Full-time permanent	0	0	0	0	0
	Other than full-time permanent	0	0	0	0	0
	Total	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Office of Marine and Aviation Operations
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent compensation	528	464	464	464	0
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	3	0	0	0	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military Personnel	0	0	0	0	0
11.9	**Total personnel compensation**	532	300	300	300	0
12.1	Civilian personnel benefits	175	136	136	136	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	36	0	0	0	0
22	Transportation of things	37	0	0	0	0
23	Rent, communications, and utilities					
23.1	Rental payments to GSA	19	0	0	0	0
23.2	Rental payments to others	1	0	0	0	0
23.3	Communications, utilities, and misc. charges	6	0	0	0	0
24	Printing and reproduction	3	0	0	0	0
25	Other contractual services					
25.1	Advisory and assistance services	142,179	75,000	75,000	75,000	0
25.2	Other services from non-Federal sources	13,581	13,158	13,158	8,658	(4,500)
25.3	Other goods and services from Federal sources	805	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,961	9,320	9,320	6,320	(3,000)

Exhibit 16A

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
Office of Marine and Aviation Operations
SELECT ACTIVITIES BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
31	Equipment	835	1,300	1,300	1,122	(178)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	160,174	99,378	99,378	91,700	(7,678)
	Personnel Data					
	Full-time Equivalent Employment					
	Full-time permanent	4	11	11	11	0
	Other than full-time permanent	0	0	0	0	0
	Total	4	11	11	11	0
	Authorized Positions:					
	Full-time permanent	4	11	11	11	0
	Other than full-time permanent	0	0	0	0	0
	Total	4	11	11	11	0

Department of Commerce
National Oceanic and Atmospheric Administration
ACTIVITY/SUBACTIVITY CHANGE CROSSWALK
Part 1 2020 Structure
(Dollar amounts in thousands)

Activity / Subactivity	2020 Direct Obligations*	Proposed Changes
National Environmental Satellite, Data and Information Service		
Systems Acquisition		
Joint Polar Satellite Systems (JPSS)	528,035	Move to Polar Weather Satellites (PWS)
Polar Follow On (PFO)	329,956	Move to Polar Weather Satellites (PWS)
COSMIC 2/GNSS RO	5,892	Move to Low Earth Orbit (LEO)
Satellite Ground Services	40,802	Move to Low Earth Orbit (LEO), Geostationary Earth Orbit (GEO), and Systems Architecture and Engineering (SAE)
System Architecture and Advance Planning	4,929	Move to Systems Architecture and Engineering (SAE)
Projects, Planning and Analysis	35,273	Move to Low Earth Orbit (LEO), Geostationary Earth Orbit (GEO), and Systems Architecture and Engineering (SAE)
Commercial Weather Data Pilot	6,000	Move to Systems Architecture and Engineering (SAE)

* The 2020 Proposed Budget Restructure is done at the FY 2019 Enacted funding level and does not include any transfers or program changes outlined in the 2020 President's Budget.

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Department of Commerce
National Oceanic and Atmospheric Administration
ACTIVITY/SUBACTIVITY CHANGE CROSSWALK
Part 2 2020 Structure
(Dollar amounts in thousands)

Activity / Subactivity	FY 2016 Spend Plan	FY 2017 Spend Plan	FY 2018 Spend Plan	FY 2019 Enacted	FY 2020 President's Budget
National Environmental Satellite, Data and Information Service					
Systems Acquisition					
Geostationary Systems – R	870,016	745,102	518,532	408,380	304,056
Jason-3	7,443	4,357	-	-	-
Joint Polar Satellite Systems (JPSS)	807,319	787,246	757,777	548,035	-
Polar Follow-On (PFO)	369,247	327,668	419,000	329,956	-
Cooperative Data and Rescue Services (CDARS)	499	500	21,650	26,539	14,850
DSCOVR	7,808	3,745	-	-	-
Space Weather Follow On	1,198	5,000	8,545	27,000	25,600
COSMIC 2/GNSS RO	8,879	8,100	6,100	5,892	-
Satellite Ground Services	53,890	53,835	57,325	58,000	-
System Architecture and Advance Planning	3,921	3,929	4,929	4,929	-
Projects, Planning and Analysis	25,149	25,123	39,391	40,000	-
Commercial Weather Data Pilot	2,994	5,000	6,000	6,000	-
	2,158,363	1,966,971	1,857,249	1,454,731	
Systems Acquisition					
Polar Weather Satellites (PWS)					755,038
Low Earth Orbit (LEO)					33,202
Geostationary Earth Orbit (GEO)					22,403
Systems Architecture and Engineering (SAE)					44,822
					1,199,971

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Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $391,551,000 and 1,074 FTE/1,041 positions for the National Ocean Service, including a net decrease of $219,092,000 and 47 FTE/94 positions in program changes.

The National Ocean Service (NOS) enables safe, sustainable, and efficient use of marine and coastal resources across a range of significant economic sectors. Those sectors include maritime commerce and marine transportation, fishing and aquaculture, energy development, coastal recreation, and more. NOS efforts even support inland export and import industries, which depend on the flow of goods through seaports.

In 2014, coastal and Great Lakes counties (less than 10 percent of the land area of the U.S.) were home to 42 percent of our country's population and accounted for 48 percent of the U.S. gross domestic product.[1] These communities and their economies depend on marine resources, but also face unique environmental threats. Coastal storms threaten lives and destroy property. Tidal flooding damages infrastructure and forces costly adaptations. Ecological hazards, such as harmful algal blooms, disrupt fishing, water supplies, and tourism. Production and transport of fossil fuels, while essential to the U.S. economy, creates a constant risk of spills, including catastrophic ones like the Deepwater Horizon oil spill. The same coastal industries that are the engines of thriving ocean economies also generate port congestion, marine pollution, and navigation hazards. Coastal communities, governments, and businesses need reliable data and tools to help make informed decisions in the face of these threats.

NOS's products and services sustain livelihoods, reduce risk, and facilitate adaptation to change. NOS's earth observations and navigation products are used daily by ship pilots, port managers, surveyors, resource managers, and airports. When oil spills, chemical releases, and marine debris damage coastal resources, NOS's scientific expertise is essential to emergency response and long-term recovery. NOS plays a leading role in protecting the Nation's special marine places: the National Marine Sanctuaries System, the National Estuarine Research Reserve System (NERRS), and the National System of Marine Protected Areas. NOS also promotes smart resource management through technical assistance, applied research, and partnership building.

Significant Adjustments:

Calculated Adjustments
NOAA's FY 2020 Base includes an increase of $4,871,000 and 0 FTE/ 0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for NOS activities. This includes the estimated 2020 military pay raise of 2.1

[1] National Ocean Economics Program, *State of the U.S. Ocean and Coastal Economies* (www.oceaneconomics.org)

percent as well as inflationary increases for labor and non-labor activities, including benefits, and rent charges from the General Services Administration (GSA).

NARRATIVE INFORMATION:

Following this section are base justification materials and program change narratives by Activity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 1 and 11). Please contact NOAA if details for any of these changes are required.

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL OCEAN SERVICE											
Navigation, Observations and Positioning	Pos/BA	552	236,895	552	226,967	552	229,288	552	192,785	0	(36,503)
	FTE/OBL	549	242,239	549	226,967	549	229,288	549	192,785	0	(36,503)
Coastal Science and Assessment	Pos/BA	253	106,628	253	95,500	253	96,653	159	54,398	(94)	(42,255)
	FTE/OBL	247	91,190	247	95,500	247	96,653	200	54,398	(47)	(42,255)
Ocean and Coastal Management and Services	Pos/BA	300	255,252	314	259,100	314	260,497	314	122,522	0	(137,975)
	FTE/OBL	298	246,162	309	259,100	309	260,497	309	122,522	0	(137,975)
TOTAL NOS - ORF	**Pos/BA**	**1,105**	**598,775**	**1,119**	**581,567**	**1,119**	**586,438**	**1,025**	**369,705**	**(94)**	**(216,733)**
	FTE/OBL	**1,094**	**579,591**	**1,105**	**581,567**	**1,105**	**586,438**	**1,058**	**369,705**	**(47)**	**(216,733)**
Construction	Pos/BA	0	4,699	0	3,900	0	3,900	0	1,541	0	(2,359)
	FTE/OBL	0	3,663	0	3,900	0	3,900	0	1,541	0	(2,359)
TOTAL NOS - PAC	**Pos/BA**	**0**	**4,699**	**0**	**3,900**	**0**	**3,900**	**0**	**1,541**	**0**	**(2,359)**
	FTE/OBL	**0**	**3,663**	**0**	**3,900**	**0**	**3,900**	**0**	**1,541**	**0**	**(2,359)**
Damage Assessment and Restoration Revolving Fund	**Pos/BA**	**15**	**4,629**	**15**	**5,992**	**15**	**5,968**	**15**	**5,968**	**0**	**0**
	FTE/OBL	**15**	**34,529**	**15**	**71,777**	**15**	**46,475**	**15**	**46,475**	**0**	**0**
Sanctuaries Enforcement Asset Forfeiture Fund	**Pos/BA**	**0**	**14**	**0**	**120**	**0**	**120**	**0**	**120**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**440**	**0**	**120**	**0**	**120**	**0**	**0**
Gulf Coast Ecosystem Restoration Fund	**Pos/BA**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**
	FTE/OBL	**1**	**5,867**	**1**	**8,830**	**1**	**4,217**	**1**	**4,217**	**0**	**0**
TOTAL NOS	**Pos/BA**	**1,121**	**608,117**	**1,135**	**591,579**	**1,135**	**596,426**	**1,041**	**377,334**	**(94)**	**(219,092)**
	FTE/OBL	**1,110**	**623,650**	**1,121**	**666,514**	**1,121**	**641,150**	**1,074**	**422,058**	**(47)**	**(219,092)**

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Navigation, Observations and Positioning

Goal Statement

NOAA's Navigation, Observations and Positioning programs produce physical oceanographic observations and applications for the safe and efficient use of coastal waterways. In addition, this foundational data informs many other NOAA mission areas and essential activities, such as hazard and inundation forecasting, emergency response, habitat restoration, fishing, recreation and coastal energy development.

Base Program

The following offices comprise the Navigation, Observation, and Positioning activity:

- **Office of Coast Survey (OCS)** is responsible for surveying and producing navigation charts in the Nation's waters. OCS is America's oldest scientific agency and NOAA's oldest mission, dating to the administration of Thomas Jefferson in 1807.
- **National Geodetic Survey (NGS)** provides the authoritative U.S. positioning framework, delineates the national shoreline and sets standards for all foundational positioning, geodesy, and coastal mapping activities.
- **Center for Operational Oceanographic Products and Services (CO-OPS)** produces oceanographic observations and forecasts of tides, currents, and water levels. CO-OPS also provides the vertical framework for tidal datums across the U.S., and maintains long term sea level trends for the nation.
- **Integrated Ocean Observing System (IOOS).** NOAA IOOS leads the implementation and administration of a vast network of Federal and non-Federal observing systems that fulfill regional, national, and global needs. U.S. IOOS is a partnership of 17 Federal agencies and 11 Regional Associations.

Statement of Operating Objectives

Schedule and Milestones:

- Progressively implement data archive capability for ocean mapping data from University-National Oceanographic Laboratory System (UNOLS) and NOAA non-hydrographic vessel projects (FY 2020-2021)
- Annually increase topo-bathy shoreline data collection and reach full production levels in FY 2021
- Partner with NOAA/OAR/Ocean Acidification Program to deploy and operate ocean acidification sensors (buoys, shore

stations, gliders) on regional IOOS platforms (ongoing)
- Transition demonstrated marine sensor tools and technologies into operations (ongoing)

Deliverables:
- Nine new editions of Coast Pilot published annually and updated weekly for download
- 2,279 square nautical miles of hydrographic data
- 120 hydrographic surveys (conducted by NOAA survey units, contractors, and other sources) evaluated and approved
- Enhanced procedures and technology to improve hydrographic survey efficiency via ellipsoidally-referenced surveying
- U.S. Tide Predictions and Current Predictions
- Greater than 95 percent of water level data made available to the public annually
- A highly-accurate gravity-based geoid based on GRAV-D data (FY 2022)
- 30 GPS satellites and ground station positions analyzed daily to ensure precise orbits
- “Quality Assurance of Real Time Oceanographic Data” (QARTOD) manuals issued for IOOS core variables (ongoing)
- Annual analysis of high frequency radar system performance and operational readiness
- Two or more emerging tools or technologies deployed in two or more U.S. IOOS regions every three years
- Update 6.6 percent of the National Shoreline and 33 percent of Priority Ports Shoreline with new aerial imagery and 1,200 square nautical miles of nearshore bathymetric data from topobathy lidar

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
Navigation, Observations and Positioning	Pos/BA	539	154,161	539	156,467	539	158,788
	FTE/OBL	536	157,865	536	156,467	536	158,788
Hydrographic Survey/Priorities Contracts	Pos/BA	13	30,000	13	32,000	13	32,000
	FTE/OBL	13	30,000	13	32,000	13	32,000
IOOS Regional Observations	Pos/BA	0	35,000	0	38,500	0	38,500
	FTE/OBL	0	35,451	0	38,500	0	38,500
Total Navigation, Observations and Positioning	Pos/BA	552	219,161	552	226,967	552	229,288
	FTE/OBL	549	223,316	549	226,967	549	229,288

Navigation Services

Just as highways and railways are the backbone of U.S. surface transportation, NOAA's navigation products and services are the information-based infrastructure for safe and efficient marine transportation. In 2018, U.S. seaports moved over $536 billion of goods in international cargo[2], supporting agriculture, manufacturing, retail trade and other activities. The total economic impact to the national economy exceeds $4 trillion annually[3]. Commercial shippers, fishers, the U.S. Navy, the U.S. Coast Guard, state and local governments, recreational boaters, and many others rely on NOAA's charts and oceanographic services. The importance of timely, accurate and reliable oceanographic data and charts is increasing rapidly as vessel traffic and cargo value is expected to double between 2015 and 2021 and double again shortly after 2030[4]. NOAA uses all resources available to meet this demand, including initiatives such as the Integrated Ocean and Coastal Mapping (IOCM) program. Through IOCM, NOAA leads the National

[2] U.S. Department of Commerce, Census Bureau. (2018). FT920 U.S. Merchandise Trade: Selected Highlights, November 2018, Total Vessel Annual Value. p.1. Retrieved February 13, 2019 from https://www.census.gov/foreign-trade/Press-Release/2018pr/11/ft920/ft920.pdf

[3] Martin Associates. (2015, March). 2014 National Economic Impact of the U.S. Coastal Port System. Report prepared for the American Association of Port Authorities. Retrieved February 24, 2017 from http://aapa.files.cms-plus.com/PDFs/Martin%20study%20executive%20summary%20final.pdf

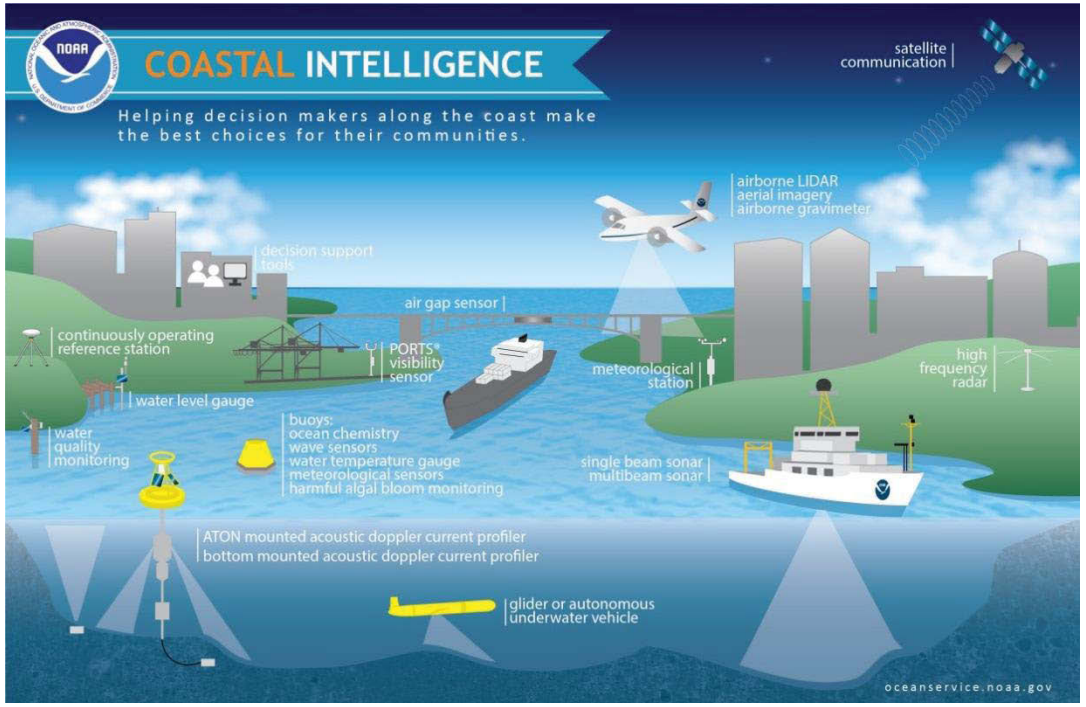
[4] National Ocean Service. (2015). The Value of PORTS to the Nation: How Real-Time Observations Improve Safety and Economic Efficiency of Maritime Commerce. (U.S. Department of Commerce, NOAA Report) Washington, D.C.

coordination on acquisition and management of ocean and coastal mapping data to maximize return on mapping resources. NOAA's suite of navigation products and services comprises the following:

- **Marine Charts and Hydrographic Surveys.** NOAA cartographers develop and maintain approximately 2,000 navigation products, including over 1,000 nautical charts, to ensure safe navigation in the 511,000 square nautical miles of navigationally significant U.S. waters. NOAA surveys these waters for depths and hazards to navigation. This hydrographic data is also useful for many other applications such as water modeling, fisheries management, marine debris mitigation, and coastal planning. Surveys using NOAA platforms and NOAA personnel are essential to maintaining the technical expertise necessary to oversee contracts, quality control data, develop survey technologies, and coordinate with the International Hydrographic Organization. At the same time, NOAA also depends on private sector surveyors to provide critical capacity for meeting survey needs. In 2018, NOAA released its first chart that was digital from inception, breaking the longstanding practice of creating digital charts based on paper charts. NOAA released its electronic navigational chart of the Merrimack River, Massachusetts, which offers a traditional depiction of the nautical chart for use with GPS-enabled electronic chart systems or other display systems to provide real-time vessel positioning for recreational mariners. NOAA intends to incorporate all future charts that are produced only as Electronic Navigational Charts. NOAA will make updates weekly, as necessary; customers with compatible applications will get the updates automatically.
- **Navigation Response Teams (NRTs) and Regional Services.** Navigation Response Teams conduct hydrographic surveys in shallow waters and busy port areas. NRTs also conduct rapid response surveys after maritime emergencies and natural disasters, minimizing costly impacts of port closures and draft restrictions. In September 2018, NRTs conducted hydrographic surveys following Hurricane Florence and identified hazardous obstructions in the Cape Fear River Channel, North Carolina. NOAA updated its nautical charts in less than 24 hours to help safely reopen the port. NOAA regional navigation managers engage with customers and stakeholders to improve NOAA's responsiveness to their charting and navigation needs.
- **Tide and Tidal Current Predictions.** NOAA maintains and updates the official U.S. tide and current prediction tables, with over 3,000 entries each. The U.S. Coast Guard requires large vessels to carry these tide tables along with NOAA navigation charts when transiting through U.S. ports. NOAA makes annual updates to each table and incorporates new observations from NOAA's long-term and short-term water level gauges and current meters. In addition, NOAA uses real-time observations, meteorological forecasts, and astronomical predictions to produce forecasts and "nowcasts" (predictions of current conditions where there are gaps in real-time observations) of tides, currents and other oceanographic parameters.
- **Applied Research and Development.** NOAA supports research and development on the cartographic, hydrographic and oceanographic sciences that underpin mapping efforts. This research and development leads to new survey technologies, models, and geospatial products and tools. For example, NOAA's Joint Hydrographic Center (JHC) develops remote sensing technologies and processes to improve data acquisition, processing, and charting. The JHC also supports definition of the U.S.

Extended Continental Shelf and sovereign rights beyond 200 nautical miles.

- **Shoreline Mapping.** The Coastal Mapping Program defines the Nation's 95,000-mile shoreline and near-shore bathymetry. These data are essential for nautical charts and the determination of U.S. maritime boundaries such as the exclusive economic zone. These data are also used for other applications, such as inundation modeling, benthic habitat mapping, marine debris detection, and coastal zone management. NOAA maps the shoreline with tide coordinated, geo-referenced data from aerial photographs, high-resolution satellite imagery, and aerial topographic-bathymetric (topobathy) Light Detection and Ranging (LIDAR). LIDAR has the ability to provide shallow water bathymetry in areas difficult and dangerous to survey by boat. Coastal Mapping equipment and personnel are also used to collect post-event (hurricane, flooding, tornado, etc.) aerial imagery to assess damage and support emergency response efforts.
- **Physical Oceanographic Real-Time System (PORTS®).** PORTS® is a public-private partnership that provides users with data from real-time environmental observations, nowcasts, and forecasts to facilitate safe marine navigation and other uses. The program is described further under "Ocean and Coastal Observations" below.
- **Precision Navigation.** Precision Navigation is a coordinated effort amongst NOAA programs and partners to address port-specific requirements, including updated navigational charts, real-time oceanographic and geospatial observations, and hydrographic models that forecast key conditions days in advance. NOAA is currently developing Precision Navigation projects for several locations. As of December 2018, NOAA is developing Precision Navigation projects for the Port of New York New Jersey and the five ports making up the Lower Mississippi River. This request



includes an investment to improve marine transportation services through a national dissemination site for NOAA data and products. The site will increase the utility of NOAA's data and provide a platform for data from future Precision Navigation projects.

NOAA's work in the Port of Long Beach is a prime example of how innovation and public-private partnerships can lead to the next generation of marine transportation infrastructure. In 2015, NOAA collaborated with the Port of Long Beach, the Southern California Coastal Ocean Observing System (SCCOOS), California Office of Spill Prevention and Response, the Coastal Data Information Program at the University of California, San Diego, vendors and users to pilot Precision Navigation through the development of a third-party custom under keel clearance prediction system. The system, relying on high-resolution foundational data and observations from NOAA-supported assets, has enabled port authorities to ease vessel draft restrictions from 65 feet to 66 feet in 2016, to 67 feet in 2017, and to 69 feet in 2018. At 69 feet of draft, offshore lightering is no longer required. Lightering, the ship-to-ship transfer of cargo while underway, is a major driver of cost and safety and environmental risks. For every extra foot of draft, tankers can load 40,000 additional barrels of crude oil, valued at $2 million.

Ocean and Coastal Observations

NOS produces critical oceanographic observations and forecasts through two main program groups: the Tides and Currents Data Program and the Integrated Ocean Observing System. These observing programs are core components of the information infrastructure that makes safe navigation and accurate positioning possible in marine environments. In addition, emergency response and management agencies use NOS's oceanographic observations to inform their responses to oil spills, storms, tsunamis and other coastal hazards.

The Tides and Currents Data Program operates two primary observing programs that the maritime community relies upon for safe and efficient navigation: the National Water Level Observation Network (NWLON) and National Current Observation Program (NCOP). NOAA's infrastructure and expertise with these two systems are also essential to operating NOAA's Physical Oceanographic Real Time Systems (PORTS®). NOAA's Tides and Currents activities include:

- **Water Level Observations.** The NWLON consists of 210 long-term, continuously operating water level stations throughout the coastal U.S., the Great Lakes, and island possessions and territories. Information from the NWLON ranges from real-time, high frequency data (e.g., tsunami 1-minute data and storm surge) to long-term datasets (e.g., sea level and lake level trends). NWLON provides the framework for the national tidal datum network. Reference datums (such as the International Great Lakes Datum (IGLD) or Mean Lower Low Water (MLLW)) are essential for a variety of uses: navigation products,

vertical control for the dredging federally maintained channels, and shoreline and marine boundaries. Additional applications of water level information include habitat restoration, emergency management, dredging, coastal planning and management, and construction projects. The NWLON is one of the top 15 high-impact, high-benefit earth observing systems out of over 360 government earth-observing systems assessed by the National Plan for Civil Earth Observations[5].

- **Current Observations.** The NCOP collects, analyzes, and disseminates predictions of currents for navigation products and hazardous materials response. NOAA acquires data through deployments of current surveys of varying sampling durations. Channel dredging and changes in the configuration of ports and harbors over time significantly alter the physical oceanography of many coastal areas, thereby necessitating continuous surveying to maintain data accuracy. The principal product generated by this program are tidal current predictions, published annually in the Tidal Current Tables and on the NOAA Current Predictions website, and raw observations provided to universities, engineers, and hydrodynamic modelers to validate models and improve the understanding of bay and estuarine circulation.
- **Modeling and Forecasting.** NOAA operates 14 regional forecast and nowcast models to produce predictions of future conditions and calculated data where direct observations are not available. The National Operational Coastal Modeling Program (NOCMP) develops and maintains a national network of Operational Forecast Systems (OFS). These forecasts inform decision-making, particularly for vessel transit planning and execution, and support issuing of special marine weather statement to alert ships at risk of grounding. In January 2018, OFS predicted elevated water level associated with the late season Nor'easters, prompting a special release of the Storm Quicklook, which provides a synopsis of near real-time oceanographic and meteorological observations at locations affected by tropical storms, hurricanes, and other serious storms. The Storm Quicklooks supported the issuance of National Weather Service coastal flood advisories throughout the Northeast. These operational forecasts are also the engine for ecological forecasts of harmful algal blooms and other ecological hazards. In FY18, NOAA implemented the Gulf of Maine OFS, providing users with forecast guidance on water levels, currents, water temperature, and salinity. NOAA plans to operationalize models for Cook Inlet and the West Coast shelf in FY 2019.
- **Physical Oceanographic Real Time Systems (PORTS®)**. PORTS® provides real-time information to help mariners navigate safely and efficiently among U.S. seaports. For example, three current meters were placed on Aids-to-Navigation buoys at the entrance to the Miami shipping channel in January 2018, providing real-time data to allow local pilots to bring large Post-Panamax vessels into Miami. The currents data is necessary to safely navigate incoming vessels out of the Gulf Stream, align into the ship channel filling its entire width, around a coral reef, and into Port Miami. PORTS® systems in operation serve 75 of the busiest seaports in the Nation. Individual systems are designed to meet local needs with site-specific data and sensors; systems typically provide water levels, currents, salinity and meteorological data (e.g., wind, atmospheric pressure, visibility,

[5] United States Group on Earth Observations, National Plan for Civil Earth Observations, Washington, DC: Office of Science and Technology Policy, July 2014, p. 40-41

and air and water temperatures) with some locations including sensors for waves and bridge clearance. PORTS® is a cost-shared program; local partners (for example, local port authorities, pilot associations, shippers, and the Department of Defense) provide funding for the sensor systems and ongoing maintenance. NOAA provides technical expertise for systems design, 24/7 quality control, data management and dissemination infrastructure, and ongoing data management. In FY 2018, NOAA supported the initiation of a new PORTS® in Miami, Florida; Port Everglades, Florida; Port of Toledo, Ohio; and Corpus Christi, Texas; as well as several enhancements to existing systems. The PORTS® program now provides real-time observations for all of the nation's top 20 seaports by tonnage.

The NOAA Integrated Ocean Observing System (IOOS®) is a national-regional partnership working to provide new tools and forecasts to improve safety, enhance the economy, and protect our environment. Integrated ocean information is available in near real time, as well as retrospectively. Easier and better access to this information is improving our ability to understand and predict coastal events - such as storms, wave heights, and sea level change. Such knowledge is needed for everything from retail to development planning.

The IOOS program serves the dual functions of providing technical and funding support for non-federal regional observing systems and of improving compatibility between Federal and regional observations. By improving the accessibility and interoperability of ocean data, IOOS enables users of ocean data (modelers, researchers, meteorologists, and others) to focus their resources on developing products. Observations by NOS and NOAA assets and partners are critical components of IOOS and the Global Ocean Observing System (GOOS).

The IOOS Regional component supports observing requirements of local communities and complements Federal ocean observations and models. NOAA supports IOOS Regional Associations through cooperative agreements for operations and maintenance, capital projects, and new sensor technology. IOOS Regional Associations deploy observing assets in accordance with nationally coordinated build-out plans, which identify highest-priority gaps and needs. Recent focuses for investment include:

- Buoys, gliders, coastal high frequency (HF) radar, animal telemetry (data from electronic tags attached to marine animals) and models to support hurricane storm surge, inundation and intensity forecasting;
- The Ocean Technology Transition (OTT) program to support research, development, testing, and evaluation of new sensor technology and observing strategies; and
- Advances in modeling through the Coastal and Ocean Modeling Testbed (COMT), which coordinates among the research

community and IOOS Regional Associations to ensure that new observations improve operational models and forecasts.

During FY 2018, all Regional Associations earned their IOOS certification through a detailed review and assessment process. Certification provides NOAA and its interagency partners a means to verify that a Regional Association's organizational and operational practices, including data management, meet recognized and established standards set by NOAA. Certification improves confidence in the network and has increased opportunities for partnering with other Federal and non-federal data providers.

Positioning and Geodesy

NOAA's Geodesy program defines and maintains the National Spatial Reference System (NSRS), the common reference framework for all positioning activities in the Nation. Accurate positioning underpins all transportation and infrastructure activity in the Nation, as well as all NOAA's earth observations and mapping activities. The foundational elements of this coordinate-based system—latitude, longitude, elevation, scale, gravity, and orientation – and their changes over time are essential to mapping, navigation, flood risk determination, transportation, land use, and ecosystem management. NOAA's authoritative spatial data, models, and tools are vital for the protection and management of natural resources and built infrastructure.

The NSRS improves the availability and accuracy of positional information necessary for accurate geographic information systems (GIS), active Global Positioning System (GPS) navigation and surveying, and better understanding of the Earth's geophysical dynamics. As examples, farmers use GPS applications that rely on NSRS to improve crop yields and mariners use GPS to position ships in navigation channels. In the future, autonomous vehicles will use GPS to navigate the air, land, and sea. NOAA improves the quality and accessibility of the NSRS by participating in the development of international geodetic standards and guidelines.

A 2009 study estimated that the NSRS provides more than $2.4 billion in potential annual benefits to the national economy.[6] The estimated economic benefits of the NOAA Continuously Operating Reference Station (CORS) network (described below) alone were $758 million per year. The same study estimated that a new geoid-based vertical reference system through the Gravity for the Re-Definition of the American Vertical Datum (GRAV-D) initiative would yield $522 million in annual economic benefits, with approximately $240 million from improved floodplain management alone.

The NOAA Geodesy program is composed of five major elements:

- **Continuously Operating Reference Stations (CORS) and Passive Infrastructure.** CORS are a publicly available network

[6] Socio-Economic Benefits Study: Scoping the Value of CORS and GRAV-D, Leveson, 2009.

of permanent GPS receivers that enable highly accurate positioning relative to the NSRS for surveyors and engineers. NOAA is working to establish a network of NOAA-owned CORS, using the most modern GPS receivers and antennas, which will enhance connection of the NSRS to the International Terrestrial Reference Frame (ITRF), creating a more consistent worldwide spatial reference frame to improve forecasts of global sea level rise and inform coastal infrastructure planning. NOAA also maintains a network of over one million permanent geodetic survey markers as part of the NSRS.

- **Modernization of the Vertical Datum.** NOAA leads the Nation's efforts to enhance the vertical aspect of the NSRS through its Gravity for the Re-Definition of the American Vertical Datum (GRAV-D) initiative. GRAV-D is a long-term project to collect airborne gravity data and build the Nation's gravimetric geoid model. GRAV-D will ultimately lead to a new, highly accurate national vertical datum, allowing GPS to establish more accurate elevations for all positioning needs. This system can help communities improve resilience by determining where water flows, allowing them to make accurate inundation models and assessments. In 2018, NOAA completed collecting airborne gravity data for all of mainland Alaska; it is anticipated that the entire state will have airborne gravity data collected by the end of 2020.
- **Data Access and Capacity Building.** NOAA provides access to geodetic, shoreline, and aerial survey data, including data from partner organizations. As part of its technology transfer efforts, NOAA conducts workshops and hosts constituent forums around the country. For example, in 2018, NOAA hosted a workshop with commercial equipment and software representatives to obtain their needs and concerns for modernizing the National Spatial Reference System (NSRS). NOAA also runs the Regional Geodetic Advisor Program, which provides training and assistance to state and local geodetic and survey programs, GIS users, and coastal managers. A 2018 study estimates the economic benefits of the Regional Geodetic Advisor Program to be between $18.6 and $38.7 million annually.[7]
- **Research and Subject Matter Leadership.** NOAA develops standards, guidelines, and best practices for the surveying and positioning industry as well as a variety of models of geophysical and atmospheric phenomena that affect spatial measurements. These tools are crucial to scientific and commercial positioning activities.

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $36,503 and 0 FTE/0 positions in FY 2020 program changes for the Navigation, Observations and Positioning Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 1).

[7] Scoping the Value of the Regional Geodetic Advisor Program, Mathur et al., 2018. (https://www.ngs.noaa.gov/PUBS_LIB/reg-geodetic-advisor-prog-socio-economic-scoping-study-6-1-18.pdf)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Navigation, Observations, and Positioning	Pos./BA	539	158,788	539	157,288	0	(1,500)
	FTE/OBL	536	158,788	536	157,288	0	(1,500)

Reduce funding for repair/replacement of Coastal Observing Assets (-$1,500, 0 FTE/0 Positions) – NOAA proposes to decrease funding for the repair or replacement of coastal observing assets. In FY 2019, NOAA received $1.5 million to repair or replace degraded or unreliable coastal, ocean, and Great Lakes observing assets, such as National Water Level Observation Network stations. In FY 2020, NOAA will continue to prioritize maintenance and replacement to ensure functionality of critical observing assets.

Department of Commerce
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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: Navigation, Observations, and Positioning
Program Change: Reduce funding for repair/replacement of Coastal Observing Assets

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$57,562	$58,713	$60,255	60,255	$0
11.3	Other than full-time permanent	154	157	157	157	0
11.5	Other personnel compensation	1,278	1,275	1,275	1,275	0
11.7	NOAA Corps	1,588	1,895	1,944	1,944	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	60,582	62,040	63,631	63,631	0
12	Civilian personnel benefits	18,774	19,232	19,962	19,962	0
13	Benefits for former personnel	31	0	0	0	0
21	Travel and transportation of persons	2,888	3,060	3,060	3,060	0
22	Transportation of things	314	315	315	315	0
23.1	Rental payments to GSA	6,755	6,800	6,800	6,800	0
23.2	Rental Payments to others	991	1,000	1,000	1,000	0
23.3	Communications, utilities and misc charges	1,575	1,600	1,600	1,600	0
24	Printing and reproduction	36	35	35	35	0
25.1	Advisory and assistance services	38,483	14,362	14,362	14,362	0
25.2	Other services from non-Federal sources	25,250	25,326	25,326	23,826	(1,500)
25.3	Other goods and services from Federal sources	1,671	1,716	1,716	1,716	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,015	2,529	2,529	2,529	0
31	Equipment	1,670	1,500	1,500	1,500	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,164	16,951	16,951	16,951	0
42	Insurance claims and indemnities		0	0	0	0
43	Interest and dividends	6	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$179,205	$156,467	$158,788	$157,288	($1,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Navigation, Observations, and Positioning	Pos./BA	539	158,788	539	158,288	0	(500)
	FTE/OBL	536	158,788	536	158,288	0	(500)

Reduce funding for the Coastal Mapping Program (-$500, 0 FTE/0 Positions) – NOAA proposes to decrease funding for the Coastal Mapping Program. The Coastal Mapping Program defines the Nation's 95,000-mile shoreline and near-shore bathymetry. Funding also supports the continued development and advancement of geospatial analytical and mapping techniques to precisely update shorelines in a common data format. These data are essential for nautical charts and the determination of U.S. maritime boundaries, such as the exclusive economic zone. These data are also used for other applications, such as inundation modeling, benthic habitat mapping, marine debris detection, and coastal zone management.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to award/modify contracts (FY 2020)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Update Percent of the National Shoreline with current/new aerial imagery and elevation data to improve navigational safety					
with decrease	6.6%	6.6%	6.6%	6.6%	6.6%
without decrease	6.8%	6.8%	6.8%	6.8%	6.8%
Percentage of Priority Ports Shoreline updated with new aerial imagery and elevation data to improve navigation safety (priority ports)					
with decrease	33%	33%	33%	33%	33%
without decrease	35%	35%	35%	35%	35%

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: Navigation, Observations, and Positioning
Program Change: Reduce funding for the Coastal Mapping Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$57,562	$58,713	$60,255	$60,255	$0
11.3	Other than full-time permanent	154	157	157	157	0
11.5	Other personnel compensation	1,278	1,275	1,275	1,275	0
11.7	NOAA Corps	1,588	1,895	1,944	1,944	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	60,582	62,040	63,631	63,631	0
12	Civilian personnel benefits	18,774	19,232	19,962	19,962	0
13	Benefits for former personnel	31	0	0	0	0
21	Travel and transportation of persons	2,888	3,060	3,060	3,060	0
22	Transportation of things	314	315	315	315	0
23.1	Rental payments to GSA	6,755	6,800	6,800	6,800	0
23.2	Rental Payments to others	991	1,000	1,000	1,000	0
23.3	Communications, utilities and misc charges	1,575	1,600	1,600	1,600	0
24	Printing and reproduction	36	35	35	35	0
25.1	Advisory and assistance services	38,483	14,362	14,362	13,862	(500)
25.2	Other services from non-Federal sources	25,250	25,326	25,326	25,326	0
25.3	Other goods and services from Federal sources	1,671	1,716	1,716	1,716	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,015	2,529	2,529	2,529	0
31	Equipment	1,670	1,500	1,500	1,500	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,164	16,951	16,951	16,951	0
42	Insurance claims and indemnities		0	0	0	0
43	Interest and dividends	6	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$179,205	$156,467	$158,788	$158,288	($500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Navigation, Observations, and Positioning	Pos./BA	539	158,788	539	156,788	0	(2,000)
	FTE/OBL	536	158,788	536	156,788	0	(2,000)

Eliminate Single-Year Grants to Mississippi Joint Ocean and Coastal Mapping Center (-$2,000, 0 FTE/0 Positions) – NOAA proposes to discontinue new funding awards for the joint ocean and coastal mapping centers in Mississippi. The center, funded by a cooperative agreement with academic institutions, investigates the use of unmanned systems for hydrographic surveys. NOAA will continue to support these efforts through its Coast Survey Development Laboratory, which explores and develops survey, geospatial data management, and cartographic technologies, and other Navigation, Observation and Positioning programs.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Number of new or existing projects					
with decrease	0	0	0	0	0
without decrease	10	10	10	10	10

Department of Commerce
National Oceanic and Atmospheric Administration
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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: Navigation, Observations, and Positioning
Program Change: Eliminate Single-Year Grants to Mississippi Joint Ocean and Coastal Mapping Center

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$57,562	$58,713	$60,255	$60,255	$0
11.3	Other than full-time permanent	154	157	157	157	0
11.5	Other personnel compensation	1,278	1,275	1,275	1,275	0
11.7	NOAA Corps	1,588	1,895	1,944	1,944	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	60,582	62,040	63,631	63,631	0
12	Civilian personnel benefits	18,774	19,232	19,962	19,962	0
13	Benefits for former personnel	31	0	0	0	0
21	Travel and transportation of persons	2,888	3,060	3,060	3,060	0
22	Transportation of things	314	315	315	315	0
23.1	Rental payments to GSA	6,755	6,800	6,800	6,800	0
23.2	Rental Payments to others	991	1,000	1,000	1,000	0
23.3	Communications, utilities and misc charges	1,575	1,600	1,600	1,600	0
24	Printing and reproduction	36	35	35	35	0
25.1	Advisory and assistance services	38,483	14,362	14,362	14,362	0
25.2	Other services from non-Federal sources	25,250	25,326	25,326	25,326	0
25.3	Other goods and services from Federal sources	1,671	1,716	1,716	1,716	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,015	2,529	2,529	2,529	0
31	Equipment	1,670	1,500	1,500	1,500	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,164	16,951	16,951	14,951	(2,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	6	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$179,205	$156,467	$158,788	$156,788	($2,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Navigation, Observations, and Positioning	Pos./BA	539	158,788	539	150,788	0	(8,000)
	FTE/OBL	536	158,788	536	150,788	0	(8,000)

Eliminate Regional Geospatial Modeling Grants (-$8,000, 0 FTE/ 0 Positions) – NOAA requests to terminate the Regional Geospatial Modeling Grant program. NOAA will continue to support a range of other regional geospatial requirements through NOS's Coastal Zone Management and Services and Navigation, Observations and Positioning program activities. These activities include the National Spatial Reference System, Continuously Operating Reference Stations (CORS), data access, and capacity building.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY2020)

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of Continuously Operating Reference Stations (CORS) managed by grant partners in the Gulf of Mexico and operating at 80% reliability.					
with decrease	0	0	0	0	0
without decrease	20	22	24	26	28
Number of person hours of training provided on concepts and software systems associated with geographic information systems.					
with decrease	0	0	0	0	0
without decrease	1,500	1,500	1,500	1,500	1,500

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: Navigation, Observations, and Positioning
Program Change: Eliminate Regional Geospatial Modeling Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$57,562	$58,713	$60,255	$60,255	$0
11.3	Other than full-time permanent	154	157	157	157	0
11.5	Other personnel compensation	1,278	1,275	1,275	1,275	0
11.7	NOAA Corps	1,588	1,895	1,944	1,944	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	60,582	62,040	63,631	63,631	0
12	Civilian personnel benefits	18,774	19,232	19,962	19,962	0
13	Benefits for former personnel	31	0	0	0	0
21	Travel and transportation of persons	2,888	3,060	3,060	3,060	0
22	Transportation of things	314	315	315	315	0
23.1	Rental payments to GSA	6,755	6,800	6,800	6,800	0
23.2	Rental Payments to others	991	1,000	1,000	1,000	0
23.3	Communications, utilities and misc charges	1,575	1,600	1,600	1,600	0
24	Printing and reproduction	36	35	35	35	0
25.1	Advisory and assistance services	38,483	14,362	14,362	14,362	0
25.2	Other services from non-Federal sources	25,250	25,326	25,326	25,326	0
25.3	Other goods and services from Federal sources	1,671	1,716	1,716	1,716	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,015	2,529	2,529	2,529	0
31	Equipment	1,670	1,500	1,500	1,500	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,164	16,951	16,951	8,951	(8,000)
42	Insurance claims and indemnities		0	0	0	0
43	Interest and dividends	6	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$179,205	$156,467	$158,788	$150,788	($8,000)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Hydrographic Survey Priorities/Contracts	Pos./BA	0	32,000	0	26,949	0	(5,051)
	FTE/OBL	0	32,000	0	26,949	0	(5,051)

Hydrographic Survey Priorities / Contracts (-$5,051, 0 FTE/ 0 Positions) – NOAA requests to reduce the acquisition of hydrographic data from contract surveys. NOAA will continue to acquire hydrographic survey data from contract surveyors with the remaining funds in support of safe and efficient transportation and commerce.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely award/modification of contracts (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (SNM)					
with decrease	2,279	2,279	2,279	2,279	2,279
without decrease	2,319	2,319	2,319	2,319	2,319

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: Hydrographic Survey Priorities / Contracts
Program Change: Hydrographic Survey Priorities / Contracts

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$1,700	$1,734	$1,734	$1,734	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	1,700	1,734	1,734	1,734	0
12	Civilian personnel benefits	550	555	555	555	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	25,565	29,711	29,711	24,660	(5,051)
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$27,815	$32,000	$32,000	$26,949	($5,051)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
IOOS Regional Observations	Pos./BA	0	38,500	0	19,444	0	(19,056)
	FTE/OBL	0	38,500	0	19,444	0	(19,056)

Reduce Integrated Ocean Observing System Regional Observation Grants (-$19,056, 0 FTE/ 0 Positions) – NOAA requests to reduce grants to the IOOS Regional Observations Program. NOAA will continue to support the 11 IOOS Regional Associations at the reduced funding level. NOAA requests additional funds within the National Weather Service (NWS-28) to increase the use of data buys from ships as an alternative method to support NOAA's meteorological and oceanographic observations.

NOAA currently provides financial assistance for 11 IOOS Regional Associations through a competitive merit-based grant process. Matching is not a requirement of this grant; however, Regional Associations do leverage grant funding to obtain additional funding in support of the regional observing systems. In FY 2019, NOAA received $1.5 million to support data platforms, like regional ocean partnerships. In FY 2020, NOAA proposes to fund these efforts under Coastal Zone Management and Services (NOS-53).

The IOOS Regional Associations supports observing requirements of local communities and complements Federal ocean observations and models. Funding supports the deployment, operation, and maintenance of over 300 observing assets that collect oceanographic data to help improve safety, enhance the economy, and protect the environment. The Regional Associations engage with local and regional user communities to understand information needs and to transform raw observation data into useful tools. IOOS Regional Associations provide over 65 million meteorological and wave observations per year to the National Weather Service and World Meteorological Organization. IOOS Regional Observations also includes the Marine Sensor Innovation program, which supports research, development, testing, and evaluation of new sensor technology, observing strategies, and modeling.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely modification of grants (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Number of million meteorological and wave observations per year to the National Weather Service and World Meteorological Organization in support of the 2017 Weather Act (observations in millions)					
with decrease	25.0	25.0	25.0	25.0	25.0
without decrease	65.0	65.0	65.0	65.0	65.0
Number of High Frequency Radar which measure surface currents for search and rescue, oil spill response, marine navigation, and tracking harmful algal blooms					
with decrease	110	110	110	108	106
without decrease	140	140	140	140	140

Department of Commerce
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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Navigation, Observations, and Positioning
Subactivity: IOOS Regional Observations
Program Change: Reduce Integrated Ocean Observing System Regional Observation Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	7	0	0	0	0
22	Transportation of things	6	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	15	0	0	0	0
23.3	Communications, utilities and misc charges	2	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	65	0	0	0	0
25.2	Other services from non-Federal sources	136	0	0	0	0
25.3	Other goods and services from Federal sources	107	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	48	0	0	0	0
31	Equipment	367	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	34,466	38,500	38,500	19,444	(19,056)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$35,219	$38,500	$38,500	$19,444	($19,056)

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Coastal Science and Assessment

Goal Statement

Under Coastal Science and Assessment, NOAA conducts applied research and delivers scientific information for disaster response and management, protection, and restoration of ocean and coastal resources. NOAA also provides coastal managers information and tools to stabilize shorelines; site wind farms, aquaculture, and shipping channels; and to protect fisheries and drinking water from harmful algal blooms.

Base Program

The following program offices are responsible for carrying out the Coastal Science and Assessment program:

- **National Centers for Coastal Ocean Science (NCCOS)** builds the applied science foundation and delivers solutions for coastal management and resilient coastal ecosystems. NCCOS laboratories are located in Maryland, South Carolina, North Carolina, and Alaska.
- **Office of Response and Restoration (OR&R)** is a center of expertise in preparing for and responding to threats to coastal environments: oil and chemical releases, abandoned and grounded vessels, and marine debris. When coastal and marine natural resources suffer damages, OR&R assesses the damage and ensures that response and recovery actions mitigate harm to those resources and surrounding economies.

Statement of Operating Objectives

Schedule and Milestones:

- Sustain operational ecological forecasting services; develop enhanced forecasting capabilities for HABs, habitat, and pathogens; and continue transition to operations for limited HAB forecasts (ongoing)
- Increase capacity for long-term coastal planning by improving tools and products for modeling impacts of sea-level rise and assessing vulnerabilities of marshes and beaches to sea level rise and coastal storms (ongoing)
- Validate and transition HAB detection and monitoring products to provide identification and toxicity measurements for regional

observing networks, states, municipalities and tribal nations (ongoing)
- Develop marine debris emergency response planning guides with partners in the Caribbean (U.S. Virgin Islands and Puerto Rico), Mid-Atlantic, Northeast, Pacific Islands, and Pacific Coast states
- Resolve liability for four natural resource damage assessment cases annually (ongoing)
- Release updates to two publicly available emergency response tools annually (ongoing)
- Train 2,000 emergency responders annually
- Remove 400 tons of marine debris annually
- Create and execute a multi-year Incident Exercise Plan to include an annual NOAA Concept of Operations level exercise focused on mission support

Deliverables:
- National guidelines for developing aquaculture monitoring protocols that are consistent nationally, regionally appropriate and environmentally responsible
- Operational forecasts for HABs in Lake Erie and the Gulf of Mexico, and for pathogens forecasts in the Chesapeake Bay, and Pacific Northwest (ongoing)
- Geospatial data, mapping products, and integrated assessments to inform management, restoration, and research plans in the Gulf of Mexico (FY 2020)
- Up to two research projects funded annually that address marine debris research and development priorities (ongoing)
- Improved understanding of the behavior of oil in ice among responders and the public (FY 2020)
- Public release of updated and enhanced environmental sensitivity indexes (ESIs) that aid public decision making during coastal disasters from oil spills to nuisance flooding (FY 2020-2023)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Science, Assessment, Response and Restoration	Pos/BA	244	93,422	253	77,500	254	78,653
	FTE/OBL	242	77,969	247	77,500	248	78,653
Competitive Research	Pos/BA	0	13,206	0	18,000	0	18,000
	FTE/OBL	0	13,221	0	18,000	0	18,000
Total Coastal Science and Assessment	Pos/BA	244	106,628	253	95,500	254	96,653
	FTE/OBL	242	91,190	247	95,500	248	96,653

Coastal Science and Monitoring

NOAA's applied research, ecological assessment, and tool development build the scientific foundation for community, business, and regulatory decision-making. These activities inform coastal management through research on aquaculture siting and sustainability, biogeographic assessments, and habitat mapping. Ecological forecasts for hazards such as harmful algal blooms and pathogens help communities safeguard drinking water and commercial and recreational fisheries. Research on contaminants (including oil, hazardous chemicals, and microplastics) improves disaster response and restoration. Vulnerability assessments and shoreline stabilization tools help communities prepare for inundation and storms.

NOAA intramural research programs have longstanding expertise in key areas that assist critical partners in the emergency and resource management communities. For example, when natural resource damage occurs, NOAA's long-term monitoring datasets establish a baseline of ecosystem conditions that existed before the event for assessing the extent of damages. The research in these areas also enables NOAA to develop resource protection strategies for National Marine Sanctuaries and other NOAA-managed areas.

The NOAA Coastal Science and Monitoring Program has four focus areas:

- **Marine Ecology**. NOAA provides information that communities, state and Federal stewards, and industries (such as aquaculture, energy and tourism) use to make decisions balancing the trade-offs between resource use and conservation.

- **Stressor Impacts and Mitigation**. NOAA's research in ecological forecasting, stressor detection, and understanding of stressor impacts on coastal resources help communities protect their water supplies, local fishing and shellfishing industries, public health, and coastal and lakefront tourism.
- **Coastal Change**. NOAA research efforts seek to understand the ecosystem services that improve a community's adaptation to changing conditions. This knowledge will help coastal communities take action and address the persistent threats from coastal storms, flooding, and rising seas.
- **Social Science**. All coastal and marine management decisions affect multiple communities. NOAA's coastal science and monitoring social science portfolio studies connections between people and the environment.

The NCCOS Competitive Research Program conducts research, monitoring, and assessment activities in support of NOAA coastal mission areas. Executed through competitive extramural grants, this program maintains the only national and regional scale grant programs dedicated to research topics under the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA). Grantee-developed detection tools and forecast models for harmful algal blooms (HABs) have helped to protect public health and economic activities from poisonous seafood, unsafe drinking water supplies, and beachgoers' exposure to algal toxins. The grants also address a variety of other threats, such as hypoxia, habitat loss, impacts and solutions to coastal flooding, shoreline modification, invasive species, and how they affect economically significant natural resources.

Close coordination among NOAA, grantee researchers, and user communities ensures that research findings and new technologies developed through this program are applied to resource management decisions. For example, the Mississippi River/Gulf of Mexico Hypoxia Task Force, which is composed of 18 Federal, state, and tribal agencies, uses monitoring and modeling from these grant-funded projects as the basis for hypoxia mitigation. The Great Lakes states use grantee research to evaluate prevention and control strategies for zebra mussels and other invasive species. Eleven states are using grantee-developed capabilities to address substantial inundation risks and impacts on the East Coast and Gulf Coast.

Emergency Response, Assessment and Restoration of NOAA Trust Resources

Federal, state, and local agencies across the country depend on NOAA's scientific advice and training of responders to minimize harm to economically significant natural resources from hazards. These hazards can include oil and chemical spills, vessel groundings, hazardous waste releases, and national security events. NOAA also addresses persistent coastal hazards such as marine debris. NOAA's emergency services include spill trajectory modeling, shoreline cleanup assessment, impacts identification, and information management.

In 2017, NOAA consolidated its interagency and intergovernmental responder training, preparedness and response activities under a Disaster Preparedness Program (DPP). The DPP includes, and will continue to build on, the activities at the Gulf of Mexico Disaster Response Center (DRC), to improve National preparedness for and response to all hazard types. During the 2018 hurricane seasons, the DPP and the DRC coordinated across all NOS program offices to gather information on NOS mission support, logistical needs, and impacts to NOS personnel and infrastructure.

After the initial response to an acute or chronic pollution event or grounding, NOAA and other natural resource trustees are responsible for determining the extent of damages to natural resources and for seeking compensation on behalf of the public for the loss of ecosystem services. NOS's Office of Response and Restoration works with NOAA's General Counsel for Natural Resources and the NMFS Office of Habitat Conservation to carry out the NOAA Damage Assessment, Remediation and Restoration Program (DARRP). NOS's role in the DARRP is to assess ecological risk and environmental and economic injury from pollution events and ship groundings. NOS also ensures that cleanup actions protect resources from further damage.

Through the DARRP, NOAA and co-trustees have secured more than $10.3 billion[8] for restoration from responsible parties at over 268 oil spills, Superfund sites and ship groundings, since 1998. NOAA and co-trustees collected $34.3 million from settlements in FY 2018 alone. These funds are reserved for ecosystem restoration and restoration of passive and active recreational use of the damaged resources. Funds are not applied to third party or private claims for property damage and lost business. In addition to securing resources for restoration, NOAA has also ensured that protection and restoration have been integrated into 500+ waste site cleanups to reduce further injuries and promote recovery. All these restoration projects provide economic benefits in the form of tourism, recreation (fishing, etc.), green jobs, coastal resiliency, property values and quality of life. There are currently over 100 cases in the DARRP docket; as of May 2018, 48 cases were in active injury assessment and restoration planning. Each case represents an oil spill, chemical spill, hazardous waste site, or ship grounding that may have damaged natural resources or reduced recreational opportunities. The FY 2020 request includes additional investment to reduce this backlog.

NOS, through the Marine Debris Program, is the Federal lead for addressing marine debris affecting the ocean and coastal environment and navigation safety in the United States. The program scope comprises prevention, research and monitoring, emergency response, removal, and regional coordination. The program provided technical assistance to local, state, and Federal partners during responses to hurricanes Harvey, Irma, and Maria and has since distributed $18 million in disaster relief funding to support marine debris assessment, removal, and disposal in the impacted areas of Florida, Texas, South Carolina, Georgia, Puerto Rico, and the U.S. Virgin Islands.

[8] This amount includes $8.1 billion from the April 2016 settlement with BP for the Deepwater Horizon spill.

NOAA also chairs the Interagency Marine Debris Coordinating Committee and is engaged in international coordination as a participant with the United Nations Global Partnership on Marine Litter in support of the G-7 marine litter initiative. In 2018, NOAA and the United Nations Environment Programme co-hosted the Sixth International Marine Debris Conference in San Diego, California. The conference brought together more than 700 participants from more than 50 countries to work towards a marine debris-free ocean. Efforts like these help advance the priorities of the Save Our Seas Act, an important piece of legislation for promoting international action to reduce marine debris in our ocean. In October 2018, the Save our Seas Act was signed into law which reauthorized the NOAA Marine Debris Program through 2022. Recognizing these efforts, the FY 2020 request includes additional investment for a total of $7.1 million for the Marine Debris Program.

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $42,255 and 0 FTE/0 positions in FY 2020 program changes for the Coastal Science and Assessment Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 1).

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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Science, Assessment, Response ad Restoration	Pos./BA	253	78,653	159	54,989	(94)	(23,664)
	FTE/OBL	247	78,653	200	54,989	(47)	(23,664)

Terminate National Centers for Coastal Ocean Science (-$23,664, -47 FTE/-94 Positions) – NOAA requests to terminate the National Centers for Coastal Ocean Science (NCCOS) while continuing to provide $8.8 million to sustain its most important research areas.

NCCOS delivers science solutions for stewardship of the Nation's ocean and coastal resources, providing coastal managers with the scientific information necessary to decide how best to protect environmental resources and public health, preserve valued habitats, and improve the way communities interact with coastal ecosystems. NOAA will retain funding and personnel in other offices to sustain key components of the NCCOS science portfolio; specifically, harmful algal bloom, hypoxia, and pathogen research, prevention, and forecasting ($5.0 million); habitat and species forecasting ($1.3 million); and marine aquaculture siting science and tool development ($2.5 million).

The FY 2020 budget supports the broad Administration goals of promoting national security, public safety, economic growth, and job creation. To ensure we can sustain core functions and enable critical enhancements to our priorities, NOAA made tough choices to reduce a number of programs. The termination and re-scaling of programs, while challenging and impactful, is necessary to move toward a more efficient government model that re-focuses on national security and core government functions. As with many other reductions in the FY 2018 and FY 2019 President's Budget, some of the activities of NCCOS are lower priority given available resources and can be mitigated by Federal, state, and local efforts in coastal science.

To achieve the requested staffing reduction in FY 2020, NOAA will seek to minimize the use of a reduction in force through attrition and workforce restructuring. NOAA will pursue Voluntary Early Retirement and Voluntary Separation Incentive Program options in reshaping its workforce and make use of other workforce flexibilities in implementing these actions. NOAA will also reduce contract support services, which provide administrative, information technology, and scientific technical support to scientists.

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With this termination, some of NCCOS's efforts may be undertaken by other research entities where applicable. NOAA will seek to ease that transition by coordinating with research partners. Some functions may be reassigned to NOAA's National Marine Sanctuaries, but the requested amount of funding for this program does not fully offset the termination of NCCOS. NCCOS will eliminate its scientific support for identifying areas appropriate for offshore energy development. NOAA will reassign the administrative and programmatic responsibilities for the RESTORE Act Science Program within NOAA.

Schedule and Milestones:

- Partner with Workforce Management to ensure the appropriate transition for affected staff (FY 2020-2021)
- Partner with Acquisition and Grants Office to ensure timely modification of contracts (FY 2020-2021)

Deliverables:

- Applicable research projects transferred to research partners (FY 2021)

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for management					
With decrease	6	6	6	6	6
Without decrease	7	7	7	7	7
Annual number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management					
With decrease	4	0	0	0	0
Without decrease	10	10	8	8	8

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Coastal Science and Assessment
Subactivity: Coastal Science, Assessment, Response and Restoration
Program Change: Terminate National Centers for Coastal Ocean Science

Title	Grade	Number	Annual Salary	Total Salaries
Financial Manager	ZA-04	1	140,024	(140,024)
Biological Science Technician	ZT-02	1	54,765	(54,765)
Biologist	ZP-03	2	94,446	(188,892)
Biologist	ZP-04	5	105,805	(529,027)
Biologist	ZP-05	5	93,101	(465,503)
Budget Analyst	ZA-03	2	94,446	(188,892)
Chemist	ZP-03	1	89,464	(89,464)
Ecologist	ZP-03	3	62,964	(188,892)
Ecologist	ZP-04	3	88,672	(266,015)
Ecologist	ZP-05	1	160,661	(160,661)
Economist	ZP-03	1	99,428	(99,428)
Engineering Technician	ZT-02	1	59,930	(59,930)
Environmental Protection Specialist	ZA-04	1	140,024	(140,024)
Facilities Operations Specialist	ZA-03	1	89,464	(89,464)
Fish Biologist	ZP-03	2	89,464	(178,928)
Fish Biologist	ZP-04	5	53,203	(266,015)
General Engineer	ZP-04	1	125,991	(125,991)
Geneticist	ZP-04	1	125,991	(125,991)
IT Specialist	ZP-03	2	94,446	(188,892)
IT Specialist	ZP-04	4	98,002	(392,006)

Exhibit 14

Department of Commerce
National Oceanic and Atmospheric Administration
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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Title		Grade	Number	Annual Salary	Total Salaries
Microbiologist		ZP-03	1	89,464	(89,464)
Microbiologist		ZP-04	3	130,669	(392,006)
Oceanographer		ZP-02	2	70,440	(140,879)
Oceanographer		ZP-04	5	54,110	(270,548)
Oceanographer		ZP-05	1	160,613	(160,613)
Physical Science Technician		ZT-03	1	68,869	(68,869)
Physical Scientist		ZP-03	4	99,428	(397,712)
Physical Scientist		ZP-04	10	40,522	(405,220)
Physical Scientist		ZP-05	2	160,656	(321,311)
Program Specialist		ZA-03	1	89,464	(89,464)
Program Specialist		ZA-04	1	140,024	(140,024)
Program Support Assistant		ZS-03	1	51,024	(51,024)
Purchasing Agent		ZS-04	1	56,570	(56,570)
Safety & Occupational Health Specialist		ZA-03	1	89,464	(89,464)
Social Scientist		ZP-04	1	140,024	(140,024)
Statistician		ZP-04	1	140,024	(140,024)
Wildlife Biologist		ZP-03	1	89,464	(89,464)
Writer/Editor		ZA-03	1	99,428	(99,428)
Total			94		(8,087,383)
Less Lapse	50.00%		(47)		4,043,692
Total full-time permanent (FTE)			47		(4,043,691)
2020 Pay Adjustment (0%)	0.00%				0
Total					(4,043,691)

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	47
Other than full-time permanent	0
Total	47
Authorized Positions:	
Full-time permanent	94
Other than full-time permanent	0
Total	94

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Coastal Science and Assessment
Subactivity: Coastal Science, Assessment, Response and Restoration
Program Change: Terminate National Centers for Coastal Ocean Science

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$29,089	$29,671	$30,449	$26,405	($4,044)
11.3	Other than full-time permanent	490	500	500	500	0
11.5	Other personnel compensation	474	475	475	475	0
11.7	NOAA Corps	261	340	349	266	(83)
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	30,314	30,986	31,773	27,646	(4,127)
12	Civilian personnel benefits	9,548	9,606	9,972	8,637	(1,335)
13	Benefits for former personnel	1	0	0	0	0
21	Travel and transportation of persons	1,158	1,000	1,000	355	(645)
22	Transportation of things	112	100	100	30	(70)
23.1	Rental payments to GSA	1,543	1,550	1,550	1,550	0
23.2	Rental Payments to others	504	500	500	500	0
23.3	Communications, utilities and misc charges	1,250	1,250	1,250	1,250	0
24	Printing and reproduction	39	50	50	35	(15)
25.1	Advisory and assistance services	3,244	3,195	3,195	755	(2,440)
25.2	Other services from non-Federal sources	23,841	23,314	23,314	10,683	(12,631)
25.3	Other goods and services from Federal sources	422	389	389	35	(354)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,347	1,320	1,320	118	(1,202)
31	Equipment	416	450	450	164	(286)
32	Lands and structures	65	65	65	65	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	4,159	3,725	3,725	3,166	(559)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	6	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$77,969	$77,500	$78,653	$54,989	($23,664)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Competitive Research	Pos./BA	0	18,000	0	0	0	(18,000)
	FTE/OBL	0	18,000	0	0	0	(18,000)

Eliminate NCCOS competitive funding support for research on ecological threats (-$18,000, 0 FTE/ 0 Positions) – NOAA requests to eliminate NCCOS competitive grants to academic research institutions.

NOAA proposes to eliminate the NCCOS Competitive Research program, which provides grants to academic institutions to conduct ecological research that advances NOAA's missions. The program expects to begin FY 2020 with 47 open awards that received funding in FY 2019. FY 2020 is scheduled to be the final year of funding for 17 of these 47 awards. All open awards will need to find alternative sources of funding to finish their research and technology transitions.

The NCCOS Competitive Research Program conducts research, monitoring, and assessment activities through competitive extramural grant awards. The program executes three- to five-year cooperative agreements for peer-reviewed, interdisciplinary investigations that address specific coastal management needs. This funding mechanism complements NCCOS intramural research by bringing together expertise from academic institutions, businesses, and government laboratories. Grantees generally research questions of different scopes and time scales than those that NOAA laboratories address.

Resource managers and stakeholders are part of the teams that synthesize and transition research findings into tools for coastal decision-making. The funding currently supports a diverse portfolio of seven programs covering topics which include:

- Harmful algal bloom (HAB) prediction and tools to prevent, control, or mitigate their occurrence and impacts;
- The causes and biological impacts of hypoxia (low oxygen) in coastal waters;
- Coastal ecosystems changes from inundation, coastal storms, and erosion;
- The economic value of protecting the shoreline from coastal storms using natural infrastructure;
- The combined effects of ocean acidification and hypoxia on economically and ecologically significant species and habitats.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

NCCOS extramural research grants are responsible for much of the science that underpins NOAA forecasts of ecological hazards. NOAA currently produces operational forecasts for HABs off the Texas coast and West Florida Shelf, operational HAB bulletins for Lake Erie and the Pacific Northwest and operational hypoxia models for the Gulf of Mexico. In addition, NOAA has experimental research models for HABs, hypoxia and marine pathogens in vulnerable coastal and Great Lakes areas around the country. In addition, these research grants provide science on the impacts and solutions to sea level rise and coastal flooding. A number of these capabilities would be eliminated under this proposal.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely modification of contracts (FY 2020-2021)

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for					
With decrease	6	6	6	6	6
Without decrease	7	7	7	7	7
Annual number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for					
With decrease	4	0	0	0	0
Without decrease	10	10	8	8	8

Department of Commerce
National Oceanic and Atmospheric Administration
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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Coastal Science and Assessment
Subactivity: Coastal Science, Assessment, Response and Restoration
Program Change: Eliminate NCCOS competitive funding support for research on ecological threats

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$268	$0	$0	$0	$0
11.3	Other than full-time permanent	10	0	0	0	0
11.5	Other personnel compensation	8	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	286	0	0	0	0
12	Civilian personnel benefits	90	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	11	0	0	0	0
22	Transportation of things	1	0	0	0	0
23.1	Rental payments to GSA	55	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	6	0	0	0	0
24	Printing and reproduction	2	0	0	0	0
25.1	Advisory and assistance services	200	0	0	0	0
25.2	Other services from non-Federal sources	801	0	0	0	0
25.3	Other goods and services from Federal sources	23	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	47	0	0	0	0
31	Equipment	17	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	11,682	18,000	18,000	0	(18,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$13,221	$18,000	$18,000	$0	($18,000)

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services

Goal Statement

Activities and programs under the Ocean and Coastal Management and Services use place-based, community, and regional approaches to achieve sound management and sustainable use of coastal and marine resources. These approaches emphasize collaboration across governments and sectors.

Base Program

The following program offices carry out the activities within the Ocean and Coastal Management and Services activity:

- **Office for Coastal Management (OCM)** supports implementation of states' coastal management programs and the National Estuarine Research Reserve System, including technical assistance such as NOAA's Digital Coast, under the Coastal Zone Management Act. The office also administers the Coral Reef Conservation Program and supports regional partnerships of coastal states. The office also supports activities under the Ocean Thermal Energy Conversion Act and the Deep Seabed Hard Mineral Resources Act.
- **Office of National Marine Sanctuaries (ONMS)** is responsible for the stewardship and management of the National Marine Sanctuary System and two marine national monuments: Papahānaumokuākea and Rose Atoll. Within ONMS, the National Marine Protected Areas Center is responsible for developing and coordinating a national system of marine protected areas to advance national conservation goals and to identify additional areas in need of protection.

Statement of Operating Objectives

Schedule and Milestones:

- Analyze coastal land cover in coastal regions (in each region every five years) to better understand trends in and impacts of land use and other management decisions
- Provide training and workshops to build skills within coastal management communities and promote transparent decision-making (FY 2020-2024)
- Deliver technical assistance to coastal communities to use Digital Coast for decisions (FY 2020-2024)
- Implement best practices to reduce pollutant loadings in U.S. Coral Reef Task Force priority watershed sites and NOAA Habitat Focus Areas (FY 2020-2024)

- Conduct coral reef assessment and monitoring cruises in the Pacific and Atlantic/Caribbean (FY 2020-2024)
- Implement additional sentinel monitoring activities to assess impacts of threats (e.g. ocean acidification, invasive species) to ONMS resources and detect early warnings of change at national, regional, and local scales (FY 2020-2024)
- Expand certification type programs for additional national marine sanctuaries and recreational operators (e.g., boating, charter fishing and commercial snorkel and dive operations) (FY 2020-2024)
- Engage recreational fishing associations in the promotion of sustainable recreational activities in national marine sanctuaries, and other marine protected areas (FY 2020-2024)
- Assess the type, distribution, and intensity of uses in national marine sanctuaries (FY 2020-2024)
- Assess and document status and trends of natural and cultural resources in conjunction with management plan review processes (FY 2020-2024)

Deliverables:

- Data, mapping, tools, and information resources made available through Digital Coast to address competing uses of coastal resources and adaptation to coastal hazards (on-going)
- On-site and interactive webinar training to introduce successful approaches and best practices to address future risks from coastal storms or other hazards (on-going)
- Annual updates of Economics - National Ocean Watch data to characterize the economic and job impacts of ocean and coastal activity (on-going)
- Forecasts and models that enable reef managers' monitoring of and response to coral bleaching events (on-going)
- Improved coral bleaching forecasts and ocean acidification models (on-going)
- Management strategies to improve coral reef protection through targeted research to better understand impacts of stressors to coral reefs (on-going)
- Complete assessments on management effectiveness of 20 Marine Protected Areas (MPAs) in priority coral reef sites
- A virtual classroom that increases the accessibility of science-based learning for sanctuary communities
- A voluntary education and recognition program, modeled after the current Blue Star program, for charter fishing operators working in national marine sanctuaries (e.g., Florida Keys)
- Publications on the value of recreational activities in national marine sanctuaries, including the value of fishing operators in Florida Keys National Marine Sanctuary
- Assessments of the resources in each sanctuary, pressures on those resources, the current condition and trends, and

management responses to the threats to the marine environment for sanctuaries completing management plan review processes

Explanation and Justification

Line Item		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
Coastal Zone Management and Services	Pos/BA	108	42,500	118	43,500	118	44,039
	FTE/OBL	107	38,205	116	43,500	116	44,039
Coastal Management Grants	Pos/BA	0	75,000	0	75,500	0	75,500
	FTE/OBL	0	75,098	0	75,500	0	75,500
Title IX Fund	Pos/BA	0	30,000	0	30,000	0	30,000
	FTE/OBL	0	29,754	0	30,000	0	30,000
Coral Reef Program	Pos/BA	24	27,393	19	27,600	19	27,679
	FTE/OBL	24	25,007	19	27,600	19	27,679
National Estuarine Research Reserve System	Pos/BA	0	25,043	0	27,000	0	27,000
	FTE/OBL	0	24,703	0	27,000	0	27,000
Sanctuaries and Marine Protected Areas	Pos/BA	168	55,316	177	55,500	177	56,279
	FTE/OBL	167	53,395	174	55,500	174	56,279
Total, Ocean and Coastal Management and Services	Pos/BA	300	255,252	314	259,100	314	260,497
	FTE/OBL	298	246,162	309	259,100	309	260,497

Coastal Zone Management and Services

While NOAA and other Federal agencies possess significant science and data capabilities to support coastal resource management, most decisions that affect the resilience of coastal communities occur at state and local levels. NOAA makes its significant scientific

expertise and data capabilities available to state and local decision-makers through Coastal Zone Management and Services.

National Coastal Zone Management Program

The Nation's coasts are managed through coastal and Great Lakes states' and territories' voluntary partnerships with NOAA. Authorized by the Coastal Zone Management Act of 1972, the National Coastal Zone Management (CZM) Program provides the basis for protecting, restoring, and responsibly developing the nation's diverse coastal zone. The 34 participating states' management plans balance competing demands of resource use, economic development, and conservation for 61,567 miles of coastline. This includes coastal access and tourism, as well as important decisions about where and how coastal homes, businesses, and infrastructure are built.

State coastal management programs lead this decision making process, weighing economic and environmental considerations. NOAA provides policy guidance and technical assistance, helping states, businesses, and stakeholders to navigate complex sets of laws and regulations that govern our coasts. NOAA also assesses the performance of each state program approximately every seven years, measuring progress toward individual state and national program goals. Participating states gain authority to review Federal activities, which have reasonably foreseeable effects on any coastal use or natural resource of the coastal zone and ensure that they are consistent with enforceable policies of their state programs.

NOAA's training, geospatial resources and decision support tools, are critical components of the CZM program that ensure that coastal resources continue to be an engine for economic growth. One such product is the Digital Coast, a NOAA-sponsored set of information, tools, and training that helps communities address coastal issues. It is one of the most-used resources in the coastal management community. A NOAA study estimated cost-benefit ratio of 1:3 for Digital Coast, with net benefits of $25 million.[9] One tool in the Digital Coast portfolio, the Coastal Flooding Impacts Viewer tool, integrates flood projection maps, digital elevation models, and realistic visualizations to show planners and engineers how flooding affects landmarks and infrastructure. City planners for Charleston, South Carolina, used the tool to formulate their sea level rise strategy, which the city council adopted in May 2016. The city prioritized future investments that would reduce dramatic economic losses from flooding-related coastal property damage and tourism impacts. Zillow recently completed a study using NOAA's Digital Coast tools that showed six feet of sea level rise would affect 1.9 million homes and $882 billion in real estate value along East and Gulf Coasts.[10]

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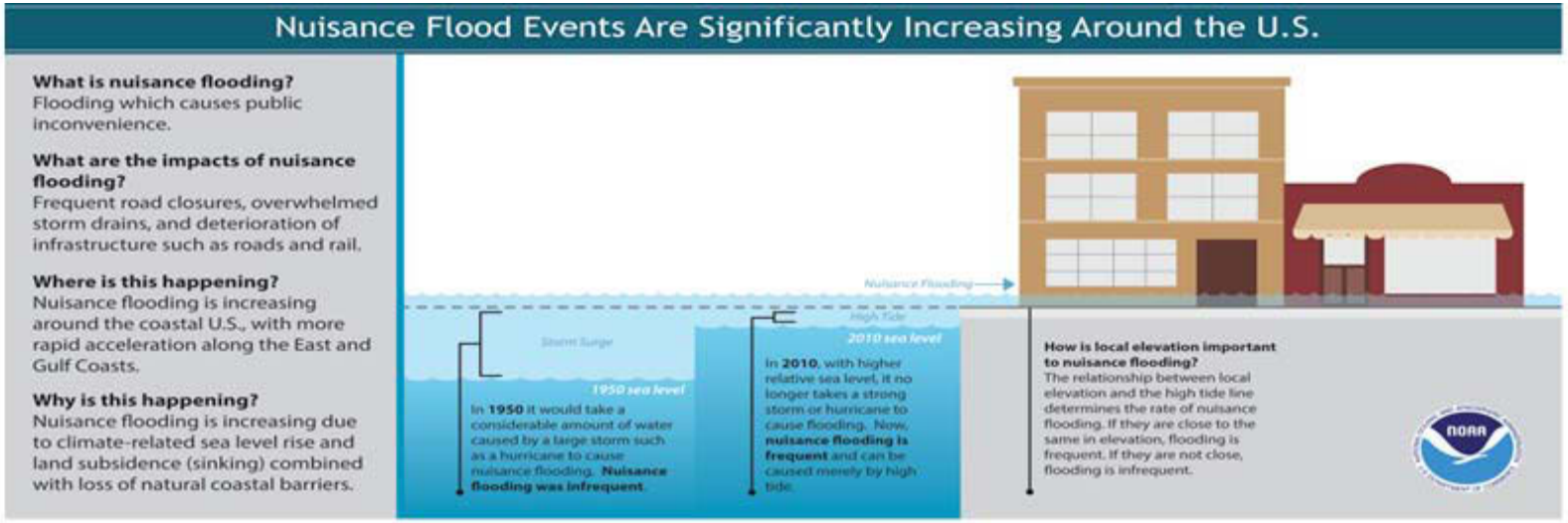
[9] Projected Benefits and Costs of the Digital Coast. NOAA, 2015. https://coast.noaa.gov/data/digitalcoast/pdf/benefits-costs.pdf
[10] Rao, K. 2017. "Climate Change and Housing: Will a Rising Tide Sink All Homes?" Published by Zillow.
Available at https://www.zillow.com/research/climate-change-underwater-homes-12890/

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



Nuisance flooding is among the many increasing threats to coastal communities that NOAA addresses through CZM technical assistance activities

NOAA's technical assistance resources help states to protect economically significant infrastructure. For example, the CZM program in California worked with NOAA to assess flood and seismic vulnerabilities of transportation assets in Alameda and Contra Costa counties. Implementing the resulting plan will better protect at least $6 billion in transportation infrastructure[11] and four refineries that produce 800,000 barrels of gasoline a day—a quarter of the state's total refining capacity.[12] A similar plan developed by Texas coastal management agencies with NOAA assistance will protect critical energy infrastructure and waterborne commerce passing through the Gulf Intracoastal Waterway valued at $25 billion annually,[13] including 29 percent of the Nation's refining capacity (more

[11] San Francisco Bay Conservation and Development Commission. 2011. Adapting to Rising Tides Transportation Vulnerability and Risk Assessment Pilot Project Technical Report.
Available at http://www.adaptingtorisingtides.org/wp-content/uploads/2015/04/RisingTides_TechnicalReport_sm.pdf
[12] Tam, L. 2017. "How Can the Bay Area's Aging Oil Refineries Meet California's New Climate Goals?" Published by SPUR.
Available at http://www.spur.org/news/2017-02-08/how-can-bay-area-s-aging-oil-refineries-meet-california-s-new-climate-goals
[13] Texas General Land Office. 2016. Shoring Up The Future for the Texas Gulf Coast.
Available at http://www.glo.texas.gov/coast/coastal-management/forms/files/shoring-up-our-future.pdf

than 5.1 billion barrels of crude oil per day) that resides in 27 Texas refineries.[14] The Georgia CZM program raised a causeway—the only road to Tybee Island—to mitigate flood risks that it identified using NOAA tools. The road is essential to recreation and tourism in the area.

Coastal Management Grants

Coastal Zone Management Grants assist states with their participation in the CZMP. Over the 46-year history of the Program, participating states and Federal agencies have partnered to streamline permitting and regulatory processes, reduce the costs associated with disasters, and address environmental risks with potentially catastrophic economic impacts. Steady support for these functions has helped states to balance multiple priorities along the coast in a transparent way, reducing regulatory uncertainty that might otherwise have hampered economic activity. States with more modest CZM programs have especially benefited from consistent resources for these functions. Another major use of the Grants has been public infrastructure projects, such as beach access facilities, boat ramps, and fishing piers.

Title IX Fund

National Coastal Resilience Fund Grants, supported by the Title IX Fund, assist states, academic institutions, and nonprofits to restore or expand natural features, such as coastal wetlands, dune systems, forests, and barrier islands that help minimize the impacts of storms, rising sea levels, and other extreme events on nearby communities and infrastructure. Investments through this national program build on significant coordination and planning that has already been done in many coastal communities and advance the implementation of projects that will have greatest benefit to both human community resilience and fish and wildlife. FY 2018 was the inaugural year for the grants. The grants are awarded in partnership with the National Fish and Wildlife Foundation. The program was preceded by the Regional Coastal Resilience Grant program.

National Estuarine Research Reserve System

The National Estuarine Research Reserve System (NERRS) is a national network of state-managed protected areas established under the Coastal Zone Management Act. The NERRS is a partnership between participating states and NOAA. NOAA provides national guidance and technical assistance while state agencies and universities perform day-to-day operations and management of

[14] Texas General Land Office. 2017. Coastal Resiliency Master Plan. Available at http://www.glo.texas.gov/coastal-grants/projects/files/Master-Plan.pdf

individual reserves with input from local partners.

The network of 29 unique reserves, located in 23 states and territories, protects over 1.3 million acres of state-owned estuarine lands and waters. They are economically significant areas that attract recreation and tourism activity, support commercial and recreational fisheries, and provide natural infrastructure for coastal protection and water quality. The NERRS have contributed billions of dollars to the shellfish and seafood industry in participating states and tens of billions of dollars in ocean-dependent industries. Coastal wetlands, such as those protected by the NERRS, provide $26 billion in storm protection each year.[15]

Reserves also serve as "living laboratories" for developing solutions to crucial issues such as climate adaptation, invasive species, habitat protection, and water quality. In 2018, reserves provided 1,958 hours of assistance to coastal decision-makers though 287 training programs. According to data collected in 2017, NERRS scientific and technical services reached 1,883 municipalities and 570 businesses nationwide. NERRS science translates readily into actions on the ground. For example, the Jacques Cousteau NERR in New Jersey developed a community self-assessment process to help over 30 municipalities to reduce risk and costs associated with severe weather impacts, such as those resulting from Hurricane Sandy. Some communities in NJ reduced flood insurance premiums for their citizens by 5 to 20 percent as a result, with greater reductions possible in the future. Nationwide, NOAA estimates similar actions could result in at least $92 million per year in flood insurance premiums savings for coastal communities.

Coral Reef Conservation Program

NOAA's Coral Reef Conservation Program (Coral Program) brings together multidisciplinary expertise from across NOAA to conserve and restore coral reefs. The program has partnerships with state, jurisdictional and international coastal resource managers. Coral reefs are among the most biologically diverse ecosystems in the world, providing a range of economic benefits and vital ecosystem services such as food, recreation, marine habitat, medicines, coastal protection, climate regulation, and biodiversity. A study in 2009 estimated the average annual value of these ecosystem services at $352,000 per hectare of reef.[16] Rapid declines in coral reefs – 19 percent of the world's reefs are effectively lost[17] and up to 75 percent are seriously threatened – have dire

[15] Costanza, R., Pérez-Maqueo, O., Martinez, M. L., Sutton, P., Anderson, S. J., & Mulder, K. (2008). The value of coastal wetlands for hurricane protection. *AMBIO: A Journal of the Human Environment*, *37*(4), 241-248. Available at https://doi.org/10.1579/0044-7447(2008)37[241:TVOCWF]2.0.CO;2

[16] Costanza, R., R. de Groot, P. Sutton, S. van der Ploeg, S.J. Anderson, I. Kubiszewski, S. Farber, and R.K. Turner. 2014 Changes in the global value of ecosystem services. Global Environmental Change 26: 152-158. (pdf, 508k) http://www.reefresilience.org/coral-reefs/reefs-and-resilience/value-of-reefs/

[17] "Coral Reef Loss Suggests Global Extinction Event." Available at http://www.worldwatch.org/node/5960

consequences for approximately 1 billion people who depend on coral reefs for their food and livelihoods.[18]

The Coral Program integrates coral protection efforts across NOAA and other agencies to address overfishing, harmful fishing practices, ocean temperature changes, ocean acidification, land-based sources of pollution, and other threats. The program's approaches include ecosystem-based management initiatives to build marine protected area management capacity; monitoring and forecasting of threats to coral reefs; and partnerships to address and reduce impacts of land-based sources of pollution. Land-based sources of pollution are major threats to coral reef ecosystems. NOAA works with jurisdictions that are upstream of coral reefs to develop 'ridge to reef' watershed management plans. These plans ensure that coral reef ecosystems are integrated into watershed planning processes.

Sanctuaries and Marine Protected Areas

National Marine Sanctuaries

NOAA serves as the trustee for a system of 13 national marine sanctuaries and two marine national monuments. These underwater parks range in size from the one square mile Monitor National Marine Sanctuary near Cape Hatteras, North Carolina, to the 582,000 square mile Papahānaumokuākea Marine National Monument along the northwestern portion of the Hawaiian Archipelago. Together these areas encompass over 621,000 square miles of ecologically significant marine habitats and maritime heritage assets (such as shipwrecks). Across all National Marine Sanctuaries, about $8 billion annually is generated in local coastal and ocean dependent economic activities such as commercial fishing, research and recreation/tourism-related activities.[19]

NOAA anticipates designating one or more national marine sanctuaries in 2019 and working with interested local communities on several other potential new or expanded sanctuaries. This request includes an investment to accelerate the economic benefits of new sanctuaries. New sanctuaries designated with program funds will have broad-based community support; protect and celebrate the nation's maritime cultural heritage and natural resources; and, expand economic development, recreation and tourism, and educational opportunities.

NOS protects these ecological and cultural assets through community engagement, applied management, research and monitoring, education, and public outreach activities. It develops and implements comprehensive management plans to ensure the protection

[18] United Nations Ocean Conference https://oceanconference.un.org/coa/CoralReefs

[19] Leeworthy, V.R. 2015. Economic Impact of National Marine Sanctuaries on Local Economies. Silver Spring, MD: National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries.

and sustainable use of resources. NOAA tailors each plan to the specific goals of each national marine sanctuary, which in turn reflect the unique resources and needs of each sanctuary's respective community. NOAA's partnerships facilitate research and monitoring and enforce the laws and regulations that protect sanctuary resources. Community engagement is a cornerstone of a site's management. Sites build and rely on volunteer participation and community input to manage the resource.

In FY 2018, NOAA continued to engage and expand its connection with local communities. NOAA expanded its Ocean Guardian Schools program to three new states - adding 2,000 students to the program. Ocean Guardian Schools receive grants to work with students on local conversation projects. Additionally, volunteers logged almost 128,000 hours supporting science, education, and public engagement programs to raise awareness and meet science needs of the sanctuaries.

NOAA also demonstrated how partnering with private businesses can enhance the health of the resources it protects. After Hurricane Irma, Florida Keys National Marine Sanctuary and local dive businesses, who are a part of the Blue Star program, worked together to remove nearly 3,000 pounds of marine debris and over 2,800 feet of fishing line throughout the site, restoring the natural beauty of the Florida Keys. NOAA also worked with public and private partners, including a local oil company, to remove the upper portion of a decommissioned oil rig in the Flower Garden Banks National Marine Sanctuary. The lower portion was left as an artificial reef for divers and anglers to enjoy. Such partnerships improve the sanctuary for everyone and contribute to the local blue economy.

Marine Protected Area Coordination

NOAA's Marine Protected Areas (MPA) Center, part of the Office of National Marine Sanctuaries, develops science, policy, and management tools to advance the effective use of MPAs for national conservation and management objectives. The MPA Center coordinates various Federal, state, and tribal MPA programs to better integrate the national system of MPAs, including national estuarine research reserves and national marine sanctuaries. This coordination focuses on developing curricula, trainings, and virtual tools to improve management capacity of MPA programs around the world. The Center also coordinates internationally with agencies that manage sites which share migratory species with the U.S. or have similar habitat and management challenges.

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $137,975 and 0 FTE/0 positions in FY 2020 program changes for the Ocean and Coastal Management and Services Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 1).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Zone Management and Services	Pos./BA	118	44,039	118	48,039	0	4,000
	FTE/OBL	116	44,039	116	48,039	0	4,000

Increase funding for Regional Ocean Data Portals ($4,000, 0 FTE / 0 Positions) – NOAA requests an increase for regional ocean data portals to implement Executive Order 13840, Ocean Policy to Advance the Economic, Security, and Environmental Interest of the United States (June 2018). Executive Order 13840 is intended to advance the economic, security, and environmental interests of the United States through improved access to credible marine data and information. Specifically, the order calls for the Federal government to "coordinate the timely public release of unclassified data and other information related to the oceans, coasts, and Great Lakes that agencies collect, and support the common information management systems, such as the Marine Cadastre, that organize and disseminate this information."

Regional ocean data portals will provide ocean-related Federal data and information to the public to inform regional, coastal, and ocean management decision-making across the United States. These platforms will also support analysis and siting of ocean infrastructure and other activities through the use of data. Funding will primarily support grants to non-Federal regional ocean entities to build their capacity to administer ocean data portals as well as address their other regional ocean data acquisition and management needs as identified in a recent study conducted by NOAA and the Department of Interior's Bureau of Ocean Energy Management. In addition, NOAA will enhance development of the Marine Cadastre to be able to manage the additional data streams and enhance accessibility for users nationwide.

Schedule and Milestones:

- Partner with the Ocean Resource Management (ORM) Subcommittee and appropriate Federal agencies to implement the scoping study's recommendations; provide Federally-sourced geospatial data to regional partners to inform management decisions (FY 2020-2021)

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

- Partner with ORM Subcommittee and their Data Work Group to specify data requirements for Federal agencies to meet regional needs (FY 2020)
- Provide grants and other assistance to increase capacity and collaboration within regions (FY 2020)
- Develop new data tools and other capabilities based on regional needs; test and evaluate with stakeholders (FY 2020)
- Implement new tools that improve regional stakeholders' ability to use and apply data to inform management decisions (FY 2021-2022)
- Provide new Automated Identification System (AIS) data to regional stakeholders and enhance the AIS data distribution platform to make it easier to access and use (FY 2021-2022);
- Add new data and functionality to Ocean Reports to enhance site selection and assist with environmental review (FY 2021-2022)
- Refresh versions of tools through continued stakeholder engagements (FY 2023-2024)
- Provide a testing platform via Marine Cadastre on which data can be prepared, tested, and openly disseminated to national, state, and regional data sharing platforms (FY 2020-2021)
- Gather stakeholder requirements to improve MarineCadastre.gov and other data and tools (FY 2020-2021)

Deliverables:

- Enhanced Federal geospatial data available for access and use by regional stakeholders
- Nine Regional Ocean Partnerships or equivalents with enhanced data sharing capabilities (e.g. data portals, metadata, and analytical tools)
- AIS data available to regional stakeholders
- New data and functionality available via Ocean Reports

	2020	2021	2022	2023	2024
Performance Measures:					
Number of U.S. coastal regions with increased access to data and information for coastal management decisions through enhancements to regional platforms and the Marine Cadastre (annual).					
With Increase	9	9	9	9	9
Without Increase	0	0	0	0	0

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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Coastal Zone Management and Services
Program Change: Increase funding for Ocean Data Platforms

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$13,424	$13,692	$14,055	$14,055	$0
11.3	Other than full-time permanent	212	0	0	0	0
11.5	Other personnel compensation	221	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	13,857	13,692	14,055	14,055	0
12	Civilian personnel benefits	4,517	4,519	4,695	4,695	0
13	Benefits for former personnel	1	0	0	0	0
21	Travel and transportation of persons	937	940	940	940	0
22	Transportation of things	21	20	20	20	0
23.1	Rental payments to GSA	1,067	1,067	1,067	1,067	0
23.2	Rental Payments to others	133	133	133	133	0
23.3	Communications, utilities and misc charges	490	490	490	490	0
24	Printing and reproduction	68	68	68	68	0
25.1	Advisory and assistance services	577	577	577	577	0
25.2	Other services from non-Federal sources	13,533	18,990	18,990	19,990	1,000
25.3	Other goods and services from Federal sources	315	315	315	315	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	387	387	387	387	0
31	Equipment	329	329	329	329	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1,973	1,973	1,973	4,973	3,000
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$38,205	$43,500	$44,039	$48,039	$4,000

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Zone Management and Services	Pos./BA	118	44,039	118	41,463	0	(2,576)
	FTE/OBL	116	44,039	116	41,463	0	(2,576)

Eliminate funding support for Integrated Water Prediction (-$2,576, 0 FTE/ 0 Positions) – NOAA proposes to eliminate funding for the NOS portion of the Integrated Water Prediction (IWP) project. IWP specifically brings together the National Weather Service (NWS) and NOS to transform the Nation's water prediction capabilities. The IWP program develops interdisciplinary water forecasts and decision support products for resource managers and emergency managers. The predictions and tools under development address both acute events and day-to-day water management challenges in changing environmental conditions. With this reduction, NOS will continue to participate as a member of the NOAA Water Team, providing guidance and in kind support as resources are available, but would significantly curtail development of new products and services for end users.

NOS is co-leading the new service delivery approach, which emphasizes stakeholder engagement to ensure that modelling outputs, decision support tools, and data generated will be used by the consumer. NOS is also leading the decision support tools core components, which apply water predictions in the development of "street-level" decision support products.

In FY 2018, NOS released a pilot stormwater decision support tool for testing. The tool enables users to better understand the impact of various water levels in coastal communities and develop an action plan to address various flooding scenarios. NOS will design phase two of the stormwater decision tool in FY 2019 that will include linkages to enhanced water estimates (waves, surge, tides and inundation) and resources to facilitate training and technical assistance for coastal communities. NOS will also conduct decision support tool needs assessments for drought and water quality, as well as workshops to demonstrate and explore tools and training resources to address coastal water issues.

NOS is also advancing development of coupled atmospheric, riverine, coastal, and terrestrial water models that will lead to the next generation of integrated Earth system models. In FY 2019, NOS expects to complete coupling NOS' operational 2-dimensional

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(Dollar amounts in thousands)

coastal model with riverine forecasts in the National Water Model, and make progress towards coupling NOS' 3-dimensional coastal models to the NWM, which would help to address water quality issues such as temperature, salinity, and ocean color.

Schedule and Milestones:

- Transfer projects to other NOAA programs and partners where applicable
- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of communities with completed analyses and community impact assessments (cumulative)					
With Decrease	4	4	4	4	4
Without Decrease	15	25	35	45	55
Percent of coastal population that will receive integrated water forecasts (i.e. forecasts coupled with terrestrial and marine models), and socioeconomic risk assessments, that did not as of FY 2017					
With Decrease	4%	4%	4%	4%	4%
Without Decrease	21%	35%	50%	55%	60%

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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Coastal Zone Management and Services
Program Change: Eliminate funding support for Integrated Water Prediction

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$13,424	$13,692	$14,055	$14,055	$0
11.3	Other than full-time permanent	212	0	0	0	0
11.5	Other personnel compensation	221	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	13,857	13,692	14,055	14,055	0
12	Civilian personnel benefits	4,517	4,519	4,695	4,695	0
13	Benefits for former personnel	1	0	0	0	0
21	Travel and transportation of persons	937	940	940	930	(10)
22	Transportation of things	21	20	20	20	0
23.1	Rental payments to GSA	1,067	1,067	1,067	1,067	0
23.2	Rental Payments to others	133	133	133	133	0
23.3	Communications, utilities and misc charges	490	490	490	490	0
24	Printing and reproduction	68	68	68	68	0
25.1	Advisory and assistance services	577	577	577	377	(200)
25.2	Other services from non-Federal sources	13,533	18,990	18,990	17,824	(1,166)
25.3	Other goods and services from Federal sources	315	315	315	315	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	387	387	387	387	0
31	Equipment	329	329	329	329	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1,973	1,973	1,973	773	(1,200)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$38,205	$43,500	$44,039	$41,463	($2,576)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Management Grants	Pos./BA	0	75,500	0	0	0	(75,500)
	FTE/OBL	0	75,500	0	0	0	(75,500)

Eliminate Coastal Zone Management Grants (-$75,500, 0 FTE/ 0 Positions) – NOAA requests a decrease to eliminate grants within the Coastal Zone Management (CZM) Program that support actions of states and other grantees authorized under the Coastal Zone Management Act (CZMA). NOAA will continue to support states' participation in the National CZM program by reviewing and supporting implementation of states' management plans, supporting Federal consistency reviews, and providing technical assistance services.

Coastal Zone Management Grants awarded from NOAA currently provide financial assistance for implementation of coastal zone management programs in 34 participating states and territories through Coastal Zone Management Grants. States match most of the CZM Grants on a 1:1 basis. State CZM Programs spend these funds on a broad range of approved activities under the CZMA including coastal planning and permitting, habitat conservation and restoration, protection of life and property from coastal hazards, public access to the coast for recreation, and urban waterfront and port revitalization. NOAA allocates the majority of CZM Grant funding using formulas based on shoreline lengths and coastal populations. CZM Grants also support projects of special merit (CZMA Section 309). These competitively awarded projects offer coastal management programs the opportunity to develop innovative projects that further their approved enhancement area strategies and focus on national priorities.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)
- Provide technical assistance to states with National CZM programs (FY 2020-2024)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures:					
Annual number of new or improved public access sites through CZM program					
With Decrease	0	0	0	0	0
Without Decrease	225	225	225	225	225
Number of coastal communities that complete projects to reduce future damage from or increase public awareness of hazards with assistance from OCM funding or staff (annual)					
With Decrease	0	0	0	0	0
Without Decrease	115	115	115	115	115
Number of participants in training events offered through CZM programs (annual)					
With Decrease	1,500	1,500	1,500	1,500	1,500
Without Decrease	20,000	20,000	20,000	20,000	20,000

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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Coastal Management Grants
Program Change: Eliminate Coastal Zone Management Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	75,098	75,500	75,500	0	(75,500)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$75,098	$75,500	$75,500	$0	($75,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Title IX Fund	Pos./BA	0	30,000	0	0	0	(30,000)
	FTE/OBL	0	30,000	0	0	0	(30,000)

Eliminate Federal Funding Support for the Title IX Fund (-$30,000, 0 FTE/ 0 Positions) – NOAA requests to eliminate Federal funding support for Title IX of the National Oceans and Coastal Security Act, which allows grants to be awarded through a partnership between the National Fish and Wildlife Foundation (NFWF) and NOAA. These grants are awarded through the National Coastal Resilience Fund (NCRF). Under this request, NOAA will continue to administer the cooperative agreement with NFWF to implement the FY 2018 grants until closed out.

NCRF grants fund restoration projects focused on engaging communities and reducing their vulnerability to growing risks from coastal storms, sea-level rise, flooding, erosion, wildfires, drought and extreme weather through strengthening natural ecosystems.

In FY 2018, NOAA and NFWF's inaugural round of funding for the NCRF awarded 35 grants in 22 states and Puerto Rico totaling $28.93 million and leveraged $38.29 million in matching funds from grantees.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of U.S. coastal states and territories restoring or expanding natural features that help minimize the impacts of storms, rising sea levels and other extreme events (annual)					
With Decrease	0	0	0	0	0
Without Decrease	23	23	23	23	23

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Title IX Fund
Program Change: Eliminate Federal Funding Support for the Title IX Fund

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	249	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	29,505	30,000	30,000	0	(30,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$29,754	$30,000	$30,000	$0	($30,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Coral Reef Program	Pos./BA	19	27,679	19	26,107	0	(1,572)
	FTE/OBL	19	27,679	19	26,107	0	(1,572)

Reduce funding for Innovative Coral Reef Restoration Initiatives (-$1,572, 0 FTE/0 Positions) – NOAA proposes to decrease funding for innovative coral reef restoration initiatives to restore degraded coral reefs. In FY 2019, NOAA will support necessary research, implement on-the-ground actions to prevent additional losses of corals and their habitat, and apply innovations in restoration and intervention techniques to create resilient, genetically diverse, and reproductively viable populations of key coral species. This will be done through work with numerous partners including academia, nongovernmental organizations, and private industry. In FY 2020, NOAA will continue to work with its partners to protect and restore coral reefs, prioritizing the most promising projects.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of projects completed to restore coral reefs					
With Decrease	1	2	2	2	2
Without Decrease	3	4	4	4	4

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Coral Reef Program
Program Change: Reduce funding for Innovative Coral Reef Restoration Initiatives

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$1,962	$2,001	$2,053	$2,053	$0
11.3	Other than full-time permanent	60	61	61	61	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,022	2,062	2,114	2,114	0
12	Civilian personnel benefits	711	732	759	759	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	405	450	450	450	0
22	Transportation of things	12	12	12	12	0
23.1	Rental payments to GSA	220	235	235	235	0
23.2	Rental Payments to others	10	20	20	20	0
23.3	Communications, utilities and misc charges	96	100	100	100	0
24	Printing and reproduction	14	20	20	20	0
25.1	Advisory and assistance services	2,186	1,849	1,849	1,849	0
25.2	Other services from non-Federal sources	5,401	7,400	7,400	5,828	(1,572)
25.3	Other goods and services from Federal sources	136	140	140	140	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	308	340	340	340	0
31	Equipment	227	240	240	240	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	13,258	14,000	14,000	14,000	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$25,007	$27,600	$27,679	$26,107	($1,572)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
National Estuarine Research Reserve System	Pos./BA	0	27,000	0	0	0	(27,000)
	FTE/OBL	0	27,000	0	0	0	(27,000)

Eliminate Federal Funding Support for NERRS (-$27,000, 0 FTE/ 0 Positions) – NOAA requests to eliminate NOAA's portion of funding support to states for the operations and management of the National Estuarine Research Reserve System authorized under the Coastal Zone Management Act (CZMA).

NOAA proposes to discontinue NOAA grants to state agencies and academic institutions that support operations of the National Estuarine Research Reserve System (NERRS). Under this proposal, NOAA will continue to provide national-level system coordination and in-kind support to state agencies and academic institutions that choose to continue operating the reserves using state funds.

NOAA provides Federal funding support to states for operation of NERRS. Federal NERRS funding (70 percent) is matched by states (30 percent) for reserve operations, research, monitoring, training and education; in FY 2018, states provided approximately $6.5 million in matching funds. This network of protected areas contributes to local, science-based training and education programs, and provides recreational opportunities for the public.

Federal grants also support the NERR System-Wide Monitoring Program (SWMP) and the NERRS Science Collaborative. The SWMP generates long-term datasets on water quality, meteorological time series data, and habitat data important to local and state decision-makers and Federal agencies. The NERRS Science Collaborative is the competitive grant program through which most of the NOAA-funded research undertaken at the Reserves is accomplished. NOAA awards an average of $4 million each year in competitive grants that fund user-driven collaborative research, assessment, and transfer activities that address coastal management needs identified by the reserves.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

	2020	2021	2022	2023	2024
Performance Measures:					
Annual number of data points collected in national estuarine research reserves via monitoring stations (millions)					
With decrease	0.0	0.0	0.0	0.0	0.0
Without decrease	50.0	50.0	50.0	50.0	50.0

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: National Estuarine Research Reserve System
Program Change: Eliminate Federal Funding Support for NERRS

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	215	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	24,488	27,000	27,000	0	(27,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$24,703	$27,000	$27,000	$0	($27,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries and Marine Protected Areas	Pos./BA	177	56,279	177	55,279	0	(1,000)
	FTE/OBL	174	56,279	174	55,279	0	(1,000)

Eliminate Research Grants for Monuments (-$1,000, 0 FTE/ 0 Positions) – NOAA requests a decrease to eliminate Federal funding for Marine Sanctuaries research grants for Marine National Monuments. These Congressionally directed grants provide funding for competitive research and management grants for the Papahanaumokuakea Marine National Monument. ONMS granted funding for this single year award for the first time in FY 2017.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Number of natural resource environments managed by the Office of National Marine Sanctuaries in which water, habitat and living resource quality is stable or improving.					
With decrease	10	10	10	10	10
Without decrease	10	10	10	10	10

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Sanctuaries and Marine Protected Areas
Program Change: Eliminate Research Grants for Monuments

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$19,139	$19,522	$20,034	$20,034	$0
11.3	Other than full-time permanent	148	151	151	151	0
11.5	Other personnel compensation	369	375	375	375	0
11.7	NOAA Corps	489	520	534	534	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,145	20,568	21,094	21,094	0
12	Civilian personnel benefits	6,570	6,787	7,040	7,040	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	1,024	1,100	1,100	1,100	0
22	Transportation of things	215	250	250	250	0
23.1	Rental payments to GSA	1,451	1,460	1,460	1,460	0
23.2	Rental Payments to others	737	750	750	750	0
23.3	Communications, utilities and misc charges	953	965	965	965	0
24	Printing and reproduction	68	70	70	70	0
25.1	Advisory and assistance services	3,293	3,430	3,430	3,430	0
25.2	Other services from non-Federal sources	8,670	9,015	9,015	9,015	0
25.3	Other goods and services from Federal sources	229	230	230	230	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	956	1,200	1,200	1,200	0
31	Equipment	208	300	300	300	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,875	9,375	9,375	8,375	(1,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$53,395	$55,500	$56,279	$55,279	($1,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries and Marine Protected Areas	Pos./BA	177	56,279	177	52,779	0	(3,500)
	FTE/OBL	174	56,279	174	52,779	0	(3,500)

Eliminate Telepresence Research Grants (-$3,500, 0 FTE/ 0 Positions) – NOAA requests a decrease to eliminate Federal funding for Marine Sanctuaries Telepresence Grants. NOAA will retain funding and personnel in NOAA's Office of Ocean Exploration and Research to support telepresence-enabled expeditions. These Congressionally directed grants provide funding to explore and document the deep-sea oceanography, marine habitats, cultural sites, and living and non-living resources in and around national marine sanctuaries to better understand their biology, ecology, geology, and cultural resources. The grants fund deep-sea exploration and education at organizations and institutions that can orchestrate state-of-the-art ocean research with Remotely Operated Vehicles (ROVs) in real-time, via telepresence. Telepresence provides real-time communications and video feeds from onsite field locations to distributed science, education, community based venues to U.S. and international locations.

ONMS granted funding for three awards for the first time in FY 2018, with work beginning in FY 2019. FY 2020 is scheduled to be the final year of funding for these awards. All open projects will need to find alternative sources of funding to finish their research and technology transitions.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of natural resource environments managed by the Office of National Marine Sanctuaries in which water, habitat and living resource quality is stable or improving.					
With increase	10	10	10	10	10
Without decrease	10	10	10	10	10

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean and Coastal Management and Services
Subactivity: Sanctuaries and Marine Protected Areas
Program Change: Eliminate Telepresence Research Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$19,139	$19,522	$20,034	$20,034	$0
11.3	Other than full-time permanent	148	151	151	151	0
11.5	Other personnel compensation	369	375	375	375	0
11.7	NOAA Corps	489	520	534	534	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,145	20,568	21,094	21,094	
12	Civilian personnel benefits	6,570	6,787	7,040	7,040	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	1,024	1,100	1,100	1,100	0
22	Transportation of things	215	250	250	250	0
23.1	Rental payments to GSA	1,451	1,460	1,460	1,460	0
23.2	Rental Payments to others	737	750	750	750	0
23.3	Communications, utilities and misc charges	953	965	965	965	0
24	Printing and reproduction	68	70	70	70	0
25.1	Advisory and assistance services	3,293	3,430	3,430	3,430	0
25.2	Other services from non-Federal sources	8,670	9,015	9,015	9,015	0
25.3	Other goods and services from Federal sources	229	230	230	230	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	956	1,200	1,200	1,200	0
31	Equipment	208	300	300	300	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,875	9,375	9,375	5,875	(3,500)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$53,395	$55,500	$56,279	$52,779	($3,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Construction

Goal Statement

The National Ocean Service's Construction activity provides construction and acquisition support for the National Estuarine Research Reserve System (NERRS) and the National Marine Sanctuaries.

Base Program

The National Estuarine Research Reserve System (NERRS) is a Federal-state partnership established under the CZMA designed to protect and understand valuable estuarine resources through research and education. NOAA funds NERRS construction and land acquisition projects on a competitive basis. For PAC, NERRS funding has been matched 70:30 (Federal: state) for facilities construction and 1:1 for land acquisition.

NERRs are state-owned lands and onsite facilities operated and managed by the states. They provide opportunities for researchers as well as the public to better understand these estuarine areas. Facilities investments at the reserves aligned with system-wide construction plans that consider requirements for implementing core NERRS programs and external opportunities for partnerships. States also used these grants to acquire additional nearby critical habitat within, or adjacent to, reserve boundaries to increase protection and provide places for conducting long-term science, education, and demonstration programs.

NOS administers the Nation's system of 13 Marine Sanctuaries and Rose Atoll and the Papahānaumokuākea Marine National Monuments under the National Marine Sanctuaries Act. PAC funding supports capital costs of maintaining the Sanctuary Program's facilities, exhibits, and small boat fleet. Vessels for research, monitoring, enforcement and emergency response are essential to site management, especially in areas such as Florida Keys National Marine Sanctuary. Capital funding is critical to ensure these assets remain operable, their life cycle costs are kept down, and that the sites can meet their mission.

The National Marine Sanctuary System's comprehensive facilities plan prioritizes capital investment in facilities, exhibits and collaborative education and visibility projects. NOS maintains a fleet of small boats to access protected areas and implement management plans. NOS periodically performs large scale maintenance, refurbishments, or upgrades to maintain vessel safety, mission effectiveness, or to extend vessels' service life.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Statement of Operating Objectives

Schedule and Milestones:

- Conduct critical capital construction activities on sanctuary facilities and vessels, construction of exhibits, signage, and kiosks, and funding for limited emergency and required major small boat repairs (ongoing)

Deliverables:

- Advance construction of ongoing projects at one of four sites: Crissy Field in San Francisco, CA, Greater Farallones National Marine Sanctuary; Key West, FL, Florida Keys National Marine Sanctuary; Galveston, TX, Flower Gardens Banks National Marine Sanctuary; or Scituate, MA, Stellwagen Bank National Marine Sanctuary
- Complete construction of exhibits, signage, and kiosks

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount
National Estuarine Research	Pos/BA	0	1,894	0	1,900	0	1,900
Reserve Construction	FTE/OBL	0	1,653	0	1,900	0	1,900
Marine Sanctuaries	Pos/BA	0	2,799	0	2,000	0	2,000
Construction	FTE/OBL	0	1,892	0	2,000	0	2,000
Total Construction	Pos/BA	0	4,693	0	3,900	0	3,900

In order to establish better understanding and appreciation for sanctuary and other ocean resources by the public, the program develops and maintains a network of exhibits, signage, and kiosks. Whenever possible NOAA develops cooperative centers at existing aquaria, museums and other appropriate facilities to engage the public and environmental decision-makers on conservation issues. Capital requirements for sanctuary facilities include safety improvements, Americans with Disabilities Act upgrades, and capital maintenance.

NOS maintains and repairs Sanctuaries' vessels over their service lives. Periodic assessments help to determine whether any

refurbishments or upgrades are needed to maintain vessel safety and legal compliance, mission effectiveness, or extend vessels' service life. Upgrades can include vessel hull form modification, propulsion system revision and replacement, and upgrades of scientific, navigational, load handling, and auxiliary systems.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
NERRS Construction	Pos./BA	0	1,900	0	0	0	(1,900)
	FTE/OBL	0	1,900	0	0	0	(1,900)

Eliminate Federal Funding Support for NERRS Construction (-$1,900, 0 FTE/ 0 Positions) – NOAA requests to eliminate Federal funding support to states for National Estuarine Research Reserve System land acquisition and construction.

NOAA proposes to discontinue grants to state agencies and academic institutions for construction and land acquisition activities within the National Estuarine Research Reserve System. Under this proposal, NOAA will continue to provide national-level system coordination and in-kind support to state governments that choose to continue operating the reserves using state funds.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing awards (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Annual number of NERRS facility construction projects that improve safety or environmental sustainability					
with increase	0	0	0	0	0
without increase	7	7	7	7	7

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Construction
Subactivity: NERRS Construction
Program Change: Eliminate Federal Funding Support for NERRS Construction

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1,659	1,900	1,900	0	(1,900)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$1,659	$1,900	$1,900	$0	($1,900)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Sanctuaries Constructon Base	Pos./BA	0	2,000	0	1,541	0	(459)
	FTE/OBL	0	2,000	0	1,541	0	(459)

Reduce National Marine Sanctuaries Construction (-$459, 0 FTE/ 0 Positions) – NOAA requests to reduce scalable funding for design and installation of signage, exhibits, and kiosks, maintenance of vessels, and facility construction and maintenance.

Funding dedicated to signage and exhibits, vessels, and facilities varies from year to year based on overall capital requirements of the Sanctuary System, including requirements for major vessel maintenance and facilities construction projects. These requirements are increasing as vessels and facilities age. For example, sanctuary facilities are generally 10 to 25 years old and are located in coastal areas subject to harsh weather conditions. NOAA will defer projects to improve the condition of these facilities and increase the use of operational funds to conduct maintenance where appropriate.

Schedule and Milestones:

- Partner with Acquisition and Grants Office to ensure timely closeout of existing contracts and awards (FY 2020)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Construction
Subactivity: Marine Sanctuaries Construction Base
Program Change: Reduce National Marine Sanctuaries Construction

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$0	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.7	NOAA Corps	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	3	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	2	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	150	0	0	0	0
25.2	Other services from non-Federal sources	1,315	0	0	0	0
25.3	Other goods and services from Federal sources	68	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	37	0	0	0	0
31	Equipment	1	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	428	2,000	2,000	1,541	(459)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$2,004	$2,000	$2,000	$1,541	($459)

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Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Enacted, 2019	15	15	5,992	71,777
2020 Adjustments to base:				
less: Obligations from prior year balances	0	0	0	0
Plus: Technical adjustments to base	0	0	(24)	(25,302)
2020 Base	15	15	5,968	46,475
Plus: 2020 Program changes	0	0	0	0
2020 Estimate	15	15	5,968	46,475

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Damage Assessment and Restoration Revolving Fund	Pos/BA	26	4,629	15	5,992	15	5,968	15	5,968	0	0
	FTE/OBL	26	34,529	15	71,777	15	46,475	15	46,475	0	0
Total: Damage Assessment and Restoration Revolving Fund	Pos/BA	26	4,629	15	5,992	15	5,968	15	5,968	0	0
	FTE/OBL	26	34,529	15	71,777	15	46,475	15	46,475	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	26	34,529	15	71,777	15	46,475	15	46,475	0	0
Total Obligations	26	34,529	15	71,777	15	46,475	15	46,475	0	0
Adjustments to Obligations:										
Federal funds	0	0	0	0	0	0	0	0	0	0
Offsetting collections, mandatory	0	(9,008)	0	(18,968)	0	(10,000)	0	(10,000)	0	0
Change in uncollected payments, Fed	0	0	0	0	0	0	0	0	0	0
Recoveries	0	(17,539)	0	(20)	0	(20)	0	(20)	0	0
Unobligated balance, adj. SOY	0	(119,678)	0	(137,657)	0	(110,860)	0	(110,860)	0	0
Unobligated balance transferred (from DOI)	0	(21,331)	0	(20,000)	0	(20,000)	0	(20,000)	0	0
Unobligated balance, transferred (to ORF)	0	0	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	38,282	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	99,375	0	110,860	0	100,372	0	100,372	0	0
Total Budget Authority	26	4,629	15	5,992	15	5,968	15	5,968	0	0
Financing from Transfers:										
Appropriation (previously unavailable)	0	(412)	0	(394)	0	(370)	0	(370)	0	0
Transfer from DOI – CY	0	(4,611)	0	(5,968)	0	(5,968)	0	(5,968)	0	0
Appropriation temporarily reduced	0	394	0	370	0	370	0	370	0	0
Net Appropriation	26	0	15	0	15	0	15	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Damage Assessment and Restoration Revolving Fund

Goal Statement

The Damage Assessment and Restoration Revolving Fund facilitates the spill response, damage assessment, and natural resource restoration activities of the National Oceanic and Atmospheric Administration.

Base Program

The NOAA Damage Assessment and Restoration Revolving Fund facilitates and sustains: (1) natural resource damage assessment while the Departments of Commerce and Justice seek full reimbursement from potentially responsible parties; and (2) restoration, replacement, or acquisition of the equivalent of injured or lost natural resources, including resources of National Marine Sanctuaries and National Estuarine Research Reserves, tidal wetlands and other habitats, for which NOAA is trustee. These program functions are conducted jointly within NOAA by the Office of General Counsel, the National Ocean Service, and the National Marine Fisheries Service.

Statement of Operating Objectives

Schedule and Milestones:
Ongoing

- Retain funds that are recovered through settlement or awarded by a court for restoration of injured natural resources and retains reasonable costs of conducting spill response and damage assessments that are recovered by NOAA through negotiated settlement, court award, or other reimbursement.
- Ensure funds deposited shall remain available to the trustee, without further appropriation, until expended to pay costs associated with response, damage assessment, and restoration of natural resources.

Deliverables:

- Natural resource damage assessments
- Restoration of injured natural resources

Explanation and Justification

A National Oceanic and Atmospheric Administration (NOAA) Damage Assessment and Restoration Revolving Fund was established under Section 1012(a) of the Oil Pollution Act for the deposit of sums provided by any party or governmental entity for response to

discharges of oil or releases of hazardous substances, for assessment of damages to NOAA trust resources resulting from those discharges and releases, and for the restoration of the injured natural resources.

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent	3,170	3,233	3,233	3,233	0
11.3	Other than full time permanent	5	2	2	2	0
11.7	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	**Total personnel compensation**	3,175	3,235	3,235	3,235	0
12.1	Civilian personnel benefits	1,053	1,074	1,074	1,074	0
12.2	Military personnel benefits	0	0	0	0	0
21	Travel and transportation of persons	639	639	639	639	0
22	Transportation of things	21	21	21	21	0
23.1	Rental payments to GSA	47	47	47	47	0
23.2	Rental payments to others	8	8	8	8	0
23.3	Comm., util., misc. charges	3	3	3	3	0
24	Printing and reproduction	9	9	9	9	0
25.1	Advisory and assistance services	695	695	695	695	0
25.2	Other services	18,652	55,819	30,517	30,517	0
25.3	Other purchases of goods and services from gov't accounts	91	91	91	91	0
26	Supplies and materials	225	225	225	225	0
31	Equipment	128	128	128	128	0
41	Grants, subsidies and contributions	9,781	9,781	9,781	9,781	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	3	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	**Total Obligations**	34,529	71,777	46,475	46,475	0

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
Federal Funds	0	0	0	0	0
Offsetting Collections Mandatory	(9,008)	(18,968)	(10,000)	(10,000)	0
Recoveries	(17,539)	0	0	0	0
Change in uncollected payments, Fed	0	0	0	0	
Less unobligated balance, SOY	(119,678)	(137,657)	(110,860)	(110,860)	0
Plus unobligated balance transferred	(21,331)	(20,000)	(20,000)	(20,000)	0
Plus unobligated balance, EOY	137,657	110,860	100,373	100,373	0
Total Budget Authority	4,629	5,992	5,992	5,992	0
Transfers:					
Appropriation previously unavailable	(412)	(394)	(394)	(394)	
Transfer from DOI	(4,611)	(5,968)	(5,968)	(5,968)	0
Appropriation temporarily reduced	394	394	370	370	0
Net Appropriation	0	0	0	0	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	26	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	26	15	15	15	0
Authorized Positions:					
Full-time permanent	26	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	26	15	15	15	15

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Enacted, 2019	0	0	120	440
2020 Adjustments to base:				
Less: Obligations from prior year balances	0	0	0	0
Plus: Technical adjustments to base	0	0	0	(320)
2020 Base	0	0	120	120
Plus: Program changes	0	0	0	0
2020 Estimate	0	0	120	120

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries Enforcement Asset Forfeiture Fund	Pos/BA	0	14	0	120	0	120	0	120	0	0
	FTE/OBL	0	0	0	440	0	120	0	120	0	0
Total: Sanctuaries Enforcement Asset Forfeiture Fund	Pos/BA	0	14	0	120	0	120	0	120	0	0
	FTE/OBL	0	0	0	440	0	120	0	120	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease From 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	0	0	440	0	120	0	120	0	0
Total Obligations	0	0	0	440	0	120	0	120	0	0
Adjustments to Obligations:										
New offsetting collections	0	0	0	0	0	0	0	0	0	0
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(256)	0	(270)	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, transferred	0	0	0	(50)	0	0	0	0	0	0
Unobligated balance, EOY	0	262	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	8	0	0	0	0	0	0	0	0
Total Budget Authority	0	14	0	120	0	120	0	120	0	0
Financing from Transfers:										
Appropriation previously unavailable	0	(8)	0	(8)	0	(8)	0	(8)	0	0
Appropriation temporarily reduced	0	8	0	8	0	8	0	8	0	0
Net Appropriation	0	14	0	120	0	120	0	120	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Sanctuaries Enforcement Asset Forfeiture Fund

Goal Statement

The Sanctuaries Enforcement Asset Forfeiture Fund receives proceeds from civil penalties and forfeiture claims against responsible parties, as determined through court settlements or agreements, for violations of NOAA sanctuary regulations.

Base Program

Penalties received are held in sanctuary site-specific accounts from year to year, as the funds are spent on resource protection within the sanctuary site where the penalty or forfeiture occurred.

Statement of Operating Objectives

Schedule and Milestones:

On-going

- Receive proceeds of civil penalties and asset forfeiture claims for violation of sanctuary regulations
- Expend resources for resource protection where the penalty or forfeiture occurred

Deliverables:

- Resource protection through enforcement strategies
- Resource management

Explanation and Justification

Funds are expended for resource protection purposes which may include all aspects of law enforcement (from equipment to labor), community oriented policing programs, and other resource protection and management measures such as the installation of mooring buoys or restoration of injured resources.

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Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full time permanent	0	0	0	0	0
11.7	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	**Total personnel compensation**	0	0	0	0	0
12.1	Civilian personnel Benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	3	3	3	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
24	Printing and reproduction	0	3	3	3	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services	0	1	1	1	0
25.3	Purchases of goods and services from Gov't accounts	0	29	29	29	0
26	Supplies and materials	0	404	84	84	0
31	Equipment	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
99.9	**Total Obligations**	0	440	120	120	0

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
Less recoveries	0	0	0	0	0
Less unobligated balance, SOY	(256)	(270)	0	0	0
Less unobligated balance, adj SOY	0	0	0	0	0
New offsetting collections	0	0	0	0	0
Unobligated balance, transferred	0	(50)	0	0	0
Plus unobligated balance, EOY	262	0	0	0	0
Plus unobligated balance, unapportioned	8	0	0	0	0
Total Budget Authority	14	120	120	120	0
Transfers:					
Appropriation previously unavailable	(8)	(8)	(8)	(8)	0
Appropriation temporarily reduced	8	8	8	8	0
Mandatory Appropriation	14	120	120	120	0

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Enacted, 2019	1	1	0	8,830
2020 Adjustments to base:				
Less: Obligations from prior year balances	0	0	0	0
Less: Technical adjustments to base	0	0	0	(4,613)
2020 Base	1	1	0	4,217
Plus: program changes	0	0	0	0
2020 Estimate	1	1	0	4,217

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Gulf Coast Restoration Fund	Pos/BA	1	0	1	0	1	0	1	0	0	0
	FTE/OBL	1	5,867	1	8,830	1	4,217	1	4,217	0	0
Total: Gulf Coast Restoration Fund	Pos/BA	1	0	1	0	1	0	1	0	0	0
	FTE/OBL	1	5,867	1	8,830	1	4,217	1	4,217	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	1	5,867	1	8,830	1	4,217	1	4,217	0	0
Total Obligations	1	5,867	1	8,830	1	4,217	1	4,217	0	0
Adjustments to Obligations:										
New offsetting collections	0	(6,365)	0	(5,885)	0	(4,217)	0	(4,217)	0	0
Change in Uncollected Payments	0	94	0	0	0	0	0	0	0	0
Recoveries	0	(26)	0	(50)	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(2,467)	0	(2,896)	0	0	0	0	0	0
Unobligated balance, EOY	0	2,896	0	0	0	0	0	0	0	0
Total Budget Authority	1	0	1	0	1	0	1	0	0	0
Financing from Transfers:										
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Appropriation temporarily reduced	0	0	0	0	0	0	0	0	0	0
Net Appropriation	1	0	1	0	1	0	1	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund

Goal Statement

The purpose of this program is to carry out research, observation, and monitoring to support the long-term sustainability of the ecosystem, fish stocks, fish habitat, and the recreational, commercial, and charter-fishing industry in the Gulf of Mexico.

Base Program

The Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund (commonly known as the RESTORE Science Program) supports applied ecosystem science focused on the Gulf of Mexico using competitively awarded cooperative agreements. To ensure the best use of resources the Program coordinates with existing Federal and State science and technology programs, including other activities funded under the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies (RESTORE) of the Gulf States Act of 2012 (RESTORE Act). Section 1604 of the RESTORE Act authorized funding for the Program using 2.5 percent of the Gulf Coast Restoration Trust Fund and 25% of the interest accrued by the Fund. National Centers for Coastal Ocean Science administers the program.

Statement of Operating Objectives

Schedule and Milestones:
On-Going

- Conduct funding competitions and manage subsequent cooperative agreements
- Advance long-term priorities as outlined in the RESTORE Science Program's Science Plan
- Engage end users in application of scientific information
- Track and report on program performance in the areas of science, application, and coordination using the program's performance management plan

Deliverables:

- Comprehensive understanding of ecosystem services, resilience, and vulnerabilities of coupled social and ecological systems
- Management-ready and accessible ecosystem models
- Improved monitoring, modeling, and forecasting of climate change and weather effects on the sustainability and resiliency of

the ecosystem
- Comprehensive understanding of freshwater, sediment, and nutrient flows and impacts on coastal ecology and habitats
- Comprehensive understanding of living coastal and marine resources, food web dynamics, habitat utilization, protected
- areas, and carbon flow
- Long-term trend and variability information on the status and health of the ecosystem, including humans
- System-wide indicators of environmental and socioeconomic conditions
- Decision-support tools to assist resource managers with management decisions planned to sustain habitats, living coastal and marine resources, and wildlife
- Network and integrate existing and planned data and information from monitoring programs
- Advanced technologies to improve monitoring

Explanation and Justification

The Gulf Coast region is essential to our nation and our economy, providing valuable energy resources, abundant seafood, extraordinary beaches and recreational activities, and a rich cultural heritage. More than 22 million Americans live in Gulf coastal counties and parishes, working in crucial U.S. industries like commercial seafood, shipping, tourism, and oil and gas production. However, the ecological health of the region has been significantly impacted in recent years. The Gulf coast states have experienced loss of critical wetland habitats, erosion of barrier islands, overfished fish stocks, water quality degradation, and significant coastal land loss.

In an effort to help the region recover, the RESTORE Act dedicates 80% of certain penalties paid by responsible parties in connection with the Deepwater Horizon oil spill to the Gulf region for ecological and economic recovery efforts. These monies are being deposited into a Gulf Coast Restoration Trust Fund established by the U.S. Treasury Department and are being used to fund programs under the RESTORE Act. One program is the NOAA RESTORE Science Program, which the Act directed NOAA to establish in consultation with the U.S. Fish and Wildlife Service (USFWS). NOAA and the USFWS also must consult with the Gulf States Marine Fisheries Commission and Gulf of Mexico Fishery Management Council in carrying out the Program.

To address the broad science categories articulated for the Program in the RESTORE Act (marine and estuarine research; marine and estuarine ecosystem monitoring and ocean observation; data collection and stock assessments; pilot programs for fishery independent data and reduction of exploitation of spawning aggregations; cooperative research), NOAA consulted the numerous documents developed in recent years that identify a wide range of science needs for the Gulf of Mexico. Many of these reports were produced with extensive stakeholder input and in consultation with resource managers throughout the Gulf States. Based on a

review of these documents and input gathered from direct engagement with stakeholders, the NOAA RESTORE Science Program developed a Science Plan which identifies a goal, desired outcomes, and long-term research priorities for the program. To advance these priorities, the program conducts funding competitions focused on the specific science and information needs identified through engagement with resource managers and other decision makers in the Gulf of Mexico. The Program's 2019 funding competition is focused on identifying, tracking, understanding and predicting trends and variability in living coastal and marine resources and the processes driving them.

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Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
11.1	Full-time permanent	103	105	118	118	0
11.3	Other than full time permanent	0	0	0	0	0
11.2	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	**Total personnel compensation**	103	105	118	118	0
12.1	Civilian personnel Benefits	38	39	43	43	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	51	51	51	51	0
22	Transportation of things	3	3	3	3	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	1	1	1	1	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	222	222	222	222	0
25.2	Other services	284	284	284	284	0
25.3	Other purchases of goods and services from Gov't accounts	49	49	49	49	0
26	Supplies and materials	355	355	355	355	0
31	Equipment	5	5	5	5	0
41	Grants, subsidies and contributions	4,756	7,716	3,103	3,103	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
99.9	**Total Obligations**	5,867	8,830	4,217	4,217	0

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base Program	2020 Estimate	Increase/Decrease from 2020 Base
Federal Funds	0	0	0	0	0
Less offsetting collections	(6,365)	(5,885)	(4,217)	(4,217)	0
Change in uncollected payments	94	0	0	0	0
Recoveries	(26)	0	0	0	0
Less unobligated balance, SOY	(2,467)	(2,896)	0	0	0
Plus unobligated balance, EOY	2,896	0	0	0	0
Plus unobligated balance transferred	0	0	0	0	0
Total Budget Authority	0	0	0	0	0
Transfers:					
Transfers from Other Accounts	0	0	0	0	0
Appropriation temporarily reduced	0	0	0	0	0
Mandatory Budget Authority	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $842,670,000 and 2,954 FTE/3,105 positions for the National Marine Fisheries Service, including a net decrease of $189,954,000 and net decrease of 9 FTE/7 positions in program changes.

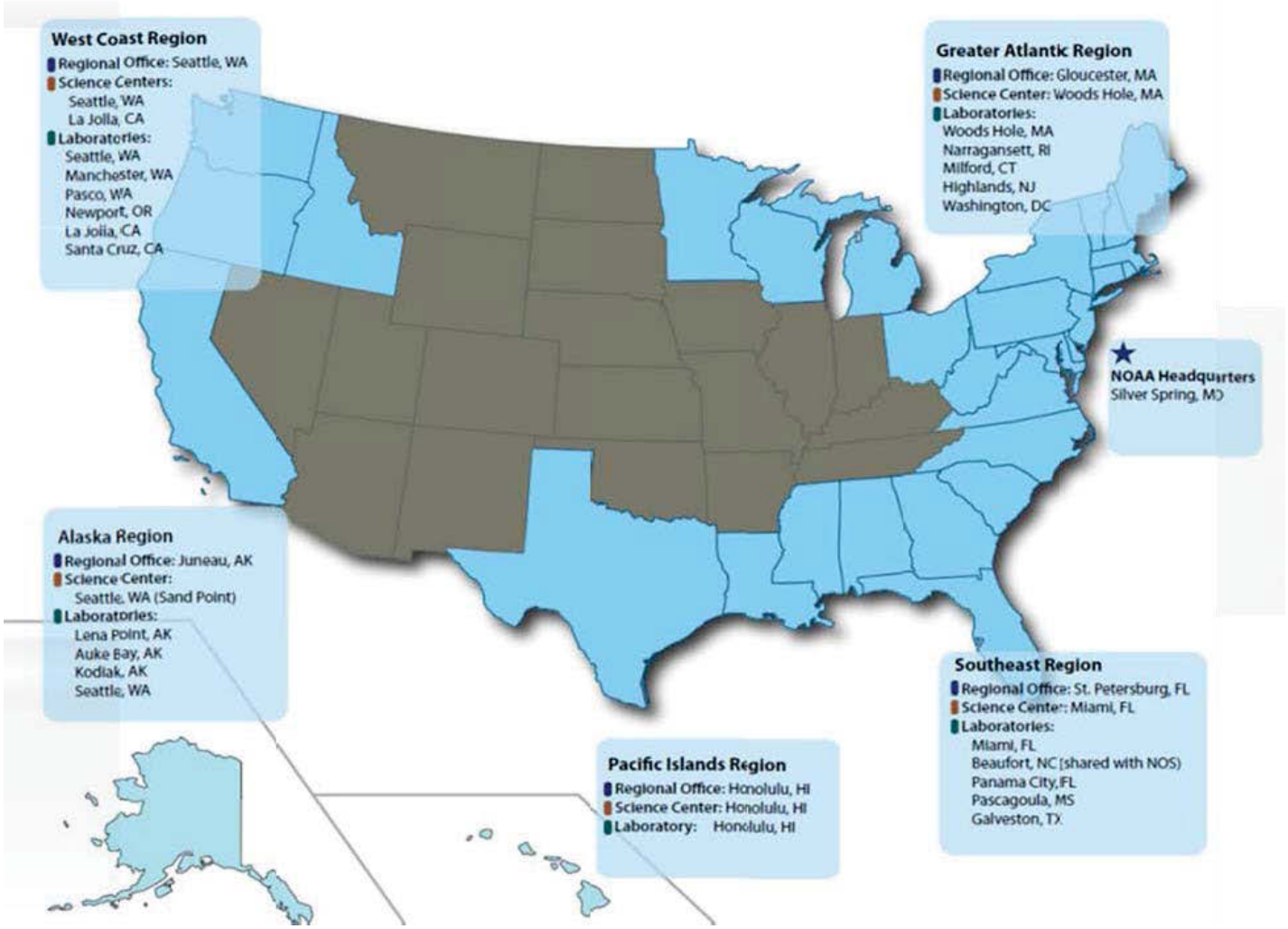
NOAA's National Marine Fisheries Service (NMFS) is responsible for the management and conservation of living marine resources within the U.S. Exclusive Economic Zone (EEZ)—the area extending from three to 200 nautical miles offshore. NMFS provides critical support to commercial and recreational marine fisheries and aquaculture industries, which generate $212 billion in sales impact, and support over 1.7 million jobs economy-wide.[1] NMFS also provides scientific and policy leadership in the international arena, and plays a key role in the management of living marine resources in coastal areas under state jurisdiction.

NMFS implements science-based conservation and management actions aimed at sustaining long-term use and promoting the health of coastal and marine ecosystems for the Nation's benefit. Programmatic authority for fisheries management, species protection, and habitat conservation activities is derived primarily from the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Marine Mammal Protection Act (MMPA), and Endangered Species Act (ESA). Other acts provide additional authority for enforcement, seafood safety, habitat restoration, and cooperative efforts with states, Tribes, interstate fishery commissions, and other countries. All of these activities rely on strong scientific and research capabilities to support the challenging public policy decision process associated with NMFS' stewardship responsibilities.

NMFS consists of Headquarters offices in Silver Spring, MD and five Regional Offices as well as six Science Centers in significant coastal areas around the country. Major NMFS facilities and laboratories are located at the following sites:

[1] National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-187. Available at: https://www.fisheries.noaa.gov/resource/document/fisheries-economics-united-states-report-2016.

Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Budget Estimates, Fiscal Year 2020



Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Budget Estimates, Fiscal Year 2020

Significant Adjustments:

Calculated Adjustments
NOAA's FY 2020 Base includes a net increase of $12,790,000 and 0 FTE/0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for National Marine Fisheries Service activities. This includes the estimated 2020 military pay raise of 2.1 percent as well as inflationary increases for labor and non-labor activities including benefits and rent charges from the General Services Administration (GSA).

Narrative Information:

Following this section are base justification materials and program change narratives by Activity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 2). Please contact NOAA if details for any of these changes are required.

Exhibit 10

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

Line Item		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL MARINE FISHERIES SERVICES (NMFS)											
Protected Resources Science and Management	**Pos/BA**	**732**	**188,356**	**854**	**196,848**	**854**	**200,012**	**854**	**186,516**	**0**	**(13,496)**
	FTE/OBL	**727**	**190,283**	**813**	**196,848**	**813**	**200,012**	**813**	**186,516**	**0**	**(13,496)**
Fisheries Science and Management	**Pos/BA**	**1,593**	**568,213**	**1,805**	**585,804**	**1,805**	**593,727**	**1,791**	**533,205**	**(14)**	**(60,522)**
	FTE/OBL	**1,583**	**571,667**	**1,718**	**585,804**	**1,718**	**593,727**	**1,704**	**533,205**	**(14)**	**(60,522)**
Enforcement	**Pos/BA**	**195**	**68,633**	**244**	**69,796**	**244**	**70,758**	**253**	**54,072**	**9**	**(16,686)**
	FTE/OBL	**194**	**69,134**	**232**	**69,796**	**232**	**70,758**	**239**	**54,072**	**7**	**(16,686)**
Habitat Conservation & Restoration	**Pos/BA**	**167**	**53,044**	**167**	**56,384**	**167**	**57,125**	**167**	**37,875**	**0**	**(19,250)**
	FTE/OBL	**166**	**53,420**	**158**	**56,384**	**158**	**57,125**	**158**	**37,875**	**0**	**(19,250)**
TOTAL NMFS - ORF	**Pos/BA**	**2,687**	**878,246**	**3,070**	**908,832**	**3,070**	**921,622**	**3,065**	**811,668**	**(5)**	**(109,954)**
	FTE/OBL	**2,670**	**884,504**	**2,921**	**908,832**	**2,921**	**921,622**	**2,914**	**811,668**	**(7)**	**(109,954)**
TOTAL NMFS - PAC	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Pacific Coastal Salmon Recovery Fund	**Pos/BA**	**2**	**64,935**	**2**	**65,000**	**2**	**65,000**	**0**	**0**	**(2)**	**(65,000)**
	FTE/OBL	**2**	**64,937**	**2**	**65,000**	**2**	**65,000**	**0**	**0**	**(2)**	**(65,000)**
Fisheries Disaster Assistance Fund	**Pos/BA**	**0**	**219,780**	**0**	**15,000**	**0**	**15,000**	**0**	**0**	**0**	**(15,000)**
	FTE/OBL	**0**	**220,000**	**0**	**15,000**	**0**	**15,000**	**0**	**0**	**0**	**(15,000)**
Fishermen's Contingency Fund	**Pos/BA**	**0**	**351**	**0**	**349**	**0**	**349**	**0**	**349**	**0**	**0**
	FTE/OBL	**0**	**120**	**0**	**349**	**0**	**349**	**0**	**349**	**0**	**0**

Exhibit 10

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Foreign Fishing Observer Fund	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Fisheries Finance Program Account	**Pos/BA**	**0**	**7,997**	**0**	**8,083**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**7,997**	**0**	**8,083**	**0**	**0**	**0**	**0**	**0**	**0**
Federal Ship Financing	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Promote and Develop Fisheries Products	**Pos/BA**	**3**	**10,664**	**3**	**426**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**3**	**12,742**	**3**	**2,515**	**0**	**0**	**0**	**0**	**0**	**0**
Environmental Improvement and Restoration Fund	**Pos/BA**	**0**	**0**	**0**	**6,563**	**0**	**7,249**	**0**	**7,249**	**0**	**0**
	FTE/OBL	**0**	**6,924**	**0**	**6,563**	**0**	**7,249**	**0**	**7,249**	**0**	**0**
Limited Access System Administration Fund	**Pos/BA**	**41**	**12,906**	**40**	**14,741**	**40**	**14.987**	**40**	**14.987**	**0**	**0**
	FTE/OBL	**41**	**12,400**	**40**	**16,307**	**40**	**16,311**	**40**	**16,311**	**0**	**0**
Marine Mammal Unusual Mortality Event Fund	**Pos/BA**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Western Pacific Sustainable Fisheries Fund	**Pos/BA**	**0**	**495**	**0**	**596**	**0**	**600**	**0**	**600**	**0**	**0**
	FTE/OBL	**0**	**512**	**0**	**596**	**0**	**600**	**0**	**600**	**0**	**0**
Fisheries Enforcement Asset Forfeiture Fund	**Pos/BA**	**0**	**4,146**	**0**	**3,844**	**0**	**3,817**	**0**	**3,817**	**0**	**0**
	FTE/OBL	**0**	**3,553**	**0**	**5,765**	**0**	**5,765**	**0**	**5,765**	**0**	**0**
North Pacific Observer Fund	**Pos/BA**	**0**	**3,754**	**0**	**4,014**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
	FTE/OBL	**0**	**1,794**	**0**	**6,119**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
TOTAL NMFS	**Pos/BA**	**2,733**	**1,203,276**	**3,115**	**1,027,448**	**3,112**	**1,032,624**	**3,105**	**842,670**	**(7)**	**(189,954)**
	FTE/OBL	**2,716**	**1,215,483**	**2,966**	**1,035,129**	**2,963**	**1,035,896**	**2,954**	**845,942**	**(9)**	**(189,954)**

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management

Goal Statement

The mission of the Protected Resources Science and Management activity is to assess, understand, and protect the health of protected species, the ecosystems that sustain them, and the communities that value and depend on them. This program supports the Department of Commerce's strategic objective 2.2, *Reduce and Streamline Regulations* and strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

The program, in partnership with internal and external stakeholders, uses best available science to develop and implement best practices and conservation actions to reduce threats to protected species and their marine and coastal ecosystems. Protected species include those listed under the Endangered Species Act (ESA) and marine mammals covered by the Marine Mammal Protection Act (MMPA). NMFS implements the ESA and MMPA with the U.S. Fish and Wildlife Service (USFWS). In general, USFWS is responsible for the conservation of terrestrial and freshwater aquatic organisms, some marine mammals, and marine turtles on their nesting beaches. NMFS is responsible for the conservation of most marine mammals, most marine and anadromous fish (i.e., fish that migrate from the sea to freshwater to spawn), marine turtles at sea, marine invertebrates (including corals), and marine plants. In addition, the Marine Mammal Commission provides oversight and makes recommendations to NMFS on priority marine mammal issues, and three regional Scientific Review Groups provide independent review of our marine mammal stock assessments.

Statement of Operating Objectives

Schedule and Milestones:
FY 2020–2024

- Review listing petitions and issue 90-day findings, conduct ESA status reviews and issue 12-month findings, and promulgate ESA protective regulations

- Prepare recovery plans and implement recovery actions identified in the plans to improve the status of ESA-listed species
- Designate critical habitat
- Provide technical assistance, consultation, and authorization services for all Federal agencies' proposed actions (ESA Section 7)
- Work with Take Reduction Teams (TRTs) to achieve MMPA goals through increased compliance monitoring and bycatch assessments
- Evaluate effectiveness and recommend enforcement measures, modify existing regulations, and add protective measures to reduce marine mammal bycatch in fisheries
- Research effects of human activities on the conservation and recovery of protected species
- Analyze protected species survey data to determine population trends
- Solicit proposals and award Species Recovery Grants to states and Tribes for conservation and recovery activities with a focus on Species in the Spotlight
- Participate in international and regional agreements to further the U.S. policy on protected species conservation

Deliverables:
FY 2020–2024

- ESA proposed and final listing regulations, Section 4(d) rules, and critical habitat regulations
- Formal and informal consultation with other Federal agencies
- Recovery plans for newly listed species with specific actions to prevent species extinction
- Timely issuance of MMPA and ESA permits, including scientific research permits and incidental harassment authorizations
- Improved or newly developed abundance and fishery mortality estimates for stocks in Alaska, the Pacific Islands, and the Gulf of Mexico to inform management decisions
- MMPA List of Fisheries classifying U.S. commercial fisheries into one of three Categories according to the level of incidental mortality or serious injury of marine mammals
- Marine Mammal Stock Assessment Reports

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Program Personnel	2020 Base Program Amount
Marine Mammals, Sea Turtles, and Other Species	Pos/BA	414	112,619	490	118,348	490	120,108
	FTE/OBL	411	114,119	466	118,348	466	120,108
Species Recovery Grants	Pos/BA	1	6,955	3	7,000	3	7,005
	FTE/OBL	1	6,976	3	7,000	3	7,005
Atlantic Salmon	Pos/BA	22	6,184	23	6,500	23	6,585
	FTE/OBL	22	6,207	22	6,500	22	6,585
Pacific Salmon	Pos/BA	295	62,598	338	65,000	338	66,314
	FTE/OBL	293	62,981	322	65,000	322	66,314
Total Protected Resources Science and Management	Pos/BA	732	188,356	854	196,848	854	200,012
	FTE/OBL	727	190,283	813	196,848	813	200,012

Marine Mammals, Sea Turtles, and Other Species

Under the legislative authority of the ESA and MMPA, this budget line supports activities that conserve and recover species threatened or endangered with extinction, as well as most marine mammals. The programs under this budget line aim to sustain marine and anadromous species and the ecosystems on which they depend, and to enable economic development in a manner compatible with species conservation and recovery.

In addition to work supporting all ESA-listed species, NOAA continues to focus on the "Species in the Spotlight: Survive to Thrive" initiative,[2] an innovative approach to marshal public and private support to slow, halt, and reverse the population decline of eight

[2] https://www.fisheries.noaa.gov/topic/endangered-species-conservation#species-in-the-spotlight

of our most endangered species—Hawaiian monk seals, southern resident killer whales, white abalone, Cook Inlet beluga whales, Atlantic salmon, Pacific leatherback turtles, Sacramento River winter-run Chinook, and Central California Coast coho.

Major components of this budget line include:

Listing (ESA Section 4): Any U.S. citizen or organization may petition NMFS to list a species as threatened or endangered, reclassify an already listed species, or revise designated critical habitat under the ESA. Once a petition is received, the ESA outlines deadlines that must be met, including 90 days for an initial determination and 12 months for determining whether the listing or reclassification is warranted. If warranted, NMFS must publish a proposed rule to list the species. NMFS then considers public comments and any new information that might become available and must publish a final determination within one year after the date of publishing the proposed rule. The ESA also requires that critical habitat be designated concurrently with the final listing.

Once a species is listed, NMFS is required to develop a recovery plan and implement the protections of the ESA. When a species is listed as endangered, the ESA prohibits any take of the species, with specific exceptions. However, if the species is listed as threatened, NMFS must issue separate protective regulations under ESA Section 4(d) in order to specify the prohibitions against harming the species.

Recovery (ESA Section 4): The ESA requires NMFS to use all methods and procedures to bring listed species to the point where the protections of the ESA are no longer necessary. Recovery is the process of conserving these species and ecosystems as well as ensuring that listed species remain functioning members of the ecosystems we all depend upon. Actions taken to recover these species provide communities with healthier ecosystems, cleaner water, greater opportunities for recreation, and the opportunity for current and future generations to share the benefits of diverse and healthy natural resources. Actions to achieve species recovery may require one or more of the following:

- restoring or preserving habitat;
- minimizing or offsetting threats to species; and/or,
- enhancing population numbers.

Species Stock Assessment and Monitoring (ESA Section 4, MMPA Sections 115 and 117): This program supports protected species stock assessment and monitoring activities using a variety of observation and survey methods, including use of marine acoustics, unmanned systems, surveys (ship, aerial, and shore-based), and telemetry. To adequately support management decisions, assessments are comprehensive and include estimates of abundance and distribution, as well as analysis of historical trends, serious injury and mortality levels, life history and demographics, and impacts of human activities (e.g., noise, climate, habitat, and ecosystem change). Collection of these basic assessment data enable NMFS to be as targeted as possible in prescribing mitigation measures that affect commercial and recreational activities.

Research (ESA Section 4, MMPA Sections 115 and 117): NMFS conducts research to inform conservation and management actions, focusing on the biology, behavior, and health of marine mammal species; genetic differentiation; ecosystem interactions; and effects of human activities on the recovery and conservation of protected species. Effective conservation requires understanding how human and natural factors influence the viability of marine species and their ecosystems.

Interagency Consultation (ESA Section 7): ESA Section 7 requires Federal agencies to ensure that any action they fund, authorize, or undertake is not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat that has been designated for these species. This consultation with Federal action agencies enables authorization for lawful activities—such as construction of roads and bridges, commercial fishing, or defense readiness training—in a manner that is compatible with species conservation and recovery.

Permits and Authorizations (ESA Section 10 and MMPA Sections 101 and 104): Under the ESA and MMPA, NMFS issues permits and authorizations (often with required mitigation measures) to allow activities that may result in the direct and indirect take of a protected species. Permits and take authorizations cover scientific research and the incidental take and harassment of marine mammals by otherwise lawful activities such as seismic surveys, construction activities, or military readiness training exercises when those activities are deemed to have negligible impact on the species.

Conservation Planning (ESA Section 10): When non-Federal entities—such as states, counties, local governments, and private landowners—wish to conduct an otherwise lawful activity that might incidentally, but not intentionally, “take” a listed species, an incidental take permit must first be obtained from NMFS. To receive a permit, the applicant must submit a Conservation Plan designed to offset harmful effects that a proposed activity might have on listed species.

Bycatch Reduction (ESA Section 4, MMPA Section 118*)*: Fishing gear can accidentally capture protected species, such as marine mammals, seabirds, and sea turtles. NMFS works with the fishing industry and others through Take Reduction Teams or other means to modify fishing gear or practices to minimize bycatch and its impact.

Co-Management with Alaska Native Organizations (MMPA Section 119): Co-management promotes full and equal participation by Alaska Natives in decisions affecting the subsistence management of marine mammals (to the maximum extent allowed by law) as a tool for conserving marine mammal populations in Alaska. NMFS has entered into agreements with Alaska Native groups to manage harvested marine mammal stocks. These agreements provide funding for cooperative management of these stocks.

Marine Mammal Health and Stranding Response Program (MMPA Title IV): NMFS is the lead Federal agency to coordinate marine mammal stranding networks, responses, and investigations of marine mammal mortality events. The Prescott Grants Program provides competitive grants to stranding network organizations to rescue, rehabilitate, or investigate sick, injured, or distressed live marine mammals and to determine the cause of death or disease of dead marine mammals. To date the program has led to significant improvements within the stranding network, enabling members to expand response coverage over wider geographic areas; enhance capabilities and data collection; upgrade rehabilitation facilities; evaluate rehabilitation success; increase understanding of the causes of disease and mortality, and provide safer operations for both animals and people. The MMHSRP also has been highly successful in developing public-private partnerships to provide emergency response to live or dead marine mammals, and to investigate the health of marine mammal populations in the wild. Over 100 partners comprise the National Marine Mammal Stranding Network and each member plays an important role in helping NMFS meet our Congressional mandates. Valuable data collected from stranded animals are used for informing marine mammal stock assessment reports, identifying key species recovery activities, monitoring ocean health, and identifying natural and manmade causes of stranding, illness, and death in marine mammals around the United States.

Species Recovery Grants (ESA Section 6)

Recovery and conservation actions for listed species under NMFS jurisdiction are implemented through Species Recovery Grants, which are awarded to states and Tribes. For listed species, funding supports activities such as reducing or removing significant sources of mortality and injury, assessing and monitoring species status and trends, developing conservation plans, conserving habitat, and engaging the public in conservation efforts. Funding may also support monitoring of candidate species and recently de-listed species.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Atlantic Salmon (ESA Sections 4, 7, 10)
These programs provide funding for the conservation and recovery of ESA-listed Atlantic salmon in the Northeast. Gulf of Maine Atlantic salmon are co-managed by NMFS, USFWS, the Maine Department of Marine Resources, and the Penobscot Indian Nation. Under the ESA, the Essential Fish Habitat provisions under Magnuson-Stevens Act, and a joint Statement of Cooperation with the co-managers, NMFS is responsible for marine stock assessments, designating critical habitat, estuary and marine interagency Section 7 consultations and habitat conservation planning, and minimizing dam impacts.

Pacific Salmon (ESA, All Sections)
Under the legislative authority of the ESA, NMFS conducts interagency Section 7 consultations, habitat conservation planning, and listing and recovery actions to protect and recover threatened and endangered Pacific salmon and steelhead. NMFS also conducts research, monitoring, and analysis to provide managers and regional stakeholders the tools and information necessary to advance salmonid recovery to ensure biological sustainability of Pacific salmonids and the ecosystems on which they depend. Partnerships among Federal, state, local, and tribal entities, together with non-governmental and private organizations are key to restoring healthy salmon runs and securing the economic and cultural benefits they provide.

PROGRAM CHANGES FOR FY 2020:
NOAA requests a net decrease of $13,496 and 0 FTE/0 positions in FY 2020 program changes for the Protected Resources Science and Management Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Mammals, Sea Turtles, and Other Species	Pos./BA	490	120,108	490	117,509	0	(2,599)
	FTE/OBL	466	120,108	466	117,509	0	(2,599)

ESA and MMPA Permitting Capacity (-$2,599, 0 FTE/0 Positions) – This request reduces the additional funding provided by Congress to work with Federal partners to improve coordination and efficiency of consultations within the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA) permitting processes. However, this budget includes continued investments in permitting capacity to reduce the burden on the regulated community by providing timelier, consistent, and clear consultations and authorizations.

NMFS has made significant gains streamlining ESA and MMPA permitting capacity recently. In response to Executive Orders[3] - predominantly targeted at reducing burden on the public and expediting environmental reviews - NMFS has implemented efficiencies in the consultation and permitting processes by decreasing the average informal ESA consultation times by approximately 65 percent; formal consultation times by 22 percent; IHA issuance times by 25%; and time to get a research permit for ESA-listed species by 29%. This program directly supports DOC strategic plan objective 2.2: Reduce and Streamline Regulations.

[3] E.O 13783 Promoting Energy Independence and Economic Growth
E.O 13766 Expediting Environmental Reviews and Approvals for High Priority Infrastructure Projects
E.O 13795 Implementing an America-First Offshore Energy Strategy
E.O. 13805 Establishing a Presidential Advisory Council on Infrastructure
E.O 13807 Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management
Subactivity: Marine Mammals, Sea Turtles, and Other Species
Program Change: ESA and MMPA Permitting Capacity

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	45,649	47,338	48,595	48,595	0
11.3	Other than full-time permanent	618	641	658	658	0
11.5	Other personnel compensation	1,147	1,190	1,222	1,222	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	47,414	49,169	50,475	50,475	0
12.1	Civilian personnel benefits	16,506	17,118	17,572	17,572	0
13	Benefits for former personnel	10	11	11	11	0
21	Travel and transportation of persons	2,992	3,103	3,103	3,103	0
22	Transportation of things	169	176	176	176	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	597	619	619	619	0
23.2	Rental payments to others	515	534	534	534	0
23.3	Communications, utilities, and misc. charges	254	263	263	263	0
24	Printing and reproduction	134	139	139	139	0
25.1	Advisory and assistance services	5,551	5,757	5,757	3,158	(2,599)
25.2	Other services from non-Federal sources	17,686	18,341	18,341	18,341	0
25.3	Other goods and services from Federal sources	1,998	2,072	2,072	2,072	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,636	2,734	2,734	2,734	0
31	Equipment	545	566	566	566	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,110	17,744	17,744	17,744	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	114,119	118,348	120,108	117,509	(2,599)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Mammals, Sea Turtles, and Other Species	Pos./BA	490	120,108	490	116,108	0	(4,000)
	FTE/OBL	466	120,108	466	116,108	0	(4,000)

Prescott Grant Program (-$4,000, 0 FTE/0 Positions) – This request will eliminate funding for this grant program. This is the only Federal funding source for the network; however, some members may still operate depending on private funding. NOAA will continue to support related activities such as the rescue of large whales entangled in fishing gear and the coordination network responses to unusual marine mammal mortality events.

The Prescott Grants Program provides grants or cooperative agreements to eligible stranding network participants for:

- recovery and treatment (i.e., rehabilitation) of stranded marine mammals;
- data collection from living or dead stranded marine mammals; and,
- facility upgrades, operations costs, and staffing needs.

The more than 100 stranding network partners are volunteers and trained professionals from nonprofit organizations; aquaria; universities; and coastal state, local, and Tribal governments. In addition to response activities, the network provides data helping NOAA establish links between marine mammal health and the condition of coastal ecosystems. The program has expanded response coverage over wider geographic areas; upgraded rehabilitation facilities; increased understanding of the causes of disease and mortality, and provided safer operations for both animals and people. In FY 2018, NOAA awarded 36 grants to members in 19 states. Applicants provide a minimum of 25 percent non-Federal cost match. More information on past accomplishments is available at the program's website.[4] This program directly supports DOC strategic plan objective 2.3: Strengthen Domestic Commerce and the U.S. Industrial Base.

[4] https://www.fisheries.noaa.gov/grant/john-h-prescott-marine-mammal-rescue-assistance-grant-program

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure:					
Percentage of stranding network organizations that have Prescott Grants to improve rapid response to marine mammal strandings (annual)					
With Decrease	0%	0%	0%	0%	0%
Without Decrease	23%	23%	23%	23%	23%

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management
Subactivity: Marine Mammals, Sea Turtles, and Other Species
Program Change: Prescott Grant Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	45,649	47,338	48,595	48,595	0
11.3	Other than full-time permanent	618	641	658	658	0
11.5	Other personnel compensation	1,147	1,190	1,222	1,222	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	47,414	49,169	50,475	50,475	0
12.1	Civilian personnel benefits	16,506	17,118	17,572	17,572	0
13	Benefits for former personnel	10	11	11	11	0
21	Travel and transportation of persons	2,992	3,103	3,103	3,103	0
22	Transportation of things	169	176	176	176	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	597	619	619	619	0
23.2	Rental payments to others	515	534	534	534	0
23.3	Communications, utilities, and misc. charges	254	263	263	263	0
24	Printing and reproduction	134	139	139	139	0
25.1	Advisory and assistance services	5,551	5,757	5,757	5,757	0
25.2	Other services from non-Federal sources	17,686	18,341	18,341	18,341	0
25.3	Other goods and services from Federal sources	1,998	2,072	2,072	2,072	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,636	2,734	2,734	2,734	0
31	Equipment	545	566	566	566	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,110	17,744	17,744	13,744	(4,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	114,119	118,348	120,108	116,108	(4,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Mammals, Sea Turtles, and Other Species	Pos./BA	490	120,108	490	119,108	0	(1,000)
	FTE/OBL	466	120,108	466	119,108	0	(1,000)

Right Whale Recovery (-$1,000, 0 FTE/0 Positions) – This request reduces the additional funding provided by Congress to increase research and monitoring of North Atlantic right whales. The focus of this funding was to better understand how the species interacts with fisheries and shipping traffic, and is adapting to changing ocean conditions and shifting feeding grounds. However, NMFS will continue to support right whale recovery, and has provided over $8.5 million toward these efforts. More information on this program is available at the program's website.[5]

NMFS will continue protection and recovery efforts of the North Atlantic right whale through implementation of various conservation, regulatory, rescue, and enforcement measures. These efforts include, but are not limited to, protecting and designating critical habitat, rescuing entangled right whales, reducing the threat of vessel collisions, reducing injury and mortality by fisheries and fishing gear, and minimizing the effects of vessel disturbance and noise. NMFS will also continue to conduct various research activities on the biology, behavior, and ecology of the North Atlantic right whale including identifying habitat and when it is used by right whales, investigating unusual mortality events, performing stock assessments to gather population information, and tracking individuals over time to monitor important population traits. The results of this research are used to inform management decisions and enhance recovery efforts for this critically endangered species. This program directly supports DOC strategic plan objective 2.3: Strengthen Domestic Commerce and the U.S. Industrial Base.

[5] https://www.fisheries.noaa.gov/species/north-atlantic-right-whale

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management
Subactivity: Marine Mammals, Sea Turtles, and Other Species
Program Change: Right Whale Recovery

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	45,649	47,338	48,595	48,595	0
11.3	Other than full-time permanent	618	641	658	658	0
11.5	Other personnel compensation	1,147	1,190	1,222	1,222	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	47,414	49,169	50,475	50,475	0
12.1	Civilian personnel benefits	16,506	17,118	17,572	17,572	0
13	Benefits for former personnel	10	11	11	11	0
21	Travel and transportation of persons	2,992	3,103	3,103	3,103	0
22	Transportation of things	169	176	176	176	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	597	619	619	619	0
23.2	Rental payments to others	515	534	534	534	0
23.3	Communications, utilities, and misc. charges	254	263	263	263	0
24	Printing and reproduction	134	139	139	139	0
25.1	Advisory and assistance services	5,551	5,757	5,757	4,757	(1,000)
25.2	Other services from non-Federal sources	17,686	18,341	18,341	18,341	0
25.3	Other goods and services from Federal sources	1,998	2,072	2,072	2,072	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,636	2,734	2,734	2,734	0
31	Equipment	545	566	566	566	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,110	17,744	17,744	17,744	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	114,119	118,348	120,108	119,108	(1,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Species Recovery Grants	Pos./BA	3	7,005	3	5,996	0	(1,009)
	FTE/OBL	3	7,005	3	5,996	0	(1,009)

Species Recovery Grants Program (-$1,009, 0 FTE/0 Positions) – This request will decrease funding for the conservation and recovery of marine and anadromous species through the Species Recovery Grant Program. This level of funding will allow NMFS to continue to adequately support our state and tribal partners in species recovery.

Species Recovery Grants support recovery actions for species listed under the Endangered Species Act (ESA) and are awarded to states and Tribes under the authority of ESA Section 6 and the Fish and Wildlife Coordination Act. Recovery actions are those actions needed to recover species so that the protections of the ESA are no longer necessary. Recovery actions include addressing significant sources of mortality and injury, assessing species status and trends, developing conservation plans to minimize and mitigate bycatch, conserving habitat, and educating and engaging the public. This program is NMFS' primary mechanism for directly supporting external partners' efforts to implement recovery actions for listed species.

As part of administering this program, NMFS will continue to prioritize funding for grants that address non-Pacific salmonid species in the "Species in the Spotlight: Survive to Thrive" initiative.[6] This program directly supports DOC strategic plan objective 2.3: Strengthen Domestic Commerce and the U.S. Industrial Base.

[6] https://www.fisheries.noaa.gov/topic/endangered-species-conservation#species-in-the-spotlight

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure:					
Number of recovery activities being addressed through Species Recovery Grants					
With Decrease	30	30	30	30	30
Without Decrease	35	35	35	35	35

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management
Subactivity: Species Recovery Grants
Program Change: Species Recovery Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	366	367	371	371	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	366	367	371	371	0
12.1	Civilian personnel benefits	93	94	95	95	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Communications, utilities, and misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	32	32	32	32	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	6,485	6,507	6,507	5,498	(1,009)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	6,976	7,000	7,005	5,996	(1,009)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
	Pos./BA	338	66,314	338	64,314	0	(2,000)
Pacific Salmon	FTE/OBL	322	66,314	322	64,314	0	(2,000)

Hatchery Genetic Management Plans (HGMPs) (-$2,000, 0 FTE/0 Positions) – This request reduces the additional funding provided by Congress to work with partners to help expedite HGMP review. With the FY 2018 resources, NMFS completed review of an additional 51 HGMPs in FY 2018 bringing the total to 197 out of 330 HGMPs completed. With the additional resources provided in FY 2019, NMFS expects to continue to make progress in HGMP review, and NMFS will continue these reviews in FY 2020.

Hatcheries, or artificial propagation, are one tool to help support wild stocks and provide fish for harvest, so long as hatchery fish are managed in the context of overall conservation goals for threatened or endangered fish. It is important to limit interactions between hatchery and natural-origin fish by using best hatchery practices. NMFS uses HGMPs to determine if an individual hatchery program meets ESA standards and incorporates best practices. This program directly supports DOC strategic plan objective 2.3: Strengthen Domestic Commerce and the U.S. Industrial Base.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Protected Resources Science and Management
Subactivity: Pacific Salmon
Program Change: Hatchery Genetic Management Plans

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	35,329	36,462	37,417	37,417	0
11.3	Other than full-time permanent	694	716	735	735	0
11.5	Other personnel compensation	416	430	441	441	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	36,439	37,608	38,593	38,593	0
12.1	Civilian personnel benefits	12,190	12,581	12,910	12,910	0
13	Benefits for former personnel	2	2	2	2	0
21	Travel and transportation of persons	742	766	766	766	0
22	Transportation of things	194	200	200	200	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	416	429	429	429	0
23.2	Rental payments to others	10	10	10	10	0
23.3	Communications, utilities, and misc. charges	585	604	604	604	0
24	Printing and reproduction	17	17	17	17	0
25.1	Advisory and assistance services	542	560	560	560	0
25.2	Other services from non-Federal sources	6,713	6,928	6,928	4,928	(2,000)
25.3	Other goods and services from Federal sources	1,119	1,155	1,155	1,155	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	434	448	448	448	0
31	Equipment	201	207	207	207	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,377	3,485	3,485	3,485	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	62,981	65,000	66,314	64,314	(2,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Fisheries Science and Management

Goal Statement

The Fisheries Science and Management activity encompasses scientific and management activities to ensure sustainability of the Nation's marine fishery resources. The activities within this activity support the Department of Commerce's Strategic Plan: Strategic Objective 2.1 Increase Aquaculture Production, Strategic Objective 2.2 Reduce and Streamline Regulations, and Strategic Objective 2.3 Strengthen Domestic Commerce and the U.S. Industrial Base.

Base Program

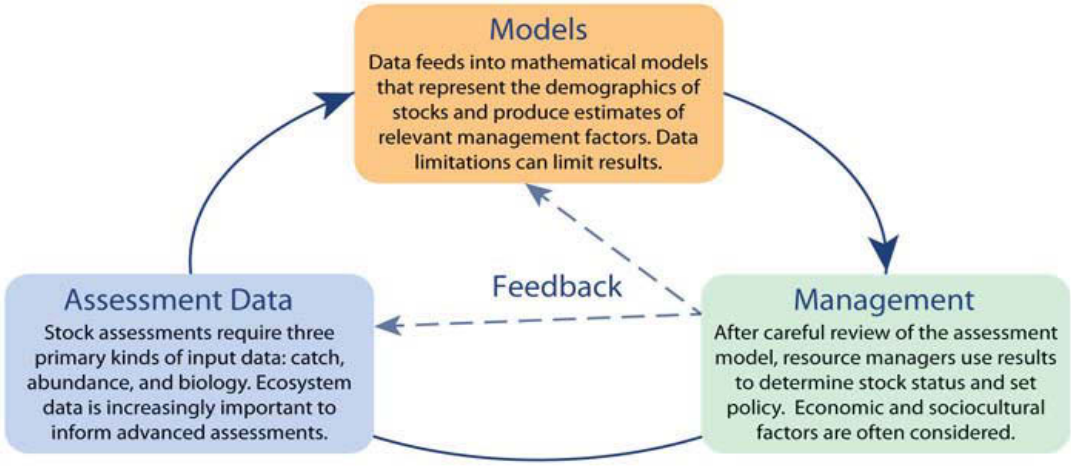
Sustainable fisheries play an important role in the Nation's economy by providing opportunities for commercial, recreational, and subsistence fishing, and marine aquaculture to increase our nation's supply of seafood. In 2016, commercial and recreational fisheries in the U.S. generated 1.7 million jobs throughout the national economy. In addition, commercial and recreational fishing generated $212.2 billion in sales impacts, $64.2 billion in income impacts, and $99.5 billion in value-added impacts.[7] The U.S. aquaculture industry produced $1.5 billion worth of seafood in 2016, which equals about 21 percent of total U.S. seafood production by value.[8] By ending overfishing, rebuilding stocks, applying an ecosystem-based management approach to the stewardship of fishery resources, and supporting development of marine aquaculture, we strengthen the near and long-term value of U.S. fisheries to commercial and recreational fishing businesses, fishing communities, and the national economy.

In partnership with the eight Regional Fishery Management Councils and state and Federal partners, NMFS manages marine fisheries, including aquaculture, using the best available science. NMFS actions result in sustainable fisheries harvest and production, rebuilding of depleted fish stocks, conservation and restoration of essential fish habitats, and other support for fishing businesses and communities. NMFS' science, which is rigorously peer-reviewed, ensures management decisions are based on

[7] National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-187. Available at: https://www.fisheries.noaa.gov/resource/document/fisheries-economics-united-states-report-2016.
[8] National Marine Fisheries Service. 2018. Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017. Available at: https://www.fisheries.noaa.gov/content/fisheries-united-states-2017. *Note, due to data availability, aquaculture production data lags the rest of the publication by one year.*

the highest-quality scientific information. NMFS conducts science on species' responses to environmental changes; impacts of fishing and other human activities on fisheries and their habitat; and social, cultural, and economic behaviors that influence interactions between humans and marine fisheries.

This activity also supports the regulatory process, which involves extensive opportunity for public input into management decisions, and thorough analysis of alternatives to meet statutory requirements and agency priorities. This work occurs in close coordination with Regional Councils, Interstate Marine Fisheries Commissions, and states.



Science informing management: Managers need high quality science to make important decisions to ensure sustainable fisheries, healthy ecosystems, and productive coastal communities. Data feeds into mathematical models that estimate stock biomass, fishing effort, and other reference points.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Statement of Operating Objectives

Schedule and Milestones:

Fisheries and Ecosystem Science Programs and Services (FY 2020–2024)

- *Economics and Social Science*: Expand implementation of an integrated Bioeconomic Length-structured Angler Simulation Tool, the Social Indicator Toolbox, and FishSET—a spatial economics toolbox; assess the economic performance of fisheries; and predict the cost/benefits of stock rebuilding programs
- *Fisheries Oceanography*: Continue to work with resource managers to provide ecosystem-based science information and trade-off analyses, to inform management decisions for evolving constituent-defined management issues in IEA regions
- *Antarctic Research*: Conduct research surveys to estimate the biomass of Antarctic krill and fishes; continue annual studies and assessments of krill-dependent predators to determine the impacts of krill fishing and climate change; complete stock assessments for 26 targeted stocks, and provide scientific advice to the U.S. Delegation to the Commission for the Conservation of Antarctic Marine Living Resources
- *Climate Regimes & Ecosystem Productivity*: Incorporate long-term observations of climate-related impacts on the Bering Sea ecosystem in integrated ecosystem assessments. Deliver Bering Sea ecosystem forecasts to help living marine resource managers incorporate climate-related impacts into management decisions
- *Information Analysis and Dissemination:* Improve population dynamics/assessment/ management model development and data analysis tools to support fisheries science programs and improve data dissemination and sharing of integrated data and analyses (climatology, socio-economic, ecosystem, fishery-dependent, and fishery-independent), both internally and externally

Fisheries Data Collections, Surveys, and Assessments (FY 2020–2024)

- *Fisheries Monitoring, Assessment, and Forecasting*: Conduct and expand fishery- independent surveys; develop advanced sampling technologies to enhance data collection for stock assessments; improve timely delivery of fish stock assessments to fishery managers; and further the implementation of the next-generation stock assessment framework
- *Cooperative Research*: Issue awards for cooperative research from the Northeast Research Set-Aside, and the Southeast CRP competitive grants; and conduct cooperative research surveys nationwide
- *MARMAP:* Perform fishery-independent assessments of reef fish abundance and life history characteristics of economically

and ecologically important reef fish species in shelf and upper slope waters from Cape Lookout to Cape Canaveral
- *SEAMAP:* Conduct groundfish and plankton surveys in state and Federal waters, inshore and offshore longline surveys, and reef fish surveys in offshore waters

Observers and Training (FY 2020–2024)
- Provide coverage in 57 fisheries nationwide, with a goal of expanding observer coverage in existing fisheries and implementing new observer programs in fisheries transitioning to catch share management
- Maintain the number of fisheries with adequate or near adequate observer coverage at 38 and the number of sea days observed annually at 78,000
- Coordinate observer program activities at the national level by developing new standards, policies, and procedures to improve observer programs

Fisheries Management Programs and Services (FMPs) (FY 2020–2024)
- *Illegal, Unreported, and Unregulated (IUU) Fishing*: Address MSA mandates to implement IUU/bycatch identification, monitoring, and certification procedures, and foreign nation capacity building. Submit biennial status reports to Congress. Review shipments of imported fishery products to monitor for IUU shipments and fraudulently labeled seafood
- *Reducing Bycatch:* Develop technological solutions and investigate changes in fishing practices designed to minimize bycatch of fish and protected species
- *Regional Fishery Management Councils Support*: Develop fishery management measures, using public input and the best available science and tools such as ACLs and AMs
- *Electronic Monitoring and Reporting:* Implement EM and ER options in key fisheries identified by 2020
- *National Catch Share Program*: Work with interested Regional Councils to support catch share programs and the use of technology, when appropriate, to improve the cost-effectiveness of these programs

Aquaculture (FY 2020–2024)
- Prepare a Programmatic Environmental Impact Statement for the Pacific Islands Region to analyze the potential environmental impacts of a proposed offshore aquaculture management program
- Establish and expand regional pilot projects (e.g., kelp and seaweed farming, offshore aquaculture)
- Advance Science Center research to support environmentally sound aquaculture practices such as genetics and tools for

aquaculture siting
- Research sustainable finfish aquaculture feeds
- Develop science-based tools for management that ensure the efficient review of aquaculture permit applications

Salmon Management Activities (FY 2020–2024)
- Support the operations and maintenance of Columbia River hatcheries to mitigate the loss of fish production due to hydropower dams
- Conduct a broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers

Regional Councils and Fisheries Commissions (FY 2020–2024)
- Continue to revise FMPs and amendments to prevent overfishing, rebuild overfished fisheries, and promote sustainability
- Complete socioeconomic analyses for fishery management actions
- Work with Councils to implement electronic technologies for fishery monitoring
- Complete necessary environmental analyses and support Council action to remove regulations determined to be outdated, unnecessary, or ineffective, to reduce the burden on commercial and recreational fishermen

Deliverables:

***Fisheries and Ecosystem Science Programs and Services (FY 2020–2024*)**
- *Economics and Social Science:* Assessments of the benefits/cost-effectiveness of fisheries rebuilding programs, habitat and protected species recovery programs, and decision support tools; and, improved quantitative models for conducting benefit-cost analyses and predicting how fishery participants will respond to changes in management measures
- *Ecosystem Science:* Updated ecosystem-status reports and risk and vulnerability assessments delivered to resource managers in the IEA regions; and delivery of environmental indicators and predicted impacts on managed species to appropriate stock assessment scientists and Regional FMCs through the FATE program
- *Antarctic Research:* Complete 26 stock assessments for targeted stocks of krill, fishes, and crabs managed by the Commission for the Conservation of Antarctic Marine Living Resources
- *Information Analysis and Dissemination:* Technical expertise and capacity infrastructure for data collection, processing, sharing, and archiving for Integrated Ocean Observing System, NOAA Environmental Data Management Committee, NMFS

Enterprise Data Management, NMFS Fisheries Information Systems, NMFS Marine Recreational Information Program, and Data.gov

Fisheries Data Collections, Surveys, and Assessments (FY 2020–2024)

- *Fisheries Monitoring, Assessment, and Forecasting:* Fishery-independent surveys to provide ongoing data for stock assessments; stock assessment reports based on a next-generation stock assessment framework for key stocks; and more precise estimates of recreational catch through improved surveys
- *Cooperative Research:* Conduct approximately 39 cooperative research projects, in partnership with stakeholders; and document the individual project final reports of the results, with data archived at the Fisheries Science Centers and added to the NMFS InPort Centralized documentation (metadata) repository
- *MARMAP:* Fishery-independent assessments of reef fish abundance and life history characteristics of economically and ecologically important reef fish species in shelf and upper slope waters from Cape Lookout to Cape Canaveral; resulting data provided for use in stock assessments and in support of other research and management needs
- *SEAMAP:* Surveys in inshore and offshore waters conducted and fishery, habitat, biological, and environmental data provided to Regional Councils for incorporation into regional species stock assessments and for development of effective fisheries and habitat management strategies

Observers and Training (FY 2020–2024)

- Information on catch, bycatch, discards, and biological data necessary for in-season monitoring and stock assessments; Also information on fishing effort, fishing gear, and specific fishing techniques that minimize bycatch
- National Observer Program (NOP) annual reports, and biennial updates to the U.S. National Bycatch Report (NBR); the next NBR update and NOP annual report are scheduled to be published online in 2019

Fisheries Management Programs and Services (FY 2020–2024)

- Development of fisheries regulations, FMPs, and amendments in order to maintain and restore productive stocks important to commercial, recreational, tribal, and subsistence fisheries
- Analysis and research to identify, consult, and certify nations whose vessels engage in IUU fishing, and bycatch of Protected Living Marine Resources (PLMR) and certain shark catches on the high seas. May also result in recommendations to the Secretary of Commerce, after coordination with other Federal agencies, on possible fishery-product trade prohibitions and

port restrictions on nations whose vessels engage in the above
- Collection of source data on fishery product imports tracing back to the harvest area and analysis of shipment documentation to verify accuracy and identify trends in import of IUU fishery products and fraudulently labeled seafood
- Improvements in fishing gear and fishing practices to reduce bycatch
- Implementation of cost-effective electronic technology applications that complement observer coverage, improve data collection and analysis, and lower the economic and time burden on fishermen for compliance with recordkeeping and reporting regulations

Aquaculture (FY 2020–2024)
- Increased domestic aquaculture production and associated jobs
- More efficient aquaculture permitting systems in state and Federal waters
- Report on interagency efforts to establish a coordinated permitting system for Federal waters
- Reports on research and development to support environmentally sound aquaculture practices
- Permits issued for aquaculture operations in the Gulf of Mexico, the Pacific Islands, and in other regions in Federal waters
- Application of science-based tools for management that ensure the efficient review of aquaculture permit applications

Salmon Management Activities (FY 2020–2024)
- Maintenance of salmon smolt production as required under the Mitchell Act
- Broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers

Regional Councils and Commissions (FY 2020–2024)
- Draft amendments to FMPs
- Collection and analysis of socioeconomic data on the impacts of fishery management actions
- Regulations removed that were determined to be outdated, unnecessary, or ineffective, to increase economic fisheries value or improve recreational activities and reduce burden on commercial and recreational fishermen

Exhibit 12

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
Fisheries and Ecosystem Science Programs and Services	Pos/BA	529	143,277	625	147,107	625	149,411
	FTE/OBL	526	143,999	595	147,107	595	149,411
Fisheries Data Collections, Surveys, and Assessments	Pos/BA	446	164,598	480	168,086	480	169,952
	FTE/OBL	443	165,786	457	168,086	457	169,952
Observers and Training	Pos/BA	122	53,611	158	53,955	158	54,430
	FTE/OBL	121	54,115	150	53,955	150	54,430
Fisheries Management Programs and Services	Pos/BA	426	117,903	466	121,116	466	122,873
	FTE/OBL	423	117,814	444	121,116	444	122,873
Aquaculture	Pos/BA	27	14,904	28	15,000	28	15,123
	FTE/OBL	27	15,165	27	15,000	27	15,123
Salmon Management Activities	Pos/BA	30	35,274	33	37,000	33	37,118
	FTE/OBL	30	35,773	31	37,000	31	37,118
Regional Councils and Fisheries Commissions	Pos/BA	12	35,642	13	40,175	13	41,455
	FTE/OBL	12	35,785	12	40,175	12	41,455
Interjurisdictional Fisheries Grants	Pos/BA	1	3,004	2	3,365	2	3,365
	FTE/OBL	1	3,230	2	3,365	2	3,365
Total Fisheries Science and Management	Pos/BA	1,593	568,213	1,805	585,804	1,805	593,727
	FTE/OBL	1,583	571,667	1,718	585,804	1,718	593,727

Fisheries and Ecosystem Science Programs and Services
This budget line supports NMFS science to prevent and eliminate overfishing, rebuild overfished stocks, support sustainable aquaculture, conserve and restore habitats, and support fishing communities.

Fisheries Science Base Activities
These funds support science used for the analysis and decision-making needed for ecosystem-based fisheries management, Fishery Management Plans (FMP) and regulatory implementation, and enforcement to ensure compliance with regulations. Major activities include the following:

- *Regional Science and Operations:* Supports core survey and science work in the regional Science Centers (Centers) such as fishery catch monitoring, survey and stock assessments, charters for survey vessels, fuel, supplies, etc. Also supports research projects at the Centers, including collaborative research with other institutions on topics such as pelagic fisheries and groundfish.
- *Recreational Fisheries Information*: Supports the Marine Recreational Information Program's (MRIP) work to improve and expand NMFS' data collection efforts for monitoring recreational fisheries impacts. MRIP has improved sampling design and accuracy of shoreside angler surveys. This data is fundamental to successfully targeting improvements to recreational fishing.
- *Marine National Monuments:* Supports science and management activities, including the development of collaborative 15-year management plans for the Marianas Trench, Rose Atoll, and the Pacific Remote Islands Marine National Monuments. The Pacific Monuments encompass nearly 481,000 square miles, making it the world's largest marine reserve.
- *West Coast Groundfish Management and Research:* Provides the key stock assessment science support for management of more than 80 fish stocks along the coasts of Washington, Oregon, and California.
- *Electronic Monitoring and Electronic Reporting:* Supports the development and implementation of electronic monitoring (EM) and reporting (ER) working with industry to integrate technology into data collections and observations to improve the timeliness, quality, integration, cost effectiveness, and accessibility of fishery-dependent data. These funds have facilitated pre-implementation of additional EM programs on the East Coast, including the Northeast groundfish fishery in 2016-2019 (with a target of full implementation in 2020) and the herring and mackerel fisheries in 2020. EM will be implemented in the West Coast whiting midwater trawl and fixed gear fisheries in 2019, and the bottom trawl and non-whiting midwater trawl fisheries in 2020. In Alaska, EM will be implemented in the small boat fixed gear and pot fisheries in 2019. ER was implemented in the Mid-Atlantic for-hire fisheries in 2018, and will be implemented in the Gulf of Mexico and South Atlantic

for-hire fisheries in 2019. ER will be implemented in the South Atlantic and Gulf of Mexico commercial fisheries by 2019. ER development will continue in the Atlantic HMS pelagic longline fishery, with implementation targeted for 2019. See Fisheries Management Base description below for implementation of management measures of EM/ER.

- *Aquaculture:* Conducts science to support a substantial increase in sustainable domestic aquaculture, enabling important contributions to the U.S. seafood supply, job creation in coastal communities, and reduced reliance on imported seafood (currently more than 85 percent of U.S. seafood is imported). Marine aquaculture is also used to enhance commercial and recreational fisheries and restore habitats.

Economics and Social Science Research
This program supports NMFS economists and social scientists conducting legislatively mandated (e.g., NEPA, MSA) economic and social analysis for almost 300 rulemakings each year. Underpinning these assessments is a broad range of socio-economic data collection, modeling, and, increasingly, a number of commercial and recreational fisheries decision support tools. This work addresses traditional fishery management issues (e.g., effects of rebuilding programs, catch share programs, aquaculture, and fishery allocation decisions on fishermen and communities) and emerging coastal and marine resource management issues such as ecosystem services trade-offs and valuation, and community resilience.

Fisheries Oceanography
Ecosystem-based approaches to management rely upon research that integrates biological, socio-economic, environmental, and oceanographic data into predictive models that improve NOAA's ability to manage resources over the long-term. Fisheries Oceanography funds are distributed between two efforts: Fisheries and the Environment (FATE) and Integrated Ecosystem Assessment (IEA) programs. FATE projects analyze the response of living marine resources to environmental change. The IEA program conducts research and develops products to enhance scientific advice for better managing the Nation's resources and achieving ecological and societal objectives. IEAs assess ecosystem status and trends relative to ecosystem management goals, analyze risks and uncertainty, and evaluate trade-offs between management options.

Antarctic Research
The U.S. Antarctic Marine Living Resources Convention Act requires that the Department of Commerce conduct directed scientific research to "achieve the United States goal of effective implementation of the objectives of the Convention [on the Conservation of Antarctic Marine Living Resources]." NOAA's Antarctic Ecosystem Research Division implements the U.S. Antarctic Marine Living

Resources program. This program is NOAA's only dedicated, long-term ecological presence in the Antarctic, with observations dating back to 1986.

Climate Regimes & Ecosystem Productivity
The Climate Regimes & Ecosystem Productivity (CREP) program provides decision-makers with information on how climate variability and change are impacting U.S. marine ecosystems and the communities and economies that depend on them. CREP is implemented in the North Pacific region through the North Pacific Climate Regimes and Ecosystem Productivity (NPCREP) project and the recently implemented Distributed Biological Observatory (DBO). NPCREP provides information, assessments, and projections of climate-related impacts on living marine resources of the Bering Sea and Gulf of Alaska. This area includes some of the Nation's richest commercial fishing grounds—6.0 billion pounds of seafood were landed in Alaska with a value of $1.8 billion in 2017[9]—as well as protected species and other resources that native communities depend on. The DBO is an array of sensors designed to detect changes in nutrients, productivity, and biological abundances and diversity along a latitudinal gradient extending from the northern Bering Sea to the Chukchi and Beaufort Seas.

Information Analysis and Dissemination
Requirements and directives for data collection, management, and dissemination are included in the MSA, MMPA, ESA, Aquaculture Act of 1980, Data Quality Act, and other policies and directives. The information analysis and dissemination program supports the NMFS infrastructure and staff that process, analyze, and produce data and disseminate it to resource managers and other users.

Fisheries Data Collections, Surveys, and Assessments
One of NMFS' core functions is to provide accurate and timely assessments of fish and shellfish stocks that support commercial and recreational fisheries. Stock assessment models estimate a stock's status over time and forecast future dynamics to advise fishery managers in their development of sustainable harvest levels. Assessment models are most reliable when they incorporate high quality data on fishery removals, stock abundance and biology, and ecosystem and environmental variability (see figure below). Funds support data collection, data management, and fisheries stock assessment production.

[9] National Marine Fisheries Service. 2018. Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017. Available at: https://www.fisheries.noaa.gov/content/fisheries-united-states-2017.

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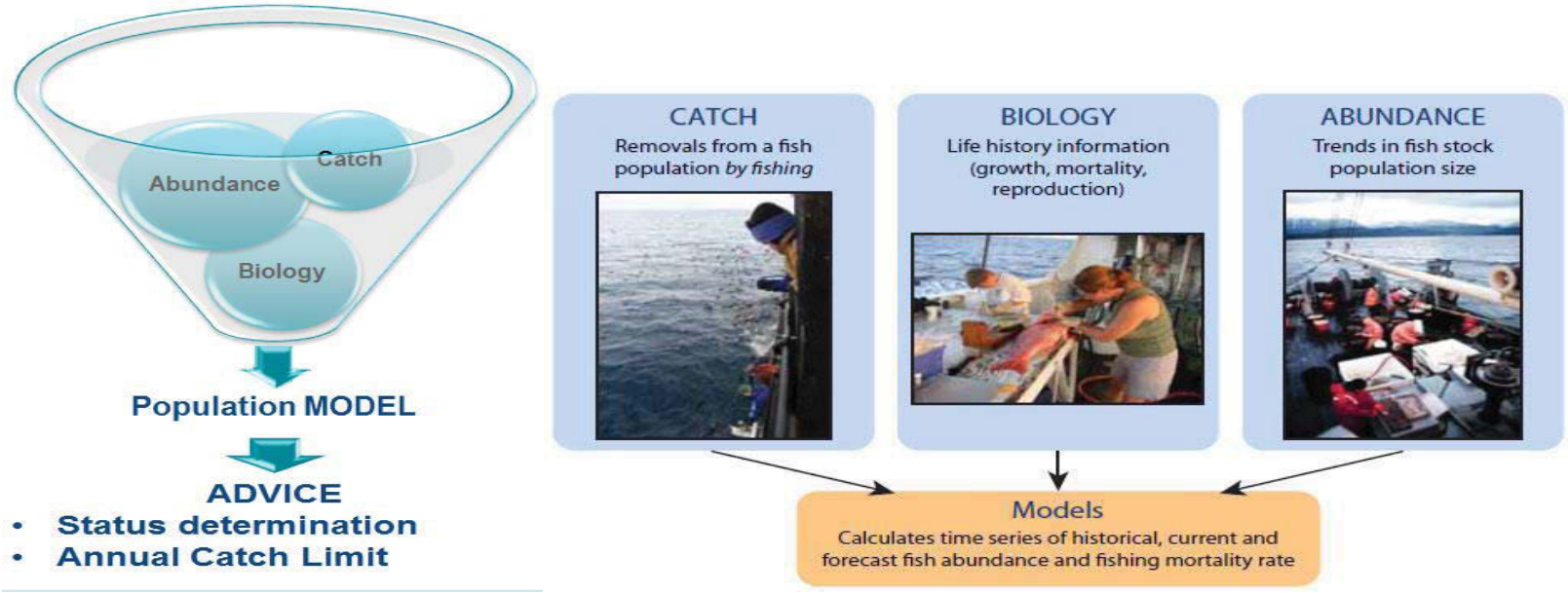
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



Expand Annual Stock Assessments (EASA)
Stock assessments provide the technical basis for fishery management decisions, such as setting annual catch limits (ACLs) to achieve optimum yield from the fishery while avoiding overfishing and ecosystem harm. Assessment activities include: catch monitoring and surveys; data analysis and stock assessment modeling; advanced sampling technologies; habitat, climate and other ecosystem indicators; and stock assessment model improvements. In addition, NMFS is addressing critical gaps in stock assessments as identified in program reviews and the implementation of the new stock assessment improvement plan and prioritization process. This process defines target frequency and assessment levels for each stock and facilitates the implementation of a next generation stock assessment framework. This framework includes assessments linked to climate, ecosystem, and habitat

dynamics where appropriate, and provides baseline monitoring for all Federally-managed fish stocks.

Fisheries Statistics
Accurate data and reliable statistics on fishing effort and catch are essential for assessing fish stocks, as well as for monitoring performance relative to wild fishery management targets and aquaculture objectives. Funds are used to manage and conduct data collection, data processing, statistical analysis, information management, and statistical reporting activities for commercial and recreational fisheries.

Fish Information Networks
The Fish Information Networks program supports several state-Federal cooperative programs that coordinate data collection, data management, and information management activities, which are essential for accurate monitoring of commercial and recreational fishing impacts. These programs collect data and manage information on fishing participation, fishing effort, and catch. They also help collect fishery-dependent biological data needed for stock assessments. The programs included are: Atlantic States Marine Fisheries Commission, Gulf of Mexico Fisheries Information Network, Alaska Fisheries Information Network, Pacific Fisheries Information Network, Recreational Fisheries Information Network, National Fisheries Information System, and the Marine Fisheries Initiative.

Survey and Monitoring Projects
Projects include support for bluefin tuna tagging research, red snapper monitoring and research, West Coast groundfish surveys, Alaska extended jurisdiction programs, Maine and New Hampshire inshore trawl surveys, Bering Sea Pollock research, and Gulf of Maine groundfish assessment, to name a few. These targeted surveys and biological investigations improve the information available to conduct accurate stock assessments and directly contribute to the *Percentage of FSSI Stocks with Adequate Population Assessments and Forecasts* (*performance indicator 3.4*).

American Fisheries Act (AFA)
NMFS collects data to support the following management measures for the AFA: 1) regulations that limit access and allocate Bering Sea and Aleutian Islands (BSAI) pollock to the fishing and processing sectors of the BSAI pollock fishery, 2) regulations governing the formation and operation of fishery cooperatives in the BSAI pollock fishery, 3) regulations to protect other fisheries from spillover effects from the AFA, and 4) regulations governing catch measurement and monitoring in the BSAI pollock fishery.

Cooperative Research
Cooperative research enables commercial and recreational fishermen to become involved in collecting fundamental fisheries information that supports management options. Through cooperative research, industry and other stakeholders can partner with NMFS and university scientists in all phases of the research program—planning the survey and statistical design, conducting research, analyzing data, and communicating results.

Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP)
MARMAP is a cooperative fisheries project of NMFS and the South Carolina Marine Resources Research Institute (MRRI). For more than 40 years, the MRRI has conducted fishery-independent surveys and research on groundfish, reef fish, and coastal pelagic fishes between Cape Lookout, North Carolina and Cape Canaveral, Florida.

Southeast Area Monitoring and Assessment Program (SEAMAP)
Funding for SEAMAP supports the collection of fishery-independent data through state, Federal, and university partnerships. Partnership arrangements are set up through cooperative agreements in three areas: South Atlantic (North Carolina to Florida), Gulf of Mexico (Florida to Texas), and Caribbean (U.S. Virgin Islands and Puerto Rico). SEAMAP coordinates state and Federal surveys for the collection, management, and dissemination of fishery-independent data on marine resources.

Observers and Training
This program provides information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries resources. The scientific data collected by observer programs provide critical inputs for population assessments of threatened and endangered species such as sea turtles, seabirds, and marine mammals, and for effective management of the Nation's fish stocks. The authority to place observers on commercial fishing and processing vessels is provided by the MSA, MMPA, and ESA. Fisheries observer programs are proven, unbiased, and valuable sources of information on the Nation's fisheries, and are a reliable and cost-effective means to collect fishery-dependent data.

Observers monitor fishing activities for 57 fisheries (including 10 catch share fisheries) across all five NMFS regions, and collect data for a range of conservation and management issues in various fisheries. This includes information on fishing practices, vessel and gear characteristics, fishing locations and times, environmental conditions within the fishing grounds, catch and bycatch, and socio-economic data.

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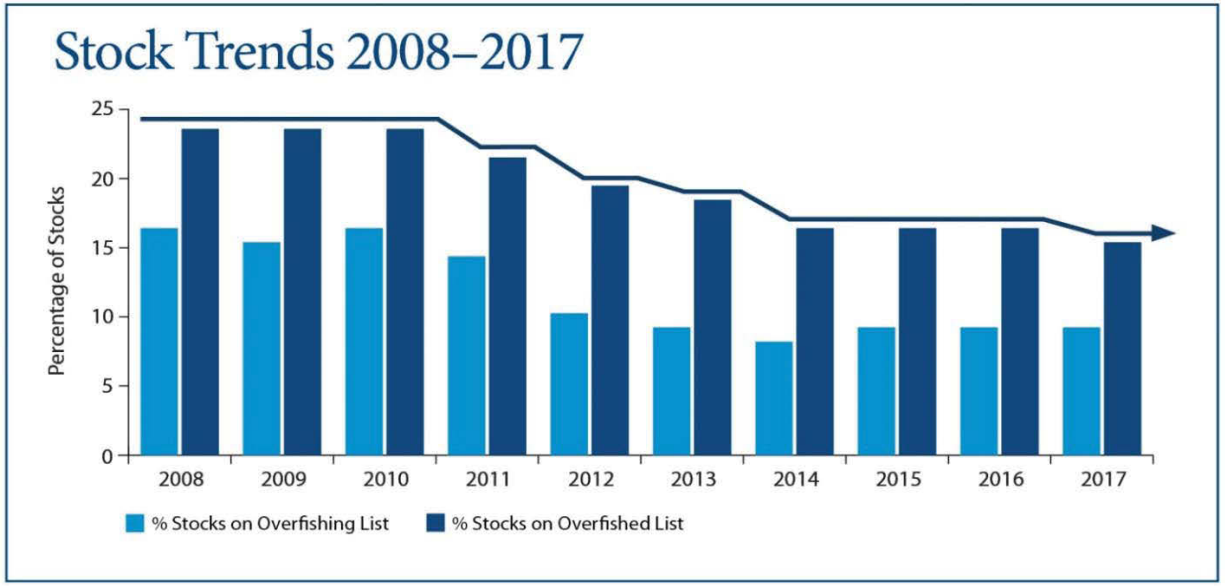
Fisheries Management Programs and Services

Under the MSA and other fisheries legislation, this budget line supports: management actions to effectively prevent and eliminate overfishing, rebuild overfished stocks, support sustainable aquaculture, and implement ecosystem-based management to support sustainable fisheries, fishing businesses, and communities. As a result of this work 45 fish stocks since 2000 have been rebuilt and the number of stocks experiencing overfishing, or determined to be overfished are at near all-time lows.[10]



Change in percentage of stocks subject to overfishing and overfished from 2008 through 2017 as shown in the Annual Report to Congress: Status of Stocks 2017.

[10] https://www.fisheries.noaa.gov/feature-story/status-stocks-2017

Fisheries Management Base

These funds support NMFS staff efforts to deliver the following services, including analysis and decision-making to support fisheries management and regulatory implementation:

- *Annual Catch Limits (ACLs) and Accountability Measures (AMs):* ACLs and AMs prevent overfishing. NMFS monitors catch levels for domestic fisheries and makes adjustments to management when those levels are exceeded. NMFS reports on the percent of fish stocks that have exceeded their ACLs, which informs improvements to ACL management systems.
- *International Requirements of the MSA:* The international requirements of the MSA include strengthening the effectiveness of international fishery management organizations in conserving and managing fish stocks under their respective jurisdictions.
- *Illegal, Unreported, and Unregulated (IUU) Fishing*: NMFS publishes a biennial report identifying nations whose vessels are engaging in IUU fishing and bycatch of protected living marine resources and of certain sharks on the high seas. The identification of these nations allows the U.S. to take corrective actions. NMFS evaluates shipment documentation of at-risk species entering U.S. commerce to monitor possible IUU shipments and identify trends of countries, firms, or regions that operate in a manner which increases the risk of importing IUU fishery products or fraudulently labeled seafood into U.S. commerce. [Note: Enforcement actions required to prosecute and deter IUU fisheries actions are covered in the NMFS Enforcement Activity].
- *National Standard Guidance:* NMFS develops and promulgates guidelines to assist in the implementation of MSA National Standards, principles that must be followed in any FMP to ensure sustainable and responsible fishery management.
- *Regional Fishery Management Councils Support*: NMFS assists in the development, review, and implementation of Council-proposed actions. NMFS staff assist the Councils with Secretarial approval and implementation of FMPs and amendments, and preparing analytical documents in support of rulemaking.
- *Electronic Monitoring and Reporting:* NMFS coordinates with partners to develop, analyze, and incorporate electronic technologies into fishery management. Funding will expedite the use of electronic solutions where appropriate to improve the timeliness, quality, integration, and accessibility of fishery-dependent data for fishery managers, stock assessment scientists, the fishing industry, and other key stakeholders. This work is in conjunction with and directly complements the electronic technology activities under the Fisheries and Ecosystem Science Programs and Services PPA.

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National Catch Share Program
Funding supports operation of catch share programs. “Catch share” is a general term for strategies that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. The term includes specific programs defined in law, such as limited access privilege (LAP) and individual fishing quota (IFQ) programs. These programs allow fishermen to maximize their flexibility to time delivery of catch to the market.

The MSA allows some or all of the incremental operational costs for the catch share programs that meet the definition of a LAP program to be recovered once the catch share program is operational, but the total amount of cost recovery is capped at a maximum of three percent of the ex-vessel value of the fishery.

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Catch share programs have been used in the U.S. since 1990 and now include 16 fisheries, which includes every region except the Pacific Islands.

Reducing Bycatch

NMFS supports research on gear technologies that reduce bycatch and bycatch mortality. Reducing bycatch can save fishing jobs by preventing fishery closures due to interactions with endangered species or attainment of strict bycatch quotas. This funding supports the Bycatch Reduction Engineering Program external competitive grants program, which supports innovative

gear designs and fishing techniques to minimize bycatch.

Product Quality and Safety
NMFS helps ensure that the Nation's seafood industry is economically sustainable and complies with food regulations. Funding supports the National Seafood Inspection Laboratory, which provides an analysis laboratory, data management, and regulatory compliance risk analysis. Voluntary services are also part of the program, and include sanitation evaluation, product inspection and certification, auditing of food quality and safety programs, and training.

Aquaculture
NMFS is one of the three line offices that support NOAA's Marine Aquaculture Program, whose mission is to provide science, services, and policies to support the significant expansion and sustainability of U.S. marine aquaculture. Each line office has distinct and complementary roles:

- NMFS leads the program and focuses on developing policies, regulations, and science-based tools for management to support streamlined permitting systems.
- The Office of Oceanic and Atmospheric Research's (OAR) National Sea Grant College Program supports industry development and extension with integrated research and technology transfers primarily through competitive grants.
- The National Ocean Service (NOS) supports development of coastal planning tools to inform siting decisions.

The Department of Commerce has identified increasing aquaculture production as one of its key strategic objectives to increase the nation's seafood supply, improve our trade balance with other nations, and create jobs.[11] NMFS' activities are led by the Office of Aquaculture. Base funding supports the following priority areas, which are guided by the Office's 2016 Strategic Plan.[12]

- Increase regulatory efficiency: Develop coordinated, consistent, and streamlined regulatory processes for the marine aquaculture sector in collaboration with state and Federal partners.
- Develop science-based tools for sustainable management: Develop science-based tools for management to support environmentally sustainable marine aquaculture, and ensure the efficient review of aquaculture permit applications using best available science.

[11] United States. Department of Commerce. 2017. *Strategic Plan, 2018-2022: Helping the Economy Grow.* p. 9.
[12] National Marine Fisheries Service. 2015. Marine Aquaculture Strategic Plan FY 2016-2020. U.S. Department of Commerce. available at: https://www.fisheries.noaa.gov/webdam/download/65605834

- Improve technical and science-based production tools and techniques (e.g., disease prevention and treatment) in support of the nation's shellfish farmers.
- Support regional pilot projects: Conduct regional pilot projects (e.g., kelp and seaweed farming, offshore aquaculture) in collaboration with industry and other partners.
- Inform the public: Develop outreach products and conduct activities to improve public understanding of marine aquaculture.

The U.S. is a major consumer of aquaculture products, yet is a minor producer. The Nation imports an estimated 85-95 percent of its seafood, over half of which is from foreign-produced aquaculture. This reliance on foreign imports resulted in an over $16 billion seafood trade deficit in 2018, moves potential seafood jobs overseas, and poses a risk to food security. Given wild fish stocks are at or near maximum harvest levels, the single greatest opportunity to increase the seafood supply is through domestic aquaculture. In 2016, U.S. marine aquaculture production decreased from the prior year by 10.0 million pounds (10 percent); however, the value of production increased by $24.3 million (6%)[13] (see figure below for aquaculture production highlights). Significant acceleration in aquaculture production is needed over the next several years to substantially reduce the seafood trade deficit.

[13] National Marine Fisheries Service (2018) Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017. Available at: https://www.fisheries.noaa.gov/content/fisheries-united-states-2017. *Note, due to data availability, aquaculture production data lags the rest of the publication by one year.*

Department of Commerce
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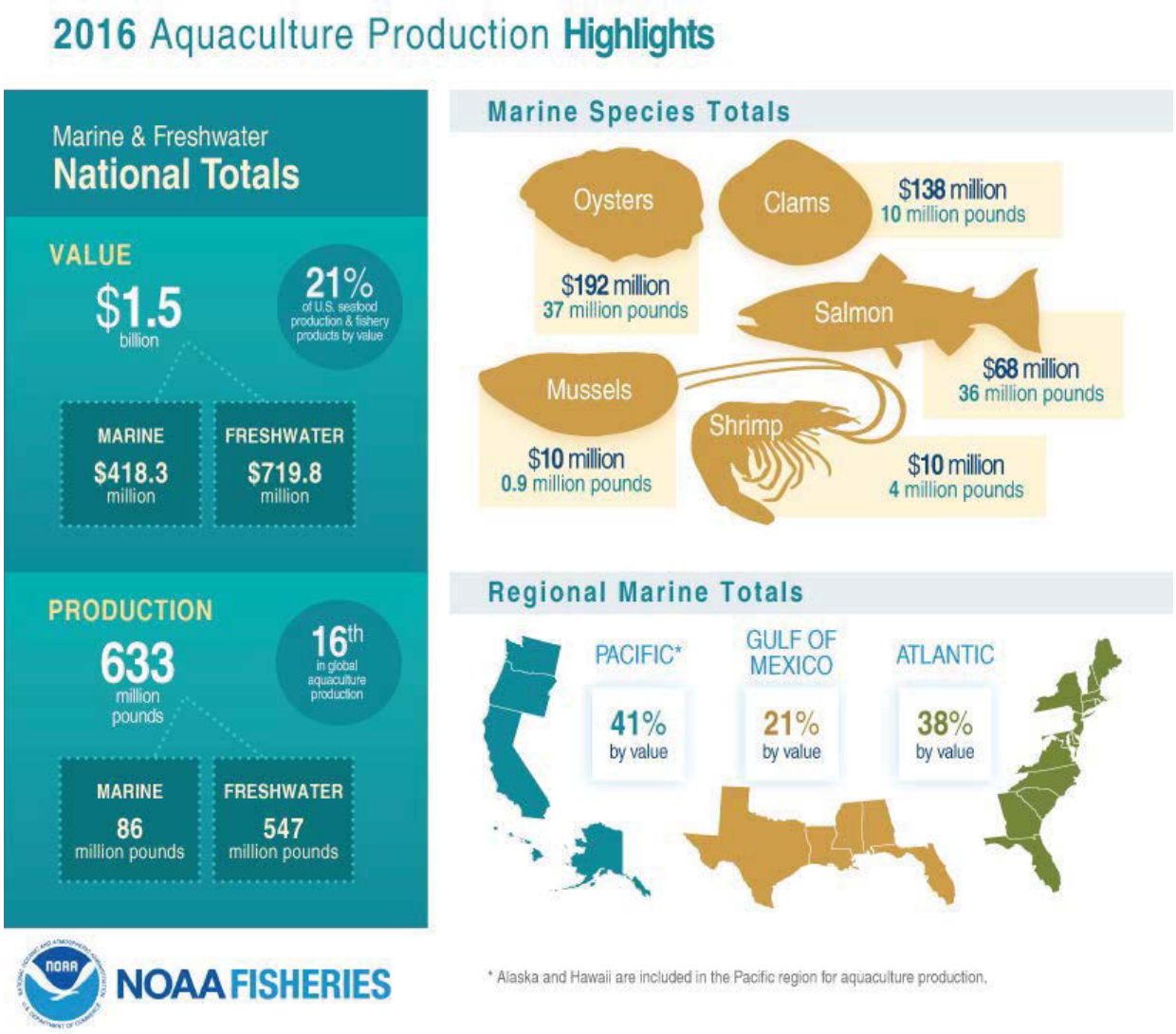
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



Salmon Management Activities
This funding supports research and management activities associated with salmon not listed under the ESA. Funding for the Mitchell Act component supports the operations and maintenance of Columbia River hatcheries through grants and contracts to the states of Washington, Oregon, and Idaho, and to the USFWS, to mitigate the loss of salmon on the Columbia and Snake Rivers. The Pacific Salmon Treaty component funds NMFS and the states of Alaska, Washington, Oregon, and Idaho to provide personnel support to the Pacific Salmon Commission's technical committees and conduct a broad range of salmon stock assessment and fishery monitoring programs required to implement the treaty provisions. These programs are carried out in fisheries and rivers located from southeast Alaska to Oregon, including the Columbia River.

Regional Councils and Fisheries Commissions
NOAA is the sole source of funding for the eight Regional Fishery Management Councils. The Councils were established by the MSA to prepare FMPs aimed at preventing and eliminating overfishing and rebuilding overfished stocks for the Nation's fisheries. The funding is divided among the eight Councils and is used for their operating costs (e.g., staff, rent, public meetings, Council member salaries, and travel). Funding also supports the activities of the Interstate Marine Fisheries Commissions, and International Fisheries Commissions. Funds provide critical operational support to the commissions and states for development and implementation of sustainable fishery management measures. This request also includes an investment to support the removal of regulations determined to be outdated, unnecessary, or ineffective. Deregulatory actions will support increased utilization of fisheries resources such as allowing access to new areas, while still achieving conservation objectives. In addition, they will enable opportunities to reduce fishermen's costs, such as allowing the use of electronic monitoring as an alternative to observer coverage.

Interjurisdictional Fisheries Grants
The Interjurisdictional Fisheries Act of 1986 (IFA) is a formula-based financial assistance program to promote state activities in support of the management of interjurisdictional fisheries resources. Any state, either directly or through an interstate commission, may submit a grant proposal that supports management of fishery resources that: 1) occur in waters under the jurisdiction of one or more states and in the U.S. EEZ; 2) are managed under an interstate FMP; or (3) migrate between the waters under the jurisdiction of two or more states bordering on the Great Lakes. Past examples of projects funded through these grants include research on: blue crab spawning in Florida; American lobster settlement in Maine; and, fishery catch statistics, stock status, and management actions for state of Alaska managed fisheries including sablefish, lingcod, black and blue rockfish, and Pacific cod.

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PROGRAM CHANGES FOR FY 2020:
NOAA requests a net decrease of $60,522 and 14 FTE/14 positions in FY 2020 program changes for the Fisheries Science and Management Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries and Ecosystem Science Programs and Services	Pos./BA	625	149,411	625	145,411	0	(4,000)
	FTE/OBL	595	149,411	595	145,411	0	(4,000)

NMFS Facilities (-$4,000, 0 FTE/0 Positions) – This request will decrease funding for NMFS science facilities to support NOAA's goal of a more efficient Federal footprint. NOAA proposes to reduce operating costs by divesting the following three owned properties combined with savings from avoidance of deferred maintenance associated with one of the facilities in the Fisheries and Ecosystem Science Programs and Services budget line for a total budget savings of $4.0 million. These decreases represent initial actions to reduce NMFS' footprint, and the agency will continue to evaluate additional actions for further facilities reductions in the following years. These proposed reductions in operations and maintenance costs will allow NMFS to focus resources on mission critical priorities rather than unneeded properties.

- **Pacific Grove Laboratory** **-$20**
  (Southwest Fisheries Science Center; Pacific Grove, CA)
  The Pacific Grove Laboratory was closed in FY 2013 when its programmatic functions were relocated to other Southwest Fisheries Science Center facilities. This proposal would divest this vacant facility and eliminate $20,000 of annual holding costs.
- **Building #74 of the James J. Howard Marine Sciences Laboratory** **-$900**
  (Northeast Fisheries Science Center, Sandy Hook, NJ)
  This proposal would consolidate functions to a single building of the J.J. Howard Marine Sciences Lab and divest from use of Building 74, eliminating $900 of annual operations and maintenance costs for more resource efficient execution of science support for northeast fisheries mandates.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

- **NOAA Estuarine Habitats And Coastal Fisheries Center** **-$3,080**
  (Southeast Fisheries Science Center (SEFSC); Lafayette, LA)
  The NOAA Estuarine Habitats and Coastal Fisheries Center provides scientific information on management of commercial and recreational shellfish and finfish, conservation of coastal habitats, protection of threatened and endangered marine species, and protection of coastal wetlands (under the Coastal Wetlands Planning Protection and Restoration Act). The Center also houses the Marine Mammal Molecular Genetics Lab. This proposal would close this Federal facility allowing recovery of $800 in annual facility operation and maintenance costs. NMFS will also continue to evaluate these programs for the most cost effective and logistically efficient manner to achieve the budget reductions. Further, NOAA will decrease $2,280 by avoiding costs planned in FY 2020 from repairs needing to be addressed at the facility. Given the proposed closure of the center, these deferred maintenance costs can be avoided.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries and Ecosystem Science Programs and Services
Program Change: NMFS Facilities

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	60,500	61,807	63,474	63,474	0
11.3	Other than full-time permanent	797	814	836	836	0
11.5	Other personnel compensation	1,771	1,809	1,858	1,858	0
11.8	Special personnel services payments	18	18	18	18	0
11.9	Total personnel compensation	**63,086**	**64,448**	**66,186**	**66,186**	0
12.1	Civilian personnel benefits	20,554	20,997	21,563	21,563	0
13	Benefits for former personnel	14	14	14	14	0
21	Travel and transportation of persons	2,535	2,590	2,590	2,590	0
22	Transportation of things	515	526	526	526	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,893	2,956	2,956	2,956	0
23.2	Rental payments to others	214	218	218	218	0
23.3	Communications, utilities, and misc. charges	3,819	3,901	3,901	3,901	0
24	Printing and reproduction	79	81	81	81	0
25.1	Advisory and assistance services	10,223	10,444	10,444	6,444	(4,000)
25.2	Other services from non-Federal sources	20,977	21,430	21,430	21,430	0
25.3	Other goods and services from Federal sources	1,052	1,075	1,075	1,075	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,466	4,562	4,562	4,562	0
31	Equipment	2,979	3,043	3,043	3,043	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,588	10,817	10,817	10,817	0
42	Insurance claims and indemnities	2	2	2	2	0
43	Interest and dividends	3	3	3	3	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	$143,999	$147,107	$149,411	$145,411	($4,000)

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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Exhibit 13

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries and Ecosystem Science Programs & Services	Pos./BA	625	149,411	625	147,411	0	(2,000)
	FTE/OBL	595	149,411	595	147,411	0	(2,000)

Northeast Groundfish Research (-$2,000, 0 FTE/0 Positions) – This request will eliminate additional funding provided by Congress for New England groundfish research. NOAA studied the effects of changing climatic conditions and warming waters on the fishery, including stock health and natural mortality through ten research projects.[14] Projects included: development of stock assessment models; improved spatial management of living marine resources through an increased understanding of spatial and temporal distributions, migration, and phenology; work with NOAA Oceanic and Atmospheric Research and academic scientists to develop short-term (day to year) and medium-term (year to decade) living marine resource forecasting products; research on the effects of multiple climate factors on living marine resources with a goal of improving assessments and scientific advice provided to managers; and ecosystem survey work in the Northeast U.S. shelf ecosystem.

[14] More on ten funded NE groundfish projects: https://www.nefsc.noaa.gov/rcb/projects/groundfish-and-climate/?utm_medium=email&utm_source=govdelivery

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries and Ecosystem Science Programs and Services
Program Change: Northeast Groundfish Research

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	60,500	61,807	63,474	63,474	0
11.3	Other than full-time permanent	797	814	836	836	0
11.5	Other personnel compensation	1,771	1,809	1,858	1,858	0
11.8	Special personnel services payments	18	18	18	18	0
11.9	Total personnel compensation	**63,086**	**64,448**	**66,186**	**66,186**	0
12.1	Civilian personnel benefits	20,554	20,997	21,563	21,563	0
13	Benefits for former personnel	14	14	14	14	0
21	Travel and transportation of persons	2,535	2,590	2,590	2,590	0
22	Transportation of things	515	526	526	526	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,893	2,956	2,956	2,956	0
23.2	Rental payments to others	214	218	218	218	0
23.3	Communications, utilities, and misc. charges	3,819	3,901	3,901	3,901	0
24	Printing and reproduction	79	81	81	81	0
25.1	Advisory and assistance services	10,223	10,444	10,444	10,444	0
25.2	Other services from non-Federal sources	20,977	21,430	21,430	21,430	0
25.3	Other goods and services from Federal sources	1,052	1,075	1,075	1,075	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,466	4,562	4,562	4,562	0
31	Equipment	2,979	3,043	3,043	3,043	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,588	10,817	10,817	8,817	(2,000)
42	Insurance claims and indemnities	2	2	2	2	0
43	Interest and dividends	3	3	3	3	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	143,999	147,107	149,411	147,411	(2,000)

Exhibit 13

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries and Ecosystem Science Programs & Services	Pos./BA	625	149,411	613	146,444	(12)	(2,967)
	FTE/OBL	595	149,411	583	146,444	(12)	(2,967)

Antarctic Research (-$2,967, -12 FTE/-12 Positions) – This request will eliminate funding for NOAA's Antarctic Ecosystem Research Program. With the termination of the program, NMFS will reduce staffing through attrition, as well as transition approximately 12 FTEs into other positions for which they are qualified, and will work diligently to mitigate any impact to affected employees. NMFS will also discontinue the research at the Southwest Fisheries Science Center in support of the U.S. commitment to the international treaty to conserve living marine resources in the Antarctic - the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), and support to the U.S. Antarctic Marine Living Resources (AMLR) Convention Act. The U.S. AMLR Convention Act requires that the Department of Commerce conduct directed scientific research to "achieve the United States goal of effective implementation of the objectives of the Convention." NMFS does not have any regulatory responsibilities in the Antarctic.

NOAA's Antarctic Ecosystem Research Program implements the U.S. AMLR program in support of U.S. policy interests related to Antarctic resource management. NMFS scientists operate land-based predator research (e.g., counting seals and penguins and monitoring their reproductive success, body condition, and diet) and ship-based research (e.g., conducting oceanographic, trawl surveys, acoustic surveys, and small boat operations) to describe the fundamental relationships between Antarctic krill, krill's predators, finfish, and key environmental variables under changing sea ice conditions. This program is NOAA's only dedicated, long term ecological presence in the Antarctic, with observations dating back to 1986. The proposed FY 2020 elimination would impact NOAA's ability to meet mandates established in the AMLR Convention Act and to make scientific recommendations regarding the management and conservation of these resources to the CCAMLR.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure:					
Number of Antarctic fish assessments					
With Decrease	0	0	0	0	0
Without Decrease	26	26	26	26	26

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PROGRAM CHANGE PERSONNEL DETAIL

Activity: Fisheries Science and Management
Subactivity: Fisheries and Ecosystem Science Programs and Services
Program Change: Antarctic Research

Title		Grade	Number	Annual Salary	Total Salaries
Fisheries Biologist		ZP-III	(2)	81,332	(162,664)
Fisheries Biologist		ZP-IV	(3)	108,155	(324,465)
Research Biologist		ZP-III	(2)	76,904	(153,808)
Research Biologist		ZP-IV	(3)	114,176	(342,528)
Supervisory Fisheries Biologits		ZP-V	(2)	134,431	(268,862)
Total			(12)		(1,252,327)
Less lapse	0.00%		0		0
Total full-time permanent (FTE)			(12)		(1,252,327)
2020 Pay Adjustment (0%)	0.00%				0
Total					(1,252,327)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(12)
Other than full-time permanent	0
Total	(12)
Authorized Positions:	
Full-time permanent	(12)
Other than full-time permanent	0
Total	(12)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries and Ecosystem Science Programs and Services
Program Change: Antarctic Research

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	60,500	61,807	63,474	62,222	(1,252)
11.3	Other than full-time permanent	797	814	836	836	0
11.5	Other personnel compensation	1,771	1,809	1,858	1,858	0
11.8	Special personnel services payments	18	18	18	18	0
11.9	Total personnel compensation	63,086	64,448	66,186	**64,934**	(1,252)
12.1	Civilian personnel benefits	20,554	20,997	21,563	21,139	(424)
13	Benefits for former personnel	14	14	14	14	0
21	Travel and transportation of persons	2,535	2,590	2,590	2,479	(111)
22	Transportation of things	515	526	526	455	(71)
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,893	2,956	2,956	2,956	0
23.2	Rental payments to others	214	218	218	218	0
23.3	Communications, utilities, and misc. charges	3,819	3,901	3,901	3,901	0
24	Printing and reproduction	79	81	81	81	0
25.1	Advisory and assistance services	10,223	10,444	10,444	10,444	0
25.2	Other services from non-Federal sources	20,977	21,430	21,430	20,742	(688)
25.3	Other goods and services from Federal sources	1,052	1,075	1,075	1,075	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,466	4,562	4,562	4,391	(171)
31	Equipment	2,979	3,043	3,043	2,793	(250)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,588	10,817	10,817	10,817	0
42	Insurance claims and indemnities	2	2	2	2	0
43	Interest and dividends	3	3	3	3	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	143,999	147,107	149,411	146,444	(2,967)

Exhibit 13

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Data Collection, Surveys & Assessments	Pos./BA	480	169,952	480	162,466	0	(7,486)
	FTE/OBL	457	169,952	457	162,466	0	(7,486)

Reef Fish Stock Assessments (-$7,486, 0 FTE/0 Positions) – This request reduces funding provided by Congress for development and implementation of agency-independent and alternative approaches to research and stock assessments for reef fish in the Gulf of Mexico and Atlantic. NOAA has received additional funding for this work over the past several fiscal years and this level of funding is not requested in FY 2020. NOAA will continue to produce stock assessments for the Gulf of Mexico reef fish complex as part of its national stock assessment process.

In FY 2016, Congress directed NOAA to invest $10.0 million in agency-independent, alternative approaches to stock assessments for reef fish in the Gulf of Mexico through $5.0 million from OAR's National Sea Grant Program PPA and $5.0 million from NMFS' Fisheries Data Collections, Surveys, and Assessments PPA. Through this partnership, NOAA provided $10.0 million in external grants for research on innovative strategies to improve abundance estimates for Gulf of Mexico red snapper and other reef fish.

In FY 2017, Congress provided funding within the Fisheries Data Collections, Surveys, and Assessments PPA to continue agency-independent red snapper stock assessments. NOAA spent $5.0 million with external partners to expand fishery-independent surveys using new technologies, collect biological samples from artificial and natural reefs caught by recreational fishermen; and modernize data systems to get new data into stock assessments efficiently and accurately, as well as further quality control procedures with the use of contractor support.

In FY 2018, Congress again provided additional funding and NOAA invested $5.0 million for red snapper stock assessments in the Gulf of Mexico. NOAA provided $3.0 million to the Gulf States Marine Fisheries Commission to optimize fishery independent sampling and continue to enhance recreational sampling. NOAA also used $2.0 million to accelerate biological sample processing

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and increase assessment support for the Gulf of Mexico Fishery Management Council. In FY 2019, additional funds were provided to continue reef fish assessments in the Gulf and Atlantic in partnership with academic institutions.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries Data Collections, Surveys, and Assessments
Program Change: Reef Fish Stock Assessments

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	44,744	45,366	46,667	46,667	0
11.3	Other than full-time permanent	351	356	366	366	0
11.5	Other personnel compensation	1,849	1,875	1,929	1,929	0
11.8	Special personnel services payments	1,625	1,647	1,694	1,694	0
11.9	Total personnel compensation	48,569	**49,244**	**50,656**	**50,656**	0
12.1	Civilian personnel benefits	15,625	15,842	16,296	16,296	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	2,591	2,626	2,626	2,626	0
22	Transportation of things	469	475	475	475	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,245	2,276	2,276	2,276	0
23.2	Rental payments to others	303	307	307	307	0
23.3	Communications, utilities, and misc. charges	6,036	6,120	6,120	6,120	0
24	Printing and reproduction	106	107	107	107	0
25.1	Advisory and assistance services	12,646	12,821	12,821	9,827	(2,994)
25.2	Other services from non-Federal sources	15,054	15,262	15,262	15,262	0
25.3	Other goods and services from Federal sources	1,590	1,612	1,612	1,612	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,640	4,705	4,705	4,705	0
31	Equipment	1,592	1,615	1,615	1,615	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	54,317	55,071	55,071	50,579	(4,492)
42	Insurance claims and indemnities	1	1	1	1	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	165,786	168,086	169,952	162,466	(7,486)

Department of Commerce **Exhibit 13**
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Data Collection, Surveys & Assessments	Pos./BA	480	169,952	480	166,972	0	(2,980)
	FTE/OBL	457	169,952	457	166,972	0	(2,980)

Cooperative Research Program (-$2,980, 0 FTE/0 Positions) – This request reduces funding for the Cooperative Research program, which will lead to approximately ten fewer projects funded in FY 2020. The program will continue to execute cooperative research with industry, fishermen, and other stakeholders.

Since 2001, the Cooperative Research program has provided a means for commercial and recreational fishermen to participate in the collection of fundamental fisheries information to support the development and evaluation of management options. This work involves regional partnerships with a broad range of external stakeholders, including state and tribal managers and scientists (e.g., interstate fishery commissions), fishing industry participants (e.g., commercial and recreational fishermen), and educational institutions. Partnerships occur in all phases of the program, including design, research, analysis, and communication of results.

Cooperative research assists scientists and managers by providing information to supplement the data currently collected through existing Federal research programs. The information provided can cover a wide range of research areas, including, but not limited to: fishery dependent data; life history studies; conservation engineering; species abundance and distribution; habitat studies; and, socio-economic studies. Benefits of cooperative research include increased data quantity and quality, inclusion of stakeholders' knowledge in science and management, improved relevance of research to fisheries management, and reduced science costs through leveraging and cost sharing.

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure:					
Number of Cooperative Research projects funded (annual)					
With Decrease	29	29	29	29	29
Without Decrease	39	39	39	39	39

Department of Commerce **Exhibit 15**
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2019
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries Data Collections, Surveys, and Assessments
Program change: Cooperative Research Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	44,744	45,366	46,667	46,667	0
11.3	Other than full-time permanent	351	356	366	366	0
11.5	Other personnel compensation	1,849	1,875	1,929	1,929	0
11.8	Special personnel services payments	1,625	1,647	1,694	1,694	0
11.9	Total personnel compensation	48,569	**49,244**	**50,656**	**50,656**	0
12.1	Civilian personnel benefits	15,625	15,842	16,296	16,296	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	2,591	2,626	2,626	2,626	0
22	Transportation of things	469	475	475	475	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,245	2,276	2,276	2,276	0
23.2	Rental payments to others	303	307	307	307	0
23.3	Communications, utilities, and misc. charges	6,036	6,120	6,120	6,120	0
24	Printing and reproduction	106	107	107	107	0
25.1	Advisory and assistance services	12,646	12,821	12,821	11,331	(1,490)
25.2	Other services from non-Federal sources	15,054	15,262	15,262	15,262	0
25.3	Other goods and services from Federal sources	1,590	1,612	1,612	1,612	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,640	4,705	4,705	4,705	0
31	Equipment	1,592	1,615	1,615	1,615	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	54,317	55,071	55,071	53,581	(1,490)
42	Insurance claims and indemnities	1	1	1	1	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	165,786	168,086	169,952	166,972	(2,980)

Exhibit 13

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observers & Training	Pos./BA	158	54,430	158	44,130	0	(10,300)
	FTE/OBL	150	54,430	150	44,130	0	(10,300)

Northeast Fishery Observers (-$10,300, 0 FTE/0 Positions) – This request will reduce additional funding provided by Congress for the Northeast At-Sea Monitoring Program (ASM). An additional $10.3 million was provided to fully fund the cost of ASM in the New England groundfish fishery, including at-sea and shoreside infrastructure costs. NOAA covered all industry costs for at-sea monitoring and data processing in fishing year 2018 (May 1, 2018, through April 30, 2019), as well as retained funding for potential out-year sea day costs for the industry. Funds were also used to support at-sea monitor training and equipment, process samples, and continue development of electronic monitoring technologies that may reduce cost of or improve at-sea monitoring in the future.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Observers and Training
Program Change: Northeast Fishery Observers

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	11,677	11,643	11,986	11,986	0
11.3	Other than full-time permanent	56	56	58	58	0
11.5	Other personnel compensation	204	204	210	210	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	**11,937**	**11,903**	**12,254**	**12,254**	0
12.1	Civilian personnel benefits	4,238	4,225	4,349	4,349	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	473	471	471	471	0
22	Transportation of things	136	136	136	136	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	978	975	975	975	0
23.2	Rental payments to others	12	12	12	12	0
23.3	Communications, utilities, and misc. charges	384	383	383	383	0
24	Printing and reproduction	56	56	56	56	0
25.1	Advisory and assistance services	3,697	3,686	3,686	486	(3,200)
25.2	Other services from non-Federal sources	19,945	19,886	19,886	19,886	0
25.3	Other goods and services from Federal sources	75	74	74	74	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	889	886	886	886	0
31	Equipment	806	804	804	4	(800)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,489	10,458	10,458	4,158	(6,300)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	54,115	53,955	54,430	44,130	(10,300)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Mgt Programs & Services	Pos./BA	466	122,873	466	121,673	0	(1,200)
	FTE/OBL	444	122,873	444	121,673	0	(1,200)

Seafood Import Monitoring Program Implementation (-$1,200, 0 FTE/0 Positions) – This request will reduce additional funding provided by Congress for specific implementation requirements of the Seafood Import Monitoring Program (SIMP). However, this budget also requests a program increase for this program to hire enforcement officers and special agents to improve the detection of illegal, unreported, and unregulated (IUU) fishing and seafood fraud (see NMFS – 85).

The Seafood Import Monitoring Program establishes reporting and recordkeeping requirements for imports of priority seafood products to prevent illegal, unreported, and unregulated seafood from entering U.S. commerce. NOAA received $1.2 million to implement the expansion of SIMP to include shrimp and abalone. NOAA used the additional funds to develop the first-ever traceability program for U.S. aquacultured shrimp and abalone. This domestic program will help NMFS verify that U.S. aquacultured shrimp and abalone were lawfully produced by providing information to trace production to entry into U.S. commerce. Establishing comparable requirements for domestic aquacultured shrimp and abalone allows imports to be subject to SIMP requirements—further leveling the playing field for U.S. fishermen, aquaculture producers, and seafood producers who play by the rules. SIMP compliance for shrimp and abalone imports became effective on December 31, 2018. NOAA will continue the program through base funds.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries Management Programs and Services
Program Change: Seafood Import Monitoring Program Implementation

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	45,462	46,736	48,018	48,018	0
11.3	Other than full-time permanent	331	340	349	349	0
11.5	Other personnel compensation	846	869	893	893	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	46,638	47,945	49,260	49,260	0
12.1	Civilian personnel benefits	15,668	16,107	16,549	16,549	0
13	Benefits for former personnel	14	14	14	14	0
21	Travel and transportation of persons	2,905	2,987	2,987	2,987	0
22	Transportation of things	77	79	79	79	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	1,446	1,487	1,487	1,487	0
23.2	Rental payments to others	943	969	969	969	0
23.3	Communications, utilities, and misc. charges	493	507	507	507	0
24	Printing and reproduction	80	82	82	82	0
25.1	Advisory and assistance services	3,760	3,866	3,866	3,866	0
25.2	Other services from non-Federal sources	24,899	25,597	25,597	24,397	(1,200)
25.3	Other goods and services from Federal sources	1,950	2,005	2,005	2,005	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	691	710	710	710	0
31	Equipment	572	588	588	588	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,676	18,171	18,171	18,171	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	117,814	121,116	122,873	121,673	(1,200)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Mgt Programs & Services	Pos./BA	466	122,873	466	118,726	0	(4,147)
	FTE/OBL	444	122,873	444	118,726	0	(4,147)

National Catch Share Program (-$4,147, 0 FTE/0 Positions) – This request will reduce support for implementation of new catch share programs; data collection improvements for recently implemented programs; and, national-level coordination to improve efficiency in the development and implementation of catch share programs. NOAA will reduce its investment in specific tools, which support more consistent data collection and increase program efficiencies and performance. NOAA will continue to provide support for the 16 programs currently under catch share management.

"Catch share" programs are a market-based approach to fisheries management that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. Depending on the nature of the fishery, catch share programs can provide significant advantages including ensuring annual catch limits are not exceeded, reducing costs to produce seafood, market gluts, and bycatch, extending fishing seasons, and improving fishermen's safety. The National Catch Share Program implements improvements requested by the fishing industry and the Regional Councils. Types of improvements may include enhancing data collection efficiency and effectiveness, and accuracy and timeliness of analyses on the biological, ecological, and socio-economic aspects of catch share fisheries. Further, the Magnuson-Stevens Act requires that catch shares be regularly reviewed to ensure programs are meeting their stated goals and the goals of the Act.

	2020	2021	2022	2023	2024
Performance Measure: Number of key objectives met by catch share programs					
With Decrease	19	19	19	19	19
Without Decrease	19	20	20	20	20

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Fisheries Management Programs and Services
Program Change: National Catch Share Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	45,462	46,736	48,018	48,018	0
11.3	Other than full-time permanent	331	340	349	349	0
11.5	Other personnel compensation	846	869	893	893	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	46,639	47,945	49,260	49,260	0
12.1	Civilian personnel benefits	15,668	16,107	16,549	16,549	0
13	Benefits for former personnel	14	14	14	14	0
21	Travel and transportation of persons	2,905	2,987	2,987	2,987	0
22	Transportation of things	77	79	79	79	0
23	Rent, communications, and utilities		0	0	0	0
23.1	Rental payments to GSA	1,446	1,487	1,487	1,487	0
23.2	Rental payments to others	943	969	969	969	0
23.3	Communications, utilities, and misc. charges	493	507	507	507	0
24	Printing and reproduction	80	82	82	82	0
25.1	Advisory and assistance services	3,760	3,866	3,866	3,866	0
25.2	Other services from non-Federal sources	24,899	25,597	25,597	24,950	(647)
25.3	Other goods and services from Federal sources	1,950	2,005	2,005	2,005	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	691	710	710	710	0
31	Equipment	572	588	588	588	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	17,675	18,171	18,171	14,671	(3,500)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	117,814	121,116	122,873	118,726	(4,147)

Exhibit 13

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Aquaculture	Pos./BA	28	15,123	28	13,005	0	(2,118)
	FTE/Obl.	27	15,123	27	13,005	0	(2,118)

Aquaculture (-$2,118, 0 FTE/0 Positions) – This request reduces additional funding provided by Congress for aquaculture. NOAA will reduce resources to coordinate and streamline interagency marine aquaculture permitting requirements, including resources to resolve regulatory bottlenecks (e.g., environmental compliance, cooperation and coordination with state permitting authorities) relative to Federal approval of marine aquaculture permits. However, this budget includes investments in aquaculture science and streamlined permitting to enable a robust U.S. marine aquaculture industry.

NOAA will maintain priority research in support of management and industry development in marine aquaculture and continue to support regional marine aquaculture pilot projects in collaboration with industry and other partners. The funding will support science capacity, especially at the Northeast and Northwest Fishery Science Centers, to advance research addressing key industry bottlenecks (e.g., hatchery methods, disease, genetics and genomics, culture system engineering, feed development) and science to support permitting and management decisions (e.g., evaluating habitat and water quality impacts, risk of escapes).

There is substantial untapped potential to increase marine aquaculture production in the U.S. The U.S. has the second largest Exclusive Economic Zone (EEZ) in the world, yet ranks 16th in global aquaculture production.[15] NOAA will continue to support the growth of U.S.-sourced seafood by allowing NMFS to develop, test, and transfer the results of aquaculture research to the seafood industry in a manner that benefits the Nation's economy and creates new jobs. Domestic aquaculture provides an alternative livelihood for coastal communities, including fishermen, and year-round commerce in coastal regions that have limited economic opportunities. Supporting the development of sustainable marine aquaculture in the U.S. can also help meet the growing demand for seafood.

[15] National Marine Fisheries Service. 2018. Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017, p. viii. Available at: https://www.fisheries.noaa.gov/feature-story/ fisheries-united-states-2017.

Department of Commerce
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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

NOAA's aquaculture program supports Executive Order 13840: Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States. The program also supports the Department's strategic objective of increasing aquaculture production to bolster U.S. seafood security and improve our trade balance with other nations (Strategic Objective 2.1 of the Department of Commerce 2018-2022 Strategic Plan).

	2020	2021	2022	2023	2024
Performance Measure:					
Percent reduction in total permitting time					
With decrease	5	10	10	15	15
Without decrease	5	15	25	30	30
Number of research advances annually					
With decrease	20	20	20	20	20
Without decrease	29	29	29	29	29

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Aquaculture
Program Change: Aquaculture

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	$3,095	$3,062	3,155	3,155	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	42	42	43	43	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3.137	3.104	**3.199**	**3.199**	0
12.1	Civilian personnel benefits	945	934	962	962	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	263	260	260	260	0
22	Transportation of things	6	6	6	6	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	111	110	110	110	0
23.2	Rental payments to others	10	10	10	10	0
23.3	Communications, utilities, and misc. charges	6	6	6	6	0
24	Printing and reproduction	5	5	5	5	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	514	508	508	402	(106)
25.2	Other services from non-Federal sources	4,090	4,045	4,045	2,033	(2,012)
25.3	Other goods and services from Federal sources	27	27	27	27	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	550	544	544	544	0
31	Equipment	82	81	81	81	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	5,419	5,360	5,360	5,360	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	$15,165	$15,000	$15,123	$13,005	($2,118)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Salmon Management Activities	Pos./BA	33	37,118	33	31,598	0	(5,520)
	FTE/OBL	31	37,118	31	31,598	0	(5,520)

Genetic Stock Identification and Pacific Salmon Treaty (-$5,520, 0 FTE/0 Positions) – This request reduces additional funding provided by Congress for Mitchell Act hatcheries and implementation of the Pacific Salmon Treaty. NOAA will reduce additional funding for genetic stock identification by $1.1 million within the Mitchell Act hatchery program. Genetic stock identification research includes the collection, analysis, and testing of methods that rely on genetics-based data to identify and track the location of Federally protected stocks in the wild. In order to identify risks and develop recovery actions for Pacific salmon, resource managers typically focus on specific stocks of fish. However, stock-specific management actions can be difficult to implement since groups of fish are often mixtures of stocks from different areas or with different behaviors. This presents a challenge for decision-makers seeking to balance fishing opportunities with resource conservation when abundant stocks intermingle with weaker stocks. Genetic stock identification programs improve salmon management and avoid harvest of weak salmon stocks by identifying the movement and location of individual stocks. NMFS will continue to support the operations and maintenance of Columbia River hatcheries at $19.9 million.

In addition, NOAA will reduce additional funding provided for Pacific Salmon Treaty implementation by $4.4 million for a total of $11.2 million. This funding supports our treaty obligations by providing personnel support to the Pacific Salmon Commission's technical committees and through a broad range of salmon stock assessment and fishery monitoring programs which produce information required to implement Pacific Salmon Treaty provisions. The FY 2020 budget request does not include additional funding for the recently negotiated Pacific Salmon Agreement. Resource requirements for this agreement are still being reviewed and analyzed.

Projects funded under the Salmon Management Activities line are conducted for the conservation, development, and enhancement of salmon. This funding supports research and management activities associated with salmon and is composed of three main activities: the Mitchell Act–Columbia River hatcheries, Pacific Salmon Treaty, and Chinook salmon research and management. The Mitchell Act component supports the operations and maintenance of Columbia River hatcheries and construction of fish passage facilities to mitigate the loss of fish production due to hydropower dams.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Salmon Management Activities
Program Change: Genetic Stock Identification and Pacific Salmon Treaty

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	1,517	1,571	1,659	1,659	0
11.3	Other than full-time permanent	11	11	12	12	0
.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	1,528	1,582	1,671	1,671	0
12.1	Civilian personnel benefits	500	517	546	546	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	26	27	27	27	0
22	Transportation of things	7	8	8	8	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Communications, utilities, and misc. charges	3	3	3	3	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	145	150	150	150	0
25.2	Other services from non-Federal sources	1,001	1,035	1,035	1,035	0
25.3	Other goods and services from Federal sources	6,112	6,321	6,321	5,199	(1,122)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	177	183	183	183	0
31	Equipment	335	346	346	346	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	25,939	26,828	26,828	22,430	(4,398)
42	Insurance claims and indemnities	0	.0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	35,773	37,000	37,118	31,598	(5,520)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Regional Councils and Fisheries Commissions	Pos./BA	13	41,455	13	37,792	0	(3,663)
	FTE/OBL	12	41,455	12	37,792	0	(3,663)

Interstate Fishery Management Commissions (-$3,663, 0 FTE/0 Positions) – This request will reduce additional funding provided by Congress for the three Interstate Marine Fisheries Management Commissions. The FY 2020 budget request proposes a total of $8.6 million for Interstate Marine Fisheries Management Commissions, International Fish Commissions, and the Atlantic Cooperative Management. The three Interstate Commissions work with NOAA on cross-state issues related to shared fishery resources.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Regional Councils and Fisheries Commissions
Program Change: Interstate Fishery Management Commissions

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	955	1,071	1,099	1,099	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	6	7	7	7	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	961	1,078	1,106	1,106	0
12.1	Civilian personnel benefits	252	283	290	290	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	24	27	27	27	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	18	21	21	21	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Communications, utilities, and misc. charges	3	3	3	3	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	111	125	125	125	0
25.3	Other goods and services from Federal sources	416	467	467	467	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	22	24	24	24	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	33,978	38,147	39,392	35,729	(3,663)
42	Insurance claims and indemnities	0	.0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	35,785	40,175	41,455	37,792	(3,663)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Interjurisdictional Fisheries Grants	Pos./BA	2	3,365	0	0	(2)	(3,365)
	FTE/OBL	2	3,365	0	0	(2)	(3,365)

Interjurisdictional Fisheries Grants (-$3,365, -2 FTE/-2 Positions) – This request will eliminate interjurisdictional fisheries grants. These grants are non-competitive, formula-based, and provide support to 38 states and territories to aid in the state/Federal management of U.S. fisheries. The purposes of the Interjurisdictional Fisheries Act of 1986 (IFA) are to promote state activities in the management of interjurisdictional resources; the management of interjurisdictional fisheries resources throughout their range of habitat; and, research used to inform ecosystem and interspecies approaches to the conservation and management of interjurisdictional fishery resources.

The Interjurisdictional Fisheries Grant Program is authorized under the IFA. Projects supported by these grants respond to fishery research needs under the Magnuson-Stevens Act, Atlantic Coastal Fisheries Cooperative Management Act, Great Lakes Fisheries Commission's Joint Strategic Plan, and a variety of multi-jurisdictional fisheries management planning programs. Many of the efforts are long-term research and data collection. This work helps to improve the quantity and quality of fisheries information used in interstate and Federal fishery management programs carried out in U.S. waters. Examples of projects funded through these grants include research on: blue crab spawning in Florida; American lobster settlement in Maine; and, fishery catch statistics, stock status, and management actions for state of Alaska managed fisheries including sablefish, lingcod, black and blue rockfish, and Pacific cod.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Interjurisdictional Fisheries Grants
Program Change: Interjurisdictional Fisheries Grants

Title		Grade	Number	Annual Salary	Total Salaries
Grants Management Specialist		ZA-4	(2)	93,624	(187,248)
Total			(2)		(187,248)
Less lapse	0.00%		0		0
Total full-time permanent (FTE)			(2)		(187,248)
Total					(187,248)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(2)
Other than full-time permanent	0
Total	(2)
Authorized Positions:	
Full-time permanent	(2)
Other than full-time permanent	0
Total	(2)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Fisheries Science and Management
Subactivity: Interjurisdictional Fisheries Grants
Program Change: Interjurisdictional Fisheries Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	28	187	187	0	(187)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	28	187	187	0	(187)
12.1	Civilian personnel benefits	8	56	56	0	(56)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Communications, utilities, and misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	1	1	1	0	(1)
25.2	Other services from non-Federal sources	83	87	87	0	(87)
25.3	Other goods and services from Federal sources	94	98	98	0	(98)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1	1	1	0	(1)
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,015	2,935	2,935	0	(2,935)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	3,230	3,365	3,365	0	(3,365)

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Enforcement

Goal Statement

NOAA's Office of Law Enforcement (OLE) strengthens domestic commerce by enforcing NOAA's natural resource protection laws and promoting compliance with Federal regulations to conserve and protect our Nation's living marine resources and their natural habitat. The activities within this activity support the Department of Commerce's Strategic Plan: Strategic Objective 2.3 Strengthen U.S. Commerce and the U.S. Industrial Base.

Base Program

OLE protects and monitors the world's largest EEZ including 13 National Marine Sanctuaries and five Marine National Monuments (Figure 1), and is the only conservation enforcement program (Federal or state) exclusively dedicated to Federal fisheries and marine resource enforcement. The office enforces more than 35 Federal statutes and international agreements related to living marine resources in order to protect marine fisheries, wildlife, and habitat and ensure these global resources are available for future generations to use and enjoy (Figure 2). OLE's work supports NMFS' core mission mandates of maximizing productivity of sustainable fisheries and fishing communities; and the protection, recovery, and conservation of protected species. OLE provides direct support for enforcement activities in the NMFS headquarters' Offices of Sustainable Fisheries and Protected Resources, NMFS Regional Offices, and the National Ocean Service's (NOS) Office of National Marine Sanctuaries. NOAA's Enforcement

Figure 1. NOAA Office of Law Enforcement's Jurisdiction

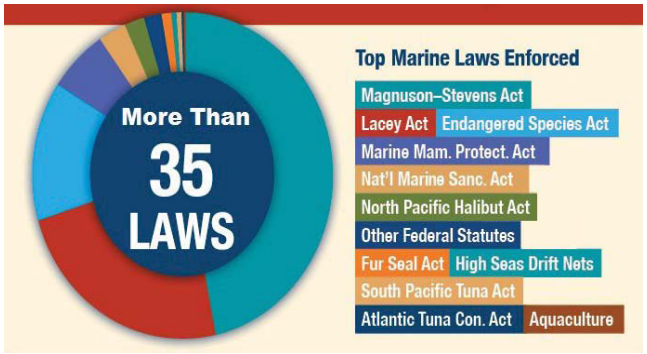

Figure 2. NOAA Enforcement Efforts by Law

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Program supports critical collaborations and leverages 28 Joint Enforcement Agreements (JEAs) with 27 coastal states and territories, and partnerships with other Federal agencies such as the U.S. Coast Guard. OLE refers enforcement cases that document violations to NOAA's Office of General Counsel or the U.S. Department of Justice for review and potential prosecution under their jurisdiction.

NOAA cannot meet the mandate to end overfishing without OLE's efforts. These efforts ensure that the millions of people who enjoy and rely on these marine resources understand and comply with the regulations necessary to ensure their sustainability and allow fair competition now and for future generations. OLE supports two objectives:

(1) Enforce laws and regulations that govern:
    a. commercial fisheries,
    b. international and interstate commerce in marine resources, and
    c. human interactions with marine mammals and threatened and endangered species.
(2) Protect resources within designated sanctuaries, marine monuments, and protected areas.

To address these mission requirements, OLE implements four primary methods:

(1) Traditional enforcement such as investigations and patrols,
(2) Partnerships with state and Federal agencies,
(3) Technological tools such as Vessel Monitoring Systems, and
(4) Outreach and education strategies designed to increase and enhance voluntary compliance with environmental laws and regulations.

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Statement of Operating Objectives

Schedule and Milestones:
OLE measures outputs in terms of incidents initiated, which includes total patrols, investigations, and compliance assistance (in the form of formal outreach and education conducted). In FY 2017 OLE reported over 8,900 incidents related to patrols and investigations of Federal laws and regulations pertaining to Protected Resources (PR), Sustainable Fisheries (SF), Illegal, Unreported, Unregulated (IUU), and other applicable Federal laws and regulations, including fraud and/or trafficking of illicit marine wildlife and resources.

During FY 2020, OLE plans to:
- Continue to advance enforcement and compliance assistance efforts in support of NOAA's Office of Law Enforcement Operational Priorities
- Finalize the hiring, training and deployment of enforcement personnel at strategic Ports of Entry
- Ensure consistent international IUU enforcement training and technical assistance

Deliverables:
FY 2020–2024
- Execution of 28 Joint Enforcement Agreements annually with the Cooperative Enforcement Program's state and U.S. territory partners
- Monitoring of and compliance assistance to approximately 4,450 vessels under the VMS requirements of 23 FMPs, two international convention areas, and the Papahanaumokuakea National Monument
- Review of progress toward current and determination of next set of strategic five-year national and regional Operational Enforcement Priorities
- Advancement of IUU training course for NOAA and other enforcement partners based on the FY 2016 pilot

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Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount
Enforcement	Pos/BA	195	68,633	244	69,796	244	70,758
	FTE/OBL	194	69,134	232	69,796	232	70,758
Total Enforcement	Pos/BA	195	68,633	244	69,796	244	70,758
	FTE/OBL	194	69,134	232	69,796	232	70,758

Enforcement and Surveillance:
NOAA's Enforcement Program ensures compliance with marine natural resource laws using enforcement tools designed to encourage people to meet their legal obligations, both domestically and internationally. Special agents and enforcement officers work to deter, detect, investigate, and document any violations of Federal laws and regulations. NOAA's approach to fisheries enforcement emphasizes compliance assistance. OLE assists regulated parties in understanding and complying with fishery regulations through contact during monitoring and inspections, and increases public awareness and understanding of enforcement goals and objectives through participation in community meetings, trade shows, and on-the-dock informational visits. Personal interactions between enforcement officers and the community have proven effective in maintaining dialog on often complex regulations, and allow NOAA's investigative efforts and subsequent prosecution to focus on cases that go beyond misunderstandings and/or clerical errors.

This program responds to inquiries and requests for assistance from a variety of industry and public stakeholders, covering a broad range of issues related to fisheries, marine mammals, and endangered and other protected marine species. The capabilities associated with deterring violations and investigating egregious violations of laws and regulation are critical elements in NOAA's enforcement approach. Most commercial and recreational fishermen comply with conservation measures, and OLE's role is to ensure fair competition and a level playing field. In recent years, additional investments in the Enforcement Program have been made to strengthen NOAA's efforts to detect and deter Illegal, Unreported and Unregulated (IUU) fishing and enforce restrictions on imports of illegally-harvested and improperly-documented seafood.

Cooperative Agreements with States:
The Cooperative Enforcement Program leverages the resources of coastal state and U.S. territorial marine conservation law enforcement agencies to provide direct support for the Federal enforcement mission. These partners execute Joint Enforcement Agreements (JEA) with NOAA to support Federal enforcement efforts near shore and at sea, as well as provide land-based monitoring and inspection activities. Since 2001, OLE has capitalized on this approach as a way to address challenges associated with the geographic jurisdiction, the breadth of laws and regulations within NOAA's stewardship responsibilities, the amount of regulated commercial activity (fishing and both domestic and international trade), and the amount of recreational use of the marine environment. This cooperative program allows OLE to concentrate on the investigation and resolution of more serious violations by integrating monitoring and inspection activities for Federal requirements with the work of state/territorial enforcement partners and the U.S. Coast Guard. In FY 2018, JEA partnerships committed to over 124,000 base hours of labor, increasing the number of hours dedicated to Federal marine conservation enforcement activities above what NOAA could have accomplished alone.

Vessel Monitoring System:
The Vessel Monitoring System (VMS) is a satellite-based technology program for remote monitoring of fishing vessels at sea. This communications system remotely reports vessel positions and provides an infrastructure for the communication of electronic monitoring data. The program supports a growing number of regulations that require many fishing vessels to report in the VMS, and it allows OLE to monitor compliance and track fishing vessels over vast expanses. The VMS data serve as valuable evidence and are vital to NMFS' scientific community and fisheries managers. Efficiencies realized by this electronic monitoring method and the data it produces are a significant advance to NOAA's at-sea monitoring efforts. VMS is a cost-effective way to help enforce protected areas, fishing quotas, actual landings, and several Federal natural resource, environmental, and species conservation laws. Prior to VMS implementation, the only methods used to monitor protected areas were surface and air patrols, which are costly and do not provide the round-the-clock coverage provided by VMS.

Implementation of the High Seas Driftnet Fisheries Enforcement Act:
The High Seas Driftnet Fisheries Enforcement Act sets U.S. policy to enforce the United Nations' worldwide moratorium on large-scale driftnet fishing beyond the EEZ of any nation. Renegade large-scale high seas driftnet fishing indiscriminately kills massive amounts of fish and other marine life such as whales and turtles with enormous nets suspended for miles in open water. The practice is universally condemned because it is a significant threat to ocean ecosystems and to the food and economic security of nations that rely on fishery resources. The Act provides for denial of port privileges to and import sanctions against nations whose vessels and/or nationals are determined to be conducting illegal driftnet activities and who do not take corrective action. OLE conducts investigation and enforcement required to prosecute and deter these illegal actions. Additionally, NOAA participates in

scientific research as part of a multi-national cooperative marine ecosystem research program on driftnet-affected species. The results of this research reduce uncertainty in population assessments for these species and inform related fishery management and enforcement decisions.

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $16,686 and increase of 7 FTE/9 positions in FY 2020 program changes for the Enforcement Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
	Pos./BA	244	70,758	253	72,351	9	1,593
Enforcement	FTE/OBL	232	70,758	239	72,351	7	1,593

Enforcement and Seafood Import Monitoring (+$1,593, 7 FTE/9 Positions) – This request will improve the detection of illegal, unreported, and unregulated (IUU) fishing and seafood fraud. This funding builds upon the existing funds for IUU enforcement and the Seafood Import Monitoring Program (SIMP) and will create and expand partnerships with other Federal agencies, as well as state and local governments. Specifically, NMFS will hire enforcement officers and special agents to implement the IUU Task Force recommendations to enforce IUU fishing seafood fraud and traceability, and wildlife trafficking restrictions. Enforcement officers will be placed in areas of highest risk identified using a list of top Ports of Entry. Special agents will investigate suspected illegal activities identified by enforcement officers and from the SIMP. This program established reporting and recordkeeping requirements for imports of certain seafood products to prevent illegal, unreported, and unregulated and/or misrepresented seafood from entering U.S. commerce. NMFS enforcement evaluate and investigate referrals from SIMP auditors, fraudulent import documentation, and “spot checks” of imports at Ports of Entry. The additional funding will cover labor and benefits of one Office of General Counsel Enforcement Section (OGCES) attorney. With a potential increase in regional case referrals, additional staff will support timely case processing.

Funding will also be used to conduct forensics analysis, including using molecular genetic tools to identify biological material taken from species or populations that are endangered or protected, and products subject to criminal mislabeling recovered during criminal investigations. NMFS will conduct outreach to inform stakeholders, supply chain managers, and consumers, as well as further engage with seafood producers, about the conservation and economic benefits, and understanding the origins of seafood, management, and tracking.

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(Dollar amounts in thousands)

Schedule and Milestones

- Hire, train, equip, and deploy three special agents and six enforcement officers (FY 2020-2021)
- Enhance analytical analysis of incoming product based on information collected through patrol operations in major Ports of Entry (FY 2020-2022)
- Enhance forensic analysis capabilities for imported seafood to help ensure and further promote fair trade (FY 2020-2024)

Deliverables

- Increased port investigations and interdiction of suspected illegal imports involving SIMP, IUU, and wildlife trafficking and seafood fraud
- Implement additional field forensic testing capabilities dependent on available science and technology

	2020	2021	2022	2023	2024
Performance Measure:					
Investigations*					
With Increase	7,230	7,672	7,672	7,672	7,672
Without Increase	7,230	7,230	7,230	7,230	7,230
Patrols**					
With Increase	1,240	1,600	1,600	1,600	1,600
Without Increase	1,240	1,240	1,240	1,240	1,240

* Total number of investigations initiated. With Increase, both enforcement officers and special agents will be in mandatory training for their first year (FY 2020).

** Total number of patrols conducted in a fiscal year. Patrols are conducted to support NMFS and OLE priorities of sustainable fisheries, protected resources, IUU, Port State Measures, and wildlife trafficking by effectively enforcing Federal laws and regulations. With Increase, both enforcement officers and special agents will be in mandatory training for their first year (FY 2020).

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PRORAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Enforcement
Subactivity: Enforcement
Program Change: Enforcement and Seafood Import Monitoring

Title		Grade	Number	Annual Salary	Total Salaries
Special Agent		ZA-III	1	70,111	70,111
Special Agent		ZA-III	1	65,075	65,075
Special Agent		ZA-III	1	69,283	69,283
Enforcement Officer		ZA-III	2	65,075	130,150
Enforcement Officer		ZA-III	2	70,111	140,222
Enforcement Officer		ZA-III	2	69,283	138,566
Total			9		613,407
Less lapse	25.00%		(2)		(153,352)
Total full-time permanent (FTE)			7		460,055
2020 Pay Adjustment (0%)	0.00%				0
Total					460,055

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	7
Other than full-time permanent	0
Total	7
Authorized Positions:	
Full-time permanent	9
Other than full-time permanent	0
Total	9

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PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Enforcement
Subactivity: Enforcement
Program Change: Enforcement and Seafood Import Monitoring

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	20,582	20,781	21,377	21,837	460
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,366	2,388	2,457	2,573	116
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	22,948	23,169	23,834	24,410	576
12.1	Civilian personnel benefits	10,254	10,352	10,649	10,879	230
13	Benefits for former personnel	116	117	117	117	0
21	Travel and transportation of persons	804	812	812	1,012	200
22	Transportation of things	761	768	768	788	20
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,253	2,274	2,274	2,274	0
23.2	Rental payments to others	459	463	463	463	0
23.3	Communications, utilities, and misc. charges	1,099	1,110	1,110	1,140	30
24	Printing and reproduction	52	53	53	53	0
25.1	Advisory and assistance services	226	228	228	228	0
25.2	Other services from non-Federal sources	24,859	25,097	25,097	25,334	237
25.3	Other goods and services from Federal sources	928	937	937	937	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,030	1,040	1,040	1,040	0
31	Equipment	384	387	387	687	300
32	Lands and structures	208	210	210	210	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,753	2,779	2,779	2,779	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	69,134	69,796	70,758	72,351	1,593

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
	Pos./BA	244	70,758	244	52,479	0	(18,279)
Enforcement	FTE/OBL	232	70,758	232	52,479	0	(18,279)

Cooperative Enforcement Program (-$18,279, 0 FTE/0 Positions) – This request will eliminate funding to support the Cooperative Enforcement Program (CEP). In FY 2020, NOAA will not be able to implement Joint Enforcement Agreements (JEA) with 27 state and U.S. territory partners. These JEAs provide funds to state and U.S. territorial law enforcement agencies to perform enforcement services in support of Federal regulations. The CEP leverages the resources of coastal state and U.S. territorial marine conservation law enforcement agencies to provide direct support for the Federal enforcement mission. These partners execute JEAs with NOAA to support Federal enforcement efforts near shore and at sea, as well as provide land-based monitoring and inspection activities. Funding for each partner is determined by a funding matrix that uses state-specific data in three general categories: base need that includes data concerning the JEA partner's capacity, enforcement effort, and targeted marine activities; NMFS priorities need; and past performance.

Since 2001, OLE has capitalized on this approach as a way to address challenges associated with geographic jurisdiction, the breadth of laws and regulations within NOAA's stewardship responsibilities, the amount of regulated commercial activity (fishing and both domestic and international trade), and the amount of recreational use of the marine environment. This cooperative program allows OLE to concentrate on the investigation and resolution of more serious violations by integrating monitoring and inspection activities for Federal requirements with the work of state/territorial enforcement partners and the U.S. Coast Guard. In FY 2018, JEA partnerships committed to over 124,000 base hours of labor, significantly increasing the number of hours dedicated to Federal marine conservation enforcement above what NOAA could have accomplished alone.

OLE will continue its dedication to Federal fisheries and marine resource enforcement through traditional enforcement such as investigations and patrols, technological tools such as the Vessel Monitoring System, and outreach and education strategies designed to increase and enhance voluntary compliance with environmental laws and regulations. In addition, NOAA has focused in recent years to ensure fair competition and a level playing field by strengthening efforts to detect and deter Illegal, Unreported and Unregulated (IUU) fishing and enforce restrictions on imports of illegally harvested and improperly documented seafood.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure					
Base hours of labor from JEAs*					
With Decrease	124,908	0	0	0	0
Without Decrease	124,908	124,908	124,908	124,908	124,908

* Note: there is a one year lag in funding and implementation, therefore an elimination of funding in FY 2020 will be reflected in FY 2021 hours.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Enforcement
Subactivity: Enforcement
Program Change: Cooperative Enforcement Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	20,582	20,781	21,377	21,377	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,366	2,388	2,457	2,457	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	22,948	23,169	23,834	23,834	0
12.1	Civilian personnel benefits	10,254	10,352	10,649	10,649	0
13	Benefits for former personnel	116	117	117	117	0
21	Travel and transportation of persons	804	812	812	812	0
22	Transportation of things	761	768	768	768	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	2,253	2,274	2,274	2,274	0
23.2	Rental payments to others	459	463	463	463	0
23.3	Communications, utilities, and misc. charges	1,099	1,110	1,110	1,110	0
24	Printing and reproduction	52	53	53	53	0
25.1	Advisory and assistance services	226	228	228	228	0
25.2	Other services from non-Federal sources	24,859	25,097	25,097	6,818	(18,279)
25.3	Other goods and services from Federal sources	928	937	937	937	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,030	1,040	1,040	1,040	0
31	Equipment	384	387	387	387	0
32	Lands and structures	208	210	210	210	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,753	2,779	2,779	2,779	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	69,134	69,796	70,758	52,479	(18,279)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Habitat Conservation and Restoration

Goal Statement

The Office of Habitat Conservation protects and restores habitat to sustain fisheries, recover protected species, and maintain resilient coastal ecosystems and communities. The activities within this activity support the Department of Commerce's Strategic Plan: Strategic Objective 2.3 Strengthen U.S. Commerce and the U.S. Industrial Base.

Base Program

Activities within the Habitat Conservation and Restoration activity include protection and restoration of habitat to sustain commercial and recreational fisheries, recover protected species, and maintain resilient coastal ecosystems and communities, under the following primary mandates: Magnuson-Stevens Act (MSA), Federal Power Act, Energy Policy Act of 2005; Endangered Species Act; Oil Pollution Act; and Comprehensive Environmental Response, Compensation and Liability Act.

Healthy habitat provides significant and essential ecosystem, community, and economic benefits. Habitat is the foundation for resilient fisheries and fishing-based communities and industries, as well as key to supporting and recovering endangered and threatened species. In 2016, the U.S. commercial and recreational saltwater fishing industries generated more than $212 billion in sales and supported 1.7 million jobs.[16]

Coastal communities rely on healthy habitat for a wide variety of additional socio-economic needs including, recreation, tourism, and as natural infrastructure that protects life and property by reducing effects of storm damage, erosion, and coastal flooding. The Nation's ocean and coastal resources annually provide non-market value (e.g., storm surge protection, wildlife viewing, beach visits, snorkeling) of over $100 billion.[17] Habitat conservation projects often also result in improved infrastructure (e.g., new or modified bridges, culverts, agricultural levees), enhance public safety (e.g., removal of obsolete dams that have become safety hazards), and support a diversified coastal economy.
However, we are facing continued widespread loss and deterioration of vital habitats for managed fisheries, as well as threatened

[16] National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-187. Available at: https://www.fisheries.noaa.gov/content/fisheries-economics-united-states-2016
[17] The National Ocean Economics Program and the Center for the Blue Economy. 2014. State of the U.S. Ocean and Coastal Economies. 84p. Available at: http://www.oceaneconomics.org/Download/.

and endangered species. This substantial habitat loss is also increasing risks to communities and the economy from coastal storms, droughts, and other extreme weather. For example, we are losing coastal wetlands—prime nurseries for many species—at the rate of about 80,000 acres per year. This rate of loss is 20,000 more acres per year than was lost during the 6-year period of 1998–2004.[18] More than 60 percent of coastal rivers and bays are moderately to severely degraded by nutrient runoff,[19] and there are over six million barriers to fish passage within the rivers of the United States.[20] In addition, each year as many as 150 oil spills and hazardous substance releases[21] occur across the Nation.

***NOAA Habitat Blueprint*:** NOAA developed the Habitat Blueprint principles to increase the effectiveness of its habitat conservation efforts for the benefit of fisheries, coastal and marine life, and the coastal communities and economies they support. These principles emphasize strengthening internal and external partnerships, implementing habitat conservation for multiple benefits, and focusing work where it can have the greatest impact. In ten Habitat Focus Areas (HFA) across the country, we are bringing together a wide variety of partners to leverage resources and make measurable progress toward discrete habitat-related objectives. (https://www.habitatblueprint.noaa.gov). To date, NOAA has directly invested over $8 million in multi-year partnership agreements for projects that support HFA objectives. In response, other sources (including other NOAA programs and external partners) have invested at least $69.5 million to advance HFA objectives.

Statement of Operating Objectives

Schedules and Milestones:

FY 2020–2024

- Develop management options for protecting deep-sea corals in partnership with the Regional Fishery Management Councils and National Marine Sanctuaries

[18] T.E. Dahl and S.M. Stedman. 2013. Status and trends of wetlands in the coastal watersheds of the Conterminous United States 2004 to 2009. U.S. Department of the Interior, Fish and Wildlife Service and National Oceanic and Atmospheric Administration, National Marine Fisheries Service. (46 p.). Available at: https://coast.noaa.gov/digitalcoast/training/wetland-trends.html.

[19] Howarth, Robert, Donald Anderson, James Cloern, Chris Elfring, Charles Hopkinson, Brian Lapointe, Tom Malone, Nancy Marcus, Karen McGlathery, Andrew Sharpley, and Dan Walker. 2000. Nutrient Pollution of Coastal Rivers, Bays, and Seas. *Issues in Ecology* (7). Available at: http://www.esa.org/esa/science/issues/.

[20] U.S. Fish and Wildlife Service. 2011. National Fish Passage Program Annual Report and Future Outlook. Available at: https://www.fws.gov/fisheries/fish-passage.html.

[21] Oil Spills. May 2017. U.S. Dept. of Commerce, NOAA, Damage Assessment, Remediation, and Restoration Program. Retrieved from https://darrp.noaa.gov/oil-spills.

- Participate in the re-licensing process for an estimated 125 hydroelectric projects
- Identify and protect essential fish habitat through consultations and partnerships
- Develop restoration plans, conduct habitat assessments, and implement priority restoration projects critical for NOAA trust resources
- Establish partnerships and leverage resources in selected Habitat Focus Areas under the NOAA Habitat Blueprint framework
- Contribute to major ecosystem restoration efforts, including Chesapeake Bay, Puget Sound, Gulf of Mexico, Great Lakes, and San Francisco Bay/Delta

Deliverables:

FY 2020–2024

- Accurate deep-sea coral habitat distribution maps that allow managers to better protect these biologically rich ecosystems
- Technical guidance and assistance provided to NOAA partners, Federal action agencies, and resource decision-makers to achieve protection and restoration of NOAA trust resources
- Restoration plans reviewed and approved through NRDA public process
- Development of maps and habitat assessments annually to support oyster restoration in the Chesapeake Bay
- Acres of habitat restored for ocean, coastal, and Great Lakes resources
- Stream miles made accessible for ocean, coastal, and Great Lakes resources

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount
Habitat Conservation	Pos/BA	167	53,044	167	56,384	167	57,125
and Restoration	FTE/OBL	166	53,420	158	56,384	158	57,125
Total Habitat Conservation	Pos/BA	167	53,044	167	56,384	167	57,125
and Restoration	FTE/OBL	166	53,420	158	56,384	158	57,125

Sustainable Habitat Management

NOAA protects healthy habitats from loss and degradation. NMFS conducts thousands of consultations each year with Federal agencies whose proposed actions may affect Essential Fish Habitat (EFH) for Federally-managed species, so actions can be taken to avoid, minimize, or compensate for marine, coastal, and riverine habitat impacts. For example, proposed actions can include construction projects, applications for dredging and filling wetlands, waste discharge permits, and renewable energy proposals. Our unique role and responsibility under the Federal Power Act also requires fish passage at hydropower dams licensed by the Federal Energy Regulatory Commission (FERC). In addition, NOAA identifies and maps locations of deep-sea corals in coordination with other Federal agencies and research institutions through its Deep Sea Coral Research and Technology Program, authorized under the MSA.

Each year, NOAA protects more than 100,000 acres of Essential Fish Habitat from non-fishing impacts. Since 2004, we have opened passage along more than 1,570 miles of streams and rivers that had been blocked by hydropower dams, improving fish passage for Federally listed species (such as Pacific and Atlantic salmon), numerous managed fish, and species such as river herring that serve as important food sources for offshore commercial and recreational fish stocks. Since 2011, NOAA has mapped more than 615,000 square kilometers of seafloor through deep-sea coral habitat surveys.

Fisheries Habitat Restoration

The NOAA Restoration Center (RC) works closely with partners to restore injured, degraded, or lost priority coastal, marine, and riverine habitat nationwide. Every year, NOAA responds to as many as 150 oil spills and hazardous substance releases across the Nation through our Damage Assessment Remediation and Restoration Program (DARRP). The NOAA RC leads the restoration planning and implementation for these events (most notably the Deepwater Horizon (DWH) oil spill) as part of NOAA's Natural

Resource Damage Assess (NRDA) and Restoration Trustee responsibilities under OPA and CERCLA. The Community-based Restoration Program (CRP) provides technical and financial assistance for the implementation of community-driven habitat restoration. Habitat restoration projects are selected through a competitive solicitation process that leverages substantial investments from partners.

In addition to improving habitat for managed fishery and protected resources, restoration projects support a variety of job types in local communities—including construction workers and project managers working directly onsite—as well as other businesses and professionals who design, engineer, provide materials for, and monitor projects. And, unlike other economic sectors, restoration jobs cannot be outsourced to far-off places. In an Oregon-based study, an average of $0.80 of every $1.00 spent on a restoration project stayed in the county where the project was located, and $0.90 stayed in the state.[22]

Chesapeake Bay Protection and Restoration

The NOAA Chesapeake Bay Office (NCBO) conducts work in fisheries, observations, education, and oyster restoration in support of the 2014 Chesapeake Bay Agreement. Chesapeake Bay fish and shellfish play a critical role in the culture, economy, and ecology of the region. The office promotes ecosystem-based management through modeling, monitoring, and research to identify the most important factors influencing Chesapeake Bay fisheries. NCBO collects and integrates information about the Bay from buoys, satellites, shipboard mapping technologies, and other sources. These observations improve fisheries and protected resource management, weather forecasts, on-the-water safety, and public health. By supporting learning in classrooms and communities, NCBO also improves knowledge and understanding of the Chesapeake Bay ecosystem.

Oysters were once a major economic driver of the Chesapeake Bay region. Today, at levels of less than 1 percent of their historic populations, they still provide significant commercial and ecological benefits. NCBO is working closely with state, Federal, academic, and not-for-profit partners to restore native oysters in ten tributaries of the Chesapeake Bay. As part of NOAA's Habitat Blueprint, NCBO leads the Choptank River Watershed HFA. Recent successes in large-scale oyster restoration in Harris Creek, a tributary within the Choptank River HFA, are being replicated in four neighboring Maryland tributaries, as well as five tributaries in Virginia waters. In addition to increasing oyster populations, these efforts are also improving water quality and restoring Essential Fish Habitat. NCBO fisheries research and monitoring allows the agency to track progress associated with this work and ensure the efficient and effective use of resources. Related education and outreach efforts have built community support for the restoration projects to ensure they are self-sustaining, continue to grow, and remain healthy into the future.

[22] Hibbard, M. and S. Lurie. 2006. "Some Community Socio-Economic Benefits of Watershed Councils: A Case Study From Oregon." Journal of Environmental Planning and Management 49: 891-908. *In Oregon's Restoration Economy.* Available at: http://www.tandfonline.com/doi/abs/10.1080/09640560600946974.

Department of Commerce
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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $19,250 and 0 FTE/0 positions in FY 2020 program changes for the Habitat Conservation and Restoration Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Habitat Conservation and Restoration	Pos./BA	167	57,125	167	54,125	0	(3,000)
	FTE/OBL	158	57,125	158	54,125	0	(3,000)

Essential Fish Habitat Consultations (-$3,000, 0 FTE/0 Positions) – This request will reduce the additional funding provided by Congress for Essential Fish Habitat (EFH) consultations. NMFS will continue to perform EFH consultations with available resources.

Fish require healthy surroundings to survive and reproduce. EFH includes all types of aquatic habitat - wetlands, coral reefs, seagrasses, and rivers - where fish spawn, breed, feed, or grow to maturity. EFH is described and designated by each of the Regional Fishery Management Councils in their development of Fishery Management Plans for Federally-managed fish species. When a Federal agency authorizes, funds, or undertakes an action that may adversely affect EFH, they must consult with NMFS on that action, as required by Section 305(b) of the Magnuson-Stevens Act. NOAA works with Federal partners to guide coastal development in a manner that protects vital fish habitat without hindering economic development opportunities, including critical transportation and infrastructure improvements.

NOAA provides early coordination and technical assistance, reviews permits, evaluates potential adverse effects to EFH, develops recommendations to avoid or minimize those effects, and engages in post-project implementation monitoring and adaptive management to ensure project improvements are realized. Through this process, the protection and restoration of EFH has helped maintain productive fisheries and rebuild depleted stocks in the U.S. With the additional funds provided in FY 2019, NMFS expects to make progress in expediting and completing consultations requests. At the FY 2020 request level, NMFS will continue to complete consultations but would only be able to review approximately 50 percent of the EFH consultation requests received, which is the same as our historical rate.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Habitat Conservation and Restoration
Subactivity: Habitat Conservation and Restoration
Program Change: EFH Consultations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	19,465	20,546	21,090	21,090	0
11.3	Other than full-time permanent	267	282	289	289	0
11.5	Other personnel compensation	304	321	330	330	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,036	21,149	21,709	21,709	0
12.1	Civilian personnel benefits	6,467	6,826	7,007	7.007	0
13	Benefits for former personnel	6	6	6	6	0
21	Travel and transportation of persons	749	790	790	790	0
22	Transportation of things	156	164	164	164	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	566	598	598	598	0
23.2	Rental payments to others	271	286	286	286	0
23.3	Communications, utilities, and misc. charges	203	214	214	214	0
24	Printing and reproduction	36	38	38	38	0
25	Other contractual services	0	0	0	0	0
25.1	Advisory and assistance services	538	568	568	568	0
25.2	Other services from non-Federal sources	8,107	9,411	9,411	6,411	(3,000)
25.3	Other goods and services from Federal sources	576	608	608	608	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	488	515	515	515	0
31	Equipment	312	329	329	329	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	14,907	14,880	14,880	14,880	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	53,420	56,384	57,125	54,125	(3,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Habitat Conservation and Restoration	Pos./BA	167	57,125	167	42,245	0	(14,880)
	FTE/OBL	158	57,125	158	42,245	0	(14,880)

Fisheries Habitat Grants (-$14,880, 0 FTE/0 Positions) – This request will eliminate grants for on-the-ground habitat restoration projects. Since the program's beginning, NOAA has implemented more than 2,000 habitat restoration projects through partnerships with over 2,500 organizations across the Nation.

NOAA will end its financial support for partnerships and grants provided through the Community-based Restoration Program. The agency will continue to provide technical expertise and leadership to states, Tribes, and local communities, as well as other programs and Federal agencies implementing fishery and coastal habitat restoration projects (e.g., NOAA's Coral Reef Conservation and Protected Species Programs, EPA, Army Corp of Engineers), within the guiding principles of NOAA's Habitat Blueprint, as resources allow. Technical expertise such as engineering and design, implementation support, and monitoring provided to external and internal partners allow NOAA to maximize the benefits for resources and habitats, including wetlands, rivers, coral reefs, and oysters, for which DOC/NOAA has trustee responsibility. In addition, the FY 2020 budget supports core operations for the Damage Assessment, Remediation, and Restoration Program (DARRP). DARRP helps to compensate the public for lost trust resources through the Natural Resource Damage Assessment (NRDA) process, and the NOAA Restoration Center directs the planning, implementation, and monitoring of case-specific projects to restore NOAA trust resources

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of habitat acres restored (annual) (Measure 3.4f)					
With Decrease	3,500	1,200	500	0	0
Without Decrease	3,500	2,200	2,000	2,000	2,000
Stream miles made accessible (annual)					
With Decrease	90	0	0	0	0
Without Decrease	90	50	50	50	50

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Habitat Conservation and Restoration
Subactivity: Habitat Conservation and Restoration
Program Change: Fisheries Habitat Grants

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	19,465	20,546	21,090	21,090	0
11.3	Other than full-time permanent	267	282	289	289	0
11.5	Other personnel compensation	304	321	330	330	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,036	21,149	21,709	21,709	0
12.1	Civilian personnel benefits	6,467	6,826	7,007	7,007	0
13	Benefits for former personnel	6	6	6	6	0
21	Travel and transportation of persons	749	790	790	790	0
22	Transportation of things	156	164	164	164	0
23	Rent, communications, and utilities	0	0	0	0	0
23.1	Rental payments to GSA	566	598	598	598	0
23.2	Rental payments to others	271	286	286	286	0
23.3	Communications, utilities, and misc. charges	203	214	214	214	0
24	Printing and reproduction	36	38	38	38	0
25	Other contractual services	0	0	0	0f	0
25.1	Advisory and assistance services	538	568	568	568	0
25.2	Other services from non-Federal sources	8,107	9,411	9,411	9,411	0
25.3	Other goods and services from Federal sources	576	608	608	608	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	488	515	515	515	0
31	Equipment	312	329	329	329	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	14,907	14,880	14,880	0	(14,880)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99.9	Total obligations	53,420	56,384	57,125	42,245	(14,880)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	2	2	65,000	65,000
Less: Obligations from Prior Year Balances	0	0	0	0
Plus: Other Adjustments-to-Base	0	0	0	0
2020 Base	2	2	65,000	65,000
Plus: 2020 Program Changes	(2)	(2)	(65,000)	(65,000)
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Decrease from 2020 Base Personnel Amount	
Pacific Coastal Salmon Recovery Fund	Pos/BA	2	64,935	2	65,000	2	65,000	0	0	(2)	(65,000)
	FTE/OBL	2	64,937	2	65,000	2	65,000	0	0	(2)	(65,000)
Total: Pacific Coastal Salmon Recovery Fund	Pos/BA	2	64,935	2	65,000	2	65,000	0	0	(2)	(65,000)
	FTE/OBL	2	64,937	2	65,000	2	65,000	0	0	(2)	(65,000)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	2	64,937	2	65,000	2	65,000	0	0	(2)	(65,000)
Total Obligations	**2**	**64,937**	**2**	**65,000**	**2**	**65,000**	**0**	**0**	**(2)**	**(65,000)**
Adjustments for:										
Recoveries	0	(791)	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(163)	0	0	0	0	0	0	0	0
Unobligated balance, expired	0	793	0	0	0	0	0	0	0	0
Unobligated balance, transferred	0	159	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**2**	**64,935**	**2**	**65,000**	**2**	**65,000**	**0**	**0**	**(2)**	**(65,000)**
Financing from Transfers and Other:										
Transfer to ORF	0	65	0	0	0	0	0	0	0	0
Appropriation	**2**	**65,000**	**2**	**65,000**	**2**	**65,000**	**0**	**0**	**(2)**	**(65,000)**

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Pacific Coastal Salmon Recovery Fund

Goal Statement

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in FY 2000 to protect, restore, and conserve Pacific salmon and steelhead and their habitats through competitive funding to states and Tribes. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

The Congressionally authorized activities include:

1) conserving salmon and steelhead populations that are listed as threatened or endangered, or identified by a state as at-risk to be so listed;
2) maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing; and,
3) conserving Pacific coastal salmon and steelhead habitat.

NOAA proposes to eliminate funding for the PCSRF program in FY 2020. Key accomplishments for PCSRF-funded activities from FY 2000 to 2018 include:

- more than 1,105,000 acres of habitat restored, and
- passage restored to over 10,900 stream miles of salmon habitat.

Since 2000, PCSRF has funded more than 13,700 projects along the Pacific Coast that contribute to preventing extinction and improving the status of ESA-listed species and their habitats, as well as supporting and protecting healthy populations. Projects implement priority actions specified in NOAA's ESA recovery plans and are Federally coordinated among NOAA, EPA, and USDA/NRCS to maximize the collective benefits of the agencies' grant programs. Actions range from single-site culvert replacement to hundreds of acres of habitat acquisition and restoration. Activities also include robust planning and monitoring programs to inform strategic prioritization of projects and track salmon conservation accomplishments.

Restoration projects have increased the quality and quantity of spawning and rearing habitat from stream headwaters to coastal estuaries. Upstream restoration activities have controlled erosion, enhanced in-stream flow and streambed conditions, and provided

the habitat necessary for successful spawning and egg survival. Estuary and wetland restoration projects closer to the coast have protected and improved feeding and rearing habitat used by juvenile fish as they transition from freshwater to the open ocean. PCSRF restoration projects have also removed nearly 3,414 barriers to fish passage along streams, restoring access to high-quality habitat. PCSRF projects provide a number of socio-economic benefits, including enhanced water quality, recreation opportunities, flood control, and coastline protection, as well as support green jobs and local economies.

Statement of Operating Objectives

PCSRF awards to grantees remain active for up to five years. Consequently, even with the proposed elimination of funding, an estimated 1,200 active projects funded with FY 2014 through FY 2019 appropriations will not be completed until FY 2020 and future years.

Active projects span all project categories, but a select list of habitat projects include:

- Alaska: Caswell and Lucille Creeks Fish Passage Restoration (end date November 2019)
- Washington: Illabot Creek Alluvial Fan Restoration – Phase 2 (end date December 2019)
- Washington: South Prairie Creek Phase 1 (end date December 2019)
- Idaho: Mason Meadow Restoration (end date June 2019)
- Idaho: Bonanza City Stream and Floodplain Project Phase I (end date December 2019)
- Oregon: Twelvemile Creek and Middle Fork JDR Riparian Enhancements (end date December 2019)
- California: Restoring Winter Refuge Habitat for Coho Salmon - Ten Mile River (end date March 2020)

Explanation and Justification

The PCSRF program provides competitive funding to states and Tribes of the Pacific Coast region to implement projects that restore and protect salmonid populations and their habitats. Eligible applicants include the states of Washington, Oregon, California, Idaho, Nevada, and Alaska and Federally recognized Tribes of the Columbia River and Pacific Coast (including Alaska). States are required to provide 33 percent matching funds, and PCSRF awards are supplemented further by significant private and local contributions at the project level. No match is required from the Federally recognized Tribes.

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Pacific Coastal Salmon Recovery Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

PCSRF habitat projects provide a number of benefits to the human community, including enhanced water quality, recreation opportunities, flood control, and coastline protection. Studies suggest that a $1.0 million investment in watershed restoration, of which PCSRF and state matching funds play a significant role, creates on average 16[23] to 17[24] new "green" jobs and averages $2.3 million[25] in economic activity. Additionally, approximately 80 percent of habitat restoration investments are spent locally in the county in which the project is located, and over 90 percent is spent within the state[26], supporting local jobs and local economies, often in rural and economically distressed communities.

[23] Nielsen-Pincus, M., and C. Moseley. 2010. Economic and employment impacts of forest and watershed restoration in Oregon. University of Oregon, Institute for a Sustainable Environment, Ecosystem Workforce Program, Working Paper Number 24, Spring 2010.
[24] Edwards, P.E.T., A.E. Sutton-Grier and C.E. Coyle. 2013 Investing in nature: Restoring coastal habitat blue infrastructure and green job creation. Marine Policy 38:65-71.
[25] Nielsen-Pincus, M., and C. Moseley. 2010. Economic and employment impacts of forest and watershed restoration in Oregon. University of Oregon, Institute for a Sustainable Environment, Ecosystem Workforce Program, Working Paper Number 24, Spring 2010.
[26] Hibbard, M. and S. Lurie. 2006. Some community socio-economic benefits of watershed councils: A case study from Oregon. Journal of Environmental Planning and Management 49:891-908.

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Pacific Coastal Salmon Recovery Fund	Pos./BA	2	65,000	0	0	(2)	(65,000)
	FTE/OBL	2	65,000	0	0	(2)	(65,000)

Pacific Coastal Salmon Recovery Fund (PCSRF) (-$65,000, -2 FTE/-2 Positions) – This reduction will eliminate funding for this grant program in FY 2020. The agency will continue its Federal commitment to advancing Pacific salmon and steelhead recovery and Tribal treaty fishing rights through other NOAA programs as resources allow.

The congressionally authorized activities for PCSRF include:

1) conserving salmon and steelhead populations that are listed as threatened or endangered, or identified by a state as at-risk to be so listed;
2) maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing; and,
3) conserving Pacific coastal salmon and steelhead habitat.

The PCSRF program provides competitive funding to states and Tribes of the Pacific Coast region. Eligible applicants include the states of Washington, Oregon, California, Idaho, Nevada, and Alaska and Federally recognized Tribes of the Columbia River and Pacific Coast (including Alaska). States are required to provide 33 percent matching funds, and PCSRF awards are supplemented further by significant private and local contributions at the project level. No match is required from the Federally recognized Tribes. More information on past program accomplishments can be found in the PCSRF base narrative above and the program's website.[27]

[27]http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/pacific_coastal_salmon_recovery_fund.html

Department of Commerce
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Pacific Coastal Salmon Recovery Fund
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measure					
Number of habitat acres restored (annual) (Indicator 3.4)					
With Decrease	14,200	12,500	8,500	4,200	1,800
Without Decrease	14,400	14,400	14,400	14,400	14,400
Number of stream miles made accessible for ocean, coastal, and Great Lakes resources (annual)					
With Decrease	460	400	270	130	60
Without Decrease	460	460	460	460	460

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
PRORAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Actvity: Pacific Coastal Salmon Recovery Fund
Subactivity: Pacific Coastal Salmon Recovery Fund
Program Change: Pacific Coastal Salmon Recovery Fund

Title	Grade	Number	Annual Salary	Total Salaries
Supervisory Grants Specialist	ZP-V	(1)	144,428	(144,428)
Grants Specialist	ZP-IV	(1)	108,955	(108,955)
				0
Total		(2)		(253,383)
		0		0
Total full-time permanent (FTE)		(2)		(253,383)
				0
Total				(253,383)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(2)
Other than full-time permanent	0
Total	(2)
Authorized Positions:	
Full-time permanent	(2)
Other than full-time permanent	0
Total	(2)

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	176	253	253	0	(253)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	176	253	253	0	(253)
12.1	Civilian personnel benefits	63	86	86	0	(86)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	13	296	296	0	(296)
26	Supplies and materials	79	0	0	0	0
31	Equipment	28	1	1	0	(1)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	64,578	64,364	64,364	0	(64,364)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	64,937	65,000	65,000	0	(65,000)

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
Less prior year recoveries	(791)	0	0	0	0
Plus unobligated balance, transferred	159	0	0	0	0
Unobligated balance, expired	793	0	0	0	0
Less unobligated balance, SOY	(163)	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Total Budget Authority	64,935	65,000	65,000	0	(65,000)

Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	2	2	2	0	(2)
Other than full time permanent	0	0	0	0	0
Total	2	2	2	0	(2)
Authorized Positions:					
Full-time permanent	2	2	2	0	(2)
Other than full time permanent	0	0	0	0	0
Total	2	2	2	0	(2)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	15,000	15,000
Plus: Obligations from prior year balances	0	0	0	0
Plus: Other Adjustments-to-Base	0	0	0	0
2020 Base	0	0	15,000	15,000
Plus: 2020 Program Changes	0	0	(15,000)	(15,000)
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Decrease from 2020 Base Personnel Amount	
Fisheries Disaster Assistance Fund	Pos/BA	0	219,780	0	15,000	0	15,000	0	0	0	(15,000)
	FTE/OBL	0	0	0	15,000	0	15,000	0	0	0	(15,000)
Total: Fisheries Disaster Assistance Fund	Pos/BA	0	219,780	0	15,000	0	15,000	0	0	0	(15,000)
	FTE/OBL	0	0	0	15,000	0	15,000	0	0	0	(15,000)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	15,000	0	15,000	0	0	0	(15,000)
Total Obligations	**0**	**0**	**0**	**15,000**	**0**	**15,000**	**0**	**0**	**0**	**(15,000)**
Adjustments for:										
Unobligated balance, adj. SOY	0	(78)	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	219,858	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**219,780**	**0**	**15,000**	**0**	**15,000**	**0**	**0**	**0**	**(15,000)**
Financing from Transfers and Other:										
Transfer to ORF	0	220	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**220,000**	**0**	**15,000**	**0**	**15,000**	**0**	**0**	**0**	**(15,000)**

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Fisheries Disaster Assistance Fund

For FY 2020, NMFS requests a total of $0 for this fund.

Goal Statement

To provide disaster assistance for addressing the economic and social effects of a commercial fishery failure, for activities to restore the fishery or prevent a similar failure in the future, and for assisting fishing communities. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

Fishery disaster assistance is administered by NOAA's National Marine Fisheries Service within the Department of Commerce. Two statutes, the Magnuson-Stevens Fishery Conservation and Management Act and the Interjurisdictional Fisheries Act, provide the authority for fishery disaster assistance. Under both statutes, a request for a fishery disaster determination is generally made by the Governor of a State, or an elected leader of a fishing community, although the Secretary of Commerce may also initiate a review at his or her own discretion. The Secretary determines whether the circumstances are consistent with relevant statutes and warrant a fishery disaster determination. If the Secretary determines that a fishery disaster has occurred, Congress may appropriate funds for disaster assistance, which are administered by the Secretary.

Statement of Operating Objectives

- MSA 312(a)(2) allows for disaster funds to be used for assessing the economic and social effects of the commercial fishery failure and for activities that restore the fishery or prevent a similar failure in the future and to assist a fishing community affected by such failure. Additionally, any such activity may not expand the size or scope of the commercial fishery failure in that fishery or into other fisheries or other geographic regions.
- MSA 315(b) allows for funding or other economic assistance for meeting immediate shore-side infrastructure needs, financial assistance and job training for fishermen, fishing capacity reduction and other activities authorized under MSA 312(a) and IFA 308(d).

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

- IFA 308(b) authorizes the Secretary to use funds to restore the fishery affected by the failure or to prevent a similar failure in the future.
- IFA 308(d) enables the Secretary to help persons engaged in the commercial fishery through projects that alleviate the harm suffered from the fishery resource disaster.

Explanation and Justification

NOAA intends to revise its procedures to provide greater clarity and improved consistency with respect to the process of requesting a fishery disaster declaration. These changes will accelerate the timeline for making disaster determinations, and establish guidelines for administering awards. The issues to be considered include, but are not limited to, deadlines, incentives for recipients to carry insurance, required documentation of loss, cost sharing by states, other available financial assistance, eligible uses, and prioritization of the long term sustainability of the affected fishery of the affected fishery. The changes under consideration will accelerate the Department's responsiveness to fishery disaster requests, help get appropriated funds distributed to affected communities in a more timely manner, and contribute to the long term environmental and economic sustainability of the fishery.

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Disaster Assistance Fund	Pos./BA	0	15,000	0	0	0	(15,000)
	FTE/OBL	0	15,000	0	0	0	(15,000)

Fisheries Disaster Assistance Fund (-$15,000, 0 FTE/0 Positions) – This request will eliminate funding provided by Congress in within the Fisheries Disaster Assistance Fund. NOAA will work with the states and Tribes with respect to future disaster determinations and shall work with Congress if future funding is necessary for declared disasters.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	15,000	15,000	0	(15,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	15,000	15,000	0	(15,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(78)	0	0	0	0
Less unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	219,858	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	219,780	15,000	15,000	0	(15,000)

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	349	349
Plus: Obligations from prior year balances	0	0	0	0
Plus: Other Adjustments-to-Base	0	0	0	0
2020 Base	0	0	349	349
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	349	349

		2018 Actual Personnel	Amount	2019 Enacted Personnel	Amount	2020 Base Personnel	Amount	2020 Estimate Personnel	Amount	Increase/ Decrease from 2020 Base Personnel	Amount
Fishermen's Contingency Fund	Pos/BA	0	351	0	349	0	349	0	349	0	0
	FTE/OBL	0	120	0	349	0	349	0	349	0	0
Total: Fishermen's Contingency Fund	Pos/BA	0	351	0	349	0	349	0	349	0	0
	FTE/OBL	0	120	0	349	0	349	0	349	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	120	0	349	0	349	0	349	0	0
Total Obligations	**0**	**120**	**0**	**349**	**0**	**349**	**0**	**349**	**0**	**0**
Adjustments for:										
Unobligated balance, adj. SOY	0	(1,316)	0	(1,547)	0	(1,547)	0	(1,547)	0	0
Unobligated balance, EOY	0	1,547	0	1,547	0	1,547	0	1,547	0	0
Total Budget Authority	**0**	**351**	**0**	**349**	**0**	**349**	**0**	**349**	**0**	**0**
Financing from Transfers and Other:										
Temporarily Reduced	0	0	0	0	0	0	0	0	0	0
Unapportioned	0	0	0	0	0	0	0	0	0	0
Discretionary Appropriation	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**351**	**0**	**349**	**0**	**349**	**0**	**349**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Fishermen's Contingency Fund

For FY 2020, NMFS requests a total of $349,000 for this fund.

Goal Statement

This fund compensates U.S. commercial fishermen for damage or loss of fishing gear, vessels, and resulting economic loss caused by obstructions related to oil or gas exploration, development, and production in any area of the Outer Continental Shelf (OCS). This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

The Fishermen's Contingency Fund is authorized under Section 402 of Title IV of the Outer Continental Shelf Lands Act Amendments of 1978. This fund minimizes financial instability of the fishing industry caused by competing uses of the OCS, and provides for timely resolution of claims by vessel owners.

Statement of Operating Objectives

Fishermen who can prove that they suffered losses in income due to inability or reduced capacity to fish as a result of the damage sustained may be eligible for compensation for economic loss and property loss or damage. Compensation for economic loss is based on 50 percent of gross income lost, rather than loss of profits

Explanation and Justification

The funds used to provide this compensation are derived solely from fees collected on an annual basis by the Secretary of the Interior from the holders of leases, exploration permits, easements, or rights-of-way in areas of the OCS. Disbursements can be made only to the extent authorized in appropriation acts.

PROPOSED LEGISLATION:
For carrying out the provisions of Title IV of Public Law 95-372, not to exceed $349,000, to be derived from receipts collected pursuant to that Act, to remain available until expended.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	120	349	349	349	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	120	349	349	349	0

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(1,316)	(1,547)	(1,547)	(1,547)	0
Less unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	1,547	1,547	1,547	1,547	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	351	349	349	349	0

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	0	0
Less: Obligations from prior year balances	0	0	0	0
Plus: 2020 Adjustments to Base	0	0	0	0
2020 Base	0	0	0	0
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total: Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	0	0	0	0	0	0
Total Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments for:										
Unobligated balance, adj. SOY	0	(522)	0	(522)	0	(522)	0	(522)	0	0
Unobligated balance, EOY	0	522	0	522	0	522	0	522	0	0
Total Budget Authority	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Unobligated balance, rescission	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Foreign Fishing Observer Fund

For FY 2020, NMFS requests a total of $0 for this fund.

Goal Statement

The goals of this fund are to provide 100 percent observer coverage aboard foreign vessels fishing within the U.S.' EEZ; to increase compliance with fishery regulations and requirements; to support balanced conservation and management measures to achieve and maintain the optimum use of our living marine resources; to collect data to determine foreign compliance with fishery regulations and the status of fish stocks within the EEZ of the United States; and to administer the base and supplemental observer programs in a cost-effective manner. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

The Foreign Fishing Observer Fund is financed through fees collected from owners and operators of foreign fishing vessels fishing within the U.S. EEZ (such fishing requires a permit issued under the MSA). The fund is used by NOAA to pay salaries, administrative costs, data editing and entry, and other costs incurred in placing observers aboard foreign fishing vessels.

Statement of Operating Objectives

- Monitor foreign fishing for compliance with U.S. fishing regulations
- Collect biological data

Explanation and Justification

The observer program is conducted primarily through contracts with the private sector. This includes longline vessels fishing in the Atlantic billfish and shark fishery and other foreign vessels fishing in the EEZ. NOAA places these observers aboard foreign fishing vessels to monitor compliance with U.S. fishery laws and to collect fishery management data. Amounts available in the fund can be disbursed only to the extent and in amounts provided in appropriation acts. In FY 1985, Congress approved the establishment of a supplemental observer program. The program provided that foreign vessels without Federally funded observers are required to obtain the services of private contractors certified by the Secretary of Commerce.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(522)	(522)	(522)	(522)	0
Plus unobligated balance, EOY	522	522	522	522	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	0	0	0	0

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	8,083	8,083
Less: 2020 Adjustments to Base	0	0	0	0
Less: Negative Subsidy Receipts Adjustment	0	0	(8,083)	(8,083)
2020 Base	0	0	0	0
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	0	0

		2018 Actual Personnel	Amount	2019 Enacted Personnel	Amount	2020 Base Personnel	Amount	2020 Estimate Personnel	Amount	Increase/ Decrease from 2020 Base Personnel	Amount
Fisheries Finance Program Account	Pos/BA	0	7,997	0	8,083	0	0	0	0	0	0
	FTE/OBL	0	7,997	0	8,083	0	0	0	0	0	0
Total: Fisheries Finance Program Account	Pos/BA	0	7,997	0	8,083	0	0	0	0	0	0
	FTE/OBL	0	7,997	0	8,083	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Cost Loan Subsidy	0	0	0	0	0	0	0	0	0	0
Credit Reestimates	0	7,997	0	8,083	0	0	0	0	0	0
Total Obligations	**0**	**7,997**	**0**	**8,083**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments for:										
Unobligated balance, adj. SOY	0	(2,779)	0	(2,779)	0	(2,779)	0	(2,779)	0	0
Unobligated balance, EOY	0	2,779	0	2,779	0	2,779	0	2,779	0	0
Total Budget Authority	**0**	**7,997**	**0**	**8,083**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Less: Permanent Indefinite Authority (Mandatory)	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**7,997**	**0**	**8,083**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Fisheries Finance Program Account

For FY 2020, NMFS requests a total of $0 for the Fisheries Finance Program Account.

Goal Statement

The Fisheries Finance Program (FFP) is a national loan program that makes long-term, fixed-rate financing available to U.S. citizens who otherwise qualify for financing or refinancing. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

NOAA's Fisheries Finance Program offers financing to U.S. companies seeking to improve their commercial fisheries and vessels. Vessel financing or refinancing that could contribute to overcapitalization by increasing harvesting capacity is prohibited by regulation.

Statement of Operating Objectives

The purpose of these loans is to provide stability to at least one aspect of an otherwise volatile industry.

Explanation and Justification

Types of activities for financing include the reconstruction, reconditioning, and, in some cases, the purchasing of fishing vessels, shoreside processing, aquaculture, mariculture facilities, purchase or refinance the purchase of harvesting rights in Federally managed limited access systems, and the purchase of individual fishing quota (IFQ) in two Northwest fisheries. The FFP also provides fishery-wide financing to ease the transition to sustainable fisheries through its fishing capacity reduction programs and provides IFQ financing to fishermen who fish from small vessels and entry-level fishermen to promote stability and reduce consolidation in already rationalized fisheries. Additionally, FFP can provide loans for fisheries investments of Native American Community Development Quota (CDQ) groups.

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
JUSTIFICATION OF PROGRAM AND PERFORMANCE

The FFP operates under the authority of Title XI of the Merchant Marine Act of 1936, as amended (46 USC 53701); Section 303(a) of the Sustainable Fisheries Act amendments to the MSA; and, from time to time FFP-specific legislation. FFP lending practices are guided by Title XI, general rules implementing Title XI (found at 50 CFR part 253, subpart B), NOAA's sustainable fisheries policy, and the practical considerations of a program that has continually not required an appropriation of loan loss subsidy under the Federal Credit Reform Act, as discussed below. The overriding guideline for all FFP financings is that they cannot contribute or be construed to contribute to an increase in existing fish harvesting.

FFP authority is subject to the Federal Credit Reform Act of 1990 (FCRA) (2 U.S.C. 661), which requires the estimated loan losses (FCRA cost) be appropriated in cash at the time Congress authorizes annual credit ceilings. Some types of FFP loans require no FCRA subsidy appropriations because these types of loans have historically not required additional loan subsidy. However, specific loan ceilings for each type of loan authority must be included in appropriation language or other bill language regardless of the need for cash appropriations.

PROPOSED LEGISLATION:
Subject to section 502 of the Congressional Budget Act of 1974, during fiscal year 2020, obligations of direct loans may not exceed $24,000,000 for Individual Fishing Quota loans and not to exceed $100,000,000 for traditional direct loans as authorized by the Merchant Marine Act of 1936.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	7,997	8,083	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	7,997	8,083	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(2,779)	(2,779)	(2,779)	(2,779)	0
Plus unobligated balance, EOY	2,779	2,779	2,779	2,779	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	7,997	8,083	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	3	3	426	2,515
Less: Obligations from prior year balances	0	0	0	0
Plus: 2020 Adjustments to Base	(3)	(3)	(426)	(2,515)
2020 Base	0	0	0	0
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Promote and Develop Fisheries Products	Pos/BA	3	10,664	3	426	0	0	0	0	0	0
	FTE/OBL	3	12,742	3	2,515	0	0	0	0	0	0
Total: Promote and Develop Fisheries Products	Pos/BA	3	10,664	3	426	0	0	0	0	0	0
	FTE/OBL	3	12,742	3	2,515	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	3	12,742	3	2,515	0	0	0	0	0	0
Total Obligations	**3**	**12,742**	**3**	**2,515**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments for:										
Unobligated balance, adj. SOY	0	(3,705)	0	(2,089)	0	0	0	0	0	0
Recoveries	0	(462)	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	2,089	0	0	0	0	0	0	0	0
Total Budget Authority	**3**	**10,664**	**3**	**426**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Transfer from USDA	(3)	(154,868)	(3)	(157,980)	0	(158,435)	0	(158,435)	0	0
Appropriations previously unavailable	0	(10,017)	0	(10,221)	0	(9,795)	0	(9,795)	0	0
Permanently Reduced	0	0	0	0	0	0	0	0	0	0
Temporarily Reduced	0	10,221	0	9,795	0	9,823	0	9,823	0	0
Transfer to ORF	0	144,000	0	157,980	0	158,407	0	158,407	0	0
Net Appropriation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Promote and Develop Fisheries Products

For FY 2020, NOAA estimates that a total of $158,435,000 will be transferred from the Department of Agriculture (USDA) to the Promote and Develop account. After accounting for sequestration, $158,407,000 will be transferred from the Promote and Develop account to the Operations, Research, and Facilities (ORF) account.

The Budget also includes a proposal to directly appropriate mandatory funding to DOC, rather than transferring amounts based on customs receipts from USDA. The Administration will formalize these changes through a legislative proposal to be transmitted at a later date. This request is part of a broader reform proposed for USDA's Section 32 program.

Goal Statement

To address the needs of fishing communities in optimizing economic benefits by building and maintaining sustainable fisheries and practices, dealing with the impacts of conservation and management measures, and increasing other opportunities to keep working waterfronts viable. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

NOAA will transfer $158,407,000 from the Promote and Develop account to offset appropriations in the NMFS ORF account. The transfer to ORF will support data collection, data management, and fisheries stock assessment production within the Fisheries Data Collections, Surveys, and Assessments PPA, which includes the Expand Annual Stock Assessments, Fish Information Networks, Survey and Monitoring Projects, Cooperative Research activities. With this transfer, there will be no funding for the Saltonstall-Kennedy program in FY 2020.

Statement of Operating Objectives

Applications should fall into one of three priorities:

- Promotion, Development, and Marketing
- Marine Aquaculture
- Support of Science that Maximizes Fishing Opportunities, Revenue, and Jobs in U.S. Fisheries While Ensuring the Long-Term Sustainability of Marine Resources

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Explanation and Justification

The Promote and Develop account funds are derived from a transfer of thirty percent of duties on imported fisheries products from USDA. Any funds remaining in this account after the ORF transfer are available to carry out the purposes of the S-K program. The American Fisheries Promotion Act (AFPA) of 1980 amended the Saltonstall-Kennedy (S-K) Act to authorize a grants program for fisheries research and development projects. In FY 2018, 38 competitive awards were funded nationwide. Projects address topics such as bycatch reduction; how aquaculture can advance fishery restoration and support local economic growth; and, what methods can improve fisheries management. More information on past accomplishments is available at the program's website.[28]

Legislative proposal:
The complex process of transferring customs duties receipts from USDA to DOC to partially fund fishery activities is neither transparent to the public nor consistent with general federal budgeting practices. In the place of customs receipts and to increase transparency, the Budget proposes to directly appropriate funding to DOC. These funds will be provided to DOC without further appropriation and are available for the same purposes as previous receipt-funded activities. Within DOC, an initial $158 million will be provided to the Promote and Develop program in FY 2020, equal to the level of funding that would otherwise have been provided by USDA, and adjusted annually in future years. The Administration will formalize these changes through a legislative proposal to be transmitted at a later date. This request is part of a broader reform proposed for USDA's Section 32 program.

[28] http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	340	340	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	340	340	0	0	0
12.1	Civilian personnel benefits	96	96	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	31	23	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	19	19	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	413	386	0	0	0
25.2	Other services from non-Federal sources	1,002	385	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	4	4	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,837	1,262	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	12,742	2,515	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
Less unobligated balance, SOY	(3,705)	(2,089)	0	0	0
Plus unobligated balance, EOY	2,089	0	0	0	0
Recoveries	(462)	0	0	0	0
Total Budget Authority	10,664	426	0	0	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	3	3	0	0	0
Other than full time permanent	0	0	0	0	0
Total	3	3	0	0	0
Authorized Positions:					
Full-time permanent	3	3	0	0	0
Other than full time permanent	0	0	0	0	0
Total	3	3	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	0	0
2020 Base	0	0	0	0
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Federal Ship Financing Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total: Federal Ship Financing Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	0	0	0	0	0	0
Total Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments for:										
Transfer to Treasury (mandatory)	0	142	0	142	0	142	0	142	0	0
Offsetting collections (mandatory)	0	(142)	0	(142)	0	(142)	0	(142)	0	0
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Federal Ship Financing Fund

For FY 2020, NMFS estimates a total of $0 for the Federal Ship Financing Fund Account.

Goal Statement

To provide for a liquidating account necessary for the collection of premiums and fees under the Fishing Vessel Obligations Guarantee program for loan commitments made prior to FY 1992. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

Administrative expenses for management of the loan guarantee portfolio were charged to the Federal Ship Financing Fund prior to the enactment of the Federal Credit Reform Act of 1990. Administrative expenses are charged to the ORF account.

Statement of Operating Objectives

- Collect repayments and interest
- Repay borrowings plus interest
- Pay default claims and interest

Explanation and Justification

These collections are for operations of this program, loans, and for use in case of default.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Plus transfers to Treasury	142	142	142	142	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Less offsetting Collections	(142)	(142)	(142)	(142)	0
Total Budget Authority	0	0	0	0	0

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	6,563	6,563
Less: obligations from prior year balances	0	0	0	0
Plus: 2020 Adjustments to Base	0	0	686	686
2020 Base	0	0	7,249	7,249
plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	7,249	7,249

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Environmental Improvement and Restoration Fund	Pos/BA	0	0	0	6,563	0	7,249	0	7,249	0	0
	FTE/OBL	0	6,924	0	6,563	0	7,249	0	7,249	0	0
Total: Environmental Improvement and Restoration Fund	Pos/BA	0	0	0	6,563	0	7,249	0	7,249	0	0
	FTE/OBL	0	6,924	0	6,563	0	7,249	0	7,249	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	6,924	0	6,563	0	7,249	0	7,249	0	0
Total Obligations	**0**	**6,924**	**0**	**6,563**	**0**	**7,249**	**0**	**7,249**	**0**	**0**
Adjustments for:										
Unobligated balance, adj. SOY	0	(8,221)	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adjusted	0	1,297	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**6,563**	**0**	**7,249**	**0**	**7,249**	**0**	**0**
Financing from Transfers and Other:										
Appropriation previously unavailable	0	0	0	0	0	0	0	0	0	0
Permanently Reduced	0	0	0	434	0	479	0	479	0	0
Net Mandatory Appropriation	**0**	**0**	**0**	**6,997**	**0**	**7,728**	**0**	**7,728**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Environmental Improvement and Restoration Fund

For FY 2020, NMFS estimates obligating $7,249,000 in the Environmental Improvement and Restoration Fund.

Goal Statement

The Environmental Improvement and Restoration Fund (EIRF) was created by the Department of Interior and Related Agencies Appropriations Act of 1998 for the purpose of carrying out marine research activities in the North Pacific. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

These funds will provide grants to Federal, state, private, or foreign organizations or individuals to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean.

Statement of Operating Objectives

- Improve understanding of North Pacific marine ecosystem dynamics and use of the resources
- Improve ability to forecast and respond to effects of changes through integration of various research activities including long term monitoring
- Improve ability to manage and protect fish and wildlife populations of the North Pacific

Explanation and Justification

Each year NOAA's EIRF account is financed with a transfer from the Department of the Interior. NOAA grants these funds to the North Pacific Research Board (NPRB) which conducts an open, competitive process for gathering research proposals. Through this process the NPRB recommends research projects relating to fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean, with emphasis on cooperative research designed to address pressing fishery management or marine ecosystem information needs.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	6,924	6,563	7,249	7,249	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	6,924	6,563	7,249	7,249	0

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(8,221)	0	0	0	0
Plus unobligated balance, adjusted	1,297	0	0	0	0
Less unobligated balance, transferred	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	6,563	7,249	7,249	0

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	40	40	14,741	16,307
Adjustments to Base	0	0	246	4
Less: Obligations from Prior Year Balances	0	0	0	0
2020 Base	40	40	14,987	16,311
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	40	40	14,987	16,311

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Limited Access System Administration Fund	Pos/BA	36	12,906	40	14,741	40	14.987	40	14,987	0	0
	FTE/OBL	36	12,400	40	16,307	40	16,311	40	16,311	0	0
Total: Limited Access System Administration Fund	Pos/BA	36	12,906	40	14,741	40	14,987	40	14,987	0	0
	FTE/OBL	36	12,400	40	16,307	40	16,311	40	16,311	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	36	12,400	40	16,307	40	16,311	40	16,311	0	0
Total Obligations	**36**	**12,400**	**40**	**16,307**	**40**	**16,311**	**40**	**16,311**	**0**	**0**
Adjustments for:										
Recoveries	0	(1,075)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(16,197)	0	(17,778)	0	(16,212)	0	(16,212)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	17,778	0	16,212	0	14,888	0	14,888	0	0
Total Budget Authority	**36**	**12,906**	**40**	**14,741**	**40**	**14,987**	**40**	**14,987**	**0**	**0**
Financing from Transfers and Other:										
Appropriations previously unavailable	0	(868)	0	(830)	0	(920)	0	(920)	0	0
Temporarily Reduced	0	830	0	920	0	930	0	930	0	0
Net Appropriation	**36**	**12,868**	**40**	**14,831**	**40**	**14,997**	**40**	**14,997**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Limited Access System Administration

For FY 2020, NMFS estimates obligating $16,311,000 in the Limited Access System Administration account.

Goal Statement

To provide for the collection of fees to recover the incremental costs of management, data collection, and enforcement of Limited Access Privilege (LAP) programs. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

Under the authority of MSA Section 304(d)(2)(A) funds collected are deposited into the "Limited Access System Administrative Fund" (LASAF). Fees cannot exceed three percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

Statement of Operating Objectives

- Provide repository for fees collected from Limited Access Programs
- Fund incremental costs of management, data collection and analysis, and enforcement of limited access privilege programs

Explanation and Justification

The LASAF is available, without appropriation or fiscal year limitation, only for the purposes of administrating the central registry system; and administering and implementing the MSA in the fishery in which the fees were collected. Sums in the fund that are not currently needed for these purposes are kept on deposit or invested in obligations of, or guaranteed by, the United States. Also, in establishing a LAP program, a Regional Council can consider, and may provide, if appropriate, an auction system or other program to collect royalties for the initial or any subsequent distribution of allocations. If an auction system is developed, revenues from these royalties are deposited in the LASAF.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	3,400	3,778	3,778	3,778	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	371	412	412	412	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3,771	4,190	4,190	4,190	0
12.1	Civilian personnel benefits	1,482	1,647	1,647	1,647	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	48	579	579	579	0
22	Transportation of things	6	6	6	6	0
23.1	Rental payments to GSA	309	309	309	309	0
23.2	Rental payments to others	3	3	3	3	0
23.3	Commun., util., misc. charges	35	35	35	35	0
24	Printing and reproduction	0	1	1	1	0
25.1	Advisory and assistance services	18	18	18	18	0
25.2	Other services from non-Federal sources	3,278	6,069	6,073	6,073	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
26	Supplies and materials	165	165	165	165	0
31	Equipment	81	81	81	81	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,204	3,204	3,204	3,204	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	12,400	16,307	16,311	16,311	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
Recoveries	(1,075)	0	0	0	0
Less unobligated balance, SOY	(16,197)	(17,778)	(16,212)	(16,212)	0
Unobligated balance, unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	17,778	16,212	14,888	14,888	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	12,906	14,741	14,987	14,987	0

Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	36	40	40	40	40
Other than full time permanent	0	0	0	0	0
Total	36	40	40	40	40
Authorized Positions:					
Full-time permanent	36	40	40	40	40
Other than full time permanent	0	0	0	0	0
Total	36	40	40	40	40

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	0	0
Adjustments to Base	0	0	0	0
2020 Base	0	0	0	0
Plus: 2019 Program Changes	0	0	0	0
2020 Estimate	0	0	0	0

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	2	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total: Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	2	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	0	0	0	0	0	0
Total Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments for:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Collections	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(25)	0	(27)	0	(27)	0	(27)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	27	0	27	0	27	0	27	0	0
Total Budget Authority	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Appropriation previously unavailable	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Marine Mammal Unusual Mortality Event Fund

For FY 2020, NMFS estimates obligating up to $27,000 from the Marine Mammal Unusual Mortality Event Fund.

Goal Statement

Provide funds to support investigations and responses to unusual marine mammal mortality events. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

An unusual mortality event (UME) is defined under the Marine Mammal Protection Act (MMPA) as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." In recent years, increased efforts to examine carcasses and live stranded animals have improved the knowledge of mortality rates and causes, allowing a better understanding of population threats and stressors and the ability to determine when a situation is "unusual." Understanding and investigating marine mammal UMEs is important because they can serve as indicators of ocean health, giving insight into larger environmental issues, which may also have implications for human health.

Statement of Operating Objectives

MMPA Section 405 (16 U.S.C. 1421d) establishes the Marine Mammal Unusual Mortality Event Fund and describes its purposes and how donations can be made to the Fund. The Fund is an emergency response fund used to help cover expenses incurred by the volunteer Marine Mammal Stranding Network during a UME. Specifically, the fund: "shall be available only for use by the Secretary of Commerce, in consultation with the Secretary of the Interior: to compensate persons for special costs incurred in acting in accordance with the contingency plan issued under section 1421c(b) of this title or under the direction of an Onsite Coordinator for an unusual mortality event;

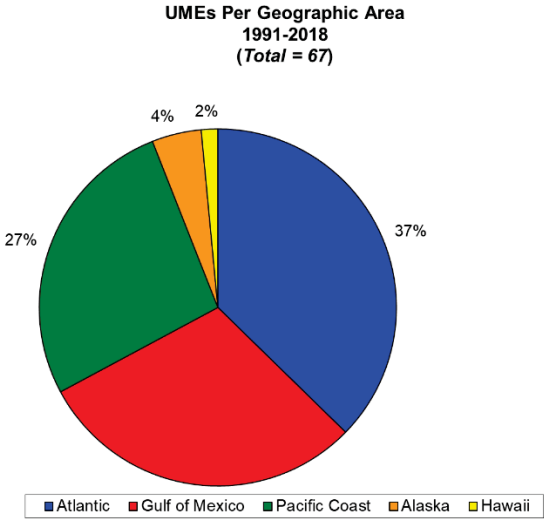
- for reimbursing any stranding network participant for costs incurred in preparing and transporting tissues collected with respect to an unusual mortality event for the Tissue Bank; and,
- for care and maintenance of marine mammal seized under section 1374(c)(2)(D) of this title."

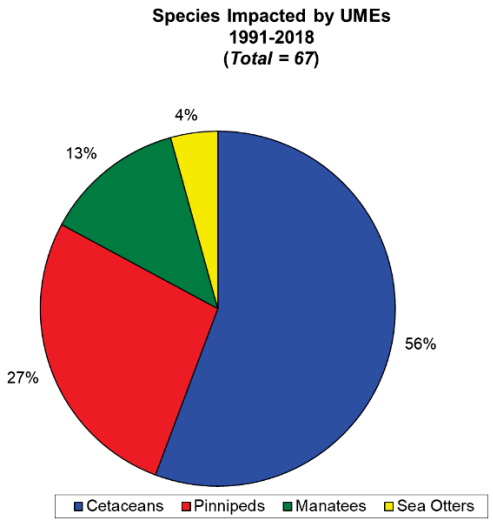
According to the MMPA, deposits can be made into Fund in the following ways:

- "amounts appropriated to the Fund;

- other amounts appropriated to the Secretary for use with respect to unusual mortality events; and,
- amounts received by the United States in the form of gifts, devises, and bequests under subsection (d) of this section."

NOAA will continue to utilize the UME Contingency Fund to support of the Marine Mammal Stranding Network's eligible work as needed.





Explanation and Justification

Since UMEs are unpredictable emergency events caused by any number of circumstances (natural or human-caused), it is impossible to anticipate how many UMEs may occur in a given year or how much funding will be needed. During the past 27 years (1991– 2018), NOAA declared 67 UMEs, an average of ~2.5 UMEs per year. The highest number of UMEs declared in a year was five (in both 2006 and 2007). The costs associated with UMEs are highly variable and depend on the species involved, location, equipment, and laboratory needs. For example, a UME involving large whales offshore can cost well over several $100,000s in expenses because of the considerable logistical challenges and needs (e.g., ship time or aerial support, number of personnel, safety equipment, etc.).

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

To date, Congress has appropriated funding for UMEs on one occasion in 2005. Some of those funds were transferred to the National Fish and Wildlife Foundation (NFWF) since they have the ability to quickly distribute funds within 30 days of invoicing to our partners during a UME. At this time there are sufficient funds held at NFWF to meet most of our expected expenses in FY 2019 and we anticipate obligating up to $27,000 from the Marine Mammal Unusual Mortality Event Fund in FY 2020. Additionally, the UME Contingency fund is listed on Pay.gov allowing the public to donate to the fund year round.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(25)	(27)	(27)	(27)	0
Plus unobligated balance, EOY	27	27	27	27	0
Less collections	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	2	0	0	0	0

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	596	596
Adjustments to Base	0	0	4	4
2020 Base	0	0	600	600
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	600	600

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
Western Pacific Sustainable Fisheries Fund	Pos/BA	0	495	0	596	0	600	0	600	0	0
	FTE/OBL	0	512	0	596	0	600	0	600	0	0
Total: Western Pacific Sustainable Fisheries Fund	Pos/BA	0	495	0	596	0	600	0	600	0	0
	FTE/OBL	0	512	0	596	0	600	0	600	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	512	0	596	0	600	0	600	0	0
Total Obligations	**0**	**512**	**0**	**596**	**0**	**600**	**0**	**600**	**0**	**0**
Adjustments for:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(17)	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**495**	**0**	**596**	**0**	**600**	**0**	**600**	**0**	**0**
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(28)	0	(33)	0	(37)	0	(37)	0	0
Temporarily Reduced	0	33	0	37	0	37	0	37	0	0
Net Appropriation	**0**	**500**	**0**	**600**	**0**	**600**	**0**	**600**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Western Pacific Sustainable Fisheries Fund

For FY 2020, NMFS estimates obligating $600,000 in the Western Pacific Sustainable Fisheries Fund.

Goal Statement

The purpose of this fund is to allow foreign fishing within the U.S. Exclusive Economic Zone (EEZ) in the Western Pacific through a Pacific Insular Area Fishery Agreement. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

Section 204(e) of the 2006 amendments to the MSA authorizes the establishment of the Western Pacific Sustainable Fisheries Fund. Before entering an Agreement, the Western Pacific Fishery Management Council must develop a Marine Conservation Plan that provides details on uses for any funds collected by the Secretary of Commerce. Marine Conservation Plans must also be developed by the Governors of the Territories of Guam and American Samoa and of the Commonwealth of the Northern Mariana Islands and approved by the Secretary or designee.

Statement of Operating Objectives

The conservation and management objectives for the Western Pacific Sustainable Fisheries Fund are listed in the four marine conservation plans:

- Hawaii and Pacific Insular Areas
- Guam
- American Samoa
- Commonwealth of the Northern Mariana Islands.

Explanation and Justification

The Western Pacific Sustainable Fisheries Fund serves as a repository for any permit payments received by the Secretary for foreign fishing within the U.S. EEZ around Johnston Atoll, Kingman Reef, Palmyra Atoll, and Jarvis, Howland, Baker and Wake Islands, sometimes known as the Pacific remote island areas (PRIA). Funds are available to:

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

- The Western Pacific Council for the purpose of carrying out implementation of a marine conservation plan (see below for more info on marine conservation plans).
- The Secretary of State for mutually agreed upon travel expenses for no more than two Federal representatives incurred as a direct result of negotiations and entering into a Pacific Insular Area fishery agreement. These fishery agreements authorize foreign fishing within the exclusive economic zone adjacent to a Pacific Insular Area other than American Samoa, Guam, or the Northern Mariana Islands, at the request of the Western Pacific Council).
- The Western Pacific Council to meet conservation and management objectives in the State of Hawaii if monies remain in the Western Pacific Sustainable Fisheries Fund after the funding requirements of subparagraphs (A) and (B) have been satisfied.

In the case of violations by foreign vessels occurring in these areas, amounts received by the Secretary attributable to fines and penalties are deposited into the fund to be used for fisheries enforcement and for implementation of a marine conservation plan. Additionally, any funds or contributions received in support of conservation and management objectives under a Marine Conservation Plan for any Pacific Insular Area other than American Samoa, Guam, or the Northern Mariana Islands are deposited in the fund.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	512	596	600	600	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	512	596	600	600	0

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Recoveries	0	0	0	0	0
Less unobligated balance, SOY	(17)	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	495	596	600	600	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	3,844	5,765
Adjustments to Base			0	0
Less: Obligations from Prior Year Balances	0	0	(27)	0
2020 Base	0	0	3,817	5,765
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	3,817	5,765

		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount	2020 Estimate Personnel	2020 Estimate Amount	Increase/ Decrease from 2020 Base Personnel	Increase/ Decrease from 2020 Base Amount
Fisheries Enforcement Asset Forfeiture Fund	Pos/BA	0	4,146	0	3,844	0	3,817	0	3,817	0	0
	FTE/OBL	0	3,553	0	5,765	0	5,765	0	5,765	0	0
Total: Fisheries Enforcement Asset Forfeiture Fund	Pos/BA	0	4,146	0	3,844	0	3,817	0	3,817	0	0
	FTE/OBL	0	3,553	0	5,765	0	5,765	0	5,765	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	3,553	0	5,765	0	5,765	0	5,765	0	0
Total Obligations	**0**	**3,553**	**0**	**5,765**	**0**	**5,765**	**0**	**5,765**	**0**	**0**
Adjustments for:										
Recoveries	0	(1)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(15,682)	0	(16,276)	0	(14,355)	0	(14,355)	0	0
Unobligated balance, transferred	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	16,276	0	14,355	0	12,407	0	12,407	0	0
Total Budget Authority	**0**	**4,146**	**0**	**3,844**	**0**	**3,817**	**0**	**3,817**	**0**	**0**
Financing from Transfers and Other:										
Mandatory Appropriation Temporarily Reduced	0	264	0	237	0	237	0	237	0	0
Appropriations previously unavailable	0	(276)	0	(264)	0	(237)	0	(237)	0	0
Net Appropriation	**0**	**4,134**	**0**	**3,817**	**0**	**3,817**	**0**	**3,817**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Enforcement Asset Forfeiture Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Fisheries Enforcement Asset Forfeiture Fund

For FY 2020, NMFS estimates it will collect $3,817,000 in fines, penalties, and forfeitures proceeds.

Goal Statement

To pay certain enforcement-related expenses from fines, penalties, and forfeiture proceeds received for violations of the MSA, MMPA, National Marine Sanctuaries Act, or any other marine resource law enforced by the Secretary. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

Pursuant to Section 311(e)(1) of the MSA, NOAA has established a Civil Monetary Penalty/Asset Forfeiture Fund (AFF) where these proceeds are deposited.

Statement of Operating Objectives

The objective of the Fisheries Enforcement Asset Forfeiture Fund is to provide a repository for fines, penalties and forfeiture proceeds which are only used to fund the authorized costs listed below.

Explanation and Justification

When Congress established the AFF it was deemed appropriate to use these proceeds to offset in part the costs of administering the Enforcement program. Expenses funded through this source include: costs directly related to the storage, maintenance, and care of seized fish, vessels, or other property during a civil or criminal proceeding; expenditures related directly to specific investigations and enforcement proceedings such as travel for interviewing witnesses; enforcement-unique information technology infrastructure; and annual interagency agreement and contract costs for the administrative adjudication process, including Administrative Law Judges.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	1,697	3,205	3,205	3,205	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	12	18	18	18	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	6	6	6	6	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	398	790	790	790	0
25.3	Other goods and services from Federal sources	803	1,033	1,033	1,033	0
26	Supplies and materials	387	387	387	387	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	250	326	326	326	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	**3,553**	**5,765**	**5,765**	**5,765**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(15,682)	(16,276)	(14,355)	(14,355)	0
Recoveries	(1)	0	0	0	0
Plus unobligated balance, EOY	16,276	14,355	12,407	12,407	0
Less unobligated balance, transferred	0	0	0	0	0
Total Budget Authority	**4,146**	**3,844**	**3,817**	**3,817**	**0**

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Fishery Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2019 Enacted	0	0	4,014	6,119
Adjustments to Base	0	0	0	0
Less: Obligations from Prior Year Balances	0	0	(14)	(2,119)
2020 Base	0	0	4,000	4,000
Plus: 2019 Program Changes	0	0	0	0
2020 Estimate	0	0	4,000	4,000

		2018 Actual Personnel Amount		2019 Enacted Personnel Amount		2020 Base Personnel Amount		2020 Estimate Personnel Amount		Increase/ Decrease from 2020 Base Personnel Amount	
North Pacific Fishery Observer Fund	Pos/BA	0	3,754	0	4,014	0	4,000	0	4,000	0	0
	FTE/OBL	0	1,794	0	6,119	0	4,000	0	4,000	0	0
Total: North Pacific Fishery Observer Fund	Pos/BA	0	3,754	0	4,014	0	4,000	0	4,000	0	0
	FTE/OBL	0	1,794	0	6,119	0	4,000	0	4,000	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Fishery Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/ Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	1,794	0	6,119	0	4,000	0	4,000	0	0
Total Obligations	**0**	**1,794**	**0**	**6,119**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
Adjustments for:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(145)	0	(2,105)	0	0	0	0	0	0
Unobligated balance, EOY	0	2,105	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**3,754**	**0**	**4,014**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(274)	0	(262)	0	(248)	0	(248)	0	0
Temporarily Reduced	0	262	0	248	0	248	0	248	0	0
Net Appropriation	**0**	**3,742**	**0**	**4,000**	**0**	**4,000**	**0**	**4,000**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Fishery Observer Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: North Pacific Fishery Observer Fund

For FY 2020, NMFS estimates obligating $4,000,000 for the North Pacific Fishery Observer Fund.

Goal Statement

To fund observer coverage on the vessels and processors in the partial coverage category within the North Pacific Groundfish Observer Program. This program supports the Department of Commerce's strategic objective 2.3, *Strengthen Domestic Commerce and the U.S. Industrial Base*.

Base Program

On January 1, 2013, the restructured North Pacific Groundfish Observer Program (NPGOP) went into effect and made important changes to how observers are deployed, how observer coverage is funded, and the vessels and processors that must have some or all of their operations observed.

Statement of Operating Objectives

- Collect catch data onboard fishing vessels and at onshore processing plants that is used for in-season management and scientific purposes such as stock assessments and ecosystem studies
- Ensure that the data collected by observers are of the highest quality possible by implementing rigorous quality control and quality assurance processes

Explanation and Justification

Coverage levels are no longer based on vessel length and processing volume; rather, NMFS now has the flexibility to decide when and where to deploy observers based on a scientifically defensible deployment plan. The new observer program places all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two observer coverage categories: (1) full coverage category and (2) partial coverage. Vessels and processors in the full coverage category (≥100% observer coverage) will obtain observers by contracting directly with observer providers. Vessels and processors in the full observer coverage category are required to have at least one observer at all times. This will represent no change from the status quo for participants in the full coverage category. Vessels and processors in the partial coverage category (<100% observer coverage) will no longer contract independently

with an observer provider, and will be required to carry an observer when they are selected through the Observer Declare and Deploy System (ODDS). Additionally, landings from all vessels in the partial coverage category will be assessed a 1.25 percent fee on standard ex-vessel prices of the landed catch weight of groundfish and halibut. The fee percentage is set in regulation and will be reviewed periodically by the North Pacific Council after the second year of the program. The money generated by this fee will be used to pay for observer coverage on the vessels and processors in the partial coverage category in the following year. NMFS expects approximately $4.0 million to be collected in fees from the FY 2019 season, to be used in FY 2020 for observer coverage.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Fishery Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/ Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other goods and services from Federal sources	1,794	6,119	4,000	4,000	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	1,794	6,119	4,000	4,000	0

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Fishery Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Recoveries	0	0	0	0	0
Less unobligated balance, SOY	(145)	(2,105)	0	0	0
Plus unobligated balance, EOY	2,105	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	3,754	4,014	4,000	4,000	0

Department of Commerce
National Oceanic and Atmospheric Administration
Oceanic and Atmospheric Research
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $335,149,000 and 682 FTE/ 727 positions for the Office of Oceanic and Atmospheric Research including a net decrease of $236,597,000 and 77 FTE/ 79 positions in program changes.

Oceanic and Atmospheric Research (OAR) is NOAA's central research Line Office charged with improving the understanding of changes in the Earth's environment. OAR integrates and conducts research across NOAA to advance NOAA's mission by providing better forecasts and improving understanding of the Earth and its processes. OAR conducts research on ocean acidification, aquaculture, severe weather, climate, and deep sea environments and develops technology that is transitioned into operations at one of the other NOAA Line Offices or that improve the scope and efficiency of our observing systems. OAR also provides information to individuals, businesses, and communities to reduce vulnerability to extreme weather and climate, prepare for drought and water resource challenges, protect and preserve coasts and coastal infrastructure from inundation, and identify and manage risks to marine ecosystems and the services they provide.

OAR's Organizational Components:
OAR operates through a national network of laboratories, other university-based research institutes, and specialized programs. These centers of expertise collaborate across NOAA's weather, climate, and ocean research to apply an integrated approach to global and local scientific challenges. OAR consists of the following organizational components:

OAR Laboratories:
OAR has ten laboratories across the United States providing the research foundation for NOAA products and services that support decision making by policymakers and the public. These laboratories collaborate with numerous external partners, including NOAA-funded Cooperative Institutes at academic and scientific institutions.

Map displays the location of OAR's ten laboratories. There are four laboratories at the ESRL location in Boulder, CO.

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National Oceanic and Atmospheric Administration
Oceanic and Atmospheric Research
Budget Estimates, Fiscal Year 2020

Performance:
Performance evaluation is an integral part of OAR's business process. OAR uses the performance management process to align resources, systems, and workforce to achieve research-based objectives and priorities for the Nation. The effectiveness of these investments is assessed using numerous internal and external performance measures including the Government Performance and Results Act (GPRA) and other performance measures. In the table below is a list of OAR-led GPRA metrics that cross multiple laboratories and programs. For current GPRA targets please see FY 2020/2018 Annual Performance Plan and Report.

Adjustments:

Inflationary Adjustments
NOAA's FY 2020 Base includes an increase of $3,943,000 and 0 FTE/ 0 positions to account for the full funding requirement for inflationary adjustments to current programs for OAR activities. This includes the estimated 2020 military pay raise of 2.1 percent as well as inflationary increases for labor and non-labor activities, including benefits, service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments (Transfers)
NOAA also requests the following transfers for a net change of $0 and 0 FTE/ 0 Positions to the operating unit:

From Office	Subactivity	To Office	Subactivity	Amount
OAR	Climate Competitive Research	OAR	U.S. Weather Research Program (USWRP)	$5,676,000 / 0 FTE/ 0 positions
OAR	Climate Competitive Research	OAR	Climate Research Laboratories & Cooperative Institutes	$14,331,000 / 29 FTE/ 29 positions
OAR	Regional Climate Data & Information	OAR	Climate Research Laboratories & Cooperative Institutes	$0 / 14 FTE / 14 positions

NOAA requesting to transfer $20,007,000 and 43 FTE to consolidate Climate Research and allow for better alignment of funding within specific programs and activities being carried out within the Climate Research Climate Laboratories & Cooperative Institutes

and the U.S. Weather Research Program (USWRP). Specifically, $5,676,000 will be moved from the Climate Competitive Research Subactivity to the USWRP Subactivity to support research and development associated with Seasonal to Subseasonal (S2S) atmospheric research. This funding complements S2S funding already located in the USWRP Subactivity. Additionally, $14,282,000 and 29 FTE will be moved from the Climate Competitive Research Subactivity to the Climate Research Climate Laboratories & Cooperative Institutes Subactivity to support Earth Systems Research within the OAR laboratories and long-term observations and climate records. This funding will be sent to the NOAA labs in support of their observation activities. A total of 14 FTE will be moved without funding from Regional Climate Data & Information (RCDI) Subactivity to the Climate Laboratories & Cooperative Institute Subactivity. This is a result of the RCDI funding opportunities no longer being available for OAR laboratory to receive and to fund their existing researcher. While laboratory FTE will not be reduced as part of the Climate Program decreases, they will have to be funded from their laboratory's base funding. The Climate Competitive Research Subactivity is proposed for elimination in FY 2020. Further transfer change detail can be found in Exhibit 3T (OAR - 7).

From Office	Subactivity	To Office	Subactivity	Amount
NESDIS	Product Development, Readiness & Stewardship (ORF)	OAR	U.S. Weather Research Program (ORF)	$2,680,000/ 0 FTE/ 0 positions

NOAA requests a technical adjustment to move $2,680,000 and 0 FTE/ 0 positions from the NESDIS Product Development, Readiness & Stewardship (PDR&A) ORF Subactivity to the Office of Atmospheric Research (OAR) U.S. Weather Research Program ORF Subactivity. NOAA is consolidating its model and code development as well as data assimilation techniques, system architecture integration, and computational efficiencies within OAR's Earth Prediction Innovation Center (see OAR-35), which will include current NESDIS funded efforts such as the Joint Effort for Data assimilation Integration (JEDI) and the Community Radiative Transfer Model (CRTM). Satellite data products will not be impacted by this request. Further transfer change detail can be found in Exhibit 3T (OAR - 11).

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National Oceanic and Atmospheric Administration
Oceanic and Atmospheric Research
Budget Estimates, Fiscal Year 2020

OAR's labs include:

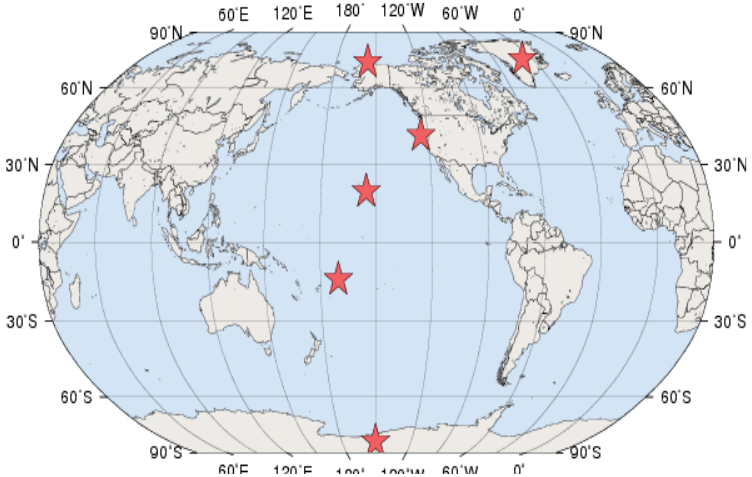
Air Resources Laboratory (ARL), College Park, Maryland
ARL conducts research on atmospheric dispersion, atmospheric chemistry, climate composition, and the complex behavior of the atmosphere near the Earth's surface, providing weather forecasters' direct access to dispersion estimates of airborne hazardous materials to predict the transport of acid rain, volcanic ash, wildfires, air chemistry, mercury contamination, and radioactive material.

Atlantic Oceanographic and Meteorological Laboratory (AOML), Miami, Florida
AOML conducts research that protects coastal populations and ecosystems with more accurate forecasting of hurricanes, better understanding of the role of oceans in climate, and protection from environmental degradation.

Earth System Research Laboratories (ESRL), Boulder, Colorado
Four laboratories within ESRL pursue a broad and comprehensive understanding of the Earth system, including the atmosphere, ocean, and the climate system.

Chemical Sciences Laboratory (CSL)
CSL focuses on quantifying manmade and natural emissions, understanding processes that alter the atmosphere's composition and the distribution of pollutants, and offering information and practical applications to local decision makers and the public.

Global Monitoring Laboratory (GML)
GML sustains long-term observation of atmospheric compounds from over 100 sites around the world and identifies emerging trends in compound location and concentration. It also validates the NASA and NOAA satellite data of greenhouse gases, ozone, radiation, aerosols, and many other atmospheric compounds.



Among other observation networks, GML operates 6 Atmospheric Baseline Observatories (ABOs), strategically located across the globe, that collect high quality, long-term atmospheric data used by more than 500 external partners and stakeholders.

Department of Commerce
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Global Systems Laboratory (GSL)
GSL improves weather and water by developing and integrating next-generation Earth system models at storm-to-global scales and advances new modeling.

Physical Sciences Research Laboratory (PSL)
PSL conducts physical science research that advances NOAA's abilities to observe, understand, and predict the physical behavior of the Earth system, improving forecasts and seasonal outlooks.

Geophysical Fluid Dynamics Laboratory (GFDL), Princeton, New Jersey
GFDL modeling research provides the foundation for our Nation's weather prediction, seasonal forecasting and ocean modeling.

Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, Michigan
GLERL develops information and tools for coastal decision makers managing 95 percent of our country's surface freshwater. GLERL advances forecasts of environmental change in the Great Lakes through environmental observation, ecosystem process studies, and integrated modeling.

National Severe Storms Laboratory (NSSL), Norman, Oklahoma
NSSL focuses on understating the causes of severe weather, such as tornadoes, flash floods, hail, damaging winds, and winter weather, in order to improve the lead time and accuracy of severe weather forecasts and warnings.

Pacific Marine Environmental Laboratory (PMEL), Seattle, Washington
PMEL explores the complex physical and geochemical processes operating in the world's oceans, including the processes driving ocean circulation and the global climate system.

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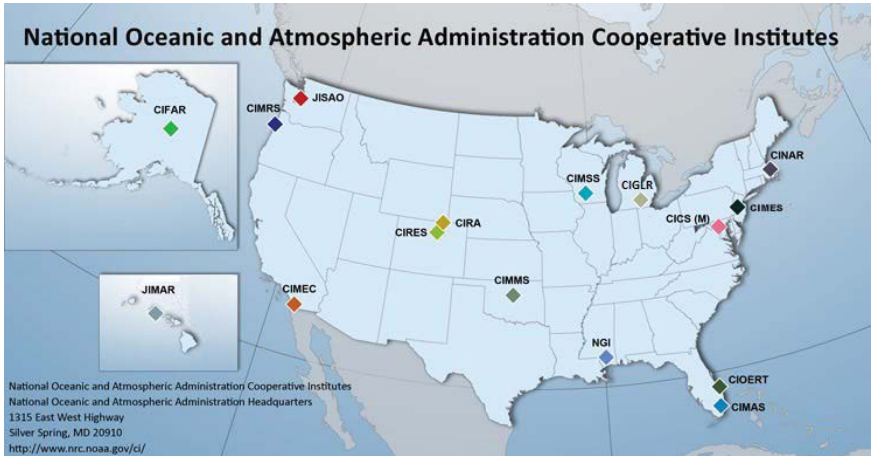
Oceanic and Atmospheric Research
Budget Estimates, Fiscal Year 2020

OAR Cooperative Institutes:

OAR Cooperative Institutes (CIs) are long-term collaborations between NOAA and academic and scientific institutions dedicated to advancing oceanic and atmospheric research. CIs are co-located with one or more NOAA facilities to promote scientific exchange and technology transfer. Each CI is competitively selected to address a specific research theme within NOAA's mission, such as weather forecast improvement or ecosystem forecasting. These partnerships help maximize scientific breadth, quality, productivity, and return on investment. NOAA currently supports 16 CIs consisting of 42 universities and research institutions across 23 states and the District of Columbia.



NOAA's Cooperative Institutes and their host institution are:

- CI for Alaska Research (CIFAR), University of Alaska - Fairbanks
- CI for Climate and Satellites (CICS-M), University of Maryland - College Park
- CI for Modeling the Earth System (CIMES), Princeton University
- CI for Great Lakes Research (CIGLR), University of Michigan
- CI for Marine and Atmospheric Studies (CIMAS), University of Miami
- CI for Marine Ecosystems & Climate (CIMEC), University of California - San Diego
- CI for Marine Resources Studies (CIMRS), Oregon State University
- CI for Mesoscale Meteorological Studies (CIMMS), University of Oklahoma
- CI for the North Atlantic Region (CINAR), Woods Hole Oceanographic Institution
- CI for Ocean Exploration, Research & Technology (CIOERT), Florida Atlantic University
- CI for Research in the Atmosphere (CIRA), Colorado State University
- CI for Research in Environmental Sciences (CIRES), University of Colorado
- CI for Meteorological Satellite Studies (CIMSS), University of Wisconsin - Madison
- CI for the Pacific Island Region (CIPIR), University of Hawaii
- Joint Institute for the Study of the Atmosphere & Ocean (JISAO), University of Washington
- Northern Gulf Institute (NGI), Mississippi State University

Department of Commerce
National Oceanic and Atmospheric Administration
Salaries and Expenses
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Research
Subactivity: Climate Competitive Research Transfer to USWRP

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	5,648	0	2,168
11.3	Other than full-time permanent	248	0	146
11.5	Other personnel compensation	73	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	5,969	0	2,314
12	Civilian personnel benefits	1,791	0	694
13	Benefits for former personnel	3	0	0
21	Travel and transportation of persons	470	0	234
22	Transportation of things	146	0	0
23	Rent, communications, and utilitites		0	
23.1	Rental payments to GSA	799	0	799
23.2	Rental Payments to others	340	0	0
23.3	Communications, utilities and misc charges	855	0	682
24	Printing and reproduction	34	0	0
25.1	Advisory and assistance services	2,878	(2,451)	387
25.2	Other services from non-Federal sources	6,375	0	4,239
25.3	Other goods and services from Federal sources	1,133	0	1,082
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	86	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	1,219	0	691
31	Equipment	304	0	0
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	37,598	(3,225)	28,926
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	60,000	(5,676)	40,048

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
Salaries and Expenses
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: U.S. Weather Research Program (USWRP)
Subactivity: USWRP Transfer from Climate Competitive Research

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	437	0	454
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	4	0	4
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	441	0	458
12	Civilian personnel benefits	132	0	137
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	34	0	34
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites		0	
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	5	0	5
25.1	Advisory and assistance services	118	2,451	2,569
25.2	Other services from non-Federal sources	2,036	0	4,716
25.3	Other goods and services from Federal sources	217	0	217
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	303	0	303
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	51	0	51
31	Equipment	109	0	109
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	13,554	3,225	16,781
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	17,000	5,676	25,380

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
Salaries and Expenses
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Research
Subactivity: Climate Competitive Research Transfer to Climate Laboratories & Cooperative Institutes

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	5,648	(3,514)	2,168
11.3	Other than full-time permanent	248	(102)	146
11.5	Other personnel compensation	73	(73)	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	5,969	(3,689)	2,314
12	Civilian personnel benefits	1,791	(1,104)	694
13	Benefits for former personnel	3	(3)	0
21	Travel and transportation of persons	470	(236)	234
22	Transportation of things	146	(146)	0
23	Rent, communications, and utilitites		0	
23.1	Rental payments to GSA	799	0	799
23.2	Rental Payments to others	340	(340)	0
23.3	Communications, utilities and misc charges	855	(173)	682
24	Printing and reproduction	34	(34)	0
25.1	Advisory and assistance services	2,878	(40)	387
25.2	Other services from non-Federal sources	6,375	(2,136)	4,239
25.3	Other goods and services from Federal sources	1,133	(51)	1,082
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	86	(86)	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	1,219	(528)	691
31	Equipment	304	(304)	0
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	37,598	(5,461)	28,926
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	60,000	(14,331)	40,048

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
Salaries and Expenses
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Laboratories & Competitive Institutes
Subactivity: Climate Laboratories & Competitive Institutes Transfer from Climate Competitive Research

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	19,648	3,514	23,911
11.3	Other than full-time permanent	336	102	438
11.5	Other personnel compensation	361	73	434
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	20,345	3,689	24,783
12	Civilian personnel benefits	6,104	1,104	7,529
13	Benefits for former personnel	0	3	3
21	Travel and transportation of persons	765	236	1,001
22	Transportation of things	736	146	882
23	Rent, communications, and utilitites		0	
23.1	Rental payments to GSA	1,580	0	1,580
23.2	Rental Payments to others	5	340	345
23.3	Communications, utilities and misc charges	508	173	681
24	Printing and reproduction	1,302	34	1,336
25.1	Advisory and assistance services	221	40	261
25.2	Other services from non-Federal sources	9,917	2,136	12,053
25.3	Other goods and services from Federal sources	876	51	927
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	78	86	164
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	2,670	528	3,198
31	Equipment	1,057	304	1,361
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	14,836	5,461	20,297
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	61,000	14,331	76,401

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
Salaries and Expenses
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: U.S. Weather Research Program (USWRP)
Subactivity: USWRP Transfer from NESDIS Product Development, Readiness & Stewardship (PDR&A)

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	437	0	454
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	4	0	4
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	441	0	458
12	Civilian personnel benefits	132	0	137
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	34	0	34
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites		0	
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	5	0	5
25.1	Advisory and assistance services	118	0	2,569
25.2	Other services from non-Federal sources	2,036	2,680	4,716
25.3	Other goods and services from Federal sources	217	0	217
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	303	0	303
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	51	0	51
31	Equipment	109	0	109
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	13,554	0	16,781
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	17,000	2,680	25,380

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

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Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Enacted		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
OFFICE OCEANIC AND ATMOSPHERIC RESEARCH (OAR)											
Climate Research	Pos/BA	308	158,000	308	159,000	308	154,500	283	87,509	(25)	(66,991)
	FTE/OBL	297	159,216	297	159,000	297	154,500	273	87,509	(24)	(66,991)
Weather & Air Chemistry	Pos/BA	262	131,516	262	135,380	262	144,676	225	110,565	(37)	(34,111)
Research	FTE/OBL	237	135,983	237	135,380	237	144,676	201	110,565	(36)	(34,111)
Ocean, Coastal, and Great	Pos/BA	221	205,823	221	218,500	221	219,335	204	98,840	(17)	(120,495)
Lakes Research	FTE/OBL	211	209,257	211	218,500	211	219,335	194	98,840	(17)	(120,495)
Innovative Research & Technology	Pos/BA	15	12,180	15	12,180	15	12,235	15	12,235	0	0
	FTE/OBL	14	12,324	14	12,180	14	12,235	14	12,235	0	0
TOTAL OAR - ORF	**Pos/BA**	**806**	**507,519**	**806**	**525,060**	**806**	**530,746**	**727**	**309,149**	**(79)**	**(221,597)**
	FTE/OBL	**759**	**516,780**	**759**	**525,060**	**759**	**530,746**	**682**	**309,149**	**(77)**	**(221,597)**
Systems Acquisition	Pos/BA	0	41,000	0	41,000	0	41,000	0	26,000	0	(15,000)
	FTE/OBL	0	41,000	0	41,000	0	41,000	0	26,000	0	(15,000)
TOTAL OAR - PAC	**Pos/BA**	**0**	**41,000**	**0**	**41,000**	**0**	**41,000**	**0**	**26,000**	**0**	**(15,000)**
	FTE/OBL	**0**	**41,000**	**0**	**41,000**	**0**	**41,000**	**0**	**26,000**	**0**	**(15,000)**
TOTAL OAR	**Pos/BA**	**806**	**548,519**	**806**	**566,060**	**806**	**571,746**	**727**	**335,149**	**(79)**	**(236,597)**
	FTE/OBL	**759**	**557,780**	**759**	**566,060**	**759**	**571,746**	**682**	**335,149**	**(77)**	**(236,597)**

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(Dollar amounts in thousands)

Activity: Climate Research

Goal Statement

The mission of the Climate Research in OAR is to monitor and understand Earth's climate system to predict potential changes in global climate, as well as understand and communicate to the public and decision-makers near-term, regional climate variations that are of societal and economic importance. The long-term observing, monitoring, research, and modeling capabilities performed in OAR's Climate Research provides the science that Americans need to understand how, where, and when Earth's conditions are changing.

Base Program

NOAA's climate research activities are authorized under the National Climate Program Act (15 U.S.C. §§ 2901-2908), the Global Change Research Act (15 U.S.C. §§ 2921-2961), and the Weather Research and Forecasting Innovation Act (15 U.S.C. § 8501). In 2018, there were 14 weather and climate disaster events with losses exceeding $1 billion each across the United States. These events included 1 drought event, 8 severe storm events, 2 tropical cyclone events, 1 wildfire event, and 2 winter storm events. Overall, these events resulted in the deaths of 247 people and had significant economic effects on the areas impacted. Businesses, policy leaders, resource managers and citizens are increasingly asking for information to help them address challenges like these.

The following three Subactivities are included in the Climate Research Portfolio:

- *Laboratories & Cooperative Institutes*: OAR's Laboratories and Cooperative Institutes primarily support Earth System science research, modeling, and technology development and maintain long-term atmospheric observation networks and infrastructure, including a network of tall towers and the Atmospheric Baseline Observatories (ABOs) which collect data on the atmosphere's composition.
- *Regional Climate Data & Information*: OAR supports activities that improve resilience and preparedness throughout the Nation with research that advances our understanding of climate-related risks and vulnerabilities across sectors and regions and with the development of tools to enable more informed decision making.
- *Climate Competitive Research*: OAR funds high-priority climate science through a competitive selection process to advance understanding of the Earth's climate system and climate impacts on society.

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Statement of Operating Objectives

Schedule and Milestone Highlights
FY 2020–2024
Laboratories and Cooperative Institutes

- Publish updates on Annual Greenhouse and Ozone Depleting Gas Indices
- Apply new Earth system modeling for tipping point prediction in global estuarine, coastal, and benthic ecosystems
- Deploy and maintain an array of 1,200 surface drifters
- Maintain and augment 38 moorings that measure carbon dioxide (CO_2) and ocean acidification
- Complete 1-2 cruises that will collect important ocean chemistry data while servicing moorings and collecting information on coastal and deep ocean currents
- Long term global records of greenhouse gases, stratospheric ozone, and aerosols

Regional Climate Data & Information

- Improve drought indicators and indices in support of the Regional Drought Early Warning Information System
- Conduct climate training for tribal communities in the Southern U.S.
- Lead and support the quadrennial National Climate Assessment and the Scientific Assessment of Ozone Depletion, under the Montreal Protocol on Substances that Deplete the Ozone Layer
- Test experimental drought indicators based on decision making needs in the NIDIS Pilot regions

Climate Competitive Research Subactivity

- Expand Earth system data collection for cryospheric, boundary layer properties, hydrometeorological, and oceanic process studies
- Increase, from two to five, the cumulative number of science-based adaptation tools and technologies that are used by NOAA partners and stakeholders to improve ecosystem-based management of fisheries

Deliverable Highlights
Laboratories and Cooperative Institutes

- Long term global records of atmospheric compounds, up to 55 trace gases, stratospheric ozone, aerosols, and surface radiation

- Updated status of South Pole Ozone hole

Regional Climate Data & Information

- Forty total interoperable drought systems accessible through the U.S. Drought Portal
- Increased skill and capacity among stakeholders in businesses and communities to build resilience to climate-related impacts
- Climate.gov received more than 9 million visits in FY 2018 (averaging over 751,000 visits per month), which was a 18.36 percent increase in visit rate over FY 2017
- Climate training workshops and reports directed to the needs of resource managers

Climate Competitive Research Subactivity

- In FY 2018, OAR's Climate Program Office (CPO) supported projects, ranging from advancing the understanding and prediction of drought to building resilience in coastal communities, conducted by universities, other research institutions, and other federal agencies

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Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Laboratories & Cooperative Institutes (Climate Research)	Pos/BA	236	60,000	236	61,000	279	76,401
	FTE/OBL	227	60,076	227	61,000	270	76,401
Regional Climate Data & Information	Pos/BA	28	38,000	28	38,000	14	38,051
	FTE/OBL	27	37,754	27	38,000	13	38,051
Climate Competitive Research	Pos/BA	44	60,000	44	60,000	15	40,048
	FTE/OBL	43	59,966	43	60,000	14	40,048
	Pos/BA	308	158,000	308	159,000	308	154,500
Total Climate Research	FTE/OBL	297	157,796	297	159,000	297	154,500

During 2018, the U.S. experienced a very active year of weather and climate disasters. In total, the U.S. was impacted by 14 separate billion-dollar disaster events: two tropical cyclones, eight severe storms, two winter storms, drought, and wildfires. The past three years (2016-2018) have been historic, with the annual average number of billion-dollar disasters being more than double the long-term average. From 2016-2018, the U.S. was impacted by 6 separate billion-dollar hurricanes (i.e., Matthew, Harvey, Irma, Maria, Florence, Michael) with an inflation-adjusted loss total of $329.9 billion and 3,318 fatalities. Additionally, there is no modern comparison regarding the scale and cost of the 2017 and 2018 Western wildfire seasons. In total, over 18 million combined acres burned in 2017 and 2018, with costs in excess of $40 billion. The total U.S. wildfire costs for the last two years is roughly equal the costs of the previous 37 years combined (1980-2016). On average, previous U.S. wildfire seasons have cost $1.0-2.0 billion annually. The wildfire conditions were enhanced by the preceding drought conditions. During the 2018 wildfire season, 106 lives were lost and the Camp Fire in California was the deadliest U.S. wildfire in over 100 years (i.e., Moose Lake and Cloquet Fires of October 1918).

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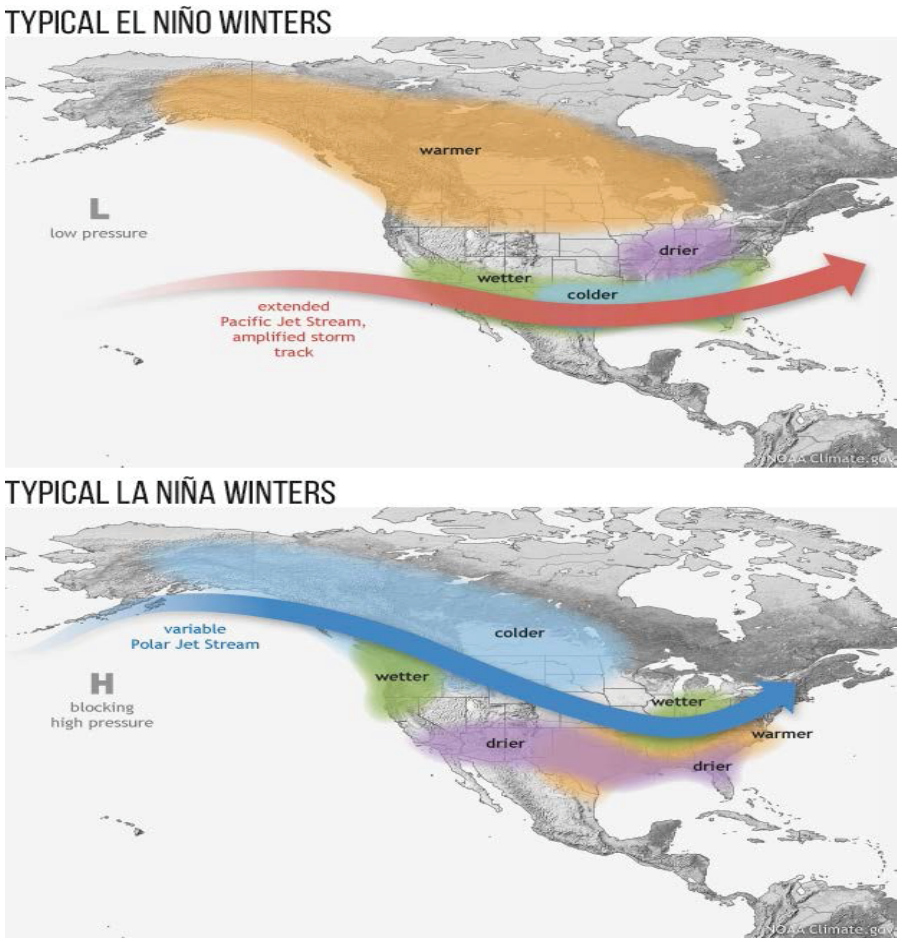
Climate Research continues to sustain its investments and partnerships in global ocean observation and monitoring systems and participated in scientific field campaigns, like "Years of the Maritime Continent" — a 2-year joint research project to improve understanding and prediction of variability over the Indo-Pacific Ocean region, and how that influences weather patterns around the world. Climate Research has advanced use of autonomous robotic ocean profiling instruments such as Deep Argo and saildrones. Ocean observations led to assessments of ocean acidification impacts to coral reefs and fisheries and to sea level change risks that improved coastal community preparedness. Climate Research-sponsored field campaigns also conducted research on impacts to air quality from urban emissions and wildfires, which can adversely impact human health and the nation's economy due to reduced productivity. In its continuing efforts to help bolster the nation's economy and meet stakeholders' need for science-based decision support, Climate Research enhanced its Regional Drought Early Warning Systems and expanded its online "Climate Explorer" tool, whereby decision makers can access maps and graphs of downscaled climate projections of decision-relevant variables for their county, like the annual numbers of days above or below critical temperature, precipitation, and high-tide flooding thresholds. Similar tools were developed to improve heat risk information and address other health impacts.



NOAA Climate Research

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OAR's Climate Research is collaborative and crosscutting and therefore is often funded through multiple Subactivities. Some cross-cutting themes include:

Global Observations
To better document and understand global processes, OAR provides an array of observational capabilities. For example, OAR's four ABOs have been collecting 250 measurements of atmospheric trends for over 50 years such that measurements conducted in the 1960s are exactly comparable to those made today and 100 years from now. These observations and supplemental measurements help identify trends and anomalies in the atmosphere, like radioactive dust releases and transport of mercury in the air from China to the U.S., and their impacts. With this information, decision-makers are better able to address global atmospheric challenges. For example, OAR's long-term and on-going measurements of ozone, UV, and ozone-depleting compounds help policymakers identify successes and needs to repair the ozone layer. OAR also supports the Global Ocean Observing System including the drifting buoy network, Argo profiling floats, tropical moored arrays in the Atlantic, and ocean carbon networks, and continually researches new climate observing strategies.

Predicting Future Change
OAR's Climate Research predicts future change to inform decision making. The Earth System comprises many physical, chemical and biological processes that need to be dynamically integrated to better predict their behavior over scales from local to global and periods of minutes to millennia. OAR research produces state-of-the-art models of the Earth System to better predict climate extremes and variability impacting the U.S., such as changes in the risk for heavy rainfall and snow events during an El Niño, frequency of high-impact weather events, and ocean dynamics like the Meridional Overturning Circulation.

Assessing Impacts
OAR Climate Research provides in-depth analysis of climate change impacts on the United States. OAR assesses the multitude of ways climate change is already affecting and will increasingly affect the lives of Americans. For example, the National Climate Assessment details the changes various geographic regions and economic sectors are experiencing and can expect to experience in the future. Past assessments have included studies of how climate impacts tornadoes, sea level, and drought. This research is pointing to more effective ways to meet environmental management and policy goals while avoiding costly overregulation.

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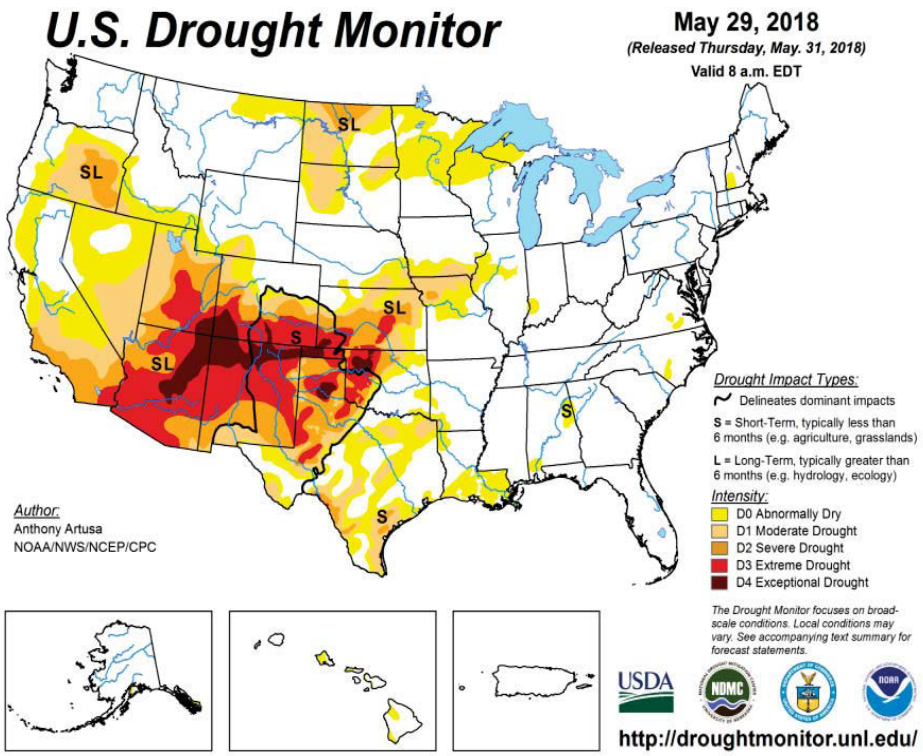

The U.S. Drought Monitor (pictured above) is a weekly map based on measurements of climatic, hydrologic, and soil conditions as well as reported impacts and observations collected from more than 350 contributors around the U.S.

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Supporting Decisions
OAR Climate Research also delivers resources and tools to foster resilience and preparedness throughout the U.S. and abroad, across sectors and regions. In particular, Regional Integrated Sciences and Assessments support external research teams who collaborate with regional decision makers (such as water utilities, coastal managers, and city and state planners) to develop information for science-based management of natural resources, infrastructure, transportation, and public health. This program works closely with other areas of OAR Climate Research, including the NOAA-led National Integrated Drought Information System (NIDIS), established by the National Integrated Drought Information System Act of 2006 and amended in the National Integrated Drought Information System Reauthorization Act of 2018. NIDIS provides accessible drought information for the Nation through improved drought monitoring and forecasting capabilities. In addition, the NOAA Climate.gov Portal provides easy public access to NOAA and its partners' climate data and information services. Climate.gov also hosts and supports the U.S. Climate Resilience Toolkit (toolkit.climate.gov).

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Climate Laboratories &	Pos./BA	279	76,401	279	75,903	0	(498)
Cooperative Institutes	FTE/Obl.	270	76,401	270	75,903	0	(498)

Laboratories and Cooperative Institutes Decrease (-$498, 0 FTE/ 0 Positions) – With this reduction, NOAA will decrease the funding used to support activities in its Climate Labs and CIs funding line. The Consolidated Appropriations Act, 2019 provides NOAA additional funding that was directed to prioritized efforts within NOAA's Climate Laboratories. These activities included socioeconomic studies on the localized impacts of severe weather and seasonal to decadal climate work to help NOAA meet its mission responsibilities to inform long-term planning and preparedness.

Schedule and Milestones
FY 2020

- Decrease funding for Laboratories and Cooperative Institute activities

Deliverables

- Decrease funding for climate socioeconomics studies
- Decrease funding for seasonal to decadal climate research

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Research
Subactivity: Climate Laboratories & Cooperative Institutes
Program Change: Laboratories & Cooperative Institutes Decrease

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	19,282	19,648	23,911	23,911	0
11.3	Other than full-time permanent	336	336	438	438	0
11.5	Other personnel compensation	361	361	434	434	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	19,979	20,345	24,783	24,783	0
12	Civilian personnel benefits	5,994	6,104	7,529	7,529	0
13	Benefits for former personnel	0	0	3	3	0
21	Travel and transportation of persons	765	765	1,001	1,001	0
22	Transportation of things	736	736	882	882	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	1,580	1,580	1,580	1,580	0
23.2	Rental Payments to others	5	5	345	345	0
23.3	Communications, utilities and misc charges	508	508	681	681	0
24	Printing and reproduction	1,302	1,302	1,336	1,336	0
25.1	Advisory and assistance services	221	221	261	261	0
25.2	Other services from non-Federal sources	9,917	9,917	12,053	12,053	0
25.3	Other goods and services from Federal sources	876	876	927	927	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	78	78	164	164	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,670	2,670	3,198	3,198	0
31	Equipment	1,057	1,057	1,361	1,361	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	14,388	14,836	20,297	19,799	(498)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	60,076	61,000	76,401	75,903	(498)

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		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Climate Laboratories &	Pos./BA	279	76,401	279	74,461	0	(1,940)
Cooperative Institutes	FTE/Obl.	270	76,401	270	74,461	0	(1,940)

Arctic Research Elimination (-$1,940, 0 FTE/ 0 Positions) – With this reduction, NOAA will eliminate Arctic research within the Climate Laboratories & Cooperative Institutes Subactivity. Arctic research will also be eliminated in the Regional Climate Data & Information Subactivity, described below (OAR - 26). NOAA's budget proposes to terminate improvements to sea ice modeling and predictions. Many other Arctic research products, including future scenarios for changes to Arctic Ocean sea-ice extent, ecosystem and fisheries vulnerabilities, and ocean acidification will also be eliminated. This proposed decrease will reduce support for research related to mid-latitude weather and other Arctic projects conducted with other NOAA Line Offices.

Schedule and Milestones
FY 2020
- Conclude Arctic research activities within OAR
- Reduce program to support highest priority activities within available climate research funding

FY 2021–2024
- Maintain support for highest priority activities within available climate research funding

Deliverables
Terminate Arctic research activities

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Annual number of advances in climate and weather research and information products transitioned to a new stage (development, demonstration, or application) to improve earth system understanding and provide information to private and public sectors with decrease	6	6	6	6	6
Annual number of advances in climate and weather research and information products transitioned to a new stage (development, demonstration, or application) to improve earth system understanding and provide information to private and public sectors without decrease	7	7	7	7	7

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Research
Subactivity: Climate Laboratories & Cooperative Institutes
Program Change: Arctic Research Elimination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	19,282	19,648	23,911	23,911	0
11.3	Other than full-time permanent	336	336	438	438	0
11.5	Other personnel compensation	361	361	434	434	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	19,979	20,345	24,783	24,783	0
12	Civilian personnel benefits	5,994	6,104	7,529	7,529	0
13	Benefits for former personnel	0	0	3	3	0
21	Travel and transportation of persons	765	765	1,001	981	(20)
22	Transportation of things	736	736	882	872	(10)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	1,580	1,580	1,580	1,580	0
23.2	Rental Payments to others	5	5	345	345	0
23.3	Communications, utilities and misc charges	508	508	681	681	0
24	Printing and reproduction	1,302	1,302	1,336	1,336	0
25.1	Advisory and assistance services	221	221	261	261	0
25.2	Other services from non-Federal sources	9,917	9,917	12,053	12,053	0
25.3	Other goods and services from Federal sources	876	876	927	927	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	78	78	164	139	(25)
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,670	2,670	3,198	3,098	(100)
31	Equipment	1,057	1,057	1,361	1,334	(27)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	14,388	14,836	20,297	18,539	(1,758)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	60,076	61,000	76,401	74,461	(1,940)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Regional Climate Data &	Pos./BA	14	38,051	14	34,306	0	(3,745)
Information	FTE/Obl.	13	38,051	13	34,306	0	(3,745)

Arctic Research Elimination (-$3,745, 0 FTE/ 0 Positions) – With this reduction, NOAA will eliminate Arctic research within the Regional Climate Data & Information Subactivity. Arctic Research will also be eliminated in the Climate Laboratories & Cooperative Institutes Subactivity, described above (OAR - 23). NOAA's budget proposes to terminate improvements to sea ice modeling and predictions. Many other Arctic research products, including future scenarios for changes to Arctic Ocean sea-ice extent, ecosystem and fisheries vulnerabilities, and ocean acidification will also be eliminated. This proposed decrease will reduce support for research related to mid-latitude weather and other Arctic projects conducted with other NOAA Line Offices.

Schedule and Milestones
FY 2020
- Conclude Arctic research activities within OAR
- Reduce program to support highest priority activities within available climate research funding

FY 2021–2024
- Maintain support for highest priority activities within available climate research funding

Deliverables
Terminate Arctic research activities

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Annual number of advances in climate and weather research and information products transitioned to a new stage (development, demonstration, or application) to improve earth system understanding and provide information to private and public sectors with decrease	6	6	6	6	6
Annual number of advances in climate and weather research and information products transitioned to a new stage (development, demonstration, or application) to improve earth system understanding and provide information to private and public sectors without decrease	7	7	7	7	7

Exhibit 15

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Subactivity: Regional Climate Data & Information
Program Change: Arctic Research Elimination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,594	2,643	2,679	2,679	0
11.3	Other than full-time permanent	41	41	41	41	0
11.5	Other personnel compensation	9	9	9	9	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,644	2,693	2,729	2,729	0
12	Civilian personnel benefits	793	808	823	823	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	182	182	182	105	(77)
22	Transportation of things	43	43	43	32	(11)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	191	191	191	191	0
23.2	Rental Payments to others	33	33	33	33	0
23.3	Communications, utilities and misc charges	2	2	2	2	0
24	Printing and reproduction	11	11	11	8	(3)
25.1	Advisory and assistance services	1,704	1,704	1,704	1,061	(643)
25.2	Other services from non-Federal sources	5,571	5,571	5,571	5,571	0
25.3	Other goods and services from Federal sources	1,684	1,684	1,684	1,684	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	7	7	7	7	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	218	218	218	74	(144)
31	Equipment	319	319	319	319	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	24,352	24,534	24,534	21,667	(2,867)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	37,754	38,000	38,051	34,306	(3,745)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Regional Climate Data &	Pos./BA	14	38,051	4	17,291	(10)	(20,760)
Information	FTE/Obl.	13	38,051	3	17,291	(10)	(20,760)

Eliminate Climate Competitive Research Funding (-$20,760, -10 FTE/ -10 Positions) – With this reduction, NOAA will eliminate climate competitive research activities in the Regional Climate Data and Information Subactivity, terminating the Regional Integrated Sciences and Assessments Program (RISA) program, and eliminating NOAA's portion of the funding for the National Climate Assessment. With this termination, NOAA will explore a range of options to address staffing, including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP), and other options will be requested and/or explored.

This request will terminate the Regional Integrated Sciences and Assessments Program (RISA) program, by eliminating the ten RISA teams and partnerships and reducing regionally tailored decision-support tools that support disaster management and city planning. The RISA program supports ten external research teams who collaborate with regional decision makers to provide data and tools on the impacts of extreme weather and climate events on society, natural and managed resources, infrastructure, and health. The RISA teams partner with other Federal entities such as U.S. Department of Agriculture (USDA), U.S. Department of the Interior (DOI), U.S. Environmental Protection Agency (EPA), and Federal Emergency Management Agency (FEMA) to build connections. Stakeholders from regions across the country will continue to receive weather and climate data and information from programs within NOAA, across the federal government, and private sector climate services. Private sector climate services is a rapidly growing, multi-billion dollar industry and may provide some of the same services as the RISA program.

This request will terminate NOAA's portion of the funding dedicated to the National Climate Assessment. The Global Change Research Act of 1990 requires a National Climate Assessment not less frequently than every four years. NOAA led the Federal effort to develop the 2014 and the 2018 National Climate Assessments. The required National Climate Assessments will continue to be produced with available funding in NOAA and other federal agencies. NOAA will continue to lead this effort and provide necessary climate research and information using resources from other projects and programs.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Schedule and Milestones

FY 2020

- End climate competitive research activities in the Regional Climate Data and Information Subactivity
- Terminate the solicitation of proposals to expand applied research and engagement with local, state and regional decision makers
- Terminate dedicated Climate Assessment funding

FY 2021–2024

- Maintain support for National Integrated Drought Information System (NIDIS)
- Lead the 2022 National Climate Assessment

Deliverables

- Terminate competitive research funding under the Regional Climate Data and Information Subactivity
- Terminate Regional Integrated Sciences and Assessments Program (RISA)
- Terminate dedicated funding for the National Climate Assessment

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of assessment reports or integrated plans developed or implemented across NOAA programs to enhance NOAA climate services with decrease	0	0	0	0	0
Number of assessment reports or integrated plans developed or implemented across NOAA programs to enhance NOAA climate services without decrease	4	4	4	4	4

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Climate Research
Activity: Regional Climate Data & Information
Program Change: Eliminate Climate Competitive Research Funding

Title		Grade	Number	Annual Salary	Total Salaries
Management and Program Analyst		ZA-4	(6)	156	(934)
Program Analyst		ZA-3	(3)	112	(335)
Program Specialist		ZA-2	(1)	87	(87)
Total			(10)		(1,356)
Less lapse	0.00%		0		0
Total full-time permanent (FTE)			(10)		(1,356)
2020 Pay Adjustment (0%)	0.00%				0
					(1,356)

Personnel Data Summary	
Full-time Equivalent Employment (FTE)	
Full-time permanent	(10)
Total FTE	(10)
Authorized Positions:	
Full-time permanent	(10)
Total Positions	(10)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Climate Research
Subactivity: Regional Climate Data & Information
Program Change: Eliminate Climate Competitive Research Funding

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,594	2,643	2,679	1,323	(1,356)
11.3	Other than full-time permanent	41	41	41	0	(41)
11.5	Other personnel compensation	9	9	9	0	(9)
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,644	2,693	2,729	1,323	(1,406)
12	Civilian personnel benefits	793	808	823	397	(426)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	182	182	182	171	(11)
22	Transportation of things	43	43	43	1	(42)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	191	191	191	42	(149)
23.2	Rental Payments to others	33	33	33	0	(33)
23.3	Communications, utilities and misc charges	2	2	2	0	(2)
24	Printing and reproduction	11	11	11	7	(4)
25.1	Advisory and assistance services	1,704	1,704	1,704	0	(1,704)
25.2	Other services from non-Federal sources	5,571	5,571	5,571	5,383	(188)
25.3	Other goods and services from Federal sources	1,684	1,684	1,684	0	(1,684)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	7	7	7	0	(7)
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	218	218	218	20	(198)
31	Equipment	319	319	319	66	(253)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	24,352	24,534	24,534	9,881	(14,653)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	37,754	38,000	38,051	17,291	(20,760)

Department of Commerce
National Oceanic and Atmospheric Administration
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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Climate Competitive	Pos./BA	15	40,048	0	0	(15)	(40,048)
Research	FTE/Obl.	14	40,048	0	0	(14)	(40,048)

Eliminate Climate Competitive Research Subactivity (-$40,048, -14 FTE/ -15 Positions) – With this reduction, NOAA will eliminate the Climate Competitive Research Subactivity.

With this decrease, the Climate Program Office (CPO) will be reduced to the National Integrated Drought Information System (NIDIS) program. This will result in the termination of other CPO programs including the International Research and Applications Project (IRAP), the Coastal and Ocean Climate Applications (COCA), the Sectoral Applications Research Program (SARP), the Atmospheric Chemistry, Carbon Cycle, & Climate (AC4), the Climate Variability and Predictability (CVP) Program, and the Modeling, Analysis, Predictions, and Projections (MAPP) Program. NOAA will reduce competitive research grants to cooperative institutes, universities, NOAA research laboratories, and other partners. NOAA's extramural grant competitions fund research in all 50 states and support nine Cooperative Institutes (CI) focused on climate research. With this termination, NOAA will explore a range of options to address staffing, including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP), and other options will be requested and/or explored.

Schedule and Milestones
FY 2020

- End CPO's research, communication, education and engagement activities
- End OAR's Service Level Agreement with the National Weather Service (NWS) for climate funding
- Maintain support for the National Integrated Drought Information System (NIDIS) through the Regional Climate Data and Information PPA (OAR - 30)

Deliverables

- Terminate funding under the Climate Competitive Research Subactivity

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Annual number of new research awards to improve climate, understanding, prediction, and information with decrease	0	0	0	0	0
Annual number of new research awards to improve climate, understanding, prediction, and information without decrease	50	50	50	50	50

Performance Measures	2020	2021	2022	2023	2024
Annual number of advances in climate and weather research and information products transitioned to a new stage to improve earth system understanding and provide information to private and public sectors with decrease	0	0	0	0	0
Annual number of advances in climate and weather research and information products transitioned to a new stage to improve earth system understanding and provide information to private and public sectors without decrease	7	7	7	7	7

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Climate Research
Subactivity: Climate Competitive Research
Program Change: Eliminate Climate Competitive Research Funding

Title		Grade	Number	Annual Salary	Total Salaries
Director, Climate Program Office		SES	(1)	168	(168)
Physical Scientist		ZP-5	(4)	168	(671)
Supervisory Management & Program Analyst		ZA-5	(1)	168	(168)
Physical Scientist		ZP-4	(5)	160	(801)
Program Analyst		ZA-4	(1)	130	(130)
Physical Scientist		ZP-3	(1)	115	(115)
Program Analyst		ZA-3	(1)	115	(115)
Total			(14)		(2,168)
Less lapse	0.00%				
Total full-time permanent (FTE)			(14)		(2,168)
2020 Pay Adjustment (0%)	0.00%				0
Total					(2,168)

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	(14)
Other than full-time permanent	0
Total	(14)
Authorized Positions:	
Full-time permanent	(14)
Other than full-time permanent	0
Total	(14)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Climate Research
Subactivity: Climate Competitive Research
Program Change: Eliminate Climate Competitive Research Funding

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	5,543	5,648	2,168	0	(2,168)
11.3	Other than full-time permanent	248	248	146	0	(146)
11.5	Other personnel compensation	73	73	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	5,864	5,969	2,314	0	(2,314)
12	Civilian personnel benefits	1,759	1,791	694	0	(694)
13	Benefits for former personnel	3	3	0	0	0
21	Travel and transportation of persons	470	470	234	0	(234)
22	Transportation of things	146	146	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	799	799	799	0	(799)
23.2	Rental Payments to others	340	340	0	0	0
23.3	Communications, utilities and misc charges	855	855	682	0	(682)
24	Printing and reproduction	34	34	0	0	0
25.1	Advisory and assistance services	2,878	2,878	387	0	(387)
25.2	Other services from non-Federal sources	6,375	6,375	4,239	0	(4,239)
25.3	Other goods and services from Federal sources	1,133	1,133	1,082	0	(1,082)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	86	86	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,219	1,219	691	0	(691)
31	Equipment	304	304	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	37,701	37,598	28,926	0	(28,926)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	59,966	60,000	40,048	0	(40,048)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research

Goal Statement

Weather & Air Chemistry Research continually improves capabilities to provide more accurate and timely warnings and forecasts of various high-impact weather, water, and air quality events by prioritizing improvements in weather data observation, modeling, computing, forecasting, and warnings for the protection of life and property, for the enhancement of the national economy and in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

OAR's weather research laboratories, programs, and partners are key contributors to advancing the National Weather Service (NWS) prediction capabilities. In addition, scientists working within OAR's Weather & Air Chemistry Research study atmospheric chemistry to accurately characterize atmospheric composition and predict meteorological processes to more effectively understand their role in severe weather.

The following two Subactivities are included in Weather & Air Chemistry Research

- Laboratories & Cooperative Institutes: OAR's Laboratories & Cooperative Institutes primarily support weather forecasting improvement and air chemistry research, modeling, and technology development.
- Weather & Air Quality Research Programs: Primarily encourages cooperation with external experts in weather and air chemistry research by improving predictions and warnings for the public and weather sensitive U.S. industries with cutting-edge research, analysis techniques, and observing platforms.

NOAA's weather research activities are authorized under the Weather Service Modernization Act (Title VII, 15 U.S.C. § 313 note, §§ 701-709), the National Oceanic and Atmospheric Administration Authorization Act (Title I, § 108, 15 U.S.C. § 313 note), and the Weather Research and Forecasting Innovation Act (15 U.S.C. § 8501). NOAA also focuses resources on better understanding and providing information on seasonal (3 months to 2 years) and sub-seasonal (2 weeks to 3 months) outlooks for farmers, fishermen, emergency responders, other industry workers, and the American people regarding what to expect in two weeks, next month, or next season.

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(Dollar amounts in thousands)

Statement of Operating Objectives

Schedule and Milestone Highlights
FY 2020–2024
Laboratories & Cooperative Institutes

- Install domestic and international Science On a Sphere systems for educational exhibits in science museums and other venues for a cumulative total of 185 systems
- High-quality hurricane observations from airborne experiments for use in hurricane regional model data assimilation and evaluation

Weather & Air Quality Research Programs

- Advance radar capabilities to better estimate precipitation in the cool season using dual polarization techniques in operational radar's Multi Radar Multi Sensor (MRMS)
- Complete annual competitive grant process to select USWRP-funded and demonstration projects
- Build and evaluate Advanced Technology Demonstrator (ATD) as a proof-of-concept for phased array radar
- Review industry proposals for phased array radar pre-production contract award, provided that NOAA accepts phased array radar as its solution for its future radar system
- Test/evaluation of dual-polarization panel characteristics and performance on phased array radar systems including the ATD
- Improved tornado warning decision performance evaluated and quantified in collaboration with NWS forecasters within the HWT

Deliverable Highlights
Laboratories & Cooperative Institutes

- Tsunami observation, mitigation, and forecast tools
- Probabilistic products incorporated into flash flood forecasting system
- A total of 100,000 stations feeding observations data to the Meteorological Assimilation Data Ingest System (MADIS)
- Improved skill and reliability of flood and water supply forecasts

Weather & Air Quality Research Programs

- Prototype phased array radar products available for transfer into NOAA operations

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		FY 2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Laboratories & Cooperative Institutes (Weather & Air Chemistry Research)	Pos/BA	206	85,758	252	85,758	252	86,658
	FTE/OBL	204	85,387	227	85,758	227	86,658
U.S. Weather Research Program	Pos/BA	4	13,136	6	17,000	6	25,380
	FTE/OBL	4	12,624	6	17,000	6	25,380
Tornado Severe Storm Research/Phased Array Radar	Pos/BA	3	12,622	3	12,622	3	12,634
	FTE/OBL	3	12,305	3	12,622	3	12,634
Joint Technology Transfer Initiative	Pos/BA	1	20,000	1	20,000	1	20,004
	FTE/OBL	1	21,802	1	20,000	1	20,004
Total Weather & Air Chemistry Research	Pos/BA	214	131,516	262	135,380	262	144,676
	FTE/OBL	212	132,118	237	135,380	237	144,676

Overall, OAR's Weather Research supports

- Research and development that provides the Nation with accurate and timely warnings and forecasts of high-impact weather events and their broader impact on issues of societal concern such as weather and air chemistry; and
- Research that provides the scientific basis for informed management decisions about weather, water, and air chemistry.

In 2018, NOAA upgraded the two primary short-range weather models, the hourly-updating High-Resolution Rapid Refresh model (HRRR) and its "parent" model, the Rapid Refresh model (RAP). Decision makers in the weather, aviation, and energy forecasting communities rely on frequently updating sets of environmental data to produce accurate and detailed weather-related guidance. In support of these needs, the upgrades will allow NOAA, as well as other national forecast centers and local forecast offices across the

country, to nearly double the forecast period from 18 to 36 hours for hazardous weather and flooding potential. Aviation forecasts also boosted their forecast range to 39 hours from the previous 21 hours. The forecast area has also been expanded to include Alaska, where the primary mode of transportation is aircraft and predictions of small-scale details on clouds, visibility, and icing are vital for pilot safety. These updates provide the foundation for many of the forecast products issued by NOAA and represent the annual efforts of NOAA researchers to develop and transition research into operations. There will be few better examples of NOAA's research-to-operations than in FY19, when the implementation of "FV3" into NOAA's Global Forecast System reaches completion. The implementation of FV3 will mark the first system infrastructure upgrade to NOAA's flagship weather model in more than 35 years, representing the first step in re-engineering NOAA's models to provide best possible science-based predictions for the nation.

The 2018 Atlantic hurricane season was once again relentless with 15 named storms, including eight hurricanes of which two were "major" (Florence and Michael). NOAA's extensive observations collected during the 2018 Hurricane season provided landmark datasets for the evaluation of ocean models and hurricane forecast improvements, further progressing NOAA's ability to protect American life and property throughout each hurricane season. NOAA scientists and operational crew matched the busy season with a banner year for aircraft observations as NOAA's Hurricane Hunter aircraft flew more than 480 hours and deployed nearly 1200 severe weather reconnaissance devices. These missions provided critical real-time data and allowed researchers to test unmanned aircraft systems, observe critical stages of hurricane intensification, and evaluate the experimental Hurricane Weather Research and Forecasting (HWRF-B) model with its operational counterpart (HWRF) and official NHC forecasts.

OAR's Weather Research Portfolio is collaborative and crosscutting and therefore is often funded through multiple Subactivities. Some cross-cutting themes include:

Tornado Severe Storm Research / Phased Array Radar
OAR is working to couple weather forecast model information with dual-polarized radar observations to better determine the type and intensity of precipitation, and add the ability to classify hail size and detect tornado debris. Other radar research includes developing phased array radar, which can reduce the time to scan a weather system from 4-5 minutes to less than one minute, providing earlier weather predictions.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Each spring, during prime time for severe thunderstorms and tornadoes, the NOAA Hazardous Weather Testbed hosts experiments that bring together researchers, forecasters and academics to test new technologies. Forecasters and researchers get to walk in each other's shoes.

Forecaster and Researcher Collaboration
Researchers and forecasters work side-by-side throughout the year in the NOAA Hazardous Weather Testbed (HWT) to develop, test, and evaluate new forecast and warning strategies. Participants explore innovative radar and satellite technologies, decision support systems, and new weather and water prediction models. Each year, the HWT draws as many as 60 researchers and forecasters together for six to eight weeks to review emerging ideas and answer the question, “What do forecasters need?” HWT scientists also test new concepts and tools with forecasters in simulated settings and with real-time forecasts. This collaborative approach promotes effective transfer of research into forecasting and warning operations.

Earlier Warnings
Currently, NWS does not issue warnings for local severe weather until they see an early signal on radar, or the weather hazard is spotted. This approach provides the public with an average tornado warning lead time of 9 minutes. However, hospitals, nursing homes, large venue operators, aviation officials, and others require 30 minutes of lead time or more to move citizens to safety. Through its Warn-On-Forecast project, OAR is working to combine high-resolution surface satellite and radar data into a set of analyses allowing computer models to predict specific weather hazards 30-60 minutes before they form. This would enable decision-makers to take more effective action to mitigate damage and reduce injuries and loss of life.

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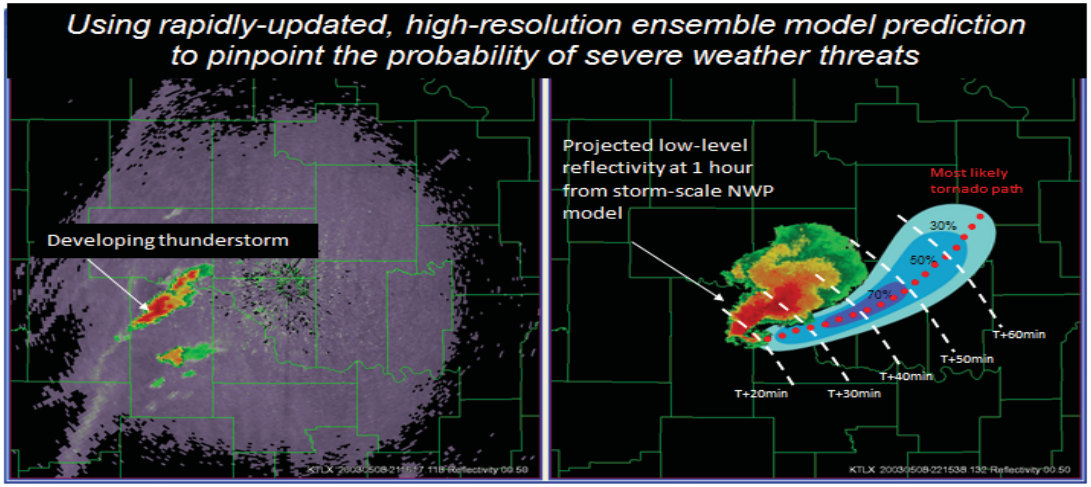
U.S. Weather Research Program

Through a competitive grant program, the U.S. Weather Research Program (USWRP) provides continuous improvements to understand, predict, and communicate information associated with hazardous weather, air quality and seasonal to sub-seasonal events. Results of this research are transferred to NWS after demonstration in several NOAA testbeds. Projects are selected using a peer-review process with NWS participation.



Earth Prediction Innovation Center

The National Integrated Drought Information System Reauthorization Act of 2018 expands Section 102(b) of the Weather Research and Forecasting Innovation Act of 2017 to include the Earth Prediction Innovation Center (EPIC) for advancing weather modeling skill and international leadership in the area of numerical weather prediction, and directs NOAA's U.S. Weather Research Program (USWRP) to carry out the activities of EPIC. The Act directs NOAA to create a true community global weather research modeling system that is accessible by the public and utilizes innovative strategies to host and manage the modeling system. EPIC leverages existing NOAA resources to accelerate advances to the Unified Forecast System (UFS), a community-based, coupled comprehensive Earth system model-based analysis and prediction system designed to meet NOAA's operational forecast mission to protect life and property and improve economic growth.

Department of Commerce
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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Improved Flood & Drought Predictions
Accurate rain and snowfall predictions help water and emergency managers better balance water supply needs. Partnering with NWS and other Federal, state, and local water resource agencies, OAR researches the extreme precipitation and weather conditions that can lead to flooding by evaluating new observations and modeling tools to improve these forecasts. Results from OAR's Hydrometeorology Testbed (HMT) enable forecasters to predict precipitation intensity, amount, and impacts more accurately and at higher resolutions, and to customize information to support local and regional decision-making. HMT participants on the West Coast discovered that the bulk of heavy precipitation associated with land-falling winter storms often occurs within "atmospheric rivers," which are corridors of concentrated water vapor transport. These results led the state of California and the HMT to launch a 100-station network of high tech sensors integrated with prediction models to improve lead times and forecast accuracy. Other regional efforts are underway in North Carolina, as well as pilots in the Pacific Northwest and Rocky Mountain West.

The Flooded Locations and Simulated Hydrographs (FLASH) project introduces a new paradigm in flash flood prediction. FLASH produces flash-flooding forecasts up to 6 hours in advance with a 5-min update cycle. The primary goal of the FLASH project is to improve the accuracy, timing, and specificity of flash flood warnings in the U.S., saving lives and protecting infrastructure.

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(Dollar amounts in thousands)

Whether it's fine particulate matter, or other airborne substances, air pollution can have significant impact on the environment and human health. OAR Weather Research & Air Chemistry provides a strong scientific understanding of these air chemistry problems to help all stakeholders make effective management decisions. With long-term monitoring of chemicals like mercury, nitrogen and other compounds, OAR provides data to identify sources and evaluate the effectiveness of emission controls. Data from these observations, along with model evaluations and other studies, help improve predictions of where airborne substances come from and where they will go. NWS uses OAR-developed air chemistry models to issue air quality warnings so that people can limit their exposure to air pollution. OAR's atmospheric dispersion models also predict impacts during emergencies, like the 2011 Fukushima, Japan disaster.

NOAA Research has developed a unique sampling system, called the

Unmanned Aircraft Systems

The Unmanned Aircraft Systems (UAS) program is working to advance the technological readiness of UAS systems and build capability for their application across the agency. Working with a large and diverse range of partners, UAS is demonstrating the utility of the technology for the agency: from observing high impact weather events like hurricanes (with NASA's UAS Global Hawk), to testing potent rapid response capability for oil spills in the Arctic, monitoring marine life or possible fishing violations, and conducting marine debris surveys (all with a thirteen-pound Puma UAS). Hurricane forecasting received a boost from UAS during the 2017 hurricane season as 2017 marked the first time that unmanned Global Hawk dropsondes were assimilated in real-time into hurricane forecasts generated by the Global Forecast System model. During Hurricane Maria, scientists launched six small Coyote drones to collect unique data from within the eyewall in the lower part of the storm where it gains strength from the ocean. This new information has the potential to provide weather models with information that improves predictions of hurricane intensification.

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Weather & Air Chemistry Research Laboratories and Cooperative Institutes	Pos./BA	252	86,658	217	81,815	-35	(4,843)
	FTE/Obl.	227	86,658	193	81,815	-34	(4,843)

The Air Resources Laboratory Closure (-$4,843, -35 FTE/ -34 Positions) – With this reduction, NOAA will close the Air Resources Laboratory and eliminate ARL's research on air chemistry, mercury deposition, and atmospheric dispersion of harmful materials in order to fund other priority programs. ARL's headquarters in College Park, MD will be closed, as will satellite campuses in Oak Ridge, TN, Idaho Falls, ID, Las Vegas, NV, and Mercury, NV. With this termination, NOAA will explore a range of options to address staffing, including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP), and other options will be requested and/or explored.

NOAA also will end ARL's applied research and observational data collection that is being used to study and project effects of air chemistry on human health and the environment. NOAA will no longer support the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model, which is used for emergency response applications and by researchers to study topics ranging from mercury deposition to anthrax bioterrorism. While HYSPLIT may still be used as a research and emergency response tool, ARL will no longer maintain HYSPLIT's online platform, provide support for users, or improve the model. The budget also ends ARL's support for agencies to predict where airborne hazardous materials – like acid rain, wildfire smoke, mercury contamination, or radioactive materials – will go. ARL has historically been funded out of both the Weather and Air Chemistry Research Laboratories and Cooperative Institutes Subactivity and the Climate Research Laboratories and Cooperative Institutes Subactivity. The U.S. Climate Reference Network (CRN) and other observational networks managed by ARL under OAR's Climate Research will be consolidated into other NOAA laboratories.

Schedule and Milestones
FY 2020
- Close the Air Resources Laboratory
- Consolidate ARL Climate Research into other NOAA laboratories

FY 2021–2024
- Maintain support for highest priority activities within available weather research funding

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(Dollar amounts in thousands)

Deliverables

- Terminate funding and close the Air Resources Laboratory

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of data and modeling products requested by the Department of Energy at the Idaho National Laboratory and the Nevada National Security Site in support of research studies, field experiments, and emergency response exercises and drills with termination	0	0	0	0	0
Cumulative number of data and modeling products requested by the Department of Energy at the Idaho National Laboratory and the Nevada National Security Site in support of research studies, field experiments, and emergency response exercises and drills without termination	51	68	85	102	102

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Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Weather & Air Chemistry Research
Subactivity: Weather and Air Chemistry Laboratories & Cooperative Institutes
Program Change: The Air Resources Laboratory Closure

Title		Grade	Number		Salary	Salaries
Supervisory Physical Scientist		ZP-5	(4)	$	125	(500)
Physical Scientist/Meteorologist/IT Specialist/Electronics Engineer		ZP-4	(14)	$	93	(1,309)
Management & Program Analyst		ZA-4	(2)	$	94	(189)
Meteorological Technician		ZT-4	(2)	$	67	(134)
Physical Scientist/Meterologist		ZP-3	(6)	$	66	(396)
Administrative Officer/Program Analyst/Budget Analyst		ZA-3	(5)	$	66	(330)
Program Specialist		ZA-2	(1)	$	48	(48)
Total			(34)			(2,905)
Less lapse	0.00%					
Total full-time permanent (FTE)			(34)			(2,905)
2020 Pay Adjustment (0%)	0.00%					0
Total						(2,905)

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	(34)
Other than full-time permanent	0
Total	(34)
Authorized Positions:	
Full-time permanent	(34)
Other than full-time permanent	0
Total	(34)

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: Weather & Air Chemistry Research Laboratories & CIs
Program Change: Air Resources Laboratory Closure

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	20,074	20,455	21,085	18,180	(2,905)
11.3	Other than full-time permanent	196	196	196	196	0
11.5	Other personnel compensation	299	299	299	299	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,569	20,950	21,580	18,675	(2,905)
12	Civilian personnel benefits	6,022	6,137	6,555	5,683	(872)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	969	969	969	953	(16)
22	Transportation of things	87	87	87	86	(1)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	3,422	3,422	3,422	3,422	0
23.2	Rental Payments to others	2,689	2,689	2,689	2,689	0
23.3	Communications, utilities and misc charges	936	936	936	933	(3)
24	Printing and reproduction	156	156	156	154	(2)
25.1	Advisory and assistance services	451	451	451	446	(5)
25.2	Other services from non-Federal sources	12,086	12,086	12,086	11,897	(189)
25.3	Other goods and services from Federal sources	810	810	810	653	(157)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	673	673	673	673	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,894	1,894	1,894	1,737	(157)
31	Equipment	3,995	3,995	3,995	3,913	(82)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	30,628	30,503	30,355	29,901	(454)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	85,387	85,758	86,658	81,815	(4,843)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Weather & Air Chemistry Research Laboratories and Cooperative Institutes	Pos./BA	252	86,658	249	81,261	-3	(5,397)
	FTE/Obl.	227	86,658	224	81,261	-3	(5,397)

The Unmanned Aircraft Systems (UAS) Program Office Closure (-$5,397, -3 FTE/ -3 Positions) – With this reduction, NOAA will close its program office dedicated to the research, development, and transition to application of new UAS observing strategies. In addition, NOAA will discontinue intramural grants to examine innovative UAS technologies to improve the efficiency and safety of observing operations across NOAA for weather prediction, earth system monitoring, and environmental research. With this termination, NOAA will explore a range of options to address staffing; including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP) and other options will be requested and/or explored.

The FY 2020 Budget requests a program increase of $4 million for a new operational program to efficiently and effectively manage use of unmanned systems within Office of Marine and Aviation Operations.

Schedule and Milestones
FY 2020
- Close the Unmanned Aircraft Systems Program Office

FY 2021–2024
- Maintain support for highest priority activities within available weather research funding

Deliverables
- Terminate funding and close the Unmanned Aircraft Systems Program Office

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of UAS projects which advance technology readiness for operations by at least one technology readiness level with termination	0	0	0	0	0
Number of UAS projects which advance technology readiness for operations by at least one technology readiness level without termination	2	2	2	2	2

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PROGRAM CHANGE PERSONNEL DETAIL

Activity: Weather & Air Chemistry Research
Subactivity: Weather and & Chemistry Laboratories & Cooperative Institutes
Program Change: The Unmanned Aircraft Systems Program Office Closure

Title		Grade	Number	Salary	Salaries
Supervisory Physical Scientist		ZP-5	(1)	$171	($171)
Management & Program Analyst		ZA-4	(1)	$125	($125)
Management & Program Analyst		ZA-3	(1)	$117	($117)
Total			(3)		($413)
Less lapse	0.00%		0		0
Total full-time permanent (FTE)			(3)		(413)
2020 Pay Adjustment (0%)	0.00%				0
Total					(413)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(3)
Other than full-time permanent	0
Total	(3)
Authorized Positions:	
Full-time permanent	(3)
Other than full-time permanent	0
Total	(3)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: Weather & Air Chemistry Research Laboratories & CIs
Program Change: The Unmanned Aircraft Systems (UAS) Program Office Closure

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	20,074	20,455	21,085	20,672	(413)
11.3	Other than full-time permanent	196	196	196	196	0
11.5	Other personnel compensation	299	299	299	299	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,569	20,950	21,580	21,167	(413)
12	Civilian personnel benefits	6,022	6,137	6,555	6,431	(124)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	969	969	969	786	(183)
22	Transportation of things	87	87	87	87	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	3,422	3,422	3,422	3,385	(37)
23.2	Rental Payments to others	2,689	2,689	2,689	2,689	0
23.3	Communications, utilities and misc charges	936	936	936	936	0
24	Printing and reproduction	156	156	156	156	0
25.1	Advisory and assistance services	451	451	451	451	0
25.2	Other services from non-Federal sources	12,086	12,086	12,086	8,192	(3,894)
25.3	Other goods and services from Federal sources	810	810	810	810	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	673	673	673	673	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,894	1,894	1,894	1,810	(84)
31	Equipment	3,995	3,995	3,995	3,826	(169)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	30,628	30,503	30,355	29,862	(493)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	85,387	85,758	86,658	81,261	(5,397)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Weather & Air Chemistry Research Laboratories and Cooperative Institutes	Pos./BA	252	86,658	252	81,692	0	(4,966)
	FTE/Obl.	227	86,658	227	81,692	0	(4,966)

The Vortex-Southeast Termination (-$4,966, 0 FTE/ 0 Positions) – With this reduction, NOAA will terminate Vortex-Southeast (VORTEX-SE), a project that seeks to improve tornado forecasts in the southeastern U.S. NOAA has used congressionally directed funding for field campaigns, science workshops, and data collection under VORTEX-SE to understand how to anticipate, detect, issue warnings against, and respond to forecast information regarding tornadoes in the Southeastern United States.

Schedule and Milestones
FY 2020
- Terminate VORTEX-SE

FY 2021–2024
- Maintain support for highest priority activities within available weather research funding

Deliverables
- Terminate funding for VORTEX-SE

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
VORTEX-SE studies completed annually with termination	0	0	0	0	0
VORTEX-SE studies completed annually without termination	10	10	10	10	10

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: Weather & Air Chemistry Research Laboratories & CIs
Program Change: Vortex-Southeast Termination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	20,074	20,455	21,085	21,085	0
11.3	Other than full-time permanent	196	196	196	196	0
11.5	Other personnel compensation	299	299	299	299	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,569	20,950	21,580	21,580	0
12	Civilian personnel benefits	6,022	6,137	6,555	6,555	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	969	969	969	755	(214)
22	Transportation of things	87	87	87	54	(33)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	3,422	3,422	3,422	3,422	0
23.2	Rental Payments to others	2,689	2,689	2,689	2,689	0
23.3	Communications, utilities and misc charges	936	936	936	936	0
24	Printing and reproduction	156	156	156	156	0
25.1	Advisory and assistance services	451	451	451	451	0
25.2	Other services from non-Federal sources	12,086	12,086	12,086	12,086	0
25.3	Other goods and services from Federal sources	810	810	810	810	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	673	673	673	176	(497)
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,894	1,894	1,894	1,894	0
31	Equipment	3,995	3,995	3,995	3,002	(993)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	30,628	30,503	30,355	27,126	(3,229)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	85,387	85,758	86,658	81,692	(4,966)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Weather & Air Chemistry Research Laboratories and Cooperative Institutes	Pos./BA	252	86,658	252	81,896	0	(4,762)
	FTE/Obl.	227	86,658	227	81,896	0	(4,762)

Laboratories and Cooperative Institutes Decrease (-$4,762, 0 FTE/ 0 Positions) – With this reduction, NOAA will decrease the funding used to advance priority activities in its Weather & Air Chemistry Laboratories and Cooperative Institutions Subactivity. In 2018, for example, these prioritized efforts included funding for the activities in support of the Weather Research and Forecasting Innovation Act of 2017 (Weather Act). These activities focused on high performance computing recapitalization of the Boulder, CO "Jet" supercomputer, support for OAR's Forecasting a Continuum of Environmental Threats (FACETs) work, support for Tornado Warning Extension Improvement Project in Section 103 of the Weather Act, and support for the Joint Center for Satellite Data Assimilation's (JCSDA) Joint Effort for Data assimilation Integration (JEDI) project to benefit the Next-Generation Global Prediction System (NGGPS) effort and data assimilation activities in the Weather Act. Many of these impacts may be offset through the program increase requested for the new Earth Prediction Innovation Center.

Schedule and Milestones
FY 2020

- Decrease funding for Laboratories and Cooperative Institute activities

Deliverables

- Decrease funding for weather research

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: Weather & Air Chemistry Research Laboratories & CIs
Program Change: Laboratories and Cooperative Institutes Decrease

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	20,074	20,455	21,085	21,085	0
11.3	Other than full-time permanent	196	196	196	196	0
11.5	Other personnel compensation	299	299	299	299	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	20,569	20,950	21,580	21,580	0
12	Civilian personnel benefits	6,022	6,137	6,555	6,555	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	969	969	969	969	0
22	Transportation of things	87	87	87	87	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	3,422	3,422	3,422	3,422	0
23.2	Rental Payments to others	2,689	2,689	2,689	2,689	0
23.3	Communications, utilities and misc charges	936	936	936	936	0
24	Printing and reproduction	156	156	156	156	0
25.1	Advisory and assistance services	451	451	451	451	0
25.2	Other services from non-Federal sources	12,086	12,086	12,086	10,657	(1,429)
25.3	Other goods and services from Federal sources	810	810	810	810	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	673	673	673	673	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,894	1,894	1,894	1,894	0
31	Equipment	3,995	3,995	3,995	3,995	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	30,628	30,503	30,355	27,022	(3,333)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	85,387	85,758	86,658	81,896	(4,762)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
U.S. Weather Research Program (USWRP)	Pos./BA	6	25,380	7	37,700	1	12,320
	FTE/Obl.	6	25,380	7	37,700	1	12,320

Earth Prediction Innovation Center ($12,320, 1 FTE/ 1 Positions) – To address long-standing challenges in migrating advancements in weather research to operations, this request will establish the Earth Prediction Innovation Center (EPIC) to accelerate community-developed scientific and technological enhancements into operational applications for numerical weather prediction (NWP). This virtual center will serve as the core research-to-operations-to-research (R2O2R) hub for a community modeling framework linking world class external scientists and software engineers with the research, development, and operational activities inside NOAA. EPIC will significantly amplify NOAA's access to NWP expertise nationally, reestablishing preeminence of U.S. operational forecast skill and enhancing its ability to provide accurate warnings of weather-based threats.

This request will allow EPIC to serve as a R2O2R testbed for advancing community-developed enhancements into the Unified Forecast System (UFS) through an objective verification and evaluation framework based on requirements defined by the NWP enterprise, including the National Weather Service Environmental Modeling Center (EMC). EPIC will enable leading scientists and software engineers to work collaboratively and effectively to improve the skill of the end-to-end operational modeling system. The UFS delivered through EPIC will use novel and more cost-effective cloud-based high-performance computing (HPC) to make the UFS available to a wide range of scientists and developers and enable a parallel testing environment that mirrors the operational configuration of the NOAA/NWS Environmental Modeling Center. This will accelerate innovation development by eliminating the computing bottleneck associated with serial testing environments on over-subscribed big iron HPC systems. EPIC will also maintain state of the art software development standards, infrastructure software, configuration management, and development / test / verification protocols and training to ensure the most efficient and rapid R2O processes.

EPIC will strongly leverage components of existing NOAA testbeds and established governance processes associated with R2O2R for NWP. Specifically, some components of the Joint Center for Satellite Data Assimilation (JCSDA) may be transferred to EPIC, including the Joint Effort for Data assimilation Integration (JEDI) and the Community Radiative Transfer Model (CRTM). In addition, elements of the Developmental Testbed Center (DTC) related to the UFS and community model development will be transitioned to

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(Dollar amounts in thousands)

EPIC. The total resource effort for the EPIC initiative in FY 2020 is $15 million. This includes a $2.7 million technical transfer from NESDIS (see OAR - 3) in addition to this $12.3 million request.

NOAA envisions other private, academia, and Federal agencies such as Department of Energy and Department of Defense, also participating in this endeavor in the future.

Schedule and Milestones
FY 2020-2024

- Design, build and implement a community model framework for the UFS that's scientifically credible, documented, supported, computationally flexible, managed and available to the scientific community for use in fundamental research or operational applications.
- Create and implement a parallel production environment for the UFS to mirror the operational configuration of the NOAA/NWS Environmental Modeling Center.
- Ensure the NGGPS community modeling framework is computationally flexible and can run on many HPC platforms, including cloud computing.
- Design, develop and implement national scale tutorials and scientific workshops to engage academia and the private sector in developing the UFS community model framework
- Bi-annual upgrade of FV3 based Global Ensemble Forecast System
- Annual upgrade of Hurricane Forecast System
- Implement FV3 based forecast system for weeks 3-4 (FY22)
- Implement FV3 based seasonal forecast system (FY23)
- Implement FV3 based Convection Allowing Regional Forecast System (FY23)

Deliverables

- Establish the community-based UFS
- Develop roadmap for regaining and maintaining international supremacy in weather modelling
- Establish community UFS code repository and collaborative developmental environment enabling broad research community contribution to the USF
- Provide updated Strategic Implementation Plan for the UFS on an annual basis
- Provide FV3 based Convection Allowing Regional Forecast System (FV3CAM)
- Provide FV3 based Hurricane Forecast System
- Provide FV3 based Seasonal Forecast System

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(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of national UFS tutorials and scientific workshops with increase	2	4	4	4	4
Number of national UFS tutorials and scientific workshops without increase	0	0	0	0	0

Performance Measures	2020	2021	2022	2023	2024
Increased useful forecast lead time (Days when GEFS 500 hpa CC drop to 0.6) with increase	8.4	8.4	8.5	8.5	8.6
Increased useful forecast lead time (Days when GEFS 500 hpa CC drop to 0.6) without increase	8.3	8.3	8.3	8.4	8.4

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PROGRAM CHANGE PERSONNEL DETAIL

Activity: Weather and Air Quality Research
Subactivity: Weather and Air Quality Research Programs
Program Change: Earth Prediction Innovation Center (EPIC)

Title		Grade	Number	Salary	Salaries
Program Manager		ZP-5	1	$167	$167
Total			1		$167
Less lapse	25.00%		0		(42)
Total full-time permanent (FTE)			1		125
2020 Pay Adjustment (0%)	0.00%				0
Total					125

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather and Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Earth Prediction Innovation Center

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	429	437	454	579	125
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	4	4	4	4	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	433	441	458	581	125
12	Civilian personnel benefits	130	132	137	175	38
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	34	34	34	44	10
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	5	5	5	5	0
25.1	Advisory and assistance services	118	118	2,569	2,569	0
25.2	Other services from non-Federal sources	2,036	2,036	4,716	4,716	0
25.3	Other goods and services from Federal sources	217	217	217	217	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	303	303	303	5,100	4,797
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	51	51	51	51	0
31	Equipment	109	109	109	109	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,188	13,554	16,781	24,131	7,350
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	12,624	17,000	25,380	37,698	12,320

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
U.S. Weather Research Program (USWRP)	Pos./BA	6	25,380	6	22,780	0	(2,600)
	FTE/Obl.	6	25,380	6	22,780	0	(2,600)

Airborne Phased Array Radar (APAR) Termination (-$2,600, 0 FTE/ 0 Positions) – With this reduction, NOAA will terminate research and development on improving the detection and understanding of severe weather with a new airborne phased array radar (APAR) and other airborne measurements. This will halt research and development by NOAA and its partners on advanced methods of aircraft-based hazardous weather observation that would make public warnings and forecasts more accurate by providing critical information about severe storms, tropical storms (and hurricanes), and heavy precipitation storms.

NOAA will no longer work with the research community to develop a prototype APAR system or examine the potential benefits of the system for providing the real-time data needed for National Weather Service forecasts and warnings and improving forecasts. OAR has already begun observation system simulation experiments (OSSE) and will obtain results for consideration of future APAR development. APAR is being terminated at this time to use constrained resources to maintain other critical weather research activities related to improvements in forecast/warning techniques and tools associated with high-impact weather, such as flash flooding, severe thunderstorms, and hurricanes, and the transition of that research into operations.

Schedule and Milestones
FY 2020
- Terminate APAR

FY 2021-2024
- Maintain support for highest priority activities within available weather research funding

Deliverables
- Terminate funding for the airborne phased array radar (APAR) research and development

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of forecast and mission improvements, based on The Weather Research and Forecasting Innovation Act of 2017, to weather applications at operational US weather services and in the US weather commercial sector with decrease	13	13	13	13	13
Number of forecast and mission improvements, based on The Weather Research and Forecasting Innovation Act of 2017, to weather applications at operational US weather services and in the US weather commercial sector without decrease	15	15	15	15	15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Weather and Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Airborne Phased Array Radar Termination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	429	437	454	454	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	4	4	4	4	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	433	441	458	458	0
12	Civilian personnel benefits	130	132	137	137	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	34	34	34	9	(25)
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	5	5	5	5	0
25.1	Advisory and assistance services	118	118	2,569	2,569	0
25.2	Other services from non-Federal sources	2,036	2,036	4,716	4,520	(196)
25.3	Other goods and services from Federal sources	217	217	217	217	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	303	303	303	303	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	51	51	51	20	(31)
31	Equipment	109	109	109	109	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,188	13,554	16,781	14,433	(2,348)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	12,624	17,000	25,380	22,780	(2,600)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
U.S. Weather Research Program (USWRP)	Pos./BA	6	25,380	6	23,380	0	(2,000)
	FTE/Obl.	6	25,380	6	23,380	0	(2,000)

Infrasonic Weather Monitoring Research Termination (-$2,000, 0 FTE/ 0 Positions) – With this reduction, NOAA will conclude infrasonic monitoring research. NOAA has completed an evaluation of this technology using congressionally directed funding in FY 2016, FY 2017, and FY 2018.

Schedule and Milestones
FY 2020
- Terminate Infrasonic Weather Monitoring Research

FY 2021-2024
- Maintain support for highest priority activities within available weather research funding

Deliverables
- Terminate funding for infrasonic monitoring research

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Number of forecast and mission improvements, based on The Weather Research and Forecasting Innovation Act of 2017, to weather applications at operational US weather services and in the US weather commercial sector with decrease	13	13	13	13	13
Number of forecast and mission improvements, based on The Weather Research and Forecasting Innovation Act of 2017, to weather applications at operational US weather services and in the US weather commercial sector without decrease	15	15	15	15	15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Weather and Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Infrasonic Weather Monitoring Research Termination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	429	437	454	454	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	4	4	4	4	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	433	441	458	458	0
12	Civilian personnel benefits	130	132	137	137	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	34	34	34	34	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	5	5	5	5	0
25.1	Advisory and assistance services	118	118	2,569	2,569	0
25.2	Other services from non-Federal sources	2,036	2,036	4,716	4,716	0
25.3	Other goods and services from Federal sources	217	217	217	217	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	303	303	303	303	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	51	51	51	51	0
31	Equipment	109	109	109	109	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,188	13,554	16,781	14,781	(2,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	12,624	17,000	25,380	23,380	(2,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
U.S. Weather Research Program (USWRP)	Pos./BA	6	25,380	6	20,517	0	(4,863)
	FTE/Obl.	6	25,380	6	20,517	0	(4,863)

U.S. Weather Research Program (USWRP) Decrease (-$4,863, 0 FTE/ 0 Positions) – With this reduction, NOAA will decrease the funding used to advance priority activities in U.S. Weather Research Program (USWRP) line. In 2019, these funds are focusing OAR/NWS activities to address three priorities identified by the Congress and OAR leadership: support for the second year of economic studies that were initiated in FY18; activities associated with initiating EPIC at NCAR and within NOAA; and activities at the Northern Gulf Institute to establish a capability to develop and evaluate the National Water Model in collaboration with the NWC and OAR labs/programs. Many of these impacts will be offset by the program increase for EPIC and related investments.

Schedule and Milestones
FY 2020
- Decrease funding for U.S. Weather Research Program activities

FY 2021-2024
- Decrease funding for weather research

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather and Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Laboratories and Cooperative Institutes Decrease

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	429	437	454	454	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	4	4	4	4	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	433	441	458	458	0
12	Civilian personnel benefits	130	132	137	137	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	34	34	34	34	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	5	5	5	5	0
25.1	Advisory and assistance services	118	118	2,569	2,569	0
25.2	Other services from non-Federal sources	2,036	2,036	4,716	4,716	0
25.3	Other goods and services from Federal sources	217	217	217	217	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	303	303	303	303	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	51	51	51	51	0
31	Equipment	109	109	109	109	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,188	13,554	16,781	11,918	(4,863)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	12,624	17,000	25,380	20,517	(4,863)

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Joint Technology Transfer	Pos./BA	1	20,004	1	3,004	0	(17,000)
Initiative	FTE/Obl.	1	20,004	1	3,004	0	(17,000)

Joint Technology Transfer Initiative: Transition Scientific and Technological Advances into National Weather Service Operations (-$17,000, 0 FTE/ 0 Position) - With this reduction, NOAA will decrease the funding used to accelerate the transition of the most promising research activities within NOAA and the weather enterprise into NWS operations through testing, demonstrating, and partnerships with important external partners. In an effort to prioritize R2O research within budget constraints, NOAA will seek to fund the transition of promising research through offsetting reductions or discontinuation of less promising research.

Schedule and Milestones

FY 2020

- In coordination with NWS, develop JTTI program priorities and publish funding opportunities for internal and external projects
- Select final Transition projects
- Work with NWS to evaluate previously funded transition projects that advanced in Readiness Level for possible operational implementation

FY 2021–2024

- Annually, in coordination with NWS, develop JTTI program priorities and publish funding opportunities for internal and external projects
- Annually work with NWS to evaluate previously funded transition projects that advanced in Readiness Level for possible operational implementation

Deliverables

- Improved weather forecasting tools transitioned to NWS operations

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Annual number of OAR R&D products transitioned to a new stage(s) with decrease	54	54	54	54	54
Annual number of OAR R&D products transitioned to a new stage(s) without decrease	65	65	65	65	65

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Weather and Air Chmistry Research
Subactivity: Joint Technology Transfer Initiative

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	73	74	77	77	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	73	74	77	77	0
12	Civilian personnel benefits	22	22	23	23	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	21,707	19,904	19,904	2,904	(17,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	21,802	20,000	20,004	3,004	(17,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Ocean, Coastal, and Great Lakes Research

Goal Statement

The Ocean, Coastal, and Great Lakes Research in OAR provides science to coastal communities from a wide network of university partners, develops technology to advance the Nation's oceans and Great Lakes observations, and coordinates multi-partner ocean exploration missions to characterize our natural resources and improve our understanding of the changes occurring in the oceans and Great Lakes.

Base Program

OAR's ocean, coastal, and Great Lakes laboratories, programs, and partners have been key contributors to advancing NOAA's National Marine Fisheries Service (NMFS), National Ocean Service (NOS), and National Weather Service (NWS) by providing research to better understand our oceans and Great Lakes natural resources and the influence of the oceans and Great Lakes on the Earth's weather and climate through technological advancements in modeling, computing, observing, and information dissemination.

The following five Subactivities are included in the Ocean, Coastal, and Great Lakes Research portfolio:

- Laboratories & Cooperative Institutes: Primarily supports foundational ocean observation networks and research, modeling, and technology development at OAR's laboratories and cooperative institutes.
- National Sea Grant College Program: Established by Congress through the National Sea Grant College Program Act, the National Sea Grant Collage Program is a Federal-state partnership that turns research into actions that support science-based sustainable practices. This partnership ensures that coastal communities remain engines of economic growth. The Sea Grant programs form a dynamic national network of more than 300 participating institutions represented by more than 2,300 scientists, engineers and outreach experts based at universities across the country.
- Ocean Exploration and Research: Established by Congress through the Ocean Exploration Act, Ocean Exploration and Research is the only Federal organization dedicated to ocean exploration.
- Integrated Ocean Acidification authorized under the Federal Ocean Acidification Research and Monitoring Act to better understanding ocean acidification (OA) and the consequences of OA on marine resources to enable communities to mitigate, prepare, and adapt to changes.

- Oceanographic Research Partnership Program (ORPP): This program was established in FY 2019 to advance ocean science research through the program established under 10 U.S.C. 7901 and to continue support for Ocean Joint Technology Transfer Initiative projects funded in fiscal year 2018.
- Sustained Ocean Observations and Monitoring: A global system for observations, modelling, and analysis of marine and ocean variables to support operational ocean services worldwide.

Statement of Operating Objectives

Schedule and Milestone Highlights
FY 2020–2024

Laboratories & Cooperative Institutes
- Continue collection and analysis of acoustic data from Ocean Noise Reference Stations, in coordination with NMFS and NOS
- Demonstrate/test new ocean observing/communication technologies

National Sea Grant College Program
- Hold local and regional state program requests for proposals
- Continue to ensure accountability to NOAA aligned program plans through external Performance Review Panels

Ocean Exploration and Research
- Develop an annual extramural competition for conducting the next phase of research into the potential resources and natural habitats in areas identified through the ECS Mapping Initiative
- Develop an annual extramural competition for the exploration of unknown and poorly known ocean areas where there is a high potential for discovery

Integrated Ocean Acidification
- Conduct OA coastal observing and process research cruises and deploy OA sensors on NOAA research and volunteer observing ships
- Develop a coastal early-warning system that can identify episodic low pH events and alert managers of potentially impacted resources
- Partner with IOOS Marine Sensor Program to develop marine sensors that can assist coastal industries with both scientific and monitoring capacity

- Optimize observing systems in each of the eight large marine ecosystem regions
- Increase number of living marine resources characterized for vulnerability to ocean acidification

Oceanographic Research Partnership Program (ORPP)
- Projects focused on improving NOAA's operational efficiency and resource management responsibilities, including activities designed to support the blue economy.

Sustained Ocean Observations and Monitoring
- Maintain NOAA's contribution of 1500 active Argo ocean profiling floats and implement Deep (6000 meters) Argo array
- Maintain Global Ocean Observing System (GOOS)

Deliverable Highlights
Laboratories & Cooperative Institutes
- Technical Report to describe current and chemical distributions in coastal waters in relation to known point sources, to assessing relative strengths of land-based sources of pollution over southeast Florida reef tracks
- Pre-operational forecast products to alert the over two million coastal Lake Erie residents of algal toxins in drinking water
- An annual, synthetic, ecosystem-based assessment of the eastern Bering Sea for the North Pacific Fisheries Management Council

National Sea Grant College Program
- Continue to leverage state and other partners
- Assist coastal communities to adopt sustainable development principles
- Create and transfer decision-support tools/technologies to coastal managers
- Support Sea Grant activities to restore degraded ecosystems
- Provide coastal resource managers with information/training in local hazard resiliency, and hazard mitigation tools, techniques, and best practices

Ocean Exploration and Research
- Complete Bureau of Ocean Energy Management (BOEM)-NOAA Partnership expedition to explore and characterize habitats and ecosystems the Arctic and other key areas within the U.S. Exclusive Economic Zone (EEZ)
- Increased number of telepresence-enabled systematic expeditions providing opportunities to engage a multitude of shore-based stakeholders and other users in real-time ocean exploration

Integrated Ocean Acidification
- Regional biogeochemical and ecological models

Oceanographic Research Partnership Program (ORPP)
- Transition research into operational applications

Sustained Ocean Observations and Monitoring
- 1,000 drifting buoys deployed annually
- 250 Argo Array Buoys deployed annually

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Laboratories & Cooperative Institutes (Ocean, Coastal and Great Lakes Research)	Pos/BA	107	36,000	124	36,000	124	36,467
	FTE/OBL	106	36,971	118	36,000	118	36,467
National Sea Grant College Program	Pos/BA	15	76,500	18	80,000	18	80,071
	FTE/OBL	15	76,238	18	80,000	18	80,071
Ocean Exploration and Research	Pos/BA	17	36,500	23	42,000	23	42,087
	FTE/OBL	17	38,523	22	42,000	22	42,087
Integrated Ocean Acidification	Pos/BA	13	11,000	17	12,000	17	12,063
	FTE/OBL	13	10,980	16	12,000	16	12,063
Sustained Ocean Observations and Monitoring	Pos/BA	40	42,823	39	43,000	39	43,147
	FTE/OBL	40	42,463	37	43,000	37	43,147
Oceanographic Research Partnership Program	Pos/BA	0	0	0	5,500	0	5,500
	FTE/OBL	0	0	0	5,500	0	5,500
Total Ocean, Coastal, and Great Lakes Research	Pos/BA	192	202,823	221	218,500	221	219,335
	FTE/OBL	191	205,175	211	218,500	211	219,335

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Overall, OAR's Ocean, Coastal, and Great Lakes Research supports:

- Improving understanding of the physics, chemistry, and ecology of oceanic, coastal, and Great Lakes systems, including changes in these environments and the impacts of stressors such as changes in temperature, changes in ocean and Great Lakes chemistry, pollution, and invasive species;
- Improving predictive capability for oceanic, coastal, and Great Lakes processes, including developing predictive models for ecosystems, and coupling these with physical and biogeochemical models to create comprehensive Earth System Models;
- Translating ocean, coastal, and Great Lakes science into services through tools developed for resource managers, policy makers and the public, and through increased education and outreach; and
- Developing and using cutting edge technology for understanding and exploring the ocean, coasts and Great Lakes.

In early FY 2019, the Argo Program, a hallmark of NOAA's global ocean observing systems, reached a major milestone with its two millionth profile of ocean temperature and salinity conditions. The Argo Program has collectively revolutionized the ability to monitor our global oceans, providing nearly four times the information as all other ocean observing tools combined. Argo data are freely available to anyone and used every day in operational weather and ocean forecasting, with broader applications that include aquaculture, pollution monitoring, ocean education, and national defense. As it celebrates its two millionth profile, the Argo Program is expanding and innovating with new types of instruments. Deep Argo floats will dive three times deeper, down to 3.7 miles, into the largely unobserved deep ocean. Biogeochemical Argo floats measure oxygen, carbon, and pH, critical for addressing pressing environmental issues such as ocean acidification and low oxygen levels that have been associated with harmful algal blooms.

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(Dollar amounts in thousands)

OAR's Argo Program reached a major milestone in early FY 2019 with its two millionth profile of ocean temperature and salinity conditions. The Argo float responsible for the profile is one of nearly 4,000 autonomous floats that cover the global ocean (nearly half operated by NOAA), representing the growth of the two-decade program and international commitment from 26 countries across the world.

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(Dollar amounts in thousands)

Much of the research performed within OAR's Ocean, Coastal, & Great Lakes Research is collaborative and crosscutting and therefore is often funded through multiple Subactivities. Some cross-cutting themes include:

Ecosystems Research

OAR Laboratories and Cooperative Institutes conduct research on ecological processes, and provide data to develop models critical to understanding ecosystem structure and function in important and economically significant environments in the oceans and the Great Lakes, including coral reefs, deep sea hydrothermal vents, and fish and shellfish habitat. Through observations, laboratory, and field experiments researchers also develop models to forecast impacts of multiple stressors, such as invasive species and nutrient runoff, on water quality, food webs, and fishery productivity. This work supports the development of new models, forecasting tools, and applications to evaluate and mitigate impacts to present and future ecosystem stressors.

Photo shows a Harmful Algal Bloom (HAB) developing in Lake Erie. The NOAA Great Lakes HAB and Hypoxia program is a collaborative effort between GLERL and Cooperative Institute scientists. The team uses an integrated approach to understand the ecosystem dynamics and environmental drivers of HABs and hypoxia in the Great Lakes to improve prediction and mitigation strategies.

Integrated Marine and Ocean Processes

OAR carries out interdisciplinary scientific investigations of the physics of ocean currents and water properties, and on the role of the ocean in extreme weather events, and ecosystems. The tools used to carry out these studies range from sensors on deep ocean moorings to satellite-based instruments to measurements made on research and commercial shipping vessels and autonomous vehicles, and include data analysis and numerical modeling. NOAA scientists and partners conduct innovative research and develop numerical models to predict the physical, chemical, biological, and ecological response in the oceans and Great Lakes due to weather, climate, and human-induced changes. The forecast models and quantitative tools developed by researchers allow scientists, coastal resource managers, policy makers, and the public to make informed decisions for optimal management of oceans and Great Lakes resources. The ocean, coasts, and Great Lakes are closely tied to the Earth's atmosphere, and a sound understanding of ocean-earth interactions is essential for better management of marine resources and improved ocean and weather services.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Resilient Communities and Economies

OAR's Ocean, Coastal and Great Lakes Research works through the National Sea Grant College Program to develop vibrant and resilient coastal economies that use comprehensive planning to make informed strategic decisions; improve coastal water resources that sustain human health and ecosystem services; and adapt to the impacts of coastal hazards.

Sustainable Fisheries and Aquaculture

The National Sea Grant Marine Aquaculture Grant Program is the only U.S. government grant program dedicated to supporting marine aquaculture development. OAR's marine aquaculture work ensures safe, secure and sustainable supplies of domestic seafood and decreases reliance on seafood imports through aquaculture research, extension, and grants. As a part of the cross-NOAA Program, OAR works with aquaculture partners in the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS) in coordination with state fisheries managers, seafood processors, fishing associations and consumer groups. These grants tackle some of the top challenges to marine aquaculture like reducing fishmeal and fish oil in aquaculture feeds, increasing seafood safety and quality, diversifying species and products. OAR's aquaculture competition is authorized under the National Aquaculture Act of 1980.

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National Oceanic and Atmospheric Administration
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(Dollar amounts in thousands)

Ocean Exploration

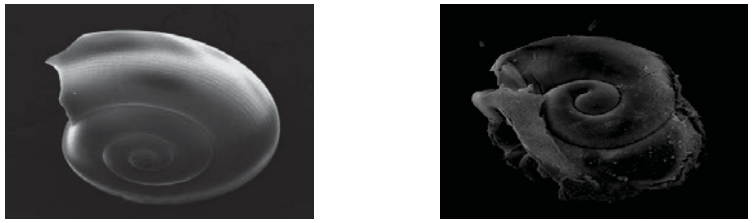
OAR leads efforts to explore and characterize deep-water areas of the U.S. Exclusive Economic Zone, Extended Continental Shelf, and other poorly known ocean areas and phenomena. Since its commissioning in 2008, the *Okeanos Explorer*, NOAA's ship assigned to exploration, has mapped over a million square kilometers of the seafloor at high resolution. Data collected from ocean exploration expeditions have been critical for science-based decisions on issues like deepwater fisheries management, potential oil and gas development or deep-sea mining, marine protected area establishment and management, determination of the U.S. Extended Continental Shelf, and nautical charting.

During OER's *Okeanos Explorer* mission in FY 2018, NOAA discovered 85 miles of deep-sea coral reef that was previously unknown, but anticipated from mapping efforts of NOAA's *Okeanos Explorer* earlier in the year. The reef was discovered approximately 160 miles east of Charleston and was formed by *Lophelia pertusa*, a reef-forming coral in the deep sea. This discovery shows that such coral reefs, which possess economic value in the form of commercial fishing, tourism and medicine, can thrive further offshore and deeper than previously thought. The image on the left is from the Windows to the Deep 2018 expedition and shows NOAA's remotely operated vehicle *Deep Discoverer* surveying mounds of *Lophelia pertusa* at the top of the crest of Richardson Ridge on June 21, 2018.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Ocean Chemistry and Ocean Acidification

Research across OAR labs, programs, and Cooperative Institutes aims to improve our understanding of how (and how fast) ocean chemistry is changing, how variable that change is by region, and what impacts these changes are having on marine life, people, and the local, regional, and national economies. OA refers to changes in the chemistry of the ocean due to rising atmospheric carbon dioxide; currently, ocean chemistry is changing faster than any period in the past 55 million years. OAR's Ocean Acidification Program (OAP) maintains long-term OA monitoring, conducts research to enhance the conservation of marine ecosystems sensitive to OA, and promotes OA educational opportunities. By better understanding and predicting OA, OAP also informs national and international carbon mitigation discussions and enables local communities to better prepare, mitigate, and adapt to changes caused by OA.



Impacts to a pteropod's shell in seawater that is too acidic (images above). The left panel shows a shell collected from a live pteropod from a region in the Southern Ocean where acidity is low. The shell on the right is from a pteropod collected in a region where the water is more acidic. Photo credits: (left) Bednaršek et al. 2012; (right) Nina Bednaršek.

Sustained Ocean Observations and Monitoring (SOOM)

SOOM supports NOAA's contribution to the sustained Global Ocean Observing System (GOOS) by maintaining over 3,950 platforms that report environmental weather/climate information to global prediction centers and researchers. GOOS is a permanent global system for observations, modelling, and analysis of marine and ocean variables to support operational ocean services worldwide. The U.S. Integrated Ocean Observing System (IOOS) is the U.S. regional contribution to GOOS and SOOM activities contribute unique and essential global measurements and capabilities to the IOOS enterprise. SOOM's contribution helps describe the present state of the oceans, monitors long-term changes, supports operational services worldwide and is the basis for forecasting climate variability and change. SOOM also supports research to develop new data products from these observations to address a broad range of stakeholder needs.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes	Pos./BA	124	36,467	124	33,467	0	(3,000)
	FTE/Obl.	118	36,467	118	33,467	0	(3,000)

Autonomous Underwater Vehicle Demonstration Testbed Termination (-$3,000, 0 FTE/ 0 Positions) – With this reduction, NOAA will eliminate the autonomous underwater vehicle (AUV) demonstration testbed, slowing the pace of evaluating new technologies for ocean observations. Without testbed funding, testing and evaluations in the marine environment will be performed with cruises planned for another purpose to conduct scientific research. Through this project, NOAA has acquired promising AUVs and related technology. NOAA will maintain these, and will continue to develop innovative instrumentation. The FY20 Budget requests a program increase of $4 million for a new operational program to efficiently and effectively manage use of unmanned systems within Office of Marine and Aviation Operations and other NOAA programs may continue to independently explore the use of AUVs to meet their missions. In addition, the program increase of $5 million for the National Oceanographic Partnership Program may offset some of these impacts, as unmanned systems is a prioritized area of research in the report by the National Science and Technology Council, “Science and Technology for America’s Oceans: A Decadal Vision.”

Schedule and Milestones:
FY 2020
- Terminate the Autonomous Underwater Vehicle Demonstration Testbed

FY 2021–2024
- Maintain support for highest priority activities within available ocean, coastal and Great Lake research funding

Deliverables:
- Terminate funding for the Autonomous Underwater Vehicle Demonstration Testbed

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Maintain or increase the number of near-surface observations (number of measurements per day or per degree latitude/longitude collected and/or processed) of ocean currents, heat content, and water mass properties to improve estimates of meridional mass and heat transport and inform extreme weather and ecosystem outlooks with termination	0	0	0	0	0
Maintain or increase the number of near-surface observations (number of measurements per day or per degree latitude/longitude collected and/or processed) of ocean currents, heat content, and water mass properties to improve estimates of meridional mass and heat transport and inform extreme weather and ecosystem outlooks without termination	600,000	600,000	600,000	600,000	600,000

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research

Subactivity: Ocean, Coastal, and Great Lakes Laboratories & Cooperative Institutes

Program Change: Autonomous Underwater Vehicle Demonstration Testbed Termination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	8,884	9,053	9,380	9,380	0
11.3	Other than full-time permanent	199	199	199	199	0
11.5	Other personnel compensation	271	271	271	271	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	9,354	9,523	9,850	9,850	0
12	Civilian personnel benefits	2,665	2,716	2,856	2,856	0
13	Benefits for former personnel	8	8	8	8	0
21	Travel and transportation of persons	544	465	465	465	0
22	Transportation of things	203	229	229	229	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	20	0	0	0	0
23.2	Rental Payments to others	2,245	2,879	2,879	2,879	0
23.3	Communications, utilities and misc charges	119	150	150	150	0
24	Printing and reproduction	37	44	44	44	0
25.1	Advisory and assistance services	1,364	931	931	931	0
25.2	Other services from non-Federal sources	4,762	3,111	3,111	3,111	0
25.3	Other goods and services from Federal sources	219	277	277	277	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	105	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,708	1,768	1,768	1,757	(11)
31	Equipment	675	351	351	351	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	12,941	13,546	13,546	10,557	(2,989)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99	Total obligations	36,971	36,000	36,467	33,467	(3,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes	Pos./BA	124	36,467	124	34,587	0	(1,880)
	FTE/Obl.	118	36,467	118	34,587	0	(1,880)

Genomics Termination (-$1,880, 0 FTE/ 0 Positions) – With this reduction, NOAA will eliminate the environmental genomics program at the Atlantic Oceanographic and Meteorological Laboratory (AOML).

The Genomics program studies Deoxyribonucleic acid (DNA), Ribonucleic acid (RNA), and proteins to better understand what organisms are present, what they are doing, and how they are affected by changing ocean conditions. Environmental genomics research scheduled at the recently built Future Reefs lab, where NOAA scientists and partners research how coral genomics can help inform restoration efforts, will be halted. NOAA will discontinue funding for 5 post-doctoral researchers, and the work will be stopped at the end of 2019. Terminating this program will slow development of new DNA sampling tools and advances in other AOML research areas, including coral monitoring and restoration, fisheries assessments for species, such as Bluefin tuna larvae, and recruitment models of endangered species. Environmental genomics research currently scheduled at the Future Reefs lab will end. The program increase of $5 million for the National Oceanographic Partnership Program may offset some of these impacts, as environmental genomics is a prioritized area of research in the report by the National Science and Technology Council, “Science and Technology for America’s Oceans: A Decadal Vision.”

Schedule and Milestones
FY 2020
- Terminate the environmental genomics program

FY 2020-2024
- Maintain support for highest priority activities within available ocean, coastal and Great Lake research funding

Deliverables
- Terminate funding for genomics research
- Eliminate funding for 5 post-doctoral researchers

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

- End work at the Future Reefs lab

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of project/partners/customers/contract adopting 'omic methods or technologies developed or validated by NOAA to increase efficiency, reduce costs, or to improve ecosystem-based understanding & management with termination	0	0	0	0	0
Cumulative number of project/partners/customers/contract adopting 'omic methods or technologies developed or validated by NOAA to increase efficiency, reduce costs, or to improve ecosystem-based understanding & management without termination	42	42	43	43	44

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research

Subactivity: Ocean, Coastal, and Great Lakes Laboratories & Cooperative Institutes

Program Change: Genomics Termination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	8,884	9,053	9,380	9,380	0
11.3	Other than full-time permanent	199	199	199	199	0
11.5	Other personnel compensation	271	271	271	271	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	9,354	9,523	9,850	9,850	0
12	Civilian personnel benefits	2,665	2,716	2,856	2,856	0
13	Benefits for former personnel	8	8	8	8	0
21	Travel and transportation of persons	544	465	465	407	(58)
22	Transportation of things	203	229	229	191	(38)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	20	0	0	0	0
23.2	Rental Payments to others	2,245	2,879	2,879	2,879	0
23.3	Communications, utilities and misc charges	119	150	150	150	0
24	Printing and reproduction	37	44	44	44	0
25.1	Advisory and assistance services	1,364	931	931	931	0
25.2	Other services from non-Federal sources	4,762	3,111	3,111	2,772	(339)
25.3	Other goods and services from Federal sources	219	277	277	277	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	105	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,708	1,768	1,768	1,380	(388)
31	Equipment	675	351	351	351	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	12,941	13,546	13,546	12,489	(1,057)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	0
44	Refunds	0	0	0	0	0
99	Total obligations	36,971	36,000	36,467	34,587	(1,880)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes	Pos./BA	124	36,467	124	33,873	0	(2,594)
	FTE/Obl.	118	36,467	118	33,873	0	(2,594)

Laboratories and Cooperative Institutes Decrease (-$2,594, 0 FTE/ 0 Positions) – With this reduction, NOAA will decrease funding in its Ocean, Coastal, and Great Lakes Research Laboratories and Cooperative Institutes Subactivity. NOAA will continue to carry out its highest priority activities. In previous years, the funding has supported activities including AUV testbeds, decision support tools, and socioeconomic studies.

Schedule and Milestones

FY 2020

- Decrease funding for Laboratories and Cooperative Institute activities

FY 2020-2024

- Maintain support for highest priority activities within available ocean, coastal and Great Lake research funding

Deliverables

- Decrease funding for ocean, coastal and Great Lake research

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research

Subactivity: Ocean, Coastal, and Great Lakes Laboratories & Cooperative Institutes

Program Change: Laboratories and Cooperative Institutes Decrease

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	8,884	9,053	9,380	9,380	0
11.3	Other than full-time permanent	199	199	199	199	0
11.5	Other personnel compensation	271	271	271	271	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	9,354	9,523	9,850	9,850	0
12	Civilian personnel benefits	2,665	2,716	2,856	2,856	0
13	Benefits for former personnel	8	8	8	8	0
21	Travel and transportation of persons	544	465	465	403	(62)
22	Transportation of things	203	229	229	199	(30)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	20	0	0	0	0
23.2	Rental Payments to others	2,245	2,879	2,879	2,879	0
23.3	Communications, utilities and misc charges	119	150	150	150	0
24	Printing and reproduction	37	44	44	38	(6)
25.1	Advisory and assistance services	1,364	931	931	808	(123)
25.2	Other services from non-Federal sources	4,762	3,111	3,111	2,699	(412)
25.3	Other goods and services from Federal sources	219	277	277	240	(37)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	105	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,708	1,768	1,768	1,534	(234)
31	Equipment	675	351	351	305	(46)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	12,941	13,546	13,546	12,210	(1,644)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	2	2	2	2	(0)
44	Refunds	0	0	0	0	0
99	Total obligations	36,971	36,000	36,467	34,181	(2,594)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
National Sea Grant	Pos./BA	18	80,071	0	0	-18	(80,071)
College Program	FTE/Obl.	18	80,071	0	0	-18	(80,071)

National Sea Grant College Program Terminations (-$80,071, -18 FTE/ -18 Positions) – With this reduction, NOAA will terminate the National Sea Grant College Program Base and the Marine Aquaculture Program.

The termination of the National Sea Grant College Program will eliminate NOAA's funding for the network of 33 Sea Grant programs located in coastal States and territories. Individual Sea Grant chapters receive funds from their respective states and other sources as part of the required matching of federal funds under the Sea Grant Program; as such, the full extent of the impact of this termination of NOAA funds may vary by state. With this termination, NOAA will explore a range of options to address staffing; including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP) and other options will be requested and/or explored. Additionally, more than 3,000 scientists, researchers, students, and outreach experts from more than over 300 institutions will lose support from NOAA's Sea Grant funding.

NOAA will also terminate the Sea Grant's Marine Aquaculture Program. As a result of this termination, support will be withdrawn for the larger cross-NOAA Aquaculture Program, impacting aquaculture partners in the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS), as well as state partnerships with fisheries managers, seafood processors, fishing associations, maritime-related business, and consumer groups.

Schedule and Milestones:
FY 2020

- Terminate the National Sea Grant College Program Base
- Terminate the Sea Grant Marine Aquaculture Program

Deliverables:

- Terminate funding for the National Sea Grant College Program Base and the Marine Aquaculture Program

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Economic and societal impacts derived from Sea Grant activities(Jobs created or retained/Businesses created or retained/Economic benefit ($M dollars) with termination	0/0/$0	0/0/$0	0/0/$0	0/0/$0	0/0/$0
Economic and societal impacts derived from Sea Grant activities(Jobs created or retained/Businesses created or retained/Economic benefit ($M dollars) without termination	10,000 / 2,000 / $400M	10,000 / 2,000 / $400M	10,000 / 2,000 / $400M	10,000 / 2,000 / $400M	10,000 / 2,000 / $400M

Performance Measures	2020	2021	2022	2023	2024
Number of fishermen, seafood processing and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities with termination	0/0/$0	0/0/$0	0/0/$0	0/0/$0	0/0/$0
Number of fishermen, seafood processing and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities without termination	15,000	15,000	15,000	15,000	15,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: **Ocean, Coastal, and Great Lakes Research Program**
Subactivity: National Sea Grant College Program
Program Change: National Sea Grant College Program Termination

Title		Grade	Number		Salary	Salaries
Director, National Sea Grant College Program		SES	(1)		$176	($176)
Supervisory Management & Program Analyst		ZA-5	(1)	$	143	($143)
Management Analysis Officer		ZA-4	(5)	$	93	($467)
Management & Program Analyst		ZA-3	(10)	$	66	($659)
Secretary - Office Administrator		ZS-4	(1)	$	52	($52)
Total			(18)			($1,498)
Less lapse	0.00%					
Total full-time permanent (FTE)			(18)			(1,498)
2020 Pay Adjustment (0%)	0.00%					0
Total						(1,498)

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	(18)
Other than full-time permanent	0
Total	(18)
Authorized Positions:	
Full-time permanent	(18)
Other than full-time permanent	0
Total	(18)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: National Sea Grant College Program
Subactivity: National Sea Grant College Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	1,379	1,448	1,498	0	(1,498)
11.3	Other than full-time permanent	58	58	0	0	0
11.5	Other personnel compensation	27	24	0	0	0
11.8	Special personnel services payments	0	27	0	0	0
11.9	Total personnel compensation	1,464	1,557	1,498	0	(1,498)
12	Civilian personnel benefits	486	434	445	0	(445)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	245	245	245	0	(245)
22	Transportation of things	2	2	2	0	(2)
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	266	266	266	0	(266)
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	10	9	9	0	(9)
24	Printing and reproduction	1	766	766	0	(766)
25.1	Advisory and assistance services	27	27	27	0	(27)
25.2	Other services from non-Federal sources	2,803	2,467	2,467	0	(2,467)
25.3	Other goods and services from Federal sources	68	68	68	0	(68)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	56	56	56	0	(56)
31	Equipment	14	14	14	0	(14)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	70,796	74,089	74,208	0	(74,208)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	76,238	80,000	80,071	0	(80,071)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean Exploration and Research	Pos./BA	23	42,087	23	19,638	0	(22,449)
	FTE/Obl.	22	42,087	22	19,638	0	(22,449)

Ocean Exploration Decrease (-$22,449, 0 FTE/ 0 Positions) – With this reduction, NOAA will decrease its extramural ocean exploration and research efforts. The OER program will reduce funding to the Cooperative Institute for Ocean Exploration, Research and Technology and the Global Foundation for Ocean Exploration, cutting exploration, education, and outreach activities. NOAA will use the remaining funds to maintain and leverage these key partnerships. In addition, OER will reduce funding for extramural grants and reduce financial support for the interagency Biodiversity Observation Network.

Schedule and Milestones:
FY 2020–2024

- Decrease ocean exploration and research
- Reduce external grants and funding for the Cooperative Institute for Ocean Exploration, Research and Technology and the Global Foundation for Ocean Exploration
- Maintain support for highest priority activities within available ocean exploration and research funding

Deliverables:

- Decrease funding for ocean exploration and research

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Cumulative percent of deepwater ocean (>200m) US Exclusive Economic Zone (EEZ) mapped with decrease	54%	54%	55%	55%	55%
Cumulative percent of deepwater ocean (>200m) US Exclusive Economic Zone (EEZ) mapped without decrease	56%	58%	60%	62%	64%

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research
Subactivity: Ocean Exploration and Research

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	1,949	1,986	2,010	2,010	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	85	85	85	85	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,034	2,071	2,095	2,095	0
12	Civilian personnel benefits	591	596	636	636	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	198	312	312	312	0
22	Transportation of things	8	50	50	50	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	211	274	274	274	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	162	1,179	1,179	1,179	0
24	Printing and reproduction	1	3	3	3	0
25.1	Advisory and assistance services	1,931	104	104	104	0
25.2	Other services from non-Federal sources	3,408	1,437	1,437	1,437	0
25.3	Other goods and services from Federal sources	42	182	182	182	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	182	182	182	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	200	200	200	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	77	300	300	300	0
31	Equipment	4	1,285	1,285	1,285	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	29,856	33,825	33,848	11,399	(22,449)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	38,523	42,000	42,087	19,638	(22,449)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Integrated Ocean Acidification	Pos./BA	17	12,063	17	8,069	0	(3,994)
	FTE/Obl.	16	12,063	16	8,069	0	(3,994)

Integrated Ocean Acidification Decrease (-$3,994, 0 FTE/ 0 Positions) – With this reduction, NOAA will reduce funding for the Integrated Ocean Acidification Program that conducts research to improve our understanding of ocean and coastal acidification (OA) and its impacts on marine resources, coastal communities, and economies. The proposed decrease will reduce efforts supporting the FOARAM ACT to 1) establish a National OA Observing Network (NOA-ON) and 2) improve our understanding of the impacts of OA to living marine resources and their dependent human communities. Planned expansions to the NOA-ON into American Samoa would be terminated limiting NOAA's capacity forecast impacts to U.S. affiliated coral reef ecosystems and dependent communities. While existing regional vulnerability assessment studies would continue through their conclusion, assessments in other regions could not be initiated in FY 2019 as planned.

Schedule and Milestones
FY 2020
- Decrease integrated ocean acidification research

FY 2020-2024
- Maintain support for highest priority activities within available integrated ocean acidification research funding

Deliverables
- Decrease funding for integrated ocean acidification research grants

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Annual Number of Ocean Acidification Observations collected by the National Ocean Acidification Observing Network with decrease	5475	5748	5748	5748	6022
Annual Number of Ocean Acidification Observations collected by the National Ocean Acidification Observing Network without decrease	7300	7665	7665	7665	8030

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Integrated Ocean Acification
Subactivity: Integrated Ocean Acification

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	1,042	1,062	1,106	1,106	0
11.3	Other than full-time permanent	51	51	51	51	0
11.5	Other personnel compensation	21	21	21	21	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	1,114	1,134	1,178	1,178	0
12	Civilian personnel benefits	334	340	353	353	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	140	140	140	140	0
22	Transportation of things	63	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	43	43	43	43	0
23.2	Rental Payments to others	1	1	1	1	0
23.3	Communications, utilities and misc charges	126	126	126	126	0
24	Printing and reproduction	3	3	3	3	0
25.1	Advisory and assistance services	37	37	37	37	0
25.2	Other services from non-Federal sources	1,529	1,529	1,529	1,529	0
25.3	Other goods and services from Federal sources	13	13	13	13	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	631	631	631	631	0
31	Equipment	137	137	137	137	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	6,809	7,866	7,871	3,877	(3,994)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	10,980	12,000	12,063	8,069	(3,994)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Sustained Ocean	Pos./BA	39	43,147	39	37,140	0	(6,007)
Observations and Monitoring	FTE/Obl.	37	43,147	37	37,140	0	(6,007)

Sustained Ocean Observation and Monitoring Decrease (-$6,007, 0 FTE/ 0 Positions) – With this reduction, NOAA will reduce funding for Sustained Ocean Observations and Monitoring (SOOM). NOAA will reduce external grant funding that is used to leverage partnerships to develop a sustained, comprehensive, and responsive global ocean observing system. The ocean covers about 71 percent of the Earth's surface, and NOAA currently maintains about 50 percent of the world's ocean observing platforms. This reduction will reduce the number of platforms NOAA and its partners can help maintain.

Schedule and Milestones
FY 2020–2024

- Decrease Sustained Ocean Observations and Monitoring
- Maintain support for highest priority activities within available Sustained Ocean Observations and Monitoring research funding

Deliverables

- Decrease funding for Sustained Ocean Observations and Monitoring research grants

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Reduced error in Global Measurement of Sea Surface Temperature. (Degrees Celsius (ºC)) to improve understanding of the environment with decrease	0.1	0.1	0.1	0.1	0.1
Reduced error in Global Measurement of Sea Surface Temperature. (Degrees Celsius (ºC)) to improve understanding of the environment without decrease	0.5	0.5	0.5	0.5	0.5

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research
Subactivity: Sustained Ocean Observations and Monitoring

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,159	2,200	2,303	2,303	0
11.3	Other than full-time permanent	103	103	103	103	0
11.5	Other personnel compensation	114	114	114	114	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,376	2,417	2,520	2,520	0
12	Civilian personnel benefits	713	725	769	769	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	374	374	374	374	0
22	Transportation of things	146	146	146	146	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	209	209	209	209	0
23.2	Rental Payments to others	1	1	1	1	0
23.3	Communications, utilities and misc charges	138	138	138	138	0
24	Printing and reproduction	21	21	21	21	0
25.1	Advisory and assistance services	1	1	1	1	0
25.2	Other services from non-Federal sources	2,185	2,185	2,185	2,185	0
25.3	Other goods and services from Federal sources	457	457	457	457	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,409	2,409	2,409	2,409	0
31	Equipment	799	799	799	799	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	32,634	33,118	33,118	27,111	(6,007)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends				0	0
44	Refunds	0	0	0	0	0
99	Total obligations	42,463	43,000	43,147	37,140	(6,007)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
	Pos./BA	0	5,500	0	0	0	(5,500)
Oceanographic Research Partnership Program	FTE/Obl.	0	5,500	0	0	0	(5,500)

Oceanographic Research Partnership Program Termination (-$5,500, 0 FTE/ 0 Position) - With this reduction, NOAA will terminate the Oceanographic Research Partnership Program (ORPP). The ORPP was established with funds appropriated in FY 2019 for NOAA to advance ocean science research through the program established under 10 U.S.C. 7901 and to continue support for Ocean Joint Technology Transfer Initiative projects funded in fiscal year 2018. Activities conducted under ORPP would be continued under the National Oceanographic Partnership Program (NOPP) Initiative below (OAR - 110)

Schedule and Milestones:
FY 2020

- Terminate the Oceanographic Research Partnership Program

Deliverables:

- Terminate funding for the Oceanographic Research Partnership Program

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of projects supported using leveraged NOAA program funding and other federal agency resources with termination	0	0	0	0	0
Cumulative number of projects supported using leveraged NOAA program funding and other federal agency resources without termination	8	16	24	32	40

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research
Subactivity: Oceanographic Research Partnership Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	5,500	5,500	0	(5,500)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	0	5,500	5,500	0	(5,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
National Oceanographic Partnership Program (NOPP)	Pos./BA	0	0	1	5,000	1	5,000
	FTE/Obl.	0	0	1	5,000	1	5,000

National Oceanographic Partnership Program ($5,000, 1 FTE/ 1 Position) - This request will increase NOAA's support for the interagency National Oceanographic Partnership Program (NOPP) by establishing a stable dedicated funding source that can be used to leverage other NOAA programs to use this extramural, competitively-awarded partnership-based research program.

The National Oceanographic Partnership Program (NOPP) was established by Public Law 104-201 of September 23, 1996, to "coordinate and strengthen national oceanographic efforts by identifying and carrying out partnerships among Federal agencies, academia, industry, and other members of the oceanographic scientific community in the areas of data, resources, education, and communication." With an increasing amount of research and development spending occurring within the private sector relative to the federal government, NOPP is a unique catalyst for participation by non-governmental organizations and industry in federal ocean research and education projects.

Previously, NOAA has been investing ad hoc resources (on an annual basis) toward the NOPP, which made planning and participation of potential projects difficult. The FY 2020 request would help stabilize funding and provide an infusion of resources to supercharge existing efforts. The FY 2020 request also supports the goals laid out in Executive Order 13840, Titled "Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States" through the coordination of activities with other Federal agencies on ocean related matters; facilitating economic growth and promoting ocean industries; and modernizing the acquisition, distribution, and use of the best use of available ocean-related science and knowledge, in partnership with the external community, to inform decisions and enhance entrepreneurial opportunity.

This increase will enhance NOAA's funding currently executed through NOPP. Capability will be further increased by using the availability of NOPP funds as an incentive to leverage other NOAA programs. Previous NOPP successes include creation of a comprehensive national ocean observing network, air/ocean modeling improvements and transitions, and innovative marine technology solutions. Future efforts under discussion include:

- Reducing plastic waste in the oceans
- Comprehensive mapping and characterization of the US Exclusive Economic Zone
- Development of next-generation autonomous and remote (air and satellite) marine data collection systems
- New discoveries of ocean resources and marine habitat dynamics that are gleaned from existing marine information databases.
- Seamless national oceanographic and marine information systems that provide transparent access and advanced data management and analysis tools

Schedule and Milestones

FY 2020

- Identification of 2-4 NOPP topics and partners
- Award of moderate- to high-impact project proposals within NOPP Broad Agency Announcement (BAA) process
- Award of projects independent of BAA process

FY 2021–2024

- Continuation of project awards
- Development and funding of new awards as warranted

Deliverables

- Initiation and support of 2-4 NOPP research projects that engage and leverage industry and other federal agency investment at moderately high levels of impact
- Increase in availability of marine data, data-derived information, and ability to use that information to realize high priority economic benefits

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Cumulative number of projects supported using leveraged NOAA program funding and other federal agency resources with increase	8	16	24	32	40
Cumulative number of projects supported using leveraged NOAA program funding and other federal agency resources without increase	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Ocean, Coastal, and Great Lakes Research
Subactivity: Ocean Laboratories and Cooperative Institutes
Program Change: National Oceanographic Partnership Program

Title		Grade	Number	Annual Salary	Total Salaries
Management and Program Analyst		ZA-4	1	99	99
Total			1		99
Less lapse	25.00%		0		(25)
Total full-time permanent (FTE)			1		74
2020 Pay Adjustment (0%)	0.00%				0
					74

Personnel Data Summary	
Full-time Equivalent Employment (FTE)	
Full-time permanent	1
Total FTE	1
Authorized Positions:	
Full-time permanent	1
Total Positions	1

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Ocean, Coastal, & Great Lakes Research
Subactivity: National Oceanographic Partnership Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	0	0	0	74	74
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	74	74
12	Civilian personnel benefits	0	0	0	22	22
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	0	0	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	4,904	4,904
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	0	0	0	5,000	5,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Innovative Research & Technology

Goal Statement

The Innovative Research and Technology accelerates the adoption and transition of advanced computing and technology throughout NOAA. Innovative Research and Technology supports High Performance Computing (HPC) Initiatives through major improvements in weather and climate forecasting, ecosystem and ocean modeling, and environmental information dissemination and in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

The Innovative Research and Technology efforts provide NOAA with necessary computational and network resources required to support continued advances in environmental modeling capabilities. The purpose of the HPCC program is to improve the accuracy and timeliness of NOAA's short-term weather warnings, seasonal forecasts, hurricane forecast improvements, as well as regional and global climate and weather predictions that are heavily dependent on major advances. Timely and responsive dissemination of NOAA's services and information requires full use of modern network and communication technologies.

The following Subactivity is included in Innovative Research & Technology:

- High Performance Computing and Communications (HPCC): Supports the computing requirements for NOAA’s modeling and research missions.

Statement of Operating Objectives

Schedule and Milestones
FY 2020–2024

- Complete migration of at least one operational model and one research model to next-generation architecture software structure

- Test impact of assimilation of new and proposed satellite observations using observing system simulation experiment (OSSE) and observing system experiments (OSE) approaches using the operational Hurricane Weather Research and Forecast (HWRF) hybrid data assimilation system to improve hurricane intensity guidance
- Quantitative evaluation of (a) (statistically) downscaled climate projections for the U.S. and (b) their suitability for use in climate impacts and decision-making applications published in the peer-reviewed literature
- Participate in the Networking and information Technology Research and Development Program (NITRD) interagency activities

Deliverable Highlights

- HPC System availability – 97 percent of computational hours made available to scientists
- 11 HPC and advanced networking R&D projects

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

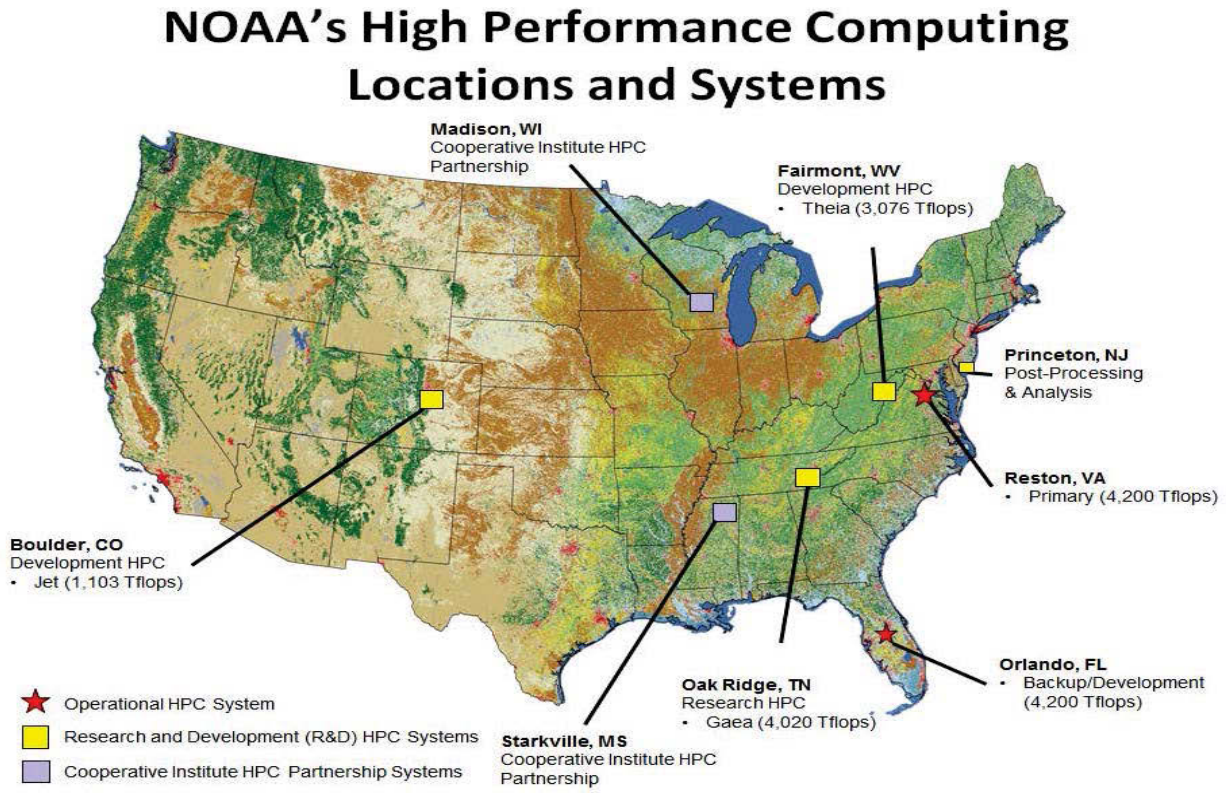
Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
High Performance Computing & Communications	Pos/BA	14	12,180	12	12,180	14	12,235
	FTE/OBL	14	12,089	11	12,180	14	12,235

High Performance Computing & Communications

HPC Initiatives, established through the High-Performance Computing Act of 1991, improve the accuracy and timeliness of NOAA's short-term weather warnings, forecasts, hurricane forecast improvements, as well as regional and global climate and ecosystem predictions. HPC Initiatives provide necessary computational and network resources required to advance in environmental modeling capabilities across NOAA. In fact, every NOAA line office uses R&D HPC systems. Benefits of HPC Initiatives include:

- Improvements in short-term warning and weather forecast systems and models,
- Enabling scientists to attack long-lead time problems associated with the physical processes that govern the behavior of the atmosphere and ocean,
- Maintaining NOAA’s leadership position in understanding climate with applications towards critical issues such as hurricanes, drought, sea-level rise, and
- Accelerating modeling and simulation activities and providing relevant decision support information on a timely basis for programs.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Systems Acquisition

Goal Statement

Research Supercomputing:
Research Supercomputing provides sustained capability to the NOAA Research and Development (R&D) High Performance Computing System (HPC) to advance Earth system science and accelerate the development of regional and sub-regional information products and services as described in the NOAA High Performance Computing Strategic Plan 2015-2020[1] and in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

NOAA's R&D HPC provides computational resources to support advances in environmental modeling crucial for understanding critical Earth system modeling issues. NOAA's environmental modeling enterprise underpins most of NOAA's products and services to the Nation. NOAA's R&D HPC assets are part of the critical infrastructure required for NOAA to accomplish its mission. NOAA's R&D HPC support the NOAA user base in the geospatial and ecosystems research communities across the Agency. However, demand for HPC compute resources outweighs the supply currently. Based on an analysis carried out in 2016, demand for HPC compute resources outweighs the current supply of NOAA's capabilities by 32X. NOAA is exploring ways of mitigating this shortfall through other means such as cloud computing. NOAA currently has several pilots examining if cloud could be a possible solution to fill the supply and demand gap.

Statement of Operating Objectives

Schedule and Milestone and Deliverable Highlights:
FY 2020 – 2024

- High-resolution Earth System Model integrations publicly available for use in regional decision-making through federated data services
- Exploratory application of Earth System Models and subsequent demonstration of Earth System modeling applications using exascale high-performance computing platforms, which would be capable of at least one exaflop, or a thousand petaflops
- High-resolution integrations for prediction of seasonal tornado risks at multi-month lead times
- Improved credibility of projections of changes of important climatic quantities, such as regional climate change and extreme

[1] http://www.cio.noaa.gov/it_plans/HPCStrategy_Final_Draft_080913.pdf

events, to allow society to efficiently plan for and adapt to climate change
- Capability to develop and provide decadal prototype forecasts and predictions made with high-resolution coupled climate model
- NOAA's environmental modeling applications able to utilize performance increases available through fine-grain architectures

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Research	Pos/BA	0	41,000	0	41,000	0	41,000
Supercomputing/CCRI	FTE/OBL	0	42,552	0	41,000	0	41,000

NOAA's R&D HPC provides computational resources to support advances in environmental modeling crucial for understanding critical Earth system modeling issues. This investment includes the supercomputing systems, associated storage devices, advanced data communications, hardware and software engineering services, security, and necessary data center space. NOAA currently operates three R&D HPCs:

- Gaea - Located at Oak Ridge National Laboratory in Oak Ridge, Tennessee, Gaea is primarily used for long-term climate and weather predictions and projections.
- Theia - Located in Fairmont, West Virginia, Theia is used for weather research and development.
- Jet - Located in Boulder, Colorado, Jet is primarily used for hurricane research.

NOAA's R&D HPC also provides software engineering support and associated tools to re-architect NOAA's applications to run efficiently on next generation fine-grain HPC architectures. Through a focused effort, engineers investigate and test new algorithms, train existing NOAA developers with new coding techniques, and assist these developers in accelerating the re-architecting of NOAA's applications. These software engineering efforts allow NOAA to take advantage of next-generation research computing

technologies, but also help NOAA to more efficiently use its existing high performance computing assets.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Research Supercomputing/CCRI (PAC)	Pos./BA	0	41,000	0	26,000	0	(15,000)
	FTE/Obl.	0	41,000	0	26,000	0	(15,000)

Mississippi State Partnership Termination (-$15,000, 0 FTE/ 0 Positions) – With this reduction, NOAA will terminate the Mississippi State University Partnership established by congressionally directed requirements to develop a dedicated high performance computing facility in collaboration with partners with existing high performance computing expertise and scientific synergies.

Consistent with the Consolidated Appropriations Act, 2018, funding was used to help address NOAA's high performance computing needs and its current limitations on providing high fidelity results in near real-time.

Schedule and Milestones:
FY 2020
- Terminate the Mississippi State Partnership

FY 2021–2024
- Maintain support for highest priority activities within available Research Supercomputing/CCRI funding

Deliverables:
- Terminate funding for the Mississippi State Partnership

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates*

Research Supercomputing/CCRI	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(15,000)	(15,000)	(11,000)	(7,000)	(7,000)	N/A	N/A
Total Mississippi State Partnership Termination	426,144	0	0	0	0	0	N/A	N/A
Total Research Supercomputing/CCRI	N/A	26,000	26,000	30,000	34,000	34,000	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Research Supercomputing
Program Change: Terminate Mississippi Partnership

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	60	0	0	0	0
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	1	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	62	0	0	0	0
12	Civilian personnel benefits	19	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	3	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites					
23.1	Rental payments to GSA	10	0	0	0	0
23.2	Rental Payments to others	299	0	0	0	0
23.3	Communications, utilities and misc charges	3	0	0	0	0
24	Printing and reproduction	2	0	0	0	0
25.1	Advisory and assistance services	9	0	0	0	0
25.2	Other services from non-Federal sources	5,955	0	0	0	0
25.3	Other goods and services from Federal sources	20,766	26,000	26,000	26,000	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	54	0	0	0	0
31	Equipment	2,153	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	13,217	15,000	15,000	0	(15,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	42,552	41,000	41,000	26,000	(15,000)

Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $1,081,874,000 and 4,174 FTE/ 4,324 positions for the National Weather Service including a net decrease of $101,662,000 and 217 FTE/ 355 positions in program changes.

The FY 2020 budget submission continues to make the United States a Weather-Ready Nation (WRN) in which NWS operations help the public best prepare for, and respond to, extreme weather events. NWS launched its WRN initiative to build community resilience in the face of increasing vulnerability to extreme weather and water events. The initiative improves support for management of the Nation's water supply, understanding of climate-related risks, economic productivity, and healthy communities and ecosystems. Record-breaking snowfall, cold temperatures, extended drought, high heat, severe flooding, violent tornadoes, and massive hurricanes have all combined to cause frequent multi-billion dollar weather disasters. The devastating impacts of extreme events can be reduced through improved readiness. The WRN initiative helps reduce the Nation's weather-related vulnerabilities. The initiative will be enacted through improvements to demand-driven support services, innovative technology, and specialized training of the NWS workforce.

At current funding levels, the evolution to a WRN involves fifteen distinct projects. Advancements in quality, consistency, and effectiveness across all portfolios are driven by the goal of building WRN. In FY 2020, NWS will continue to develop, test, and evaluate the efficacy of the Operations and Workforce Analysis (OWA) recommendations, including Impact-Based Decision Support Services[1] (IDSS). OWA concepts are intended to improve consistency across forecast boundaries, break down barriers to enhance forecast collaboration, and enable forecast staff to work more closely with core partners locally to connect weather forecasts and on-the-ground impacts: a focus on the "last mile" of the NWS' service delivery. NWS forecasters will continue to work with local partners and communities to understand and manage risk, formulate emergency response plans, and promote community resilience and public safety.

As NWS evolves, it will better support public and private users including emergency managers and businesses to make faster, smarter decisions that save lives and protect livelihoods. NWS' evolution to a WRN is guided by the National Academy of Sciences, "Becoming Second to None," and the National Academy of Public Administration (NAPA), "Forecast for the Future: Assuring the Capacity of the NWS" reports.

[1] IDSS are forecast advice and interpretative services the NWS provides to help core partners, such as emergency personnel and public safety officials, to make decisions when weather, water and climate impacts the lives and livelihoods of the American people.

Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Budget Estimates, Fiscal Year 2020

Performance:
The effectiveness of NWS investments is assessed using numerous internal and external performance measures including the Government Performance and Results Act (GPRA) goals. These efforts have been institutionalized in NWS operations to maintain quality control and use objective methods to assess NWS performance. For current GPRA targets please see FY 2020/2018 Annual Performance Plan and Report.

Adjustments:

Inflationary Adjustments
NOAA's FY 2020 Base includes a net increase of $17,986,000 and 0 FTE/ 0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for NWS activities. This includes the estimated 2020 military pay raise of 2.1 percent, where applicable, as well as inflationary increases for labor and non-labor activities including benefits and rent charges from the General Services Administration (GSA).

Technical Adjustments (Transfers)
NOAA also requests the following transfers for a net change of $0 and 0 FTE to the agency:

From Office	Subactivity	To Office	Subactivity	Amount
NWS	Dissemination (PAC)	NWS	Dissemination (ORF)	$25,000,000/ 0 FTE/ 0 positions

NOAA requests a technical adjustment to transfer $25,000,000 and 0 FTE/ 0 positions from the PAC Dissemination Subactivity to the ORF Dissemination Subactivity. This adjustment transfers only the resources necessary to operate and maintain the OneNWS Network assets recently deployed under the Ground Readiness Project (GRP), migration of NWS Telecommunications Gateway (NWSTG), applications to Integrated Dissemination Program (IDP), and the continuing upgrade to IDP systems. In order to support the completed OneNWS Network under the GRP, resources are needed for maintenance of the network utilities and 24/7 monitoring and support of the circuits. The migration of the NWSTG applications to IDP requires annual hardware and software maintenance, as well as support for switches and routers, network monitoring, a trouble ticketing system, and support for the Hurricane Coordination Hotline. In addition, similar to the circuit monitoring in the OneNWS Network, NWSTG routers and switches must be monitored to ensure no loss of connectivity for the Weather Forecast Offices (WFOs). Finally, after the IDP upgrade, resources are necessary to

support the day-to-day operations, security patching, maintenance, and 24x7 support of the applications hosted on IDP systems in College Park, MD and Boulder, CO. This technical adjustment will enable NWS to obtain budget execution and acquisition efficiencies by integrating all of the Operations & Maintenance (O&M) activities in one Subactivity, and eliminating artificial boundaries between accounts.

From Office	Subactivity	To Office	Subactivity	Amount
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Observations (ORF)	$1,520,000/ 0 FTE/ 0 positions
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Central Processing (ORF)	$90,000/ 0 FTE/ 0 positions
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Analyze, Forecast, and Support (ORF)	$1,331,000/ 5 FTE/ 5 positions

NOAA requests a technical adjustment to mission transfer $2,941,000 and 5 FTE/ 5 positions from the NESDIS Office of Satellite and Product Operations ORF Subactivity to the NWS ORF Observations, Analyze, Forecast, and Support (AFS) and Central Processing Subactivities. NOAA seeks to realign the United States National Ice Center (NIC) from NESDIS to NWS. The NIC is a unique, tri-agency government organization comprising NOAA, the United States Navy, and the United States Coast Guard. NIC's mission is to provide high-quality strategic and tactical ice analysis services tailored to meet the operational requirements of U.S. national interests. This realignment is in acknowledgement of the mature state of the NIC analysis capability and, given increasing maritime activities in the Arctic resulting from decreasing sea ice coverage during the summer months, the need to house it in an operational organization that can advance their mission by integrating sea ice and marine weather information into operational forecasts with 24/7 support. The realignment places the NIC in the organization responsible for predictions, thereby enabling improved predictions of sea ice and seasonal outlooks in the polar oceans, while more efficiently integrating sea ice information into operational and developmental models. The funds transferring to Observations ORF are associated with foreign satellite data purchases and support for the international Arctic Buoy Program, essential for the NIC to successfully accomplish their mission. Funds transferring to AFS ORF will support the five (5) FTEs/ 5 positions being realigned to NWS, four (4) contractor staff members

conducting ice and snow analysis, as well as facilities costs. Finally, the funds in Central Processing ORF will support the IT O&M costs for the Interactive Multisensor Snow and Ice Mapping System (IMS), which provides a critical input to operational numerical weather prediction models by depicting the extent of daily hemispheric snow and ice coverage.

Narrative Information:

Following this section are base justification materials and program change narratives by Activity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 5). Please contact NOAA if details for any of these changes are required.

Department of Commerce
National Oceanic and Atmospheric Administration
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Dissemination
Subactivity: Dissemination Transfer From PAC

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	0	0	0
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	0	0	0
12	Civilian personnel benefits	0	0	0
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	30	0	30
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	19,000	(16,000)	4,000
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	0	0	0
25.2	Other services from non-Federal sources	15,960	(9,000)	5,960
25.3	Other goods and services from Federal sources	0	0	0
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	10	0	10
31	Equipment	0	0	0
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	0	0	0
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	35,000	(25,000)	10,000

Department of Commerce
National Oceanic and Atmospheric Administration
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Dissemination
Subactivity: Dissemination Transfer To ORF

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	10,303	0	10,358
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	216	0	216
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	10,519	0	10,574
12	Civilian personnel benefits	3,155	0	3,523
13	Benefits for former personnel	10	0	10
21	Travel and transportation of persons	409	0	414
22	Transportation of things	39	0	39
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	1,458	0	1,485
23.2	Rental Payments to others	1,367	0	1,367
23.3	Communications, utilities and misc charges	9,169	16,000	25,169
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	41	0	41
25.2	Other services from non-Federal sources	23,006	9,000	32,006
25.3	Other goods and services from Federal sources	17	0	17
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	247	0	247
31	Equipment	196	0	196
32	Lands and structures	17	0	17
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	377	0	377
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	50,028	25,000	75,482

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Observations ORF
Subactivity: Observations Transfer From NESDIS Office of Satellite and Product Operations

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	68,354	0	68,695
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	2,604	0	2,604
11.8	Special personnel services payments	107	0	107
11.9	Total personnel compensation	71,065	0	71,406
12	Civilian personnel benefits	25,028	0	27,327
13	Benefits for former personnel	38	0	38
21	Travel and transportation of persons	2,945	0	2,973
22	Transportation of things	3,572	0	3,572
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	3,284	0	3,454
23.2	Rental Payments to others	2,685	0	2,685
23.3	Communications, utilities and misc charges	15,097	0	15,097
24	Printing and reproduction	63	0	63
25.1	Advisory and assistance services	10,958	0	10,958
25.2	Other services from non-Federal sources	58,816	1,520	60,336
25.3	Other goods and services from Federal sources	795	0	795
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	24,421	0	24,421
31	Equipment	2,608	0	2,608
32	Lands and structures	782	0	782
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	2,206	0	2,206
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	224,363	1,520	228,721

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Central Processing ORF
Subactivity: Central Processing Transfer From NESDIS Office of Satellites and Product Operations

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	28,193	0	28,326
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	815	0	815
11.8	Special personnel services payments	238	0	238
11.9	Total personnel compensation	29,246	0	29,379
12	Civilian personnel benefits	9,956	0	10,858
13	Benefits for former personnel	9	0	9
21	Travel and transportation of persons	717	0	728
22	Transportation of things	111	0	111
23.1	Rental payments to GSA	1,838	0	1,905
23.2	Rental Payments to others	20	0	20
23.3	Communications, utilities and misc charges	3,660	0	3,660
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	7,231	0	7,231
25.2	Other services from non-Federal sources	34,674	90	34,764
25.3	Other goods and services from Federal sources	20	0	20
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	5,348	0	5,348
31	Equipment	4,767	0	4,767
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	293	0	293
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	97,890	90	99,093

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Analyze, Forecast, and Support
Subactivity: Analyze, Forecast, and Support Transfer From NESDIS Office of Satellite and Product Operations

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	276,809	905	279,088
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	23,185	0	23,185
11.8	Special personnel services payments	175	0	175
11.9	Total personnel compensation	300,169	905	302,448
12	Civilian personnel benefits	104,651	426	114,353
13	Benefits for former personnel	155	0	155
21	Travel and transportation of persons	6,905	0	7,020
22	Transportation of things	3,609	0	3,609
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	7,967	0	8,654
23.2	Rental Payments to others	1,353	0	1,353
23.3	Communications, utilities and misc charges	26,783	0	26,783
24	Printing and reproduction	28	0	28
25.1	Advisory and assistance services	2,752	0	2,752
25.2	Other services from non-Federal sources	30,464	0	30,464
25.3	Other goods and services from Federal sources	338	0	338
25.4	Operation and maintenance of facilities	8,000	0	8,000
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	3,251	0	3,251
31	Equipment	528	0	528
32	Lands and structures	376	0	376
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	8,109	0	8,109
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	505,438	1,331	518,221

* The 2020 Base column reflects the full 2020 Base for the Subactivity, including calculated ATBs and any additional transfers.

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL WEATHER SERVICE (NWS)											
Observations	Pos/BA	775	224,363	793	224,363	793	228,721	793	211,699	0	(17,022)
	FTE/OBL	739	231,687	739	224,363	739	228,721	739	211,699	0	(17,022)
Central Processing	Pos/BA	269	92,790	242	97,890	242	99,093	168	86,864	(74)	(12,229)
	FTE/OBL	257	94,975	257	97,890	257	99,093	183	86,864	(74)	(12,229)
Analyze, Forecast and Support	Pos/BA	2,985	503,938	3,060	505,438	3,065	518,221	2,784	483,036	(281)	(35,185)
	FTE/OBL	2,843	515,587	2,843	505,438	2,848	518,221	2,705	483,036	(143)	(35,185)
Dissemination	Pos/BA	87	50,028	91	50,028	91	75,482	91	75,093	0	(389)
	FTE/OBL	83	52,493	83	50,028	83	75,482	83	75,093	0	(389)
Science and Technology Integration	Pos/BA	459	143,000	461	143,000	461	145,129	461	132,606	0	(12,523)
	FTE/OBL	438	144,833	438	143,000	438	145,129	438	132,606	0	(12,523)
TOTAL NWS - ORF	**Pos/BA**	**4,575**	**1,014,119**	**4,647**	**1,020,719**	**4,652**	**1,066,646**	**4,297**	**989,298**	**(355)**	**(77,348)**
	FTE/OBL	**4,360**	**1,039,575**	**4,360**	**1,020,719**	**4,365**	**1,066,646**	**4,148**	**989,298**	**(217)**	**(77,348)**
Systems Acquisition	Pos/BA	26	134,333	27	122,890	27	97,890	27	83,942	0	(13,948)
	FTE/OBL	26	162,826	26	122,890	26	97,890	26	83,942	0	(13,948)
Construction	Pos/BA	0	8,650	0	19,000	0	19,000	0	8,634	0	(10,366)
	FTE/OBL	0	12,344	0	19,000	0	19,000	0	8,634	0	(10,366)
TOTAL NWS - PAC	**Pos/BA**	**26**	**142,983**	**27**	**141,890**	**27**	**116,890**	**27**	**92,576**	**0**	**(24,314)**
	FTE/OBL	**26**	**175,170**	**26**	**141,890**	**26**	**116,890**	**26**	**92,576**	**0**	**(24,314)**
TOTAL NWS	**Pos/BA**	**4,601**	**1,157,102**	**4,674**	**1,162,609**	**4,679**	**1,183,536**	**4,324**	**1,081,874**	**(355)**	**(101,662)**
	FTE/OBL	**4,386**	**1,214,745**	**4,386**	**1,162,609**	**4,391**	**1,183,536**	**4,174**	**1,081,874**	**(217)**	**(101,662)**

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Observations
Subactivity: Observations

Goal Statement

NWS is fundamentally dependent on environmental observations, from the surface of the sun to the bottom of the sea, to meet its forecast and warnings mission. NWS integrates in-situ and remotely-sensed data from satellites and radars, NOAA systems, commercial sources, Federal, and even international partners in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

Funding from this Activity is used to operate and maintain all NWS observing systems, evaluate observational requirements, engineer technical solutions, and perform systems development and testing. Together, these systems enable forecasters to identify emerging threats, characterize their severity, and provide detailed warnings and forecasts.

Observing systems must measure a broad array of parameters to support forecasting in the varied mission service areas of the NWS including aviation weather, severe weather, space weather, tropical weather, and more. All of these systems have strengths and weaknesses in monitoring the environment, so individual systems in the overall suite must complement each other. By gathering information from multiple sources, NWS ensures the most complete data picture possible.

Specific activities in Observations include:

- Manage operations and maintenance of NWS observational systems;
- Provide holistic, ongoing assessments/analyses of the observing systems portfolio;
- Identify and validate NWS' observation requirements;
- Seek solutions to fulfill NWS' observation requirements;
- Develop a strategy to maximize effectiveness while minimizing cost; and,
- Coordinate NWS' observing system activities with NOAA and its partners.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Statement of Operating Objectives

Schedule and Milestones
FY 2020–2024

- Maintain the tri-agency Next Generation Weather Radar (NEXRAD) radar network
- Maintain the radiosonde network
- Maintain the tri-agency Automated Surface Observing System (ASOS) system
- Operate and maintain weather/ocean buoy, Coastal Marine Automated Networks (C-MAN), Deep-ocean Assessment and Reporting of Tsunamis (DART®), and Tropical Atmosphere Ocean (TAO) arrays
- Sustain data processing of the National Solar Observatory's GONG and observatory support
- Maintain paperless reporting of Cooperative Observer Program (COOP) data
- Develop, test, and deploy NEXRAD Radar Product Generator (RPG) and Radar Data Acquisition (RDA) Software Builds
- Develop, test, and deploy Terminal Doppler Weather Radar (TDWR) Supplemental Product Generator (SPG) Builds
- Develop, test, and deploy NOAA Profiler Network Software Builds

Deliverables

- Support operations of 122 NEXRAD systems at 96 percent availability
- Support operations of 45 TDWR SPG systems
- Support operations of 102 radiosonde stations in the United States and possessions, Caribbean, and Pacific Island nations
- Support operations of 309 NWS ASOS units and maintenance of 570 FAA and 97 Department of Defense (DoD) ASOS units under a reimbursable funding arrangement
- Support operations of 103 Coastal Weather Buoys (CWB) systems at 80 percent data availability (assumes adequate ship time provided by the U.S. Coast Guard) to provide hourly marine weather wind speed and direction, air and sea temperature, atmospheric pressure, and detailed wave information
- Support operations of 48 C-MAN stations at 80 percent data availability
- Support operations of 39 DART® buoys with data availability of 80 percent
- Support operations of the TAO buoy array at 80 percent data availability (assumes adequate ship time provided by OMAO)
- Continuity of GONG data to the Space Weather Prediction Center
- Support operations of three Wind Profiler systems in Alaska
- Leverage data flow from aircraft observations commercial data purchases
- Maintain National Mesonet Program Office and leverage data flow from commercial data purchases
- Leverage data flow from lightning commercial data purchases

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos/BA	775	224,363	793	224,363	793	228,721
	FTE/OBL	739	231,687	739	224,363	739	228,721

In FY 2020 the Observations portfolio will support the observing systems, such as the NEXRAD, the ASOS, and Radiosondes that collect data necessary to provide weather forecasts, warnings, and outlooks. They will also operate and maintain multiple networks of weather/ocean buoys, and develop, test and deploy software builds for the NEXRAD RPG and RDA, the TDWR SPG, and the NOAA Profiler Network.

In FY 2019, NWS is maintaining an average, cross platform buoy data availability rate of 80 percent, a NEXRAD system availability rate of 98 percent and an ASOS system availability rate of 98 percent. In FY 2020, NWS will continue to maintain its critical observing systems while improving their sustainability through configuration management.

Under Observations, NWS maintains the following programs to accomplish this activity:

Upper Air (UA) Observations Program provides a vertical profile of meteorological data across the Earth's atmosphere. To provide humidity, pressure, and other data that shape weather forecasts, NWS operates a radiosonde network, acquires observations from private and commercial aircraft, acquires lightning data from commercial vendors, and operates a wind profiler network in Alaska. In addition, the program provides for critical, terrestrial-based space weather observations.

- Each year, NWS launches over 78,000 radiosondes from locations throughout the United States and its territories, including the Caribbean and Pacific Island nations. Radiosondes provide atmospheric profiles of pressure, temperature, relative humidity and winds aloft. These data are critical inputs for NWS weather prediction models and forecaster operations supporting severe storm, aviation and marine forecasts, and climate and other research uses. Radiosondes also serve to provide a reference for satellite sounding data.
- NWS leverages private-public partnerships to obtain additional data for more comprehensive upper air observations. Meteorological Data, Collection and Reporting System (MDCRS)-equipped aircraft currently provide temperature and wind information.

- The Alaskan NOAA Profiler Network (NPN) consists of three Doppler radar sites providing continuous vertical wind profile data. The most critical use of the Alaska profiler network is to support the production of aviation warnings of volcanic ash, which can cause catastrophic engine failure for aircraft in flight.
- NWS supports the National Solar Observatory's (NSO) Global Oscillation Network Group (GONG). GONG consists of six ground-based observatories strategically placed around the globe, so that at least one site has the opportunity to observe the sun at all times.

Radar Observations Program provides meteorological data about clouds and precipitation that can predict storm impacts and severity. To produce timely and accurate storm data, NWS operates 122 NEXRADs and acquires supplementary radar data from other sources.

- NEXRAD is a tri-agency weather radar system with NWS, the U.S. Department of Defense (DoD) and the Federal Aviation Administration (FAA). NEXRAD is the primary tool used by NOAA's meteorologists for issuing warnings for flash floods, tornadoes, and severe thunderstorms.
- NWS leverages other radar data sources such as the FAA's Terminal Doppler Weather Radar (TDWR) to supplement the NEXRAD network to ensure adequate national radar coverage.

Surface Observations Program provides meteorological data at the Earth's surface. To provide on-the-ground observations, NWS operates the ASOS, the Cooperative Observer Program (COOP) and the National Mesonet Program.

- ASOS is the Nation's primary surface weather observing network supporting aviation operations and the needs of the meteorological, hydrological, and climatological research communities. ASOS is a tri-agency automated surface observation system with NWS, FAA, and DoD and consists of 976 operational systems.
- COOP is a network of volunteer observers providing a significant and cost effective source of meteorological and climatological data representative of where our citizens live, work, and play. The COOP data are the primary data utilized in the NWS snowfall forecast guidance.
- The National Mesonet Program is a network of automated weather stations located in areas most susceptible to tornadoes and installed closely together to gather "mesoscale meteorological" observations such as temperature, humidity, lightning, and atmospheric pressure. Due to their proximity to each other, Mesonet data can identify small scale features at the surface that can indicate rapidly deteriorating weather conditions not shown by other observations.

Marine Observations Program provides real-time meteorological, oceanographic and climatological data in the open ocean and coastal zones surrounding the United States. NWS operates the Weather and Ocean Platform network, the Tropical Atmosphere

Ocean (TAO) Array, the Deep-ocean Assessment and Reporting of Tsunamis (DART®) buoy program, and the Volunteer Observing Ship (VOS) program.

- The Weather and Ocean Platform is a network of 144 meteorological and ocean observing platforms that provide real-time marine meteorological, oceanographic, and geophysical observations. The network includes 103 moored Coastal Weather Buoys (CWB) and 48 land-based Coastal Marine Automated Networks (C-MAN) stations deployed in coastal and offshore waters from the western Atlantic, Gulf of Mexico, and Caribbean Sea to the western Pacific around Hawaii, to the Bering Sea, and in the Great Lakes. This network provides forecasters and the public with frequent, high-quality marine observations for forecast and warning preparation (including for hurricanes) and to verify forecasts after they are produced. Other users rely on the observations and forecasts for commercial and recreational activities.
- The TAO array is designed for the study of seasonal and year-to-year climatic variations related to El Niño and the Southern Oscillation (ENSO) that can have tremendous impact on the Nation's weather. These data are used to produce NWS' seasonal outlooks. Like shorter-term forecasting, the study of this variability enables more rapid prediction of climate anomalies that may result in hazardous weather conditions within the United States. The array consists of 55 moored ocean buoys and four Acoustic Doppler Current Profilers (ADCP) in the equatorial Pacific.
- DART® buoys, located largely along the 'ring of fire' throughout the Pacific Ocean, Atlantic Ocean, Caribbean Sea and Gulf of Mexico, collect observational data that is used by NWS' Tsunami Warning Centers to prepare and refine tsunami watches and warnings covering all U.S. territories and coastal states.
- NWS supports the maintenance of a number of the tsunami-capable tide gauges operated by both the NOS Center for Operational Oceanographic Products and Services (CO-OPS), and the University of Hawaii Sea Level Network. These sensors provide the NWS Tsunami Warning Centers with coastal water-level information updated every minute in key tsunami threat regions. NWS also supports maintenance of a number of coastal sea-level gauges and seismic networks to support tsunami detection, forecast, and warning.
- NWS operates the Volunteer Observing Ship (VOS) program, which obtains ship-based weather and oceanographic observations used in marine weather forecasts in both coastal and high seas areas, and informs local surface conditions. The VOS program is supported by NWS Port Meteorological Officers (PMO) located at twelve major port cities across the county.

Systems Engineering and Support provides systems acquisition, engineering, and logistics support for NWS mission critical observing systems, as well as the functional expertise necessary to design, acquire, test and provide life cycle support. Actions include:

- Perform system engineering and acquisition to support operational weather systems;
- Plan, coordinate, and implement hardware modifications, retrofits and rehabilitation programs to meet changing program requirements and improving system performance;

- Direct product identification, configuration control, auditing, and status accounting for all systems that are under formal NWS Configuration Management control;
- Prescribe and manage efficient logistics for stocking levels (i.e. level of stock needed to balance the need for the part, without carrying the overhead of having unneeded items on hand) and ensuring procurement of initial and replenishment spares for depot-level stock (i.e. required level of on-hand spare parts inventory needed to repair a particular system or system component);
- Provide maintenance, repair, quality assurance, and warehousing of new and reconditioned parts;
- Develop and maintain software for observing systems; and,
- Perform system and operational tests and evaluation of alternative systems.

Without the continued support for Upper Air, Radar, Surface, and Marine observations and support, provided for in Observations ORF, NWS cannot enhance observation capabilities and outputs by (1) improving assimilation of data collected by NWS and others; (2) improving research community collaboration through creative approaches; (3) improving the techniques used by expert forecasters; (4) making NWS information available quickly, efficiently, and in useful forms; (5) incorporating forecast uncertainty to help customers make better-informed decisions; (6) leveraging emerging technologies to disseminate information; and (7) maintaining an up-to-date technology base and a trained workforce to integrate these tools to maximum effect.

PROGRAM CHANGES FOR FY 2020

NOAA requests a net decrease of $17,022,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Observations Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	793	228,721	793	216,221	0	(12,500)
	FTE/OBL	739	228,721	739	216,221	0	(12,500)

Reduce Surface Observations (-$12,500, 0 FTE/ 0 Positions) – This program change reduces the scope and operations of the surface observations platform.

NOAA will reduce the National Mesonet Program. The National Mesonet Program gathers “mesoscale meteorological” observations that can identify rapidly deteriorating weather conditions not identified by other observation platforms. NOAA will reduce the geographic scope from all 50 states to prioritize states most susceptible to tornadoes and severe weather and limit the observations to surface meteorological observations and lightning.

Schedule and Milestones
FY 2020-2024

- Reduce scope of the National Mesonet Program to highest priority geographic extent and observations that support severe weather watches and warnings

Deliverables

- Purchase surface observations from 9 Mesonet networks located in Southeast and South Central U.S

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures					
Number of observations platforms from Mesonet with decrease	5,000	5,000	5,000	5,000	5,000
Number of Observation platforms from Mesonet without decrease	18,700	18,700	18,700	18,700	18,700

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Observations
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	68,354	68,354	68,695	68,695	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,604	2,604	2,604	2,604	0
11.8	Special personnel services payments	107	107	107	107	0
11.9	Total personnel compensation	71,065	71,065	71,406	71,406	0
12	Civilian personnel benefits	25,028	25,028	27,327	27,327	0
13	Benefits for former personnel	38	38	38	38	0
21	Travel and transportation of persons	2,945	2,945	2,973	2,888	(85)
22	Transportation of things	3,572	3,572	3,572	3,377	(195)
23.1	Rental payments to GSA	3,284	3,284	3,454	3,454	0
23.2	Rental Payments to others	2,685	2,685	2,685	1,554	(1,131)
23.3	Communications, utilities and misc charges	15,097	15,097	15,097	14,590	(507)
24	Printing and reproduction	63	63	63	63	0
25.1	Advisory and assistance services	10,958	10,958	10,958	5,448	(5,510)
25.2	Other services from non-Federal sources	58,816	58,816	60,336	57,803	(2,533)
25.3	Other goods and services from Federal sources	795	795	795	795	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	24,421	24,421	24,421	22,472	(1,949)
31	Equipment	2,608	2,608	2,608	2,608	0
32	Lands and structures	782	782	782	782	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,206	2,206	2,206	1,616	(590)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	224,363	224,363	228,721	216,221	(12,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	793	228,721	793	227,221	0	(1,500)
	FTE/OBL	739	228,721	739	227,221	0	(1,500)

Reduce Marine Observations (-$1,500, 0 FTE/ 0 Positions) – This program change reduces the scope and operations of marine observations. Tsunamis are low probability/high impact events and difficult decisions and tradeoffs must be made among program priorities to ensure that NOAA most effectively meets its mission mandates and supports stakeholders. NOAA will maintain its full array of 39 Deep-ocean Assessment and Reporting of Tsunamis (DART®) moorings to support the tsunami mission, but will remove 17 of the 210 NOAA Water Level Observation Network (NWLON) stations and NOAA's contribution to the U.S. Geological Survey Seismic network which also support the tsunami mission. This also includes cutting direct funding support to the University of Alaska Fairbanks for the Consolidated Reporting of Earthquakes and Tsunamis (CRESTnet) and the University of Hawaii's Sea Level Center.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures					
Number of water level and seismic network platforms with decrease	0	0	0	0	0
Number of water level and seismic network platforms without decrease	472	472	472	472	472

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Observations
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	68,354	68,354	68,695	68,695	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,604	2,604	2,604	2,604	0
11.8	Special personnel services payments	107	107	107	107	0
11.9	Total personnel compensation	71,065	71,065	71,406	71,406	0
12	Civilian personnel benefits	25,028	25,028	27,327	27,327	0
13	Benefits for former personnel	38	38	38	38	0
21	Travel and transportation of persons	2,945	2,945	2,973	2,973	0
22	Transportation of things	3,572	3,572	3,572	3,572	0
23.1	Rental payments to GSA	3,284	3,284	3,454	3,454	0
23.2	Rental Payments to others	2,685	2,685	2,685	2,685	0
23.3	Communications, utilities and misc charges	15,097	15,097	15,097	15,097	0
24	Printing and reproduction	63	63	63	63	0
25.1	Advisory and assistance services	10,958	10,958	10,958	10,958	0
25.2	Other services from non-Federal sources	58,816	58,816	60,336	58,836	(1,500)
25.3	Other goods and services from Federal sources	795	795	795	795	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	24,421	24,421	24,421	24,421	0
31	Equipment	2,608	2,608	2,608	2,608	0
32	Lands and structures	782	782	782	782	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,206	2,206	2,206	2,206	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	224,363	224,363	228,721	227,221	(1,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	793	228,721	793	227,421	0	(1,300)
	FTE/OBL	739	228,721	739	227,421	0	(1,300)

Reduce Marine Observations Tropical Atmosphere Ocean Platform (-$1,300, 0 FTE/ 0 Positions) – This program change reduces the scope and operations of marine observations.

NOAA will reduce the Tropical Atmosphere Ocean (TAO) Platform. The TAO array studies and monitors climatic variations in the Pacific Ocean that have profound impacts on the Nation's weather. NOAA will reduce the 55-buoy array by 15 ($1.3 million) while maintaining 80 percent availability for the remaining network. This reduction may delay recognition of the onset of an El Niño and the Southern Oscillation (ENSO) phenomenon and increase the uncertainty of seasonal weather forecasts issued around the world, in turn delaying the ability to mitigate impacts of drought or other conditions signaled by the ENSO phenomenon.

Schedule and Milestones
FY 2020-2024

- Reduce TAO Array by 15 buoys, maintaining the remaining 40-buoy array at 80 percent availability

Deliverables

- Support operations of the reduced TAO buoy array with annual average data availability of 80 percent.

Department of Commerce
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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures					
Number of observations from TAO array with decrease	280,320	280,320	280,320	280,320	280,320
Number of observations from TAO array without decrease	384,440	384,440	384,440	384,440	384,440

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Observations
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	68,354	68,354	68,695	68,695	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,604	2,604	2,604	2,604	0
11.8	Special personnel services payments	107	107	107	107	0
11.9	Total personnel compensation	71,065	71,065	71,406	71,406	0
12	Civilian personnel benefits	25,028	25,028	27,327	27,327	0
13	Benefits for former personnel	38	38	38	38	0
21	Travel and transportation of persons	2,945	2,945	2,973	2,973	0
22	Transportation of things	3,572	3,572	3,572	3,472	(100)
23.1	Rental payments to GSA	3,284	3,284	3,454	3,454	0
23.2	Rental Payments to others	2,685	2,685	2,685	2,685	0
23.3	Communications, utilities and misc charges	15,097	15,097	15,097	15,097	0
24	Printing and reproduction	63	63	63	63	0
25.1	Advisory and assistance services	10,958	10,958	10,958	10,958	0
25.2	Other services from non-Federal sources	58,816	58,816	60,336	59,736	(600)
25.3	Other goods and services from Federal sources	795	795	795	795	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	24,421	24,421	24,421	23,821	(600)
31	Equipment	2,608	2,608	2,608	2,608	0
32	Lands and structures	782	782	782	782	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,206	2,206	2,206	2,206	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	224,363	224,363	228,721	227,421	(1,300)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	793	228,721	793	226,450	0	(2,271)
	FTE/OBL	739	228,721	739	226,450	0	(2,271)

Reduce Upper Air Observations (-$2,271, 0 FTE/ 0 Positions) – This program change reduces the scope and operations of upper air observations platforms. The Aircraft-based Observations Data Buy provides over 3.7 million observations per year from aircraft worldwide, both over land and data sparse areas over the oceans. These observations provide valuable information for aviation forecasters and input into global forecast models. NOAA will reduce the geographic scope of the observations and purchase observations over the Continental US and major air routes over the oceans, and will eliminate aircraft observations over other parts of the oceans and in other continents.

Radiosondes provide atmospheric profiles of pressure, temperature, relative humidity and winds aloft. These data are critical inputs for NWS weather prediction models and forecaster operations supporting severe storm, aviation and marine forecasts, and climate and other research uses.

Schedule and Milestones
FY 2020-2024

- Reduce number of aircraft observations to concentrate on higher priority CONUS and Atlantic Ocean routes.

Performance Measures	2020	2021	2022	2023	2024
Number of Aircraft-based observations with decrease	1.7M	1.7M	1.7M	1.7M	1.7M
Number of Aircraft-based observations without decrease	3.7M	3.7M	3.7M	3.7M	3.7M

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Observations
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	68,354	68,354	68,695	68,695	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,604	2,604	2,604	2,604	0
11.8	Special personnel services payments	107	107	107	107	0
11.9	Total personnel compensation	71,065	71,065	71,406	71,406	0
12	Civilian personnel benefits	25,028	25,028	27,327	27,327	0
13	Benefits for former personnel	38	38	38	38	0
21	Travel and transportation of persons	2,945	2,945	2,973	2,973	0
22	Transportation of things	3,572	3,572	3,572	3,572	0
23.1	Rental payments to GSA	3,284	3,284	3,454	3,454	0
23.2	Rental Payments to others	2,685	2,685	2,685	2,685	0
23.3	Communications, utilities and misc charges	15,097	15,097	15,097	15,097	0
24	Printing and reproduction	63	63	63	63	0
25.1	Advisory and assistance services	10,958	10,958	10,958	10,958	0
25.2	Other services from non-Federal sources	58,816	58,816	60,336	58,776	(1,560)
25.3	Other goods and services from Federal sources	795	795	795	795	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	24,421	24,421	24,421	23,710	(711)
31	Equipment	2,608	2,608	2,608	2,608	0
32	Lands and structures	782	782	782	782	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,206	2,206	2,206	2,206	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	224,363	224,363	228,721	226,450	(2,271)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	793	228,721	793	230,921	0	2,200
	FTE/OBL	739	228,721	739	230,921	0	2,200

NOAA Ship Observation Data Buy (+$2,200, 0 FTE/ 0 Positions) – This request will improve tropical and marine watches and warnings, as well as global weather models, by providing for the initiation of a data buy contract for meteorological and oceanographic observations from ships. The 2015 sinking of the container ship *El Faro* in the Bahamas highlights the necessity of better forecasts and warnings for extreme weather events at sea. NOAA's most sparse in-situ measurements are on the oceans, so this initiative would work to fill a significant data gap used to support maritime commerce and warnings of extreme events (e.g. hurricanes, winter storms, etc.).

Ship-based observations constitute one of the most cost-effective opportunities to increase skill of the global prediction system. A very small number of ships around the world currently participate in the Volunteer Observations Ship (VOS) Program, so this initiative has the potential to increase data availability from ships by orders of magnitude.

Without this increase, NOAA will continue to be reliant on remotely sensed data from satellites and an extremely sparse Volunteer Observing Ship (VOS) network to support its forecast and warning responsibilities in all its areas of maritime responsibility, and it will miss the opportunity of increasing the level of data available in data sparse areas.

This initiative supports the goals laid out in Executive Order 13840, Titled "Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States". This request is consistent with Congressional direction through the Weather Research and Forecasting Innovation Act, which directs NOAA to improve weather forecasting through new sources of data and research. The model for this initiative is the Aircraft Observations data buy that has been operating successfully for over 20 years. A small fraction of this funding would be needed to support data assimilation systems at the National Data Buoy Center, similar to their current ingest of Regional Integrated Ocean Observing System data.

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Schedule and Milestones

- Establish a contract with a data provider to obtain meteorological and oceanographic observations from shipping companies

Deliverables

- Increased ship observation data ingested into NOAA by a factor of at least ten (10x) in the first year, with the VOS data as the initial benchmark

Performance Measures	2020	2021	2022	2023	2024
Number of Ships Observations collected with increase	4,600,000	4,600,000	4,600,000	4,600,000	4,600,000
Number of Ships Observations collected without increase	460,000	460,000	460,000	460,000	460,000

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Observations
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	68,354	68,354	68,695	68,695	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	2,604	2,604	2,604	2,604	0
11.8	Special personnel services payments	107	107	107	107	0
11.9	Total personnel compensation	71,065	71,065	71,406	71,406	0
12	Civilian personnel benefits	25,028	25,028	27,327	27,327	0
13	Benefits for former personnel	38	38	38	38	0
21	Travel and transportation of persons	2,945	2,945	2,973	2,973	0
22	Transportation of things	3,572	3,572	3,572	3,572	0
23.1	Rental payments to GSA	3,284	3,284	3,454	3,454	0
23.2	Rental Payments to others	2,685	2,685	2,685	2,685	0
23.3	Communications, utilities and misc charges	15,097	15,097	15,097	15,097	0
24	Printing and reproduction	63	63	63	63	0
25.1	Advisory and assistance services	10,958	10,958	10,958	11,458	500
25.2	Other services from non-Federal sources	58,816	58,816	60,336	62,036	1,700
25.3	Other goods and services from Federal sources	795	795	795	795	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	24,421	24,421	24,421	24,421	0
31	Equipment	2,608	2,608	2,608	2,608	0
32	Lands and structures	782	782	782	782	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,206	2,206	2,206	2,206	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	224,363	224,363	228,721	230,921	2,200

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing

Goal Statement

Central Processing is the next step in the NWS forecast process. Through this Activity, NWS ingests data obtained from observing infrastructure, and delivers it in a usable form to NWS modelers and meteorologists in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

- Activities under Central Processing include managing the Weather and Climate Operational Supercomputing System (WCOSS), the Advanced Weather Interactive Processing System (AWIPS), hydrology information technology initiatives, and the information technology (IT) infrastructure that supports national centers and field operations. Together these ensure the uninterrupted flow of information from collection of observations to central guidance production and local access to all essential weather and climate data products.
- Specific activities in Central Processing include:
    - Operate NWS' IT processing infrastructure;
    - Sustain reliability of NWS' IT processing by keeping infrastructure up to date:
    - Identify NWS' processing requirements and gaps;
    - Review NWS' processing system capabilities;
    - Seek solutions to fulfill NWS processing requirements;
    - Coordinate NWS' processing system activities across NOAA; and,
    - Maintain a 24/7 help desk for all forecast systems.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Statement of Operating Objectives

Schedule and Milestones
FY 2020-2024

- Manage HPC usage, reliability, and resources including a major system upgrade
- Support scheduled improvements to NCEP production suite
- Deploy updated AWIPS hardware infrastructure at National Centers
- Maintain updated AWIPS architecture and infrastructure at National Centers, RFCs, and WFOs
- Continue to improve flood lead time and accuracy improvement

Deliverables

- WCOSS capacity substantially increased and meeting or exceeding reliability metrics
- 43 million numerical prediction products produced per day for weather, climate, ocean, river, and space-weather forecasts
- 4,011 operational AHPS forecast locations
- AHPS performance meeting or exceeding flood lead time and accuracy goals
- National Center and Regional IT infrastructure that meets operational reliability goals through improved annual maintenance

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central Processing	Pos/BA	269	92,790	242	97,890	242	99,093
	FTE/OBL	257	94,975	257	97,890	257	99,093

In 2015, NWS completed the deployment of AWIPS II. AWIPS II is an underlying software design enhancement that enables the AWIPS software, NWS' primary forecasting software, to more rapidly integrate new data sources and forecast capabilities into operations while improving system maintainability. In FY 2019, NWS is maintaining an average on-time model production delivery rate of 99.9 percent from its Weather and Climate Operational Supercomputing System. In FY 2020, NWS will continue to integrate new forecast capabilities into AWIPS and model improvements onto WCOSS.

Central Processing maintains the following programs to accomplish this activity:

NCEP Central Operations (NCO) provides support for WCOSS including the software and infrastructure that forms the basis for predictions from NCEP Centers and WFOs through its Weather and Climate Computing Infrastructure Services (WCCIS) program. WCCIS provides the following services:

- Performs quality assurance of incoming observations and outgoing products;
- Transitions and disseminates numerical weather and climate prediction models from development into operational use by forecasters at NCEP and the WFOs;
- Performs 24/7 system maintenance and administration service;
- Performs software development for data processing, display, interaction, and product generation; and,
- Monitors the creation of all products in the NCEP production suite on a 24/7 basis.

Advanced Weather Interactive Processing System (AWIPS) is the information processing, display, and telecommunications system that is the cornerstone of NWS field operations. AWIPS provides the following services:

- Integrates and displays observing data (meteorological, hydrological, satellite, and radar) at NWS field offices;
- Processes and displays forecast data at operational sites;
- Provides an interactive communications system including the Satellite Broadcast Network (SBN) to connect NWS field locations and allows a mechanism for external partners to access the data;
- Initiates the dissemination of weather and flood warnings and forecasts in a rapid and highly reliable manner; and,
- Provides the communication interface for the public to see NOAA's data.

Hydrology Information Technology Initiatives gather, integrate and utilize advanced and localized water and related observations to predict streamflow and produce water resources information to inform decisions, which optimize water use and mitigate the impacts of floods and droughts.

- The Advanced Hydrologic Prediction System (AHPS) is a web-based suite of graphical river-forecast products that provide advanced information on the magnitude and likelihood of floods and droughts. Advanced river forecast information is provided at 4,011 locations throughout the United States to enable government agencies, private institutions, and individuals to make more informed decisions about risk-based policies and actions to mitigate the dangers posed by floods and droughts. This advanced forecast information includes uncertainty information generated by the Hydrologic Ensemble Forecast Service (HEFS).

- Community Hydrologic Prediction System (CHPS) is the information technology infrastructure that all 13 RFCs use to develop and run operational hydrologic forecast models. This infrastructure generates data and information that water resource managers and emergency managers use to effectively respond to flooding events.

National Centers and Regional IT Infrastructure maintain the information technology infrastructure and standards that enable the National Centers and regional offices, including forecast offices, to effectively work together. This includes:

- Computing that occurs outside of AWIPS;
- Local area networking;
- Security; and
- Data center power and cooling.

Without the continued support for NCEP, NCO, AWIPS, Hydrology Information Technology Initiatives, and National Centers and Regional IT Infrastructure, provided for in Central Processing ORF, NWS cannot continue to support the information technology necessary to process weather data and run weather models in support of national centers and field operations. These include not only the systems and initiatives outlined above, but also the Weather and Climate Operational Supercomputing System (WCOSS), the AHPS, and other hydrology information technology initiatives.

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $12,229,000 and 74 FTE/ 74 positions in FY 2020 program changes for the Central Processing Activity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central	Pos./BA	242	99,093	168	88,993	-74	(10,100)
Processing	FTE/OBL	257	99,093	183	88,993	-74	(10,100)

Establishment of Regional Enterprise Application Development and Integration Teams (-$10,100, -74 FTE/ -74 Positions) – This program change reduces the scope and to reflect the significant efficiencies that can be achieved by transitioning to a new information technology (IT) service delivery model for the National Weather Service (NWS) Weather Forecast Offices (WFO).

The NWS has realized efficiencies in the delivery of IT support services to field offices through investments in open source software and implementation of IT best practices. In FY 2020, NWS proposes to initiate a phased consolidation of its 122 Information Technology Officer (ITO) full-time equivalents (FTE). Consolidating IT support functions is a critical part of evolving the NWS, including a right-sized workforce and appropriate organizational structure. ITO officers were hired at each WFO in 2000 to support the initial installation of Advanced Weather Interactive Processing System (AWIPS), which required frequent software installation and technology upgrades. The deployment of AWIPS II, with simplified software code and strengthened system performance, has since reduced the need for on-site local maintenance. The latest follow-on contract for AWIPS will further reduce the hardware footprint through virtualization and greatly reduce maintenance needs.

These advances in technology allow NWS to decouple from a one-to-one WFO to ITO relationship and establish Regional Enterprise Application Development and Integration (READI) teams. The READI team concept has several benefits, including increased support up to 24-hour coverage (from 9 a.m. to 5 p.m., Monday through Friday, which is 24 percent of a WFOs operating hours). READI teams will ensure the working order of all computer applications and software, including regular maintenance and installation, at all WFOs remotely.

The concept enables NWS to reduce its IT workforce without impacting its mission to protect lives and property and enables the agency to provide a higher degree of consistency in service delivery. NWS will seek to reduce ITO staffing through attrition or the transitioning of staff into other positions for which they are qualified and will work diligently to mitigate any impact to affected employees.

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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

NWS will cease recruiting and hiring personnel into the legacy ITO positions and employees encumbering 74 of the 122 ITO positions will be assigned to the NWS budget Portfolio and program for which their educational background and skill sets most closely support. This will achieve the planned FTE reduction and will provide NWS the ability to phase in changes in IT support and employee position duties. Due to existing and projected NWS personnel vacancies across all of the portfolios, there will be sufficient FTE personnel capacity and budget authority to absorb these incumbent staff during FY 2020. However, the NWS may need to make future adjustments to the annual portfolio budget spend plans to mitigate temporary imbalances in existing staff to current vacancies during the implementation period.

Employees' organizational assignment and position description will not change immediately but will be transitioned to established NWS position billets over a four-year implementation period. Final placement of employees into established billets in the proper grade, series, and position description will depend on 1) establishment and successful implementation of READI teams; and 2) alignment of staff to requirements, first using voluntary personnel reassignments and then directed reassignments where necessary. In many cases, employees will be able to quickly fill corresponding vacancies in their assigned portfolio once READI teams are established. Examples include IT specialists in Central Processing or meteorologist forecaster positions under Analyze, Forecast and Support where the employee qualifications and operational skills are commensurate with a vacancy in the same series and grade. All existing ITO employees will have a job in the NWS and will retain their current grade and salary.

Schedule and Milestones
FY 2020-2024

- 74 ITO FTE redirected to other NWS budget portfolios
- Initiate limited scope implementation
- Test and evaluation of READI team concept
- Phased transition to full implementation
- Phased transition of former ITO into other NWS positions

Deliverables

- READI teams meeting or exceeding current service levels

Exhibit 14

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Central Processing
Subactivity: Central Processing
Program Change: Establishment of Regional Enterprise Application Development and Integration Teams

Title	Grade	Number	Annual Salary	Total Salaries
Information Technology Officer	GS-13	74	103,435	7,654,190
Total		74		7,654,190
Less lapse	0.00%	0		0
Total full-time permanent (FTE)		74		7,654,190
2020 Pay Adjustment (0%)	0.00%			0
Total				7,654,190

Personnel Data Summary

Full-time Equivalent Employment (FTE)	
Full-time permanent	74
Part-time permanent	0
Total FTE	74
Authorized Positions:	
Full-time permanent	74
Partl-time permanent	0
Total Positions	74

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	28,193	28,193	28,326	20,672	(7,654)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	815	815	815	815	0
11.8	Special personnel services payments	238	238	238	238	0
11.9	Total personnel compensation	29,246	29,246	29,379	21,725	(7,654)
12	Civilian personnel benefits	9,956	9,956	10,858	8,412	(2,446)
13	Benefits for former personnel	9	9	9	9	0
21	Travel and transportation of persons	717	717	728	728	0
22	Transportation of things	111	111	111	111	0
23.1	Rental payments to GSA	1,838	1,838	1,905	1,905	0
23.2	Rental Payments to others	20	20	20	20	0
23.3	Communications, utilities and misc charges	3,660	3,660	3,660	3,660	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	6,661	7,231	7,231	7,231	0
25.2	Other services from non-Federal sources	32,794	34,674	34,764	34,764	0
25.3	Other goods and services from Federal sources	20	20	20	20	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,948	5,348	5,348	5,348	0
31	Equipment	2,517	4,767	4,767	4,767	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	293	293	293	293	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	92,790	97,890	99,093	88,993	(10,100)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central	Pos./BA	242	99,093	242	97,093	0	(2,000)
Processing	FTE/OBL	257	99,093	257	97,093	0	(2,000)

Slow Advanced Hydrologic Prediction System Expansion (-$2,000, 0 FTE/ 0 Positions) – This program change will slow the expansion of new technology at Advanced Hydrologic Prediction Services (AHPS) forecast locations.

AHPS is a web-based suite of graphical river-forecast products that provide advanced information on the magnitude and likelihood of floods and droughts for specific locations. The Hydrologic Ensemble Forecast Service (HEFS) is the key piece of the AHPS program providing forecast likelihood (uncertainty) information. NOAA expects to complete implementation of HEFS version 1 (HEFSv1) at 978 river forecast locations across the country by the end of FY1 209. Early development and preliminary prototyping of enhanced components for a prospective HEFS version 2 is ongoing in FY 2019. Without additional funding, NOAA will delay/forgo aspects of the planned research and development needed to address known limitations in HEFSv1 – such as the ability to incorporate the effects of reservoir regulation and improve performance for large precipitation events. Training and implementation support also will be reduced for the HEFS. As a result, there will be fewer AHPS forecast locations with HEFS-based uncertainty information.

HEFS is an operational ensemble prediction service that leverages the skill in weather and climate forecasts to produce reliable ensemble forecasts of precipitation, temperature, and streamflow at forecast lead times ranging from one hour to one year. HEFS provides uncertainty ranges for hydrologic forecasts at all-time scales and enables better risk-informed decisions to support water management.

Schedule and Milestones
FY 2020-2024

- Sustain existing support to continue HEFS implementation
- Maintain HEFS services

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Deliverables

- HEFS services at 1,500 water forecast service locations

Performance Measures	2020	2021	2022	2023	2024
Number of AHPS forecast locations with HEFS integration with Decrease	1,053	1,203	1,378	1,500	1,500
Number of AHPS forecast locations with HEFS integration without Decrease	1,178	1,478	1,828	2,228	2,734

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	28,193	28,193	28,326	28,326	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	815	815	815	815	0
11.8	Special personnel services payments	238	238	238	238	0
11.9	Total personnel compensation	29,246	29,246	29,379	29,379	0
12	Civilian personnel benefits	9,956	9,956	10,858	10,858	0
13	Benefits for former personnel	9	9	9	9	0
21	Travel and transportation of persons	717	717	728	728	0
22	Transportation of things	111	111	111	111	0
23.1	Rental payments to GSA	1,838	1,838	1,905	1,905	0
23.2	Rental Payments to others	20	20	20	20	0
23.3	Communications, utilities and misc charges	3,660	3,660	3,660	3,660	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	6,661	7,231	7,231	7,231	0
25.2	Other services from non-Federal sources	32,794	34,674	34,764	32,764	(2,000)
25.3	Other goods and services from Federal sources	20	20	20	20	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,948	5,348	5,348	5,348	0
31	Equipment	2,517	4,767	4,767	4,767	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	293	293	293	293	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	92,790	97,890	99,093	97,093	(2,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central	Pos./BA	242	99,093	242	99,797	0	704
Processing	FTE/OBL	257	99,093	257	99,797	0	704

Improve System Support Capabilities (+$704, 0 FTE/ 0 Positions) – This funding will add three systems administration support contractors at the National Centers for Environmental Prediction (NCEP) Central Operations to enable appropriate timeliness of response and resolution of system issues that impact forecasters in the National Centers. To continue meeting the Central Processing (CP) Program's operational requirements, NWS requires this funding to maintain current level of services and ongoing operations necessary to issue warnings and forecasts to protect life and property. Funding will restore core capabilities that were previously redirected for labor costs.

Currently these liabilities are being funded through cuts to its existing base requirements adding risk to operational continuity and readiness.

Deliverables

- Continuity of timely and accurate weather and water forecasts and warnings

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	28,193	28,193	28,326	28,326	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	815	815	815	815	0
11.8	Special personnel services payments	238	238	238	238	0
11.9	Total personnel compensation	29,246	29,246	29,379	29,379	0
12	Civilian personnel benefits	9,956	9,956	10,858	10,858	0
13	Benefits for former personnel	9	9	9	9	0
21	Travel and transportation of persons	717	717	728	728	0
22	Transportation of things	111	111	111	111	0
23.1	Rental payments to GSA	1,838	1,838	1,905	1,905	0
23.2	Rental Payments to others	20	20	20	20	0
23.3	Communications, utilities and misc charges	3,660	3,660	3,660	3,660	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	6,661	7,231	7,231	7,935	704
25.2	Other services from non-Federal sources	32,794	34,674	34,764	34,764	0
25.3	Other goods and services from Federal sources	20	20	20	20	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,948	5,348	5,348	5,348	0
31	Equipment	2,517	4,767	4,767	4,767	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	293	293	293	293	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	92,790	97,890	99,093	99,797	704

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Analyze, Forecast, and Support
Subactivity: Analyze, Forecast, and Support

Goal Statement

NWS' mission is to provide forecasts and warnings for the protection of life and property, and to support the national economy. The Analyze, Forecast and Support (AFS) Activity leverages innovations from the Science and Technology Integration (STI) Activity, and utilizes output and support services from the Observations, Central Processing, and Dissemination Activities by applying expertise to the observed data, model outputs, and dissemination systems, resulting in forecasts, warnings, and Impact-based Decision Support Services (IDSS) for the Nation in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

NWS' distributed network of forecast offices, specialized centers, and associated workforce of meteorologists, hydrologists, climatologists, and space physicists is supported through the AFS Activity. This expert workforce monitors the weather, water, climate and space weather from our oceans to the surface of the sun, 24 hours a day, seven days a week. These professionals provide information using a collaborative forecast process which enables forecasts and warnings to benefit from the NWS' fully integrated forecast process. Forecasts globally support agriculture, transportation, energy production and water management among other missions and industries. Forecasts and warnings, provided days in advance of pending winter storms or hurricanes, wildland fire conditions, tornado outbreaks, heat waves or river floods enable the public, industry, and emergency managers to plan effective preparation and response strategies. Warnings for high impact, rapidly evolving hazards such as solar storms, tornadoes, tsunamis, flash floods or ash plumes following volcanic eruptions, enable decision makers to keep the public out of harm's way to protect their lives and livelihoods.

NOAA's network of Weather Forecast Offices (WFOs), River Forecast Centers (RFCs), and specialized national centers house the NOAA equipment and expertise that results in weather forecasts, warnings, and the provision of IDSS. Like any other physical asset, this infrastructure must be maintained to support NWS' mission delivery and efforts to build a Weather-Ready Nation. As such, NWS conducts facility condition assessments (FCAs) for all leased and owned facilities. A first assessment of all facilities was completed in

FY 2019, and NWS has a comprehensive analysis of site conditions, itemized deferred maintenance, and projected life cycle cost for the next ten years. In some instances, the FCA identifies issues that might significantly affect operational readiness, service delivery, or occupant safety. With the addition of funding specifically focused on deferred maintenance, which started in FY 2018, progress is being made toward completing priority deferred maintenance and capital improvements.

Statement of Operating Objectives

Schedule and Milestones

FY 2020–2024

- Operate national network of 24/7 and part time WFOs, that provide weather surveillance, IDSS, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Operate the National Centers for Environmental Prediction (NCEP) service centers that monitor the tropics, warn of space weather hazards, predict tornadoes, provide outlooks for subseasonal and seasonal events and develop and deliver foundational data sets
- Operate the National Water Center (NWC) to support water resource decision making across the Nation
- Operate NOAA's component of the interagency National Ice Center (NIC) to support sea ice analysis and prediction
- Provide IDSS to core partners during routine and high impact events
- Operate a Tsunami Warning Center to monitor and predict the development and onset of tsunamis along the Nation's coasts and coasts of other countries as agreed by treaty
- Provide weather support to the Nations of the Pacific Island Compact

Deliverables

- Operations and maintenance of all WFOs, RFCs, National Centers, and a Tsunami Warning Center
- IDSS provided to local, regional and state partners and decision makers from WFOs and National Centers
- Provision of field operational support from National Headquarters
- Operations and maintenance of OCONUS WSOs that support the Nations of the Pacific Island Compact
- Operations and maintenance of WSOs and Data Collection Offices in Hawaii and Alaska as important parts of the national observation program
- Improved hydrologic predictions, subseasonal and seasonal outlooks, forecasts of space weather conditions, and forecasts of hurricanes, blizzards, heat waves and severe storms

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

- Operational sea ice forecasts from the National Ice Center (NIC)
- Aviation weather forecasts for all identified airports and air routes
- Deployments of Incident Meteorologists (IMETs) to support decision makers at wildland fires
- Continued support of StormReady® communities
- Street-level water information for every stream reach in the CONUS, at 2.7 million locations
- A predictive 1-hr-to-10-day national water forecast for the entire Nation
- A 30-day water outlook for the entire Nation (excluding storm influences)
- Flood forecast inundation maps for communities across the Nation

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and	Pos/BA	2,985	503,938	3,060	505,438	3,065	518,221
Support	FTE/OBL	2,843	503,938	2,843	505,438	2,848	518,221

NWS forecasts, predicts, provides outlooks, and communicates the effects of changing weather, sub-seasonal to seasonal conditions, and water resources to the American public. Weather and water impact every sector of the economy, and businesses rely on NOAA's information to improve commerce. Timely and accurate warnings for weather-related hazards – provided reliably and on time, every time – are necessary for public safety. NWS measures satisfaction with NOAA information and warning services through surveys of emergency managers, first responders, natural resource and water managers, public health professionals, industry, government, and the public. NWS then uses these results to inform service improvements.

In 2017, the Office of Water Prediction (OWP) created a fifth division, the Water Prediction Operations Division (WPOD), and began efforts to staff this division at the National Water Center (NWC) as directed in the Consolidated Appropriations Act of 2017. Staffing of the 12 WPOD positions is ongoing. WPOD activities include facilitating collaboration within the NWS, across NOAA, and among Federal Water Agencies to improve water resources situational awareness and decision support services. These collaborative activities include daily leadership situational awareness briefings, routine coordination calls, and the annual National Hydrologic Assessment/Spring Flood Outlook. Before, during, and after significant national or multi-regional hydrologic events, WPOD will work

with NCEP Centers, Regional Operations Centers, RFCs, WFOs, and core federal agency partners (i.e. U.S. Geological Survey (USGS), U.S. Army Corps of Engineers (USACE), and Federal Emergency Management Agency (FEMA)) to establish a common operating picture to ensure coordinated decision support services. WPOD will also provide routine feedback on rapid analysis and verification of the National Water Model (NWM), and will continue to build the capability to provide backup to RFCs.

Upgrades to the National Water Model (NWM) in FY 2019 included an expanded domain, which encompasses Hawaii. Planned FY 2020 upgrades to the NWM will expand the domain to include Puerto Rico and the southern Canada (Great Lakes) channel flow network. NOAA's NWM, introduced in August 2016, is a continental-scale water resources model that combines data from USGS stream gauges with outputs from NOAA's atmospheric weather models to greatly improve flood forecasting. The NWM represents NOAA's first foray into high performance computing for water prediction and simulates conditions for 2.7 million stream reaches nationwide every hour (a 700-fold increase over the ~3,600 locations previously available every few hours), providing water information in previously underserved locations. The model also improves NOAA's ability to meet the needs of stakeholders by providing more frequent, accurate, and expanded streamflow information, as well as forecasts of soil moisture, evapotranspiration, runoff, snow water equivalent and other water resources parameters on a high resolution grid nationwide. The experimental NWM supports future improvements to hydrologic forecasting by leveraging collaboration with the public, private, and academic sectors.

In FY 2020's request, the NOAA component of the tri-agency NIC is realigned from the National Environmental Satellite, Data, and Information Service (NESDIS) to NWS, into NCEP's Ocean Prediction Center (OPC), to enable NOAA to meet growing requirements for operational sea ice forecasting. Given NIC's mission to produce global snow cover and sea ice products, this action aligns national and global scale operational weather analysis and prediction functions within NWS/NCEP. This realignment also leverages the organizational synergies within NCEP by combining NIC's existing global sea ice analysis capability with hazardous marine weather forecasting at OPC.

In FY 2018, NWS met or exceeded 10 of its 16 field-based Government Performance and Results Act (GPRA) goals. In addition, NOAA operationalized new time of arrival graphics for tropical storm winds and continued to utilize and improve new storm surge watches and warnings during the hurricane season. Storm surge warnings provide decision makers with even more details about impacts of landfalling tropical storms and hurricanes by providing them information about how high the water is likely to get in their area due to wind driven waves and surge. Through the FY 2018-2019 NOAA Agency Priority Goal, NWS will Mitigate Flood Impacts by demonstrating Improved Decision Support Services to Emergency Managers by (1) demonstrating a new flood inundation mapping capability serving 25 million people (approximately 8% of the continental U.S. population) residing in flood-vulnerable

freshwater basins, and (2) delivering an enhanced excessive rainfall outlook product, with lead time of “High Risk” predictions extended from two days to three days.

AFS maintains the following programs to accomplish this and other mission critical activities:

Weather and Climate Services and Warnings provide real-time meteorological and subseasonal to seasonal products and services to the public. To achieve this requirement, NWS operates WFOs and other field offices within the continental United States, Alaska, Hawaii, and U.S. territories.

- WFOs issue warnings, advisories, statements, and forecasts for their geographic area of responsibility at multiple time scales, from alerting for immediate threats, to seasonal reports. WFOs operate 24/7 all year. WFO forecasts include aviation, fire weather, marine, severe and tropical weather and the prediction of winter storms. WFOs also issue warnings for tornadoes, blizzards, large hail, flash floods (including ice jams and dam failures) and projected tsunami impacts. WFOs control broadcasts of weather information on the NOAA Weather Radio All Hazards stations, provide weather spotter training to communities, and foster close ties with both the media and the emergency management community. Staff at WFOs have a close relationship with local, state, territorial and native American government officials and emergency managers and provide IDSS to support their decision making both remotely and at their operations centers during hazardous conditions.
- Weather Service Offices (WSO) are located within Alaska and Pacific Regions and provide a collection of expert hydro-meteorological data in support of local, regional, national, and global weather, hydrologic, climatic, and warning programs. WSOs support the mission of their associated WFO through public service, education, and outreach. They differ from WFOs in that they do not issue forecasts or warnings, are responsible primarily for observations and data collection, and are not operated 24 hours a day.
- Through an interagency agreement with the FAA, NWS forecasters are embedded within all 21 Air Route Traffic Control Centers and at the Air Traffic Control System Command Center to provide direct decision support services to air traffic managers promoting aviation safety and supporting efficient airspace management.

National Centers provide specialized forecast guidance and products for NWS field offices and other direct users (such as FEMA HQ) through NCEP. Each National Center depends on data from the Observations Subactivity, model output from the supercomputers in Central Processing, dissemination infrastructure from the Dissemination Subactivity, and innovations from the Science and Technology Integration Subactivity to provide expert analysis and prediction services to the local WFO and RFC infrastructure and other core partners. The National Centers provide an integrated suite of numerical weather and environmental

forecast guidance, at scales ranging from local to global, at various time frames. National Centers also issue watches and warnings which include tornado watches, hurricane watches and warnings, gale and storm warnings for large oceanic storms, warnings for hazards to aircraft, space weather alerts, and seasonal predictions for El Niño and La Niña events. NWS Forecasters and the weather enterprise use this information and the suite of weather model output as the basis for consistent forecast products, advisories and warnings. The AFS Subactivity supports seven NCEP National Centers:

- **Aviation Weather Center (AWC)** delivers consistent, timely and accurate weather information to support safe air navigation for the world airspace system. AWC provides aviation warnings and forecasts of hazardous flight conditions (including volcanic ash), at all levels within domestic and international airspace, and has an embedded group of forecasters at the FAA's Air Traffic Control System Command Center.
- **Climate Prediction Center (CPC)** delivers real-time products and information on timescales from two weeks to sub-seasonal and seasonal, integrating observed weather with longer-term climate variability. This includes predictions for the onset and duration of El Niño and La Niña events, which can have a significant impact on the nation's weather from the potential extremes of flood, drought, excessive heat or cold, and severe weather. Better predictions of these events could save the U.S. billions of dollars in damage costs[2]. Application of CPC services provides social and economic benefits to agriculture, energy, transportation, water resources, and public health. CPC works with scientific partners around the world to understand and predict modes of natural global climate variability.
- **National Hurricane Center (NHC)** issues watches, warnings, forecasts and analyses of hazardous tropical weather (e.g., tropical storms and hurricanes including storm surge), and offshore and high seas marine forecasts for a large part of the southwest North Atlantic (south of 30 Degrees North), Caribbean Sea, Gulf of Mexico and the eastern North Pacific (east of 140 Degrees West). NHC also leads a substantial education and outreach program on tropical hazards both domestically and internationally.
- **Ocean Prediction Center (OPC)** issues marine warnings, forecasts, and guidance for maritime users and continually monitors and analyzes maritime data for protection of life and property, safety at sea, and enhancement of economic opportunity. OPC issues gale, storm and hurricane-force wind warnings for the Atlantic and Pacific Oceans, north of 30 Degrees North. As part of OPC, NOAA's component of the interagency NIC produces global snow cover and operational sea ice prediction products.

[2] https://www.ncdc.noaa.gov/billions/

- **Space Weather Prediction Center (SWPC)** provides real-time monitoring and forecasting of solar and geophysical events and disturbances such as geomagnetic storms and solar flares. SWPC researchers and partners develop advanced models to improve understanding of the space weather environment and predict future events. Model improvements enable better prediction of these events and their potential impact on Earth. Impacts could include disruptions to satellite communications, impacts to the terrestrial electric grid and communication outages to cross polar airline flights. SWPC supports the Space Weather Operations, Research and Mitigation (SWORM) national space weather strategy.
- **Storm Prediction Center (SPC)** provides forecasts and watches for tornadoes, severe thunderstorms, large hail, lightning, wildfire potential, and heavy precipitation for the United States.
- **Weather Prediction Center (WPC)** is responsible for preparing a variety of analyses, national guidance products, and reliable national forecasts through a collaborative forecast process that ensures consistency and accuracy. The mission of WPC includes the prediction of winter storms and heavy rain.

Hydrologic Services and Warnings provides hydrologic data, analysis, forecast information, and decision support services through the Office of Water Prediction (OWP), RFCs, and WFOs to address the Nation's growing water resources challenges. The OWP National Water Center (NWC) serves as a cornerstone for Integrated Water Resources Science and Services (IWRSS), and interagency collaboration on water capabilities and information, and as a central hub to integrate and advance national and regional hydrologic field operations and services.

- RFCs provide daily river stage data, river forecasts and flash flood guidance for emergency and water management. A wide range of users depend on these forecasts including those in agriculture, hydroelectric dam operation, and water supply resources. The information is also the basis for river and flash flood warnings, watches, and advisories issued by the WFOs. NWS operates 13 RFCs.
- IWRSS facilitates interagency collaboration among a consortium of Federal water agencies including NOAA, the USACE, the USGS, and the FEMA. IWRSS' overarching objective is to integrate water resources capabilities and information to establish a common operating picture for water resources which better informs water-related planning, preparedness and response activities.
- The NWC acts as a catalyst for interagency activities as they relate to the transformation of NOAA's water prediction capability and decision support services. Moreover, it serves as an operational forecasting center, which is envisioned to be staffed with personnel from multiple federal agencies. The goal is to establish an integrated and common operating picture for water resources. The NWC is focused on developing new national water prediction capabilities such as the National Water Model. A second new transformational hydrologic forecasting capability is the Hydrologic Ensemble Forecasting Service

(HEFS), which produces reliable and skillful ensemble streamflow forecasts at lead times ranging from one hour to one year. HEFS is particularly useful for long-range water resource planning and risk-based water resources decision-making.

Tsunami Warning Program provides reliable, 24/7 monitoring of seismic events that could generate a tsunami that could impact the Atlantic or Pacific coastlines (including Pacific and Caribbean islands). In the event of a tsunami, the program generates timely and precise warnings, predictions of wave impact times and heights, and operational tools for emergency managers and public officials to guide rapid, critical decisions in which lives and property are at stake. The program uses information from DART® buoys within the Observations program as critical input and verification of tsunami forecasts.

The program coordinates with a variety of national and international partners and is supported by the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska which collaborate with academia or scientific institutions and partners with agencies such as USGS. Ongoing work in the Tsunami Warning Program includes:

- Performing innovative research, as appropriations permit, to speed earthquake detection and improve the reliability of predictions of tsunami track, speed, height, onset times and potential coastal impact;
- Issuing tsunami watches and warnings for all U.S. communities at risk and for international areas by agreement or compact and
- Operating the International Tsunami Information Center (ITIC), the Tsunami National Service Program, the National Tsunami Hazard Mitigation Program (NTHMP) and the TsunamiReady® program.

Pacific Island Compact is part of the U.S. Compact of Free Association (COFA) with the Republic of the Marshall Islands (RMI), the Federated States of Micronesia (FSM), and the Republic of Palau (ROP) in which the U.S. government provides basic government and commerce services including weather services to these island nations. The Compact provides the necessary funding to support the NWS WSOs and associated weather warning, forecast, and observation services for these islands. This continued investment preserves critical weather observation infrastructure and services necessary to support core NOAA mission responsibilities in the Pacific such as aviation, typhoon, and marine forecasts; climate monitoring; and support to U.S. Navy operations.

Without the continued support for Weather and Climate Services and Warnings, the National Centers, Hydrologic Services and Warnings, the Tsunami Warning Program, and the Pacific Island Compact, provided for in AFS ORF, NWS cannot continue to support a distributed network of Weather Forecast Offices and specialized centers comprising a workforce of meteorologists,

hydrologists, climatologists, and space physicists whose expertise convert observational data and model outputs, to timely and accurate weather forecasts, warnings, and outlooks.

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $35,185,000 and 143 FTE/ 281 positions in FY 2020 program changes for the Analyze, Forecast, and Support Subactivity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	2,817	503,221	-248	(15,000)
	FTE/OBL	2,848	518,221	2,738	503,221	-110	(15,000)

NWS Workforce Savings (-$15,000, -110 FTE/ -248 Positions) – This program change request reduces 110 FTE forecast personnel by implementing recommendations outlined in NWS' Operations and Workforce Analysis (OWA), (https://www.weather.gov/media/nws/OWA_Catalog_09072017.pdf) which will enable NWS to continue to evolve and build a Weather-Ready Nation. The OWA recognizes inherent inefficiencies associated with the rigid field office structure of NWS and provides various recommendations to make the agency more effective and efficient to protect lives and property. Of these recommendations, OWA suggested increasing flexibility within NWS' operating model. This workforce savings is the initial step of implementing OWA recommendations.

NWS will immediately begin implementing a series of operational reforms aimed at increasing staffing flexibility to best match service demands with available resources, including implementing three operational changes which will enable these reductions. NWS believes it is prudent to continually test and evaluate the impacts of the staffing reforms, and prefers to reduce positions only through attrition. NWS will continually monitor and evaluate performance to maintain the products and services provided by the offices. (FTE savings distribution based on OWA estimates only, subject to test and evaluation):

1. As discussed in the OWA, increasing flexibility while streamlining administrative processes at NWS offices will enable the agency to meet demand for its products and services. For instance, not all forecast offices serve the same constituency. Some offices respond to and serve a wide population, while others serve more remote locations. With this in mind, operation times at various offices will be reduced to address partner needs to the maximum extent possible. To minimize potential risk to the public and partners, offices will collaborate with other NWS offices for met watch and services during off hours, while sustaining situational awareness, allowing for certain offices to reduce operation times while increasing focus on addressing partner needs. NWS will move away from the current uniform staffing model, redistributing staff to best meet partner needs. In FY 2020, NWS will implement, test, and evaluate this reform and estimates a 33 FTE savings. The operational change is similar to the backup

practice used today when there is a system or communications failure of an office. Service Backup offices will require available surge capacity and may require the supporting office to increase staffing.

2. As discussed in the OWA, evolving the agency's weather forecast office field structure through collaborative forecast processes and technological innovation and changes to forecasters' career paths will help unlock current resources to meet service demand. In FY 2020, NWS will implement, test, and evaluate these reforms and estimates a 33 FTE savings. NWS offices set staffing levels to best serve their partners and population. Safety and security of NWS employees is paramount and must be ensured where an office would have only one person in the building on duty. This operational change will also require the office to be able to recall employees, or leverage Service Backup, if unexpected local operations or high-impact weather events occur.

3. NWS will vary office sizes to best match the needs of the local public and its many partners given available resources. NWS will move away from the current uniform staffing model, redistributing staff to best meet partner needs. In FY 2020, NWS will implement, test, and evaluate this reform and estimates a 44 FTE savings.

As noted above, these operational reforms intended to increase staffing flexibility will be conducted in FY 2020. Their testing and implementation could present some short-term risks that will need to be managed effectively to minimize any impact to operations. Finally, OWA suggested NWS would realize operating efficiencies by adopting time unlocks, which would then be leveraged to increase capacity for Impacts-based Decision Support Services (IDSS). By applying the operational efficiencies to implement IDSS as envisioned by OWA, these time savings will be used in part or in full to meet these reductions.

	2020	2021	2022	2023	2024
Performance Measures:					
Number of times Service Backup invoked with decrease	20	23	26	30	35
Number of times Service Backup invoked without decrease	5	7	8	8	8

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Analyze ,Forecast and Support
Subactivity: Analyze ,Forecast and Support
Program Change: NWS Workforce Savings

Title		Grade	Number	Annual Salary	Total Salaries
Meteorologist		Various	(110)	111,381	(12,251,910)
Total			(110)		(12,251,910)
Less lapse	0.00%		0		0
Total full-time permanent (FTE)			(110)		(12,251,910)
2020 Pay Adjustment (0%)	0.00%				0
Total					(12,251,910)

Personnel Data Summary	
Full-time Equivalent Employment (FTE)	
Full-time permanent	(110)
Part-time permanent	0
Total FTE	(110)
Authorized Positions:	
Full-time permanent	(248)
Part-time permanent	0
Total Positions	(248)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	266,836	(12,252)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	290,196	(12,252)
12	Civilian personnel benefits	102,191	104,650	114,352	111,604	(2,748)
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	503,221	(15,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,040	507,221	-25	(11,000)
	FTE/OBL	2,848	518,221	2,823	507,221	-25	(11,000)

Reduce Tsunami Warning Program (-$11,000, -25 FTE/ -25 Positions) – This program change eliminates NOAA's Tsunami Research and Operational Warning program as a national service program and merges the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska.

NOAA proposes to continue to fund critical operational tsunami program components to ensure high-quality tsunami watches, warnings, and advisories at one center, eliminating the nation's backup capability, and puts at risk some international agreements established under the International Oceanic Commission (IOC). This reduction also eliminates all NWS-sponsored R&D to improve tsunami warning models, and partner funding for education and awareness programs including National Tsunami Hazard Mitigation Program (NTHMP) grant funding to state and territory education, awareness, and inundation and evacuation map development, and the TsunamiReady® Program. This reduction also eliminates the International Tsunami Information Center (ITIC) and the Caribbean Tsunami Warning Program (CTWP). NOAA will continue to explore options in the 2010 National Academies of Sciences report, *Tsunami Warning and Preparedness: An Assessment of the U.S. Tsunami Program and the Nation's Preparedness Efforts,* to merge the two Tsunami Warning Centers or co-locate them with (1) academic or scientific institutions or (2) warning or mission-critical centers such at the National Centers for Environmental Prediction.[3]

Schedule and Milestones
FY 2020-2024

- Operate Tsunami Warning Center

[3] https://www.nap.edu/read/12628/chapter/8#188 and http://dels.nas.edu/Report/Tsunami-Warning-Preparedness-Assessment/12628

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Deliverables

- Operational Tsunami Warning Center

	2020	2021	2022	2023	2024
Performance Measures:					
Percent improvement in warning accuracy (in tsunami arrival times) with decrease	0	0	0	0	0
Percent improvement in warning accuracy (in tsunami arrival times) without decrease	2	5	7	8	9

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Analyze, Forecast, and Support
Subactivity: Analyze, Forecast, and Support
Program Change: Reduce Tsunami Warning Program

Title	Grade	Number	Annual Salary	Total Salaries
Admin Support Assistant	GS-08	(1)	64,461	(64,461)
Computer Scientist	GS-13	(1)	121,756	(121,756)
Director	GS-15	(1)	170,613	(170,613)
Electronics Systems Analyst	GS-13	(1)	121,756	(121,756)
Electronics Technician	GS-12	(1)	103,249	(103,249)
Electronics Technician	GS-11	(1)	86,140	(86,140)
Geophysicist	GS-14	(2)	144,065	(288,130)
IT Specialist	GS-13	(2)	121,756	(243,512)
Oceanographer	GS-14	(1)	144,065	(144,065)
Oceanographer	GS-13	(2)	121,756	(243,512)
Oceanographer	GS-12	(1)	103,249	(103,249)
Physical Scientist	GS-14	(3)	144,065	(432,195)
Physical Scientist	GS-13	(7)	121,756	(852,292)
Tsunami Warning Science Officer	GS-14	(1)	144,065	(144,065)
Total		(25)		(3,118,995)
Less lapse	0.00%	0		0
Total full-time permanent (FTE)		(25)		(3,118,995)
2020 Pay Adjustment (0%)	0.00%			0
Total				(3,118,995)

Personnel Data Summary

Full-time Equivalent Employment (FTE)	
Full-time permanent	(25)
Part-time permanent	0
Total FTE	(25)
Authorized Positions:	
Full-time permanent	(25)
Part-time permanent	0
Total Positions	(25)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	275,969	(3,119)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	299,329	(3,119)
12	Civilian personnel benefits	102,191	104,650	114,352	113,971	(381)
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	25,284	(1,500)
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	2,109	(6,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	507,221	(11,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,065	523,081	0	4,860
	FTE/OBL	2,848	518,221	2,848	523,081	0	4,860

Support Impact-based Decision Support Services and IT Security (+$4,860, 0 FTE/ 0 Positions) – NOAA requests an increase of $4,860,000 to support Impact-based Decision Support Services (IDSS) and information technology (IT) Security within the National Weather Service.

Specifically, $2,500,000 is requested to support core IDSS training which includes courses that improve professional competencies which range from base training in risk communications to specialized training for incident meteorologists. An additional $500,000 is requested to support travel for Warning Coordination Meteorologists and other IDSS-qualified staff to work directly with emergency managers prior to and during high-impact events. Both requests directly support Section 4 of the Public Law 115-25, Weather Research and Forecasting Innovation Act of 2017.

Finally, $1,860,000 is requested to refresh IT equipment used by forecasters and field managers in the provision of forecasts and warnings. The funds will be used to purchase laptops and tablets, which are used by forecasters both in field offices and those deployed to emergency operations centers, dispatches to front line fire camps and to support post-storm damage surveys. This request directly supports the Administration's prerogative to improve cyber security of government systems.

Deliverables FY 2020 - 2024

- Updated software on field laptops and tablets with latest security enhancements to support provision of IDSS
- Development and provision of training courses used to improve professional competencies to improve risk communications and more effective IDSS

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of training courses supported with increase	35	36	34	33	31
Number of training courses without increase	23	18	15	12	9

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	282,733	3,645
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,129	300,169	302,448	306,093	3,645
12	Civilian personnel benefits	102,191	104,651	114,353	115,568	1,215
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	523,081	4,860

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,065	516,415	0	(1,806)
	FTE/OBL	2,848	518,221	2,848	516,415	0	(1,806)

Terminate Aviation Science Research to Operations (-$1,806, 0 FTE/ 0 Positions) – This program change terminates aviation science research and development and R2O transition efforts within the Analyze, Forecast and Support Subactivity. This program change is in coordination with the decrease in aviation science R2O termination request from the Science and Technology Integration Subactivity (NWS-101).

With this reduction, NOAA will be able to maintain current levels of operational aviation weather forecast products and services. However, NOAA will discontinue efforts to complete, develop and implement aviation tools and capabilities to support futures advances in the Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen). Specifically, NWS will lose access to objective forecast performance data required to be tracked and reported routinely to the FAA, lose support to the convective weather collaborative forecast process among government and airline industry meteorologists, and be unable to support the safety of flight need for plain language destination forecasts at 157 airports in Alaska.

Schedule and Milestones
FY 2020-2024
- Maintain currently deployed aviation products and services

Deliverables
- No new innovations transitioned to operations

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures:					
Number of aviation forecasting innovations with decrease	0	0	0	0	0
Number of aviation forecasting innovations without decrease	2	2	2	2	2

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	279,088	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	302,448	0
12	Civilian personnel benefits	102,191	104,651	114,353	114,353	0
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	28,657	(1,806)
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	516,415	(1,806)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,057	517,021	-8	(1,200)
	FTE/OBL	2,848	518,221	2,840	517,021	-8	(1,200)

Consolidate Climate Prediction Center/Weather Prediction Center Functions (-$1,200, -8 FTE/ -8 Positions) – NOAA will consolidate functions at the National Centers for Environmental Prediction (NCEP) Climate Prediction Center (CPC) and Weather Prediction Center (WPC).

NOAA proposes to consolidate NCEP's CPC into the WPC. Specifically, this consolidation will result in the following:

- Create one national center that will span the continuum of prediction services from the present through existing sub-seasonal and seasonal time domains
- Eliminate overlap between the ever-changing transition at the weather and climate scale domains to develop a more continuous suite of products
- Improve efficiency and create more staffing flexibility as the WPC's contributions toward Evolving the NWS expands
- Promote consistency in presentation of data and forecast information with increased ability to respond to extreme weather
- Base products, such as routine monthly and seasonal predictions of temperature and precipitation and El Nino/La Nina products will continue

While some efficiency will be realized, this consolidation will limit some of NOAA's products and services such as climate prediction products with domains over hemispheres other than North America/Arctic. Some of these global climate predictions have supported national security planning and execution activities at the Department of Defense and the United States Agency for International Development including food security and disaster risk reduction, as well as pandemic health planning.

Schedule and Milestones
FY 2020-2024

- Weather Prediction Center provides a continuum of products and services from near term through sub-seasonal to seasonal timeframes

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Deliverables

- Operations of the Weather Prediction Center providing weather and climate predictions from near term through sub-seasonal to seasonal timeframes

	2020	2021	2022	2023	2024
Performance Measures:					
Number of climate scale innovations with decrease	1	1	1	1	1
Number of climate scale innovations without decrease	3	4	4	3	3

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Analyze, Forecast, and Support
Subactivity: Analyze, Forecast, and Support
Program Change: Consolidate CPC/WPC Functions

Title	Grade	Number	Annual Salary	Total Salaries
Director	SES	(1)	175,835	(175,835)
Lead Physical Scientist	GS-14	(2)	130,875	(261,750)
Physical Scientist	GS-13	(4)	110,628	(442,512)
Admin Assistant	GS-08	(1)	57,703	(57,703)
Total		(8)		(937,800)
Less lapse	0.00%	0		0
Total full-time permanent (FTE)		(8)		(937,800)
2020 Pay Adjustment (0%)	0.00%			0
Total				(937,800)

Personnel Data Summary

Full-time Equivalent Employment (FTE)	
Full-time permanent	(8)
Part-time permanent	0
Total FTE	(8)
Authorized Positions:	
Full-time permanent	(8)
Part-time permanent	0
Total Positions	(8)

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	278,150	(938)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	301,510	(938)
12	Civilian personnel benefits	102,191	104,651	114,353	114,091	(262)
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	517,022	(1,200)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,065	510,221	0	(8,000)
	FTE/OBL	2,848	518,221	2,848	510,221	0	(8,000)

Reduce Deferred Maintenance Support (-$8,000, 0 FTE/ 0 Positions) – Congressionally directed funding in the Consolidated Appropriations Act, 2019 was used to reduce the backlog of deferred maintenance projects at National Weather Service (NWS) field facilities. However, this funding level could not be maintained in the FY 2020 President's Budget. Difficult decisions were made and dedicated funding to support deferred maintenance for NWS operational field facilities was reduced. Deferred maintenance will be addressed within the broader NWS Analyze, Forecast and Support subactivity.

Schedule and Milestones
FY 2020-2024

- Minimal deferred facilities maintenance provided to NWS operational facilities

Performance Measures	2020	2021	2022	2023	2024
Percent of facilities maintained with decrease	2	2	1	1	1
Percent of facilities maintained without decrease	15	15	15	15	15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	279,088	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	302,448	0
12	Civilian personnel benefits	102,191	104,651	114,353	114,353	0
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,609	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	(1)
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	0	(8,000)
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	510,221	(8,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	3,065	518,221	3,065	516,721	0	(1,500)
	FTE/OBL	2,848	518,221	2,848	516,721	0	(1,500)

Reduction to Office of Water Prediction Center Staffing Support (-$1,500, 0 FTE/ 0 Positions) – Congressionally directed funding in the Consolidated Appropriations Act, 2019 was used to fully staff the Initial Operating Capability of the Water Prediction Operations Division (WPOD) within the Office of Water Prediction (OWP) at the National Water Center (NWC). NOAA is committed to maintaining these staffing levels in the WPOD. However, this funding level could not be maintained in the FY 2020 President's Budget. Difficult decisions were made and staffing may be reduced within other areas of the Office of Water Prediction.

Schedule and Milestones
FY 2020

- Initial Operating Capability (IOC) at the NWC WPOD supported by full staffing level

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	269,768	276,809	279,088	277,963	(1,125)
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	23,185	23,185	23,185	23,185	0
11.8	Special personnel services payments	175	175	175	175	0
11.9	Total personnel compensation	293,128	300,169	302,448	301,323	(1,125)
12	Civilian personnel benefits	102,191	104,651	114,353	113,978	(375)
13	Benefits for former personnel	155	155	155	155	0
21	Travel and transportation of persons	6,905	6,905	7,020	7,020	0
22	Transportation of things	3,609	3,609	3,609	3,608	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	7,967	7,967	8,654	8,654	0
23.2	Rental Payments to others	1,353	1,353	1,353	1,353	0
23.3	Communications, utilities and misc charges	26,784	26,784	26,784	26,784	0
24	Printing and reproduction	28	28	28	28	0
25.1	Advisory and assistance services	2,752	2,752	2,752	2,752	0
25.2	Other services from non-Federal sources	30,464	30,464	30,464	30,464	0
25.3	Other goods and services from Federal sources	338	338	338	338	0
25.4	Operation and maintenance of facilities	16,000	8,000	8,000	8,000	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	3,251	3,251	3,251	3,251	0
31	Equipment	528	528	528	528	0
32	Lands and structures	376	376	376	376	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	8,109	8,109	8,109	8,109	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	503,938	505,438	518,221	516,721	(1,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Dissemination
Subactivity: Dissemination

Goal Statement

The ability to communicate warnings and forecasts to the American public is essential to protect property and save lives. To be effective, NWS requires a scalable, robust, secure, 24x7 operational dissemination infrastructure, an optimized network that meets capacity requirements, and a sophisticated suite of communications systems to meet varied customer needs in a timely, reliable and authoritative manner in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

Forecasts and warnings are transmitted using the infrastructure provided by the Dissemination Activity. Dissemination maintains communication technology required by NWS for the collecting, tailoring, and distribution of data and products. The resilient Integrated Dissemination Program (IDP) infrastructure, located in Boulder, CO, and College Park, MD, collects and distributes watches, warnings, advisories, data, and products internally and externally. Information is provided to multiple users in a variety of formats including satellite broadcast and terrestrial networks, internet, radio, and social media. Current major systems included in IDP are the NWS Geostationary Weather Satellite Antenna System (GWSAS), OneNWS Network, NWS web and GIS services, NOAA Weather Radio (NWR), the Emergency Managers Weather Information Network (EMWIN), and an extensive network connecting NWS sites to one another and to NWS partners. The IDP infrastructure is the main communications hub that delivers information to different dissemination networks such as to NWS offices over the OneNWS Network, to the public and partners via NWR, and to emergency managers via EMWIN.

Building on the successes in the last few years of implementing robust geographically-diverse dissemination systems and upgrading the network infrastructure, NWS will operationally maintain, operate, and enhance the existing IDP application services. In FY 2020, NWS will continue to maintain a NWR system availability rate of 96 percent and have a maximum transit time for warning messages of one second or less for system latency. Furthermore, NWS will maintain an IDP system availability rate of 99 percent providing 24x7 support to maintain existing infrastructure and dissemination services with application failover between IDP sites in 15 minutes or less. In FY 2020, NWS will support and preserve existing IDP capabilities including Web and GIS-based Services to accommodate data providers and data throughput.

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the NWS organized the Dissemination Subactivity around infrastructure, networks, web services and other warning-delivery services.

In general, activities in the Dissemination portfolio will perform the following:

- Operate NWS' information technology (IT) dissemination infrastructure and services;
- Identify NWS' dissemination requirements and gaps;
- Analyze NWS' system capabilities;
- Maintain, and support a scalable and geographically diverse redundant NWS dissemination architecture (IDP) consistent with, and part of the NOAA enterprise architecture;
- Maintain a strategy to maximize effectiveness while minimizing cost; and
- Maintain and operate NWS' dissemination system capabilities including IDP and NWS networks at 99% operational availability.

Statement of Operating Objectives

Schedule and Milestones
FY 2020–2024

- Maintain NWR service at 96 percent availability
- Maintain IDP services and NWS Global Information System Centres (GISC) services at 99 percent reliability
- Maintain existing Enterprise Geospatial and Web Services to accommodate data providers, users and increase data throughput
- Execute approved Roadmap for future Weather Distribution Services to support a WRN
- Operate and maintain NWS Network bandwidth/reliability
- Manage IDP system usage, reliability, and resources
- Operate and maintain IDP Systems
- Operate and maintain NWS networks
- Maintain operational support and maintenance of IDP systems in College Park, MD and Boulder, CO
- Conduct enhancements of existing IDP applications and services

FY 2020

- Conduct (second year) of five-year refresh of Dissemination Infrastructure hardware

FY 2021

- Conduct (third year) of five-year refresh of Dissemination Infrastructure hardware
- Maintain operational support and maintenance of a backup NWS network through a Very-Small-Aperture Terminal (VSAT) antenna system at each NWS Weather Forecast Office (WFO)
- Maintain existing Enterprise Geospatial and Web Services to accommodate data providers, users and increase data thro

FY 2022

- Conduct (fourth year) of five-year refresh of Dissemination Infrastructure hardware
- Maintain operational support and maintenance of a backup NWS network through a Very-Small-Aperture Terminal (VSAT) antenna system at each NWS Weather Forecast Office (WFO)
- Maintain and support NWS networks under the GSA Enterprise Infrastructure Solutions (EIS) contract

FY 2023

- Conduct (fifth year) of five-year refresh of Dissemination Infrastructure hardware
- Maintain operational support and maintenance of a backup NWS network through a Very-Small-Aperture Terminal (VSAT) antenna system at each NWS Weather Forecast Office (WFO)
- Maintain and support NWS networks under the GSA Enterprise Infrastructure Solutions (EIS) contract

FY 2024

- Conduct (first year) of next five-year refresh of Dissemination Infrastructure hardware
- Maintain operational support and maintenance of a backup NWS network through a Very-Small-Aperture Terminal (VSAT) antenna system at each NWS Weather Forecast Office (WFO)
- Maintain and support NWS networks under the GSA Enterprise Infrastructure Solutions (EIS) contract

Deliverables

- Delivery of NWS core watches, warnings, and advisories at 99.8 percent availability
- Maximum transit time for warning messages of less than one second
- NWR service availability at 96 percent
- Overall IDP system availability at 99 percent
- Integration of enhanced weather data and web services operationally supported on IDP system with resilience
- 24x7 support of Operational Terrestrial and Satellite Networking Services

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Dissemination	Pos/BA	87	50,028	91	50,028	91	75,482
	FTE/OBL	83	50,028	83	50,028	83	75,482

NWS operates and maintains critical infrastructure, which enables the provision of NOAA's services to the Nation. NWS manages a distributed network of offices that span the United States and its territories, delivering essential NOAA services, especially those related to high-impact events at the local level where critical, life-saving decisions are made. This includes the management of all major weather observing systems from software engineering and communications, to facilities and logistics planning. NWS also ensures worldwide acquisition and delivery of weather and water data through its IDP systems and the OneNWS Network.

Dissemination maintains the following programs to accomplish this activity:

Dissemination IT Infrastructure and Virtualized Application Services within the IDP provides a scalable, robust, secure dissemination IT infrastructure in two geographically diverse locations, for NWS, NOAA and federal partners.

- Weather and environmental disturbances can disrupt virtually every major public infrastructure system including transportation systems, power grids, telecommunications, and emergency response systems that protect the public. Facing these interruptions, users could be cut off from government services. Minutes (sometimes seconds) count in saving lives and the performance of the NWS dissemination systems to supply necessary information quickly is crucial.
- The IDP infrastructure is the Nation's hub for collecting and distributing weather data and products. Applications within the IDP systems automatically collect and distribute a wide variety of environmental data such as observations, analysis, and forecast products to WFOs, National Centers, NWS web-services, broadcasters, the commercial meteorological community, and major international partners. These time-perishable data products are distributed to ensure the fastest availability of the information fully integrated within IDP in College Park, MD and Boulder, CO.

- NWS IDP applications and services provide users with flexible access to observational weather data, hazardous weather information, and other weather forecast products required for air traffic management. NOAA provides data discovery services, data format translation, and dissemination services to improve the accuracy and availability of weather information.

Terrestrial and Satellite Networking Services ensures the required networking capacity and reliability to deliver critical weather data for internal and external partners. NWS operates and maintains critical terrestrial and satellite networking capabilities. With its updated information technology (IT) infrastructure, NWS ensures adequate processing, delivery, and exploitation of new environmental satellite, model, and radar data. These terrestrial and satellite operational networks enable NWS to use the new data to improve the accuracy and timeliness of weather warnings and forecasts.

- NWS manages the OneNWS Network, a distributed network of terrestrial telecommunication circuits, satellite communications space segments, wireless, and broadband capabilities that span the Nation, including the Pacific and Alaskan regions, delivering essential NOAA data.
- NWS National Centers, Pacific Region, and Alaska Region Offices require full resolution and aerial coverage of satellite imagery and products to achieve their mission. NWS provides the operational support and maintenance for the GOES-16, GOES-17, and Himawari-8 Re-Broadcast Antennas at the National Hurricane Center, Inouye Research Center, WFO Guam, WFO Anchorage, Aviation Weather Center, Storm Prediction Center, Space Weather Prediction Center, and NOAA Center for Weather Climate Prediction.
- In FY 2019, Initial Operational Readiness (IOR) of the GOES-17 imagery was achieved along with further enhancements to receive broadcasts from the NWS direct readout (DRO) antennas located at NWS National Centers, Pacific Region, and Alaska Region. In FY 2020, NWS will continue to sustain and operate the infrastructure to meet the NWS mission.
- In late FY 2019 or early FY 2020, NOAA plans to award a contract to begin the transition of network services from GSA's Networx contract to the Enterprise Infrastructure Solutions (EIS) contract. This transition is expected to be completed in FY 2022.

Weather Information Distribution Services provides the capabilities to communicate weather-related warnings directly to emergency managers and the American public. These services include providing NWS data and product access for international partners via the World Meteorological Organization (WMO) Information Systems (WIS) and the robust NWS Global Information System Centres (GISC). NWS operates several weather warning services systems:

- NOAA Weather Radio (NWR) is a national warning network consisting of 1,029 transmitter stations with a broadcast coverage that reaches more than 98 percent of the Nation's population, providing critical weather and other hazard information to the

U.S. public and media outlets. NWR is the only NWS dissemination system capable of reaching individuals at nominal cost (individual purchase of NOAA weather radio) in both rural and urban locations as well as across the coastal marine waters to serve the boater community.

- EMWIN provides the emergency management community with direct access to a set of NWS warnings, watches, forecasts, and other products via either satellite broadcast or an internet connection.
- NOAA Weather Wire Service (NWWS) is a satellite data collection and dissemination system that provides NWS partners, federal, state, local emergency managers, and the public with timely delivery of meteorological, hydrological, climatological, and geophysical information. The vast majority of NWWS products are weather and hydrologic forecasts and warnings issued around the clock from NWS Forecast Offices. NWWS is one method used to activate the Emergency Alert System.
- Web and Geographic Information System (GIS) services enable the access and delivery of NOAA and NWS data and products to forecasters, NOAA users, Federal partners (Federal Aviation Administration (FAA), Federal Emergency Management Agency (FEMA), the Weather Enterprise, and International community and public.

Without the continued support for Dissemination IT Infrastructure and Virtualized Application Services, Terrestrial and Satellite Networking Services, and the Weather Information Distribution System, provided for in Dissemination ORF, NWS cannot continue to support the operations of the network and communication infrastructure, such as the OneNWS Network, IDP infrastructure and applications, and NOAA Weather Radio, required to distribute forecasts, warnings, and other products to customers, partners, and the American public.

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $389,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Dissemination Subactivity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Dissemination	Pos./BA	91	75,482	91	75,705	0	223
	FTE/OBL	83	75,482	83	75,705	0	223

Support Operations and Maintenance of Integrated Dissemination Program System (+$223, 0 FTE/ 0 Positions) – This funding will add one contract system administrator at the National Centers for Environmental Prediction (NCEP) Coordination Office (NCO) to support the operations and maintenance of the Integrated Dissemination Program (IDP) system, the new applications being on boarded to IDP, and enhancements to the applications currently running on the system. To continue meeting the Dissemination Program's operational requirements, NWS requires this funding to maintain current level of services and ongoing operations necessary to issue warnings and forecasts to protect life and property. Currently these liabilities are being funded through cuts to its existing base requirements adding risk to operational continuity and readiness.

Deliverables

- Continuity of timely and accurate weather and water forecasts and warnings

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Dissemination
Subactivity: Dissemination

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	10,303	10,303	10,358	10,358	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	216	216	216	216	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	10,519	10,519	10,574	10,574	0
12	Civilian personnel benefits	3,155	3,155	3,523	3,523	0
13	Benefits for former personnel	10	10	10	10	0
21	Travel and transportation of persons	409	409	414	414	0
22	Transportation of things	39	39	39	39	0
23.1	Rental payments to GSA	1,458	1,458	1,485	1,485	0
23.2	Rental Payments to others	1,367	1,367	1,367	1,367	0
23.3	Communications, utilities and misc charges	9,169	9,169	30,169	30,169	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	41	41	41	264	223
25.2	Other services from non-Federal sources	23,006	23,006	27,006	27,006	0
25.3	Other goods and services from Federal sources	17	17	17	17	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	247	247	247	247	0
31	Equipment	196	196	196	196	0
32	Lands and structures	17	17	17	17	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	377	377	377	377	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	50,028	50,028	75,482	75,705	223

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

Goal Statement

NWS improves the overall quality of the environmental information needed to safeguard life and livelihoods by integrating new science and technology into its operations. Funding in NWS' STI Subactivity leverages the entire weather enterprise including users, research communities, partner agencies, and industry, to provide improved weather forecast guidance for the Nation in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

STI engages partners in outreach efforts, supporting targeted development efforts, improving a suite of forecast guidance models and post-processing, continuously training the workforce on scientific advances, and infusing new science into operations. Transition of new research into operations (R2O) is a fundamental activity of this portfolio. NWS identifies and transfers new science concepts and techniques to improved operational warning, forecast, and decision support services, thus enabling the NWS vision to build a Weather-Ready Nation through improved products and services.

In 2018, NWS linked the terrestrial and coastal water models to improve the ability to assess flood risk nationwide. In 2019, NWS is implementing the operational Next Generation Global Prediction System (NGGPS) Version 1.0; version 12 of the operational Global Ensemble Forecast System; version 2.0 of the National Water Model; and will continue to implement the results from the Operations and Workforce Analysis.

For FY 2020, key actions included in the STI portfolio include the following:

- Develop applications (i.e. ways to use the data) of advanced observing capabilities including data assimilation;
- Continue to develop and implement advances to operational numerical forecast models and applications of HPC capabilities;
- Develop the next generation warning and forecast guidance paradigm, taking into account user perspectives about warning and forecast information;
- Use testbeds and proving grounds to enable the research community to leverage operational infrastructure to conduct research, thus laying the groundwork for R2O transition;
- Continue development of training approaches to enable the workforce to keep pace with advanced science and technologies;

- Develop solutions to address regional and local forecast issues through partnership within NOAA and with the university research community;
- Complete transition of operational models to next-generation HPC systems;
- Implement operational seasonal Arctic sea ice outlook;
- Continue development of version 3 of the operational Seasonal Forecast System; and
- Continue to implement results from Operations and Workforce Analysis study.

Statement of Operating Objectives

Schedule and Milestones

FY 2020–2024

- Conduct testing, demonstration and validation of new science and service capabilities through testbeds and proving grounds
- Implement model upgrades routinely
- Improve weather model and post processing guidance
- Update product suite based on customer requirements
- Demonstrate high resolution large watershed modeling with nested hyper-resolution modeling over three regional areas

FY 2020

- Complete transition of Operational Models to next-generation HPC systems
- Implement operational seasonal Arctic sea ice outlook
- Demonstrate high resolution large watershed modeling with nested hyper-resolution modeling over three regional areas
- Implement Hurricane Weather Research and Forecast system (HWRF) Upgrade
- Implement upgrade to the NGGPS, Version 2.0

FY 2021

- Run transitioned operational models on next-generation HPC systems
- Implement version 13 of the Global Ensemble Forecast System Forecast System
- Implement version 3 of the operational Seasonal Forecast System
- Implement HWRF Upgrade
- Implement Version 3.0 of the National Water Model

FY 2022

- Implement Finite Volume Cubed-Sphere Dynamical Core (FV3) -based High-Resolution Rapid Refresh (HRRR)
- Implement HWRF Upgrade

- Implement NGGPS Version 3.0

FY 2023
- Demonstrate operational probability-based forecasts of high impact weather for extended ranges (weeks 3 and 4)
- Implement Version 14 of the Global Ensemble Forecast System
- Implement HWRF Upgrade
- Implement Version 4.0 of the National Water Model

FY 2024
- Implement FV3-based Hurricane Forecast & Analysis System (to replace HWRF)
- Implement decision support tools for week 3-4 precipitation forecasts targeted toward water resource managers
- Implement operational high resolution large watershed modeling with nested hyper-resolution capability in at least five regional areas

Deliverables
- Biannual upgrade to global operational atmospheric prediction system
- Annual upgrades to operational NOAA Hurricane Forecast System
- Implement FV3-based HRRR regional system
- Probabilistic hydrologic forecasts for assessing river level and flood risks
- Continuous improvements to NOAA's suite of operational forecast models
- New and improved modeling techniques, evaluated by the Developmental Testing Center and Global Modeling Test Bed, and delivered to NWS, for incorporation in the Operational Modeling Suite
- Annual upgrades to operational Data Assimilation System
- Annual upgrades to the NOAA Environmental Modeling System (NEMS) infrastructure
- Upgraded ocean, atmosphere, sea ice, land surface, aerosol, wave component models
- Agile HPC environment with quicker operational transition of R&D efforts
- Upgraded operational storm surge warning service products (e.g., inundation maps)
- Upgraded probabilistic storm surge guidance
- Operational seasonal sea ice outlook guidance products for Arctic Ocean
- Forecaster applications (tools, methodologies, datasets) of near real-time data products from research ocean remote sensing satellites
- Week-2, 3 & 4 to seasonal outlook tools/products for local decision support services
- New NWS experimental products focused on extreme events

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

- Global operational coupled atmosphere-ocean-land-wave-sea ice prediction system extending today's operational weather outlooks from 16 days out to 35 days
- Improved forecasts provided to the Nation's critical infrastructure to ensure lives and property are protected from the effects of space weather
- Evaluation of NWS testing/demonstration plans and results
- Improved public access to Federal water information
- Atmospheric, coastal, and terrestrial modeling components integrated into the community WRF-Hydro Earth system modeling framework
- Upgraded ozone and particulate prediction system

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology	Pos/BA	459	143,000	461	143,000	461	145,129
Integration	FTE/OBL	438	143,000	438	143,000	438	145,129

In support of NOAA's operational forecasting mission, NWS develops, improves, and monitors data assimilation systems and models of the atmosphere and oceans using advanced methods developed internally, as well as cooperatively with scientists from universities, NOAA laboratories, other government agencies, and the international scientific community.

STI maintains the following programs to accomplish this activity:

Weather-Ready Nation is a nationwide initiative to build community resilience in the face of increasing vulnerability to extreme weather, water, and climate events. Weather-Ready Nation empowers emergency managers, first responders, government officials, businesses, and the public to make faster, smarter decisions to save lives and protect livelihoods. Key actions that enable implementation of the Weather-Ready Nation roadmap include the following:

- Develop, transition, and improve advanced forecast tools, techniques, service products and next generation warning and forecast paradigms to enhance NWS' national, regional and local warning, forecast, and guidance services.

- Incorporate and integrate social science into forecasting process to develop more effective decision support capabilities, improving the effectiveness of warnings and forecasts, and to better convey forecast risk and uncertainty.
- Develop high-resolution probabilistic weather information consistent across space and time to support safe air traffic operations.
- Extend warning and forecast lead times for tornado, hurricane, storm surge, fire weather, and winter storms with increased certainty and confidence. Develop/improve models, tools, and data sets to forecast and monitor real-time climate variations.
- Improve space weather warnings and forecasts for geomagnetic and radiation storms and ionospheric disturbances to protect the reliability and resilience of the Nation's electric power system, satellite navigation, and telecommunication infrastructure, and support aviation and space flight safety.

Operational Environmental Prediction Modeling Suite is the foundation for all warning, forecast and decision support services. The Environmental Modeling Center (EMC) develops, enhances, and maintains complex software of numerical weather, ocean, climate, sea ice, and coastal prediction models and data assimilation systems that span the globe. These forecast systems underpin all NOAA forecast capabilities. The operational modeling suite provides the basic numerical guidance that NWS forecasters rely on in making forecasts, warnings, and decision support service products.

- EMC integrates advancements of environmental prediction modeling research and development at universities and research laboratories, and incorporates them into advanced NWS operational models.
- EMC also collaborates with partners within NOAA and with other Federal agencies to conduct studies to validate observing requirements and data impacts for existing and new observing platforms and technologies such as satellites and radar.

Improving Effectiveness of Warning and Forecasts aims to accelerate the transition of advanced modeling research into operations. This program is focused on improving warning and forecast lead-times and accuracy of severe weather events associated with hurricanes, tornados, flash floods and other severe weather hazards. Major efforts include:

- Improving the accuracy and reliability of hurricane track and intensity forecasts, through the Hurricane Forecast Improvement Project (HFIP), as required by the Weather Research and Forecasting Innovation Act of 2017 (P.L. 115-25), to reduce unnecessary evacuations. This effort also focuses on advanced data assimilation and improved global atmospheric ocean models, which underpin forecast systems for all severe weather.
- The Next Generation Global Prediction System (NGGPS) will form the backbone of NOAA's future operational numerical weather prediction capability meeting the public's evolving needs for more accurate, more specific, and longer lead time weather forecasts. NGGPS will result in significant advancements for warning and forecast skill across multiple service areas.
- Develop and evaluate national air quality forecast models to provide national pollutant forecast information for states, local communities, commercial sectors, the U.S. Environmental Protection Agency, and the U.S. Department of State.

- Extend forecast of extreme and high impact weather to four weeks through the development of improved outlooks and transitioning into modeling operations of advancements in prediction science coming from the scientific research community. Extending foundational forecasts of subseasonal and seasonal temperature and precipitation is a key requirement of the Weather Research and Forecasting Innovation Act of 2017.
- Unify NOAA's operational model suite based on FV3 Dynamic Core.

Hydrology and Water Resource Programs leverage NOAA partnerships in the areas of atmosphere, watersheds, estuaries and oceans to improve and integrate water resource prediction modeling capabilities. NWS' Hydrology Laboratory conducts studies, investigations and analyses, leading to the application of new scientific and computer technologies to hydrologic forecasting and related water resources problems.

- NWS transitions research in atmosphere, watershed, estuary and ocean modeling, and data assimilation science and technology into operational hydrologic and water resource forecast capabilities in order to provide integrated decision support tools that offer a seamless suite of summit-to-sea forecasts.
- Through partnerships, especially the IWRSS Consortium, NWS is developing a new suite of high-resolution forecasts of streamflow, soil moisture, soil temperature and other variables directly related to watershed conditions to enable monitoring and forecasting of hydrologic conditions from floods to droughts.

Training Infrastructure is critical to preparing the current and future workforce for WRN. Effective training leads to better integration of new models, transition of science and technology into operations, and improved service to the Nation. The NWS workforce must remain agile and flexible to meet core partner needs. NWS uses a blended learning approach including online courses, webinars, and residence training. Implementation of these training initiatives requires new and enhanced methods and technologies for training delivery, such as simulations and on-demand training, integrated into applications and other systems. As a part of this effort:

- NWS identifies and addresses local training needs, facilitates professional development, and addresses individual strengths and weaknesses of the local forecast staff.
- Ensures local operations and management teams are fully proficient and knowledgeable in protocols, tools, forecast and warning operations for delivery of effective IDSS

Improve Operational Forecast Products and Services through a continuous infusion of science and technology. This is critical for improving services and ensuring the current and future workforce is prepared to meet the requirements of a WRN. These actions include:

- Centrally manage national and regional implementation of research to operations transitions at the local level including applications that improve model guidance;

- Maintain local science and training expertise through the Science and Operations Officers (SOO) and the Development and Operations Hydrologists (DOH) to lead coordinated improvements of operations through adopting new science and technology by the forecasting staff, and addressing local forecast and warning issues;
- Maintain close connections with the research community to enable, and accelerate, research to operations, including sponsoring the Collaborative Science and Technology Applied Research (CSTAR) program, supporting testbeds, and supporting visiting scientists programs, a priority of the Weather Research and Forecasting Innovation Act of 2017 (P.L. 115-25), to improve NWS services.
- Enhance testbeds and operational proving grounds with a Centralized Development and Testing Environment (CDTE) capability for testing of applications in real time in a protected functionally operational environment; and,
- Provide operational platforms for the broad research and development community across NOAA, academia, core partners, and the weather enterprise to conduct demonstration, simulation, verification, and validation of new science and service capabilities.

Without continued support for Weather-Ready Nation, the Operational Environmental Prediction Modeling Suite, Hydrology and Water Resource Programs and this training infrastructure, provided for in STI ORF, NWS cannot continue to support research and research-to-operations activities that advancer weather and climate prediction and improve NWS products and information in the future.

PROGRAM CHANGES FOR FY 2020

NOAA requests a net decrease of $12,523,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Science and Technology Integration Subactivity. Following this section are program change narratives for this Subactivity that represent program changes greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	143,028	0	(2,101)
	FTE/OBL	438	145,129	438	143,028	0	(2,101)

Reduce the Investment in Numerical Weather Prediction Modeling (-$2,101, 0 FTE/ 0 Positions) – This program change will decelerate investment that would transition advanced modeling research into operations for improved warnings and forecasts.

NOAA proposes to slow down the development of the Next Generation Global Prediction System (NGGPS) and Hurricane Forecast Improvement Project (HFIP) by reducing research grants for the collaborative research activities and NOAA's testbeds including the Development Test Center, Global Modeling Test Bed, and Joint Center for Satellite Data Assimilation. This reduction in NWS may be offset by the Earth Prediction Innovation Center, established in the National Integrated Drought Information System Reauthorization Act of 2018, and funded within OAR.

Deliverables

- Implement Next Generation Global Modeling System
- Complete transition of Operational Models to next-generation High Performance Computing Systems

Performance Measures	2020	2021	2022	2023	2024
Finite Volume Cubed-Sphere Dynamical Core (FV3) Global Forecast System (GFS) useful forecast lead time in days without decrease	8.3	8.3	8.3	8.4	8.4
FV3 GFS useful forecast lead time in days with decrease	8.2	8.2	8.2	8.3	8.3

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	11,568	(1,101)
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	8,830	(1,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	143,028	(2,101)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	139,129	0	(6,000)
	FTE/OBL	438	145,129	438	139,129	0	(6,000)

Terminate Hydrology and Additional Water Resources (-$6,000, 0 FTE/ 0 Positions) – Congressionally directed funding in the Consolidated Appropriations Acts of 2018 and 2019 is being used to collaborate with external academic partners to improve fine and large-scale measurements of snow depth and soil moisture data that can be used to expand and improve the National Water Model (NWM). However, this funding level could not be maintained in the FY 2020 President's Budget. Difficult decisions were made and this request will terminate the multi-year project awarded to the University of Alabama by the University Consortium for Atmospheric Research. The project has six focus areas - all will be terminated. The focus areas are: (1) Sensors and Miniaturization; (2) Antenna & Arrays; (3) Platforms & Integration; (4) Field Programs & Data Collection; (5) Data Processing & Data Projects; and (6) Models & Synthesis. NOAA will continue research-to-operations efforts with academia and other external partners to maintain and enhance the operational NWM to provide valuable river forecast guidance.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	12,669	0
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	3,830	(6,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	139,129	(6,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	140,129	0	(5,000)
	FTE/OBL	438	145,129	438	140,129	0	(5,000)

Terminate COASTAL Act (-$5,000, 0 FTE/ 0 Positions) – This program change will terminate actions associated with the implementation within the National Weather Service of the Consumer Option for an Alternative System To Allocate Losses (COASTAL) Act of 2012. This includes efforts to develop the capability to produce detailed “post-storm assessments” in the aftermath of a damaging tropical cyclone that strikes the U.S. or its territories, using output from the Named Storm Event Model (NSEM) that indicate the strength and timing of damaging winds and water at a given location. This also terminates efforts to create a Coastal Wind and Water Event Database (CWWED) to provide the public access to “covered data” (the observations collected during the storm to assist with the assessment). This includes ending developmental efforts necessary for building NSEM and CWWED (including high-resolution hurricane model-based post storm assessments, coastal storm surge and wave model upgrades, and integration), as well as execution and maintenance requirements.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	9,669	(3,000)
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	7,830	(2,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	140,129	(5,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	147,129	0	2,000
	FTE/OBL	438	145,129	438	147,129	0	2,000

Establish National Weather Service Pilots (+$2,000, 0 FTE/ 0 Positions) – NOAA has proposed efforts to improve operational efficiency in the NWS. This increase will allow NWS to accelerate efforts in NWS model technology that is foundational to the Collaborative Forecast Process (CFP); specifically, the National Blend of Models (NBM).

In FY 2020 NWS will focus on the NBM as a primary science and technology tool that will enable the CFP by allowing forecasters the ability to have a scientifically valid common starting point for forecasts. A common starting point will improve national forecast consistency, and improve NWS customers' confidence in the forecast. Early testing of the NBM as a common starting point suggests that there may be efficiencies in the forecast process that could be used to improve Impact Based Decision Support Services (IDSS) to NWS partners.

Testing in recent years of NBM has identified improvement needed in the NBM and its underlying components in order to have it operating at the capability necessary for the CFP. This increase will allow NWS to improve the NBM in areas identified during initial demonstration projects, such as mountainous terrain. This increase may also be used to support the Operations Proving Ground (OPG) to do limited testing of the CFP. The OPG represents NWS field offices in the research into operations (R2O) process by conducting pre-deployment readiness evaluations of promising new science and technology innovations in a realistic operational environment.

Schedule and Milestones
FY 2020-2024

- Improve capabilities and technologies that enable NBM to support and improve CFP.
- Improve the ability to disseminate the capabilities to deliver the NBM.
- Demonstrate the use of NBM as the common starting point for the CFP.
- Demonstration and transition into operations.

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(Dollar amounts in thousands)

Deliverables

- Improved NBM
- Improved underlying components of the NBM
- Report outlining dissemination needs for future year for the NBM
- Improved verification and validation tools for NBM

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	12,669	0
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	11,830	2,000
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	147,129	2,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	146,422	0	1,293
	FTE/OBL	438	145,129	438	146,422	0	1,293

Collaborative Science, Technology, and Applied Research Contracts (+$1,293, 0 FTE/ 0 Positions) –This funding will restore grants for the Collaborative Science, Technology, and Applied Research (CSTAR) program and provide contracts for information technology (IT) support at the National Centers for Environmental Prediction (NCEP) Environmental Modeling Center. To continue meeting the Science, and Technology Integration (STI) Program's operational requirements, NWS requires this funding to maintain current level of services and ongoing operations necessary to issue warnings and forecasts to protect life and property. Funding will restore core capabilities that were previously redirected for labor costs.

Currently these liabilities are being funded through cuts to its existing base requirements adding risk to operational continuity and readiness.

Deliverables

- Continuity of timely and accurate weather and water forecasts and warnings

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	12,669	0
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	11,123	1,293
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	146,422	1,293

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	461	145,129	461	144,129	0	(1,000)
	FTE/OBL	438	145,129	438	144,129	0	(1,000)

Terminate Aviation Science Research to Operations (-$1,000, 0 FTE/ 0 Positions) – NOAA proposes to terminate aviation science research and development and research into operations (R2O) transition efforts within the National Weather Service (NWS). This program change is in coordination with the decrease aviation science R2O termination request in the Analyze, Forecast and Support Subactivity (NWS-64).

The NWS will maintain the current level of operational aviation weather forecast products and services. However, this reduction will terminate efforts to develop and implement key aviation tools and capabilities. Specifically, NWS will terminate support for the development and implementation of the following:

- Automated aviation forecast verification tools associated with gridded aviation forecasts to meet obligations to the Federal Aviation Administration (FAA) for implementing the Quality Management System (QMS) for aviation weather services;
- Digital aviation service tools for improved consistency of aviation weather information across the National Airspace System;
- Collaborative aviation weather statement (CAWS) and convective forecast planning guidance (CCFP) to support FAA for effective traffic flow management;
- Local aviation model statistical guidance supporting aviation weather services by Center Weather Service Units, Weather Forecast Offices and FAA; and
- Integrated support for impacted air-traffic environment (INSITE) tool supporting NOAA's Aviation Weather Center and the FAA's Air Traffic Control System Command Center to improve management of National Airspace System.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	54,727	54,727	54,983	54,983	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	1,603	1,603	1,603	1,603	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	56,330	56,330	56,586	56,586	0
12	Civilian personnel benefits	18,873	18,873	20,597	20,597	0
13	Benefits for former personnel	13	13	13	13	0
21	Travel and transportation of persons	2,215	2,215	2,236	2,236	0
22	Transportation of things	91	91	91	91	0
23.1	Rental payments to GSA	2,937	2,937	3,065	3,065	0
23.2	Rental Payments to others	31	31	31	31	0
23.3	Communications, utilities and misc charges	6,236	6,236	6,236	6,236	0
24	Printing and reproduction	88	88	88	88	0
25.1	Advisory and assistance services	12,669	12,669	12,669	12,169	(500)
25.2	Other services from non-Federal sources	32,076	32,076	32,076	32,076	0
25.3	Other goods and services from Federal sources	645	645	645	645	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	506	506	506	506	0
31	Equipment	460	460	460	460	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,830	9,830	9,830	9,330	(500)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	143,000	143,000	145,129	144,129	(1,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisitions, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Observations

Goal Statement

The PAC Observations Programs, Projects, and Activities (Subactivity) supports the life-cycle of all NWS observing system investments by providing technical solutions to meet NWS' operational observational requirements. With Procurement, Acquisition, and Construction (PAC) funding, NOAA improves current observational capabilities, provides large scale recapitalization of significant observational systems, and engineers technical solutions for systems to meet evolving requirements and demands in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

Observations is responsible for the collection of space, atmosphere, water, and climate observational data owned or leveraged by NWS. Observations is also responsible for the development, acquisition and management of cost-effective observing technologies, hardware and software enhancements, maintenance and repairs, logistics, cost management, technical data verification, and life-cycle replacements of NWS observational platforms.

Specifically, with the PAC appropriation, the funds in the PAC Observations Subactivity are used to:

- Extend the service life of the Nation's weather radar network; and
- Extend the service life of the Nation's primary surface weather observing network supporting aviation operations, and the needs of the meteorological, hydrological, and climatological research communities.

Statement of Operating Objectives

Schedule and Milestones
FY 2020-2024
Next Generation Weather Radar (NEXRAD) Service Life Extension Program (SLEP)

- Complete modification of radar transmitters
- Complete pedestal refurbishments
- Complete refurbishment of radar shelters

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Automated Surface Observing System (ASOS) SLEP
- Complete production and installation of Acquisition Control Unit (ACU) and Data Collection Package (DCP) upgrades
- Complete telecommunications architecture upgrades

Deliverables:
NEXRAD SLEP
- Refurbish pedestals with expected service life to at least 2030
- Refurbish transmitters with expected service life to at least 2030
- Refurbish radar shelters

ASOS SLEP
- Total refreshment of ACU-DCU with expected service life to at least 2040
- Increase data flow and remote maintenance capabilities

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos/BA	0	32,953	0	21,129	0	21,129
	FTE/OBL	0	32,953	0	21,129	0	21,129

PAC Observation objectives are achieved through the following programs:

Next Generation Weather Radar (NEXRAD) SLEP is an effort to sustain the aging NEXRAD infrastructure that underpins severe weather forecast and warning services for high-impact events critical for a WRN. NEXRAD is a tri-agency Program with the U.S. Department of Defense (DoD) and the U.S. Department of Transportation (DOT). Though the system is nearing end of life, the Federal government is 20 years away from full deployment of the next generation of weather radar design. Therefore, NWS is undertaking a technology refresh effort to sustain NEXRAD fleet availability until the current network is replaced.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Automated Surface Observing System (ASOS) SLEP is a cost effective approach to maintaining the aging ASOS infrastructure that provides critical aviation weather parameters at airports supporting the air transportation industry, and provides high quality meteorological data supporting NWS's forecast and warning mission. The original capital investment for this system was $227 million and was initiated in the mid-1980s. In addition to extending its longevity, the ASOS SLEP enhances overall system capabilities by enabling high speed/high resolution data transmissions; provides greater safety to aviation operations by increasing reliability of the system, as well as a stable platform for more consistent and accurate data; and allows for remote and cost effective maintenance, logistics, and training. ASOS is an inter-agency effort supporting meteorological observational requirements of NOAA, DoD and DOT.

In FY 2018, NWS focused on awarding the Pedestal Refurbishment contract for the NEXRAD SLEP and issuing the solicitation for the Acquisition Control Unit (ACU) and Data Collection Package (DCP) production contract for the ASOS SLEP.

In FY 2020, NWS will continue its Next Generation Weather Radar (NEXRAD) Service Life Extension Program (SLEP), continuing transmitter, pedestal, and shelter refurbishments to extend overall service life, and reduce the average time between failures. NWS will also continue the Automated Surface Observing System (ASOS) SLEP with production and installation of the upgraded Acquisition Control Unit (ACU) and Data Collection Package (DCP), in partnership with and including reimbursable funding from tri-agency partners, the Federal Aviation Administration (FAA) and the DoD.

Without continued support for the NEXRAD and ASOS SLEP projects, provided for in Observations PAC, NWS cannot continue to support necessary enhancements and life-cycle replacements of these systems that collect and process observations necessary to provide weather forecasts, warning, and outlooks.

Outyear Funding Estimates*

Observations	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-4,879	-5,429	-6,479	-16,619	-21,129		N/A
Total Request	99,357	16,250	15,700	14,650	4,510	0	NA	150,467

*Outyears are estimates. Future requests will be determined through the annual budget process.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

NEXRAD	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-2,379	-2,929	-3,979	-9,919	-11,129		N/A
Total Request	71,857	8,750	8,200	7,150	1,210	0	N/A	97,167

*Outyears are estimates. Future requests will be determined through the annual budget process.

ASOS	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-2,500	-2,500	-2,500	-6,700	-10,000		N/A
Total Request	27,500	7,500	7,500	7,500	3,300	0	NA	53,300

*Outyears are estimates. Future requests will be determined through the annual budget process.

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $4,879,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Observations Subactivity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	0	21,129	0	18,750	0	(2,379)
	FTE/OBL	0	21,129	0	18,750	0	(2,379)

Reduce Service Life Extension Program for Next Generation Weather Radar (-$2,379, 0 FTE/ 0 Positions) – This program change reflects the planned program decrease for the Service Life Extension Program (SLEP) to sustain aging Next Generation Weather Radar (NEXRAD) infrastructure.

NEXRAD SLEP is a multi-year effort that began in FY 2015 and was originally anticipated to be completed in 2022. NEXRAD underpins severe weather forecast and warning services for high-impact events critical for a Weather-Ready Nation. The current NEXRAD system was fielded in the mid-1990s with an original design life of 20 years. The SLEP will extend the useful life of the NEXRAD array by approximately 15 years. Refurbishing the existing system is a cost effective approach to preserving this $3.1 billion capital investment.[4] Investment in this SLEP mitigates high operational risk by extending the useful life of the radars.

Schedule and Milestones (Includes NWS, DoD, DOT assets)
FY 2020
- *Transmitter* - 22 transmitters modified - Complete modification of 180 transmitters
- *Pedestal* - 30 pedestals rebuilt - Total to date 52
- *Shelter* - Refurbish shelters at 50 radar sites

FY 2021
- *Pedestal* - 31 pedestals rebuilt - Total to date 83
- *Shelter* - Refurbish shelters at 15 radar sites - Complete refurbishment of 147 sites

FY 2022
- *Pedestal* - 30 pedestals rebuilt - Total to date 113

FY 2023
- *Pedestal* - 30 pedestals rebuilt - Total to date 143

[4] Derived from "The Federal Plan for Meteorological Services and Supporting Research", FY 1980-2000.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

FY2024

- *Pedestal* - 25 pedestals rebuilt - Complete refurbishment of 168 pedestals

Deliverables

- New signal processor replacing obsolete hardware; implementation of new signal processor software replacing obsolete antenna control cards
- Refurbished pedestals with expected service life to at least 2030
- Refurbished transmitters with expected service life to at least 2030
- Refurbished radar shelters

Outyear Costs:	2020	2021	2022	2023	2024
Direct Obligations	(2,379)	(2,379)	(2,379)	(2,379)	(2,379)
Uncapitalized	0	0	0	0	0
Budget Authority	(2,379)	(2,379)	(2,379)	(2,379)	(2,379)
Outlays	(833)	(833)	(833)	(833)	(833)
FTE	0	0	0	0	0
Positions	0	0	0	0	0

Outyear Funding Estimates*

NEXRAD	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-2,379	-2,929	-3,979	-9,919	-11,129		N/A
Total Request	71,857	8,750	8,200	7,150	1,210	0	N/A	97,167

*Outyears are estimates. Future requests will be determined through the annual budget process.

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Procurement, Acquisitions, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Systems Acquisition
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	106	106	106	106	0
22	Transportation of things	8	8	8	8	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	231	231	231	231	0
23.2	Rental Payments to others	4	4	4	4	0
23.3	Communications, utilities and misc charges	8	8	8	8	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	29,499	17,675	17,675	15,296	(2,379)
25.3	Other goods and services from Federal sources	4	4	4	4	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	422	422	422	422	0
31	Equipment	2,670	2,670	2,670	2,670	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1	1	1	1	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	32,953	21,129	21,129	18,750	(2,379)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	0	21,129	0	18,629	0	(2,500)
	FTE/OBL	0	21,129	0	18,629	0	(2,500)

Reduce Service Life Extension Program for Automated Surface Observing System (-$2,500, 0 FTE/ 0 Positions)
This program change reflects the planned program decrease for the Service Life Extension Program (SLEP) to sustain aging Automated Surface Observing System (ASOS) infrastructure.

ASOS SLEP is a multi-year effort with the Department of Defense and Federal Aviation Administration that began in FY 2017 and was originally anticipated to be completed in 2023. ASOS serves two important surface observation roles by providing critical aviation weather parameters at airports supporting the air transportation industry and by providing high quality meteorological data supporting forecasts and warnings. Data from the ASOS is required by Department of Transportation for flights for take-off and landings at airports across the country. Performing a SLEP is critical to ensuring availability of the observing system until at least 2040. This decrease aligns with the tri-agency planning and execution for deployment of upgraded ASOS processing and for transition to Internet-protocol (IP) based communications.

Schedule and Milestones
FY 2020
- Complete Operation Test and Evaluation of ASOS processing capabilities

FY 2021
- Begin field deployment of ASOS processing capability; evaluate solutions for IP-based communications

FY 2022
- Continue fielding upgraded ASOS processing capability; begin implementation of IP-based communications conversion

FY 2023
- Complete upgraded processing deployment and IP-based communications conversion

FY 2024
- Complete/close project

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Outyear Costs:	2020	2021	2022	2023	2024
Direct Obligations	(2,500)	(2,500)	(2,500)	(2,500)	(2,500)
Uncapitalized	0	0	0	0	0
Budget Authority	(2,500)	(2,500)	(2,500)	(2,500)	(2,500)
Outlays	(875)	(875)	(875)	(875)	(875)
FTE	0	0	0	0	0
Positions	0	0	0	0	0

Outyear Funding Estimates*

ASOS	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-2,500	-2,500	-2,500	-6,700	-10,000		N/A
Total Request	27,500	7,500	7,500	7,500	3,300	0	NA	53,300

*Outyears are estimates. Future requests will be determined through the annual budget process.

Exhibit 15

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Systems Acquisition
Subactivity: Observations

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	106	106	106	106	0
22	Transportation of things	8	8	8	8	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	231	231	231	231	0
23.2	Rental Payments to others	4	4	4	4	0
23.3	Communications, utilities and misc charges	8	8	8	8	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	29,499	17,675	17,675	15,175	(2,500)
25.3	Other goods and services from Federal sources	4	4	4	4	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	422	422	422	422	0
31	Equipment	2,670	2,670	2,670	2,670	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1	1	1	1	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	32,953	21,129	21,129	18,629	(2,500)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Central Processing

Goal Statement

The PAC Central Processing Subactivity ensures the uninterrupted flow of information from the collection of observations, to central guidance production, to local applications of all essential weather and climate data products, and continuity of public watches and warnings in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

Central Processing is responsible for program and budget planning for the Weather and Climate Operational Supercomputing System (WCOSS) and the Advanced Weather Interactive Processing System (AWIPS), Central Processing is also responsible for maintaining an optimum processing systems configuration and an enterprise architecture for processing systems to meet current and future NWS missions requirements, including the strategy for maximizing effectiveness while minimizing operating costs and coordination with the Office of Dissemination.

Statement of Operating Objectives

Schedule and Milestones
FY 2020–2024
- Provide Operations and Maintenance support for WCOSS
- Provide Operations and Maintenance support for NOAA's R&D HPC System
- Phased implementation of new forecast tools and capabilities into AWIPS.

FY 2020
- Award follow-on WCOSS contract
- Provide Operations and Maintenance support for WCOSS

FY 2021
- Transition to a new WCOSS computing configuration under new contract
- Provide Operations and Maintenance support for new WCOSS computing configuration

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(Dollar amounts in thousands)

FY 2022

- Transition operations to new WCOSS contract
- Provide Operations and Maintenance support for new WCOSS computing configuration

Deliverables

- Operational WCOSS with full backup capability
- Production Suite On-Time Product Generation at 99 percent
- Sustained WCOSS capacity at 4.2 TFLOPS, in each of the primary and backup systems
- New forecast tools and capabilities for IDSS/WRN operations
- Weather Event Simulator integration into AWIPS

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central Processing	Pos/BA	26	66,761	27	66,761	27	66,761
	FTE/OBL	24	66,761	26	66,761	26	66,761

PAC Central Processing objectives are achieved through the following programs:

Weather and Climate Operational Supercomputing System (WCOSS) supports (a) weather and climate forecasting capabilities 24/7 (b) numerical environmental prediction model development and testing, and (c) dissemination of operational products using a wide area network. These products include national and global weather, water, climate and space weather guidance, forecasts, warnings and analyses to a broad range of users and partners including other NOAA programs, government agencies, military, and the general public.

WCOSS is composed of primary and backup operational supercomputing systems, storage resources, wide area network, support services, and developmental R&D computing systems. The primary system runs the NCEP production suite. The backup is used to thoroughly test new weather and climate forecasting applications when it is not being used to run the production suite (during a backup system test or an actual emergency). The backup supercomputer system is capable of handling 100 percent of the operational workload should the primary supercomputer system be disrupted. In accordance with NOAA Critical Infrastructure

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Protection plans, implementation and maintenance of a redundant WCOSS architecture ensures uninterrupted flow of weather and climate data and products, such as storm watch and warning services, to the public.

WCOSS also provides NWS access to developmental computing systems through the NOAA-wide enterprise Research and Development High Performance Computing System.

Advanced Weather Interactive Processing System (AWIPS) is an information processing, display, and telecommunications system that is the cornerstone of NWS field operations. AWIPS provides the following services:

- Integrates and displays radar, satellite, and other meteorological and hydrological data at NWS field offices;
- Acquires and processes data from sensors and local sources;
- Provides computational and display functions at the forecaster's desk;
- Provides an interactive communications system to interconnect NWS operational sites;
- Initiates the dissemination of weather and flood warnings and forecasts in a rapid and highly reliable manner; and,
- Provides the communication interface for internal and external users of much of NOAA's real-time environmental data.

Sustained investments in the AWIPS hardware, communications, and software infrastructure, are necessary for integrating many other programs such as NEXRAD, weather satellites, other weather radars, sensors, and instruments. NWS Government Performance and Results Act (GPRA) goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. As the NWS continues to evolve toward an IDSS-based WRN, improvements to AWIPS technology will be needed to ensure NWS meteorologists and hydrologists have the necessary tools and technology. Continued AWIPS improvements produce increased performance in the GPRA goals of Tornado Warning Lead Time, Flash Flood Warning Lead Time, and Winter Storm Warning Lead Time.

In FY 2020, NWS will continue to develop new Advanced Weather Interactive Processing System (AWIPS-II) forecast capabilities. In FY 2020, NWS will award a new follow-on Weather and Climate Operational Supercomputing System (WCOSS) contract and begin the transition of operational modeling applications.

Without continued support for WCOSS and for investments in AWIPS, provided for in Central Processing PAC, NWS cannot provide operational and developmental high performance computing (HPC) capacity, and forecast and process improvements within AWIPS.

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PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $8,622,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Central Processing Subactivity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central Processing	Pos./BA	27	66,761	27	62,589	0	(4,172)
	FTE/OBL	26	66,761	26	62,589	0	(4,172)

Eliminate Integrated Water Prediction High Performance Computing (-$4,172, 0 FTE/ 0 Positions) – This program change will eliminate high performance computing funding for continued improvement of the Nation's first Integrated Water Prediction (IWP) capability.

As the Federal agency charged with water prediction and warning responsibilities, NOAA is uniquely positioned to address water challenges facing our Nation. NOAA is establishing the Integrated Water Program (IWP) to deliver water intelligence products to stakeholders such as emergency managers and local decision makers. In FY2016, the NWS implemented the National Water Model providing forecast guidance for every stream reach in the continental United States (CONUS), at 2.7 million locations. Efforts to address compute resource for IWP may be offset through the Earth Prediction Innovation Center, established in the National Integrated Drought Information System Reauthorization Act of 2018. Likewise, NOAA is pursuing cloud computing pilot projects, consistent with the Act, to reduce computer hardware needs while increasing resource availability.

This request eliminates funding for NOAA to procure additional operational HPC resources to support coupling of the current generation of terrestrial and coastal models and develop the next generation of integrated Earth system coupled models necessary to expand NOAA's hydrologic products and services. This reduction significantly limits any further expansion of the existing water modeling capability which sustains the current situation where over 20 million Americans living in major cities on the coast do not have access to hydrological forecasts.

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	2020	2021	2022	2023	2024
Percent of Coastal Populations with hydrological forecasts with Decrease	0%	0%	0%	0%	0%
Percent of Coastal Populations with hydrological forecasts without Decrease	8%	22%	41%	69%	100%

Outyear Funding Estimates*

Central Processing	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-8,622	-8,622	-8,622	-8,622	-8,622	N/A	N/A
Total Request	N/A	58,139	58,139	58,139	58,139	58,139	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Systems Acquisition
Subactivity: Central Processing

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	4,851	4,851	4,851	4,851	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	68	68	68	68	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	4,919	4,919	4,919	4,919	0
12	Civilian personnel benefits	1,662	1,662	1,662	1,662	0
13	Benefits for former personnel	1	1	1	1	0
21	Travel and transportation of persons	258	258	258	258	0
22	Transportation of things	8	8	8	8	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	1,557	1,557	1,557	1,557	0
23.2	Rental Payments to others	17	17	17	17	0
23.3	Communications, utilities and misc charges	1,942	1,942	1,942	1,942	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	298	298	298	298	0
25.2	Other services from non-Federal sources	52,265	52,265	52,265	48,093	(4,172)
25.3	Other goods and services from Federal sources	17	17	17	17	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	13	13	13	13	0
31	Equipment	523	523	523	523	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,281	3,281	3,281	3,281	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	66,761	66,761	66,761	62,589	(4,172)

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central Processing	Pos./BA	27	66,761	27	62,761	0	(4,000)
	FTE/OBL	26	66,761	26	62,761	0	(4,000)

Reduce Research and Development High Performance Computing (-$4,000, 0 FTE/ 0 Positions) – This program change will reduce the NWS contribution to NOAA's Research and Development High Performance Computing System (R&D HPCS).

NOAA proposes to eliminate the "Jet" supercomputing system and associated contract support in Boulder, CO and reduce NWS's supercomputing use (and, to a lesser degree, capacity) and associated contract support in Fairmont, WV. Major transition projects including hurricane forecast improvement, the Next Generation Global Prediction System, and storm surge modeling will need to compete for space on NOAA's remaining supercomputing assets, potentially resulting in delays to implementation of and upgrades to operational models and improvements to forecasts and warnings, as NWS priorities will compete with other NOAA priorities.

Efforts to address compute resource for NOAA may be offset through the Earth Prediction Innovation Center, established in the National Integrated Drought Information System Reauthorization Act of 2018. Likewise, NOAA is pursuing cloud computing pilot projects, consistent with the Act, to reduce computer hardware needs while increasing resource availability.

The R&D HPCS enterprise approach enables each NOAA program requiring resources to achieve its computing needs by sharing in the cost of investment. The NWS currently uses a portion of the R&D HPC to accomplish transition to operations projects resulting in operational model improvements, mostly in Boulder and Fairmont.

Schedule and Milestones
FY 2020

- Eliminate existing R&D supercomputing system in Boulder, Colorado
- Reduce R&D supercomputing capacity and use in Fairmont, West Virginia
- Sustain existing operational computing capacity

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(Dollar amounts in thousands)

Deliverables

- Sustain existing National Water Model capability

Performance Measures	2020	2021	2022	2023	2024
Reduction of R&D Computing with Decrease	20%	20%	20%	20%	20%
Reduction of R&D Computing without Decrease	0%	0%	0%	0%	0%

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar obligation amounts in thousands)

Activity: Systems Acquisition
Subactivity: Central Processing

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	4,851	4,851	4,851	4,851	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	68	68	68	68	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	4,919	4,919	4,919	4,919	0
12	Civilian personnel benefits	1,662	1,662	1,662	1,662	0
13	Benefits for former personnel	1	1	1	1	0
21	Travel and transportation of persons	258	258	258	258	0
22	Transportation of things	8	8	8	8	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	1,557	1,557	1,557	1,557	0
23.2	Rental Payments to others	17	17	17	17	0
23.3	Communications, utilities and misc charges	1,942	1,942	1,942	1,942	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	298	298	298	298	0
25.2	Other services from non-Federal sources	52,265	52,265	52,265	48,265	(4,000)
25.3	Other goods and services from Federal sources	17	17	17	17	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	13	13	13	13	0
31	Equipment	523	523	523	523	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,281	3,281	3,281	3,281	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	66,761	66,761	66,761	62,761	(4,000)

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(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Dissemination

Goal Statement

The NOAA Integrated Dissemination Program (IDP) is a multi-year NWS response to organizational and technical dissemination challenges created through the years as individual efforts built stovepipes across the NWS enterprise. These weaknesses resulted in telecommunications, web sites and other system outages with near-national impacts during severe weather events. These outages highlighted the urgent need for organizational change and the development of a reliable and scalable NWS dissemination infrastructure to sustain 24x7 mission operations in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts. While IDP reached Full Operating Capability in FY 2018, there remain approximately 50 additional applications to be onboarded to the systems, and to do that, additional expansion of the system will also be necessary.

Base Program

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the PAC Dissemination Subactivity is organized around infrastructure, networks, web services and warning dissemination services.

Specific to the PAC appropriation, funding within the PAC Dissemination Subactivity:

- Procures NWS' IT dissemination infrastructure and services;
- Closes NWS' dissemination requirements and gaps;
- Enhances NWS' dissemination system capabilities; and
- Develops a strategy to maximize effectiveness while minimizing cost.

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Statement of Operating Objectives

Schedule and Milestones
FY 2020-2024

- Provide processing and storage resources to support WRN
- Conduct phased implementation of enhanced applications and capabilities into IDP
- Upgrade NWR telecoms to digital Enterprise Systems
- Replace obsolete transmitter site monitoring equipment
- Integrate website operations to College Park, MD and Boulder, CO
- Transition from the GSA Networx contract to GSA Enterprise Infrastructure Solutions contract based on the budget
- Replace obsolete and end-of-life NWR site components

Deliverables

- Robust and high capacity websites for NWS Field Offices
- Improved reliability of enterprise GIS capabilities on IDP
- Enabled AWIPS access to IDP services

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Dissemination	Pos/BA	0	34,619	0	35,000	0	10,000
	FTE/OBL	0	34,619	0	35,000	0	10,000

To achieve these goals, NWS manages the following programs:

NOAA Weather Radio (NWR)
NWR provides the NWS with the capability to quickly disseminate severe and high impact weather warnings, watches and forecasts and non-weather emergency messages to the public. In FY 2019, NWS began the transition of NOAA Weather Radio legacy technology to Ethernet/ Internet Protocol-based services. Furthermore, in FY 2019, NWS has strengthened its partnership with FEMA to look for efficiencies in delivering both weather and non-weather emergency messages via NWR and FEMA's Integrated and Alert Warning System (IPAWS). This partnership ensures that messages from both the Federal Communication Commission managed Emergency Activation System (EAS) and Wireless Emergency Alerts (WEA) are distributed appropriately.

Improve Dissemination Reliability Project
The improved dissemination reliability project encompasses the efforts previously reported under NWS Telecommunications Gateway (NWSTG) and the Ground Readiness Project (GRP). Together, these projects mitigate risk to mission operations during severe weather events by enhancing capabilities to reduce single points of failure and increase website capacity.

Providing phased hardware refresh of the IDP/NWSTG architecture and modest enhancements to existing core applications on IDP will ensure reliable delivery of NWS products to users and will capitalize on better observation data and prediction models to improve services. Acquiring backup communication paths to NWS Weather Forecast Offices, will make the NWS network infrastructure more resilient and robust while also decreasing the risk of product delivery outages.

Specific activities, spanning multiple years, include:

- Reducing Enterprise Single Points of Failure: Acquire robust and reliable networking capabilities by upgrading networking lines (such as aging copper lines) with fiber optics and providing a backup satellite-based network path at mission-critical NWS Weather Forecast Offices.
- Providing Robust and Enterprise Web and GIS services: Increase web and GIS services for NWS Weather Forecast Offices at the primary and backup integrated dissemination sites to ensure the services align with growing requirements and increased use during severe weather events. NWS will acquire computing and storage to augment the existing IT dissemination infrastructure at the primary and backup IDP sites providing 100 percent backup capabilities.
- Integrating IT Infrastructure Redesign and Upgrades: Enhance the delivery of web and GIS services, as well as the radar, model, and observational data necessary as new satellites with increased data collection become operational.

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Without the continued support for NWR and the Improve Dissemination Reliability Project (including NWSTG and GRP), provided for in Dissemination PAC, NWS cannot continue to enhance the infrastructure of NWS dissemination systems and upgrade existing applications, including web and GIS services, to meet new satellite and model data requirements, including the Integrated Dissemination Program (IDP), and the Telecommunications Gateway, as well as upgrades to select NOAA Weather Radio locations.

Outyear Funding Estimates*

Dissemination	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	-447	-447	-447	-447	-447	N/A	N/A
Total Request	N/A	9,553	9,553	9,553	9,553	9,553	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

PROGRAM CHANGES FOR FY 2020
NOAA requests a decrease of $447,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Dissemination Subactivity. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

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Activity: NWS Construction
Subactivity: Facilities Construction and Major Repairs

Goal Statement

The objective of the Construction activity is to construct and provide for major repairs to forecast offices and other government-owned weather facilities in support of the Department of Commerce 2018-2022 Strategic Plan, Strategic Objective 3.3 Reduce Extreme Weather Impacts.

Base Program

To support its mission, the NWS operates and maintains 122 Weather Forecast Offices (WFO), 13 River Forecast Centers (RFC), 18 Weather Service Offices (WSO) and associated employee housing units, and 8 National Centers. There are 85 owned and 37 leased WFOs and WFO/RFCs. To support these facilities, the Facilities Construction & Major Repairs Subactivity account is managed by NWS Headquarters Office of Facilities.

The objectives of the Facilities Construction & Major Repairs activity are to:

- Upgrade and improve NOAA's NWS Facilities;
- Maintain operational readiness by addressing deferred maintenance and real property disposal; and
- Maintain compliance with Federal law and national and local building codes.

Statement of Operating Objectives

Schedule and Milestones
FY 2020–2024

- Design and build out tenant improvements for the relocation of up to five operational sites
- Award contracts for highest priority repairs, replacements, and real property disposals

Deliverables

- Address mandatory relocations through new GSA leases
- Complete tenant improvements, construction, and relocate operations

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(Dollar amounts in thousands)

- Conduct necessary actions for real property disposals and address deferred maintenance with available resources

Explanation and Justification

Line Item		2018 Actual		2019 Enacted		2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Facilities Construction and	Pos/BA	0	8,650	0	19,000	0	19,000
Major Repairs	FTE/OBL	0	8,650	0	19,000	0	19,000

NWS facilities are reaching and exceeding twenty-five years of age and need typical capital improvements to maintain their structural and operational integrity, (e.g., heating, ventilating, and air conditioning systems (HVAC), roof, and uninterruptible power supply replacements). This effort is essential to ensure the safety of the workforce and continuity of uninterrupted forecasts for local communities. The Facilities Portfolio must meet the evolving needs of the NWS mission to provide facilities that enable a fully integrated field structure capable of supporting impact-based decision support services (IDSS). In addition, recent NWS investments in facilities have addressed required tenant improvements at newly leased locations and the costs associated with relocating. A select number of expiring forecast office leases resulted in forced relocations.

In FY 2019 NWS initiated the forced relocation of Charleston, WV. In the remainder of the year, NWS will complete the design of WFO Cleveland, award a lease for the new WFO/RFC Burlington location, and negotiate a succeeding lease for WFO Honolulu. In FY 2020, NWS will complete construction of WFO Cleveland and relocate to its new location. NWS will also begin construction of the new WFO/RFC Burlington location. NWS will also focus resources on lifecycle management of government owned assets to address deferred maintenance and real property disposal backlogs. Lifecycle management includes NOAA's efforts to consolidate data centers and improved space utilization in the National Capital Region. In FY 2021, NWS will complete the ongoing forced relocations and continue to address deferred maintenance and field requirements for lifecycle management.

NWS cannot continue to support upgrades and improvements to NOAA's NWS facilities or to improve safety, functionality, and relocations with partners without continued support for construction and major repairs provided for in Facilities Construction and Major Repairs PAC.

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Procurement, Acquisitions, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $10,366,000 and 0 FTE/ 0 positions in FY 2020 program changes for the Facilities Construction and Major Repairs Subactivity. Narratives are only provided for program changes which are greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 5).

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Facilities Construction & Major Repairs	Pos./BA	0	19,000	0	8,634	0	(10,366)
	FTE/OBL	0	19,000	0	8,634	0	(10,366)

Completion of Weather Forecast Office Slidell and Radar Relocation (-$10,366, 0 FTE/ 0 Positions) – NOAA requests a decrease of $10,366,000 to reflect the relocation of the Weather Forecast Office (WFO) and River Forecast Office (RFC) in Slidell, LA. In addition to the WFO and RFC being relocated, the associated Next Generation Weather Radar (NEXRAD) is also being relocated. Congressionally directed funding in the Consolidated Appropriations Act, 2019 was used for this one-time relocation project which will be complete in FY 2023.

Schedule and Milestones
FY 2020 - FY 2023

- Award lease at new location
- Complete Tenant Improvements
- Complete relocation of WFO Slidell office and radar
- Initiate disposal of vacated location

Deliverables

- GSA lease for a new location that is less susceptible to flooding; ensures operations and improved service delivery
- Disposal of vacated property

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates

Facilities Construction & Major Repairs	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(10,366)	(10,366)	(10,366)	(10,366)	(10,366)	N/A	N/A
Total Request	N/A	8,634	8,634	8,634	8,634	8,634	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

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Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: NWS Constructions
Subactivity: Facilities Construction and Major Repair

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	200	200	200	200	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	850	850	850	850	0
25.2	Other services from non-Federal sources	6,000	13,000	13,000	5,984	(7,016)
25.3	Other goods and services from Federal sources	850	4,200	4,200	850	(3,350)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	750	750	750	750	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	8,650	19,000	19,000	8,634	(10,366)

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Executive Summary

For FY 2020, NOAA requests a total of $1,472,711,000 and 778 FTE/ 867 positions for the National Environmental Satellite, Data and Information Service (NESDIS) including a net decrease of $218,898,000 and an increase of 2 FTE / 3 positions in program changes.

NESDIS OVERVIEW

NESDIS (http://www.nesdis.noaa.gov/) provides timely access to global environmental data from satellites and other sources to enhance the Nation's economy, security, environment, and quality of life. Billions of dollars in damage are incurred each year due to natural disasters and extreme weather events such as tornadoes, hurricanes, floods, and drought. In 2018 alone, there were 14 weather and climate disaster events with losses exceeding $1 billion each across the United States and directly resulting in 247 deaths and totaling more than $91 billion.[1] Businesses, communities, governments, and the general public have come to rely on NOAA satellite data and products to provide reliable, accurate information to make decisions regarding public safety and emergency preparedness. This allows decision makers to reduce the losses incurred by these destructive events, making it imperative to ensure the continuity of these satellite systems.

To fulfill its responsibilities, NESDIS procures, launches, and manages the Nation's civil operational environmental satellites. Along with managing and operating NOAA's satellites in real time, NESDIS develops and distributes products and information based on data from NOAA, multiple partner satellites, and commercial sources. NOAA satellite-based observations support a broad range of environmental monitoring for weather, climate, oceans, coasts, and ecosystems impacting the general public and their decision-making. Satellite-based observations assist with disaster mitigation through monitoring severe weather, precipitation, fires and smoke, volcano eruptions, dust storms and other air quality issues. NESDIS-developed products, information from NOAA and partner satellite observations, and commercial sources underpin weather and other environmental forecasts, saving lives and property. NESDIS also works toward developing the next generation of satellites to continue meeting primary mission essential functions without incurring gaps in data coverage.

NOAA satellite data drives critical decision-making and impacts national security and various sectors of the economy including, agriculture, transportation, energy, construction, infrastructure, emergency management, and hazard mitigation. NOAA satellites are essential to the agency's integrated observing system, which is the foundation of the environmental intelligence that the agency

[1] Credit National Centers for Environmental Information (NCEI): http://www.ncdc.noaa.gov/billions/

provides. NESDIS maintains primary constellations of environmental satellites in the polar and geostationary orbits, and in deep space at Lagrange point 1, directly along the sun-earth line. Along with operating its satellites in real time, NESDIS manages the global data gathered by these satellites, by numerous partner-deployed satellites, and by other sources to develop and distribute products and information that support a broad range of environmental monitoring for weather, climate, coasts, oceans, and ecosystems.

NOAA satellites, along with those of its partners and commercial sources, provide uninterrupted global coverage critical for generating short-term and long-term weather forecasts, and for monitoring planetary change. NESDIS is committed to the international effort to establish a global observing system that meets the Nation and the world's need for environmental intelligence. A fully implemented global observing system will yield increasingly accurate and reliable warnings of severe weather and other environmental events in the United States and all around the world.

BUDGET RESTRUCTURE & ORGANIZATIONAL ALIGNMENT

The weather and environmental data landscape has been changing rapidly over recent years, both domestically and internationally. There are more reliable data providers and many more knowledgeable data users. We now see more nations launching operational satellites that provide high quality observations, and a commercial market that may be able to provide certain observations more efficiently. The number of public and private sector applications for Earth observations is growing rapidly in areas of environmental monitoring, emergency preparedness and response, as well as traditional sectors of the economy (e.g., transportation, energy).

The current NESDIS budget and organizational structure has enabled NESDIS to develop and successfully exploit individual NESDIS-owned and operated satellite missions. However, it lacks the flexibility to effectively exploit partnerships and technology innovation, or to manage risks across the observing system. Resources and activities are bound to specific satellite missions and activities, rather than on an optimized set of observations and measurements intended to meet mission objectives, regardless of the source.

NOAA is proposing to restructure the NESDIS budget, and realign the organization, to position itself to thrive in this new, heterogeneous observing system environment. The new architecture and paradigm provides NOAA's core space-based observational capability, while leveraging commercial and governmental partnerships to expand its observational datasets. It will allow NOAA to continue as the world leader in operational Earth observations and to expand commercial space activity. The

proposed combination of NOAA-owned and managed assets, partner assets, commercial partnerships, and the purchase of data will:

- Leverage new public and private sector science and technical innovation – Domestic partnerships with NASA, other government organizations, and international partners are providing new opportunities for NOAA, and significantly expanding Earth observation capabilities. There is a growing availability of commercial data, and access to private capital is accelerating the ability of commercial data providers to meet NOAA's needs. The budget restructure allows NOAA to commit resources and enter into contracts and partnerships proactively and timely.
- Be agile and responsive to public and private users' needs and expectations – Currently the major satellite programs dominate the NESDIS budget, making it difficult to build resilience in the architecture. The optimum future architecture will be disaggregated, with a mix of large and small satellites, some developed on much shorter timescales, allowing NOAA to be more responsive to evolving user needs. NOAA's ability to expand and diversify its observational portfolio will allow NOAA users to limit the impact of severe weather events, while fueling the growing commercial weather enterprise.
- Reduce and mitigate risks – The proposed budget structure will allow NOAA to manage risk across its portfolio of observations to ensure continuity of key data sets. This may include more rapid development and deployment of targeted observations in response to user needs or large satellite system anomalies.

Transition from Current to Proposed Future Architecture

As NESDIS plans for and implements its new architecture, the budget restructure will be necessary to lessen or remove some of its current limitations, as identified in Figure 1. It will avoid suboptimal risk management and a higher cost / lower performance future architecture. The proposed budget restructure consists of 6 Subactivities within the Operations, Research, and Facilities (ORF) account and 8 Subactivities within the Procurement, Acquisition, and Construction (PAC) account. As part of this transition, NESDIS proposes to maintain budget lines for established satellite missions: Geostationary Systems – R (GOES-R), Space Weather Follow On (SWFO), and Cooperative Data and Rescue Services (CDARS) will remain individual subactivities; Joint Polar Satellite System program of record (JPSS) and Polar Follow On (PFO) will be merged into a single subactivity called Polar Weather Satellites (PWS), but will continue to be tracked according to established JPSS and PFO life cycle costs (LCCs). Since each of these represent established missions with unique visibility and stakeholders, NESDIS proposes to keep the current reporting structure for the duration of these missions. By making small adjustments to a limited set of budgetary features, NESDIS will be able to more easily partner with the commercial sector, take advantage of cost-saving, and forecast improving technologies, all while maintaining cost and schedule transparency, as seen in Figure 2.

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Figure 1: Current Budget Structure and Organizational Limitations

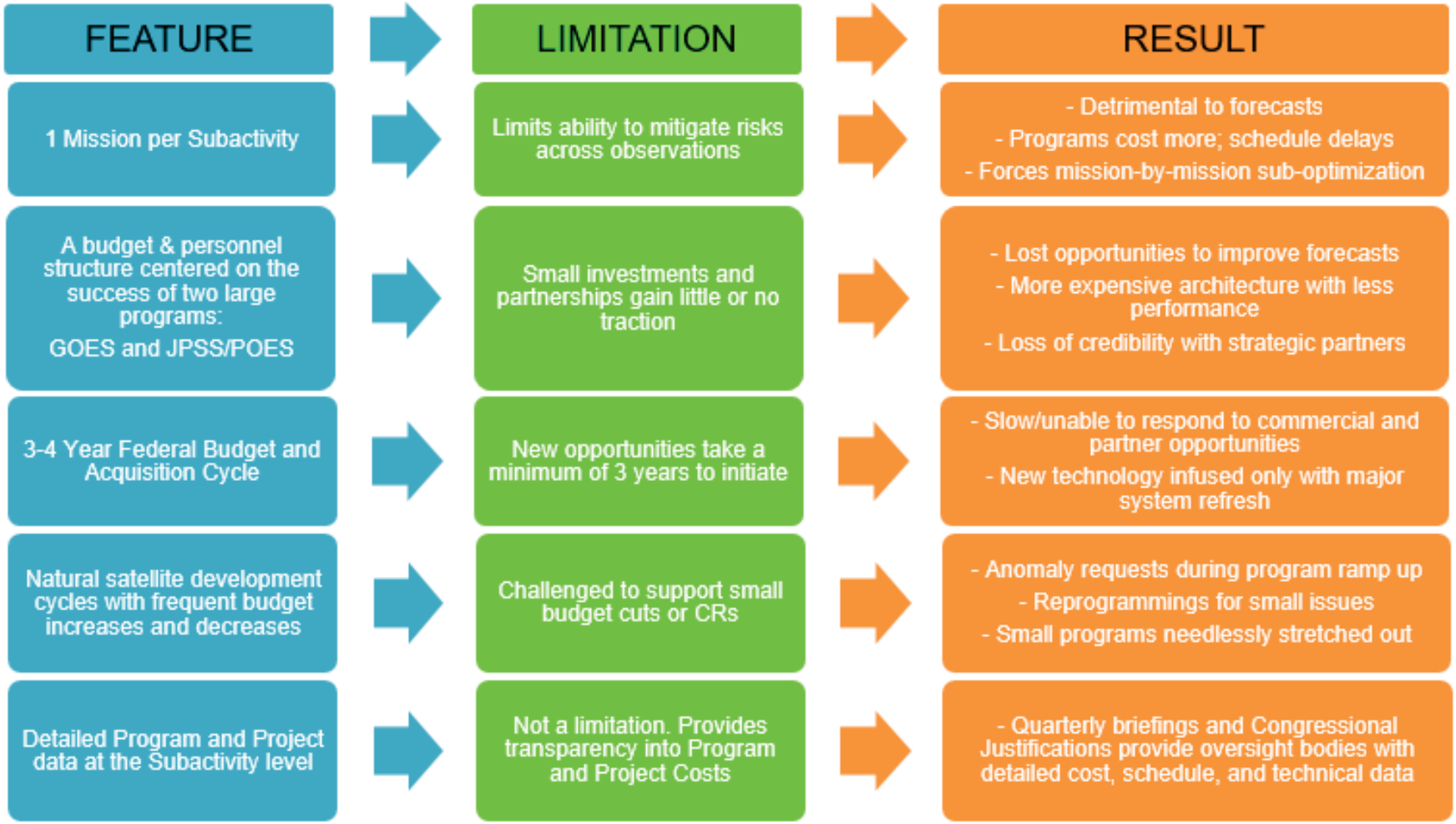

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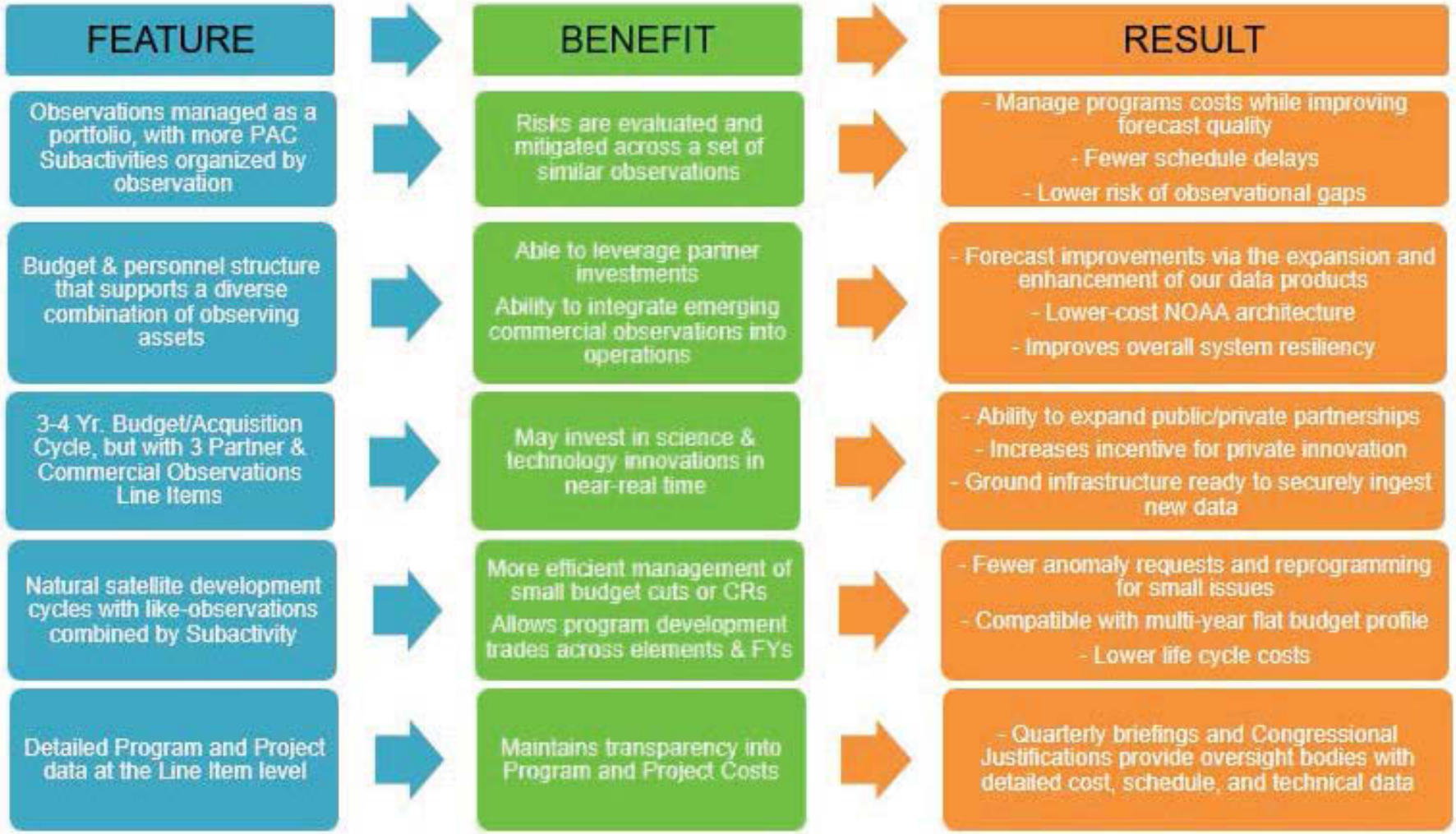
Figure 2: Proposed Budget Structure and Organizational Benefits



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Budget Restructure Details

The proposed restructure will increase cost and program efficiencies to deliver space-based observations under a new architecture and paradigm. It reduces the overall number of Subactivities from 17 to 14, with 6 Subactivities in ORF and 8 Subactivities in PAC. The NESDIS PAC Subactivity Crosswalk is displayed in the Table 1 below.

Table 1: NESDIS PAC Subactivity Crosswalk

FY 2019 PAC Subactivities (11)	FY 2020 Subactivitites (8)
PAC	
Geostationary Systems – R (GOES-R)	**Geostationary Systems – R (GOES-R)**
Joint Polar Satellite System (JPSS)	**Polar Weather Satellites (PWS)**
Polar Follow On (PFO)	
Cooperative Data and Rescue Services (CDARS)	**Cooperative Data and Rescue Services (CDARS)**
Space Weather Follow On (SWFO)	**Space Weather Follow On (SWFO)**
COSMIC 2/GNSS RO	**Low Earth Orbit (LEO)**
Satellite Ground Services (SGS) – split*	
Projects, Planning and Analysis (PPA) – split*	
Satellite Ground Services (SGS) – split*	**Geostationary Earth Orbit (GEO)**
Projects, Planning and Analysis (PPA) – split*	
System Architecture and Advanced Planning (SAAP)	**Systems/Services Architecture & Engineering (SAE)**
Commercial Weather Data Pilot (CWDP)	
Satellite Ground Services (SGS) – split*	
Projects, Planning and Analysis (PPA) – split*	
Satellite CDA Facility	**Satellite CDA Facility**

* SGS and PPA Subactivities are split across the LEO, GEO, and SAE Subactivities in PAC, and the Office of Satellite and Product Operations (OSPO) Subactivity in ORF.

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Within each section of this budget request, Subactivities are further subdivided into Line Items to increase transparency and traceability in the NESDIS portfolios. Table 2 below identifies the FY 2019 Enacted amounts transferring to each new Line Item within the proposed budget restructure:

Table 2: Crosswalk of NESDIS FY 2019 Enacted to FY 2020 Proposed Restructure Subactivity:

FY 2019 Enacted Funding ORF Crosswalk[1]						
Current Budget Structure ↓ / Subactivity	OSPO	PDR&A	CRSRA	OSC	USGEO	NCEI
OSPO	$146,924					
PDR&A		$31,000				
CRSRA			$1,800			
OSC				$1,800		
USGEO					$500	
NCEI						$60,642
SGS - PAC to ORF[2]	$17,198					
PPA - PAC to ORF[3]	$4,727					
Total, NESDIS ORF Subactivities	**$168,849**	**$31,000**	**$1,800**	**$1,800**	**$500**	**$60,642**

(1) This table aligns the FY 2019 Enacted amounts with the new FY 2020 Proposed Restructure. It does not include any of the Calculated ATBs, Technical Adjustments or Operational Phase Transfers outlined in the Significant Adjustments section (NESDIS-14). Final post-adjustment FY 2020 base amounts are reflected in Exhibit 10 (NESDIS-28).
(2) As part of this restructure, the long-term maintenance to preserve the form, fit, and function of legacy systems contained in the previous PAC Satellite Ground Services (SGS) Subactivity is transferred to the Office of Satellite and Product Operations (OSPO) ORF Subactivity.
(3) As part of this restructure, the on-orbit anomaly support for the GOES-N and POES series of satellites contained in the previous PAC Projects, Planning, and Analysis (PPA) Subactivity is transferred to the Office of Satellite and Product Operations (OSPO) ORF Subactivity.

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FY 2019 Enacted PAC Funding Crosswalk[1]												
Current Budget Structure ↓	**GOES-R**	**Polar Weather Satellites (PWS)**		**CDARS**	**SWFO**	**Low Earth Orbit (LEO)**		**Geostationary Earth Orbit (GEO)**		**Systems/Services Architecture & Engineering (SAE)**		**Satellite CDA Facility**
Line Item		**JPSS**	**PFO**			**Partner & Comm Obs**	**Com Prod & Services**	**Partner & Comm Obs**	**Com Prod & Services**	**Architecture, Engineering & Requirements**	**Partner & Comm Obs**	
GOES-R	$408,380											
JPSS		$548,035										
PFO			$329,956									
CDARS				$26,539								
SWFO					$27,000							
COSMIC 2						$5,892						
SGS							$17,534		$20,975	$2,293		
OSAAP										$4,929		
PPA						$13,697		$4,244		$17,332		
CWDP											$6,000	
CDA Facility												$2,450
Total, NESDIS - PAC Line Items	**$408,380**	**$548,035**	**$329,956**	**$26,539**	**$27,000**	**$19,589**	**$17,534**	**$4,244**	**$20,975**	**$24,554**	**$6,000**	**$2,450**
Total, NESDIS – PAC Subactivities	**$408,380**	**$877,991**		**$26,539**	**$27,000**	**$37,123**		**$25,219**		**$30,554**		**$2,450**

(1) This table aligns the FY 2019 Enacted with the new FY 2020 Proposed Restructure. It does not include any of the Calculated ATBs, Technical Adjustments or Operational Phase Transfers outlined in the Significant Adjustments section (NESDIS-14). Final post-adjustment FY 2020 base amounts are reflected in Exhibit 10 (NESDIS-28).

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In FY 2020, NOAA is organizing the NESDIS budget by thematic portfolios rather than hardware based portfolios. To this end, NESDIS requests to combine the JPSS and PFO Subactivities into a new single Subactivity for the full JPSS series of satellites: Polar Weather Satellites (PWS). This merge will allow NESDIS to maximize flexibility, responsiveness, and sustainability across its PWS portfolio. The merge will:

- Eliminate duplicative management costs;
- Improve the program's reserves posture by sharing reserves between the JPSS and PFO Line Items; and
- Create additional critical synergies among the JPSS-2, -3, and -4 satellites to protect against catastrophic events, such as impacts to supply chain, by minimizing time and management effort necessary to swap components, instruments and reserves. Spares, hardware, staff and other capacity that become available would be deployed seamlessly, efficiently and effectively to reduce cost and avoid schedule delays since funds would be contained within a single Subactivity.

This approach is consistent with the recommendations of an Independent Review Team, which concluded that "Treating JPSS-2 and JPSS-3/4 as separate programs is inefficient, costly and contrary to establishing a robust program in a timely manner." NOAA will continue to track to the cost and schedule baselines for the JPSS and PFO Line Items, and proposes to track and report on the development and launch costs of each individual satellite mission, providing greater transparency.

NOAA also proposes to take the next step to deliver space-based observations under a new architecture and paradigm by creating the following 3 new Subactivities:

- Low Earth Orbit (LEO) – will set the stage for managing future polar and other low earth and medium earth orbit satellite observations as a portfolio. It will include the development and sustainment of ground systems for observations from the low earth orbit, as well as part of the Common Products and Services for enterprise capabilities, both transferred to LEO from the previous PAC SGS Subactivity. It will also include funding for COSMIC2/GNSS RO, the funding to continue NOAA's partnership with European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) on the Meteorological Operational Satellite (Metop) series of satellites in the morning orbit, and a portion of the Office of Projects, Planning and Analysis (OPPA) Project Management & Execution Division, transferred to LEO from the previous PAC PPA Subactivity. Together, these observations primarily serve the requirements of NOAA's NWS Numerical Weather Prediction models, providing the short-term (0-3 days), and mid-range (3-7 days) warnings of severe weather events critical for emergency managers and communities to make timely decisions to protect life and property. Future activities in this portfolio could also include assimilation of research observations from NASA, JAXA, ESA or others for operational use.

- The Geostationary Earth Orbit (GEO) – will set the stage for managing future geostationary and space weather observations as a portfolio. It will include development and sustainment of ground systems for observations from the geostationary earth orbit and from the Lagrange Point, as well as part of the Common Products and Services for enterprise capabilities, both transferred to LEO from the previous PAC SGS Subactivity. GEO will also include a portion of the OPPA Project Management & Execution Division, transferred to LEO from the previous PAC PPA Subactivity. These observations serve the near real time requirements supporting NOAA's weather forecast offices and severe storm alerts and warnings. Future GEO space weather projects provide the essential earth orbit and deep space observations to support NOAA's space weather forecasts and warnings.
- Systems/Services Architecture and Engineering (SAE) – will merge the PAC System Architecture and Advanced Planning (SAAP) and Commercial Weather Data Pilot (CWDP) Subactivities into a single new PAC Subactivity. It will contain systems engineering supporting the enterprise and the observing system architecture, and the Research to Operations and Project Planning Division of OPPA, transferred to SAE from the previous PAC PPA Subactivity. These activities will support NESDIS' transition to a more agile flight and ground architectures.

Throughout the budget restructure, NESDIS will continue to adhere to and track the LCCs for major satellite programs such as GOES-R, JPSS, PFO, CDARS and SWFO. To ensure NESDIS maintains its commitment to the LCC for the existing JPSS and PFO programs, the amounts for JPSS and PFO will each be separately reported through annual program plans.

Within each section of this budget request, Program Changes are aligned with specific Subactivities and Line Items (see Table 3).

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Table 3: NESDIS Subactivity to New Line Item Crosswalk

Activity	Subactivity	Line Item	FY 2020 Program Changes
Environmental Satellite Observing Systems	**OSPO**	OSPO	Minor Program Change ($3,218)
	PDR&A	PDR&A	Minor Program Change ($702)
	USGEO	USGEO	
	NCEI	NCEI	RCC Termination: ($3,650) Minor Program Change ($993)
Systems Acquisition	**GOES-R**	GOES-R	GOES-R: ($104,324)
	PWS	JPSS	PWS: ($102,953)
		PFO	
	CDARS	CDARS	CDARS: ($11,689)
	SWFO	SWFO	SWFO: ($1,400)
	Low Earth Orbit (LEO)	Partner & Commercial Observations	Metop-C: ($9,339) Metop-SG: +$9,339
		Common Products and Services	Minor Program Change ($1,421)
	Geostationary Earth Orbit (GEO)	Partner & Commercial Observations	
		Common Products and Services	Common Products and Services: ($2,816)
	Systems/Services Architecture & Engineering (SAE)	Architecture, Engineering and Requirements (AER)	Joint Venture: +$2,268 GEO-XO: +$10,000
		Partner and Commercial Observations	CWDP: ($3,000) Commercial Data Buy: +$5,000
Construction	**Satellite CDA Facility**	Satellite CDA Facility	

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Proposed Organizational Alignment Details

To manage program execution within this new budget restructure, NESDIS is also proposing to align its organizational structure to the new budget, and provide for strong governance and management of the budget. The benefits of this alignment include the following:

- Portfolio Management Framework – NESDIS will adopt a governance structure that provides for a robust portfolio management process, leading to better planning and management of risks and resources within a given set of observations, while maintaining accountability and transparency on mission execution at the project level.
- Innovation Efficiencies – NESDIS will increase its focus on science functions, deriving maximum use of data, and optimizing product distribution to users.
- Common Products and Services Model – NESDIS will provide a more effective and cost efficient implementation of services and products that can be leveraged across the entire organization.

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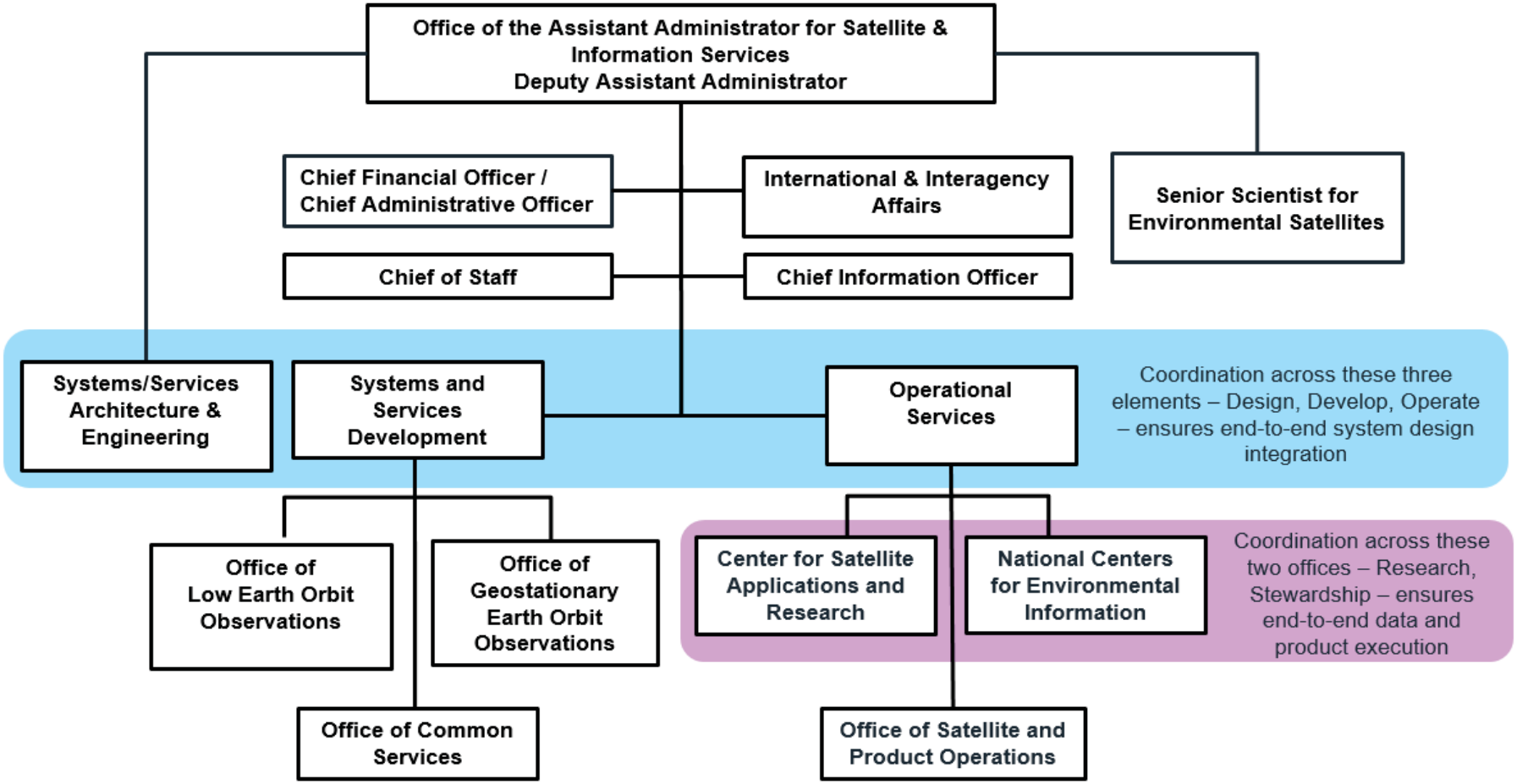
The proposed NESDIS organization will be structured as follows:



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Adjustments:

Inflationary Adjustments
NOAA's FY 2020 Base includes a net increase of $2,285,000 and 0 FTE/ 0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for NESDIS activities. This includes the estimated 2020 military pay raise of 2.1 percent, where applicable, as well as inflationary increases for labor and non-labor activities, including benefits and rent charges from the General Services Administration (GSA).

Technical Adjustments (Transfers)
NOAA also requests the following transfers for a net decrease of $9,221,000 and a net 14 FTE / 16 positions to the operating unit:

From Office	Subactivity	To Office	Subactivity	Amount
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Observations (ORF)	$1,520,000/ 0 FTE/ 0 positions
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Analyze, Forecast, and Support (ORF)	$1,331,000/ 5 FTE/ 5 positions
NESDIS	Office of Satellite and Product Operations (ORF)	NWS	Central Processing (ORF)	$90,000/ 0 FTE/ 0 positions

NOAA requests a technical adjustment to move $2,941,000 and 5 FTE/ 5 positions from the NESDIS ORF Office of Satellite and Product Operations Subactivity to the NWS ORF Observations; Analyze, Forecast, and Support; and Central Processing Subactivities. NOAA seeks to realign the United States National Ice Center (NIC) operations from NESDIS to NWS. The NIC is a unique, tri-agency government organization comprised of NOAA, the United States Navy, and the United States Coast Guard. NIC's mission is to provide high-quality strategic and tactical ice analysis services tailored to meet the operational requirements of U.S. national interests. This realignment is in acknowledgement of the mature state of the NIC analysis capability and, given increasing maritime activities in the Arctic resulting from decreasing sea ice coverage during the summer months, the need to house it in an operational organization that can advance their mission by integrating sea ice and marine weather information for operational forecasts and 24/7 support. The realignment places the NIC in the organization responsible for predictions, thereby enabling improved predictions of sea ice and seasonal outlooks in the polar oceans, while more efficiently integrating sea ice information into

operational and developmental models. The funds transferring to Observations are associated with established foreign satellite data purchases through a long standing agreement between NOAA and the Canadian Space Agency, and support for the international Arctic Buoy Program, essential for NIC to successfully accomplish their mission. Funds transferring to Analyze, Forecast, and Support will support the five FTEs being realigned to NWS, four contractor staff members conducting ice and snow analysis, as well as facilities costs. Finally, the funds in Central Processing will support the information and technology operations and maintenance costs of the Interactive Multisensor Snow and Ice Mapping System.

From Office	Subactivity	To Office	Subactivity	Amount
NESDIS	Commercial Remote Sensing and Regulatory Affairs (ORF)	DOC	Operations and Administration	$1,800,000/ 6 FTE/ 6 positions
NESDIS	Office of Space Commerce (ORF)	DOC	Operations and Administration	$1,800,000/ 3 FTE/ 5 positions

NOAA requests a technical adjustment to move $1,800,000 and 6 FTE/ 6 positions from the NESDIS ORF Commercial and Remote Sensing and Regulatory Affairs Subactivity and $1,800,000 and 3 FTE/ 5 positions from the NESDIS ORF Office of Space Commerce Subactivity, both to the Department of Commerce Operations and Administration Subactivity (See DM-4).

From Office	Subactivity	To Office	Subactivity	Amount
NESDIS	Product Development, Readiness & Application (ORF)	OAR	U.S. Weather Research Program (ORF)	$2,680,000/ 0 FTE/ 0 positions

NOAA requests a technical adjustment to move $2,680,000 and 0 FTE/ 0 positions from the NESDIS Product Development, Readiness & Application ORF Subactivity to the Office of Atmospheric Research (OAR) U.S. Weather Research Program ORF Subactivity. This adjustment will eliminate the NESDIS contribution to the Joint Center for Satellite Data Assimilation (JCSDA). NOAA is consolidating its model and code development as well as data assimilation techniques, system architecture integration, and computational efficiencies within OAR's Earth Prediction Innovation Center (see OAR-43 and OAR-59), which will include current NESDIS JCSDA funded efforts, such as the Joint Effort for Data assimilation Integration (JEDI) and the Community Radiative

Transfer Model (CRTM). Satellite data products will not be impacted by this request.

FY 2020 Operational Phase Transfers

The NOAA satellite budget profiles in the PAC account are formulated to reflect the full LCC of NESDIS satellite programs including design, development, and operations. An Operational Phase Transfer (OPT) is required to transfer the LCC funding currently budgeted within a PAC Subactivity to the appropriate Subactivities in the ORF account for operational functions. It results in a net change of zero to the NESDIS budget.

In FY 2020, NOAA requests two OPTs from the PAC account to the ORF account to support the operations functions for Suomi NPP, NOAA-20 (formerly JPSS-1), and Metop-C satellites, as detailed below.

Polar Weather Satellites (PWS):

From Office	Subactivity	To Office	Subactivity	Amount/ FTE
NESDIS	Polar Weather Satellites (PAC)	NESDIS	Office of Satellite and Product Operations (ORF)	$20,000,000/ 0 FTE / 0 positions

NOAA requests a technical adjustment to move $20,000,000 and 0 FTE/ 0 positions from the PWS Subactivity in PAC to the OSPO Subactivity in ORF. This is the first phase of OPTs for the PWS program, which transfers the operations funding currently budgeted in the JPSS program of record (POR) LCC from the PAC to the ORF account. The PWS profile will also be reduced by the OPT amount in each outyear through FY 2025, to fund operational requirements through the JPSS POR LCC. Please see NESDIS-18 for a detailed breakout of the LCC for PWS by Program.

Metop-C:

From Office	Subactivity	To Office	Subactivity	Amount/ FTE
NESDIS	Low Earth Orbit (LEO)	NESDIS	Office of Satellite and Product Operations (ORF)	$2,500,000/ 0 FTE /0 positions

NOAA requests a technical adjustment to transfer $2,500,000 and 0 FTE/ 0 positions from the LEO Subactivity in PAC to the OSPO Subactivity in ORF. The adjustment will transfer the Metop-C anomaly support currently budgeted in the LEO Subactivity from PAC to the ORF account. The LEO profile will also be reduced by the OPT amount in each outyear to fund operational requirements through the projected Metop-C mission life.

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Life Cycle Costs: The following tables provide the details of the total LCC of NOAA satellites that have a required base funding level of over $250 million.

GOES-R LCC ($ in thousands): The GOES-R Series LCC is being re-evaluated based on the emerging requirement to replace the IBM servers used in the GOES-R Series Ground System due to the IBM sale of its X86 business to Lenovo, a Chinese-owned company. The requirement results from the National Security Agreement between the Lenovo Group, IBM, the U.S. Government, and the Committee on Foreign Investment in the U.S. (CFIUS) monitoring agencies to ensure that U.S. cleared persons maintain the hardware and guarantee the hardware code is not managed by China.

GOES-R LCC**	FY 2019 & Prior***	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	CTC	Total
GOES-R LCC (PAC & ORF)	**8,709,588**	**337,956**	**326,400**	**326,400**	**283,900**	**283,900**	**559,915**	**10,828,059**
Procurement, Acquisition, and Construction (PAC)								
Total PAC	**8,607,888**	**304,056**	**292,500**	**292,500**	**250,000**	**250,000**	**153,115**	**10,150,059**
GOES-R Series	8,607,888	304,056	292,500	292,500	250,000	250,000	153,115	10,150,059
Operations, Research and Facilities (ORF)								
Total ORF	**101,700**	**33,900**	**33,900**	**33,900**	**33,900**	**33,900**	**406,800**	**678,000**
Office of Satellite and Product Operations (OSPO)	79,470	26,490	26,490	26,490	26,490	26,490	317,880	529,800
Product Development, Readiness & Application (PDR&A)	18,000	6,000	6,000	6,000	6,000	6,000	72,000	120,000
National Centers for Environmental Information (NCEI)	4,230	1,410	1,410	1,410	1,410	1,410	16,920	28,200

*The reevaluation is being led by GOES-R with an independent evaluation by the Department of Commerce Office of Acquisition Management.

**The table reflects the requested funding levels in the ORF and PAC accounts for the total GOES-R LCC as presented in the FY 2020 President's Budget submission.

*** The FY 2019 & Prior column has been adjusted to account for the FY 2018 spend plan, including the mandatory deobligation assessment, and FY 2019 Enacted amount.

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Polar Weather Satellites (PWS) (JPSS and PFO) LCC* ($ in thousands):

PWS**		FY 2019 & Prior***	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	CTC	Total
Total PWS (PAC & ORF)		**11,192,460**	**775,038**	**849,538**	**685,020**	**594,521**	**628,130**	**4,170,418**	**18,895,125**
JPSS LCC (PAC & ORF)		9,748,577	445,082	218,408	218,408	159,521	155,576	148,811	11,322,125
PFO LCC (PAC & ORF)		1,443,883	329,956	458,000	412,000	435,000	472,554	4,021,607	7,573,000
Procurement, Acquisition and Construction (PAC)									
Total PAC		**11,192,460**	**755,038**	**829,538**	**665,020**	**574,521**	**608,130**	**4,150,418**	**18,775,125**
Subactivity	**Program**								
Polar Weather Satellites	JPSS	9,748,577	425,082	371,538	253,020	139,521	135,576	128,811	11,202,125
	PFO	1,443,883	329,956	458,000	412,000	435,000	472,554	4,021,607	7,573,000
Operations, Research and Facilities (ORF)									
Total ORF		**0**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**120,000**
Subactivity	**Program**								
Office of Satellite and Product Operations	JPSS	0	20,000	20,000	20,000	20,000	20,000	20,000	120,000

* The PFO LCC will be rebaselined in FY 2019 at which time a new LCC will be established for this program.
** The table reflects the requested funding levels in the ORF and PAC accounts for the total Polar Weather Satellites as presented in the FY 2020 President's Budget submission.
*** The FY 2019 & Prior column has been adjusted to account for the FY 2018 spend plan, including the mandatory deobligation assessment, and FY 2019 Enacted amount.

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Narrative Information:

Following this section are base justification materials and program change narratives by Subactivity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 2). Please contact NOAA if details for any of these changes are required.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Office of Satellite and Product Operations (ORF) - Transfer of National Ice Center to NWS (ORF).

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	28,799	(447)	28,756
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	28,799	(447)	28,756
12	Civilian personnel benefits	7,042	(191)	7,818
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	490	0	506
22	Transportation of things	191	0	191
23	Rent, communications, and utilitites	18,609	0	18,822
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	44	0	44
25.1	Advisory and assistance services	10,191	0	10,191
25.2	Other services from non-Federal sources	66,743	(2,303)	64,440
25.3	Other goods and services from Federal sources	4,744	0	4,744
25.4	Operation and maintenance of facilities	543	0	543
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	2,268	0	2,268
31	Equipment	973	0	973
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	1,179	0	1,179
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	5,108	0	5,108
99	Total obligations	146,924	(2,941)	145,582

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Commercial Remote Sensing and Regulatory Affairs (ORF) - Transfer to DOC Operations and Administration

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	648	(648)	0
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	648	(648)	0
12	Civilian personnel benefits	203	(203)	0
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	77	(77)	0
22	Transportation of things	0	(0)	0
23	Rent, communications, and utilitites	32	(32)	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	0	0	0
25.2	Other services from non-Federal sources	92	(92)	0
25.3	Other goods and services from Federal sources	692	(692)	0
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	0	0	0
31	Equipment	0	0	0
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	0	0	0
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	57	(57)	0
99	Total obligations	1,800	(1,800)	0

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Office of Space Commerce (ORF) - Transfer to DOC Operations and Administration

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	444	(444)	(0)
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	444	(444)	(0)
12	Civilian personnel benefits	133	(133)	0
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	31	(31)	(0)
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites	79	(79)	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	610	(610)	0
25.2	Other services from non-Federal sources	459	(459)	(0)
25.3	Other goods and services from Federal sources	0	0	0
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	2	(2)	0
31	Equipment	0	0	0
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	0	0	0
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	42	(42)	0
99	Total obligations	1,800	(1,800)	(0)

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Product Development, Readiness & Application (ORF) - Transfer of Joint Center for Satellite Data Assimilation to OAR (ORF)

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	6,824	0	6,853
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	6,824	0	6,853
12	Civilian personnel benefits	2,127	0	2,196
13	Benefits for former personnel		0	0
21	Travel and transportation of persons	313	0	314
22	Transportation of things	33	0	33
23	Rent, communications, and utilitites	2,311	0	2,326
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	63	0	63
25.1	Advisory and assistance services	1	0	1
25.2	Other services from non-Federal sources	10,705	(2,680)	8,025
25.3	Other goods and services from Federal sources	101	0	101
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	2,369	0	2,369
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	328	0	328
31	Equipment	2,177	0	2,177
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	3,124	0	3,124
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	525	0	525
99	Total obligations	31,000	(2,680)	28,434

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Office of Satellite Product and Operations (ORF) - JPSS Operational Phase Transfer from Polar Weather Satellites (PAC)

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	28,799	0	29,203
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	28,799	0	29,203
12	Civilian personnel benefits	7,042	0	8,009
13	Benefits for former personnel		0	0
21	Travel and transportation of persons	490	0	506
22	Transportation of things	191	0	191
23	Rent, communications, and utilitites	18,609	0	18,822
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	44	0	44
25.1	Advisory and assistance services	10,191	0	10,191
25.2	Other services from non-Federal sources	66,743	0	66,743
25.3	Other goods and services from Federal sources	4,744	20,000	24,744
25.4	Operation and maintenance of facilities	543	0	543
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	2,268	0	2,268
31	Equipment	973	0	973
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	1,179	0	1,179
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	5,108	0	5,109
99	Total obligations	146,924	20,000	168,524

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

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National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Systems Acquisition
Subactivity: Polar Weather Satellites (PAC) - JPSS Operational Phase Transfer to Office of Satellite Product and Operations (ORF)

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	4,292	0	4,292
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	4,292	0	4,292
12	Civilian personnel benefits	1,166	0	1,166
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	153	0	153
22	Transportation of things	5	0	5
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	1,621	0	1,621
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	31	0	31
25.1	Advisory and assistance services	14,190	0	14,190
25.2	Other services from non-Federal sources	25,280	0	25,280
25.3	Other goods and services from Federal sources	794,878	(20,000)	774,878
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	12,137	0	12,137
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	169	0	169
31	Equipment	735	0	735
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	17,804	0	17,804
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	5,530	0	5,530
99	Total obligations	877,991	(20,000)	857,991

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Environmental Satellite Observing System
Subactivity: Office of Satellite Product and Operations (ORF) - Metop-C Operational Phase Transfer from Low Earth Orbit (PAC)

	Object Class	2019 Enacted	2020 Transfer	2020 Base*
11.1	Full-time permanent compensation	28,799	0	29,203
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	28,799	0	29,203
12	Civilian personnel benefits	7,042	0	8,009
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	490	0	506
22	Transportation of things	191	0	191
23	Rent, communications, and utilitites	18,609	0	18,822
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	44	0	44
25.1	Advisory and assistance services	10,191	0	10,191
25.2	Other services from non-Federal sources	66,743	0	66,743
25.3	Other goods and services from Federal sources	4,744	2,500	7,244
25.4	Operation and maintenance of facilities	543	0	543
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	2,268	0	2,268
31	Equipment	973	0	973
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	1,179	0	1,179
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	5,108	0	5,109
99	Total obligations	146,924	2,500	151,024

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisitions, and Construction
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Systems Acquisition
Subactivity: Low Earth Orbit (PAC) - Metop-C Operational Phase Transfer to Office of Satellite Product and Operations (ORF)

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	3,502	0	3,502
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	3,502	0	3,502
12	Civilian personnel benefits	1,038	0	1,038
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	127	0	127
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites	406	0	406
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	8,241	0	8,241
25.2	Other services from non-Federal sources	6,387	0	6,387
25.3	Other goods and services from Federal sources	11,019	(2,500)	8,519
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	1,375	0	1,375
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	224	0	224
31	Equipment	667	0	667
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	2,930	0	2,930
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
77	Overhead	1,208	0	1,208
99	Total obligations	37,124	(2,500)	34,624

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match the amounts in exhibit 10. Please refer to Exhibit 10 (NESDIS-28) for the accurate 2020 Base of each Subactivity.

Exhibit 10

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

Comparison by Subactivity		2018 Actuals Personnel	2018 Actuals Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount	2020 Estimate Personnel	2020 Estimate Amount	Increase/Decrease from 2020 Base Personnel	Increase/Decrease from 2020 Base Amount
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE (NESDIS)											
Office of Satellite and Product Operations	Pos/BA	295	145,730	295	146,924	303	190,008	303	186,790	0	(3,218)
	FTE/OBL	259	159,155	259	146,924	267	190,008	267	186,790	0	(3,218)
Product Development, Readiness & Application	Pos/BA	84	31,000	84	31,000	84	28,434	84	27,732	0	(702)
	FTE/OBL	72	34,003	72	31,000	72	28,434	72	27,732	0	(702)
Commercial Remote Sensing Regulatory Affairs	Pos/BA	5	1,800	6	1,800	0	0	0	0	0	0
	FTE/OBL	5	2,050	6	1,800	0	0	0	0	0	0
Office of Space Commerce	Pos/BA	5	1,200	5	1,800	0	0	0	0	0	0
	FTE/OBL	3	1,285	3	1,800	0	0	0	0	0	0
Group on Earth Observations	Pos/BA	0	500	0	500	0	500	0	500	0	0
	FTE/OBL	0	517	0	500	0	500	0	500	0	0
National Centers for Environmental Information	Pos/BA	200	60,642	200	60,642	200	61,213	200	56,570	0	(4,643)
	FTE/OBL	187	63,020	187	60,642	187	61,213	187	56,570	0	(4,643)
TOTAL NESDIS - ORF	**Pos/BA**	**589**	**240,872**	**590**	**242,666**	**587**	**280,155**	**587**	**271,592**	**0**	**(8,563)**
	FTE/OBL	**526**	**260,030**	**527**	**242,666**	**526**	**280,155**	**526**	**271,592**	**0**	**(8,563)**

Exhibit 10

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Actuals		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
Comparison by Subactivity		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Geostationary Systems-R	Pos/BA	59	518,532	59	408,380	59	408,380	59	304,056	0	(104,324)
	FTE/OBL	59	519,598	59	408,380	59	408,380	59	304,056	0	(104,324)
Jason-3	Pos/BA	1	0	0	0	0	0	0	0	0	0
	FTE/OBL	1	492	0	0	0	0	0	0	0	0
Joint Polar Satellite System	Pos/BA	65	775,777	65	548,035	0	0	0	0	0	0
	FTE/OBL	60	781,199	60	548,035	0	0	0	0	0	0
Polar Follow On	Pos/BA	29	419,000	29	329,956	0	0	0	0	0	0
	FTE/OBL	24	420,368	24	329,956	0	0	0	0	0	0
Polar Weather Satellites	Pos/BA	0	0	0	0	94	857,991	94	755,038	0	(102,953)
	FTE/OBL	0	0	0	0	84	857,991	84	755,038	0	(102,953)
Cooperative Data and Rescue Services	Pos/BA	0	21,650	0	26,539	0	26,539	0	14,850	0	(11,689)
	FTE/OBL	0	21,947	0	26,539	0	26,539	0	14,850	0	(11,689)
DSCOVR	Pos/BA	2	0	0	0	0	0	0	0	0	0
	FTE/OBL	2	30	0	0	0	0	0	0	0	0
Space Weather Follow On	Pos/BA	1	8,545	2	27,000	2	27,000	5	25,600	3	(1,400)
	FTE/OBL	1	8,885	2	27,000	2	27,000	4	25,600	2	(1,400)

Exhibit 10

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

Comparison by Subactivity		2018 Actuals Personnel	2018 Actuals Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount	2020 Estimate Personnel	2020 Estimate Amount	Increase/Decrease from 2020 Base Personnel	Increase/Decrease from 2020 Base Amount
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE (NESDIS)											
COSMIC 2/GNSSRO RO	Pos/BA	1	6,100	2	5,892	0	0	0	0	0	0
	FTE/OBL	1	11,951	1	5,892	0	0	0	0	0	0
Satellite Ground Services	Pos/BA	86	57,325	86	58,000	0	0	0	0	0	0
	FTE/OBL	74	59,518	78	58,000	0	0	0	0	0	0
System Architecture & Advanced Planning	Pos/BA	12	4,929	12	4,929	0	0	0	0	0	0
	FTE/OBL	10	5,370	10	4,929	0	0	0	0	0	0
Projects, Planning and Analysis	Pos/BA	37	39,391	35	40,000	0	0	0	0	0	0
	FTE/OBL	30	40,220	29	40,000	0	0	0	0	0	0
Commercial Weather Data Pilot	Pos/BA	0	6,000	0	6,000	0	0	0	0	0	0
	FTE/OBL	0	10,190	0	6,000	0	0	0	0	0	0
Low Earth Orbit	Pos/BA	0	0	0	0	40	34,623	40	33,202	0	(1,421)
	FTE/OBL	0	0	0	0	35	34,623	35	33,202	0	(1,421)
Geostationary Orbit	Pos/BA	0	0	0	0	40	25,219	40	22,403	0	(2,816)
	FTE/OBL	0	0	0	0	36	25,219	36	22,403	0	(2,816)
Systems/Services Architecture & Engineering	Pos/BA	0	0	0	0	42	30,554	42	44,822	0	14,268
	FTE/OBL	0	0	0	0	34	30,554	34	44,822	0	14,268
Satellite CDA Facility	Pos/BA	0	2,450	0	2,450	0	2,450	0	2,450	0	0
	FTE/OBL	0	2,980	0	2,450	0	2,450	0	2,450	0	0
Transfer to OIG	Pos/BA	0	(1,302)	0	(1,302)	0	(1,302)	0	(1,302)	0	0
	FTE/OBL	0	(1,302)	0	(1,302)	0	(1,302)	0	(1,302)	0	0
TOTAL NESDIS - PAC	**Pos/BA**	**293**	**1,858,397**	**290**	**1,455,879**	**277**	**1,411,454**	**280**	**1,201,119**	**3**	**(220,366)**
	FTE/OBL	**262**	**1,881,446**	**263**	**1,455,879**	**250**	**1,411,454**	**252**	**1,201,119**	**2**	**(220,366)**
TOTAL NESDIS	**Pos/BA**	**293**	**2,099,269**	**290**	**1,698,545**	**864**	**1,691,609**	**867**	**1,472,711**	**3**	**(218,898)**
	FTE/OBL	**851**	**2,122,318**	**853**	**1,698,545**	**776**	**1,691,609**	**778**	**1,472,711**	**2**	**(218,898)**

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Environmental Satellite Observing System

Goal Statement

NOAA manages environmental satellites and related ground systems to provide timely and accurate environmental data for forecasts and warnings to ensure the safety of U.S. citizens, public property, and infrastructure.

Base Program

NOAA's Environmental Satellite Observing Systems activities are to:

- Maintain and operate a system of polar-orbiting satellites which provide global imaging and sounding for medium and long-range weather forecasting and climate analysis crucial to numerical weather prediction models.
- Maintain and operate a system of geostationary satellites to provide near-continuous environmental observations of the Earth's Western Hemisphere critical for weather forecasting and severe storm tracking.
- Supply data and operational products to the public and decision-makers. Operate and maintain the mission control center for the search and rescue satellite system.
- Provide operational weather and environmental satellite observations for Alaska and the polar regions, which include monitoring global sea ice conditions to support safe and effective marine transportation.

Statement of Operating Objectives

Office of Satellite and Product Operations (OSPO)
Schedule and Milestones
FY 2020 - FY 2024

- Maintain Satellite Operation Facilities at Suitland, MD; Wallops, VA; Fairbanks, AK; and Fairmont, WV
- 24/7 operations and anomaly support for geostationary satellites, polar-orbiting satellites, DSCOVR and Jason-3 satellites, and backup operations for Jason Continuity of Service (Jason-CS) mission
- Process and distribute environmental data from Geostationary Operational Environmental Satellites, Polar-orbiting Operational Environmental Satellites, Metop-A, B, C, and EUMETSAT Polar System Second Generation (EPS-SG)
- Conduct annual penetration testing on all IT systems
- Continuously monitor all IT Systems

- Enhance common processes in response to IT Security events or incidents including moving NESDIS non-satellite control high impact networks into NOAA OCIO's secure active directory
- Provide collision avoidance support for the Metop constellation (A, B and C), JPSS, and Jason-3
- Provide engineering services to support on-orbit anomalies for GOES 13,14, and 15 satellites; POES (NOAA 19); and U.S. instruments on Metop satellites (A, B, and C)

FY 2020
- Command and control 9 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA-20, legacy GOES and POES, and Metop data
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

FY 2021
- Command and control 10 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R series, Suomi NPP, NOAA-20, legacy GOES and POES, and Metop data
- Accept handover of GOES-T after completion of on-orbit testing
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

FY 2022
- Command and control 8 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA-20, legacy GOES, Metop, and EPS-SG data
- Maintain infrastructure for 13 National/Mission High and Moderate Critical IT Systems

FY 2023
- Command and control 9 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA-20, NOAA-21, legacy GOES, and EPS-SG data
- Maintain infrastructure for 12 National/Mission High and Moderate Critical IT Systems

FY 2024
- Command and control 9 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA-20, NOAA-21, legacy GOES, and EPS-SG data
- Maintain infrastructure for 12 National/Mission High and Moderate Critical IT Systems

Deliverables

- Maintain infrastructure for National/Mission High and Moderate Critical IT Systems
- Delivery of Suomi NPP, JPSS, GOES-R Series, legacy GOES, legacy POES, DSCOVR, Jason-3, Metop, and EPS-SG data and products to users
- Engineering support for the on-orbit GOES-13, 14, 15 satellites, POES satellites and support to EUMETSAT for U.S. instruments for the on-orbit Metop satellites (A, B, and C)
- Support search and rescue antenna performance checks on POES (NOAA 19) and Metop A and B
- Satellite Operation Facilities at Suitland, MD; Wallops, VA; Fairbanks, AK; and Fairmont, WV, maintained

Product Development, Readiness & Application (PDR&A)
Schedule and Milestones

FY 2020

- Complete initial GOES-17 ABI anomaly mitigations, transition to routine calibration, validation, algorithm maintenance, and anomaly resolution
- Complete pilot project for transitioning GOES-R Series baseline algorithms to enterprise algorithms
- Perform checkout of Kompsat-6 and Sentinel-6 radio occultation (RO) data
- Complete Jason-CS/Sentinel-6 Mission Performance Budget, Project Specification, Cal/Val Concept Plan, and Cal/Val Implementation Plan

FY 2021

- Promote KOMPSAT-6 and Sentinel-6 RO into operations
- Complete closeout of Jason-2, pending partner plans to continue operations into 2021
- Jason-CS-1/Sentinel-6A post-launch evaluation, initial validation of products, implement work packages in 1-year commissioning phase with Jason-3
- Update CoastWatch and OceanWatch for new Sentinel observations

FY 2022– FY 2024

- Complete implementation of PolarWatch and associated sea ice product suite
- Complete initial validation of JPSS-2 products, and transition to routine calibration, validation, algorithm maintenance, and anomaly resolution
- Validate new synthetic aperture radar (SAR) observation data flows and transition highest priority flows to SAR operational processing system (SAROPS)

- Transition the ocean remote sensing product suite for illegal, unreported and unregulated (IUU) fishing monitoring system to operations
- Jason-CS-2/Sentinel-6B pre-launch development, post-launch evaluation, initial validation of products, implement work packages in 6-month commissioning phase with Jason-CS-1/Sentinel-6A

Deliverables

- Maintain algorithms and data product validation to translate raw data into useful products meeting quality requirements for GOES-R Series, Jason, POES, Metop, COSMIC, CWDP, EOS, Himawari, Meteosat, Sentinel, Scatsat, and lead for JPSS series and GCOM-W
- Complete initial instrument calibration and product validation for recently launched satellites
- Perform suitability assessment, and validation of non-NOAA data sources for NOAA use, and incorporate non-NOAA data flows into NOAA enterprise algorithms
- Provide science coordination with National and International Partners, including NASA, Navy, USAF, EUMETSAT, ESA, JMA, Kari, ISRO etc.

US Group on Earth Observations (USGEO)
Schedule and Milestones
FY 2020 – FY 2024

- Support the development and growth of U.S. programmatic contributions to the GEO Work Program in support to U.S. national and international policy and NOAA mission objectives.
- Coordinate and manage the participation of USGEO leadership in regular meetings of the GEO Executive Committee, annual GEO Plenary sessions and Ministerial Summit.
- Coordinate U.S. Government participation in the implementation of GEO's strategic plan through a grant to the GEO Trust Fund.

Deliverables

- Reports for the Executive Office of the President as requested
- Participation in major GEO meetings and activities to promote international engagement and coordination with stakeholders and outreach

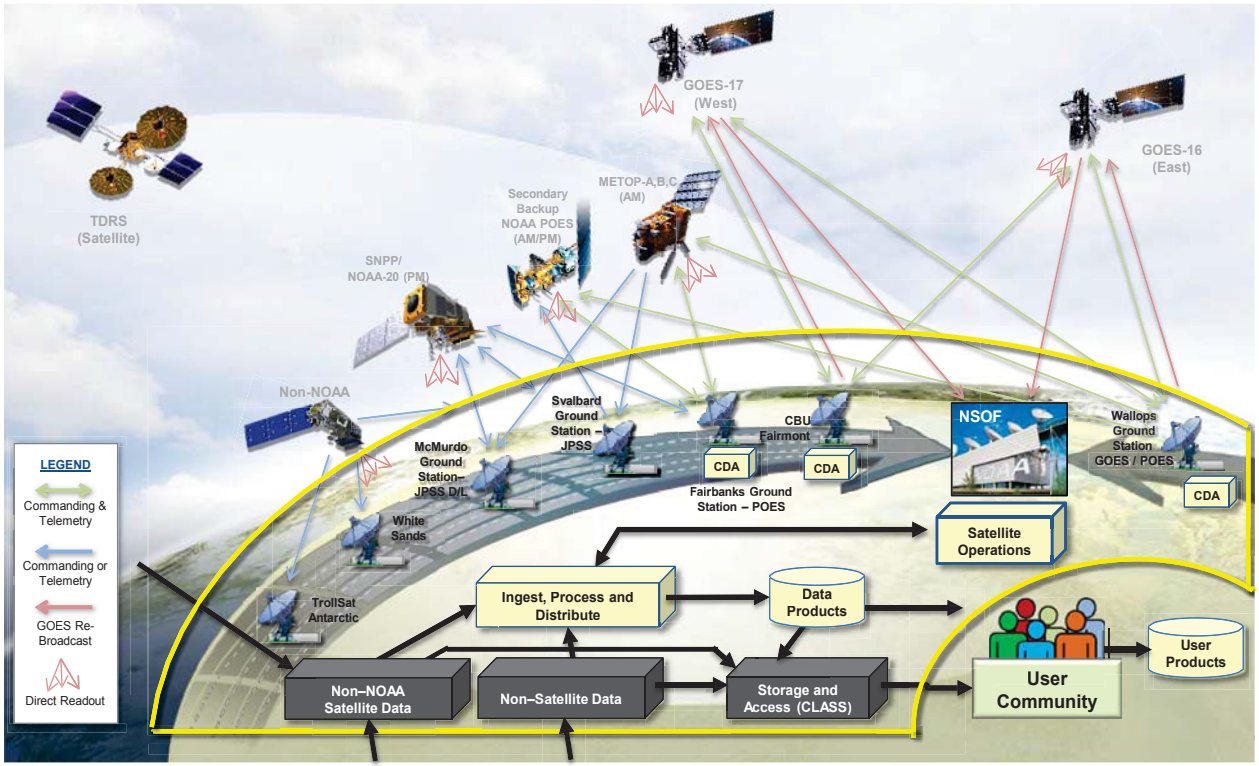
Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

		2018 Actuals		2019 Enacted		2020 Base	
Line Item		Personnel	Amount	Personnel	Amount	Personnel	Amount
Office of Satellite and	Pos/BA	295	145,730	295	146,924	303	190,008
Product Operations	FTE/OBL	259	159,155	259	146,924	267	190,008
Product Development,	Pos/BA	84	31,000	84	31,000	84	28,434
Readiness & Application	FTE/OBL	72	34,003	72	31,000	72	28,434
Commerical Remote	Pos/BA	5	1,800	6	1,800	0	0
Sensing Regulatory & Affairs	FTE/OBL	5	2,050	6	1,800	0	0
Office of Space Commerce	Pos/BA	5	1,200	5	1,800	0	0
	FTE/OBL	3	1,285	3	1,800	0	0
Group on Earth	Pos/BA	0	500	0	500	0	500
Observations	FTE/OBL	0	517	0	500	0	500
Total Environmental Satellite	Pos/BA	389	180,230	390	182,024	387	218,942
Observing Systems	FTE/OBL	339	197,010	340	182,024	339	218,942

Office of Satellite and Product Operations (OSPO) (http://www.ospo.noaa.gov/): provides satellite health and safety monitoring, satellite operations, and data acquisition to meet user needs providing support during launch, activation, and evaluation of new satellites; assessment of satellite and ground station anomalies, and support to appropriate recovery actions for those anomalies. OSPO manages and directs NOAA's command and control of the suite of on-orbit satellites that supply the environmental data critical for developing weather and climate products used daily by industry and citizens across the Nation. To this end, OSPO works with NOAA's National Weather Service (NWS) to supply the satellite data that makes up approximately 93 percent of the information used in their numerical weather prediction models.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



Overall, OSPO:

- Maintains and operates a system of polar-orbiting satellites which provide global imaging and sounding for medium and long-range weather forecasting and climate analysis crucial to numerical weather prediction models;
- Maintains and operates a system of geostationary satellites to provide near-continuous environmental observations of the Earth's Western Hemisphere critical for weather forecasting and severe storm tracking;
- Supplies data and operational products to the public and decision-makers;

- Operates and maintains the mission control center for the search and rescue satellite system; and
- Provides operational weather and environmental satellite observations for Alaska and the polar regions.

In FY 2018, OSPO operated and supported a total of 17 on-orbit satellites including: legacy Geostationary Operational Environmental Satellites (GOES) and Polar-orbiting Operational Environmental Satellites (POES) satellites; Suomi National Polar-orbiting Partnership (Suomi NPP) and Joint Polar Satellite System (JPSS) satellites; GOES-R Series satellites; Department of Defense (DOD) Defense Meteorological Satellite Program (DMSP); Deep Space Climate Observatory (DSCOVR); Jason-3; as well as other non-NOAA operational environmental satellites. OSPO's IT Security implements vulnerability management against the latest threats on satellite ground systems to lower the operational risk, which will ensure continuity of critical satellite data flow to key customers such as NOAA's NWS.

OSPO supports:

- The NOAA Satellite Operations Facility (NSOF) for NOAA's 24 hours a day, 365 days a year, environmental satellite operations. Through NSOF, NOAA operates the ground systems that command, control, and acquire data from on-orbit satellites. Each day, NSOF processes more than 25 terabytes of environmental satellite raw data from on-orbit DOD and NOAA satellites including GOES-16 and 17, Suomi NPP, JPSS-20, Jason-3, and DSCOVR;
- The Satellite Operations Control Center, which serves as the vital link between satellites and users by providing uninterrupted availability of critical observations and real-time delivery of satellite data to product processing centers. These include the Command and Data Acquisition Stations (at Wallops, Virginia and Fairbanks, Alaska and the consolidated backup (CBU) at Fairmont, West Virginia;
- The Comprehensive Large Array-data Stewardship System (CLASS) providing the long-term preservation of and access to the ever-increasing input of data from our observing systems (e.g., satellites, radar, and other ground observations);
- NOAA's Search and Rescue Satellite Aided Tracking (SARSAT) system, and coordinates participation in the international COSPAS-SARSAT Program; and
- The NOAA instruments on the Metop-C satellite by providing data processing and distribution of environmental data, as well as anomaly support of the NOAA instruments on the satellite.

Product Development, Readiness & Application (PDR&A) (http://www.star.nesdis.noaa.gov/star/index.php): provides state-of-the-art satellite-based information, capitalizing on NOAA's investment in the acquisition and management of the Nation's operational environmental satellites. PDR&A enables transformation of raw observations and data feeds from NOAA-managed, partner, and

commercial satellite missions into information products to support NOAA's mission. PDR&A:

- Leads comprehensive and rigorous calibration/validation of all data in NOAA's satellite operations to assure the accuracy of satellite products to meet user performance requirements throughout mission lifecycles;
- Supports resolution of instrument anomalies either pre-launch or on-orbit through compensating changes to data product algorithms and tables;
- Combines NOAA's environmental satellite measurements with other available information to create fit for purpose blended data, products, and services;
- Provides data products to meet the needs of NOAA's National Weather Service, NOAA's other line offices, and partner U.S. Government and international agencies for critical real time satellite data products. These products feed forecast models and operational forecasters;
- Enables NOAA to ensure NOAA services protect lives, property, and livelihoods by addressing challenges such as increasing lead times for severe weather warning, severe ocean condition warning, and providing accurate warnings of related environmental phenomena such as floods, droughts, volcanic ash, toxic algal blooms, sea ice, water quality, etc.

As NOAA prepares for additional launches of JPSS and GOES-R Series satellites, partners launch new missions with increased capabilities, and commercial data becomes available, PDR&A is essential for these mission capabilities to be translated into high-quality satellite products to meet NOAA's mission.

US Group on Earth Observations (USGEO): provides program resources to support the domestic cooperative activities of the U.S. Group on Earth Observations (USGEO) - a Subcommittee of the National Science and Technology Council's Committee on Environment, Natural Resources, and Sustainability. USGEO:

- Is comprised of thirteen Federal departments and agencies;
- Serves to coordinate, plan, and assess Federal Earth observation activities in cooperation with domestic stakeholders;
- Fosters improved Earth system data management and interoperability throughout the Federal Government; and
- Engages international stakeholders by formulating U.S. positions for and coordinating U.S. participation in the intergovernmental Group on Earth Observations.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $3,218,000 and 0 FTE/ 0 positions in FY 2020 program changes for the OSPO Subactivity, and a decrease of $702,000 and 0 FTE/0 positions in FY 2020 program changes for the PDR&A Subactivity. Following this section are program change narratives for Subactivities that represent program changes greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: National Centers for Environmental Information

Goal Statement

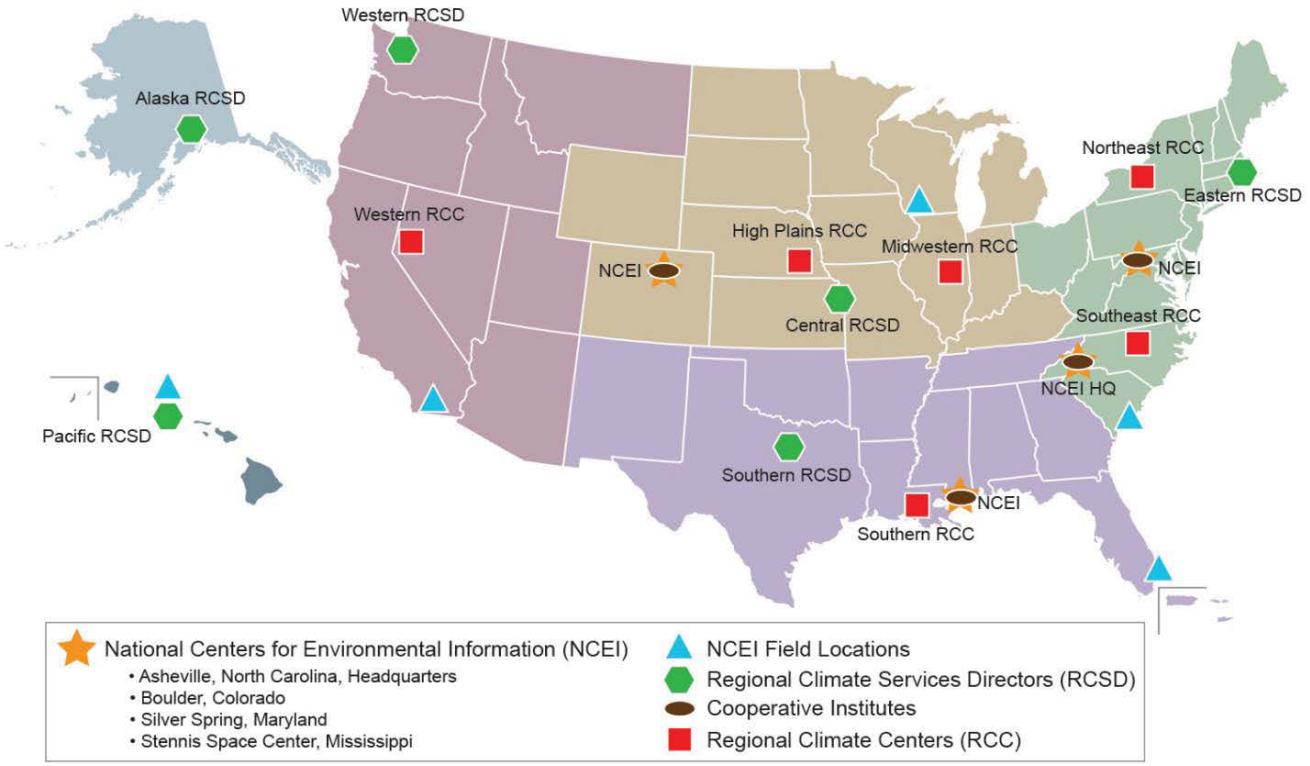
NOAA's National Centers for Environmental Information (NCEI) are responsible for preserving and providing access to one of the most significant environmental archives on earth, with comprehensive historical oceanic, atmospheric, and geophysical data and information.

Base Program

The amount of and demand for high-value environmental data and information has dramatically increased in recent years. NCEI is continually working to foster innovative and value-added strategies, including the development of newly integrated products and services that span the science disciplines and enable better data discovery.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

National Centers for Environmental Information (NCEI)



NCEI has a nationwide presence. NCEI's headquarters are in Asheville, NC, with major presences in Boulder, CO; Stennis Space Center, MS; and Silver Spring, MD. NCEI works with many partners, including all NOAA Line Offices as well as Cooperative Institutes, state and Federal agencies, national and international contributors, and users of NCEI data.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Statement of Operating Objectives

National Centers for Environmental Information (NCEI)
Schedule and Milestones
FY 2020 – FY 2024

- Transition additional Reference Environmental Data Records from research to operations, including those developed for coastal environments
- Archive a minimum of 98 percent of all U.S. Climate Reference Network (USCRN) data received, and provide subject matter expertise in installation and monitoring of USCRN stations in Alaska
- Archive a minimum of 98 percent of space weather products from data extracted at full original resolution, with geolocation and calibration information (Level 1b) received, including available operational space weather data products from GOES-16 and GOES-17
- Review and adjudicate requirements from U.S. sectors, and use them to validate existing product lines and develop and refine future development
- Provide access to regional and Large Marine Ecosystem data, climatologies, and products for use in ecosystem, baselines, monitoring, and assessments
- Address increasing number of user need summaries collected through NCEI's user engagement records system

Deliverables
FY 2020 – FY 2024

- Continue to develop capabilities, provide or coordinate archive, and enable access to GOES-R Series, Suomi NPP, JPSS, Jason, and DSCOVR series data and their derived products
- Continue to archive and provide access to regional and Large Marine Ecosystem data
- Expand products, including baseline summaries, across all NOAA's designated Regional Ecosystems, excluding the Great Lakes

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Line Item		2018 Actuals Personnel	2018 Actuals Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
National Centers for Environmental Information	Pos/BA	200	60,642	200	60,642	200	61,213
	FTE/OBL	187	63,020	187	60,642	187	61,213
Total National Centers for Environmental Information	Pos/BA	200	60,642	200	60,642	200	61,213
	FTE/OBL	187	63,020	187	60,642	187	61,213

National Centers for Environmental Information (NCEI) (https://www.ncei.noaa.gov/): provides products and services to private industry, governments, academia, and the general public by preserving, stewarding, and maximizing the utility of the Federal government's billion-dollar investment in high-quality environmental data. NCEI:

- Provides billions of dollars of benefit to the US economy, across sectors including Finance, Agriculture, Fisheries, Transportation, Energy, Insurance, and Manufacturing, enabling future investments to include the best possible environmental data to minimize possible future consequences;
- Transforms complex, long-term data from a variety of legacy and modern observing systems into consistent use-inspired, operational products to meet the needs of government, academia, and U.S. industry;
- Provides data preservation and access services that enable full use of the Nation's multi-billion dollar investment in satellite, ship, aircraft, and *in situ* observations;
- Advances and enables environmental science and decision making for resilient ocean and coastal communities, the Arctic, and space weather through derived products, authoritative assessments, and information services in support of customer requirements;
- Provides authoritative U.S. and global retrospective weather and climate data for decision making through use-inspired applied science, products, services, and assessments and monitoring;
- Maintains the Nation's archive of environmental information, as well as international data holdings through the World Data System, leveraging data portals and cloud services to maximize the availability and accessibility of official, archived records;

- Conducts integrated scientific analyses of coastal and marine environmental data sets to better understand historical trends, anomalies, and the frequency of event occurrences; and
- Provides regional and sectoral climate services in coordination with other NOAA and federal entities to ensure that broad national comprehensive data and information, products, and services are available to public and private sector users at the local, state, regional, and Federal levels.

PROGRAM CHANGES FOR FY 2020

NOAA requests a decrease of $4,643,000 and 0 FTE/ 0 positions in FY 2020 program changes for the NCEI Subactivity. Following this section are program change narratives for Subactivities that represent program changes greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Direct Obligations amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
National Centers for Environmental Information	Pos./BA	200	61,213	200	57,563	0	(3,650)
	FTE/OBL	187	61,213	187	57,563	0	(3,650)

Regional Climate Centers Termination (-$3,650, 0 FTE/ 0 Positions) - NOAA requests to terminate the Regional Climate Centers (RCCs). The RCC program is located at six universities and research institutions that are responsible for managing the RCC resources from NOAA and non-NOAA sources alike. Each RCC provides climate services tailored to the specific needs of the region within which it is located. They respond to emerging issues, such as droughts and floods.

NOAA funding largely supports the staff in the RCCs responsible for product production and delivery, and enables RCCs to respond to customer phone requests, collect current weather and climate information, and provide an active website that includes value-added climate information and products. Terminating the RCCs will result in a reduction in staff; remaining staff will likely only be those supported on non-NESDIS research grants and projects. However, this termination will enable NOAA to better support other existing NOAA priorities. Other funding sources for RCCs include other Federal agencies, and partners at the regional, state, and local level.

Because RCCs are cooperative with other state and federal agencies, NOAA is proposing to leverage other existing programs and partnerships to continue to produce and deliver climate data, information, and knowledge for decision makers and other users at the local, state, regional, and national levels. For example, State-funded Universities and State Climatologists may step in to support each University or State Climatologist focusing on their own state, rather than the region. The output would vary from state to state and region to region.

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Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Direct Obligations amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Percent of reported NOAA Cooperative Observer data collected and disseminated with decrease	0%	0%	0%	0%	0%
Percent of reported NOAA Cooperative Observer data collected and disseminated without decrease	98%	98%	98%	98%	98%

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: National Centers for Environmental Information
Subactivity: National Centers for Environmental Information

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	18,593	18,387	18,387	18,387	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	18,593	18,387	18,387	18,387	0
12	Civilian personnel benefits	6,015	5,965	5,965	5,965	0
13	Benefits for former personnel	3	3	3	3	0
21	Travel and transportation of persons	427	420	420	420	0
22	Transportation of things	250	250	250	250	0
23	Rent, communications, and utilitites	5,162	4,411	4,411	4,411	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	54	54	54	54	0
25.1	Advisory and assistance services	6,411	6,194	6,194	6,194	0
25.2	Other services from non-Federal sources	13,863	15,146	15,717	12,067	(3,650)
25.3	Other goods and services from Federal sources	988	973	973	973	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	2	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	245	244	244	244	0
31	Equipment	581	580	580	580	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	5,563	4,538	4,538	4,538	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	3,081	3,476	3,476	3,476	0
99	Total obligations	61,239	60,642	61,213	57,563	(3,650)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Activity: Systems Acquisition

Goal Statement

NOAA's satellite portfolio provides the backbone for the operational data products that support NOAA's work related to weather, climate, oceans, coasts, and ecosystems. NOAA satellite data drives critical decision-making and impacts national security and various sectors of the economy including agriculture, transportation, energy, construction, infrastructure, emergency management, and hazard mitigation. NOAA maintains two primary constellations of environmental satellites that produce crucial set of observations: polar-orbiting and geostationary satellites.

Base Program

The FY 2020 request enables NOAA satellite programs to continue to meet milestones, as well as to plan for future programs and comprehensive engineering solutions.

Statement of Operating Objectives

Geostationary Systems-R (GOES- R): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

Polar Weather Satellites (PWS): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

Cooperative Data and Rescue Services (CDARS): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

Space Weather Follow On (SWFO): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Low Earth Orbit (LEO):
Schedule and Milestones
FY 2020-2024

- Reception and processing of equatorial LEO satellite RO data from COSMIC-2 mission
- Reception and processing of mid and high latitude LEO satellite RO data from partner missions
- Continue to sustain enterprise distribution and archive services from the ESPDS/NDE and CLASS Network Systems
- Continue to implement the final Operating Capability of Mission Science Network (MSN)
- Validate the successful operation of Mission Support Services (MSS), a risk mitigation backup system, deployment to the consolidated backup (CBU) located in West Virginia
- Plan MSS deployment at Wallops and Fairbanks Command Data Acquisition Stations

Deliverables

- Processed RO data; improved quality control algorithms for Global Navigation Satellite System (GNSS) RO data in NWS operational data assimilation systems
- GNSS RO data for assimilation into the NWS predictive weather models
- Continue to ensure enterprise distribution and archive services from the ESPDS/NDE and CLASS Network Systems

Outyear Funding Estimates*

LEO	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	0	2,000	2,000	2,000	2,000	N/A	N/A
Total LEO Request**	N/A	33,202	35,202	35,202	35,202	35,202	TBD	TBD

* Outyears are estimates only. Future requests will be determined through the annual budget process.
** The increase in FY 2021 represents a $2 million planned increase for the COSMIC Program as part of the LEO outyear profile.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE

Geostationary Earth Orbit (GEO): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

Systems/Services Architecture & Engineering (SAE): See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE

Explanation and Justification

Line Item		2018 Actuals Personnel	2018 Actuals Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Program Personnel	2020 Base Program Amount
Geostationary Systems - R	Pos/BA	59	518,532	59	408,380	59	408,380
	FTE/OBL	59	518,532	59	408,380	59	408,380
Joint Polar Satellite System	Pos/BA	65	775,777	65	548,035	0	0
	FTE/OBL	60	775,777	60	548,035	0	0
Polar Follow On	Pos/BA	29	419,000	29	329,956	0	0
	FTE/OBL	24	419,000	24	329,956	0	0
Polar Weather Satellites	Pos/BA	0	0	0	0	94	857,991
	FTE/OBL	0	0	0	0	84	857,991
Cooperative Data and Rescue Services	Pos/BA	0	21,650	0	26,539	0	26,539
	FTE/OBL	0	21,947	0	26,539	0	26,539
Space Weather Follow On	Pos/BA	1	8,545	2	27,000	2	27,000
	FTE/OBL	1	8,885	2	27,000	2	27,000
COSMIC 2/GNSS RO	Pos/BA	1	6,100	2	5,892	0	0
	FTE/OBL	1	11,951	1	5,892	0	0
Satellite Ground Services	Pos/BA	86	57,325	86	58,000	0	0
	FTE/OBL	74	59,518	78	58,000	0	0
System Architecture and Advanced Planning	Pos/BA	12	4,929	12	4,929	0	0
	FTE/OBL	10	5,370	10	4,929	0	0
Projects, Planning and Analysis	Pos/BA	37	39,391	35	40,000	0	0
	FTE/OBL	30	40,220	29	40,000	0	0
Commercial Weather Data Pilot	Pos/BA	0	6,000	0	6,000	0	0
	FTE/OBL	0	10,190	0	6,000	0	0
Low Earth Orbit (LEO)	Pos/BA	0	0	0	0	40	34,623
	FTE/OBL	0	0	0	0	35	34,623
Geostationary Earth Orbit (GEO)	Pos/BA	0	0	0	0	40	25,219
	FTE/OBL	0	0	0	0	36	25,219
Systems/Services Architecture & Engineering (SAE)	Pos/BA	0	0	0	0	42	30,554
	FTE/OBL	0	0	0	0	34	30,554
Total NESDIS Systems Acquisition	Pos/BA	290	1,857,249	290	1,454,731	277	1,410,306
	FTE/OBL	259	1,871,390	263	1,454,731	250	1,410,306

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Geostationary Systems – R (GOES-R) (http://www.goes-r.gov): provides NOAA's latest generation of Geostationary Operational Environmental Satellites (GOES). The GOES-R Series provides advanced imagery and atmospheric measurements of Earth's weather, oceans and environment, real-time mapping of lightning activity, and improved monitoring of solar activity and space weather. Observations from these satellites will provide coverage of the western hemisphere from a geostationary orbit, allowing continuous monitoring of severe storms, tropical cyclones, volcanic eruptions, fire hot spots, cloud and atmospheric moisture changes, lightning, currents flow dynamics, and atmospheric smoke and dust. The GOES-R Series program will provide end-to-end system development and integration through the acquisition and deployment of the space, ground system, and satellite launch. NOAA will maintain two operational GOES satellites designated as GOES-East and GOES-West, and will further maintain one on-orbit spare positioned midway between them. This on-orbit spare allows NOAA to quickly replace a failed satellite and ensure continuous coverage within the geostationary orbit. This program also supports risk reduction efforts for future geostationary requirements as part of its continuing work with SAE on future GEO architecture efforts.

The GOES program, which has provided essential observational data since 1975, supports NOAA's National Weather Service (NWS) in forecasting, tracking, and monitoring severe storms. The GOES-R Series launched the second satellite on March 1, 2018. GOES-S became GOES-17 when it reached geostationary orbit. GOES-17 became operational as GOES-West on February 12, 2019. The GOES-R Series satellites provide significant enhancements for all operational users of geostationary observations, in particular NWS. For example, calculating the probability that a developing storm will produce severe weather within the next hour will be improved in the GOES-R Series era, given the additional information from the Advanced Baseline Imager (ABI) and total lightning data from the Geostationary Lightning Mapper (GLM). The products resulting from this data will improve as a result of more frequent images, a factor of four improvement in spatial resolution, more spectral bands for inferring cloud properties, and lightning mapping. The increased quantity, quality, and accuracy of satellite data that the GOES-R Series will enable NWS to issue improved and timely weather advisories to the public, protecting life and property.

The GOES-R Series provides data that enhances a number of NOAA products and services, including:

- Cloud images and precipitation estimates for hurricanes and other coastal storms;
- Images of the United States and adjacent ocean areas to enable the detection, tracking, and intensity changes of hurricanes and other major weather events; and
- Improved numerical weather prediction models and flood/drought assessments.

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On March 1, 2018, at 5:02 PM EST, GOES-S launched from Cape Canaveral Air Force Station at the opening of the launch window. The satellite reached geostationary orbit on March 12 and was renamed GOES-17.

Polar Weather Satellites (PWS): includes NOAA's JPSS program of record (POR) and PFO programs, which are managed as one program. The JPSS POR consists of three satellite missions: the NOAA/NASA Suomi National Polar-orbiting Partnership (Suomi NPP), and the NOAA 20/JPSS-1 and JPSS-2 satellites. It also encompasses the JPSS ground segment, as well as maintenance, and support of the JPSS POR missions through FY 2025. PFO extends the operations of the NOAA polar satellite systems through FY 2038 by adding two additional missions, JPSS-3 and JPSS-4, to ensure that NOAA continues to provide accurate and timely weather forecasts and warnings beyond JPSS-2. NOAA is developing the JPSS-3 and JPSS-4 instruments and spacecraft buses as copies of JPSS-2. This allows NOAA to take advantage of the JPSS-2 instrument development and spacecraft bus contracts to

reduce cost and risk. The full NOAA JPSS-2, -3 and -4 missions are comprised of the Advanced Technology Microwave Sounder (ATMS), Cross-track Infrared Sounder (CrIS), Visible Infrared Imaging Radiometer Suite (VIIRS), and the Ozone Mapping Profiler Suite-Nadir (OMPS-N) instruments. NASA's Radiation Budget Instrument (RBI) has been demanifested from JPSS-2 (it was cancelled by NASA). NOAA has a mass-model ready to replace it in the RBI slot, but it is also looking to see if there are any alternative payloads available that would add value to the mission set while avoiding any adverse impact to the JPSS schedule and risk. NOAA will also continue the development, maintenance, and sustainment of the ground systems, update ground infrastructure, and conduct risk reduction efforts to support current and future polar data acquisition requirements.

The primary purpose of the PWS program is to provide global meteorological observations to enable short-term (0-3 days), and mid-range (3-7 days) warnings of severe weather events critical for emergency managers and communities to make timely decisions to protect life and property. In addition, JPSS missions provide an array of global environmental observations for short term, mid-range, and seasonal monitoring and forecasting of weather and a wide variety of environmental phenomena, including:

- Operational and short-term forecasts in Alaska;
- Severe storm and flood warnings;
- Tropical cyclone and hurricane warnings;
- Hydrologic forecasts;
- Ocean surface temperature, ocean color for ocean monitoring e.g., reef conditions, harmful algal bloom warnings, etc.;
- Aviation forecasts (domestic, military, and international);
- Ice monitoring and forecasting;
- Ozone monitoring;
- Environmental air quality monitoring;
- Detection and analysis of wildfires and volcanic eruptions including volcanic ash warnings for Aviation Safety;
- Short-term and mesoscale forecasts;
- Seasonal and inter-annual climate forecasts;
- Decadal-scale monitoring of climate variability; and
- Assessment of long-term global environmental change.

PWS contributes to the U.S./European partnership of operational civilian polar-orbiting satellites that together provide the primary input data for all Numerical Weather Prediction (NWP) models. Polar satellites contribute to ~85 percent of all data for NWP models. This program also supports risk reduction and mitigation efforts for future polar requirements as part of its continuing work with the Office of Systems Architecture and Engineering on future LEO architecture efforts.

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Cooperative Data and Rescue Services (CDARS) (http://www.sarsat.noaa.gov/) (http://www.noaasis.noaa.gov/ARGOS/): The CDARS program supports the space-based components of Argos Advanced Data Collection System (A-DCS) and the Search and Rescue Satellite Aided Tracking's (SARSAT) Medium-Earth Orbiting Search and Rescue (MEOSAR) ground station.

The SARSAT system relays distress signals from mariners, aviators, and recreational enthusiasts in distress almost anywhere in the world at any time and in almost any condition. It supports the international COSPAS-SARSAT program that is managed by the United States, Russia, France, and Canada with 41 other countries and organizations. The satellite instruments that are currently meeting the requirements for these systems are onboard legacy polar orbiting satellites (e.g. Metop-A, Metop-B, NOAA-15, 18, and 19) most of which are operating past their design lives. Changes to schedules for CDARS have led NOAA to adjust its approach to avoiding a gap for the SARSAT system. The plan is to replace NOAA's legacy polar-orbiting satellite constellation that have SARSAT instruments in space, with a Medium-Earth Orbiting system with satellite assets deployed by the United States Air Force (USAF), as well as similar constellations deployed by Europe and Russia. These satellites will support the future MEOSAR system. In order to accelerate the utilization of the MEOSAR system and avoid a gap in search and rescue capability, NOAA provides support operations and maintenance for the SARSAT MEOSAR ground station installed in the Southwest United States to provide the required coverage of the Southern Pacific Ocean.

Space Weather Follow On (SWFO): The most pressing concern that SWFO addresses is the very high risk of a loss of coronal mass ejection (CME) imagery. Currently, operational warnings and watches rely on data from NASA's research satellite, the Solar and Heliophysics Observatory (SOHO), which was launched in 1995, and is significantly past its mission design life. NOAA does not have an independent CME operational warning capability. Without CME imagery, the 1-4 day lead-time of likely storm conditions will be degraded, thereby affecting the accuracy of geomagnetic storm watches and endangering U.S. infrastructure. NOAA has been focused on ensuring the continuity of CME imagery for operational use by the National Weather Service's Space Weather Prediction Center for geomagnetic storm watches beyond SOHO. NOAA has been working with Naval Research Laboratory (NRL) to develop a flight compact coronagraph (CCOR) to obtain CME imagery, and will continue to obtain the quickest possible delivery of the CCOR instrument through the NRL. Once launched, the CCOR provides coronal mass ejection (CME) imagery necessary for tracking eruptive events from the sun and provide initial estimates of the likelihood and severity of any impacts to Earth.

The SWFO program is planning for continuity in the measurements of solar wind plasma and CME imagery. Currently, solar wind measuring capability is provided by NOAA's Deep Space Climate Observatory (DSCOVR). However, DSCOVR is a research-grade satellite susceptible to mission failure with the loss of any of several single string critical components. Loss of DSCOVR without a replacement will significantly reduce NOAA's ability to monitor solar wind and provide short-term warnings (15-45 minutes) of space

weather storms. In March 2018, NOAA and NASA completed a study to explore options to leverage a rideshare with the NASA Interstellar Mapping and Acceleration Probe (IMAP) mission to Earth-Sun Lagrange point 1 (L1) in 2024[2]. The L1 orbit provides the closest and continuous optimal view of the sun. Because the L1 orbit is closer to the sun, it allows the CCOR and space weather instrument suite (SWIS) to detect a CME and/or solar wind particles early enough to provide adequate warnings to Earth. NOAA prioritizes a satellite at the Earth-Sun L1 and is dedicating resources towards that effort. Flying a second CCOR in a geostationary orbit would add operational resilience and reliability to the CME imagery necessary for space weather forecasting, as well as programmatic resiliency to ensure deployment of this critical observation.

Both SOHO and DSCOVR operate at the L1 station, and provide warnings for the two major types of space weather events that affect the Earth: solar radiation storms and geomagnetic storms. Satellites are mostly impacted by solar radiation storms. Commercial airlines are re-routed during both radiation and/or geomagnetic storms. These storms cause communication blackouts and impacts to navigation accuracy. The most extreme geomagnetic storms have resulted in severe impacts to commercial power grids and impacted hundreds of millions of people. Satellite data, including CME imagery and measurement of solar wind plasma, are critical to providing accurate and early warnings of these potentially destructive space weather events.

Low Earth Orbit (LEO): Low Earth and future medium Earth observations, provided by NOAA assets, partner assets or commercially procured, are most critical for weather forecasting, environmental monitoring, climate monitoring, and to help inform public watches and warnings. LEO comprises services and data products from specific missions, as well as from enterprise products and services that are source-agnostic. This subactivity also includes ground system development and sustainment for LEO and for future medium Earth observations. NESDIS will maintain transparency into the development schedule, and the annual and life cycle costs for all individual programs and projects comprising the observing system elements. The LEO Subactivity is divided into two Line Items:

- **Partner and Commercial Observations –** allows NOAA to partner with other U.S. agencies, foreign governments, and private industry to provide critical LEO and future medium Earth observations, measurements and services. The number of partnerships in NESDIS' future space architecture is expected to grow three fold over the next ten years (FY 2020 - FY 2030). The Partner and Commercial Observations and Services Line Item will accommodate these cost-saving opportunities that will improve NOAA's weather and environmental forecast capabilities and continue critical *in situ* data relay and search and rescue services. The investments made will evolve NESDIS' current architecture into one with more small and medium-sized satellites, individual instruments on commercial hosts, data buys, and an increased number of partnerships with domestic and foreign

[2] 2018 Space Weather Follow-On Interstellar Mapping and Acceleration Probe Feasibility Study.

space agencies. NOAA will leverage emerging opportunities, new innovations and science within the commercial space industry when it becomes available. These changes will result in increased forecast capability, without the need to greatly expand U.S. government-owned assets.

NOAA partnerships include:

- COSMIC-2/GNSS RO: NOAA participates in a collaboration between Taiwan, National Science Foundation, NASA, USAF, and University Corporation for Atmospheric Research (UCAR) called Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC), which is a six-satellite constellation that was launched to the polar orbit in 2006. The original COSMIC program was a research effort to explore a new and inexpensive atmospheric sounding technique, GNSS RO, to obtain global atmospheric temperature profiles which were not available from other sources. GNSS RO provides temperature, water vapor, and pressure profiles, resulting in weather forecasts that are more accurate. GNSS RO is now considered a proven and cost-effective means of increasing the volume of quality global atmospheric soundings.

  A six-satellite COSMIC-2 constellation is scheduled to be launched to the equatorial orbit by the USAF no earlier than April, 2019. The USAF provided the RO sensors and Taiwan provided the spacecraft. After launch, Taiwan will be the satellite operator. NOAA will operate a ground system consisting of a network of ground reception stations and a RO data processing center. NOAA will leverage the ground system to acquire and process GNSS RO data from agency and international partner missions as well, especially those that provide RO data in the mid to high latitudes (polar orbits) that are not covered by the COSMIC-2 constellation.

- Meteorological Operational Satellite (Metop): Our long-standing international partnership with EUMETSAT allows NOAA to share the cost and responsibility of operating satellites to provide the high-quality, timely, global observations required for weather and environmental prediction. EUMETSAT will launch their Metop Second Generation (Metop-SG) 1A and 1B in 2021 and 2022, respectively, as a continued mission following the launch of Metop-C. In order to meet the continued, and additional, data from the next generation of Metop and partner mission satellites, NOAA must be able to ingest the Metop-SG data, including preparation for the future development of ground infrastructure, processing and distribution capability for Metop-SG and other partner mission data. NOAA must receive, ingest, process, validate and distribute these data to the NWS (this is the equivalent of the NOAA upgrade from the POES NOP series to the JPSS series). Advanced infrared and microwave instruments on Metop-SG will provide finer details of moisture content and temperature inside storms that the NWS' Numerical Weather Prediction (NWP) Models need in order to a) forecast if

storms are strengthening or weakening, b) estimate wind speed and precipitation of storms 3-5 days in advance, and c) derive forecasts of storms that will evolve to dangerous superstorms like the Nor'easter that caused extensive damage to much of the Northeastern seaboard in March 2018. This is an emerging requirement that will require leveled base funding of the Subactivity budget line in order to successfully support the contracts and cooperative institute for algorithms/products from Metop-SG.

- **Common Products and Services –** provides NESDIS' common services and enterprise products. Common Products and Services funds in both LEO and GEO are used to plan, execute, acquire, integrate, and transition to operations all common services for NOAA's environmental satellite systems. This Line Item supports operational satellite services, enterprise distribution, and archive services. Each year projects may include antennas, data ingest, product generation, product distribution, and archival activities. The core focus of this Line Item includes, but is not limited to:
    - Providing project management and systems engineering for ground service design, development, integration, testing, and infrastructure;
    - Assisting in the development and maintenance of Level 2 requirements and leading the development, maintenance, and allocation of Level 3 and lower-level requirements across the ground enterprise;
    - Directing financial, programmatic, technical, contractual oversight, and performance measurement activities supporting common ground systems and services; and
    - Developing a portfolio of source-agnostic data products, also known as enterprise products or blended products.

To expand its portfolio of enterprise or blended products, NESDIS will fuse data products from multiple data sources. This may include both NOAA and non-NOAA data, from both commercial and government sources, so as to harness the full capabilities of the global observing system. NOAA will move beyond the traditional focus on products for individual satellite missions toward observations that are ingested, harmonized, and fused from multiple platforms and agencies. This will provide a more comprehensive and innovative set of data and information products with a broader spectrum of use to better serve user needs.

Geostationary Earth Orbit (GEO): GEO observations and measurements, provided by NOAA assets, partner assets or commercially procured, are most critical for issuing short term watches and warnings for weather, and space weather events. GEO observations and measurement comprise data products from specific missions, as well as for enterprise or blended products that are source-agnostic. NESDIS will maintain transparency into the development schedule, and the annual and life cycle costs for all individual programs and projects comprising the observing system elements.

- **Partner and Commercial Observations –** allows NOAA to partner with other U.S. agencies, foreign governments, and private industry to provide critical GEO observations, and measurements. The number of partnerships in NESDIS' future space architecture is expected to grow three fold over the next ten years (FY 2020 - FY 2030). The Partner and Commercial Observations Line Item will accommodate these cost-saving opportunities that will improve NOAA's weather and environmental forecast capabilities. The investments made will evolve NESDIS' current architecture into one with more small and medium-sized satellites, individual instruments on commercial hosts, data buys, and an increased number of partnerships with domestic and foreign space agencies. NOAA will leverage emerging opportunities, new innovations and science within the commercial space industry when they become available. These changes will result in increased forecast capability, without the need to greatly expand US government-owned assets.

- **Common Products and Services –** provides NESDIS common services and enterprise products. Common Products and Services funds in both LEO and GEO are used to plan, execute, acquire, integrate, and transition to operations all common services for NOAA's environmental satellite systems. This Line Item supports operational satellite services, enterprise distribution, and archive services. Each year projects may include antennas, data ingest, product generation, product distribution, and archival activities. The core focus of this Line Item includes, but is not limited to:
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    - Directing financial, programmatic, technical, contractual oversight, and performance measurement activities supporting common ground systems and services; and
    - Developing a portfolio of source-agnostic data products, also known as enterprise products or blended products.

To expand its portfolio of enterprise or blended products, NESDIS will fuse data products from multiple data sources. This may include both NOAA and non-NOAA data, from both commercial and government sources, so as to harness the full capabilities of the global observing system. NOAA will move beyond the traditional focus on products for individual satellite missions toward observations that are ingested, harmonized, and fused from multiple platforms and agencies. This will provide a more comprehensive and innovative set of data and information products with a broader spectrum of use to better serve user needs.

Systems Architecture & Engineering (SAE): SAE provides governance over the NESDIS Enterprise architecture, including flight, ground, and related services, to ensure it enables achievement of NESDIS strategic goals and objectives, and provides stewardship

across NESDIS in the implementation of its strategic plan. SAE also manages the Commercial Weather Data Pilot (CWDP) program, which focuses on acquiring, expanding, and evaluating commercial data.

- **Architecture, Engineering, and Requirements (AER):** AER leads and manages NESDIS' assessments of and planning for future enterprise architectures, including flight, ground, and related services, to ensure architectures enable achievement of NESDIS strategic goals and objectives. This includes performing trade studies with industry, pre-formulation activities, and demonstrations, as well as developing roadmaps for achieving future architectures. It manages the NESDIS requirements development process, including development (in collaboration with other NESDIS offices) of project Level 1 requirements. SAE maintains the NESDIS products and services baseline, leads the prioritization and governance process to make changes to that baseline, and validates that baseline products are meeting requirements.

  AER also guides NESDIS in the implementation of its strategic plan, interfaces with other agencies in service to NESDIS strategic goals, manages the NESDIS enterprise risk process, and develops and maintains systems engineering and program management guidance applicable to all NESDIS programs and activities.

  Additional AER responsibilities include:
  - Undertaking quantitative assessments for objective analyses to evaluate relative value and benefits of future data sources and satellite architectures;
  - Providing an independent assessment to the milestone decision authority for all Key Decision Points and other milestones to ensure systemic compliance with architecture and effective implementation of requirements; and
  - Managing the TPIO Office, which is responsible for the implementation of the NOAA Administrative Order 212-16 "Observing Systems Portfolio Management", including validation of NOAA observation requirements, conducting observing system impact and portfolio analyses. TPIO supports all branches of NOAA and manages the NOAA Observing System Integrated Analysis (NOSIA) which is used to manage NOAA's current and future observing system investments.

- **Partner & Commercial Observations:** The NOAA Commercial Space Policy calls for NOAA to undertake projects as appropriate to demonstrate the viability of integrating commercial data into the NOAA operational data stream, and the ability of the commercial sector to establish and sustain capabilities to meet NOAA's ongoing operational needs. NESDIS regularly conducts assessments to determine the viability of commercial solutions to address NOAA observing system objectives prior to the purchase of commercial data for operational use. In FY 2016 NESDIS initiated Commercial Weather Data Pilot (CWDP)

Round 1 to purchase, evaluate, and calibrate available commercial satellite data. After evaluating the commercial data in FY 2017, NOAA awarded an expanded CWDP Round 2 contract in FY 2018. Each pilot project includes a Request for Proposal (RFP) and contract(s) for sample(s) of one type of data or other capability; for data pilots, securely ingesting the delivered data; engineering, quality, and performance assessments of the delivered capability; and assessing the potential weather forecast and/or mission impact of the vendor's capability.

The CWDP will continue to assess new types of data and capabilities that are available on the commercial market. Through the CWDP program, NESDIS will continue to:

- Test commercially available capabilities to assess the accuracy, value, and impact of the commercial data or service - to the extent possible such capabilities will be evaluated by comparison to established and validated NOAA operational products and deliverables;
- Ensure the necessary ground systems, services, IT security interfaces, and data processing are in place for ingesting the commercial data selected; and
- Deliver assessment report(s) on the viability of the pilot data set(s) and the capabilities of the commercial systems to meet NOAA observation requirements for operational services.

If NOAA determines that data or services licensed and evaluated through the CWDP are cost effective and operationally viable for meeting a NOAA observation requirement, NESDIS will pursue purchase of the commercial data or service based on its ability to provide an ongoing operational service as part of the NOAA observation architecture.

PROGRAM CHANGES FOR FY 2020

NOAA requests a net decrease of $210,335,000 and an increase of 2 FTE/ 3 positions in FY 2020 program changes for the Systems Acquisition Activity. Following this section are program change narratives for this Subactivity that represent program changes greater than five percent of a program or are new starts or terminations. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 2).

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Geostationary Systems - R	Pos./BA	59	408,380	59	304,056	0	(104,324)
	FTE/OBL	59	408,380	59	304,056	0	(104,324)

GOES-R Series Planned Decrease (-$104,324 0 FTE/ 0 Positions) - Following the successful launch of the GOES-17 satellite on March 1, 2018, NOAA proposes a planned funding reduction to the Geostationary Operational Environmental Satellite - R (GOES-R) Series program. The remaining funds will continue satellite engineering development, production, and integration for the GOES-R Series program. This includes the continued development and delivery of the GOES-R Series satellites and post-launch testing. NESDIS will continue integration and test (I&T) activities for the GOES-T and U satellites, including ground system check out and a flight ready spare Advanced Baseline Imager (ABI). FY 2020 funds will also be used to continue recapitalization of GOES-R Series Ground System, including replacement of IBM servers.

Schedule and Milestones *(The GOES-T launch has been delayed and a new launch date will be identified after coordination with the launch services provider. The new date will be determined based on the health and performance of on-orbit assets, and the schedule and milestones will be updated once a new schedule is established.)*

FY 2020

- Ship GOES-T to launch base, launch GOES-T, and conduct post launch checkout and calibration activities
- Continue GOES-U I&T
- Continue recapitalization of GOES-R Series Ground System, including replacement of IBM servers

FY 2021

- Complete GEOS-T product validation and transition GOES-T to operations
- Continue GOES-U I&T
- Continue recapitalization of GOES-R Series Ground System, including replacement of IBM servers

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

FY 2022

- Continue GOES-U I&T
- Complete recapitalization of GOES-R Series Ground System, including replacement of IBM servers

FY 2023

- Complete GOES-U I&T

FY 2024

- Ship GOES-U to launch base and prepare to launch GOES-U

Deliverables

Spacecraft*	Launch Commitment Date	Target Launch Date
GOES-T**	TBD	TBD
GOES-U***	Q1 FY 2025	TBD

* Launch Readiness Dates were previously reported due to their relevance in contingency mission discussions. NOAA will no longer be reporting them to remain consistent with the Annual Satellite Reports.
**The GOES-T launch has been delayed. A new target launch date will be identified in coordination with the launch services provider after a new Launch Commitment Date has been established. The new date will be determined based on the health and performance of on-orbit assets within 3-years of the new Launch Commitment Date.
*** The GOES-U target launch date will be identified in coordination with the launch services provider within 3-years of the Launch Commitment Date.

Department of Commerce
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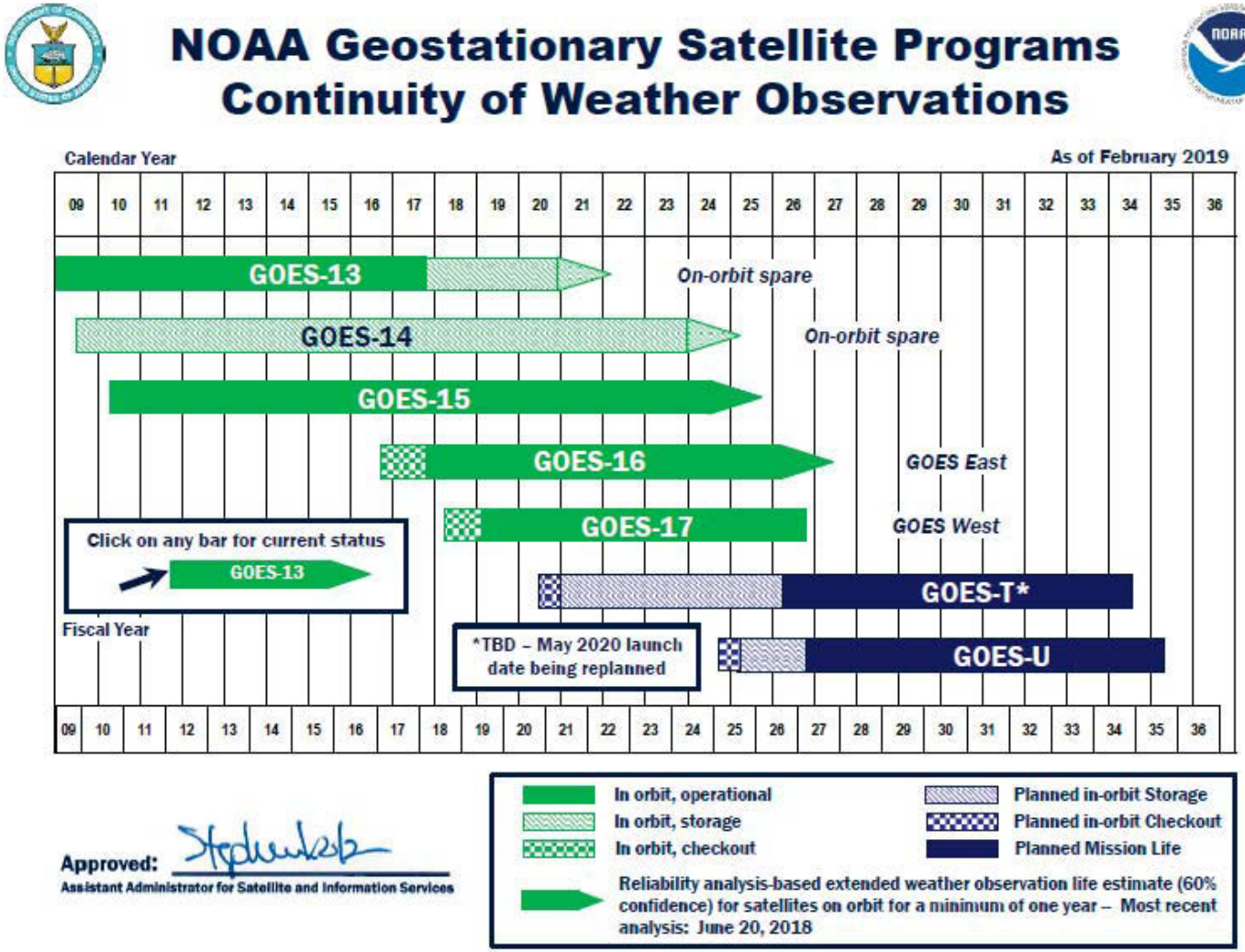
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)



Department of Commerce
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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Percent of milestones completed on time with decrease	75%	75%	75%	75%	75%
Percent of milestones completed on time without decrease	75%	75%	75%	75%	75%
Outyear Costs:					
Direct Obligations	(104,324)	(115,880)	(115,880)	(158,380)	(158,380)
Uncapitalized	0	0	0	0	0
Budget Authority	(104,324)	(115,880)	(115,880)	(158,380)	(158,380)
Outlays					
FTE	0	0	0	0	0
Positions	0	0	0	0	0

Outyear Funding Estimates*

GOES-R Series	2019 & Prior**	2020	2021	2022	2023	2024	CTC *	Total*
Change from 2020 Base	N/A	(104,324)	(115,880)	(115,880)	(158,380)	(158,380)	N/A	N/A
Total GOES-R Series PAC Request	8,607,888	304,056	292,500	292,500	250,000	250,000	153,115	10,150,059
Total GOES-R Series ORF Request	101,700	33,900	33,900	33,900	33,900	33,900	406,800	678,000
GOES-R Series life cycle costs (LCC)	8,709,588	337,956	326,400	326,400	283,900	283,900	559,915	10,828,059

* Outyears are estimates. Future requests will be determined through the annual budget process.
** The FY 2019 & Prior column has been adjusted to account for the FY 2018 spend plan, including the mandatory deobligation assessment, and FY 2019 Enacted amount.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquistion
Subactivity: Geostationary Systems - R

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,310	2,310	2,310	2,310	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,310	2,310	2,310	2,310	0
12	Civilian personnel benefits	703	703	703	703	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	332	332	332	332	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	230	230	230	230	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	5	5	5	5	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	8,459	8,459	8,459	8,459	0
25.3	Other goods and services from Federal sources	378,085	324,092	324,092	219,768	(104,324)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	592	592	592	592	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	269	269	269	269	0
31	Equipment	101,101	47,734	47,734	47,734	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	10,815	10,815	10,815	10,815	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	12,838	12,838	12,838	12,838	0
99	Total obligations	515,740	408,380	408,380	304,056	(104,324)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

NESDIS Restructure: Merging JPSS and PFO into Polar Weather Satellites (PWS) - The FY 2020 Presidents Budget requests the merger of the Joint Polar Satellite System (JPSS) Program of Record and Polar Follow On (PFO) Subactivities into one Polar Weather Satellites (PWS) Subactivity. The PWS Subactivity will enable NOAA to execute the entire JPSS program for all four satellites more efficiently. This will provide flexibility and management efficiencies similar to the GOES-R program, which includes all four satellites within one series. For example, the GOES-R program was able to replace a faulty component on GOES-S with one on GOES-U, allowing GOES-S to maintain its scheduled launch date. As seen with GOES-R, developing all missions together allows for the flexibility to apply resources across all satellites and activities to reduce program risk, and enable cost avoidance opportunities, while maintaining transparency. The goal of this merger is to maximize NESDIS' ability to have a polar-orbiting constellation through the Polar Weather Satellite Subactivity that is flexible, responsive, and sustainable to the Nation's growing need for critical environmental observations. The PWS merger will:

- Reduce Program Risk: PWS will reduce risk and increase flexibility in the production stages of the JPSS satellites. This flexibility provides protection against catastrophic events (e.g. impacts to the supply chain, launch failure, on-orbit failure) by minimizing the time and management effort needed to swap instruments and reserves across programs, or have a spacecraft ready earlier than planned. In addition, program risk will be reduced because of the improved program reserve posture as reserves can be shared between Subactivities.
- Increase Cost Savings: PWS will eliminate duplicative administrative costs existing from having JPSS and PFO as two separate programs. This will enable seamless, efficient and effective deployment of resources throughout the program. Additionally, PWS, as a single program Subactivity, will take advantage of industry cost saving opportunities, such as staffing (ups and downs due to production schedules), and system support equipment.
- Continue and Improve Program Transparency: Under a single Subactivity, NOAA will continue to track the life cycle costs (LCC) of JPSS and PFO separately to ensure transparency. In addition, NOAA proposes to establish individual satellite development cost baselines to improve transparency. NOAA will still be able to track and report on both NOAA and NASA funds by LCC.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Polar Weather Satellites	Pos./BA	94	857,991	94	755,038	0	(102,953)
	FTE/OBL	84	857,991	84	755,038	0	(102,953)

Polar Weather Satellites Planned Decrease (-$102,953, 0 FTE/ 0 Positions) - The FY 2020 funds will be used to continue the build of the JPSS-2 instruments and spacecraft, continue JPSS-2 satellite level integration and testing, and continue the development of the spacecraft and ATMS, CrIS, VIIRS, and OMPS instruments for JPSS-3 and JPSS-4. NOAA will continue the maintenance and sustainment of the ground system supporting the Suomi National Polar-orbiting Partnership (Suomi NPP) and NOAA 20 (formerly JPSS-1) satellites, and continue development of the ground system to support JPSS-2. NOAA will continue to work to improve its constellation strategy for PWS continuity while seeking cost efficiencies, managing system technical risks and leveraging partnerships.

To keep NOAA's commitment to build a robust polar orbiting weather satellite program as rapidly as possible, during FY 2020 NOAA will focus its efforts on the JPSS-2 launch and on the development of the JPSS-3 instruments on the critical path. The schedule and milestones will be updated when JPSS-3 and JPSS-4 are baselined.

Schedule and Milestones
FY 2020
- JPSS-2 satellite integration and test in preparation for JPSS-2 launch
- Continue build and assembly of JPSS-3 and JPSS-4 ATMS, CrIS, VIIRS, and OMPS instruments
- Sustain and maintain ground system to support Suomi NPP, NOAA-20

FY 2021
- Continue assembly, integration and test of JPSS-3 spacecraft
- Conduct pre-environmental reviews for JPSS-3 VIIRS and OMPS instruments
- Conduct JPSS-3 VIIRS and OMPS instrument level environmental testing
- Sustain and maintain Suomi NPP and NOAA-20
- Sustain and maintain ground system to support Suomi NPP, NOAA-20

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

FY 2022
- Deliver JPSS-2 satellite to launch site
- Conduct launch site integration and test in preparation for JPSS-2 launch
- Deliver JPSS-3 ATMS and CrIS instruments
- Deliver JPSS-3 VIIRS and OMPS instruments
- Continue assembly, integration and test of JPSS-3 spacecraft
- Conduct JPSS-4 VIIRS instrument level environmental testing
- First year of operational support for NOAA-20 data acquisition using the renovated and upgraded Communications Infrastructure
- Sustain and maintain Suomi NPP, NOAA-20
- Sustain and maintain ground system to support Suomi NPP, NOAA-20

FY 2023
- Launch, commission and operate JPSS-2
- Conduct System Integration Review for JPSS-3
- Start JPSS-4 spacecraft procurement activities and initiate assembly of essential spacecraft subsystems
- Conduct JPSS-4 OMPS instrument level environmental testing
- Initiate procurement of JPSS-3 launch services
- Sustain and maintain Suomi NPP, NOAA-20 and JPSS-2
- Sustain and maintain ground system to support Suomi NPP, NOAA-20 and JPSS-2

FY 2024
- Conduct KDP-D review for JPSS-4
- Deliver JPSS-4 ATMS and CrIS instruments
- Deliver JPSS-4 VIIRS and OMPS instruments
- Sustain and maintain NOAA-20 and JPSS-2
- Sustain and maintain ground system to support NOAA-20 and JPSS-2

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Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Deliverables

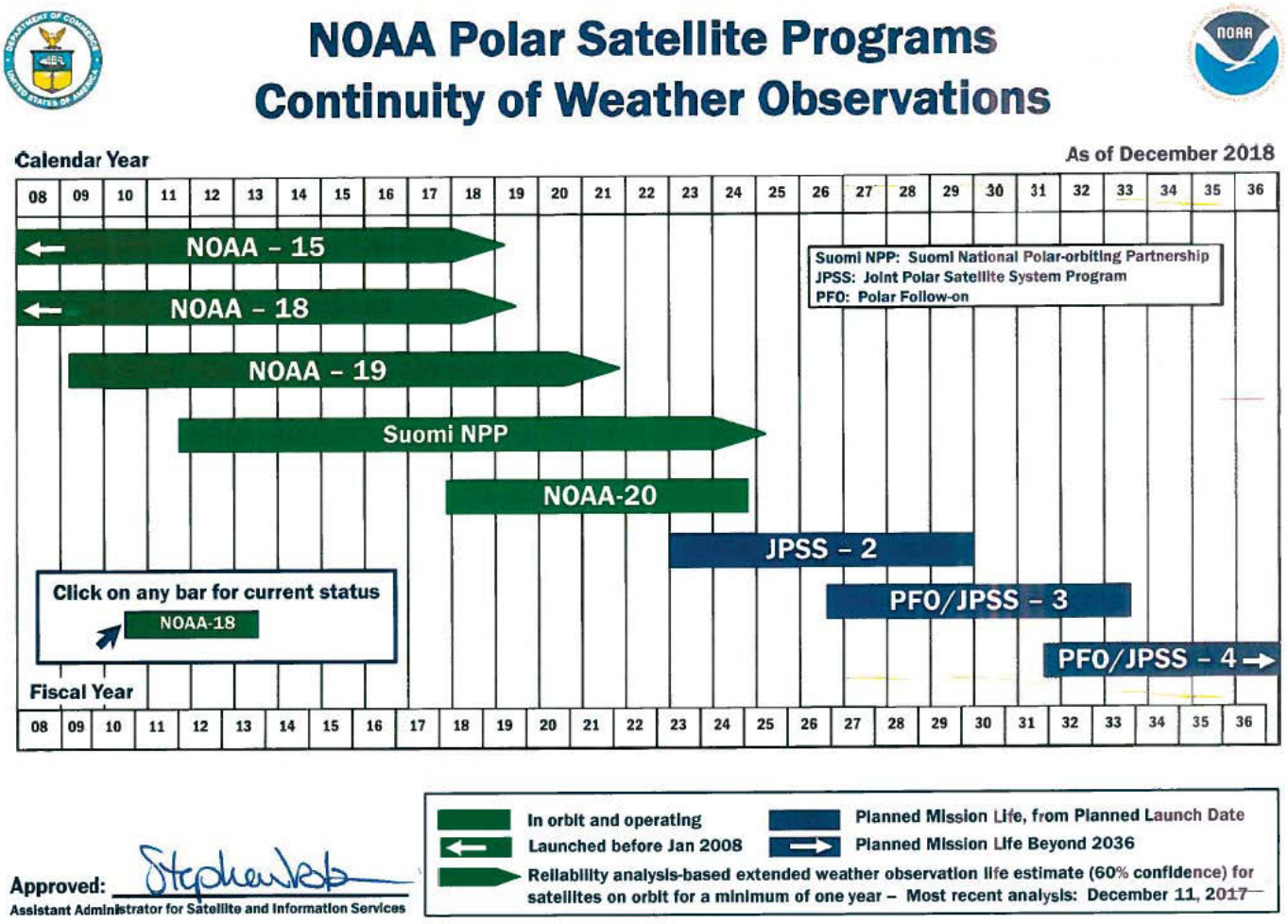
- On-orbit support for Suomi NPP and NOAA-20

Spacecraft*	Launch Commitment Date**	Target Launch Date****
JPSS-2	Q1 FY 2023	TBD
JPSS- 3***	Q4 2026	TBD
JPSS-4***	Q4 2031	TBD

* Launch Readiness Dates were previously reported due to their relevance in contingency mission discussions. NOAA will no longer be reporting them to remain consistent with the Annual Satellite Reports.
** Launch Commitment Dates will be re-evaluated based on annual appropriations, the performance of on-orbit assets, and the overall constellation risk posture.
*** Launch Commitment Date for JPSS-3 and JPSS-4 will be re-evaluated as part of the annual polar satellite constellation availability analysis to analyze the launch schedules in order to minimize risk across the constellation.
**** Target launch Date is only known after coordination with the launch services provider and in accordance with the NESDIS 1330 Polar-Orbiting Launch Policy.

Performance Measures	2020	2021	2022	2023	2024
Percent PFO milestones completed on time with decrease	75%	75%	75%	75%	75%
Percent PFO milestones completed on time without decrease	75%	75%	75%	75%	75%
Outyear Costs:					
Direct Obligations	(102,953)	(28,453)	(192,971)	(283,470)	(249,861)
Uncapitalized	0	0	0	0	0
Budget Authority Outlays	(102,953)	(28,453)	(192,971)	(283,470)	(249,861)
FTE	0	0	0	0	0
Positions	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)



Note: this polar satellite programs flyout chart has not yet been updated to account for the JPSS-2 launch delay.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates*

PWS	2019 & Prior**	2020	2021	2022	2023	2024	CTC *	Total*
Change from 2019 Base	N/A	(102,953)	(28,453)	(192,971)	(283,470)	(249,861)	N/A	N/A
Total PWS PAC Request	11,192,460	755,038	829,538	665,020	574,521	608,130	4,170,411	18,895,125
Total JPSS ORF Request	0	20,000	20,000	20,000	20,000	20,000	20,000	120,000
JPSS PAC* **	9,748,577	425,082	371,538	253,020	139,521	135,576	128,811	11,202,125
JPSS life cycle costs (LCC)* **	9,748,577	445,082	391,538	273,020	159,521	155,576	148,811	11,322,125
PFO LCC** **	1,443,883	329,956	458,000	412,000	435,000	472,554	4,021,607	7,573,000

*Outyears are estimates. Future requests will be determined through the annual budget process. The outyears estimates maintain the established LCCs for the combined programs.

** The FY 2019 & Prior column has been adjusted to account for the FY 2018 spend plan, including the mandatory deobligation assessment, and FY 2019 Enacted amount.

*** Rephasing in FY 2021-2023 is needed to mitigate risks associated with the JPSS-2 launch and the ground system contract. FY 2024 was reduced by $20 million, which was added back to FY 2021-2023, to allow POR to better align funding to support launch and ground activities planned in those years.

**** The PFO LCC will change once the Program is re-baselined.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Systems Acquisition
Subactivity: Polar Weather Satellites

	Object Class	2018 Actuals	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	8,281	4,292	4,292	4,292	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	8,281	4,292	4,292	4,292	0
12	Civilian personnel benefits	2,327	1,166	1,166	1,166	0
13	Benefits for former personnel		0	0	0	0
21	Travel and transportation of persons	342	153	153	153	0
22	Transportation of things	8	5	5	5	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	1,435	1,621	1,621	1,621	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	6	31	31	31	0
25.1	Advisory and assistance services	98,062	14,190	14,190	14,190	0
25.2	Other services from non-Federal sources	30,746	25,280	25,280	25,280	0
25.3	Other goods and services from Federal sources	1,012,079	794,878	774,878	671,925	(102,953)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	13,576	12,137	12,137	12,137	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	459	169	169	169	0
31	Equipment	669	735	735	735	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	24,553	17,804	17,804	17,804	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	11	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	26,293	5,529	5,529	5,529	0
99	Total obligations	1,218,847	877,991	857,991	755,038	(102,953)

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Low Earth Orbit	Pos./BA	40	34,624	40	25,285	0	(9,339)
	FTE/OBL	35	34,624	35	25,285	0	(9,339)

Metop Planned Decrease (-$9,339, 0 FTE/ 0 Positions) – NOAA is requesting a planned decrease to the Meteorological Operational Satellite (Metop) for the preparations needed to ingest Metop-Second Generation (Metop-SG) data. At the time of the FY 2019 President's Budget, NOAA was still evaluating funding for Metop-SG beyond FY 2019, and outyear support was not included in the outyear profile. NOAA now has an FY 2020 funding estimate for Metop-SG (see NESDIS-77) and requests the necessary funds in the FY 2020 President's Budget to continue to leverage NOAA's partnership with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) for Metop-SG satellite polar satellite data.

Performance Measures	2020	2021	2022	2023	2024
Percent of ground infrastructure work completed to deliver Metop-SG products with decrease	20%	30%	30%	30%	30%
Percent of ground infrastructure work completed to deliver Metop-SG products without decrease	40%	60%	80%	90%*	100%*
Percent of science algorithms completed to deliver Metop-SG products to NWS with decrease	7%	10%	10%	10%	10%
Percent of science algorithms completed to deliver Metop-SG products to NWS without decrease	10%	30%	50%	60%	75%

* The 90 percent target fully supports operation of Metop-SG 1A starting in FY 2023. In FY 2024, the infrastructure will be 100% capable of supporting the Metop-SG 1A and 1B missions.

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates*

LEO (Metop-SG)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(9,339)	(9,339)	(9,339)	(9,339)	(9,339)	N/A	N/A
Total Metop-SG	9,339	0	0	0	0	0	N/A	N/A
Total LEO Request**	N/A	33,202	35,202	35,202	35,202	35,202	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.
** The increase in FY 2021 represents a $2 million planned increase for the COSMIC Program as part of the LEO outyear profile.

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Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Low Earth Orbit (LEO)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	3,561	3,502	3,502	3,502	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3,561	3,502	3,502	3,502	0
12	Civilian personnel benefits	1,037	1,038	1,038	1,038	0
13	Benefits for former personnel	16	0	0	0	0
21	Travel and transportation of persons	127	127	127	127	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	460	406	406	406	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	10,134	8,241	8,241	8,241	0
25.2	Other services from non-Federal sources	6,563	6,387	6,387	2,651	(3,736)
25.3	Other goods and services from Federal sources	10,555	11,019	8,519	2,916	(5,603)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,396	1,375	1,375	1,375	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	229	224	224	224	0
31	Equipment	727	667	667	667	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,135	2,930	2,930	2,930	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	1,065	1,208	1,208	1,208	0
99	Total obligations	39,006	37,124	34,624	25,285	(9,339)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Low Earth Orbit (LEO)	Pos./BA	40	34,624	40	43,963	0	9,339
	FTE/OBL	35	34,624	35	43,963	0	9,339

Metop Second Generation ($9,339, 0 FTE/ 0 Positions) – NOAA requests an increase to the LEO Subactivity to allow NOAA to leverage its partnership with European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) for data from Meteorological Operational Satellite (Metop) Second Generation (Metop-SG) satellites. Leveraging this partnership provides NOAA a cost avoidance of a several hundred million dollar investment because EUMETSAT and the European Space Agency are responsible for the research, development, testing, and launch of the Metop satellites provided in the morning polar orbit. The U.S. receives approximately 50 percent of the data used by the NWS from the Metop series of satellites. The U.S. commitment to this partnership includes the sharing of ground infrastructure in exchange for polar satellite data. NOAA will leverage its existing data ingest, processing and distribution systems to allow the U.S. to receive data from the European funded Metop-SG 1A and 1B satellites. This is similar to the massive change and advancement from the POES satellites to the JPSS series. The addition of the Metop-SG will more than double the data flowing to NOAA from EUMETSAT and will provide approximately half of the satellite data ingested by the NWS numerical prediction models.

Schedule and Milestones
FY 2020 – FY 2024

- Complete development of the Metop-SG science algorithms used to create data products
- Complete development of Metop-SG ground infrastructure, processing, and distribution capabilities
- Begin providing Metop-SG data products to the NWS
- Sustain ground system enhancements

Deliverables

- Provide Metop-SG data products to NWS

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Percent of ground infrastructure work completed to deliver Metop-SG products with increase	40%	60%	80%	90%*	100%*
Percent of ground infrastructure work completed to deliver Metop-SG products without increase	20%	30%	30%	30%	30%
Percent of science algorithms completed to deliver Metop-SG products with increase	10%	30%	50%	60%	75%
Percent of science algorithms completed to deliver Metop-SG products without increase	7%	10%	10%	10%	10%

* The 90% target fully supports operation of Metop-SG 1A starting in FY 2023. In FY 2024, the infrastructure will be 100% capable of supporting the Metop-SG 1A and 1B missions

Outyear Funding Estimates*

LEO (Metop-SG)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	9,339	9,339	9,339	9,339	9,339	N/A	N/A
Total Metop-SG (LEO)	N/A	9,339	9,339	9,339	9,339	9,339	N/A	N/A
Total LEO Request**	N/A	33,202	35,202	35,202	35,202	35,202	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.
** The increase in FY 2021 represents a $2 million planned increase for the COSMIC Program as part of the LEO outyear profile.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Low Earth Orbit (LEO)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	3,561	3,502	3,502	3,502	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3,561	3,502	3,502	3,502	0
12	Civilian personnel benefits	1,037	1,038	1,038	1,038	0
13	Benefits for former personnel	16	0	0	0	0
21	Travel and transportation of persons	127	127	127	127	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	460	406	406	406	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	10,134	8,241	8,241	8,241	0
25.2	Other services from non-Federal sources	6,563	6,387	6,387	10,123	3,736
25.3	Other goods and services from Federal sources	10,555	11,019	8,519	14,122	5,603
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,396	1,375	1,375	1,375	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	229	224	224	224	0
31	Equipment	727	667	667	667	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,135	2,930	2,930	2,930	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	1,065	1,208	1,208	1,208	0
99	Total obligations	39,006	37,124	34,624	43,963	9,339

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
CDARS	Pos./BA	0	26,539	0	14,850	0	(11,689)
	FTE/OBL	0	26,539	0	14,850	0	(11,689)

Cooperative Data and Rescue Services (-$11,689, 0 FTE/ 0 Positions) – This decrease will allow NOAA to continue supporting the Argos Advanced Data Collection System (A-DCS) and Search and Rescue Satellite Aided Tracking (SARSAT) Medium Earth Orbit Search and Rescue (MEOSAR) programs. The U.S. Air Force (USAF) Hosted Payload Solutions (HoPS) contract delivery order for the Argos A-DCS instrument and a contract for a SARSAT ground station were awarded in 2018. The CDARS funding profile has been adjusted to reflect the two contract values, contract management costs and overall mission assurance. This funding will support the launch of the Argos A-DCS instrument as a hosted payload to low Earth orbit on a commercial spacecraft by late 2021. NESDIS will complete installation of the Southwest USA (SUSA) Medium Earth Orbiting Local User Terminal (MEOLUT) ground station in New Mexico. The SUSA MEOLUT will increase the overall distress signal detection coverage area for MEOSAR, accelerating the implementation of MEOSAR and providing operational redundancy to NOAA's current MEOLUTs in Hawaii and Florida.

Schedule and Milestones
FY 2020
- Critical Design Review (CDR) for Host Spacecraft
- Pre-ship Review for the Argos A-DCS instrument
- Delivery of Argos A-DCS instrument to the Host Spacecraft contractor
- SUSA site acceptance test readiness review
- SUSA MEOLUT final site acceptance testing
- Sustain the SARSAT MEOSAR Southwest MEOLUT ground station

FY 2021
- Complete integration of Argos A-DCS instrument on Host Spacecraft
- Launch of Host Spacecraft to the desired 1730 sun synchronous orbit
- Initiate Argos A-DCS post launch activities
- Sustain the SARSAT MEOSAR Southwest MEOLUT ground station

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

FY 2022 -2024

- Continue post launch activities for Argos A-DCS
- Sustain the SARSAT MEOSAR Southwest MEOLUT ground station

Deliverables

- Operational Argos missions in the desired 1730 sun synchronous orbit through FY 2026
- Operational coverage for emergency beacons used by aviators, mariners and land-based users

Mission	Launch Commitment Date	Target Launch Date*
Argos HoPS	12/31/2021	TBD

*Schedule to be supplied by General Atomics by 3/31/19.

Performance Measures	2020	2021	2022	2023	2024
Percent Argos HoPS contract milestones completed on time with decrease	75%	75%	75%	75%	75%
Percent Argos HoPS contract milestones completed on time without decrease	75%	75%	75%	75%	75%

Outyear Costs:					
Direct Obligations	(11,689)	(11,689)	(24,789)	(24,789)	(24,789)
Uncapitalized	0	0	0	0	0
Budget Authority Outlays	(11,689)	(11,689)	(24,789)	(24,789)	(24,789)
FTE	0	0	0	0	0
Positions	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates

CDARS	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(11,689)	(11,689)	(24,789)	(24,789)	(24,789)	TBD	TBD
Total CDARS Request	51,712	14,850	14,850	1,750	1,750	1,750	TBD	TBD

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: CDARS

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	40	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	40	0	0	0	0
12	Civilian personnel benefits	12	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	5	5	5	5	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	620	620	620	620	0
25.2	Other services from non-Federal sources	15,415	22,755	22,755	11,066	(11,689)
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	2,726	2,726	2,726	2,726	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	433	433	433	433	0
99	Total obligations	19,251	26,539	26,539	14,850	(11,689)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Space Weather Follow On	Pos./BA	2	27,000	5	25,600	3	(1,400)
	FTE/OBL	2	27,000	4	25,600	2	(1,400)

Space Weather Decrease (-$1,400), 2 FTE/ 3 Positions) – This request will ensure the continuity of space weather observations beyond the solar wind measurements from NOAA's Deep Space Climate Observatory (DSCOVR) and the coronal mass ejection (CME) observations from the NASA/European Space Agency (ESA)'s Solar and Heliospheric Observatory (SOHO). Both sets of data are required to forecast space weather and provide accurate warnings.

The funds will allow NOAA to prioritize the accommodation of CME imagery and solar wind observations in the following ways:

- Develop the Space Weather Follow On (SWFO) Earth-Sun Lagrange point 1 (L1) spacecraft (SWFO-L1) to maintain the 2024 NASA Interstellar Mapping & Acceleration Probe (IMAP) ride-share opportunity. The IMAP rideshare is an opportunity to launch the SWFO-L1 mission and is an essential step towards deploying the SWFO-L1 satellite carrying a compact coronagraph and solar wind instruments necessary to ensure continuity of space weather data beyond DSCOVR and SOHO, which are well past their design life.
- Develop the Solar Wind Instrument Suite (SWIS) for the SWFO-L1 mission. The SWIS comprises a magnetometer, an ion sensor, and a plasma sensor to measure the properties of solar wind that are necessary to issue geomagnetic storm warnings.
- Continue the development of compact coronagraphs to provide CME imaging.

Schedule and Milestones
FY 2020

- Continue the development of compact coronagraphs to provide CME imaging
- Continue development of additional accommodation possibilities for a compact coronagraph to provide system resiliency
- Continue the development of the SWIS
- Develop SWFO-L1 mission design to maintain the 2024 NASA IMAP rideshare
- Continue SWFO ground segment development to meet the schedule of rideshare opportunities

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

FY 2021
- CCOR instrument available for spacecraft integration
- Continue development of the SWFO-L1 mission
- Continue development of the SWIS
- Continue the SWFO ground segment development

FY 2022 – 2023
- SWIS instrument delivery and integration
- Support the integration schedules of NESDIS partnership missions
- Continue the SWFO ground segment development (Preliminary Design Review and Critical Design Review)

FY 2024
- Launch the SWFO-L1 (CCOR and SWIS instruments) on the NASA IMAP rideshare
- Complete the SWFO ground system

Deliverables
- Provide timely access to operational solar wind data and CME imagery for short and long-term warnings of geomagnetic storms

Performance Measures	2020	2021	2022	2023	2024
Percentage of SWFO program milestones completed on time with decrease	75%	75%	75%	75%	75%
Percentage of SWFO program milestones completed on time with decrease	75%	75%	75%	75%	75%

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Costs:					
Direct Obligations	(1,400)	52,000	74,400	69,400	58,600
Uncapitalized	(351)	(702)	(702)	(702)	(702)
Budget Authority Outlays	(1,400)	52,000	74,400	69,400	58,600
FTE	2	4	6	6	6
Positions	3	6	6	6	6

Outyear Funding Estimates*

SWFO	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(1,400)	41,870	69,920	65,470	56,600	N/A	N/A
Total Request*	41,700	25,600	68,870	96,920	92,470	83,600	127,220	536,210

*Outyears are estimates only. Future requests will change as we refine NOAA's space weather follow on development plans. CCOR integration is not included in the current outyear estimates.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Space Weather Follow On
Program Change: Space Weather Decrease

Title:	Band	Number of Positions	Annual Salary	Total Salaries
General Engineer	IV	1	148,967	148,967
General Engineer	IV	1	148,967	148,967
General Engineer	IV	1	148,967	148,967
Total		3		446,901
less Lapse	25%	1		111,725
Total full-time permanent (FTE)		2		335,176
2020 Pay Adjustment (0%)				0
TOTAL				335,176

Personnel Data Summary	Number
Full-Time Equivalent Employment	
Full-time permanent	2
Part-time permanent	0
Total	2
Authorized Positions:	
Full-time permanent	3
Part-time permanent	0
Total	3

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: Space Weather Follow On (SWFO)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	274	274	274	609	335
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	274	274	274	609	335
12	Civilian personnel benefits	86	86	86	96	10
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	12	12	12	12	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	1	1	1	1	0
25.3	Other goods and services from Federal sources	8,324	26,265	26,265	24,514	(1,751)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1	1	1	1	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	149	361	361	367	6
99	Total obligations	8,847	27,000	27,000	25,600	(1,400)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Geostationary Earth Orbit	Pos./BA	40	25,219	40	22,403	0	(2,816)
	FTE/OBL	36	25,219	36	22,403	0	(2,816)

Common Products and Services (-$2,816, 0 FTE/ 0 Positions) – This decrease will continue the funding needed to provide ground system support, including technology refresh and hardware and software. In order to fully support other existing NOAA priorities within the PAC portfolio, NOAA will move forward, albeit at a slower pace, with the common ground services activities to plan, execute, acquire, integrate, and transition to operations all common services for NOAA's environmental satellite systems.

Schedule and Milestones
FY 2020
- Continue to sustain enterprise distribution and archive services from the Environmental Satellite Processing and Distribution Services (ESPDS) Suomi NPP Data Exploitation (NDE) Product Distribution and Access (PDA) and the Comprehensive Large Array-data Stewardship System (CLASS) Network Systems
- Continue to implement the final Operating Capability of Mission Science Network (MSN)
- Validate the successful operation of Mission Support Services (MSS), a risk mitigation backup system, deployment to the Consolidated Backup (CBU) located in West Virginia
- Plan MSS deployment at Wallops and Fairbanks Command Data Acquisition Stations

FY 2021-2024
- Continue to ensure enterprise distribution and archive services from the ESPDS/NDE and CLASS Network Systems

Deliverables
- Continued support for operational satellite ground services
- Continued support for enterprise distribution and archive services

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

Outyear Funding Estimates*

GEO (Common Products and Services)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(2,816)	(2,816)	(2,816)	(2,816)	(2,816)	N/A	N/A
Total Common Products and Services (GEO)	N/A	18,159	18,159	18,159	18,159	18,159	N/A	N/A
Total GEO Request*	N/A	22,403	22,403	22,403	22,403	22,403	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquistion
Subactivity: Geostationary Earth Orbit

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	3,316	3,243	3,243	3,243	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3,316	3,243	3,243	3,243	0
12	Civilian personnel benefits	970	970	970	970	0
13	Benefits for former personnel	19	0	0	0	0
21	Travel and transportation of persons	71	71	71	71	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	369	304	304	304	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	4,043	3,553	3,553	3,553	0
25.2	Other services from non-Federal sources	7,042	6,831	6,831	4,015	(2,816)
25.3	Other goods and services from Federal sources	6,714	7,075	7,075	7,075	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	532	507	507	507	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	263	257	257	257	0
31	Equipment	789	714	714	714	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	1,070	825	825	825	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
77	Overhead	716	869	869	869	0
99	Total obligations	25,914	25,219	25,219	22,403	(2,816)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Systems Architecture & Engineering	Pos./BA	42	30,554	42	27,554	0	(3,000)
	FTE/OBL	34	30,554	34	27,554	0	(3,000)

Commercial Weather Data Pilot (-$3,000, 0 FTE/ 0 Positions) – This decrease request will allow NOAA to continue executing pilots for the next available commercial data type. These pilots are critical to NOAA's future satellite architecture as they assess operational viability of possible future commercial capabilities. With the additional pilot project work, NOAA will continue to assess new capabilities that are available on the commercial market, and test commercially available capabilities based on market research conducted regularly in accordance with the NOAA Commercial Space Policy. CWDP will base the next pilot (Round 3) on the outcome of an FY 2018 Request for Information (RFI), which focused on commercially available data that may improve numerical weather prediction, consistent with direction in the *Weather Research and Forecasting Innovation Act of 2017*, and on continued regular canvassing of emerging commercial sector capabilities, consistent with the NOAA Commercial Space Policy.

Schedule and Milestones

FY 2020

- Complete the assessment phase of CWDP Round 2
- Develop findings on the results of CWDP Round 2
- Demonstrate the ability to securely ingest data from commercial sources
- Conduct additional market research to support CWDP Round 3 and/or release solicitation to support Round 3, pending commercial sector readiness

FY 2021

- Award CWDP Round 3 contract(s), pending commercial sector readiness
- Explore additional sources/types of data and capabilities available from the commercial sector through market research

FY 2022-24

- Complete the assessment phase of CWDP Round 3
- Develop findings on the results of CWDP Round 3

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

- Explore additional sources/types of data and capabilities available from the commercial sector through market research
- Initiate CWDP Round 4, pending commercial sector readiness

Deliverables

- Provide results of ongoing market research
- Complete evaluation of new data and capabilities and report results of those evaluations
- Prepare for establishing operational services contracts with commercial providers

Performance Measures	2020	2021	2022	2023	2024
Number of calls for commercial data and services issued to industry (cumulative) with decrease	1	3	5	7	9
Number of calls for commercial data and services issued to industry (cumulative) without decrease	2	4	6	8	10

Outyear Funding Estimates*

SAE (CWDP)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	(3,000)	2,000	2,000	2,000	2,000	N/A	N/A
Total Commercial Weather Data Pilot (SAE)	20,000	3,000	8,000	8,000	8,000	8,000	N/A	N/A
Total SAE Request*	N/A	44,822	TBD	TBD	TBD	TBD	N/A	N/A

*Outyears are estimates only. Future requests will be determined through the annual budget process.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: SAE (CWDP)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,845	2,803	2,803	2,803	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,845	2,803	2,803	2,803	0
12	Civilian personnel benefits	851	840	840	840	0
13	Benefits for former personnel	2	1	1	1	0
21	Travel and transportation of persons	130	126	126	126	0
22	Transportation of things	2	200	200	200	0
23	Rent, communications, and utilitites	525	517	517	517	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	1	1	1	1	0
25.1	Advisory and assistance services	4,767	4,456	4,456	4,456	0
25.2	Other services from non-Federal sources	12,505	8,413	8,413	5,413	(3,000)
25.3	Other goods and services from Federal sources	7,555	7,613	7,613	7,613	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,384	1,393	1,393	1,393	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	134	133	133	133	0
31	Equipment	250	244	244	244	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,291	3,113	3,113	3,113	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	959	700	700	700	0
99	Total obligations	35,202	30,554	30,554	27,554	(3,000)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Systems/Services Architecture & Engineering (SAE)	Pos./BA	42	30,554	42	32,822	0	2,268
	FTE/OBL	34	30,554	34	32,822	0	2,268

Joint Venture Partnership ($2,268, 0 FTE/ 0 Positions) – This request will enable NESDIS to initiate Joint Venture Partnership activities with NASA, other agencies, or the commercial sector. The National Academies' 2017 Earth Science and Applications from the Space Decadal Survey recommended that NOAA and NASA develop a cost effective and joint framework for identifying and executing activities that advance NOAA's observation capabilities; the Decadal Survey also recommended that NOAA provide funding to support its share of the collaboration. The reauthorization of the *Weather Research and Forecasting Innovation Act of 2017* requests NOAA to analyze data sources that can lower the cost of observations or provide value-adding technological advancements to improve weather forecasting. Additionally, community feedback on implementation of recommendations from the NOAA Satellite Observing System Architecture Study indicated the need for funded engagement with industry early on in program and project development to best leverage industry's investments and ability to innovate.

This increase will allow NESDIS to leverage NASA's Earth Science and Heliophysics satellite programs including their observation of the atmosphere, oceans, land surface, and the Sun and sun-earth environment, to develop and demonstrate evolving capabilities for NOAA's operational use. NOAA's ability to influence and partner with NASA, along with the build of the NOAA infrastructure necessary to capitalize on those NASA programs, will speed transition of research capabilities into operational use at a lower cost.

This request, pending agreements with NASA and industry, would co-fund 1) a NASA Announcement of Opportunity, either through an Earth Venture mission, which demonstrates new observations, or through the Earth Science Technology Office, which demonstrates new technologies, and 2) partnerships with industry to leverage ongoing industry development of new observation capabilities, spacecraft design, and/or ground system capabilities and further this development to meet NOAA's operational needs. These partnerships would address areas across NOAA's broad mission objectives, including the coupling of the water and energy cycles, extending and improving weather and water quality forecasts, and sea level rise. NOAA will fund unique operational characteristics for the selected capabilities, such as download bandwidth, ingest and processing of data on operational timelines, and the development of operational algorithms for NOAA use. Data types of mutual interest to NOAA and NASA and/or with work already

underway in industry that the partnership could pursue include microwave and infrared atmospheric soundings, ocean color, sea surface height, 3D winds, visible and infrared imagery, microwave imagery, and global precipitation rate.

While NOAA will initiate partnerships in FY 2020 focused on critical next generation atmospheric soundings and planning steps with NASA, outyear funding would allow NOAA to optimize partnerships in multiple areas, participate in multiple NASA or partner agency missions of interest (New Earth Venture missions are planned for announcement every 18 months), and fully leverage industry capabilities. Future funding would also support Proving Grounds activities, where NESDIS personnel would enable operational product assimilation into weather models, and evaluate the data's operational impact using NESDIS and NWS teams.

Schedule and Milestones

FY 2020

- Release RFP for targeted industry studies to support definition of NOAA's future LEO sounding architecture
- Award study contracts based on proposals received
- Initiate the development of requirements documents, concept of operations, and schedule based on industry study results
- Develop a second more specific RFP for release in FY 2021 seeking detailed proposals to implement the LEO sounding architecture
- Collaborate with NASA to select the observation and/or technology to be pursued within the first Joint Venture mission
- Assist in the preparation of a solicitation for the first Joint Venture mission, utilizing a NASA Earth Venture or Earth Science Technology Office Announcement of Opportunity

FY 2021

- Release RFP for detailed LEO sounding capability proposals
- Award contracts based on proposals received
- Evaluate proposals for the first Joint Venture mission and contribute funding toward operational characteristics within the contract award
- Initiate infrastructure and product development for the first Joint Venture mission
- Collaborate with NASA to select the observation and/or technology to be pursued within the second Joint Venture mission

FY 2022

- Issue additional solicitation to industry for priority next generation observational needs and award contracts based on proposals received

Department of Commerce
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Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

- Evaluate proposals for the second Joint Venture mission and contribute funding toward operational characteristics within the contract award
- Initiate infrastructure and product development for the second Joint Venture mission

FY 2023 - 2024

- Issue additional solicitations to industry for priority next generation observational needs and award contracts based on proposals received
- Continue evaluating proposals for future Joint Venture missions and contribute funding toward operational characteristics within the contract award
- Continue to initiate future infrastructures and product developments for Joint Venture missions

Deliverables

- RFP to industry in support of future LEO sounding architecture
- Development and demonstration of evolving capabilities for NOAA's operational use, including new observations and/or technologies that will inform NESDIS' future space architecture and suite of products
- Faster transition of research capabilities into operational use, and at a lower cost

Outyear Funding Estimates*

SAE (Joint Venture)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	2,268	TBD	TBD	TBD	TBD	N/A	N/A
Total Joint Venture (SAE)	N/A	2,268	TBD	TBD	TBD	TBD	N/A	N/A
Total SAE Request*	N/A	44,822	TBD	TBD	TBD	TBD	N/A	N/A

*Outyears are estimates only. Future requests will be determined through the annual budget process.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: SAE (Joint Venture)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	2,845	2,803	2,803	2,803	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,845	2,803	2,803	2,803	0
12	Civilian personnel benefits	851	840	840	840	0
13	Benefits for former personnel	2	1	1	1	0
21	Travel and transportation of persons	130	126	126	126	0
22	Transportation of things	2	200	200	200	0
23	Rent, communications, and utilitites	525	517	517	517	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	1	1	1	1	0
25.1	Advisory and assistance services	4,767	4,456	4,456	4,456	0
25.2	Other services from non-Federal sources	12,505	8,413	8,413	9,547	1,134
25.3	Other goods and services from Federal sources	7,555	7,613	7,613	8,747	1,134
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,384	1,393	1,393	1,393	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	134	133	133	133	0
31	Equipment	250	244	244	244	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,291	3,113	3,113	3,113	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	959	700	700	700	0
99	Total obligations	35,202	30,554	30,554	32,822	2,268

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Systems Architecture and Engineering (SAE)	Pos./BA	42	30,554	42	40,554	0	10,000
	FTE/OBL	34	30,554	34	40,554	0	10,000

Geostationary and Extended Orbits (GEO-XO) ($10,000, 0 FTE/ 0 Positions) – This request will allow NOAA to conduct a series of industry studies, analyses, and potential flight demonstrations to optimize ways to meet NOAA's future requirements from a geostationary and other extended orbits (Lagrange Point, highly-elliptical/high inclination orbits), informed by results of NOAA's Satellite Observing System Architecture (NSOSA) study. The scope of the studies and demonstrations include:

- Identify commercial hosting opportunities – NOAA will conduct trade and industry surveys and analysis to determine potential hosting opportunities in the late 2020s to 2040 timeframe for future instruments. NOAA will also assess whether there likely to be launches to acceptable geostationary positions at a sufficient cadence to meet operational needs, and with adequate competition.
- Assess whether a future imager could be modified to make it more host-friendly, and determine if other Earth viewing (i.e. Geostationary Lightning Mapper), solar imaging. and space weather *in situ* measurement instruments are good candidates for hosting.
- Gain operational experience from non-NOAA hosted missions – evaluating existing NASA programs and missions through which NOAA could partner to gain operational experience.
- Develop, with industry, recommendations for procurement terms/business models for future hosted instrument and advanced technology instrument development and operation.
- Determine new technologies needed to enable future instruments and their readiness to support future GEO architectures.
- Understand status of enabling technology and advanced instrument design and development work in industry that could support future GEO instruments.

NOAA's future architecture analysis identified a "hybrid" class of constellations, which included different mixtures of government satellites and hosted payloads observing from geostationary orbit, that scored high in their cost to mission benefit ratio. Hybrid geostationary architectures may reduce cost, provide flexibility to adjust to changing technology, requirements and opportunities, at

lower overall programmatic risk than the GOES constellation. By taking advantage of hosting opportunities in the geostationary orbit, if available, NOAA may be able to obtain critical weather observations more cost-effectively than building multiple large, dedicated satellites. NOAA may also be able to use commercial spacecraft for technology demonstrations to quickly deploy and evaluate the benefit of new instruments to meet mission requirements.

By the late 2020s, GOES-16 and GOES-17 will have reached the end of their design lives and NOAA will no longer be able to provide an on-orbit spare satellite in geostationary orbit. NOAA is currently evaluating architecture options to ensure long-term continuity of the geostationary imaging mission, based on the NSOSA analysis identified above. This initiative is necessary to integrate community and industry input into potential options, inform development activities for future systems, and confirm the viability of commercial hosting architectures.

Additionally, this increase follows the guidance on Next Generation Satellite Architecture provided under the Satellite Architecture Planning section of Public Law 115-25 to plan for future data sources and satellite architectures, based on NSOSA findings, that lower costs, disaggregate satellite systems where appropriate, include new, value adding technological advancements, and improve weather forecasting and predictions. NOAA will initiate Phase B under the GEO portfolio in future years.

Schedule and Milestones

FY 2020

- Identify breakout of topics for Requests for Proposal to industry
- Define instrument accommodation requirements for a commercial host spacecraft.
- Release Requests for Proposals to industry to award study contracts
- Initiate industry studies
- Define observation and performance requirements for industry Phase A (Concept & Technology Development) study of next gen GEO instruments

FY 2021

- Complete industry studies for hosted and other advanced instruments and technologies
- For comparison to host solution, develop mission concept and cost estimate for instruments on a dedicated spacecraft. Compare cost and advantages/disadvantages for host vs dedicated bus solutions
- Initiate instrument technology development efforts
- Initiate industry competitive Phase A studies of next gen GEO instruments

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

FY 2022
- Initiate industry competitive Phase A studies of next gen GEO spacecraft and ground system

FY 2023
- Complete industry competitive Phase A studies of next gen GEO spacecraft and ground system
- Finalize instrument requirements for implementation of next gen GEO instruments and complete acquisition strategy decision

FY 2024
- Complete Phase A studies for instruments

Deliverables
- Selection of the next generation of GEO instruments and architecture

Outyear Funding Estimates*

SAE [Geostationary and Extended Orbits (GEO-XO)]	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	10,000	TBD	TBD	TBD	TBD	N/A	N/A
Total GEO-XO (SAE)	N/A	10,000	TBD	TBD	TBD	TBD	N/A	N/A
Total SAE Request	N/A	44,822	TBD	TBD	TBD	TBD	N/A	N/A

*Outyears are estimates only. Future requests will be determined through the annual budget process.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: SAE (GEO-XO)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	2,845	2,803	2,803	2,803	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,845	2,803	2,803	2,803	0
12	Civilian personnel benefits	851	840	840	840	0
13	Benefits for former personnel	2	1	1	1	0
21	Travel and transportation of persons	130	126	126	126	0
22	Transportation of things	2	200	200	200	0
23	Rent, communications, and utilitites	525	517	517	517	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	1	1	1	1	0
25.1	Advisory and assistance services	4,767	4,456	4,456	4,456	0
25.2	Other services from non-Federal sources	12,505	8,413	8,413	8,413	0
25.3	Other goods and services from Federal sources	7,555	7,613	7,613	17,613	10,000
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,384	1,393	1,393	1,393	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	134	133	133	133	0
31	Equipment	250	244	244	244	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,291	3,113	3,113	3,113	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	959	700	700	700	0
99	Total obligations	35,202	30,554	30,554	40,554	10,000

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Systems/Services Architecture & Engineering (SAE)	Pos./BA	42	30,554	42	35,554	0	5,000
	FTE/OBL	34	30,554	34	35,554	0	5,000

Commercial Data Purchase ($5,000, 0 FTE/ 0 Positions) – This request will allow NESDIS to purchase commercial Global Navigation Satellite System (GNSS) Radio Occultation (RO) data for operational use. It will also support continued development of the infrastructure and capability to securely import, transfer, process, and store external data from commercial partners for operational use. GNSS RO is now considered a proven and cost-effective means of increasing the volume of quality global atmospheric soundings. It provides temperature, water vapor, and pressure profiles, necessary for accurate weather forecasts. In FY 2016, NESDIS initiated the Commercial Weather Data Pilot (CWDP) Round 1 to purchase, evaluate, and calibrate available commercial satellite data, and in FY 2017 initiated an expanded CWDP Round 2. The focus of both CWDP Round 1 and Round 2 was for the purchase of GNSS RO data. NOAA will confirm the readiness of the commercial sector to provide this data through Round 2 of the CWDP, planned to be complete by FY 2020. Once the commercial sector has demonstrated readiness, NOAA will be ready to initiate an initial operational data purchase to include this data in NOAA's numerical weather prediction models. This approach is consistent with NOAA's reported plans for obtaining GNSS RO data from a combination of government assets, partner contributions and commercial purchases. The amount of GNSS RO data purchased will depend on the price, quality, and availability of data from commercial partners. These factors will also impact how quickly future data purchases will occur. NOAA will conduct initial data purchases during the ramp up directly following the pilot phase and future operational data purchases of GNSS RO data purchases will be conducted by the LEO portfolio.

Schedule and Milestones
FY 2020

- Release Request for Proposals for initial operational GNSS RO data purchase
- Complete ground system readiness to ingest, process, and distribute data
- Award contracts for data purchase

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

FY 2022-24

- Release additional solicitations or exercise options on initial contracts for increased amounts of GNSS-RO data, pending commercial sector offerings

Deliverables

- Commercial GNSS RO data included with other satellite data delivered to the National Weather Service for use in operational weather models

Performance Measures	2020	2021	2022	2023	2024
Number of solicitations seeking commercial data for operational use issued to industry (cumulative) with increase	1	TBD	TBD	TBD	TBD
Number of solicitations seeking commercial data for operational use issued to industry (cumulative) without increase	0	0	0	0	0

Outyear Funding Estimates*

SAE (Commercial Data Purchase)	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	5,000	15,000	25,000	25,000	25,000	N/A	N/A
Total Commercial Data Purchase (SAE)	N/A	5,000	15,000	25,000	25,000	25,000	N/A	N/A
Total SAE Request	N/A	44,822	TBD	TBD	TBD	TBD	N/A	N/A

*Outyears are estimates only. Future requests will be determined through the annual budget process.

Exhibit 15

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Systems Acquisition
Subactivity: SAE (Commercial Data Purchase)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	2,845	2,803	2,803	2,803	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,845	2,803	2,803	2,803	0
12	Civilian personnel benefits	851	840	840	840	0
13	Benefits for former personnel	2	1	1	1	0
21	Travel and transportation of persons	130	126	126	126	0
22	Transportation of things	2	200	200	200	0
23	Rent, communications, and utilitites	525	517	517	517	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	1	1	1	1	0
25.1	Advisory and assistance services	4,767	4,456	4,456	4,456	0
25.2	Other services from non-Federal sources	12,505	8,413	8,413	13,413	5,000
25.3	Other goods and services from Federal sources	7,555	7,613	7,613	7,613	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	1,384	1,393	1,393	1,393	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	134	133	133	133	0
31	Equipment	250	244	244	244	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	3,291	3,113	3,113	3,113	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	1	1	1	1	0
44	Refunds	0	0	0	0	0
77	Overhead	959	700	700	700	0
99	Total obligations	35,202	30,554	30,554	35,554	5,000

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Construction

Goal Statement

The objectives of the Satellite Command and Data Acquisition (CDA) Facility Subactivity are to support repairs and renew facilities that contain critical infrastructure; maintain structural integrity through capital improvements; and to ensure availability of power and cooling necessary for NOAA's satellite ground system.

Base Program

The Satellite CDA Facility Subactivity addresses NESDIS facility requirements.

Statement of Operating Objectives

Schedule and Milestones
FY 2020 - FY 2024

- Replace Uninterrupted Power Supply (UPS) Battery (All Locations)
- Replace UPS Capacitor (All Locations)
- Repair paving at Fairbanks CDA Station
- Building Automation Upgrade (Fairmont Consolidated Backup (CBU) and Suitland Satellite Operations Facility (NSOF)
- Replace the facility roofs (Fairbanks CDA Station and Wallops CDA Station)
- Provide an Engine-Generator replacement at Fairbanks CDA Station
- Replace the backup groundwater well at Fairbanks CDA Station
- Repair the redundant switchgear and cooling systems at Fairbanks CDA Station
- Provide essential building renovations at Fairbanks CDA Station

Deliverables

- Replacement of failed and obsolete components
- Reliability improvements based on results of single point of failure analysis at Fairbanks CDA Station
- Implement recommended countermeasure from anti-terrorism risk assessments.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Outyear Funding Estimates*

Satellite CDA	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from FY 2020 Base	N/A	0	0	0	0	0	N/A	N/A
Total Request	33,088	2,450	2,450	2,450	2,450	2,450	N/A	Recurring

*Outyears are estimates. Future requests will be determined through the annual budget process.

Explanation and Justification

Comparison by activity		2018 Actuals Personnel	2018 Actuals Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
NESDIS Construction	Pos/BA	0	2,450	0	2,450	0	2,450
	FTE/OBL	0	2,980	0	2,450	0	2,450

To support its mission requirement to ensure that the control, health and safety of NOAA satellites can be maintained at all times, and that the satellites are available to provide timely and essential environmental data to a wide range of users, NESDIS operates and maintains CDA Stations at Fairbanks, AK and Wallops, VA; NSOF at Suitland, MD; and the NESDIS CBU at Fairmont, WV. These facilities provide power and cooling to the satellite ground systems uninterrupted 24 hours per day, 365 days per year.

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Department of Commerce
National Oceanic and Atmospheric Administration
Mission Support
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $266,203,000 and 703 FTE/ 748 positions for Mission Support, including a net decrease of $37,537,000 and 11 FTE/11 positions in program changes.

In FY 2020, Mission Support will continue to provide the services that are essential to the safe and successful execution of NOAA's Mission.

The Mission Support budget is organized into five activities within the Operations, Research and Facilities (ORF) account.

- Executive Leadership provides centralized executive management as well as policy formulation and direction.
- Mission Services and Management includes such activities as financial reporting, budgeting, information technology, acquisition and grants, human resource services, and facilities management.
- IT Security leads priority cyber security initiatives.
- Payment to the DOC Working Capital Fund provides centralized services to NOAA's Line Offices and Staff Offices.
- Office of Education provides expert support of education activities to NOAA Line, Program, and Staff Offices while promoting NOAA services and products and their benefits to the public.

The Mission Support budget is organized under one activity within the Procurement, Acquisition, and Construction (PAC) account: NOAA Construction provides for restoration of capital assets including alteration or modification of properties.

Significant Inflationary Adjustments:

Calculated Adjustments
NOAA's FY 2020 Base includes a net increase of $5,400,000 and 0 FTE/0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for Mission Support activities. This includes the estimated 2020 military pay raise of 2.1 percent as well as inflationary increases for labor and non-labor activities including benefits and rent charges from the General Services Administration (GSA).

Technical Adjustments
NOAA's FY 2020 Base includes a technical adjustment of $6,127,000 and 0FTE/0 positions to account for the full payment to the Department Working Capital Fund in FY 2020.

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Department of Commerce Enterprise Services Initiative:
Department of Commerce's leadership established the Enterprise Services Office (ESO) to improve customer service and enhance the delivery of the Human Resources, Acquisition Services, Financial Management and Information Technology functional areas with Human Resources (HR) being the first functional area to transition to the Enterprise Services model. In late FY 2016, NOAA began a transition to an Enterprise Services model in concert with the Department to streamline the delivery of human resources services. This new delivery model and approach outsources HR clerical and transactional tasks, such as Personnel Action Requests (PAR), staffing, recruitment, classification, separations, compensation and benefits. The transition has allowed NOAA's Office of Human Capital Services (OHCS, formerly Workforce Management Office) to shift focus and develop expertise to provide strategic workforce planning and solutions to the NOAA Line and Staff Offices. In FY 2020, OHCS will continue to provide NOAA with expert consultative services in the areas of executive resources management, labor and employee relations, administrative investigations, quality assurance, program performance, detailed HR data modeling and analytics, employee and labor relations, retirement counseling and benefits, personnel mentoring, and workplace violence prevention and response support. As a result, OHCS will focus its efforts on implementing advanced strategic solutions that strengthen mission delivery and improve overall customer service.

Narrative Information:
Following this section are base justification materials and program change narratives by Activity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 7 and 12). Please contact NOAA if details for any of these changes are required.

Exhibit 10

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(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease From 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
MISSION SUPPORT (MS)											
Executive Leadership	Pos/BA	109	26,924	127	27,078	127	27,566	127	28,305	0	739
	FTE/OBL	108	27,402	119	27,078	119	27,566	119	28,305	0	739
Mission Services and Management	Pos/BA	549	140,490	600	148,000	600	150,452	600	154,712	0	4,260
	FTE/OBL	545	158,461	563	148,000	563	150,452	563	154,712	0	4,260
IT Security	Pos/BA	11	10,030	14	10,050	14	10,107	14	15,079	0	4,972
	FTE/OBL	11	10,247	14	10,050	14	10,107	14	15,079	0	4,972
Payment to the DOC Working Capital Fund	Pos/BA	0	58,641	0	53,585	0	62,070	0	62,070	0	0
	FTE/OBL	0	56,913	0	53,585	0	62,070	0	62,070	0	0
Office of Education	Pos/BA	21	34,263	18	28,500	18	28,545	7	1,039	(11)	(27,506)
	FTE/OBL	21	34,496	18	28,500	18	28,545	7	1,039	(11)	(27,506)
TOTAL MISSION SUPPORT - ORF	**Pos/BA**	**690**	**270,348**	**759**	**267,213**	**759**	**278,740**	**748**	**261,205**	**(11)**	**(17,535)**
	FTE/OBL	**685**	**287,519**	**714**	**267,213**	**714**	**278,740**	**713**	**261,205**	**(11)**	**(17,535)**
TOTAL MISSION SUPPORT - PAC	**Pos/BA**	**1**	**31,846**	**0**	**25,000**	**0**	**25,000**	**0**	**4,998**	**0**	**(20,002)**
	FTE/OBL	**1**	**9,410**	**0**	**25,000**	**0**	**25,000**	**0**	**4,998**	**0**	**(20,002)**
Spectrum Relocation Fund - ORF	**Pos/BA**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	0
	FTE/OBL	**6**	**1,874**	**0**	**1,956**	**0**	**19,520**	**0**	**19,520**	0	0
Spectrum Relocation Fund-PAC	**Pos/BA**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**2**	**69,133**	**0**	**65,770**	**0**	**32,601**	**0**	**32,601**	**0**	**0**

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Spectrum Efficient National Surveillance Radar - ORF	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**12,459**	**0**	**1,549**	**0**	**0**	**0**	**0**	**0**	**0**
Spectrum Pipeline - ORF	**Pos/BA**	**0**	**12,013**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**6,403**	**0**	**5,840**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL MISSION SUPPORT	**Pos/BA**	**699**	**314,207**	**759**	**292,213**	**748**	**303,740**	**748**	**265,213**	**(11)**	**(37,537)**
	FTE/OBL	**694**	**386,798**	**714**	**367,328**	**714**	**355,861**	**713**	**317,334**	**(11)**	**(37,537)**

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Activities: Executive Leadership, Mission Services and Management, IT Security Payment, to the DOC Working Capital Fund and Office of Education

Goal Statement

The objectives of these Mission Support activities are to: 1) develop policies regarding the administration of NOAA programs with Federal agencies, the Congress, and private industry; and 2) develop and implement policy, planning, and program oversight.

Base Program

NOAA's Mission Support services are the backbone of NOAA's programs and mission. These services provide the planning, administrative, financial, procurement, information technology, human resources, and infrastructure services that are essential to the safe and successful execution of NOAA's mission.

Statement of Operating Objectives

Schedule and Deliverables:

AGO

- Continue efforts to decrease backlog of required contract closeouts
- Continue to track fees generated against fee projections (cumulative total including fee for service, NOAALink and ProTech)
- Strengthen alignment of acquisition resources to NOAA program requirements
- Increase AGO/Program Office engagement early in the acquisition/grants lifecycle

OCAO

- Implement near-term actions as informed by the Housing Plan for the Silver Spring Metro Center campus
- Continue implementation of the NOAA Asset Management Program to support data driven decision making
- Maintain, and possibly increase, focus on timely resolution of commercial leases
- Institute governance best practices to increase transparency and enhance cross Line Office buy-in of strategic planning initiatives

- Continue the safety culture that has been established at NOAA over the past four years
- Successfully execute construction and repair projects on time and within budget
- Complete inventory of NOAA facilities and their status, operations and maintenance costs, and activities and programs supported, and use this to develop a NOAA-wide facilities plan (FY 2019)

OCFO

- Go live with the new Commerce Business System (CBS) architecture (complete technology refresh in FY 2020)
- Finalize possible solutions to streamline and standardize CBS across NOAA
- Continue to deliver DOC Strategic Planning and Performance elements ahead of schedule
- Execute at least one major economic reporting product (e.g. NOAA by the numbers, NOAA's Contribution to the U.S. Economy and Economic Reporting System –ERS)

OCIO

- Incorporate machine learning and automation into Security Operations
- Expand NOAA's enterprise network to achieve economic efficiencies and increased reliability
- Establish a sustainable relationship with industry to provide enhanced, cloud-based access to NOAA's environmental data
- Continue to increase utilization of the cloud

OHCS

- Mature and broaden use of HRConnect (HR IT system) throughout NOAA to conduct transactional HR services and provide data-in-depth for detailed HR analytics
- Continue to implement a Full Service HR Model
- Continue transformation of OHCS to provide strategic HR services
- Complete the transition of talent acquisition (staffing and recruitment services) to Enterprise Services to Support NOAA

OED

- Advance education both within NOAA and with the public we serve
- Provide scholarships and collaborate with universities to prepare the brightest minds from diverse backgrounds in NOAA-related fields

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- Offer competitive grants and establish partnerships to integrate NOAA science into schools and organizations
- Coordinate educational activities across NOAA and with external partners to ensure that these efforts are effective and continually improved

Explanation and Justification

Comparison by subactivity		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Program Personnel	2020 Base Program Amount
Executive Leadership	Pos/BA	109	26,924	127	27,078	127	27,566
	FTE/OBL	108	27,402	119	27,078	119	27,566
Mission Services and Management	Pos/BA	549	140,490	600	148,000	600	150,452
	FTE/OBL	545	158,461	563	148,000	563	150,452
IT Security	Pos/BA	11	10,030	14	10,050	14	10,107
	FTE/OBL	11	10,247	14	10,050	14	10,107
DOC Working Capital Fund	Pos/BA	0	58,641	0	53,585	0	62,070
	FTE/OBL	0	56,913	0	53,585	0	62,070
Education	Pos/BA	21	34,263	18	28,500	18	28,545
	FTE/OBL	21	34,496	18	28,500	18	28,545
Total Mission Support	Pos/BA	690	270,348	759	267,213	759	278,740
	FTE/OBL	685	287,519	714	267,213	714	278,740

Executive Leadership

Executive Leadership supports the leadership and management of NOAA, and represents NOAA at the executive level with other Federal agencies, Congress, NOAA stakeholders, and private industry.

The Offices of the Under Secretary/Assistant Secretary and Deputy Under Secretary (USAO): These offices support NOAA's leadership. Program activities consist of formulating and executing policies for achieving NOAA objectives, responding to Executive Branch policy decisions, and exercising delegated authority in committing NOAA to courses of action. USAO also includes the following offices:

Office of Legislative and Intergovernmental Affairs (OLIA): This office serves as the primary liaison for NOAA with the members and staff of Congress. The office is responsible for the planning, direction, and coordination of legislative programs that are of immediate concern to the Office of the Under Secretary.

Office of Communications and External Affairs: This office is the principal point of contact for NOAA programs with the public and the news media. Its staff advises NOAA and other Departmental officials on all aspects of media relations and communication issues.

Office of International Affairs (OIA): This office coordinates NOAA and other leadership officials' relationship's with international programs, as directed by the Office of the Under Secretary. The Director of the Office of International Affairs exercises a leadership role in establishing policies, guidelines, and procedures for NOAA's international programs.

Office of the Federal Coordinator for Meteorology (OFCM): This office establishes procedures for systematic and continuing review of national basic specialized meteorological and oceanographic requirements for services and supporting research. It also brings Federal agencies concerned with international activities and programs in meteorological and oceanographic programs into close consultation and coordination.

Office of General Counsel (OGC): OGC provides legal advice, review, and representation on a host of complex matters arising from the fulfillment of NOAA's mission. NOAA OGC ensures NOAA management decisions are made with necessary consideration of proper legal requirements, procedures, and options.

Mission Services and Management

Mission Services and Management is the mission-enabling arm of NOAA that supports all operational activities and is essential to its success.

Acquisition and Grants Office (AGO): AGO provides high-value services to NOAA Line and Staff Offices, compliant with laws and regulations, on time, and at the best value to the government through the planning, solicitation, award, administration, and closeout of nearly 25,000 acquisition and financial assistance transactions annually. NOAA's ability to accomplish its mission and achieve its

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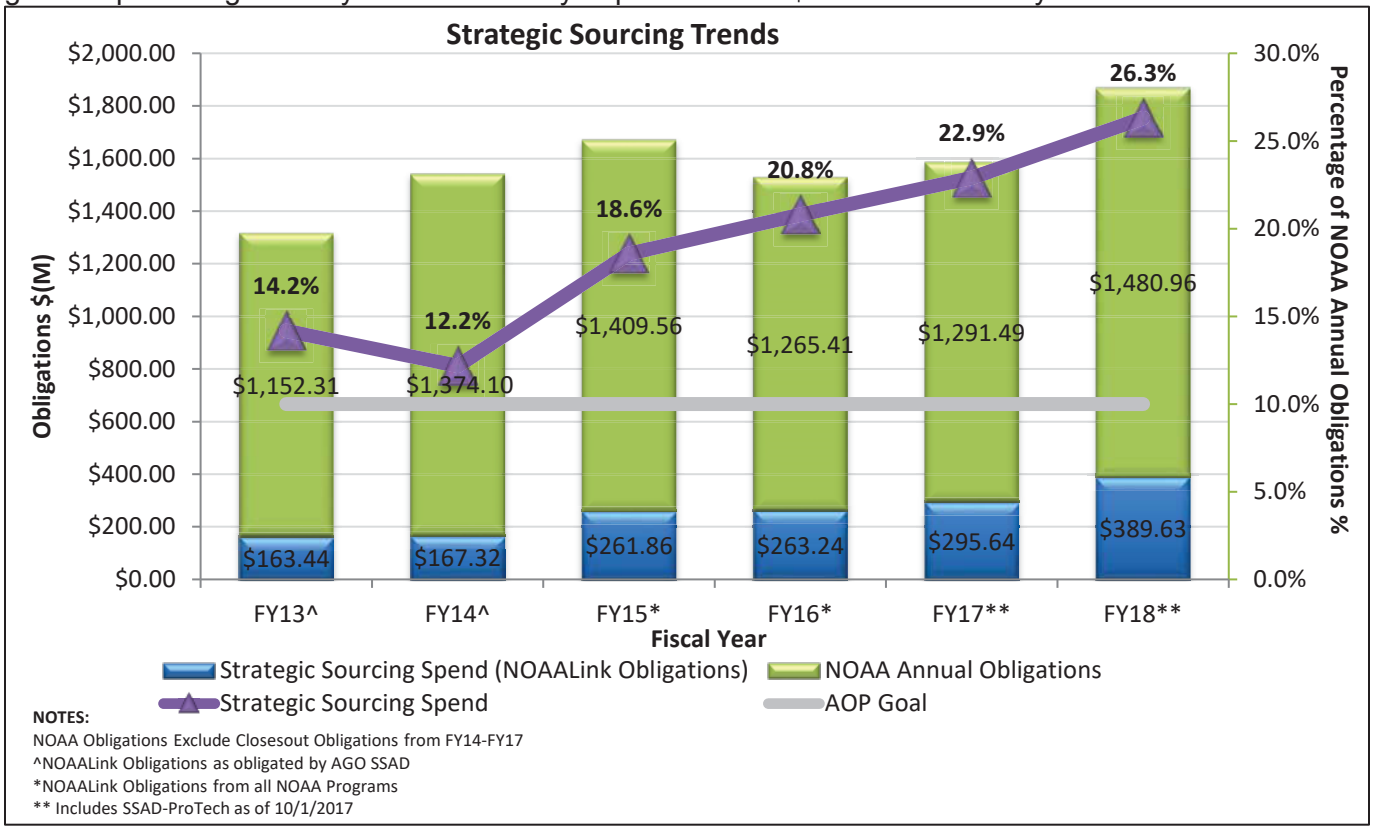
goals depends significantly on AGO's ability to process over $2.5 billion annually in accordance with statutory and regulatory requirements. In FY 2018 for example, over 11,000 acquisition transactions were executed to obligate $1.481 billion and manage 4,300 active contracts. In addition, AGO executed nearly 4,000 financial assistance transactions to award $1.062 billion and managed over 500 active grants. NOAA also successfully executed over 9,000 closeout actions.



In addition, NOAA continued its strong support of small businesses in FY 2018, obligating approximately $745 million out of $1.4 billion to small businesses equating to a 52.1 percent overall small business achievement for the year. AGO also continued to place emphasis on NOAA's two key strategic sourcing initiatives, NOAALink program and ProTech Acquisition Initiative, to improve efficiency and reduce costs. In FY 2018, 26 percent of NOAA dollars were awarded via strategic sourcing vehicles.

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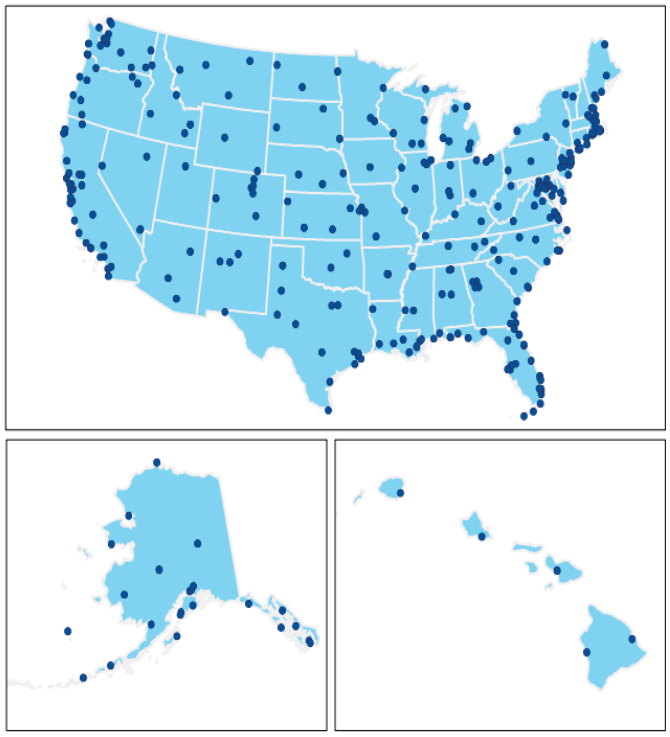
Office of the Chief Administrative Officer (OCAO):
The national scope of NOAA's mission requires a diverse portfolio of geographically distributed facilities. OCAO supports NOAA-wide activities by managing assets in terms of risk and maintenance, and ensuring efficient use of government resources. OCAO administers a real property portfolio of more than 665 properties in 160 markets, including 401 NOAA-owned facilities with an estimated replacement value of $3 billion; and administers a personal property portfolio of approximately 186,000 personal property assets valued at over $8.7 billion. OCAO manages the Safety and Occupational Health program, coordinates security and anti-terrorism risk protection, and ensures best business practices around records and financial controls.



Current NOAA Footprint

NOAA recently launched the NOAA 2030 Footprint initiative to develop and implement best practices in facilities management. The initiative consists of three major projects: developing and implementing a Strategic Facilities Master Plan for 2030; consolidating four locations around the National Capital Region into NOAA Headquarters in Silver Spring, MD; and implementing asset management tools to track facility capabilities, condition and readiness. In FY 2018, OCAO improved NOAA's capability to manage, prioritize, and make decisions to address the strategic priorities of the NOAA footprint. Through the creation of a Facility Program Office (FPO) and governance by the Senior Facility Council (SFC), NOAA is able to better align facility capability to mission, minimize redundancy and costs, and leverage technology and modern workplace attributes while continuing to support community presence and strategic partnerships. In FY 2018, NOAA completed a facilities enterprise baseline, footprint framework, and regional opportunities analysis as steps towards the Strategic Facilities Master plan. In FY 2019, NOAA initiated a pilot regional analysis of the Northwest and Alaska as the first of several regional studies that will inform the master plan.

NOAA is working to improve the quality and accuracy of real property data on NOAA-owned facilities by conducting additional facility condition assessments (FCAs) and continuing implementation of the US Army Corps of Engineers BUILDER™ Sustainment Management System. The NOAA

Asset Management Program (AMP) has imported all available digital data into BUILDER and created a configuration control board responsible for formulating business rules.

Additionally, NOAA created standardized processes for how and what real property data is collected and awarded a contract to validate the data on seventy-five percent (1.8 million gross square feet) of NOAA's owned properties. Upon full implementation and data validation, NOAA will have a repeatable, traceable, and accurate owned facility data set. With this information NOAA executives will make data-driven decisions to best utilize limited resources to sustain its mission-critical footprint.

Office of the Chief Financial Officer (OCFO): OCFO serves as NOAA's principal financial manager. NOAA has annual appropriated resources of almost $6 billion and recorded capital asset value in excess of $7 billion. OCFO is responsible under the CFO Act to provide the leadership necessary for NOAA to obtain an annual 'unqualified opinion' on the audit of its consolidated financial statements. The areas under the direction of the OCFO are the Budget Office, the Finance Office, Performance, Risk and Social Science Office (PRSSO), the DOC Working Capital Fund (WCF), Common Services and the NOAA Direct Bill. The Budget Office provides oversight, management, outreach and communication of the budget process, which includes coordinating the preparation of budget submissions, and allocating and controlling the execution of all budgetary resources. The Finance Office ensures that the consolidated financial statements and reports are accurate, manages and operates the financial management system, and is responsible for the timely payment of bills. The PRSS Office leads and deploys best practices from social science integration and enterprise performance and risk management to advance NOAA's mission.

DOC Accounting System (CBS application): The CBS application requires that the application (along with associated interfaces and feeder systems) be operated, maintained, and enhanced. Changes to the system need to be tested to ensure that integrity, availability, and confidentiality are maintained within the context of a secure application environment. The CBS user community (which consists of over 10,000 users across the agency) requires ongoing helpdesk services and training. Ongoing maintenance and support of CBS allows NOAA to maintain compliance with legal, regulatory and executive requirements such as the OMB Circular A-123 and the Federal Information Security Management Act (FISMA) and allows NOAA managers to have access to financial data necessary to make informed decisions. CBS system components have reached end of life and NOAA is taking mitigating actions in the interim such as extending maintenance agreements and identifying other technical alternatives to continue operations until the hardware upgrades can be completed. NOAA is in the process of upgrading the existing CBS technical architecture (i.e., hardware, system software, supporting infrastructure) to ensure the operability of CBS through FY 2025. CBS no longer has a planned "retirement" date and therefore, budget planning must include updating the technical architecture and supporting application software components (i.e., Oracle

products, Tibco, etc.) through FY 2025. In addition, enhancements to CBS are required to maintain compliance with evolving federal financial management mandates (i.e., G-invoicing, etc.).
Common Services (CS) account: The Common Services account supports the NOAA CFO in providing resources for NOAA-wide activities and services provided through the DOC and other agencies through Memoranda of Understanding (MOU) and/or Interagency Agreements (IA). CS funds the Departmental Management Advances and Reimbursements (A&R) accounts providing a centralized funding source for special services and tasks provided by the DOC; off-site health services at the Census Bureau Health Unit; OPM USAJobs portal usage and maintenance; and other miscellaneous services and products.
NOAA Direct Bill Process: The NOAA Direct Bill process enables NOAA Line and Staff Office service providers to assess other Line and Staff Offices for their proportionate share of the costs of enterprise-wide programs or services. Direct Bill proposals are only for unique services/products that provide an enterprise-wide benefit or that consolidate funding for enterprise solutions.

Office of the Chief Information Officer (OCIO): NOAA OCIO's operating model is focused on service delivery, customer support, innovation, and security with a mission to provide a secure and agile information enterprise with advanced computing capability that propels NOAA's scientific and operational missions. The cornerstone of the operating model is delivering shared enterprise information services through technology advancements including cloud computing, mobile devices, and big data. OCIO provides the enterprise IT infrastructure that connects and manages networks, telecommunications, systems, and people to enable NOAA to provide data observation, ingestion, assimilation and modeling, processing, dissemination, and archiving capabilities at greater scales. NOAA OCIO has established four organizational goals: (1) advance the mission using innovative IT; (2) protect the mission; (3) achieve excellence in IT service delivery; and (4) enable the IT workforce. During FY 2018, OCIO provided cloud-based access to NOAA's environmental data and extended the Big Data Project Cooperative Research and Development Agreement (BDP CRADA) experiment for an additional year through May 2019; over 40 NOAA datasets have been made available to industry and the public through to the BDP CRADA partners' cloud platforms, an increase of more than 34 from FY 2017. OCIO is actively exploring options with industry for sustaining this partnership in operations. OCIO improved customer satisfaction and productivity by increasing collaboration tool utilization, and focused resources on modernizing and streamlining IT systems to protect against cyber-attack, equipment malfunctions, or natural disasters. OCIO's Homeland Security Program led NOAA's participation in a National Level Exercise (called *Eagle Horizon*), to showcase NOAA's incident preparedness, response, and readiness, test continuity of operations (COOP) during a mock natural disaster, and examine and validate core capabilities nationwide across preparedness mission areas. OCIO's Research and Development (R&D) High Performance Computing (HPC) program implemented the final phase of HPC recapitalization at Oak Ridge National Laboratory, doubling the existing storage available for scientific experimentation.

Office of Human Capital Services (OHCS): OHCS provides human capital policies, programs, consultative services, and processes that facilitate the acquisition, development and retention of a diverse, highly skilled, motivated, and effective workforce capable of accomplishing the Agency's mission. This office provides NOAA's human capital functions including strategic human capital planning, labor-management and employee relations, accountability and quality assurance, performance management and incentive awards, executive resources, leadership development, training and career development, personnel mentoring, human resources data management, and HR information technology systems. OHCS also oversees all HR functions including staffing, classification, recruitment and hiring actions, personnel action request processing services, and compensation and benefits provided by the Department's new Enterprise Services model of human resources delivery which was initiated in FY 2016 Q4 and will be fully implemented in FY 2020. These enterprise services to provide transactional support were outsourced to provide focused, efficient and cost-effective products and services to NOAA organizations and employees. OHCS has implemented the NOAA Strategic Human Capital Management Plan; engaged new vendors and partners and provided detailed and improved workforce planning support; adopted new technologies and features including those embedded in HR Connect (a multi-faceted human capital transactions software application supporting all of NOAA), and chairs the NOAA Human Resource Directors' Advisory Committee (HRDAC) to provide close coordination with each Line and Staff Office regarding all HR matters. Each of these achievements has provided improved transparency of human capital actions and greater consistency of services while 1) capitalizing on economies of scale and efficiency and 2) improving the quality of services provided. OHCS has also taken distinct actions to improve employee and labor relations for NOAA to include supporting the National Weather Service to renegotiate the 2001 National Weather Service/(National Weather Service Employee Organization Collective Bargaining Agreement and eliminate a large historical backlog of inquiries from employees based on allegations of harassment.

In FY 2020, NOAA will continue to charge customers (Line and Staff Offices) directly for HR transactional services provided by the Enterprise Services model. Simultaneously, OHCS will continue to implement and mature its robust consultative services approach to provide human capital expert advisors dedicated to individual Line and Staff offices to ensure mission alignment, unity of purpose and customer satisfaction. In addition, OHCS will continue to mature specific centers of expertise initially organized in FY 2017 to advance strategic and practical developments in workforce strategy, performance culture and learning, and human resource analytics to support all of NOAA. OHCS will also expand its NOAA-wide mentoring program.

Office of Inclusion and Civil Rights (OICR): In FY 2018, the Office of Civil Rights, a division under the Office of the Chief Administrative Officer, was officially reorganized as an independent staff office and renamed the Office and Inclusion and Civil Rights (OICR). The office was realigned and renamed to reflect the addition of Agency-wide responsibilities pertaining to Diversity and Inclusion (D&I), and to reflect the strategic importance of the office to the agency's mission. The newly formed Office of Inclusion and

Civil Rights is responsible for ensuring NOAA-wide compliance with Equal Employment Opportunity (EEO) and Civil Rights laws, regulations, executive orders, and policies that prohibit discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, and genetic information. This includes the processing of informal EEO complaints and ensuring NOAA complies with any findings or and sanctions from the U.S. Equal Employment Opportunity Commission (EEOC) or federal courts. Additionally, OICR is now responsible for developing an Agency-wide D&I program and overseeing affirmative employment initiatives. OICR's mission is to ensure that D&I is a business priority for the Agency that becomes ingrained into NOAA's organizational culture leading to the establishment of the Agency as an Employer of Choice. To accomplish this goal OICR is responsible for providing advice and counsel to Agency leaders regarding D&I issues, developing and providing D&I training, conducting outreach activities to underrepresented groups, organizational climate assessments, and barrier analyses to identify and remove any barriers to hiring, promoting, and retention within the Agency. OICR also plays a pivotal role in the Agency's efforts to prevent Sexual Assault and Sexual harassment.

OICR employs six EEO counselors who together process approximately 155 informal EEO cases and with an average of about 55 of those cases resulting in a Formal filing with the Department of Commerce each year. Approximately 93 percent of all informal EEO complaints are processed timely within regulatory deadlines. During FY 2019, OICR will continue seeking innovative methods to make progress towards meeting all EEO standards and improve its efficiency in complaint processing. OICR leadership continues to meet with senior leaders for all line and staff offices on a quarterly basis to discuss and proactively address EEO/D&I issues. To promote D&I and cultural awareness, each year OICR holds eight special observance programs and hosts a D&I Summit. The D&I Summit attracts approximately 350 managers, supervisors and staff in attendance. OICR also identifies and deploys D&I best practices list to continue to promote D&I Agency-wide. In FY 2018, OICR began to conduct Organizational Climate Assessments, a proactive tool that evaluates interpersonal relationships and workgroup dynamics in an effort to identify issues that may directly impact organizational effectiveness. In FY 2019, OICR plans to continue to build out the program and promote the use of these assessments. From an outreach perspective, OICR ensured NOAA had a significant presence at a number of affinity group conferences including the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), Black Engineer of the Year Awards (BEYA) and the Woman of Color STEM Conference. OICR intends to maintain and expand NOAA's presence at these events and others like it to assist with increase minority representation within NOAA's workforce. OICR is committed to establishing NOAA as an Employer of Choice and in FY 2019 intends to continue to enhance and create new programs to expand its D&I portfolio and further this goal and achieve the mission of the Agency.

Workplace Violence Prevention and Response Program: The Workplace Violence Prevention and Response Program was created to comply with two separate laws; the 2015 Congressional mandate (33 U.S.C § 893) and the 2016 National Defense Authorization Act (NDAA) for the fiscal year 2017 sections 3542-3547 (Actions to Address Sexual Assault at NOAA). These

mandates directed NOAA stand up a Workplace Violence Prevention and Response Program manager who would develop comprehensive services for victims of sexual assault and sexual harassment (SASH) for all NOAA employees, contractors, and affiliates. This dictates that there be full-time victim advocates for the agency and collateral victim advocates across NOAA by region. The program also develops comprehensive and centralized prevention for all of NOAA employees; tracks incidents and cases of workplace violence and coordinates the annual congressional report; provides ongoing consultation to leadership; and coordinates the development of the workplace violence prevention plan, which creates goals to be reviewed biannually.

Within NOAA, a portion of resources currently allocated within each Line Office is assessed to support the program. In FY 2020, NOAA will ensure sufficient resources are allocated to ensure a safe workplace for all NOAA staff. These funds will support multiple contracts for prevention, response, and consultation services; development of full-time victim advocates (4-5 FTE) across the NOAA regions to comply with Congressional mandate; development of (20-40) part-time victim advocate liaison; ongoing prevention initiatives and the 2020 workplace violence summit; a dedicated hotline for SASH response services; development of toolkits for employees and management; a workplace violence website and marketing materials; maintenance of the Rape, Abuse & Incest National Network (RAINN) contract; continued grant assistance to the National Academies of Sciences, Engineering and Medicine; continuing education funds; and travel costs for the annual victim advocate summit.

IT Security

The mission of the IT Security Program is to defend NOAA's data, networks, equipment, intellectual property and personnel against a wide variety of adversaries ranging from nation states to lone-wolf attackers. Successful attacks by adversaries could negatively impact NOAA's ability to keep nearly 330 million Americans, as well as others, safe and informed of weather, environmental, and other events with widespread economic impact. Additionally, with NOAA's reliance on information systems and data connected to the Internet, cyber-espionage is an effective, low-cost, low-risk way to compromise data and information products and services.

NOAA's interconnected nature presents significant risk to IT infrastructure components and data. OCIO implements NOAA's IT Security Program through a risk-based approach that emphasizes vulnerability management to achieve defense in depth via a common prevention, response, and mitigation strategy to manage mission risk related to cyber security threats. The total number and the sophistication of attempts against NOAA systems increases year by year (420 billion events in FY 2014 to an estimated 1.4 trillion events in FY 2017) and is not likely to decrease in the foreseeable future. Over the last three years every measure used to estimate threat such as events, incidents, and our attack surface (expressed as the number of systems being monitored) has

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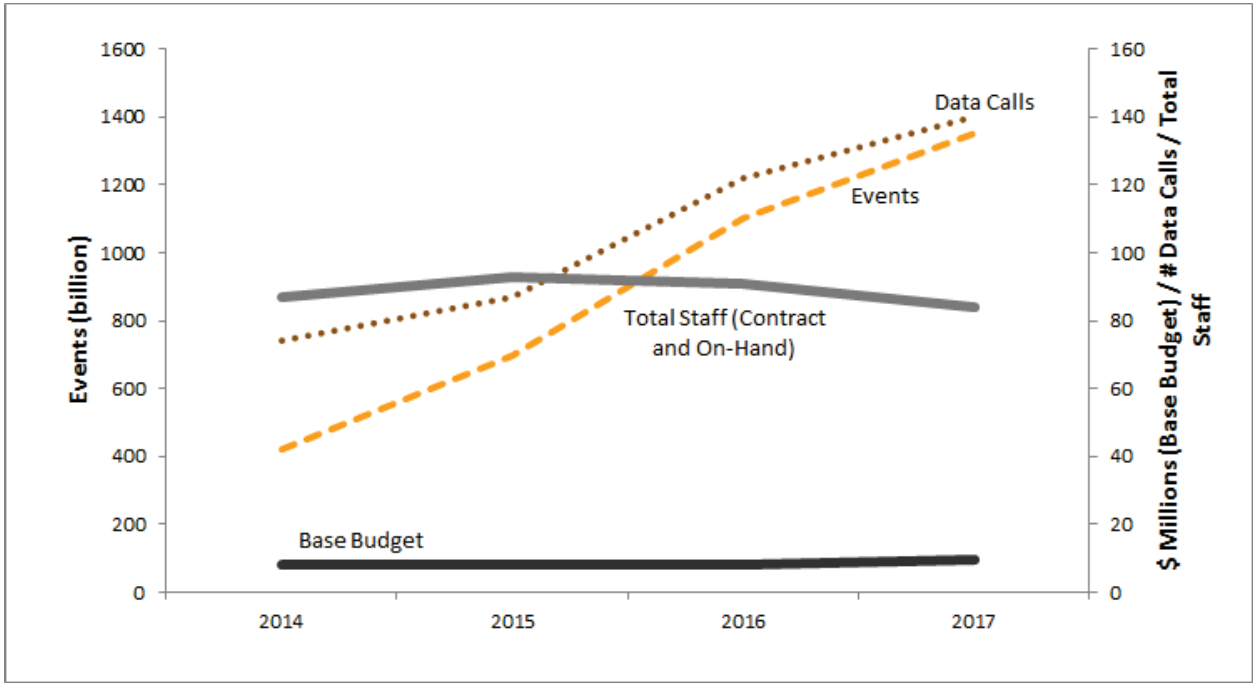
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)



increased (see chart). Over this same period, although efficiencies have been leveraged to address this delta, the base budget for the IT Security Program has remained essentially flat.

Current high-priority risks include: insider threat, inadequate network segmentation, increasing activity by national/international/non-state adversaries, highly sophisticated social engineering attacks, advanced persistent threats, botnets, and precision-targeted malware (including ransomware). Future trends influencing the IT Security Program include the use of the Internet of Things (IoT) to support attacks, an "arms race" in the use of artificial intelligence by attackers and defenders, additional legislation and regulation driven by high-profile data breaches, and competing demands to improve NOAA's security posture while simultaneously decreasing program costs. Major initiatives include improving system segmentation to limit adversaries from traversing from external facing systems to internal resources, full monitoring of all NOAA end points, improving the quality of enterprise IT security services and the implementation of all five phases of the DHS Continuous Diagnostic Monitoring Program.

During FY 2018, the IT Security Program continued its efforts to increase the efficiency of base-level functionality, which resulted in significantly increased visibility into defending the NOAA networks and systems. This included building out our sensors so more NOAA systems are sending information to our centralized network defense systems, better integration of cyber threat intelligence, and better processes and procedures to use this data. One particularly significant accomplishment involved dramatically improving perimeter protection for NOAA by fully activating all five Trusted Internet Connection Access Providers (TICAPs). The IT Security

Program also completed and issued a FY 2018-2022 Cybersecurity Roadmap, which sets forth an ambitious plan for NOAA to move from a compliance-based program to one that is risk-based, while also implementing a full suite of effective enterprise IT services. The Roadmap will be a primary driver for FY 2020 IT Security Program activities, and includes acquiring and implementing a Common Operating Picture (COP) capability to share information across the enterprise on current and future threats. Additionally, in response to OMB, DHS, DOC, and NIST policies and recommendations, the NOAA OCIO plans to continue focusing its resources on protecting US intellectual property, defending against insider threats, and bolstering Data Loss Prevention capabilities. All of these initiatives will promote NOAA's mission of knowledge and information sharing for the American people and the protection of lives and property everywhere.

Payment to the Department of Commerce (DOC) Working Capital Fund (WCF)

The DOC WCF provides centralized services to NOAA's Line and Staff Offices in the most efficient and economical manner. Organizational units within DOC provide the administrative, legal, information technology, financial, and policy support needed to accomplish NOAA's overall mission. The WCF was established pursuant to 5 USC 607 (15 USC 1521). Unlike other DOC bureaus, the NOAA contribution to the WCF is provided by specific allocation within the NOAA appropriation.

Office of Education

The Office of Education (OED) provides advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education, coordinates education activities throughout NOAA through the NOAA Education Council and represents the Agency in inter-agency education initiatives. The office fosters American competitiveness in science, technology, engineering, and mathematics (STEM) by providing quality educational opportunities for the next generation, including competitive scholarships, internships and professional training for post-secondary students. The Office of Education also supports Educational Partnership Program with Minority Serving Institutions (EPP/MSI) grants, Ernest F. Hollings (Hollings) Scholarships, Competitive Education Grants, and the Bay-Watershed Education and Training Program.

Educational Partnership Program with Minority Serving Institutions: EPP/MSI provides financial assistance, through competitive processes, to students and MSIs that train students and conduct research in NOAA mission sciences. The program's goal is to increase the number of students, particularly from underrepresented groups, who are trained and earn degrees in sciences directly related to NOAA's mission. Long term goals of the program include increasing the diversity of the STEM and NOAA workforce and fostering American competitiveness in STEM fields. Among EPP's accomplishments:

- Over 2,300 degrees granted to higher education students in NOAA mission fields since 2001
- Approximately 75 percent of graduates are from underrepresented minority groups
- 349 PhDs granted in NOAA mission disciplines
- 305 students in NOAA mission fields currently in the pipeline

EPP/MSI website: http://www.noaa.gov/epp

Ernest F. Hollings Scholarship Program: The NOAA Hollings Scholarship Program is a competitive program that increases undergraduate training in oceanic and atmospheric sciences, research, technology, and education. The Hollings Scholarship Program catalyzes scientific research, improves environmental literacy and fosters American competitiveness in STEM fields. It recruits and prepares students for careers with NOAA and other natural resource and science organizations at the Federal, state and local levels of government, in academia and the private sector, as well as careers as science and environmental educators in the United States.

Based on the FY 2020 Request of $4.47 billion, NOAA estimates it will have $4.47 million for scholarships. For more information, please visit the Hollings Scholarship website: http://www.noaa.gov/hollings

Competitive Education Grants: NOAA's Competitive Education Grants program is the longest standing and most comprehensive national grants program focused on environmental literacy. This program improves and expands the learning, understanding, and application of Earth systems science and advances science, technology, engineering, and mathematics (STEM) education. Multi-year grants and cooperative agreements are competitively awarded to a variety of educational institutions and organizations within the United States to support formal, informal, and community education projects and programs aligned with NOAA's mission. Competitive Education Grants accomplishments include the following:

- $72 million provided through 133 awards since the program's inception in 2005.
- In FY 2018, more than 145 institutions advanced NOAA's mission to enhance awareness and understanding of Earth systems science through NOAA-supported formal (K-12) and informal education initiatives that both inspire and prepare people to make the best social, economic, and environmental decisions.
- In FY 2018, more than 45 million people visited institutions hosting NOAA-supported exhibits and/or programs (including NOAA Science On a Sphere®) designed to increase their knowledge of the systems of the natural world and ability to use scientific evidence to make informed decisions regarding environmental issues.
- In FY 2018, more than 250,000 youth and adults participated in NOAA-supported, informal education programs that enhance ecosystem stewardship and promote informed decision making.

- In FY 2018, more than 2,000 educators participated in NOAA-supported professional development programs using evidence-based practices conveying Earth systems science in compelling and relevant ways.

Bay-Watershed Education and Training (B-WET): B-WET is an environmental education program that promotes locally relevant, experiential learning in the K-12 environment through competitive funding that promotes Meaningful Watershed Educational Experiences (MWEEs). B-WET currently serves seven areas of the country: California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawai'i, New England, and the Pacific Northwest. B-WET accomplishments include the following:

- B-WET grants reached approximately 70,000 students and 2,500 teachers in 2018 through 159 new and continuing awards.
- Since the program's inception in 2002 NOAA has awarded over $90 million to support more than 700 projects.
- B-WET has created a cross-region, internal evaluation system to monitor program implementation and outcomes on an ongoing basis. Results are shared with grantees and applicants to help promote best practices for Meaningful Watershed Educational Experiences.

PROGRAM CHANGES FOR FY 2020:

NOAA requests a net decrease of $17,535 and 11 FTE/11 positions in FY 2020 program changes for these Activities. Following this section are program change narratives for these Activities that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 7).

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Mission Services and Management	Pos./BA	600	150,452	600	152,452	0	2,000
	FTE/OBL	563	150,452	563	152,452	0	2,000

Silver Spring Metro Center (SSMC) Consolidation (+$2,000, 0 FTE/0 Positions) – NOAA's National Capital Region (NCR) footprint for corporate, line office, and program headquarters includes a substantial and primary presence in Silver Spring, MD. Space in Silver Spring includes four office buildings in the Silver Spring Metro Center (SSMC) campus as well as outlying space nearby that houses the Office of Marine and Aviation Operations. NOAA also maintains a presence for select leadership and staff office functions at the Department of Commerce Herbert C. Hoover Building (HCHB) in Washington, DC. Additionally, the NOAA Finance Office in the Office of the Chief Financial Officer resides in Germantown, MD, approximately twenty miles away. As a result of this proposal, NOAA will begin consolidating these four capital area sites into one primary NCR location, the SSMC campus.

NOAA recognizes an opportunity to bring staff together within the NCR that will reduce operating costs, and provide a modern office environment to attract and retain the agency's workforce by consolidating office space into the SSMC campus. Hundreds of additional staff can be accommodated within the existing SSMC campus through consolidation and renovation. Space at HCHB in particular commands a substantial premium in rent costs over the Silver Spring campus. Rents at other locations are not as disparate, but the benefits of collaboration, use of amenity spaces and services in the campus, and closer working relationships between organizations provide substantial benefits in performance and long-term employee satisfaction.

With the requested resources, NOAA will make an initial investment in FY 2020 to begin the move of the NOAA Finance Office from Germantown to Silver Spring. NOAA will identify and target additional moves from HCHB and other Silver Spring locations to the SSMC campus in FY 2020 and beyond. Resources will be used to consolidate existing staff within SSMC and build out reconfigured forward-looking spaces. Internal movements through consolidation in SSMC will allow the agency to realize efficiencies through space consolidation, comply with the DOC goal of 170 sq. ft. per person (includes employee offices and surrounding areas), and provide for an updated, modern workplace, with improved use of technology, that is attractive to the current and next generation of agency staff. Long-term, NOAA seeks to reduce its footprint by moving nearly all staff in these four areas to existing SSMC space while maintaining a much smaller presence for

Department of Commerce
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Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

visiting staff at HCHB. Once consolidated standards have been implemented, savings will continue indefinitely going forward allowing NOAA to focus resources on mission performance.

Schedule and Milestones:

- Initiate consolidation of Germantown, MD and other National Capital Region Area space to the Silver Spring Metro Center campus (FY 2020)

Performance Measures	2020	2021	2022	2023	2024
Reduce the SSMC Utilization rate (UR) to meet Department of Commerce policy of 170 square feet per person					
With Increase	260	200	180	170	170
Without Increase	260	255	245	235	235

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Mission Services and Management
Subactivity Mission Services and Management
Program Change: SSMC Consolidation

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	59,301	61,758	62,458	62,458	0
11.3	Other than full-time permanent	26	62	62	62	0
11.5	Other personnel compensation	1,151	1,240	1,240	1,240	0
11.8	Special personnel services payments	233	240	240	240	0
11.9	Total personnel compensation	60,711	63,300	64,000	64,000	0
12	Civilian personnel benefits	18,378	19,188	20,875	20,875	0
13	Benefits for former personnel	32	35	35	35	0
21	Travel and transportation of persons	932	1,100	1,126	1,126	0
22	Transportation of things	193	210	210	210	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	7,338	7,799	7,981	7,981	0
23.2	Rental Payments to others	190	210	210	210	0
23.3	Communications, utilities and misc charges	886	1,057	1,057	1,057	0
24	Printing and reproduction	95	191	191	191	0
25.1	Advisory and assistance services	20,514	15,856	15,856	16,356	500
25.2	Other services from non-Federal sources	34,854	25,709	25,566	26,566	1,000
25.3	Other goods and services from Federal sources	9,604	9,215	9,215	9,715	500
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,531	1,320	1,320	1,320	0
31	Equipment	3,123	2,652	2,652	2,652	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	72	158	158	158	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	7	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	158,460	148,000	150,452	152,452	2,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Mission Services	Pos./BA	600	150,452	600	152,869	0	2,417
and Management	FTE/OBL	563	150,452	563	152,869	0	2,417

Commerce Business System (CBS) (+$2,417, 0 FTE/0 Positions) -- NOAA requests an increase of $2,417 to support critical upgrades needed to NOAA's Commerce Business System (CBS) hardware and software. While the Budget proposes an investment in the Commerce-wide Business Application Solutions (BAS), NOAA must maintain CBS operability until these systems are developed and launched.

The current CBS hardware/software has reached end of life and migration off the outdated CBS architecture is required to maintain CBS operability. New CBS hardware/infrastructure was purchased in FY 2018 with configuration of the hardware and the migration of data to the new infrastructure planned for FY 2019. The CBS architecture must be refreshed in FY 2020 to ensure it continues to run on a vendor supported architecture. Additional funds are required to support the operations and maintenance of the new CBS architecture. Separate from the infrastructure refresh, NOAA's critical financial system reporting capability is no longer supported by the vendor and additional funds are required to transition the capability to another system. CBS availability is critical to NOAA's ability to record payments and obligations and to provide status of funds to NOAA program managers and executives. Without CBS, executing NOAA's mission and maintaining an unqualified audit opinion for NOAA and DOC would be impossible. Without sufficient funds, CBS continuity of operations would be significantly jeopardized and NOAA would not be able to comply with all legal, regulatory, and/or executive requirements.

Schedule and Milestones:

- Go live with the new Commerce Business System (CBS) architecture (complete technology refresh in FY 2020)

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Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Performance Measures	2020	2021	2022	2023	2024
Percentage of CBS architecture that has vendor supported maintenance required to maintain a clean financial audit opinion					
With Increase	100%	100%	100%	100%	100%
Without Increase	95%	60%	45%	25%	0%
Number of hours of unplanned CBS downtime for end users per year					
With Increase	< 8	< 8	< 8	< 8	< 8
Without Increase	16	40	80	120	200

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Mission Services and Management
Subactivity Mission Services and Management
Program Change: Commerce Business System (CBS)

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	59,301	61,758	62,458	62,458	0
11.3	Other than full-time permanent	26	62	62	62	0
11.5	Other personnel compensation	1,151	1,240	1,240	1,240	0
11.8	Special personnel services payments	233	240	240	240	0
11.9	Total personnel compensation	60,711	63,300	64,000	64,000	0
12	Civilian personnel benefits	18,378	19,188	20,875	20,875	0
13	Benefits for former personnel	32	35	35	35	0
21	Travel and transportation of persons	932	1,100	1,126	1,126	0
22	Transportation of things	193	210	210	210	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	7,338	7,799	7,981	7,981	0
23.2	Rental Payments to others	190	210	210	210	0
23.3	Communications, utilities and misc charges	886	1,057	1,057	1,057	0
24	Printing and reproduction	95	191	191	191	0
25.1	Advisory and assistance services	20,514	15,856	15,856	15,856	0
25.2	Other services from non-Federal sources	34,854	25,709	25,566	27,983	2,417
25.3	Other goods and services from Federal sources	9,604	9,215	9,215	9,215	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	1,531	1,320	1,320	1,320	0
31	Equipment	3,123	2,652	2,652	2,652	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	72	158	158	158	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	7	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	158,460	148,000	150,452	152,869	2,417

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
IT Security	Pos./BA	14	10,107	14	15,079	0	4,972
	FTE/OBL	14	10,107	14	15,079	0	4,972

Improve Cybersecurity Capabilities (+$4,972, 0 FTE/ 0 Positions) – NOAA has identified cybersecurity as a Tier 1 enterprise risk' the agency's models, data, and day-to-day functions are at significant risk of security compromise. Funding will establish an effective, NOAA enterprise-wide, Internal Risk Mitigation capability within NOAA's Cyber Security Program with the capability to deter, detect, and mitigate action by employees, contractors, or others, who may represent a threat to national security and NOAA's mission. The funding will also protect NOAAs mission to move data into the Cloud, and cloud services offer significant improvements in cost-effectiveness for many of NOAA's programs. There have been documented examples of NOAA data exfiltration to hostile powers or international competitors. The funding will enable NOAA to establish service contracts that provide cybersecurity staff to supplement NOAA Cyber Security Program federal staff to perform the following: benchmark current NOAA capabilities to Internal Risk Mitigation best practice, identify gaps, implement processes and tools, such as Data Loss Prevention (DLP) and Cloud Access Security Broker (CASB) solutions, to address the gaps, and provide ongoing User and Entity Behavior Analytics (UEBA) capability. The NOAA Cyber Security Program would have enhanced ability to identify and analyze anomalous behavior to protect against threats. NOAA's critical data and intellectual property (IP) would be better identified, employee interaction with that data would be baselined to assist in identifying potential unauthorized activities, NOAA would see improvements in monitoring of traffic for data exfiltration and insecure data transfer, and a number of important technical controls would be implemented. UEBA capabilities will provide protection for information in NOAA's physical data centers, as well as data hosted in the cloud. Current DLP tools only extend to the Google Apps for Government Unified Messaging System (UMS) and do not cover the gamut of data access and dissemination solutions in use at NOAA. A CASB solution that integrates with the NOAA Cyber Security Center will provide visibility for NOAA's multi-cloud environment and protect information from internal and external threats. A CASB solution will ensure security policies extend into the cloud environment and identify high-risk applications, high-risk information, high-risk users and other key risk factors. Adding Internal Risk Mitigation and improving cloud security capabilities will enable the NOAA Cyber Security Program to prevent data loss and protect IP that is critical to NOAA's mission, human capital and reputation, and provides competitive advantage to the nation.

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Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Schedule and Milestones:

FY 2020-2024

- Research existing Federal and DoD Internal Risk Mitigation capabilities for applicability to NOAA
- Prepare solicitation and associated documentation to award contract for a Threat/Digital Loss Prevention/Cloud Security services contract to provide support to NOAA and its Line Offices
- Develop program and project plans in coordination with the selected contractor
- Complete identification of NOAA critical data assets
- Complete identification of NOAA cloud solutions
- Baseline user and entity behavior on NOAA systems per project plan and available resources
- Establish data protection mechanisms and alert rules to identify unauthorized data transfers
- Evaluate monitoring effectiveness on outbound traffic, identify areas for improvement in approach and implement per project plan and available resources
- Implement controls, to include, but not limited to those specified in above bullet per project plan and available resources

Deliverables:

- Services contract to support the Threat/Digital Loss Prevention/Cloud Security Program
- Project plan to execute Program work consistent with available resources
- NOAA policies and procedures for Threat/Digital Loss Prevention/Cloud Security to include periodic updates
- Documentation for all processes established by the contractor in support of the program
- Program metrics to support periodic reporting and an electronic dashboard that provides high-level summary information on Threat and Digital Loss Prevention
- Program metrics to support periodic reporting on the security of NOAA Cloud computing
- Identification of critical data assets and baseline of user behavior to enable detection of anomalous behavior

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Operations, Research, and Facilities
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

	2020	2021	2022	2023	2024
Performance Measures					
Percentage of fully implemented Internal Risk Mitigation best practices (policies, procedures & controls)					
With Increase	20%	40%	60%	80%	100%
Without Increase	10%	15%	18%	20%	25%
Percentage of User and Entity correlation to internal and external network traffic					
With Increase	60%	70%	80%	90%	100%
Without Increase	50%	50%	50%	50%	50%
Percentage of NOAA enterprise applications that are monitored by Advanced User Behavior Analytics					
With Increase	20%	40%	60%	80%	100%
Without Increase	2%	6%	8%	9%	9%
Percentage of Cloud Service Provider instances that are compliant to NOAA Cloud security standards					
With Increase	25%	50%	75%	90%	100%
Without Increase	20%	20%	20%	20%	20%

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE OBJECT CLASS DETAIL
(Dollar amounts in thousands)

Activity: IT Security
Subactivity IT Security
Program Change: Improve Cybersecurity Capabilities

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	1,439	1,858	1,873	1,873	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	28	25	25	25	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	1,467	1,883	1,898	1,898	0
12	Civilian personnel benefits	456	580	617	617	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	138	129	130	130	0
22	Transportation of things	7	6	6	6	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	484	451	455	455	0
23.2	Rental Payments to others	2	1	1	1	0
23.3	Communications, utilities and misc charges	218	205	205	205	0
24	Printing and reproduction	2	2	2	2	0
25.1	Advisory and assistance services	65	51	51	51	0
25.2	Other services from non-Federal sources	6,765	6,135	6,135	11,107	4,972
25.3	Other goods and services from Federal sources	445	424	424	424	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	51	46	46	46	0
31	Equipment	145	137	137	137	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	10,247	10,050	10,107	15,079	4,972

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Office of Education	Pos./BA	18	28,545	11	8,539	(7)	(20,006)
	FTE/OBL	18	28,545	11	8,539	(7)	(20,006)

Office of Education (-$20,006, -7 FTE/-7 Positions) – NOAA proposes to reduce funding for the Office of Education ($1,006) and eliminate funding for the Competitive Education Grants Program ($3,000) and the Educational Partnership Program for Minority Serving Institutions (EPP/MSI) ($16,000). After a separate reduction in this budget line of $7,500 for the termination of the Bay-Watershed Education and Training (B-WET) Regional Program (p. MS-35), remaining funds of $1,039 for the Office of Education will support a streamlined, centralized office focused on coordinating and improving the performance of NOAA's numerous activities in STEM education. These funds recognize this office's critical role as primary point of contact for the National Science and Technology Council (NSTC)'s Committee on STEM Education for NOAA and the Department of Commerce.

The Competitive Education Grants Program supports 145 institutions per year that advance its missions to enhance awareness and understanding of Earth systems science through NOAA-supported formal (K-12) and informal education initiatives that both inspire and prepare people to make the best social, economic, and environmental decisions.

Each year NOAA's EPP/MSI program supports cooperative agreements with four EPP Cooperative Science Centers (CSCs) at Minority Serving Institutions, including funds for 24 institutions graduating students from underrepresented groups in NOAA mission sciences. This program also provides undergraduate scholarships to 5-12 students from Minority Serving Institutions each year. Over 75 percent of supported students are from underrepresented groups. Since program inception in 2001, 50 percent of all African Americans receiving PhDs in Atmospheric Sciences and Marine Sciences graduated from CSC institutions.

Schedule and Milestones:
(FY 2020-2024)

- Represent NOAA and the Department of Commerce in interagency Federal STEM Education coordination activities required by America COMPETES Act statutory authority
- Support and manage www.noaa.gov/education to provide an integrated, NOAA-wide portal for education resources and opportunities

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

- Coordinate the NOAA Citizen Science Community of Practice to increase use of citizen science throughout the agency
- Coordinate partnerships with over 165 informal learning institutions to better connect NOAA resources to their visitors
- Implement NOAA's Education 2020-2040 Strategic Plan across the Agency by working with the NOAA Education Council as required by America COMPETES Act statutory authority

Deliverables:
- Alignment of NOAA Education activities with the Federal STEM Education Strategic Plan (FY 2020)
- Annual reporting that improves transparency and public awareness of the performance and outcomes of NOAA Education efforts (FY 2020-2024)
- A community of practice that shares best practices and lessons learned to improve program performance (FY 2020-2024)
- NOAA's Education Strategic Plan for 2020-2040, fulfilling America COMPETES Act requirements (FY 2020)
- Over 25 updated thematic Resource Collections for the NOAA website, integrating the latest NOAA science into formal and informal education (FY 2020-2021)
- Expanded partnerships with informal learning institutions involving over 165 institutions reaching 50 million visitors (FY 2020-2024)
- Enhanced NOAA Citizen Science Community of Practice providing more than half a million volunteer hours per year through over 160 projects (FY 2020-2024)

Performance Measures	2020	2021	2022	2023	2024
Number of people (in millions) that visit informal learning institutions with a NOAA-funded exhibit or program that integrates NOAA sciences, data and other information					
With Decrease	0	0	0	0	0
Without Decrease	45	45	45	45	45
Institutions served by Competitive Education Grants					
With Decrease	0	0	0	0	0
Without Decrease	145	145	145	145	145

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

K-12 teachers and staff served by Competitive Education Grants					
With Decrease	0	0	0	0	0
Without Decrease	2,000	2,000	2,000	2,000	2,000
Number of EPP/MSI students from underrepresented communities trained with support from EPP/MSI					
With Decrease	0	0	0	0	0
Without Decrease	135	135	135	135	135
Number of institutions with increased educational capacity supported by EPP/MSI					
With Decrease	0	0	0	0	0
Without Decrease	24	24	24	24	24

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Office of Education
Subactivity: Office of Education
Program Change: Office of Education

Title		Grade	Number	Annual Salary	Total Salaries
Supervisory Program Manager		ZA-V	(1)	157,665	(157,665)
Program Specialist		ZA-IV	(2)	137,413	(274,826)
Policy Analyst		ZA-IV	(3)	137,413	(412,239)
Senior Policy Analyst		ZA-IV	(1)	137,413	(137,413)
Total			(7)		(982,143)
Less lapse	0.0%		0		0
Total full-time permanent (FTE)			(7)		(982,143)
2020 Pay Adjustment (0%)	0.0%				0
Total					(982,143)

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	(7)
Other than full-time permanent	0
Total	(7)
Authorized Positions:	
Full-time permanent	(7)
Other than full-time permanent	0
Total	(7)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Office of Education
Subactivity: Office of Education
Program Change: Office Of Education

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,658	2,100	2,112	1,130	(982)
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	63	47	47	15	(32)
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,722	2,147	2,159	1,145	(1,014)
12	Civilian personnel benefits	841	630	659	336	(323)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	141	141	142	42	(100)
22	Transportation of things	7	7	7	0	(7)
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	291	291	294	44	(250)
23.2	Rental Payments to others	242	242	242	0	(242)
23.3	Communications, utilities and misc charges	19	19	19	1	(18)
24	Printing and reproduction	10	10	10	1	(9)
25.1	Advisory and assistance services	26	26	26	0	(26)
25.2	Other services from non-Federal sources	8,370	2,677	2,677	328	(2,349)
25.3	Other goods and services from Federal sources	64	64	64	0	(64)
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	41	41	41	2	(39)
31	Equipment	32	32	32	11	(21)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	21,690	22,173	22,173	6,629	(15,544)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	34,496	28,500	28,545	8,539	(20,006)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Office of Education	Pos./BA	18	28,545	14	21,045	(4)	(7,500)
	FTE/OBL	18	28,545	14	21,045	(4)	(7,500)

NOAA Bay-Watershed Education and Training (B-WET) Regional Program (-$7,500, -4 FTE/-4 Positions) -- NOAA requests to terminate the Bay-Watershed Education and Training (B-WET) Regional Program. NOAA's operating plan for FY 2019 provided $7,500 for B-WET regional programs, which promote place-based, experiential learning in K-12 Science, Technology, Education, & Mathematics (STEM) education. With these funds, NOAA supported Meaningful Watershed Educational Experiences (MWEE) through competitive funding to local and state education offices and government agencies, academic institutions, and nonprofit organizations. MWEEs integrate field experiences with multi-disciplinary classroom activities and instruction in NOAA-related sciences.

Performance Measures	2020	2021	2022	2023	2024
Number of students served by the Bay Regional Watershed Education Program (in thousands)					
With Decrease	0	0	0	0	0
Without Decrease	70	70	70	70	70
Educators served by Bay Regional Watershed Education Program					
With Decrease	0	0	0	0	0
Without Decrease	2,500	2,500	2,500	2,500	2,500

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

Activity: Office of Education
Subactivity: Office of Education
Program Change: NOAA Bay-Watershed Education and Training (B-WET) Regional Program

Title	Grade	Number	Annual Salary	Total Salaries
Policy Analyst	ZA-IV	(4)	96,970	(387,880)
Total		(4)		(387,880)
Less lapse	0.0%	0		0
Total full-time permanent (FTE)		(4)		(387,880)
2020 Pay Adjustment (0%)	0.0%			0
Total				(387,880)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(4)
Other than full-time permanent	0
Total	(4)
Authorized Positions:	
Full-time permanent	(4)
Other than full-time permanent	0
Total	(4)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE OBJECT CLASS DETAIL
(Dollar amounts in thousands)

Activity: Office of Education
Subactivity: Office of Education
Program Change: NOAA Bay-Watershed Education and Training (B-WET) Regional Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	2,658	2,100	2,112	1,724	(388)
11.3	Other than full-time permanent	1	0	0	0	0
11.5	Other personnel compensation	63	47	47	47	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	2,722	2,147	2,159	1,771	(388)
12	Civilian personnel benefits	841	630	659	543	(116)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	141	141	142	102	(40)
22	Transportation of things	7	7	7	7	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	291	291	294	294	0
23.2	Rental Payments to others	242	242	242	242	0
23.3	Communications, utilities and misc charges	19	19	19	19	0
24	Printing and reproduction	10	10	10	10	0
25.1	Advisory and assistance services	26	26	26	26	0
25.2	Other services from non-Federal sources	8,370	2,677	2,677	2,359	(318)
25.3	Other goods and services from Federal sources	64	64	64	64	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	41	41	41	41	0
31	Equipment	32	32	32	23	(9)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	21,690	22,173	22,173	15,544	(6,629)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	34,496	28,500	28,545	21,045	(7,500)

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Construction

Goal Statement

The Construction activity ensures that NOAA has safe and modern facilities to support NOAA's critical science, service, and stewardship mission.

Base Program

NOAA's facilities constitute a significant capital investment with over 665 different facilities and 6,965,592 total Usable Square Feet, including 401 NOAA-owned facilities with an estimated replacement value (CRV) of $3 billion. These facilities require maintenance, repair, and investment to minimize the impact to operations. Construction acquisition and project planning enables NOAA to complete the analyses, pre-design work, and initial preparation that make the actual construction phase of projects more efficient and effective. Activities include Business Case Analyses, NEPA planning, special environmental studies, condition surveys, site work, and any other preliminary development needed to ensure successful acquisition and completion of construction projects within budget and on schedule.

Statement of Operating Objectives

Schedule and Milestones/Deliverables:
The Construction activity uses recurring base funds to do centralized project planning, analyses, and site preparation to ensure NOAA is prepared to execute major projects when project funding is received. In FY 2018, project funding was received to address deferred maintenance and repair across NOAA's facilities; construction of the National Marine Fisheries Service's Northwest Fisheries Science Center Mukilteo Research Station replacement project (aka Mukilteo); and planning activities for the Office of Marine and Aviation Operations U.S. Naval Station Newport project. In FY 2019 NOAA received funds to complete the Mukilteo project. In FY 2020, NOAA will:

- Execute projects to address NOAA's highest priority facilities repair and deferred maintenance requirements by replacing the Utqiaġvik Atmospheric Baseline Observatory (formerly Barrow) in Utqiaġvik, AK, and addressing a number of facilities issues at the Western Regional Center in Seattle, WA

Department of Commerce
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Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

- Execute the environmental assessments and design studies needed prior to construction for the Mukilteo project, begin demolition of the existing facility (FY 2020); begin construction (early FY 2021)
- Continue necessary environmental assessments, permitting activities, and design work for the Newport Pier project in Newport, Rhode Island (FY 2020)

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Comparison by subactivity		Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Construction	Pos/BA	1	31,846	0	25,000	0	25,000
	FTE/OBL	1	9,410	0	25,000	0	25,000
Total Construction	Pos/BA	1	31,846	0	25,000	0	25,000
	FTE/OBL	1	9,410	0	25,000	0	25,000

NOAA Construction
Constructing new facilities and reinvesting in existing facilities is critical to NOAA's mission accomplishment. Conducting and effectively managing construction projects on facilities that have major deferred maintenance issues corrects health and life safety issues, averts emergency repairs and associated costs, reduces energy costs through creation of more efficient and sustainable building systems, and brings facilities up to modern standards making sustainment easier.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA	Pos./BA	0	25,000	0	29,000	0	4,000
Construction	FTE/OBL	0	25,000	0	29,000	0	4,000

Judgment Fund Repayment (+$4,000, 0 FTE/ 0 Positions) – These funds will allow NOAA to continue to repay the Judgment Fund. Construction of NOAA's Southwest Fisheries Science Center in La Jolla, CA resulted in an extended contract dispute and the Department of Justice recently approved a settlement of $22,312,061. While Treasury paid the claimant the settlement from the Government's Judgment Fund in 2017, NOAA is required to repay the Judgment Fund and has negotiated with Treasury's Bureau of the Fiscal Service to make payments over multiple years. NOAA made an initial payment of $10 million in FY 2018 and plans to make payments of $4 million per year each year following until repayment is complete.

Outyear Funding Estimates

NOAA Construction/Judgment Fund Repayment	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	N/A	4,000	4,000	4,312	0	0		N/A
Total Request	10,000	4,000	4,000	4,312	0	0	N/A	22,312

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Construction
Subactivity NOAA Construction
Program Change: Judgment Fund Repayment

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	9,410	25,000	25,000	29,000	4,000
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	9,410	25,000	25,000	29,000	4,000

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA	Pos./BA	0	25,000	0	25,998	0	998
Construction	FTE/OBL	0	25,000	0	25,998	0	998

Facilities Analysis and Planning (+$998, 0 FTE/ 0 Positions) – NOAA requests an increase of $998 to establish recurring base funding for NOAA Construction analyses and project planning. This funding will allow NOAA to centrally plan projects, conduct analyses and site preparation to ensure NOAA is prepared to execute major projects when project funding is received. Activities include regional analyses, business case analyses, NEPA planning, special environmental studies, condition surveys, site work, and any other preliminary development needed to ensure successful acquisition and completion of construction projects within budget and on schedule.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Construction
Subactivity NOAA Construction
Program Change: Facilities Analysis and Planning

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	9,410	25,000	25,000	25,998	998
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	9,410	25,000	25,000	25,998	998

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA	Pos./BA	0	25,000	0	0	0	(25,000)
Construction	FTE/OBL	0	25,000	0	0	0	(25,000)

National Marine Fisheries Service Facilities Initiative (-$25,000, 0 FTE/ 0 Positions) – NOAA requests a decrease of $25,000 for the replacement of the Northwest Fisheries Science Center facility in Mukilteo, Washington. The funding received in FY 2017-2019 is sufficient to complete the project, based on current estimates. This facility is a priority because of its structural condition and is slated for completion in late FY 2022.

Outyear Funding Estimates:

NOAA Construction/NMFS Facilities Initiative	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base	0	(25,000)	-	-	-	-	N/A	40,057
Total Request	40,057	0	-	-	-	-	N/A	40,057

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Construction
Subactivity NOAA Construction
Program Change: National Marine Fisheries Facilities Initiative

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11.1	Full-time permanent compensation	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23	Rent, communications, and utilitites	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	9,410	25,000	25,000	0	(25,000)
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	9,410	25,000	25,000	0	(25,000)

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Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations
Budget Estimates, Fiscal Year 2020

Executive Summary

For FY 2020, NOAA requests a total of $354,945,000 and 981 FTE/1,017 positions for the Office of Marine and Aviation Operations, including a net decrease of $6,605,000 and a net increase of 8 FTE/10 positions in program changes.

NOAA's Office of Marine and Aviation Operations (OMAO) manages a variety of specialized ships and aircraft that play a critical role in the in-situ collection of oceanographic, atmospheric, hydrographic, and fisheries data in support of NOAA's missions. OMAO also administers the NOAA-wide Diving Program, the Small Boat Program, and provides oversight for Unmanned Aircraft System (UAS) operations. The staff includes civilians along with the NOAA Commissioned Officer Corps (NOAA Corps).

The NOAA fleet operates throughout the world supporting a wide array of NOAA missions including fisheries research, nautical charting, hurricane reconnaissance and research, snow surveys, and specialized atmospheric and ocean research. NOAA ships range from large oceanographic research vessels capable of exploring the world’s deepest oceans to smaller ships responsible for charting the shallow bays and inlets of the United States. NOAA aircraft range from high altitude jets, capable of penetrating hurricanes and tracking ocean winds, to the Twin Otters, well-suited for water resource management data collection and marine mammal surveys where slower airspeeds and low altitudes are essential.

In addition to research and monitoring activities, NOAA ships and aircraft provide an emergency response capability. Following major natural and environmental disasters, NOAA ships and aircraft conduct emergency navigation hazard surveys that help ports reopen quickly and obtain aerial images of disaster-torn areas. Emergency hazard surveys provide critical information for first responders, disaster response, and residents; this information, provided by NOAA assets, is often the only source of data.

OMAO is charged with the safe and efficient operation and maintenance of the NOAA fleet. OMAO develops annual fleet allocation plans, conducts lifecycle maintenance, and provides centralized fleet management including: standard procedures, safety inspections, and medical services in partnership with the U.S. Public Health Service Commissioned Corps. OMAO maintains a safe field environment through the coordination of training and certification of officers, crew members, and scientists in at-sea and airborne safety procedures.

OMAO’s Headquarters in Silver Spring, Maryland is responsible for the formulation of policies and procedures; development of operating plans and budgets; strategic planning and performance measure management; oversight of safety and regulatory compliance; program management of ship and aircraft acquisitions; and management of IT infrastructure and security.

The NOAA Commissioned Personnel Center (CPC), also headquartered in Silver Spring, Maryland, provides NOAA a specialized workforce – the NOAA Corps. The NOAA Corps is one of the Nation's seven uniformed services and has the skills to plan, prepare, and execute the acquisition of environmental and scientific data on land, at sea, and in the air. The NOAA Corps supports and commands the NOAA fleet. It also provides support to NOAA's Line Offices. CPC is responsible for active duty Corps officers and associated human resource activities that include recruitment, appointment, training, assignment, promotion, separation, retirement, and officer entitlements. There are currently 324 authorized NOAA Corps officers, including three flag officers.

In an effort to better align OMAO's budget structure with its intended purpose and improve budget clarity, NOAA is proposing to realign OMAO's programs, projects, and activities (PPAs) within the Procurement, Acquisition and Construction (PAC) account under one activity that covers both vessels and aircraft. Currently, the budget only includes funding for vessel related activities in the Fleet Capital Improvement and Technology Infusion PPA as aircraft funding for these large-scale maintenance activities is not required annually. In years where aircraft funds are required for this activity, some of the funds in this PPA would support the aircraft sub-PPA. This flexibility is important to allow NOAA to meet its aircraft maintenance needs when they do arise. However, this PPA's location in the current budget structure creates a misconception that these funds are exclusively for vessel activities. The proposed new budget structure would increase transparency, and more clearly align the budget with NOAA's plans under this PPA in the future. OMAO will ensure that the integrity of aircraft and vessel maintenance funds under the Platform Capital Improvements and Tech Infusion is upheld consistent with applicable legislation and will not reallocate resources or reorganize activities except as authorized by Congress.

With this realignment, OMAO's budget has one PAC activity with three PPAs:

- Marine and Aviation Capital Investments
    - Platform Capital Improvements and Tech Infusion
    - Vessel Recapitalization
    - Aircraft Recapitalization

Significant Inflationary Adjustments:

Calculated Adjustments
NOAA's FY 2020 Base includes an increase of $4,180,000 and 0 FTE/ 0 positions to account for the full funding requirement for certain inflationary adjustments to current programs for OMAO activities. This includes the estimated 2020 military pay raise of 2.1 percent as well as inflationary increases for labor and non-labor activities, including benefits, and rent charges from the General Services Administration (GSA).

Technical Adjustments
NOAA also requests the following transfer for a net change of $0 and 0 FTE/0 positions to the agency:

From Office	PPA	To Office	PPA	Amount / FTE
OMAO	Aviation Operations and Aircraft Services	OMAO	*Unmanned System Operations	$665,000 / 0 FTE

*The Unmanned System Operations is a new proposed PPA under ORF.

NOAA requests to transfer $665,000 and 0 FTE/0 positions from Aviation Operations and Aircraft Services to consolidate funding for Unmanned System Operations This funding is currently appropriated to the Aviation Operations and Aircraft Services PPA to support OMAO's management and oversight over Unmanned Aviation System (UAS) operations. This reallocation will create efficiencies by consolidating current funding with requested resources for unmanned system operations (OMAO-24).

Narrative Information:

Following this section are base justification materials and program change narratives by Activity for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table – 8 and 12). Please contact NOAA if details for any of these changes are required.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Aviation Operations and Aircraft Services
Subactivity: Aviation Operations and Aircraft Services transfer to Unmanned System Operations

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	12,100	0	12,100
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	532	0	532
11.8	Special personnel services payments	357	0	357
11.9	Total personnel compensation	12,989	0	12,989
12	Civilian personnel benefits	2,661	0	2,661
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	1,944	(115)	1,829
22	Transportation of things	171	0	171
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	2,247	0	2,247
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	0	0	0
25.2	Other services from non-Federal sources	9,550	(346)	9,204
25.3	Other goods and services from Federal sources	0	0	0
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	6,004	(200)	6,431
31	Equipment	184	(4)	180
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	0	0	0
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	35,750	(665)	35,712

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match amounts in Exhibit 10. Please refer to Exhibit 10 (OMAO-6) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
TRANSFER CHANGE DETAIL BY OBJECT CLASS
(Direct Obligations amounts in thousands)

Activity: Unmanned System Operations
Subactivity: Aviation Operations and Aircraft Services Transfer To Unmanned System Operations

	Object Class	2019 Enacted	2020 Transfer	2020 Base
11.1	Full-time permanent compensation	0	0	0
11.3	Other than full-time permanent	0	0	0
11.5	Other personnel compensation	0	0	0
11.8	Special personnel services payments	0	0	0
11.9	Total personnel compensation	0	0	0
12	Civilian personnel benefits	0	0	0
13	Benefits for former personnel	0	0	0
21	Travel and transportation of persons	0	115	115
22	Transportation of things	0	0	0
23	Rent, communications, and utilitites	0	0	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental Payments to others	0	0	0
23.3	Communications, utilities and misc charges	0	0	0
24	Printing and reproduction	0	0	0
25.1	Advisory and assistance services	0	0	0
25.2	Other services from non-Federal sources	0	346	346
25.3	Other goods and services from Federal sources	0	0	0
25.4	Operation and maintenance of facilities	0	0	0
25.5	Research and development contracts	0	0	0
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	0	0	0
25.8	Subsistence and support of persons	0	0	0
26	Supplies and materials	0	200	200
31	Equipment	0	4	4
32	Lands and structures	0	0	0
33	Investments and loans	0	0	0
41	Grants, subsidies and contributions	0	0	0
42	Insurance claims and indemnities	0	0	0
43	Interest and dividends	0	0	0
44	Refunds	0	0	0
99	Total obligations	0	665	665

* The 2020 Base column includes calculated ATBs in addition to the transfer amounts. As a result, the 2020 total obligations do not match amounts in Exhibit 10. Please refer to Exhibit 10 (OMAO-6) for the accurate 2020 Base of each Subactivity.

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar amounts in thousands)

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)											
Marine Operations & Maintenance	Pos/BA	821	191,129	869	190,670	869	194,223	869	192,422	0	(1,801)
	FTE/OBL	816	189,696	840	190,670	840	194,223	840	192,422	0	(1,801)
Aviation Operations & Aircraft Services	Pos/BA	125	34,780	127	35,750	127	35,712	127	34,586	0	(1,126)
	FTE/OBL	124	34,377	122	35,750	122	35,712	122	34,586	0	(1,126)
Unmanned System Operations	Pos/BA	0	0	0	0	0	665	10	4,665	10	4,000
	FTE/OBL	0	0	0	0	0	665	8	4,665	8	4,000
TOTAL OMAO - ORF	**Pos/BA**	**946**	**225,909**	**996**	**226,420**	**996**	**230,600**	**1,006**	**231,673**	**10**	**1,073**
	FTE/OBL	**940**	**224,073**	**962**	**226,420**	**962**	**230,600**	**970**	**231,673**	**8**	**1,073**
Marine and Aviation Capital Investments	Pos/BA	4	232,378	11	99,378	11	99,378	11	91,700	0	(7,678)
	FTE/OBL	4	160,174	11	99,378	11	99,378	11	91,700	0	(7,678)
TOTAL OMAO - PAC	**Pos/BA**	**4**	**232,378**	**11**	**99,378**	**11**	**99,378**	**11**	**91,700**	**0**	**(7,678)**
	FTE/OBL	**4**	**160,174**	**11**	**99,378**	**11**	**99,378**	**11**	**91,700**	**0**	**(7,678)**
Medicare Eligible Retiree Health Care Fund	**Pos/BA**	**0**	**1,603**	**0**	**1,603**	**0**	**1,497**	**0**	**1,497**	**0**	**0**
	FTE/OBL	**0**	**1,603**	**0**	**1,449**	**0**	**1,497**	**0**	**1,497**	**0**	**0**
NOAA Corps Commissioned Officers Retirement	**Pos/BA**	**0**	**30,102**	**0**	**30,075**	**0**	**30,075**	**0**	**30,075**	**0**	**0**
	FTE/OBL	**0**	**30,102**	**0**	**30,075**	**0**	**30,075**	**0**	**30,075**	**0**	**0**
TOTAL OMAO	**Pos/BA**	**950**	**489,992**	**1,007**	**357,476**	**1,007**	**361,550**	**1,017**	**354,945**	**10**	**(6,605)**
	FTE/OBL	**944**	**415,952**	**973**	**357,322**	**973**	**361,550**	**981**	**354,945**	**8**	**(6,605)**

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Marine Operations and Maintenance

Goal Statement

The Marine Operations and Maintenance activity goals are to:

- Support present and future NOAA data collection requirements
- Maximize the service life of the Fleet through maintenance and repair
- Support NOAA's priorities by carrying out the annual ship allocation schedule
- Increase utilization of the Fleet
- Maintain safe and efficient operations through required and developmental training

Base Program

Marine Operations and Maintenance supports centralized management for NOAA's research and survey vessels. Marine Operations (MO), based in Newport, Oregon, manages OMAO's three Marine Centers located in Norfolk, Virginia, Newport, Oregon, and Honolulu, Hawaii, additional port offices, and Marine Operations activities in Headquarters, including the Small Boat Program and the Dive Center program.

Statement of Operating Objectives

Schedule and Milestones/Deliverables:

- Complete maintenance based on American Bureau of Shipping (ABS) scheduling by ship class.
- Ensure required training for all ship personnel is completed, by showing training requirements on the NOAA FAP
- Provide approximately 2,279 Days at Sea (DAS); this equates to 73 percent utilization rate
- Execute 100 percent of approved DAS in the Fleet Allocation Plan (FAP), less any DAS lost for weather and DAS removed from the schedule at the request of the Programs
- Perform program-funded DAS as scheduled
- Survey 1,136 Square Nautical Miles

More detailed deliverables are determined on a project-by-project basis as documented in sailing instructions. Annual ship schedules and milestones are governed by the FAP, as agreed to and signed by the NOAA Fleet Council. The FAP details the objective and duration of individual NOAA projects on specific NOAA ships.

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

Comparison by subactivity		2018 Actual Personnel	2018 Actual Amount	2019 Enacted Personnel	2019 Enacted Amount	2020 Base Personnel	2020 Base Amount
Marine Operations and Maintenance	Pos/BA	812	191,129	869	190,670	869	194,233
	FTE/OBL	816	189,696	840	190,670	840	194,233
Total Marine Operations and Maintenance	Pos/BA	812	191,129	869	190,670	869	194,233
	FTE/OBL	816	189,696	840	190,670	840	194,233

NOAA's ships fulfill multiple missions in support of NOAA's programs in nautical charting, bathymetric mapping, fishery stock assessments and research, ecosystem assessments, marine environmental baseline assessments, coastal-ocean circulation, tending tsunami buoys, and oceanographic research and weather forecasts. NOAA research and survey vessels are diverse in size and associated range, endurance and scientific berths. The table on the next page outlines the diversity of the NOAA Fleet and primary mission areas of each vessel.

Given the diverse portfolio of NOAA program requirements and responsibilities, a single vessel type will not meet all of NOAA's mission requirements. The Marine Operations and Maintenance program is responsible for providing ships that meet required capabilities, geographic location and timing to meet prioritized at-sea NOAA requirements. These requirements are defined through NOAA's Fleet Council, with input from across NOAA, to balance ship schedules.

In FY 2020, OMAO plans to provide approximately 2,525 Days at Sea (DAS) to support NOAA's highest-priority requirements. NOAA estimates available DAS annually based on a variety of factors including maintenance, staffing, training, outfitting, fuel, and other costs necessary to support ship operations. This year's estimate is based on a fleet of 15 operational vessels. In early 2019, NOAA identified extensive repair requirements on the *Hi'ialakai,* rendering it inoperable without a significant investment. The vessel is currently in lay up status and will be docked at OMAO's Marine Operations Center in Newport, Ore. NOAA is working to identify solutions for fulfilling the vessel's scheduled missions.

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Ship	Length	Class	Primary Mission	Homeport	Year Launched
Rainier	231 ft.	Ocean	2	Newport, OR	1967
Fairweather	231 ft.	Ocean	2	Ketchikan, AK	1967
Oregon II	170 ft.	Regional	1	Pascagoula, MS	1967
Hi'ialakai	224 ft.	Ocean	1, 2, 3	Honolulu, HI	1984
Oscar Elton Sette	224 ft.	Ocean	3	Honolulu, HI	1987
Okeanos Explorer	224 ft.	Ocean	1, 2	Davisville, RI	1988
Gordon Gunter	224 ft.	Ocean	1	Pascagoula, MS	1989
Nancy Foster	187 ft.	Ocean	1	Charleston, SC	1990
Thomas Jefferson	208 ft.	Ocean	2	Norfolk, VA	1991
Ronald H. Brown	274 ft.	Global	3	Charleston, SC	1996
Oscar Dyson	209 ft.	Ocean	1	Kodiak, AK	2003
Henry B. Bigelow	209 ft.	Ocean	1	Newport, RI	2005
Pisces	209 ft.	Ocean	1	Pascagoula, MS	2007
Bell M. Shimada	209 ft.	Ocean	1	Newport, OR	2008
Ferdinand R. Hassler	124 ft.	Regional	2	New Castle, NH	2009
Reuben Lasker	209 ft.	Ocean	1	San Diego, CA	2012

Mission 1: Assessment and Management of Living Marine Resources
Mission 2: Charting and Mapping
Mission 3: Oceanographic Monitoring, Research, and Modeling

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Marine operations and maintenance provides funds for the repair and maintenance of NOAA ships necessary to meet the rigorous demands of NOAA's scientific and regulatory missions. Regular maintenance, including proper preventive maintenance, is scheduled to ensure readiness prior to and during the field season. Unscheduled maintenance costs are increasing significantly due to the aging of NOAA's fleet; the accumulation of deferred maintenance; and, the history of not conducting an optimal level of preventative maintenance. These unscheduled costs include: new maintenance requirements discovered while completing scheduled operational maintenance; scheduled repairs requiring more extensive work, increasing costs in excess of the standard 20 percent estimated cost overrun; and urgent responses to machinery or equipment casualties. In 2018, NOAA spent $14.3 million ($10.4 million ORF and $3.9 million PAC funds) on unscheduled maintenance and lost 526 DAS[1].

OMAO makes every effort to restore lost DAS by modifying the sailing schedules of the impacted ships, or rescheduling the project on another NOAA vessel. In cases where this is not feasible, a project or projects may be cancelled, resulting in lost scientific data. This has a significant impact on NOAA's mission.

NOAA vessels must adhere to safety and emissions requirements and regulations established by a variety of organizations. The American Bureau of Shipping (ABS) certifies ships as seaworthy. OMAO uses ABS rules to design its maintenance program and conduct Ship Structure and Machinery Evaluations (SSME) on the NOAA Fleet. Under the Clean Air Act, the Environmental Protection Agency issues regulations governing airborne emissions that affect ship engine and exhaust components. The U.S. Coast Guard issues regulations on all discharges from ships to ensure marine environments are protected from harmful discharges.

In addition to vessel management, the Marine Operations and Maintenance activity supports the following activities:

NOAA Dive Program: The NOAA Dive Center (NDC) provides diver certification, technical advice, and a standardized equipment program. The NDC, in cooperation with the NOAA Diving Control and Safety Board, issues safe diving standards and practices, according to the Standards of Training, Certification and Watch keeping for Seafarers and the International Maritime Organization conventions. NOAA maintains approximately 375 divers who perform over 11,000 dives annually in support of NOAA's mission. Fleet divers help maintain NOAA's ships with tasks such as cleaning propellers and sea strainers, surveying hulls for damage, and installing transducers. NOAA divers' work also includes installation of observing systems such as tide gauges. Scientists trained as divers study and describe the habitats and species that NOAA is mandated to protect and manage. These activities enable NOAA to meet requirements and mandates, enhance customer service and operational safety, and facilitate self-sufficiency at sea.

[1] Lost DAS totals do not include NOAA's efforts to mitigate the loss through changes in planned schedule or adding DAS to other NOAA vessels to offset the loss.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

NOAA Small Boat Program (SBP): The SBP is designed to reduce risk, promote standardization, and enhance the safety of NOAA's small-boat operations. It enforces the policy of the safety program and ensures compliance through onsite inspections, risk assessments and marine incident investigations. NOAA maintains approximately 400 small boats, which are operated and funded within the Line Offices. The SBP provides technical and marine engineering assistance to Line Office field units as needed and to the NOAA Small Boat Safety Board to ensure compliance with the NOAA Small Boat Standards and Procedures Manual requirements.

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Operations and Maintenance	Pos./BA	869	194,233	869	194,432	0	199
	FTE/OBL	840	194,233	840	194,432	0	199

Increase Marine Operations and Maintenance ($199, 0 FTE/0 Positions) – NOAA requests an increase to provide for fleet operations and maintenance activities. This includes activities that will mitigate the impact on NOAA missions due to significant maintenance issues identified on NOAA Ship *Hi'ialakai*. These funds will increase utilization and provide for high priority maintenance activities.

During the *Hi'ialakai*'s scheduled repair period in early FY 2019, NOAA identified extensive repair requirements making the vessel inoperable without a significant investment. To better identify and address repair requirements before they become debilitating, NOAA is applying best practices and working with partners such as the American Bureau of Shipping to improve maintenance planning and to more accurately assess the condition of NOAA's vessels. Appropriated funds in FY 2018 and FY 2019 have considerably reduced NOAA's deferred maintenance backlog (as of the end of FY 2018, OMAO's deferred maintenance backlog is estimated at $26.9 million), and will continue to support fleet maintenance during the FY 2019 and FY 2020 vessel repair periods. At this funding level, NOAA expects to stabilize its deferred maintenance.

On average, NOAA plans 150 Days at Sea (DAS) on the *Hi'iakakai* each year, conducting important missions like coral reef health assessments, ecosystem mapping, Hawaii Island air and sea flux observations on ocean acidification, endangered Monk Seal recovery activities, and maritime heritage surveys. To best mitigate the loss of this vessel, NOAA is reviewing all ship capabilities and requirements from the projects previously scheduled on the ship, and considering all viable options to fulfill those missions. Options include, but are not limited to, re-scheduling *Hi'ialakai* projects onto other ships within the NOAA fleet, the use of NOAA's small boats, and the use of unmanned technologies. Funding will be used to support the modifications and minor conversions needed to ensure that other ships, small boats, or unmanned technologies can meet the unique operational requirements of the *Hi'ialakai*'s mission projects. The FY 2020 request includes an investment of $3 million for these activities in response to the unprecedented and unexpected loss of a productive vessel.

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

Deliverables:

- Operational maintenance and repairs to stabilize the material condition of the ships.
- Coral reef health and ecosystem mapping
- Hawaii Islands Ocean Time series – Air and Sea flux observations
- Endangered Monk Seal recovery
- Maritime Heritage Surveys

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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Marine Operations and Maintenance
Subactivity: Marine Operations and Maintenance
Program Change: Increase Marine Operations and Maintenance

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$59,486	$59,486	$61,579	$61,579	$0
11.3	Other than full-time permanent	0	0	0	0	$0
11.5	Other personnel compensation	9,442	9,442	9,442	9,442	$0
11.8	Special personnel services payments	622	622	622	622	0
11.9	Total personnel compensation	69,550	69,550	71,643	71,643	$0
12	Civilian personnel benefits	17,781	17,781	18,781	18,781	$0
13	Benefits for former personnel	735	735	735	735	$0
21	Travel and transportation of persons	3,929	3,929	3,929	4,025	$96
22	Transportation of things	1,399	1,399	1,399	1,418	$19
23.1	Rental payments to GSA	0	0	0	0	$0
23.2	Rental Payments to others	7,390	7,390	7,390	7,390	$0
23.3	Communications, utilities and misc charges	794	794	794	794	$0
24	Printing and reproduction	61	61	61	61	$0
25.1	Advisory and assistance services	0	0	0	0	$0
25.2	Other services from non-Federal sources	71,418	70,959	71,419	71,419	$0
25.3	Other goods and services from Federal sources	0	0	0	0	$0
25.4	Operation and maintenance of facilities	0	0	0	0	$0
25.5	Research and development contracts	0	0	0	0	$0
25.6	Medical care	0	0	0	0	$0
25.7	Operation and maintenance of equipment	0	0	0	0	$0
25.8	Subsistence and support of persons	0	0	0	0	$0
26	Supplies and materials	16,522	16,522	16,522	16,580	$58
31	Equipment	1,550	1,550	1,550	1,576	$26
32	Lands and structures	0	0	0	0	$0
33	Investments and loans	0	0	0	0	$0
41	Grants, subsidies and contributions	0	0	0	0	$0
42	Insurance claims and indemnities	0	0	0	0	$0
43	Interest and dividends	0	0	0	0	$0
44	Refunds	0	0	0	0	$0
99	Total obligations	$191,129	$190,670	$194,223	$194,422	$199

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Operations and Maintenance	Pos./BA	0	194,223	0	192,223	0	(2,000)
	FTE/OBL	0	194,223	0	192,223	0	(2,000)

Unmanned Surface Vehicles (-$2,000, 0 FTE/0 Positions) – NOAA requests a decrease to end competitive acquisition of data from unmanned surface vehicles (USVs). However, funding provided for the new unmanned system program in OMAO will help mitigate this decrease. Unmanned surface vehicles remain a potential complement to NOAA's fleet. NOAA will provide operational support for USVs through a new Unmanned Systems Operational Program (OMAO-24).

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Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Marine Operations and Maintenance
Subactivity: Marine Operations and Maintenance
Program Change: Unmanned Surface Vehicles

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$59,486	$59,486	$61,579	61,579	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	9,442	9,442	9,442	9,442	0
11.8	Special personnel services payments	622	622	622	622	0
11.9	Total personnel compensation	69,550	69,550	71,643	71,643	0
12	Civilian personnel benefits	17,781	17,781	18,781	18,781	0
13	Benefits for former personnel	735	735	735	735	0
21	Travel and transportation of persons	3,929	3,929	3,929	3,929	0
22	Transportation of things	1,399	1,399	1,399	1,399	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	7,390	7,390	7,390	7,390	0
23.3	Communications, utilities and misc charges	794	794	794	794	0
24	Printing and reproduction	61	61	61	61	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	71,418	70,959	71,419	69,419	(2,000)
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	16,522	16,522	16,522	16,522	0
31	Equipment	1,550	1,550	1,550	1,550	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$191,129	$190,670	$194,223	$192,223	($2,000)

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Aviation Operations and Aircraft Services

Goal Statement

Aviation Operations and Aircraft Services activity goals are to:

- Provide centralized aircraft systems management and coordination of all airborne activity
- Support NOAA's prioritized airborne requirements through execution of the Aircraft Allocation Plan (AAP)
- Safely modify, maintain, and operate aircraft in support of prioritized requirements

Base Program

OMAO's Aircraft Operations Center (AOC), located at the Lakeland Linder Regional Airport in Lakeland, Florida, operates NOAA's Aircraft Fleet in support of NOAA's mission to understand and predict changes in climate, weather, oceans and coasts and to assist in conserving and managing coastal and marine ecosystems and resources. The aircraft operate throughout the United States and around the world over open oceans, mountains, coastal wetlands, and the Arctic. AOC provides capable, mission-ready aircraft and professional crews to safely meet NOAA's scientific mission by assisting with coastal mapping, flood prediction, hurricane prediction modeling, marine mammal population assessments, coastal erosion surveys, oil spill investigations and air quality studies. AOC flight crews operate in some of the world's most demanding flight regimes, including flying into the eye of a hurricane and at low altitudes over mountainous terrain and open ocean areas.

Statement of Operating Objectives

Schedule and Milestones/Deliverables:

- Meet annual aircraft schedules and milestones as governed by the Aircraft Allocation Plan (AAP), which is agreed to, and signed by, the NOAA Fleet Council. The AAP details the objective and duration of individual NOAA projects
- Provide 3,710 flight hours, which includes 2,900 mission hours and 810 hours for training, maintenance, and calibration
- Calibrate and validate data between the existing Turbo Commander aircraft and the King Air replacement aircraft
- Perform program-funded hours as scheduled. Detailed deliverables are determined on a project-by-project basis as documented in flight instructions agreed to by OMAO and the supported Line Office.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Comparison by subactivity		Personnel	Amount	Personnel	Amount	Personnel	Amount
Aviation Operations and	Pos/BA	127	34,232	127	35,750	127	35,712
Aircraft Services	FTE/OBL	122	34,377	122	35,750	122	35,712
Total Aviation Operations	Pos/BA	127	34,232	127	35,750	127	35,712
and Aircraft Services	FTE/OBL	122	34,377	122	35,750	122	35,712

The variety and versatility of NOAA's aircraft provides scientists with airborne platforms equipped with comprehensive data collection systems that are capable of assessing severe weather, coastal and marine resources, and the dynamics of complex ecosystems. NOAA aircraft collect snow water equivalent measurements used by the National Weather Service to issue river and flood forecasts; water supply forecasts; and spring flood outlooks. Aircraft also assist in collecting protected species data critical to managing commercial and recreational fish stocks and air chemistry data critical for public health. Aircraft are capable of carrying specialized sensors for coastal mapping and shallow-water bathymetric data collection, providing essential data to nautical charting and safe navigation. OMAO also ensures that contracted aviation operations are conducted safely by providing technical support, services, and equipment to NOAA programs.

With current resources, AOC will support approximately 3,710 OMAO-funded flight hours in support of NOAA scientific airborne requirements in FY 2020. Demands for time aboard NOAA aircraft will be prioritized by the NOAA Fleet Council. Additional flight hours may also be funded by programs during the year of budget execution, based on funding and aircraft availability. Program funded flight hours are established through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements with other agencies.

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Aircraft	Type	Max Gross Weight (lbs.)	Primary Mission	Aircraft Age (years)
N42RF	WP-3D	135,000	3	42
N43RF	WP-3D	135,000	3	42
N49RF	G-IV-SP	74,600	3	23
N57RF	DHC-6-300 Twin Otter	12,500	1, 3	36
N56RF	DHC-6-300 Twin Otter	12,500	1, 3	35
N48RF	DHC-6-300 Twin Otter	12,500	1, 3	36
N46RF	DHC-6-300 Twin Otter	12,500	1, 3	32
N68RF	King Air 350ER	16,500	2	8
N45RF	Jet Prop Commander	11,250	3	33

Mission 1: Assessment and Management of Living Marine Resources
Mission 2: Charting and Surveying
Mission 3: Weather Forecasting, Research, and Modeling

PROGRAM CHANGES FOR FY 2020:
NOAA requests a net decrease of $1,126 and 0 FTE/0 positions in FY 2020 program changes for the Aviation Operations and Aircraft Services Activity. Following this section are program change narratives for this Activity that represent program changes greater than five percent of a program. Complete program changes by Subactivity can be found in the NOAA Control Table (p. Control Table - 8).

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PROGRAM DECREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Aviation Operations	Pos./BA	127	35,653	127	34,653	0	(1,000)
and Aircraft Services	FTE/OBL	122	35,653	122	34,653	0	(1,000)

Eliminate Atmospheric Rivers Flight Hours (-$1,000, 0 FTE/0 Positions) –NOAA requests a decrease to reduce additional funds provided in FY 2019 for the monitoring of atmospheric rivers. FY 2019 funds will provide additional flight hours for the G-IV and P-3 and approximately 500 GPS dropwindsonde instrument sensors to support this project.

Performance Measures	2020	2021	2022	2023	2024
Flight Hours – Atmospheric Rivers					
With decrease	0	0	0	0	0
Without decrease	300	300	300	300	300

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PROGRAM CHANGE DETAIL BY OBJECT
(Dollar amounts in thousands)

Activity: Aviation Operations and Aircraft Services
Subactivity: Atmospheric Rivers Mission Support
Program Change: Eliminate Atmospheric River Flight Hours

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$12,100	$12,100	$12,100	$12,100	$0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	532	532	532	532	0
11.8	Special personnel services payments	357	357	357	357	0
11.9	Total personnel compensation	12,989	12,989	12,989	12,989	0
12	Civilian personnel benefits	2,661	2,661	2,661	2,661	0
13	Benefits for former personnel				0	0
21	Travel and transportation of persons	1,944	1,944	1,829	1,829	0
22	Transportation of things	171	171	171	171	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	2,247	2,247	2,247	2,247	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	9,050	9,550	9,204	9,204	0
25.3	Other goods and services from Federal	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	4,986	6,004	6,431	5,431	(1,000)
31	Equipment	185	184	180	180	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$34,232	$35,750	$35,712	$34,712	($1,000)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Unmanned System Operations

Goal Statement

The goals of the Unmanned System Operations activity are to provide training, engineering and technical support, certification and oversight, and standards and policy development for NOAA's Unmanned Systems operations.

Base Program

OMAO's support of NOAA's missions includes the oversight of Unmanned Aircraft Systems (UAS).

Statement of Operating Objectives

Schedule and Milestones/Deliverables:

- Provide operational approvals, airworthiness certification, UAS inspections, standardization of training, and coordination of airspace approvals for UAS to support NOAA Line office requirements
- Establish UAS training, procurement, maintenance and airworthiness standards for UAS systems
- Provide UAS pilot/operator support to NOAA Line Offices

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Comparison by subactivity		Personnel	Amount	Personnel	Amount	Personnel	Amount
Unmanned System Operations	Pos/BA	0	0	0	0	0	665
	FTE/OBL	0	0	0	0	0	665
Total Unmanned System Operations	Pos/BA	0	0	0	0	0	665
	FTE/OBL	0	0	0	0	0	665

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Operated by remote pilots and ranging in wingspan from less than six feet to more than 115 feet, UAS collect data in all of NOAA's areas of responsibility. NOAA UAS are used in such varied missions as gathering atmospheric data for air quality studies and tropical storm research, providing maps of coastal regions, and collecting images to help determine the health of marine mammals. The FAA defines UAS of all sizes as aircraft, and as such they are subject to Federal Aviation Regulations. NOAA Administrative Order 216-104A: Management and Utilization of Aircraft, effective May 2015, prescribes the policy and responsibilities for the management and utilization of manned and unmanned aircraft, and designates responsibility to NOAA's Aircraft Operations Center (AOC) in Lakeland, FL for their management and operational control. AOC ensures that safety and compliance with aviation regulations and policy is maintained.

The use unmanned systems and analysis of data they provide support Executive Order 13859: Executive order on Maintaining American Leadership in Artificial Intelligence. The Commercial Engagement Through Ocean Technology Act of 2018 also calls for NOAA to coordinate the Administration's research, assessment and acquisition of unmanned maritime systems and to consider the use of unmanned maritime systems in cooperative activities of the Administration.

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PROGRAM INCREASE FOR 2020
(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Increase from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Unmanned System Operations	Pos./BA	0	665	10	4,665	10	4,000
	FTE/OBL	0	665	8	4,665	8	4,000

Unmanned Systems Program (+$4,000, 8 FTE/10 Positions) – This request will establish and sustain an Unmanned Systems (UxS) Operations Program within OMAO that will provide centralized coordination, support and guidance for unmanned marine and aircraft systems across NOAA. The program will also evaluate emerging UxS technologies and determine where opportunities exist to more cost-effectively carry out NOAA mission-critical activities using UxS rather than existing means.

The program will provide operational support in four field locations - Marine Operations, Newport, OR; Marine Operations, Newport, RI; National Data Buoy Center (NDBC), Stennis, MS; Aircraft Operations Center, Lakeland, FL. The program - and will be headquartered in Silver Spring, MD with its Unmanned Maritime Systems component headquartered in Stennis, MS.

Rapidly evolving UxS technology will be invaluable in supporting NOAA mission requirements such as hydrographic and habitat mapping, fishery stock assessment, and oceanographic and atmospheric observations that support weather forecasting and extreme weather events. NOAA anticipates increased demand for UAS support because of the relaxation of airspace regulations and the dramatic growth being forecast for UAS flight time. Without additional funding, OMAO would not be able to provide the same level of oversight to effectively manage this program. Furthermore, operational support for unmanned marine systems does not exist, and centralized, strategic, support for UxS in NOAA is lacking. As UxS become more widely used, funds are required to establish a program office that provides essential, operational support for both unmanned marine systems and unmanned aircraft systems. This request will support centralized UxS management and standardization of safety, training, inspections, and operational reviews. Funds will also be used to operate and maintain UxS, and plan strategically for UxS acquisition within NOAA, consistent with NOAA's data needs and priorities. The UxS program will leverage collaborative partnerships with federal agencies, academic institutions, and industry. It will also ensure that NOAA complies with UxS governance requirements, while safely and efficiently supporting current and emerging NOAA missions. Unmanned System Operations will be a new PPA under ORF.

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(Dollar amounts in thousands)

This request supports the Commercial Engagement through Ocean Technology Act of 2018, requiring NOAA to coordinate the Administration's research, assessment, and acquisition of unmanned maritime systems; and to consider the use of unmanned maritime systems in cooperative activities of the Administration. The use unmanned systems and analysis of data they provide also supports Executive Order 13859 to Maintain American Leadership of Artificial Intelligence.

Schedule and Milestones:
FY 2020

- Begin centralization of all NOAA UxS operations within OMAO
- Expand operational support to field locations
- Establish collaborative partnerships with other Federal agencies, academia, and industry

Deliverables:

- Final assessment of NOAA's UxS observational mission requirements
- Provide training and standardization to all UAS pilots across NOAA
- Conduct field inspections for all UAS operations within NOAA
- Provide acquisition expertise and guidance to include oversight of the acquisition process, for either purchase and/or lease, of proven UxS
- Ensure cyber security of operations
- Safety review of UxS operations

Performance Measures	2020	2021	2022	2023	2024
Number of NOAA UAS Flight Hours overseen by OMAO					
With increase	525	620	750	1000	1000
Without increase	500	500	500	500	500
Percent of all NOAA UxS operations receiving OMAO oversight					
With increase	25%	50%	75%	100%	100%
Without increase	24%	20%	17%	13%	13%

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Unmanned System Operations
Subactivity: Unmanned System Operations
Program Change: Unmanned Systems Program

Title		Grade	Number	Annual Salary	Total Salaries
Program Director		15	1	152,760	152,760
Program Deputy		14	1	129,869	129,869
Operations Engineering		14	4	119,920	479,681
Operations Support		14	4	119,920	479,681
Total			10		1,241,991
Less lapse	25.00%		(3)		(310,498)
Total full-time permanent (FTE)			8		931,493
2020 Pay Adjustment	0.00%				0
Total					931,493

Personnel Data	
Full-time Equivalent Employment	
Full-time permanent	8
Other than full-time permanent	0
Total	8
Authorized Positions:	
Full-time permanent	10
Other than full-time permanent	0
Total	10

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Unmanned System Operations
Subactivity: Unmanned System Operations
Program Change: Unmanned Systems Program

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	$0	$0	$0	$931	$931
11.3	Other than full-time permanent	$0	$0	$0	$0	$0
11.5	Other personnel compensation	$0	$0	$0	$0	$0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	931	931
12	Civilian personnel benefits	0	0	0	250	250
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	115	555	440
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	150	150
23.3	Communications, utilities and misc charges	0	0	0	41	41
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	346	1,748	1,402
25.3	Other goods and services from Federal	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	5	5
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	0	0	200	335	135
31	Equipment	0	0	4	650	646
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$0	$0	$665	$4,665	$4,000

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(Dollars in thousands)

Activity: Marine and Aviation Capital Investments

Goal Statement

Marine and Aviation Capital Investments activity goals are to:

- Acquire effective and efficient aircraft and ship platforms to support NOAA's prioritized airborne and at-sea data requirements.
- Maintain NOAA's current fleet at a higher state of readiness
- Advance coastal and worldwide ocean survey and data collection through investment in new vessel construction

Base Program

PLATFORM CAPITAL IMPROVEMENTS AND TECHNOLOGY INFUSION

The Platform Capital Improvement and Tech Infusion program allows NOAA to plan and perform cyclic depot-level capital investments across the fleet each year and is designed to maintain and extend the service life of NOAA's vessel and aircraft fleet. It ensures that the required upgrades to aircraft and ship-board systems and mission equipment comply with safety requirements and the needs of the programs. Aircraft and ships receive regular upgrades and replacements of mission support equipment and technology infusions such as data processing and storage capacity, multi-beam sonars and sensors, and UAS launch and recovery systems.

VESSEL RECAPITALIZATION

The Vessel Recapitalization program includes vessel acquisition, instrumentation, service life extensions. The program supports the oversight of these activities, which include a rigorous analysis of mission requirements, detailed design and construction, and alternative options to meet prioritized requirements. Fleet recapitalization provides a clear path forward, leading to platform capability requirements, preliminary costs and timelines.

AIRCRAFT RECAPITALIZATION

Currently, NOAA has nine aircraft. Ranging from a high altitude, high-speed jet capable of hurricane surveillance to smaller highly maneuverable aircraft used for water resources and protected species management; NOAA aircraft support a wide range of

activities. In FY 2018, NOAA received funds for two aircraft – one King Air ($12.0 million), to replace NOAA's Jet Prop Commander, and one High Altitude jet ($121.0 million), to replace the G-IV as the primary aircraft for hurricane surveillance, hurricane intensity studies, and atmospheric research.

Statement of Operating Objectives

Schedule and Milestones:

Platform Capital Improvements and Technology Infusion

- Perform phased overhauls, upgrades, and replacements of ship's systems through infrastructure improvement plans
- Develop long-term ship maintenance plans
- Complete deferred maintenance plan developed for funds provided in the FY 2018 and FY 2019 appropriation

Vessel Recapitalization

- Conduct service life assessments for NOAA vessels
- Continue Force Architecture efforts to define vessel characteristics

2020

- Award detail design and construction option for first N/V Class A
- Develop Class B Vessel acquisition documentation and conduct feasibility studies
- Continue Class C Vessel requirements analysis

2021

- Begin construction of first N/V Class A
- Complete Class B acquisition efforts
- Begin procurement efforts and initiate preliminary design competition for Class C

2022

- Begin construction of second N/V Class A
- Award detail design and construction option for N/V Class B
- Develop Class C characteristics and conduct feasibility studies

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2023

- Deliver first N/V Class A
- Begin construction of first N/V Class B
- Award second N/V Class B

Aircraft Recapitalization

2020

- Procurement completed for King Air
- Procurement complete and modifications ongoing for Gulfstream 550

2021

- Testing and calibration completed for King Air.
- King Air fully operational and added to the aircraft fleet

2022

- Modification completed for the Gulfstream 550

2023

- Gulfstream 550 fully operational and added to the aircraft fleet

Deliverables:

- Improve the reliability of the fleet and reduce lost DAS from unscheduled maintenance.
- Ensure the continued capability of the NOAA Fleet
- Attain the planned operational service life of all vessels
- Two Class A vessels, adapted for NOAA's at-sea data collection (2023 and 2024)
- NOAA Class B and Class C vessels (2025 and beyond)
- King Air added to the fleet (2021)
- Gulfstream 550 added to the fleet (2023)

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Out-year Funding Estimates ($ in Thousands):

Vessel Recapitalization	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base		0	0	0	0	0	TBD	TBD
Total Request	300,050	75,000	75,000	75,000	75,000	75,000	TBD	TBD

Explanation and Justification

		2018 Actual		2019 Enacted		2020 Base	
Comparison by subactivity		Personnel	Amount	Personnel	Amount	Personnel	Amount
Platform Capital	Pos/BA	1	24,378	4	24,378	4	24,378
Improvements & Tech	FTE/OBL	1	17,749	4	24,378	4	24,378
Vessel Recapitalization	Pos/BA	1	75,000	7	75,000	7	75,000
	FTE/OBL	1	74,915	7	75,000	7	75,000
Aircraft Recapitalization	Pos/BA	1	133,000	0	0	0	0
	FTE/OBL	1	132,867	0	0	0	0
Total Fleet Replacement	Pos/BA	2	232,378	11	99,378	11	99,378
	FTE/OBL	2	225,531	11	99,378	11	99,378

PLATFORM CAPITAL IMPROVEMENTS AND TECHNOLOGY INFUSION

OMAO monitors the material condition of aircraft through periodic Service Life Assessments (SLAs) and Service Life Extension (SLE) Programs. The SLA documents completed for all aircraft in 2016 by a third-party vendor provide key data on maintenance costs and trends; sustainability costs; reliability metrics and issues all which guide future capital investment decision making. In addition, OMAO uses manufacturer provided SLE costs such as re-winging, major overhauls and upgrades to help determine economic feasibility, cost benefit and reliability data. These data are critical to maximizing future maintenance investments and capital investments.

For vessels, OMAO monitors their material condition through Ship Structure and Machinery Evaluation (SSME). The SSMEs document the results of inspections and identifies future work requirements to guides capital investment decision making. Additionally, OMAO uses manufacturer-provided information for new ships to develop maintenance profiles. To address regular capital improvements for NOAA ships, progressive lifecycle maintenance (PLM) extends the service life of vessels by proactively overhauling, upgrading, or replacing shipboard systems before they fail. Repairs completed through PLM improve the material condition of the ships, provide sustained critical technology refresh, and ensure NOAA ships remain capable of collecting environmental data to support NOAA's mission to provide accurate and reliable products services critical for national security, public safety, and economic security.

The chart below lists the types of capital investments that vary from year-to-year based on the results of SSMEs that assess the material condition of the ships and determine priority repairs.

Crew Space Refurbishment	Science/ Mission Space Refurbishment	Shipboard Systems	Underwater Body	Mission Systems Refresh
Refrigeration systems HVAC refurbishment Renovation of habitability spaces	Renovation of laboratory spaces Modifications to allow for emerging technologies	Propulsion & generation systems overhaul Re-piping Fire suppression upgrades Machinery monitoring upgrades Environmental equipment replace	Blast hull Refurbish props/shafts Refurbish valves/ piping	Multi-beam sonars and sensors Ship-board electronic data processing and storage UAS Launch/ Recovery System Small boats and launches Cranes, winches, davits

NOAA continues work to transition to a progressive lifecycle maintenance. In FY 2018 and FY 2019, NOAA received $21.5 and $21 million respectively to address the backlog of deferred maintenance. Of this, $11.5 million was provided in PAC in both FY 2018 and

FY 2019. NOAA is completing a detailed maintenance plan to define repair packages for each vessel, procurement of long lead-time spares, and additional personnel required to efficiently execute maintenance. In addition, NOAA is completing a long-term maintenance plan that provides an annual plan, by ship, of all required, preventative, and technological upgrades. The long-term maintenance plan is largely informed by the detailed data obtained through the Service Life Assessments.

VESSEL RECAPITALIZATION

NOAA's ships need to be multi-mission adaptable and provide the infrastructure and capabilities necessary to meet mission requirements now and in the future.

In October 2016, NOAA released the Fleet Plan that assesses NOAA's current and future (2016-2028) at-sea observational infrastructure needs for carrying out its mission of protecting lives, livelihoods, and valuable natural resources for the American public. It identifies an integrated approach consisting of best management practices and long-term recapitalization levers to extend and sustain capabilities. The plan includes the critical long-term strategy of designing and constructing up to eight new ships specifically designed to meet NOAA core capability requirements based on mission and activities.

To better inform the Fleet Plan, NOAA contracted the American Bureau of Shipping (ABS) to perform Service Life Assessments (SLA) on the twelve oldest ships in the sixteen ship fleet. SLAs provided current condition assessments by evaluating hull structure, and ship board systems based on four methodologies: survey assessment to include survey and machinery findings; fatigue analysis to include the full ship global finite element models and vessel service history; strength assessment; and machinery assessments to include propulsion equipment and auxiliary equipment. The resulting level of data is unprecedented for the NOAA Fleet and provides for detailed long-term maintenance planning. The SLA data and dates, in conjunction with the new vessel construction, and maintenance plans will be used to adjust planned end of service dates for the NOAA ships. Based on this information, NOAA is currently investigating options to best maintain fleet capacity.

In contrast to the wide variety of vessel types that currently comprise the NOAA Fleet, NOAA intends to reduce the number of hull types in the future, focusing each class on a core mission with secondary missions that make the best use of the vessel's capabilities. OMAO is using Force Architecture process to define vessel characteristics at a high level.

Standardization to the extent possible is critical for efficient maintenance, upgrades and optimal crewing models. Each vessel type will incorporate the latest technologies during construction and accommodate new technologies as they become available. Across the fleet, core equipment types will be standardized as much as possible to reduce operation and maintenance cost

The new ship acquisition process consists of four phases: requirements analysis, concept design, preliminary design, and detailed design and construction. These phases are immediately followed by warranty and fleet introduction activities before the ship is ready for full operation. Efforts will be made throughout the process to leverage design aspects of previous ship classes and to create standardization across the fleet to meet multiple core mission requirements.

Progress on NOAA's Fleet Recapitalization Plan has helped put NOAA on a steady path toward a more reliable fleet that supports NOAA's science needs. The appropriations from FY 2016-FY2019 primarily supported the design and construction of the first two NOAA Auxiliary General Purpose Oceanographic Research (AGOR) Variant vessels. Specifically, funding in FY 2016 enabled NOAA to enter into an Interagency Agreement with the Navy for programmatic support to begin the acquisition of the first AGOR variant vessel. FY 2017 and FY 2018 funding allowed NOAA to fully fund the Detail Design and Construction of the first vessel, and begin the acquisition of a second vessel. FY 2018 funding also supported Force Architecture efforts to conduct future fleet analysis and inform characteristics of Class B and C vessels, based on the continued requirements analysis, feasibility studies, and analysis of alternatives. NOAA will use the $75.0 million that was appropriated in FY 2019 to continue acquisition of the second AGOR variant, Force Architecture efforts, and performing the analyses, design studies and acquisition documentation for the Class B and C vessels.

NOAA's fleet recapitalization plan is a living document and is fungible to account for unanticipated/emerging requirements and other fact of life changes.

AIRCRAFT RECAPITALIZATION

NOAA relies on its specialized aircraft to make critical oceanographic, atmospheric, hydrographic, and fisheries observations. Without this data, products and services like weather forecasts and warnings, nautical charts, accurate fishery quotas and stock assessments, harmful algal bloom warnings, climate outlooks, and a host of other products, services, and management activities would not be possible.

With the $133 million provided in FY 2018 for Aircraft Acquisition, NOAA will complete the acquisition of two aircraft, adding a King

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Air to NOAA's fleet in 2021 and the Gulfstream 550 in 2023. The new aircraft will increase NOAA's ability to meet prioritized mission requirements, consolidate the number of aircraft types in NOAA's fleet, and leverage the latest technology, enhancing NOAA's support for marine transportation as well as hurricane surveillance and research.

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(Dollar amounts in thousands)

		2020 Base		2020 Estimate		Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Platform Capital Improvement and Technology Infusion	Pos./BA	4	24,378	4	16,700	0	(7,678)
	FTE/OBL	4	24,378	4	16,700	0	(7,678)

Decrease in Progressive Lifecycle Maintenance (-$7,678, 0 FTE/0 Positions) – NOAA requests a decrease in funds for capital repairs to NOAA's ship fleet through funding for the Progressive Lifecycle Maintenance program.

Appropriated funding for this program in FY 2018 and FY 2019 has considerably reduced the deferred maintenance backlog on NOAA vessels. These funds will continue to support fleet maintenance during the FY 2019 and FY 2020 vessel repair periods. NOAA anticipates it will be able to address the existing PAC maintenance backlog and increase reliability of its vessels as a result of this investment. Funds provided in FY 2020 will be used to meet priority at-sea requirements and improve Fleet support to NOAA's mission-critical nautical charting, bathymetric mapping, fisheries research, ecosystem assessments, coastal-ocean circulation, and oceanographic and atmospheric research.

Deliverables:

- Extended service life of the Fleet by stabilizing the material condition of the ships through timely performance of maintenance and capital repair, upgrade and replacements
- Enhanced long term observation capabilities and infrastructure that directly inform understanding of weather variability and ecosystem processes

Performance Measures	2020	2021	2022	2023	2024
Lost Days at Sea (DAS)					
With decrease	400	420	420	420	420
Without decrease	400	400	400	400	400

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(Dollar amounts in thousands)

Out-year Funding Estimates ($ in Thousands):

Platform Capital Improvements and Technology Infusion	2019 & Prior	2020	2021	2022	2023	2024	CTC	Total
Change from 2020 Base		(7,678)	(7,678)	(7,678)	(7,678)	(7,678)	N/A	N/A
Total Request	83,357	16,700	16,700	16,700	16,700	16,700	TBD	TBD

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Activity: Platform Capital Improvements and Technology Infusion
Subactivity: Progressive Lifecycle Maintenance
Program Change: Decrease in Progressive Lifecycle Maintenance

	Object Class	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Decrease from 2020 Base
11	Personnel compensation					
11.1	Full-time permanent	0	300	300	300	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	$0	$300	$300	$300	$0
12	Civilian personnel benefits	0	100	100	100	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental Payments to others	0	0	0	0	0
23.3	Communications, utilities and misc charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	13,758	13,358	13,358	8,858	(4,500)
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0
25.6	Medical care	0	0	0	0	0
25.7	Operation and maintenance of equipment	0	0	0	0	0
25.8	Subsistence and support of persons	0	0	0	0	0
26	Supplies and materials	2,691	9,320	9,320	6,320	(3,000)
31	Equipment	1,300	1,300	1,300	1,122	(178)
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total obligations	$17,749	$24,378	$24,378	$16,700	($7,678)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Enacted, 2019	0	0	30,075	30,075
plus: 2020 Adjustments to Base	0	0	0	0
2020 Base	0	0	30,075	30,075
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	30,075	30,075

		2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Corps	POS/BA	0	30,102	0	30,075	0	30,075	0	30,075	0	0
Retirement Pay	FTE/OBL	0	26,262	0	30,075	0	30,075	0	30,075	0	0
Total: NOAA Corps	POS/BA	0	30,102	0	30,075	0	30,075	0	30,075	0	0
Retirement Pay	FTE/OBL	0	26,262	0	30,075	0	30,075	0	30,075	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	26,262	0	30,075	0	30,075	0	30,075	0	0
Total Obligations	**0**	**30,102**	**0**	**30,075**	**0**	**30,075**	**0**	**30,075**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance	0	3,840	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**30,102**	**0**	**30,075**	**0**	**30,075**	**0**	**30,075**	**0**	**0**
Financing from Transfers and Other:	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**30,102**	**0**	**30,075**	**0**	**30,075**	**0**	**30,075**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: NOAA Corps Retirement Pay (Mandatory)

Goal Statement

The objective of this line item is to provide payment of benefits to retired NOAA Corps Officers and their families.

Base Program

In FY 2018, there were 403 retired NOAA Corps officers receiving retired pay benefits, and 31 spouses or 34 dependents of deceased retired officers, who are still eligible to receive benefits.

Operating Objectives

Schedule and Milestones:

- Transfer funds to the U.S. Coast Guard
- Administer Healthcare funds for non-Medicare-eligible retirees, dependents, and annuitants

Deliverables:

- Benefits for retired NOAA Corps Officers and their families

Explanation and Justification

The retirement system for the uniformed services provides a measure of financial security after release from active duty for service members and their survivors. It is an important factor in the choice of a career in the uniformed services, and the legal mandate for rates to be paid is the same for all uniformed services, see 10 USC. Retired pay is an entitlement to NOAA Commissioned Corps officers under 33 USCA 3044, 33 USCA 3045, and 33 USCA 3046. Retired pay funds are transferred to the U.S. Coast Guard (USCG), which handles the payments each year as adjusted pursuant to the Department of Defense Authorization legislation. Healthcare funds for non-Medicare-eligible retirees, dependents, and annuitants are administered by the Office of Marine and Aviation Operations (OMAO).

This line includes funding for the modernized retirement system which includes matching Thrift Savings Plan (TSP) contributions, continuation pay, and retirement itself. Public Law 114-92, the National Defense Authorization Act for FY 2016—provides the Secretary the authority to provide TSP contributions for members of the uniformed services effective January 1, 2018. Public Law 114-92, as amended by P.L. 114-328, the National Defense Authorization Act for FY 2017—modifies section 356 of title 37 and the

use of continuation pay for full TSP members. Members must have “completed not less than [eight] and not more than [twelve] years of service” and “[enter] into an agreement of not less than [three] additional years of obligated service.” Continuation pay applies across the board to all military members who are in the modernized retirement system and is intended to help ensure retention after a member has the ability to acquire significant retirement benefits.

Legal authority for retirement of NOAA Commissioned Corps officers is contained in 33 USCA 3044. Retired officers of the NOAA Commissioned Corps receive retirement benefits that are administered by USCG, in accordance with a Memorandum of Agreement between the USCG and NOAA, with funds certified by the Commissioned Personnel Center within OMAO.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
Object Class					
13 Benefits for Former Personnel	23,762	26,875	26,875	26,875	0
25.3 Other goods and services from Federal sources	2,500	3,200	3,200	3,200	0
Total Obligations	26,262	30,075	30,075	30,075	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	3840	0	0	0	0
Offsetting collections, Mandatory	0	0	0	0	0
Less: Previously Unavail. Unoblig. Bal.	0	0	0	0	0
Total Budget Authority Mandatory	30,102	30,075	30,075	30,075	0
Personnel Data					
Full-Time Equivalent Employment					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0
Authorized Positions:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0

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Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
Enacted, 2019	0	0	1,603	1,449
Plus: 2020 Adjustments to Base	0	0	(106)	48
2020 Base	0	0	1,497	1,497
Plus: 2020 Program Changes	0	0	0	0
2020 Estimate	0	0	1,497	1,497

		2018 Enacted		2019 President's Budget		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Medicare Eligible	Pos/BA	0	1,584	0	1,603	0	1,497	0	1,497	0	0
Health Fund Contribution	FTE/OBL	0	1,584	0	1,449	0	1,497	0	1,497	0	0
Total: Medicare Eligible	Pos/BA	0	1,584	0	1,603	0	1,497	0	1,497	0	0
Retiree Health Fund	FTE/OBL	0	1,584	0	1,449	0	1,497	0	1,497	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2018 Actual		2019 Enacted		2020 Base		2020 Estimate		Increase/Decrease from 2020 Base	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	1,584	0	1,449	0	1,497	0	1,497	0	0
Total Obligations	**0**	**1,584**	**0**	**1,449**	**0**	**1,497**	**0**	**1,497**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance	0	0	0	154	0	0	0	0	0	0
Total Budget Authority	**0**	**1,584**	**0**	**1,603**	**0**	**1,497**	**0**	**1,497**	**0**	**0**
Financing from Transfers and Other:										
Net Appropriation	**0**	**1,584**	**0**	**1,603**	**0**	**1,497**	**0**	**1,497**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare-Eligible Retiree Healthcare Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

Activity: Medicare-Eligible Retiree Healthcare Fund Contribution - NOAA Corps

Goal Statement

This account is NOAA's contribution to a health care accrual fund for NOAA Corps officers. The accrual fund pays for the future health care benefits for current officers once they retire and become Medicare-eligible, as well as for their dependents and annuitants.

Base Program

For FY 2019, payments to the accrual fund are estimated at $1,449,000.

Statement of Operating Objectives

Schedule and Milestones:
On-going

- Contribute to healthcare accrual fund
- Provide healthcare benefits to eligible retired NOAA Corps Officers and their dependents and annuitants

Deliverables:

- Healthcare benefits of present, active-duty NOAA offices and their dependents and annuitants

Explanation and Justification

The FY 2003 Department of Defense Authorization Act requires all uniformed services, including NOAA, to participate in an accrual fund for Medicare-eligible retirees. Payments into this accrual fund will cover the future health care benefits of present, active-duty NOAA officers and their dependents and annuitants.

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Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	2018 Actual	2019 Enacted	2020 Base	2020 Estimate	Increase/Decrease from 2020 Base
Object Class					
25.3 Other goods and services from Federal sources	1,584	1,449	1,497	1,497	0
Total Obligations	**1,584**	**1,449**	**1,497**	**1,497**	**0**
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	154	0	0	0
Offsetting collections, Mandatory	0	0	0	0	0
Less: Previously Unavail. Unoblig. Bal.	0	0	0	0	0
Total Budget Authority	**1,584**	**1,603**	**1,497**	**1,497**	**0**
Personnel Data					
Full-Time Equivalent Employment					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**
Authorized Positions:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

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Department of Commerce
National Oceanic and Atmospheric Administration
JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

FY 2020 NOAA Cost Recovery Language

SEC. 109. *To carry out the responsibilities of the National Oceanic and Atmospheric Administration (NOAA), the Administrator of NOAA is authorized to: (1) enter into grants and cooperative agreements with; (2) use on a non-reimbursable basis land, services, equipment, personnel, and facilities provided by; and (3) receive and expend funds made available on a consensual basis from: a Federal agency, State or subdivision thereof, local government, tribal government, territory, or possession or any subdivisions thereof, foreign government, international or intergovernmental organization, public or private organization, or individual: Provided, That funds received for permitting and related regulatory activities pursuant to this section shall be deposited under the heading "National Oceanic and Atmospheric Administration—Operations, Research, and Facilities" and shall remain available until expended for such purposes: Provided further, That all funds within this section and their corresponding uses are subject to section 505 of this Act.*

Justification

NOAA proposes to clarify NOAA's ability to receive and expend funds from, and to engage in agreements with, external entities to carry out its responsibilities. These activities include, but are not limited to, scientific data collection and research that informs NOAA's decisions and utilization of land and facilities to support NOAA's research and operational activities. Statutes include, but are not limited to, the Endangered Species Act, Marine Mammal Protection Act, Magnuson-Stevens Fishery Conservation and Management Act, National Marine Sanctuaries Act, Oil Pollution Act, Tsunami Warning and Education Act, and Weather Service Organic Act. Examples are agreements and funding arrangements to: perform research on stock assessment and ecosystem processes for conservation and management purposes; perform oceanographic surveys to determine baseline for Oil Pollution Act purposes; perform research and development on oil spill response; and perform research on endangered species for purposes of ESA consultation, or on marine mammals for MMPA Incidental Harassment Authorizations, to inform permitting of infrastructure projects, oil and gas drilling or other regulated activities. This provision also authorizes agreements and funding arrangements for the placement of scientific equipment on bridges and piers, educational kiosks in public places, use of piers, vessels, storage, freezer space, and warehouses for mission needs, and use of universities' and public organizations' laboratory and other space to increase collaboration.

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Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

For expenses necessary for activities authorized by law for the National Oceanic and Atmospheric Administration,

5 USC 5348	15 USC 1514	16 USC 4701 et seq.	33 USC 3001 et seq.	
5 USC 4703	15 USC 1517	16 USC 5001 et seq.	33 USC 3044 et seq.	
7 USC 1622	15 USC 1537-40	31 USC 1105	33 USC 3045	
10 USC 1072	16 USC 661 et seq.	33 USC 706 et seq.	33 USC 3046	
10 USC 1111-1115	16 USC 757a et seq.	33 USC 883 a-i et seq.	33 USC 4001	
10 USC 2311	16 USC 1361	33 USC 891 et seq.	33 USC 3402	
12 USC 1715m	16 USC 1431 et seq.	33 USC 893 a-b,	33 USC 3501	
15 USC 313	16 USC 1447a et seq.	as amended	33 USC 3603	
15 USC 313a	16 USC 1451 et seq.	33 USC 1121-1131	33 USC 3703	
15 USC 313b	16 USC 1456a	33 USC 1251	42 USC 8902-05	
15 USC 313nt	16 USC 1456-1	33 USC 1321	42 USC 9601 et seq.	
15 USC 325	16 USC 1531 et seq.	33 USC 1441-44	43 USC 1347e	
15 USC 330b	16 USC 1801 et seq.	33 USC 2706	44 USC 1307	
15 USC 330e	16 USC 3645	33 USC 2712	49 USC 44720	
15 USC 1511 b-e	16 USC 4101 et seq.	33 USC 2801 et seq.		

Government Organization and Employees

5 USC 5348 - Crews of Vessels

"...the pay of officers and members of crews of vessels excepted from chapter 51 of this title by section 5102(c)(8) of this title shall be fixed and adjusted from time to time as nearly as is consistent with the public interest in accordance with prevailing rates and practices in the maritime industry."

5 USC 4703- Demonstration Projects

"…the Office of Personnel Management may, directly or through agreement or contract with one or more agencies and other public and private organizations, conduct and evaluate demonstration projects."

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

Agriculture

7 USC 1622 - Distribution and Marketing of Agricultural Products

"The Secretary ... is directed and authorized: ...

(a) to determine the needs and develop or assist in the development of plans for the proper assembly, processing, transportation, storage, distribution, and handling of agricultural (fish) products.

(f) to conduct and cooperate in consumer education for the more effective utilization and greater consumption of agricultural products (fish)...

(g) to collect and disseminate marketing information... for the purpose of ... bringing about a balance between production and utilization of agricultural (fish) products.

(h) to inspect, certify, and identify the class, quality, quantity and condition of agricultural (fish) products ...

(m) to conduct ... research ... to determine the most efficient ... processes for the handling, storing, preserving, protecting...of agricultural (fish) commodities ..."

(h) - Duties of Secretary relating to agricultural products; penalties

"Whoever knowingly shall falsely make, issue, alter, forge, or counterfeit any official certificate, memorandum, or other identification, with respect to inspection, class, grade, quality, size, quantity, or condition, issued or authorized under this section or knowingly cause or procure, or aid, assist in, or be a party to, such false making, issuing, altering, forging, or counterfeiting, or whoever knowingly shall possess, without promptly notifying the Secretary (of Commerce) or his representative, utter, published, or used as true, any such falsely made, altered forged, or counterfeited official certificate, memorandum, mark, identification, or device, or whoever knowingly represents that an agricultural product has been officially inspected or graded...when in fact such commodity has not been so graded or inspected shall be fined not more than $1,000 or imprisoned not more than one year, or both."

Armed Forces

10 USC 1072 Medical and Dental Care

"…The term "uniformed services" means the armed forces and the Commissioned Corps of the National Oceanic and Atmospheric Administration and of the Public Health Service."

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

10 USC 1116 Determinations of Contributions to the Fund

"At the beginning of each fiscal year after September 30, 2005, the Secretary of the Treasury shall promptly pay into the Fund from the General Fund of the Treasury--(1) the amount certified to the Secretary by the Secretary of Defense under subsection (c), which shall be the contribution to the Fund for that fiscal year required by section 1115; and (2) the amount determined by each administering Secretary under section 1111(c) as the contribution to the Fund on behalf of the members of the uniformed services under the jurisdiction of that Secretary."

10 USC 2311 Assignment and Delegation of Procurement Functions and Responsibilities

(a) In General.--Except to the extent expressly prohibited by another provision of law, the head of an agency may delegate, subject to his direction, to any other officer or official of that agency, any power under this chapter.

(b) Procurements For or With Other Agencies.--Subject to subsection (a), to facilitate the procurement of property and services covered by this chapter by each agency named in section 2303 of this title for any other agency, and to facilitate joint procurement by those agencies--

(1) the head of an agency may delegate functions and assign responsibilities relating to procurement to any officer or employee within such agency;

(2) the heads of two or more agencies may by agreement delegate procurement functions and assign procurement responsibilities from one agency to another of those agencies or to an officer or civilian employee of another of those agencies; and

(3) the heads of two or more agencies may create joint or combined offices to exercise procurement functions and responsibilities.

Banks and Banking

12 USC 1715m - Mortgage Insurance for Servicemen [NOAA Corps]

This section authorizes payment of Federal Housing Administration (FHA) home mortgage insurance premiums to NOAA Corps Officers.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

Commerce and Trade

15 USC 313 - Duties of Secretary of Commerce [National Weather Service]
"The Secretary of Commerce...shall have charge of the forecasting of weather,...issue of storm warnings,...weather and flood signals,... gauging and reporting of rivers,...collection and transmission of marine intelligence...,...reporting of temperature and rainfall conditions..., the display of frost and cold-wave signals, the distribution of meteorological information..., and the taking of such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties."

15 USC 313a - Establishment of Meteorological Observation Stations in the Arctic Region
"... The Secretary of Commerce shall ... take such actions as may be necessary in the development of an international basic meteorological reporting network in the Arctic region of the Western Hemisphere..."

15 USC 313b - Institute for Aviation Weather Prediction
"The Administrator of the National Oceanic and Atmospheric Administration shall establish an Institute for Aviation Weather Prediction. The Institute shall provide forecasts, weather warnings, and other weather services to the United States aviation community.…"

15 USC 313 note - Weather Service Modernization Act (a)
As part of the budget justification documents submitted to Congress in support of the annual budget request for the department of Commerce, the Secretary shall include a National Implementation Plan for modernization of the National Weather Service for each fiscal year following fiscal year 1993 until such modernization is complete. The Plan shall set forth the actions, during the 2-year period beginning with the fiscal year for which the budget request is made, that will be necessary to accomplish the objectives described in the Strategic Plan.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

15 USC 325 - Spending Authority for the National Weather Service

"...Appropriations now or hereafter provided for the National Weather Service shall be available for: (a) furnishing food and shelter...to employees of the Government assigned to Arctic stations; (b) equipment and maintenance of meteorological offices and stations, and maintenance and operation of meteorological facilities outside the United States... (c) repairing, altering, and improving of buildings occupied by the National Weather Service, and care and preservation of grounds...(d) arranging for communication services... and
(e) purchasing tabulating cards and continuous form tabulating paper.

15 USC 330b - Duties of Secretary relating to Weather Modification Activities or Attempts - Reporting Requirement

"The Secretary shall maintain a record of weather modification activities, including attempts, which take place in the United States and shall publish summaries thereof from time to time as he determines."

(a) "All reports, documents, and other information received by the Secretary under the provisions of this chapter shall be made available to the public to the fullest practicable extent."

15 USC 330e - Authorization of Appropriations relating to Weather Modification Activities or Attempts - Reporting Requirement

This section provides funding authority to support the reporting requirements specified in this chapter.

15 USC 1511b - United States Fishery Trade Officers

"For purposes of carrying out export promotion and other fishery development responsibilities, the Secretary of Commerce…shall appoint not fewer than six officers who shall serve abroad to promote United States fishing interests. These officers shall be knowledgeable about the United States fishing industry, preferably with experience derived from the harvesting, processing, or marketing sectors of the industry or from the administration of fisheries programs. Such officers, who shall be employees of the Department of Commerce, shall have the designation of fishery trade officers."

15 USC 1511c - NOAA Estuarine Programs Office

"... The Estuarine Programs Office shall develop, coordinate, and implement the estuarine activities of the administration with the activities of other Federal and State agencies. There are authorized to be appropriated to the Administration not to exceed $560,000 for fiscal year 1989, and $600,000 for fiscal year 1990."

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

15 USC 1511d - Chesapeake Bay Office

The Secretary of Commerce shall establish, within the National Oceanic and Atmospheric Administration, an office to be known as the Chesapeake Bay Office…which shall provide technical assistance on processes impacting the Chesapeake Bay system, its restoration and habitat protection; develop a strategy to meet the commitments of the Chesapeake Bay Agreement; and coordinate programs and activities impacting the Chesapeake Bay, including research and grants.

15 USC 1511e - Office of Space Commercialization

"There is established with the Department of Commerce an Office of Space Commercialization" which shall "promote commercial provider investment in space activities…assist United States commercial providers in [their efforts to] conduct business with the United States Government, [act] as an industry advocate within the executive branch…, ensure that the United States Government does not compete with United States commercial providers…, [promote] the export of space-related goods and services, [represent] the Department of Commerce in the development of United States policies…and [seek] the removal of legal, policy, and institutional impediments to space commerce."

15 USC 1514 - Basic Authority for Performance of Certain Functions and Activities of Department

"Appropriations are authorized for the following activities of the Department of Commerce:

(a) furnishing to employees...and their dependents, in Alaska and other points outside the continental United States, free emergency medical services...and supplies;
(b) purchasing, transporting, storing, and distributing food and other subsistence supplies for resale to employees...and their dependents, in Alaska and other points outside the continental United States at a reasonable value...; the proceeds from such resales to be credited to the appropriation from which the expenditure was made;
(c) ...establishment, maintenance, and operation of messing facilities, by contract or otherwise, in Alaska and other points outside the continental United States..., such service to be furnished to employees...and their dependents,...
(d) reimbursement...of officers or employees in or under the Department...for food, clothing, medicines, and other supplies furnished by them in emergencies for the temporary relief of dislocated persons in remote localities;
(e) providing motion-picture equipment and film for recreation of crews of vessels..., for recreation for employees in remote localities..., and for training purposes;

(f) erecting, altering, repairing, equipping, furnishing, and maintaining...such living and working quarters and facilities as may be necessary to carry out its authorized work at remote localities not on foreign soil where such living and working accommodations are not otherwise available."

15 USC 1517 - Transfer of Statistical or Scientific Work

"The President is authorized, by order in writing, to transfer at any time the whole or any part of any office, bureau, division, or other branch of the public service engaged in statistical or scientific work, from the Department of State, the Department of the Treasury, the Department of Defense, the Department of Justice, the United States Postal Service, or the Department of the Interior, to the Department of Commerce; and in every such case the duties and authority performed by and conferred by law upon such office, bureau, division, or other branch of the public service, or the part thereof so transferred, shall be thereby transferred with such office, bureau, division, or other branch of the public service, or the part thereof which is so transferred. All power and authority conferred by law, both supervisory and appellate, upon the department from which such transfer is made, or the Secretary thereof, in relation to the said office, bureau, division, or other branch of the public service, or the part thereof so transferred, shall immediately, when such transfer is so ordered by the President, be fully conferred upon and vested in the Department of Commerce, or the Secretary thereof, as the case may be, as to the whole or part of such office, bureau, division, or other branch of the public service so transferred."

15 USC 1537 Needs Assessment for Data Management

"Not later than 12 months after October 29, 1992, and at least biennially thereafter, the Secretary of Commerce shall complete an assessment of the adequacy of the environmental data and information systems of NOAA."

15 USC 1538 – Notice of reprogramming

(a) In general

The Secretary of Commerce shall provide notice to the Committee on Commerce, Science, and Transportation and Committee on Appropriations of the Senate and to the Committee on Merchant Marine and Fisheries, Committee on Science, Space, and Technology, and Committee on Appropriations of the House of Representatives, not less than 15 days before reprogramming funds available for a program, project, or activity of the National Oceanic and Atmospheric Administration in an amount greater than the lesser of $250,000 or 5 percent of the total funding of such program, project, or activity if the reprogramming-

(1) augments an existing program, project, or activity;

(2) reduces by 5 percent or more (A) the funding for an existing program, project, or activity or (B) the numbers of personnel therefor as approved by Congress; or
(3) results from any general savings from a reduction in personnel which would result in a change in an existing program, project, or activity.

(b) Notice of reorganization
The Secretary of Commerce shall provide notice to the Committees on Merchant Marine and Fisheries, Science, Space, and Technology, and Appropriations of the House of Representatives, and the Committees on Commerce, Science, and Transportation and Appropriations of the Senate not later than 15 days before any major reorganization of any program, project, or activity of the National Oceanic and Atmospheric Administration.

15 USC 1539 – Financial Assistance
(a) Processing of applications
Within 12 months after October 29, 1992, the Secretary of Commerce shall develop and, after notice and opportunity for public comment, promulgate regulations or guidelines to ensure that a completed application for a grant, contract, or other financial assistance under a nondiscretionary assistance program shall be processed and approved or disapproved within 75 days after submission of the application to the responsible program office of the National Oceanic and Atmospheric Administration.
(b) Notification of applicant
Not later than 14 days after the date on which the Secretary of Commerce receives an application for a contract, grant, or other financial assistance provided under a nondiscretionary assistance program administered by the National Oceanic and Atmospheric Administration, the Secretary shall indicate in writing to the applicant whether or not the application is complete and, if not complete, shall specify the additional material that the applicant must provide to complete the application.
(c) Exemption
In the case of a program for which the recipient of a grant, contract, or other financial assistance is specified by statute to be, or has customarily been, a State or an interstate fishery commission, such financial assistance may be provided by the Secretary to that recipient on a sole-source basis, notwithstanding any other provision of law.
(d) “Nondiscretionary assistance program” defined
In this section, the term “nondiscretionary assistance program” means any program for providing financial assistance—

(1) under which the amount of funding for, and the intended recipient of, the financial assistance is specified by Congress; or
(2) the recipients of which have customarily been a State or an interstate fishery commission.

15 USC 1540 – Cooperative Agreements
"The Secretary of Commerce, acting through the Under Secretary of Commerce for Oceans and Atmosphere, may enter into cooperative agreements and other financial agreements with any nonprofit organization to (1) aid and promote scientific and educational activities to foster public understanding of the National Oceanic and Atmospheric Administration or its programs; and (2) solicit private donations for the support of such activities."

Conservation

16 USC 46a - Marine Fisheries Program Authorization Act
This Act authorizes NMFS fisheries programs not otherwise authorized by law, including research to reduce entanglement of marine mammals in fishing gear, development of habitat restoration techniques, restoration of Chesapeake Bay, and conservation of Antarctic living marine resources.

16 USC 661 et seq.- Declaration of Purpose; Cooperation of Agencies; Surveys and Investigations; Donations
"...the Secretary of the Interior is authorized (1) to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat, in controlling losses of the same from disease or other causes, in minimizing damages from overabundant species, in providing public shooting and fishing areas, including easements across public lands for access thereto, and in carrying out other measures necessary to effectuate the purposes of said sections; (2) to make surveys and investigations of the wildlife of the public domain, including lands and waters or interests therein acquired or controlled by any agency of the United States; and (3) to accept donations of land and contributions of funds in furtherance of the purposes of said sections."

16 USC 757a et seq.- Anadromous, Great Lakes, and Lake Champlain Fisheries
The Act authorizes cooperative agreements with States "that are concerned with the development, conservation, and enhancement of [anadromous] fish" (section 757a(a)).

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16 USC 1361 - Congressional Findings
"The Congress finds that - (1) certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities;"

"The Secretary is authorized to make grants, or to provide financial assistance in such other form as he deems appropriate, to any Federal or State agency, public or private institution, or other person for the purpose of assisting such agency, institution, or person to undertake research in subjects which are relevant to the protection and conservation of marine mammals, and shall provide financial assistance for, research into new methods of locating and catching yellow-fin tuna without the incidental taking of marine mammals."

16 USC 1431 et seq. - Findings, Purposes, and Policies [The National Marine Sanctuaries Act, as amended]
(b) Purposes and Policies

"The purposes and policies of this title are -

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance;
(2) to provide authority for ... conservation and management of these marine areas ...
(3) to support, promote, and coordinate scientific research on, and monitoring of, the resources of these marine areas...
(4) to enhance public awareness, understanding, appreciation, and wise use of the marine environment;
(5) to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;
(6) to develop and implement coordinated plans for the protection and management of these areas...;
(7) to create models of, and incentives for, ways to conserve and manage these areas..."
(8) to cooperate with global programs ...; and
(9) to maintain, restore, and enhance living resources ..."

16 USC 1447a et seq. - Regional Marine Research Programs
Authorizes NOAA/EPA and Governors of certain states to appoint members to a number of regional marine research boards. Each board is to develop a comprehensive four year marine research plan and "the Administrator of the

National Oceanic and Atmospheric Administration shall administer a grant program to support the administrative functions of each Board."

Authorization for the Boards expires on October 1, 1999. The authorization for appropriations expired at the end of fiscal year 1996.

16 USC 1451 et seq. - Findings, Purposes, and Policies [Coastal Zone Management Act]
Establishes a voluntary partnership between the Federal Government and coastal States. It also establishes the National Estuarine Reserve Research program, in which the Secretary of Commerce may designate an estuarine area as a national estuarine research reserve in consultation with governor of affected state.

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16 USC 1456a – Coastal Zone Management Fund
"(b) (1) The Secretary shall establish and maintain a fund, to be known as the 'Coastal Zone Management Fund', which shall consist of amounts retained and deposited into the Fund under subsection (a) of this section and fees deposited into the Fund under section 1456 (i) (3) of this title"

16 USC 1456-1 – Coastal and Estuarine Land Conservation Program
Amends the Coastal Zone Management Act of 1972 to authorize the Secretary of Commerce to conduct a Coastal and Estuarine Land Conservation Program to protect important coastal and estuarine areas. Requires related property acquisition grants to coastal states with approved coastal zone management plans or National Estuarine Research Reserve units. Authorizes appropriations.

16 USC 1531 et seq. – Congressional Findings and Declaration of Purposes and Policy
The purposes of the Act are "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in [the statute]" (section 1531(b)).

16 USC 1801 et seq, - Magnuson-Stevens Fishery Conservation and Management Act
The primary purpose of the Act is "to take immediate action to conserve and manage the fishery resources found off the coasts of the United States (section 1801(b)(1))."

16 USC 3645 - Pacific Coastal Salmon Recovery
"(A) For salmon habitat restoration, salmon stock enhancement, and salmon research, including the construction of salmon research and related facilities, there is authorized to be appropriated for each of fiscal years 2000, 2001, 2002, and 2003, $90,000,000 to the States of Alaska, Washington, Oregon, and California. Amounts appropriated pursuant to this subparagraph shall be made available as direct payments. The State of Alaska may allocate a portion of any funds it receives under this subsection to eligible activities outside Alaska."

Amended in PL109-479 Section 302(d) as follows: Section 16(d)(2)(A) of the Pacific Salmon Treaty, as transferred by paragraph (1), is amended—

(1) by inserting "sustainable salmon fisheries," after "enhancement,";

(2) by inserting “2005, 2006, 2007, 2008, and 2009,” after “2003”; and
(3) by inserting ‘‘Idaho,’’ after ‘‘Oregon,’’.

16 USC 4101 et seq. – Interjurisdictional Fisheries
“The purposes of this chapter are - (1) to promote and encourage State activities in support of the management of interjurisdictional fishery resources, and (2) to promote and encourage management of interjurisdictional fishery resources through their range” (3) to promote and encourage research in preparation for the implementation of the use of ecosystems and interspecies approaches to the conservation and management of interjurisdictional fishery resources throughout their range.”

16 USC 4701 et seq. - Aquatic Nuisance Prevention and Control
Establishes an interagency Aquatic Nuisance Species Task Force, of which the Administrator of NOAA is a co-chair. The task force’s responsibilities include developing and implementing “a program for waters of the United States to prevent introduction and dispersal of aquatic nuisance species; to monitor, control and study such species; and to disseminate related information.”

16 USC 5001 et seq. - Purpose of Convention
“It is the purpose ... to implement the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean, signed in Moscow, February 11, 1992.”

Money and Finance

31 USC 1105 - Budget Contents and Submission to Congress
(a) On or after the first Monday in January but not later than the first Monday in February of each year, the President shall submit a budget of the United States Government for the following fiscal year. Each budget shall include a budget message and summary and supporting information.

Amended in PL108-447 (FY 2005 Omnibus Appropriations Act) as follows: “*Provided further,* That beginning in fiscal year 2006 and for each fiscal year thereafter, the Secretary of Commerce shall include in the budget justification materials that the Secretary submits to Congress in support of the Department of Commerce budget (as submitted with the budget of the President under section 1105(a) of title 31, 10 United States Code) an estimate for each

National Oceanic and Atmospheric Administration procurement, acquisition and construction program having a total multiyear program cost of more than $5,000,000 and simultaneously the budget justification materials shall include an estimate of the budgetary requirements for each such program for each of the 5 subsequent fiscal years."

Navigation and Navigable Waters

33 USC 706 et seq. - Department of Commerce; Current Precipitation Information; Appropriation
"There is authorized an expenditure as required,..., for the establishment, operation, and maintenance by the Secretary of Commerce of a network of recording and non-recording precipitation stations, known as the Hydroclimatic Network, whenever...such service is advisable..."

33 USC 883a et seq. - Surveys and Other Activities
"...the Secretary...is authorized to conduct the following activities:

(1) Hydrographic and topographic surveys;
(2) Tide and current observations;
(3) Geodetic-control surveys;
(4) Field surveys for aeronautical charts;
(5) Geomagnetic, seismological, gravity, and related geophysical measurements and investigations, and observations ..."

33 USC 883b - Dissemination of Data; Further Activities
"...the Secretary is authorized to conduct the following activities:

(1) Analysis and prediction of tide and current data;
(2) Processing and publication of data...;
(3) Compilation and printing of nautical charts...;
(4) Distribution of nautical charts..."

33 USC 883c - Geomagnetic Data; Collection; Correlation, and Dissemination

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"To provide for the orderly collection of geomagnetic data...the Secretary ... is authorized to collect, correlate, and disseminate such data."

33 USC 883d - Improvement of Methods, Instruments, and Equipments; Investigations and Research
"...the Secretary ... is authorized to conduct developmental work for the improvement of surveying and cartographic methods, instruments, and equipments; and to conduct investigations and research in geophysical sciences..."

33 USC 883e - Cooperative Agreements for Surveys and Investigations; Contribution of Costs Incurred by National Oceanic and Atmospheric Administration
"(1) The Secretary of Commerce is authorized to enter into cooperative agreements with, and to receive and expand funds made available by... for surveys or investigations... or for performing related surveying and mapping activities... and for the preparation and publication of the results thereof."

"(2) The Secretary of Commerce is authorized to establish the terms of any cooperative agreement entered into ... including the amount of funds to be received ... which the Secretary determines represents the amount of benefits derived ... from the cooperative agreement."

33 USC 883f - Contracts with Qualified Organizations
"The Secretary is authorized to contract with qualified organizations for the performance of any part of the authorized functions of the National Ocean Survey..."

33 USC 883h - Employment of Public Vessels
"The President is authorized to cause to be employed such of the public vessels as he deems it expedient to employ, and to give such instructions for regulating their conduct as he deems proper in order to carry out the provisions of this subchapter."

33 USC 883i - Authorization of Appropriations
"There are hereby authorized to be appropriated such funds as may be necessary to acquire, construct, maintain, and operate ships, stations, equipment, and facilities and for such other expenditures, including personal services at the

seat of government and elsewhere and including the erection of temporary observatory buildings and lease of sites therefore as may be necessary..."

33 USC 891 et seq. - Fleet Replacement and Modernization Program
"The Secretary is authorized to implement... a 15-year program to replace and modernize the NOAA fleet."

33 USC 893 et seq. - Research, Development, and Education
"The Administrator….shall establish a coordinated program of ocean, coastal, Great Lakes, and atmospheric research and development….that shall focus on the development of advanced technologies and analytical methods that will promote United States leadership in ocean and atmospheric science and competitiveness in the applied uses of such knowledge."

33 USC 1121-1124, 1126-1129, 1131 - National Sea Grant College Program Act
The Sea Grant Act authorizes the awarding of grants and contracts to initiate and support programs at Sea Grant colleges and other institutions for research, education, and advisory services in any field related to the conservation and development of marine resources.

33 USC 1251- Water Pollution Prevention and Control
Through the National Shellfish Indicator Program, authorizes the Secretary of Commerce, in cooperation with the Secretary of Health and Human Services and the Administrator of EPA, to establish and administer a 5-year national shellfish research program for the purpose of improving existing classification systems for shellfish growing waters using the latest technological advancements in microbiology and epidemiological methods.

33 USC 1321 - Oil and Hazardous Substances [Clean Water Act]
Authorizes the recovery of damages to natural resources in the event of an oil spill in waters of the United States. This authority has been delegated to several Federal agencies, including the Department, pursuant to an Executive Order.

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33 USC 1441 - Monitoring and Research Program [Marine Protection, Research and Sanctuaries Act]
Authorizes the Secretary of Commerce, in coordination with other agencies, to initiate a comprehensive and continuing program of monitoring and research regarding the effects of the dumping of material into ocean waters or other coastal waters where the tide ebbs and flows or into the Great Lakes or their connecting waters.

33 USC 1442 - Research Program Respecting Possible Long-range Effects of Pollution, Overfishing, and Man-induced Changes of Ocean Ecosystems
Authorizes the Secretary of Commerce, in consultation with other agencies, to … "initiate a comprehensive and continuing program of research with respect to the possible long-range effects of pollution, overfishing, and man-induced changes of ocean ecosystems."

33 USC 1443 - Regional Management Plans for Waste Disposal in Coastal Areas
Authorizes the Secretary of Commerce to assist the Environmental Protection Agency in assessing "the feasibility in coastal areas of regional management plans for the disposal of waste materials."

33 USC 1444 - Annual Report
Requires the Secretary of Commerce to provide Congress with an annual report on the Department's activities to monitor ocean dumping and research the long-range effects of pollution on ocean ecosystems.

33 USC 2706 - Natural Resources [NOAA Oil and Hazardous Substance Spill Cost Reimbursement]
"...the National Oceanic and Atmospheric Administration acts as trustee of said marine environment and/or resources, shall be deposited in the Damage Assessment and Restoration Revolving Fund ... for purposes of obligation and expenditure in fiscal year 1991 and thereafter, sums available in the Damage Assessment and Restoration Revolving Fund may be transferred, upon the approval of the Secretary ..., to the Operations, Research, and Facilities appropriation of the National Oceanic and Atmospheric Administration."

33 USC 2712 – Use of Oil Spill Liability Trust Fund
Amends Section 1012(a)(5) of the Oil Spill Liability Trust Fund Act by: "(2) by inserting after subparagraph (A) the following:''(B) not more than $15,000,000 in each fiscal year shall be available to the Under Secretary of Commerce for Oceans and Atmosphere for expenses incurred by, and activities related to, response and damage assessment capabilities of the National Oceanic and Atmospheric Administration.''

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33 USC 2801 et seq. - National Coastal Monitoring Act
"The purposes of this chapter are to -

(1) establish a comprehensive national program for consistent monitoring of the Nation's coastal ecosystems;
(2) establish long-term water quality assessment and monitoring programs for high priority coastal waters that will enhance the ability of Federal, State, and local authorities to develop and implement effective remedial programs for those waters;
(3) establish a system for reviewing and evaluating the scientific, analytical, and technological means that are available for monitoring the environmental quality of coastal ecosystems;
(4) establish methods for identifying uniform indicators of coastal ecosystem quality;
(5) provide for periodic, comprehensive reports to Congress concerning the quality of the Nation's coastal ecosystems;
(6) establish a coastal environment information program to distribute coastal monitoring information;
(7) provide state programs authorized under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) with information necessary to design land use plans and coastal zone regulations that will contribute to the protection of coastal ecosystems; and
(8) provide certain water pollution control programs authorized under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) with information necessary to design and implement effective coastal water pollution controls."

33 USC 3001 et seq.- NOAA Corps Officers
There shall be in the National Oceanic and Atmospheric Administration a commissioned officer corps.

33 USC 3044 et seq. -Retirement for Length of Service
An officer who has completed 20 years of service, of which at least 10 years was service as a commissioned officer, may at any time thereafter, upon application by such officer and in the discretion of the President, be placed on the retired list.

33 USC 3045 - Computation of Retired Pay

(a) Officers first becoming members before September 8, 1980: Each officer on the retired list who first became a member of a uniformed service before September 8, 1980, shall receive retired pay at the rate determined by multiplying (1) the retired pay base determined under section 1406(g) of title 10; by (2) 2 ½ percent of the number of years of service that may be credited to the officer under section 1405 of such title as if the officer's service were service as a member of the Armed Forces. The retired pay so computed may not exceed 75 percent of the retired pay base. (b) Officers first becoming members on or after September 8, 1980. Each officer on the retired list who first became a member of a uniformed service on or after September 8, 1980, shall receive retired pay at the rate determined by multiplying (1) the retired pay base determined under section 1407 of title 10; by (2) the retired pay multiplier determined under section 1409 of such title for the number of years of service that may be credited to the officer under section 1405 of such title as if the officer's service were service as a member of the Armed Forces. (c) Treatment of full and fractional parts of months in computing years of service (1) In general, in computing the number of years of service of an officer for the purposes of subsection (a) of this section - (A) each full month of service that is in addition to the number of full years of service creditable to the officer shall be credited as 1/12 of a year; and (B) any remaining fractional part of a month shall be disregarded. (2) Rounding Retired pay computed under this section, if not a multiple of $1, shall be rounded to the next lower multiple of $1."

10 USC 1409 - Retired pay multiplier

"(4) Modernized retirement system.-(A) Reduced multiplier for full tsp members .-Notwithstanding paragraphs (1), (2), and (3), in the case of a member who first becomes a member of the uniformed services on or after January 1, 2018, or a member who makes the election described in subparagraph (B) (referred to as a "full TSP member")- (i) paragraph (1)(A) shall be applied by substituting "2" for "2½"; (ii) clause (i) of paragraph (3)(B) shall be applied by substituting "60 percent" for "75 percent"; and (iii) clause (ii)(I) of such paragraph shall be applied by substituting "2" for "2½". (B) Election to participate in modernized retirement system .-Pursuant to subparagraph (C), a member of a uniformed service serving on December 31, 2017, who has served in the uniformed services for fewer than 12 years as of December 31, 2017, may elect, in exchange for the reduced multipliers described in subparagraph (A) for purposes of calculating the retired pay of the member, to receive Thrift Savings Plan contributions pursuant to section 8440e(e) of title 5. (C) Election period.- (i) In general .-Except as provided in clauses (ii) and (iii), a member of a uniformed service described in subparagraph (B) may make the election authorized by that subparagraph only during the period that begins on January 1, 2018, and ends on December 31, 2018. (ii) Hardship extension .-The Secretary concerned may extend the election period described in clause (i) for a member who experiences a hardship as determined by the Secretary concerned. (iii) Effect of break in service .-A member of a uniformed service who returns

to service after a break in service that occurs during the election period specified in clause (i) shall make the election described in subparagraph (B) within 30 days after the date of the reentry into service of the member."

33 USC 3046 - Retired Grade and Retired Pay
Each officer retired pursuant to law shall be placed on the retired list with the highest grade satisfactorily held by that officer while on active duty including active duty pursuant to recall, under permanent or temporary appointment, and shall receive retired pay based on such highest grade, if - (1) the officer's performance of duty in such highest grade has been satisfactory, as determined by the Secretary of the department or departments under whose jurisdiction the officer served; and (2) unless retired for disability, the officer's length of service in such highest grade is no less than that required by the Secretary of officers retiring under permanent appointment in that grade.

33 USC 4001 **-** Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2014
The President, through the Committee on Environment and Natural Resources of the National Science and Technology Council, shall establish an Inter-Agency Task Force on Harmful Algal Blooms and Hypoxia. The Task Force shall consist of a representative from—the Department of Commerce (who shall serve as Chairman of the Task Force) among others.

33 USC 3402 – Coordinated National Ocean Exploration Program
The Administrator of the National Oceanic and Atmospheric Administration shall, in consultation with the National Science Foundation and other appropriate Federal agencies, establish a coordinated national ocean exploration program within the National Oceanic and Atmospheric Administration that promotes collaboration with other Federal ocean and undersea research and exploration programs. To the extent appropriate, the Administrator shall seek to facilitate coordination of data and information management systems, outreach and education programs to improve public understanding of ocean and coastal resources, and development and transfer of technologies to facilitate ocean and undersea research and exploration.

33 USC 3501 – Ocean and Coastal Mapping Integration
Directs the President to establish a coordinated federal program to develop an ocean and coastal mapping plan for the Great Lakes and coastal state waters, the territorial sea, the exclusive economic zone, and the continental shelf of the United States that enhances ecosystem approaches in decision-making for conservation and management of marine resources and habitats, establishes research and mapping priorities, supports the siting of research and other

platforms, and advances ocean and coastal science. Requires a plan for an integrated ocean and coastal mapping initiative within NOAA. Authorizes appropriations.

33 USC 3603 – Integrated Coastal and Ocean Observing System
Directs the President to establish a National Integrated Coastal and Ocean Observation System that is designed to address regional and national needs for ocean information, to gather specific data on key coastal, ocean, and Great Lakes variables, and to ensure timely and sustained dissemination and availability of such data. Requires an advisory committee. Authorizes appropriations.

33 USC 3703 – Federal Ocean Acidification Research and Monitoring
the Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council to: (1) coordinate federal activities on ocean acidification and establish an interagency working group; and (2) develop a strategic plan for federal research and monitoring on ocean acidification. Requires specified ocean acidification programs in NOAA, the National Science Foundation (NSF), and the National Aeronautics and Space Administration (NASA). Authorizes appropriations.

The Public Health and Welfare

42 USC 8902-8905 - Acid Precipitation Program
Authorized the Administrator of NOAA to serve as co-chair of a task force to prepare a comprehensive research plan for a program to study the causes and effects of acid precipitation. Also authorizes the Administrator of NOAA to serve as the director of a related research program.

42 USC 9601 et seq. (CERCLA)
Through associated regulations and delegations, authorizes the Administrator to provide technical assistance to the Administrator, EPA, for hazardous waste response under CERCLA and the National Contingency Plan and authorizes the Administrator to act as a natural resource trustee with authority to bring a cause of action for damages resulting from an injury to, destruction of or loss of resources under NOAA's jurisdiction.

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Public Lands

43 USC 1347e - Safety and Health Regulations
Authorizes the Secretary of Commerce in cooperation with other Federal entities, to conduct studies of underwater diving techniques and equipment "suitable for protection of human safety and improvement of diver performance…."

Public Printing and Documents

44 USC 1307 - Sale and Distribution of NOAA Nautical and Aeronautical Products
"All nautical and aeronautical products created or published ... shall be sold at ... prices ... the Secretary of Commerce shall establish annually ... so as to recover all costs attributable to data base management, compilation, printing, and distribution of such products."

Transportation

49 USC 44720 - Meteorological services
The Administrator of the Federal Aviation Administration shall make recommendations to the Secretary of Commerce on providing meteorological services necessary for the safe and efficient movement of aircraft in air commerce. In providing the services, the Secretary shall cooperate with the Administrator and give complete consideration to those recommendations.

"To promote safety and efficiency in air navigation to the highest possible degree, the Secretary shall -(1)observe, measure, investigate, and study atmospheric phenomena, and maintain meteorological stations and offices...(2) provide reports to the Administrator (3)cooperate with persons engaged in air commerce in meteorological services...(4)maintain and coordinate international exchanges of meteorological information... (5) participate in developing an international basic meteorological reporting network...(6)coordinate meteorological requirements in the United States to maintain standard observations...;(7)promote and develop meteorological science.

Department of Commerce
National Oceanic and Atmospheric Administration
ADVISORY AND ASSISTANCE SERVICES
(Dollar Amounts in Thousands)

	2018 Actual	2019 Enacted	2020 Estimate
Management and Professional Support Services	$204,991	$134,112	$120,932
Studies, Analysis and Evaluations	$84,100	$55,021	$49,614
Engineering and Technical Services	$236,530	$154,746	$139,539
Total	$525,620	$343,878	$310,085

Consulting Services are those services of a pure nature relating to the governmental functions of agency administration and management and agency problem management. These services are normally provided by persons or organizations generally considered to have knowledge and special abilities that are not usually available within the agency. Such services can be obtained through personnel appointments, procurement contracts, or advisory committees.

Management and professional services deal with management data collection, policy review or development, program development, review or evaluation, systems engineering and other management support services. Special studies and analyses deal with the highly specialized areas of agency activity, e.g., air quality, chemical, environmental, geophysical, oceanographic, technological, and etc. Management and support services for research and development are procurement actions that meet the description of management and professional services or special studies and analyses but are funded under research and development.

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Department of Commerce
National Oceanic and Atmospheric Administration
PERIODICAL, PAMPHLETS, AND AUDIOVISUAL PRODUCTS
(Dollar Amounts in Thousands)

	2018 Actual	2019 Enacted	2020 Estimate
Periodicals	$2,050	$1,602	$1,211
Pamphlets	$1,477	$1,154	$873
Audiovisuals	$701	$547	$414
Total	$4,228	$3,303	$2,498

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Department of Commerce
National Oceanic and Atmospheric Administration
AVERAGE GRADE AND SALARY

	2018 Actual	2019 Enacted	2020 Estimate
Average executive and SES level pay plans	$150,233	$159,580	$166,306
Average GS/GM grade	12	12	12
Average GS/GM salary	$99,421	$103,343	$103,343
Average Pay Band salary	$112,834	$114,080	$118,426
Average Commissioned Officers salary	$112,464	$119,489	$121,998
Average salary for other positions (FWS/Wage Marine)	$56,111	$59,068	$62,509

Average salaries provided here reflect Federal Civilian and Military pay raises for 2018, 2019 and 2020, respectively.

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FY 2020/2018 Annual Performance Plan and Report

(National Oceanic and Atmospheric Administration – NOAA)

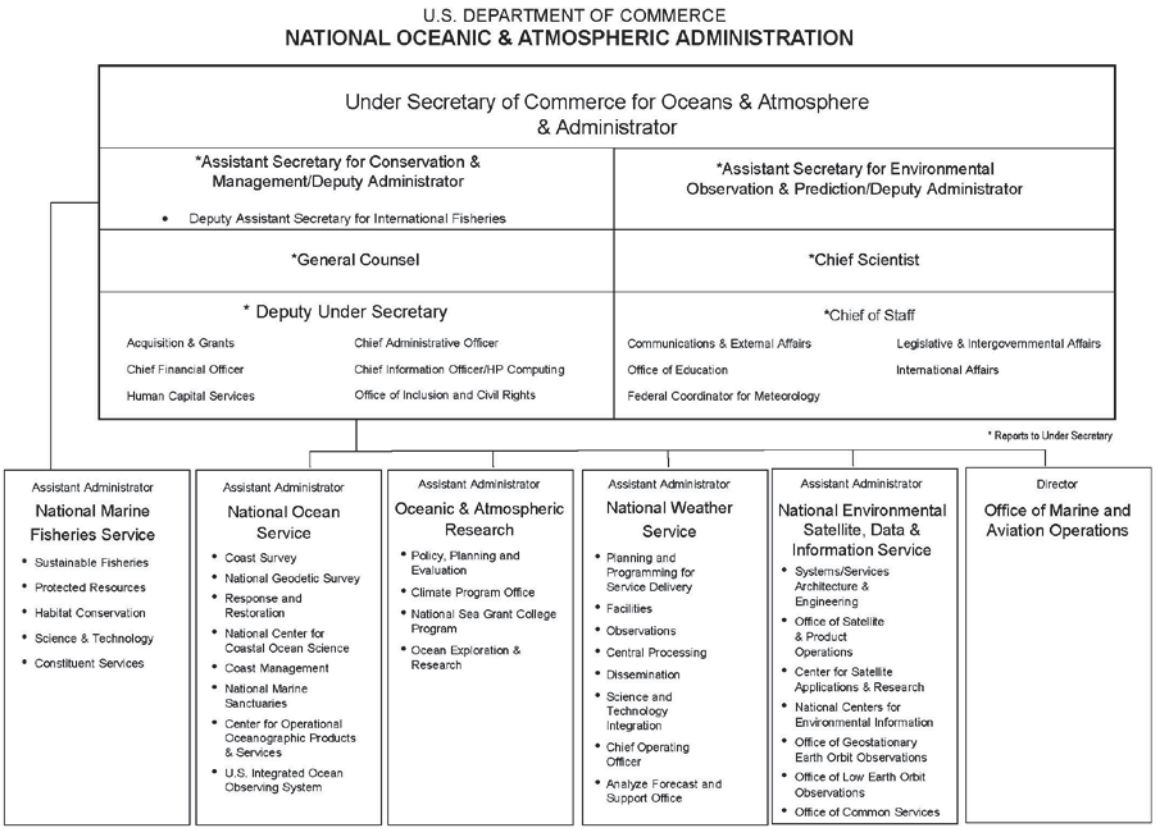
Bureau Overview

NOAA is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them. From daily weather forecasts, severe storm warnings, and climate monitoring to fisheries management, coastal restoration and supporting marine commerce, NOAA's products and services support economic vitality and affect more than one-third of America's gross domestic product. NOAA's dedicated scientists use cutting-edge research and high-tech instrumentation to provide citizens, planners, emergency managers and other decision makers with timely and reliable information they need when they need it.

Bureau Mission Statement

NOAA's mission is to understand and predict changes in climate, weather, oceans and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources.

Bureau Organizational Structure



Cross-agency Priority (CAP) Goals

Modernize Infrastructure Permitting CAP Goal: NOAA is committed to efficient implementation of the One Federal Decision (OFD) policy under Executive Order 13807 and is working cooperatively with other agencies and project sponsors to ensure its success in improving infrastructure permitting. NOAA's National Marine Fisheries Service participates in the Infrastructure Working Group, an interagency group led by the Federal Permitting Improvement

Steering Council to implement provisions of EO 13807 and Fixing America's Surface Transportation Act (FAST Act).

Lab to Market CAP Goal: NOAA contributes to the "Lab-to-Market" CAP Goal, which aims to improve the transition of federally funded innovations from the laboratory to the marketplace. NOAA's Technology Partnerships Office participates in the Lab-to-Market Subcommittee, a group that is responsible for moving forward key milestones in the CAP Goal Action Plan.

Tracking Progress On Strategic Goal(s)

NOAA has robust institutional performance management processes to track progress on each strategic objective. All 11 Line and Staff Offices develop Annual Operating Plans with performance measures and milestones that demonstrate progress on each objective in the DOC Strategic Plan. The performance data is summarized quarterly for NOAA leadership.

NOAA's progress on strategic objectives in the past fiscal year has been influenced by legislation and partnerships.

- **Legislation**: NOAA's progress on strategic objectives is affected by various regulatory and legislative initiatives.
  - Aquaculture: NOAA is working with other federal agencies on regulatory streamlining and providing technical drafting assistance for a Congressional bill that proposes to provide NOAA unambiguous authority for aquaculture permitting in federal waters, and to authorize increased funding for marine aquaculture science.
  - Commercial Space: The National Space Council approved recommendations for regulatory reform that the President incorporated into Space Policy Directives-2 and 3. The Department has been working with the Office of Management and Budget (OMB) and Congress to inform draft bills in the House and Senate that address space regulatory reform.
- **Partnerships**:
  - Extreme Weather: NOAA's National Weather Service (NWS) continues to perform Impact-based Decision Support Services with partners and feedback remains strongly positive from Emergency Managers and others.
  - Commercial Space: NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) moved forward with several initiatives geared toward a greater partnership with the commercial sector including the RFP for Round 2 of the Commercial Weather Data Pilot (CWDP) in April 2018, the RFI for Round 3 CWDP in May 2018, and an RFI in July 2018 for a "rideshare" for low earth orbit (LEO) small satellite vendors.
  - Aquaculture: NOAA engages in private sector and public collaborations on aquaculture technology development through Cooperative Research and Development Agreements and patenting and licensing technologies. Marine aquaculture technology and methods must be transferred to and adopted by industry partners, coastal communities, and coastal managers to be effective.

Strategic Goal(s) And Objective(s) And Progress

- **1.1. Expand Commercial Space Activities**. NOAA helped revitalize the Office of Space Commerce (OSC) with the addition of a Director, two assignees from other DOC bureaus and one contractor. In furtherance of Space Policy Directive-2 (Streamlining Regulations on Commercial Use of Space), OSC supported a wide range of reviews related to export control, spectrum management, and commercial remote sensing, all designed to improve the competitiveness of the U.S. commercial space sector. OSC also supported DOC's efforts to submit legislative proposals to move OSC and Commercial Remote Sensing Regulatory Affairs into the Office of the Secretary, as part of the creation of a Bureau of Space Commerce led by an Assistant Secretary. In furtherance of Space Policy Directive-3 (National Space Traffic Management Policy), OSC led DOC efforts to establish a civil space situational awareness agency, including support for a visit by the Secretary to Vandenberg Air Force Base.

OSC's additional duties included industry advocacy, deregulatory focus, industry engagement, and improving analysis of the space economy; examples included organizing a December 2018 Space Investment Summit, publishing a plain-language guidebook on U.S. export controls, participating in NOAA's commercial weather data pilot, and engaging industry groups on new and innovative capabilities emerging in the market. NOAA moved forward with several initiatives geared toward a greater partnership with the commercial space sector including the RFP for Round 2 of the Commercial Weather Data Pilot (CWDP) in April 2018, an RFI for CWDP Round 3 in May 2018, and an RFI in July 2018 for a "rideshare" for low earth orbit small satellite vendors.

- **2.1 Increase Aquaculture Production.** NOAA awarded 22 research grants and 14 pilot project grants to advance the development of a sustainable marine and coastal aquaculture industry in the U.S. The research and pilot projects focused on new domestic aquaculture technologies and business models to increase seafood production, and reduce industry barriers, production constraints, and risk. NOAA also developed a web-based GIS tool (AquaMapper) for exploration, permitting, and siting of offshore aquaculture in the Gulf of Mexico - one of many coastal planning tools designed to assist managers, planners, and industry in siting and permitting sustainable aquaculture facilities.
- **2.3 Strengthen Domestic Commerce and the U.S. Industrial Base.** NOAA and partners have been successful at collaboratively rebuilding fish stocks recently, including Pacific ocean perch (rebuilt 34 years ahead of schedule), which allow the lifting of previous fishing restrictions. Since 2000, 45 fish stocks have been rebuilt, which is the highest level of sustainability in recent years. The *Status of U.S. Fisheries* report for 2017 shows a new all-time low number of stocks on the overfished list. The overall number of fish stocks on the overfishing list also remained near all-time lows, an encouraging indicator that the U.S. fishery management system is achieving its long-term sustainability goals. NOAA launched the Seafood Import Monitoring Program, designed to prevent illegal, unreported, and unregulated-caught and/or misrepresented seafood from entering U.S. commerce. Additionally, as part of the government-wide effort to reduce unnecessary and ineffective regulatory burdens, NOAA recently opened areas off the coast of New England to commercial sea scallop harvest that had been closed for a decade, netting an economic benefit of $654 million to fishermen and the seafood industry.
- **3.3 Reduce Extreme Weather Impacts**. During Fiscal Year 2018 (FY18), NOAA successfully launched two new satellites, JPSS-1/NOAA-20 (Q1) and GOES-S/GOES-17 (Q2). Milestones continue to be achieved within the Agency Priority Goal (APG), including implementation of version 1.2 of the National Water Model, and the APG is on track for on time completion. The FV3, a new weather prediction model, was implemented as part of the Next Generation Global Prediction System (NGGPS). Within the NOAA Big Data Project, over 40 NOAA datasets have moved to the Collaborators' systems and all five Cooperative Research and Development Agreement (CRADA) Collaborators have agreed to extend the agreements to April 2019. NOAA proceeded with acquisition activities to recapitalize its ships and aircraft. The NWS organized and facilitated four partner meetings to strengthen partnerships with America's weather industry. As of August 2018, all U.S. Integrated Ocean Observing System (IOOS®) Regional Associations were certified as Regional Information Coordination Entities (RICEs), therefore meeting NOAA standards for data management practices. Certification expands the pool of federal-quality observing data available for use in NOAA and third party products and services.

Planned Actions For Achieving Strategic Goal(s) And FY2020 Performance Targets

- **1.1. Expand Commercial Space Activities**. Congressional coordination of expanded DOC role and legislative changes including support of the budget reprogramming request. Expand the Office of Space Commerce staff through new hires, contractors, and personnel assignments from other bureaus and agencies. Develop and publish notice of proposed rulemaking for commercial remote sensing licensing.
- **2.1 Increase Aquaculture Production.** NOAA will award grants for demonstration projects and research targeting the development of sustainable marine aquaculture in the U.S., and foster dynamic partnerships that channel resources toward the development of sustainable aquaculture technologies. NOAA will make available

five competitive grant programs for aquaculture, including the Sea Grant Marine Aquaculture Grant Program, Small Business Innovation Research Program, Saltonstall-Kennedy Grant Program, Marine Fisheries Initiative Program, and grants through the Interstate Marine Fisheries Commissions. These funding opportunities will expand regional pilot projects (*e.g.,* kelp and seaweed farming, offshore aquaculture) and advance research to support environmentally sound aquaculture practices. A NOAA-wide Strategic Research Plan for aquaculture will be completed. NOAA will continue to develop science-based tools for management that supports the efficient review of aquaculture permit applications.

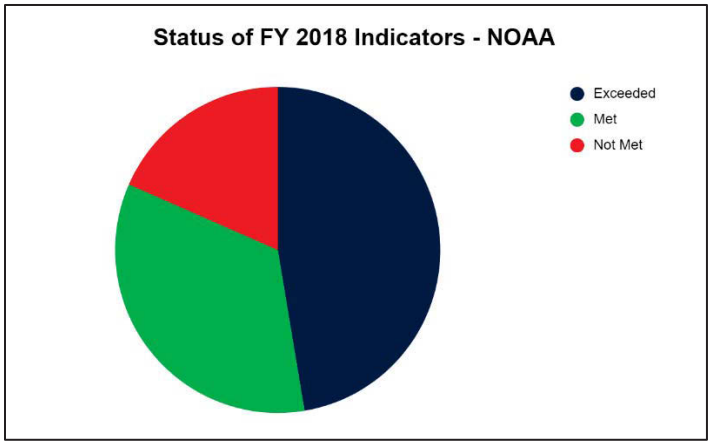
- **2.3 Strengthen Domestic Commerce and the U.S. Industrial Base.** NOAA will continue to provide timely delivery of fish stock assessments to fishery managers, improve the cost-effectiveness of catch-share programs through the use of new technologies, and continue to end overfishing and rebuild fish stocks. NOAA will also review import records for thirteen of the fish species most vulnerable to illegal, unreported, or unregulated fishing. Data will be shared and analyzed among relevant regulatory and enforcement authorities for imported seafood to aid in global food security and provide additional protections for our national economy, help sustain our shared ocean resources, and level the playing field for law-abiding fisherman. NOAA will expand its Precision Navigation program aimed at providing the best possible data to mariners and maximizing the number and size of ships that can safely navigate within our Nation's busiest seaports. NOAA will also promote ecotourism by accelerating the designation process of new National Marine Sanctuaries.
- **3.3 Reduce Extreme Weather Impacts**. To meet the Agency Priority Goal, version 2.0 of the National Water Model will be released in FY2019 and tabletop exercises with Emergency Managers will be conducted. In addition, to achieve an enhanced excessive rainfall outlook product that extends the lead time of 'high' risk predictions from two days to three days, the NWS will begin internal issuance of test 'high' risk for excessive rainfall products on day three. NOAA also plans to develop an Earth Prediction Innovation Center (EPIC) to serve as NOAA's core research-to-operations pipeline for advancing community-developed enhancements to the Next Generation Global Prediction System. EPIC will streamline existing resources across NOAA to focus on data assimilation, modeling and code developments to improve the U.S. weather model.

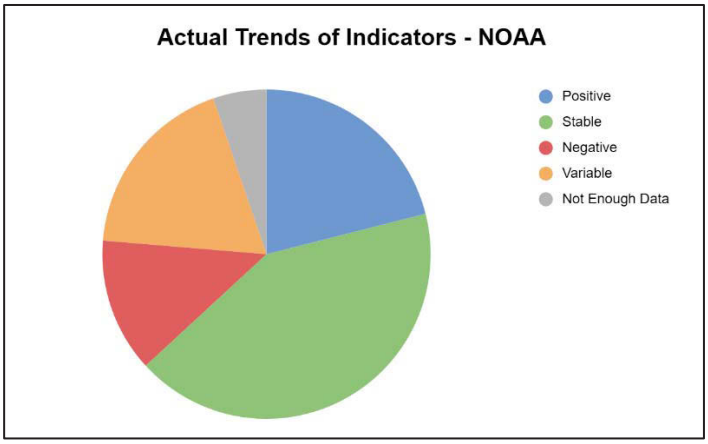
Agency Priority Goal(s)

NOAA leads the following Agency Priority Goal (APG) (FY18-19): By September 30, 2019, NOAA's NWS will improve decision support services by demonstrating a new flood inundation mapping capability serving 25 million people (i.e., 8 percent of the U.S. continental population) residing in flood-vulnerable freshwater basins and delivering an enhanced excessive rainfall outlook product that extends the lead time of high risk predictions from two to three days. The APG remains on track for completion Q4 FY 2019.

PERFORMANCE RESULTS

Summary of Performance





In FY 2018, NOAA reported results on 38 of 43 performance indicators, the five excluded were TBD or N/A. Of those indicators, NOAA exceeded 18 targets (47.4%), met 13 targets (34.2%) and did not meet 7 targets (18.4%). Of the 39 indicators, 8 (21.1%) had a positive trend, 5 (13.2%) had a negative trend, 16 (42.1%) had a stable trend, 7 (18.4%) had a varying trend, and 2 (5.3%) did not have enough data to determine a trend.

Strategic Goal: Enhance Job Creation

Objective 2.1: Increase Aquaculture Production

Indicator	Target	Actual	Status	Trend
Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (reported by each individual Sea Grant College)	10,000	11,764	Exceeded	Variable

Strategic Goal: Enhance Job Creation

Objective 2.3 Strengthen Domestic Commerce and the U.S. Industrial Base

Indicator	Target	Actual	Status	Trend
Percent of top 175 U.S. seaports with access to Physical Oceanographic Real-Time Systems (PORTS®) data (cumulative)	38%	38%	Met	Stable
Fish Stock Sustainability Index (FSSI) (cumulative)	763	757.5	Met	Stable
Percent of stocks for which catch is below the specified Annual Catch Limit (ACL) (cumulative)	83%	90.2%	Exceeded	Stable
Percentage of FSSI stocks with adequate population assessments and forecasts (cumulative)	64.8%	57.8%	Not Met	Declining

Percentage of protected species stocks with adequate population assessments and forecasts (cumulative)	21.7%	20.2%	Not Met	Stable
Number of protected species designated as threatened, endangered or depleted with stable or increasing population levels (cumulative)	30 (92)	30 (90)	Met	Stable
Percentage of actions ongoing or completed to recover endangered and threatened species (cumulative)	48.2%	48.4%	Exceeded	Positive
Number of natural resource environments managed by the Office of National Marine Sanctuaries in which water, habitat, and living resource quality is stable or improving	9	9	Met	Stable
Number of habitat acres restored (annual)	17,280 (4,400 RC + 12,880 PCSRF)	16,541 (4,251 RC + PCSRF 12,290)	Met	Negative
Annual number of coastal, marine, and Great Lakes habitat acres acquired or designated for long-term protection.	800	5,857	Exceeded	Variable

Strategic Goal: Strengthen U.S. Economic and National Security

Objective 3.3 Reduce Extreme Weather Impacts

Indicator	Target	Actual	Status	Trend
Annual number of peer-reviewed publications related to environmental understanding and prediction	1,700	1,794	Exceeded	Variable
Number of NOAA datasets made openly available via Partners' cloud platforms to the public, America's Weather Enterprise and other environmental information stakeholders (cumulative)	15	40	Exceeded	*N/A
U.S. Temperature forecasts skill	26	43	Exceeded	Positive
Key milestones completed on time for satellites and ship deployments	SAT: 2 SHIPS: 2	SAT: 2 SHIPS: 2	Met	Stable
Base funded Days-At-Sea for NOAA ships	2,783	2,352	Not Met	Variable
Percentage of data processed and delivered to operational users (NWS and other NOAA line offices, U.S. military and operational partners) from NOAA-managed satellites.	98.5%	99.44%	Exceeded	Stable
Severe weather warnings tornadoes - Storm based lead time (minutes)	13	8	Not Met	Stable
Severe weather warnings tornadoes - Storm Based Accuracy (%)	72%	57%	Not Met	Negative
Severe weather warnings tornadoes - Storm based false alarm ratio (%)	71%	69%	Met	Stable
Severe weather warnings for flash floods - Lead time (minutes)	63	62	Met	Variable
Severe weather warnings for flash floods - Accuracy (%)	76%	78%	Met	Stable
Hurricane forecast track error (48 hour)	65	TBD	TBD	Variable

Hurricane forecast intensity error (48 hour)	12	TBD	TBD	Variable
Accuracy (%) (threat score) of Day 1 precipitation forecasts	33%	36%	Exceeded	Stable
Winter storm warnings - Lead time (hours)	20	18	Not Met	Negative
Winter storm warnings - Accuracy (%)	90%	80%	Not Met	Negative
Marine wind - Percentage of accurate forecasts	79%	82%	Exceeded	Positive
Marine wave height - Percentage of accurate forecasts	82%	85%	Exceeded	Positive
Aviation ceiling/visibility forecast accuracy (%) Instrument Flight Rules (IFR)	65%	63%	Met	Stable
Aviation ceiling/visibility forecast false alarm ratio (%) Instrument Flight Rules (IFR)	38%	35%	Met	Positive
Geomagnetic storm forecast accuracy (%)	56%	60%	Exceeded	Variable
Number of communities that utilize Digital Coast	5,500	6,903	Exceeded	Positive
Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards	71%	74%	Exceeded	Positive
Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts	23%	23%	Met	Stable
Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles)	2,279	3,403	Exceeded	Variable
Percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data (cumulative)	70%	72%	Exceeded	Positive
Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application)	65	66	Exceeded	Stable
Reduction in gap between high-performance computing deployed and what is needed to meet modeling requirements	16PF	16.4PF	Exceeded	*N/A
Percentage of ingested environmental data safely archived to ensure consistent long-term stewardship and usability of the data (per National Archives and Records Administration (NARA) standards)	98%	98%	Met	Stable
Customer Satisfaction Index (CSI)	N/A[+]	85	N/A*	Stable
Number of StormReady communities	N/A[+]	157	N/A*	Positive
Number of TsunamiReady new and renewed communities	N/A[+]	53	N/A*	Positive

1. [+] *Targets are not reported for these measures.*
2. **N/A in the Trend field denotes a new measure for which a performance trend has not yet been established. Trend status is only given to measures with at least three years of performance data.*

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Current Recurring Indicators

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.1 Increase Aquaculture Production**							
Indicator	**Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (reported by each individual Sea Grant College)**							
Category	Supporting							
Type	Customer Service							
Description	This measure highlights change in jobs that communities or businesses generate or save due to Sea Grant assistance (i.e., providing information to help communities, industries or businesses expand, make better decisions or avoid mistakes). Sea Grant provides the information and training that informs business decisions, and in some Hurricane forecast track error cases firms create or sustain jobs as a result. A job created is a new position created and filled as a result of Sea Grant activities. An existing position that is filled with a Sea Grant-trained applicant should not be reported in this measure. A job sustained is an existing, filled position that is sustained as a direct result of Sea Grant activities. A job cannot be reported as both created and sustained in the same year.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	4,000	9,600	9,600	9,600	20,770	10,000	10,000	0
Actual	15,000	17,500	10,700	20,770	7,100	11,764		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Not Met	Exceeded		
Trend	Varying							
Explanation (if not met in FY2018)	None							
Actions to be taken / Future Plans	None							
Adjustments to targets	The FY 2018 APP target was zero based on the elimination of Sea Grant in the President's Budget. The target was modified following final budget appropriations for FY 2018 which included funding for Sea Grant.							
Actions to achieve FY20 target	Sea Grant was terminated in the FY 2020 President's Budget. Therefore, Sea Grant has no targets for FY 2020.							
Notes	This measure highlights change in economic impact - the jobs - that communities or businesses generate or save due to Sea Grant assistance (i.e., providing information to help communities, industries or businesses expand, make better decisions or avoid mistakes). As such the economic dollar value, jobs or businesses can vary each year depending on what technical assistance or innovation occurs in any given year.							
Information Gaps	Current efforts are focused on better defining the measure standards.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percent of top 175 U.S. seaports with access to Physical Oceanographic Real-Time Systems (PORTS®) data (cumulative)**							
Category	Supporting							
Type	Outcome							
Description	Seaports with access to real-time PORTS® data move vessels and their cargo more safely and efficiently, and this measure tracks the number of top U.S. seaports that have access to PORTS® data. To create a list of the Nation's top 175 seaports, NOS selected the top 152 ports by international tonnage, accounting for more than 99.9% of all direct imports and exports by tonnage in 2016. NOS added to this list 23 seaports that are critical to coastal military installations, the Nation's energy supply, or commercial marine fisheries landings.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target			35%	35%	35%	38%	43%	44%
Actual			35%	35%	37%	38%		
Status			Met	Met	Exceeded	Met		
Trend	Stable							
Adjustments to targets	List of top seaports was updated for FY 2019 based on more recent data sets to better reflect current status.							
Actions to achieve FY20 target	Implement PORTS projects and facilitate outreach and validation of requirements as well as identify the socio-economic benefits for other interested ports.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Fish Stock Sustainability Index (FSSI) (cumulative)**							
Category	Strategic Plan							
Type	Outcome							
Description	The Fish Stock Sustainability Index (FSSI) is comprised of 199 stocks selected for their economic, ecological, and social importance, that represent 85% of total catch. Each stock is given a score between 0 and 4 (0=status unknown; 4=meets all sustainable fishing criteria). The index (scored on a 1,000 point scale) increases when NMFS determines that a stock is either no longer subject to overfishing, no longer overfished, or its biomass has rebuilt or increased to at least 80 percent of target.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target (FSSI 1)*	617.0	NA						

Actual (FSSI 1)*	618.5	640.5						
Target (FSSI 2)*		756 (602/796)	749 (596.5/796)	758 (603.5/796)	754 (600.5/796)	763 (607.5/796)	760.5 (612.5/796)	765.5 (619.5/796)
Actual (FSSI 2)*	719 (572.5/796)	746 (594/796)	761.5 (606.5/796)	754 (600.5/796)	756.5 (602.5/796)	757.5 (603/796)		
Status	Exceeded	Met	Exceeded	Not Met	Met	Met		
Trend	Stable							
Adjustments to targets	Fewer assessments of FSSI stocks mean that anticipated gains in FSSI scores cannot be realized.							
Actions to achieve FY20 target	Determine and track the status of fish stocks. Implement annual catch limits and accountability measures. Monitor commercial and recreational catches to ensure compliance with catch limits.							
Notes	* In FY 2014, NOAA revised the number and make-up of stocks in the index, as well as the score calculation methodology, in order to allow more flexibility regarding the number of stocks in the index. Although these changes resulted in a general increase in scores (since the maximum score increased from 920 to 1,000), the trend in scores remains the same. However, scores under FSSI 1 are not directly comparable to scores under FSSI 2. The numbers in parentheses are the raw scores used to derive the index score. The numerator is the total of all individual stock scores (each is between 0 and 4). The denominator is the maximum possible raw score (199 x 4 = 796). These numbers are not provided for FSSI 1 because those scores are simply the total of the individual stock scores. For more information about the FSSI: http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percent of stocks for which catch is below the specified Annual Catch Limit (ACL) (cumulative)**							
Category	Supporting							
Type	Intermediate Outcome							
Description	This measure tracks the percentage of fish stocks that are below their annual catch limit (ACL) in a given year. In 2007, Congress enacted a requirement to use ACLs to end and prevent overfishing. The use of ACLs has been successful in ending and preventing overfishing, as stock assessments have shown the number of stocks subject to overfishing continuing to decline. Performance is measured by comparing the final annual catch estimate to the ACL for each stock that has an ACL. If the final annual catch estimate for the stock is less than the ACL, NOAA will report that the stock did not exceed its ACL. For more information: http://www.nmfs.noaa.gov/sfa/management/acls_ams/index.html							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target			79.5%	81%	82%	83%	84%	86%
Actual		91%	89.7%	90.7%	91.9%	90.2%		

Status			Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Actions to achieve FY20 target	Implement annual catch limits and accountability measures. Monitor commercial and recreational catches to ensure compliance with catch limits.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percentage of FSSI stocks with adequate population assessments and forecasts (cumulative)**							
Category	Supporting							
Type	Output							
Description	This measure tracks the percentage of FSSI fish stocks for which adequate assessments are available. Assessments are vital to determine the scientific basis for supporting and evaluating the impact of fishery management actions. To be deemed adequate, assessments must be based on recent quantitative information sufficient to determine current stock status (abundance and mortality) relative to established reference levels and to forecast stock status under different management scenarios. Since the important fish stocks tracked by this measure are the same as those in the Fish Stock Sustainability Index (FSSI), actual data for years prior to FY 2014 are not comparable to data for FY 2014 and beyond due to the recent revisions to FSSI (see above).							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	57.0%* (131/230)	64.8% (129/199)	67.3% (134/199)	61.3% (122/199)	63.8% (127/199)	64.8% (129/199)	56.8% (113/199)	57.3% (114/199)
Actual	58.3%* (134/230)	63.3% (126/199)	64.3% (128/199)	62.3% (124/199)	63.3% (126/199)	57.8% (115/199)		
Status	Exceeded	Met	Met	Exceeded	Met	Not Met		
Trend	Declining							
Explanation (if not met in FY2018)	Assessments for four fish stocks were missed: 1) Atlantic Cod - Georges Bank - transitioned to inadequate because Transboundary Resource Assessment Committee (TRAC) assessments are not an appropriate basis for determining assessment adequacy 2) Atlantic Halibut - Northwest Atlantic - assessment was planned at Level 3, but was completed at Level 1, and did not result in adequate status for the stock 3) Black Grouper - Southern Atlantic Coast / Gulf of Mexico - assessment was delayed indefinitely due to issues with the landings data for the stock 4) Blacktip Shark - Gulf of Mexico - assessment was delayed until FY19							
Adjustments to targets	Limited resources have been redirected to other activities required to meet our mandates. As a result, we are not able to renew all sunsetting assessments of FSSI stocks.							
Actions to achieve FY20 target	Conduct at-sea resource surveys to gather data on fish stocks. Conduct stock assessments to determine the status of fish stocks. Manage fisheries observer programs. Conduct cooperative research. Conduct independent peer review of NOAA Fisheries science products and programs to ensure scientific quality and integrity.							

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Notes	Since this measure covers the same fish stocks as the FSSI, actual data for years prior to FY 2014 are not comparable to data for FY 2014 and beyond. Data for these years was calculated with a different set of fish stocks. Denominators have been provided for reference. Actuals for FY 2014-2015 were updated following the discovery of reporting errors in the data.

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percentage of protected species stocks with adequate population assessments and forecasts (cumulative)**							
Category	Supporting							
Type	Output							
Description	This measure tracks the percentage of protected species stocks for which adequate assessments are available. Assessments are vital to determine the scientific basis for supporting and evaluating the impact of management actions. To be deemed adequate, assessments must be based on recent quantitative or qualitative analysis sufficient to determine current stock status based on a variety of data category levels (e.g., life history, threats, stock structure, assessment quality, assessment frequency, and abundance), and conservation status. Stock status projections are highly dependent on survey frequencies, assessment timeframes, and fiscal constraints. This measure covers the protected species stocks covered by the Marine Mammal Protection Act (MMPA) or listed under the Endangered Species Act (ESA). The number of such stocks continues to increase as new species are listed and as new stocks of listed species and marine mammals are identified— the latter typically indicates increased knowledge about population stock structure. Denominators are shown for reference.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	22.0% (88/400)	18.9% (78/412)	21.6% (89/412)	20.7% (89/429)	19.9% (85/428)	21.7% (93/429)	25.2% (109/432)	27.0% (117/433)
Actual	19.0% (76/400)	15.0% (62/412)	18.7% (77/412)	19.2% (82/428)	19.3% (83/429)	20.2% (87/430)		
Status	Not Met	Not Met	Not Met	Not Met	Met	Not Met		
Trend	Increasing							
Explanation (if not met in FY2018)	Assessments for six protected species stocks were missed: 1) Blue whale western Atlantic stock - abundance estimates are under review 2) Fin whale - western Atlantic stock - tier level target incorrectly estimated 3) Humpback whale Gulf of Maine stock - tier level target incorrectly estimated 4) Sperm whale - north Atlantic stock - deficient in stock ID, threats, and assessment quality 5) Striped dolphin - western Atlantic stock - abundance estimate under review 6) Beluga whale - eastern Chukchi sea - new information on this stock was available in FY17, but will not be incorporated into the assessment until FY19 or FY20							
Adjustments to targets	In FY18 the total number of protected species stocks being tracked was increased from 429 to 430. Two new protected species stocks are being added for tracking in FY19 and one additional species stock will be added for tracking in FY20.							

Actions to achieve FY20 target	Conduct at-sea resource surveys to gather data on protected species. Conduct stock assessments to determine the status of protected species. Manage observer programs. Conduct cooperative research. Conduct independent peer review of NOAA Fisheries science products and programs to ensure scientific quality and integrity.

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Number of protected species designated as threatened, endangered or depleted with stable or increasing population levels (cumulative)**							
Category	Supporting							
Type	Outcome							
Description	This measure tracks progress toward the recovery of endangered, threatened, or depleted protected species under NMFS' jurisdiction. Recovery of threatened, endangered, or depleted species can take decades. It may not be possible to recover or de-list a species in the near term, but progress can be made to stabilize or increase the species population. For some species, this means trying to stop steep population declines, while for others it means trying to increase their numbers.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	27	28 (out of 84)	34 (out of 74)	31 (out of 90)	30 (out of 90)	30 (out of 92)	30 (out of 93)	30 (out of 94)
Actual	30	37 (out of 84)	31 (out of 73)	31 (out of 89)	30 (out of 90)	30 (out of 90)		
Status	Exceeded	Exceeded	Met	Met	Met	Met		
Trend	Stable							
Adjustments to targets	The total number of protected species under NMFS' jurisdiction may increase or decrease occasionally due to new species being listed, species being combined or separated into populations, judicial actions, and other causes.							
Actions to achieve FY20 target	Develop and implement conservation and recovery plans. Designate critical habitat. Minimize bycatch of marine mammals and sea turtles. Conduct consultations to ensure mitigation measures reduce the impact of activities that take threatened, endangered, or depleted species.							
Notes	The species included in this measure are listed as threatened or endangered under the Endangered Species Act (ESA) or as depleted under the Marine Mammal Protection Act (MMPA). The numbers in parentheses denote the total number of species that are listed as threatened, endangered, or depleted. This number increases when new species are listed or when existing listed species are split into separate stocks, and decreases when species are de-listed or when separate stocks of a listed species are merged. This number decreased from 90 when the FY 2016 target was set to 89 because on March 11, 2016, the U.S. District Court for the District of Alaska issued a decision vacating NMFS's December 28, 2012, listing of the Arctic ringed seal as threatened. Therefore, at this time, Arctic ringed seals are not listed as a threatened species under the ESA. This number increases from 89 to 95 in FY 2017 because two populations of green turtles have been split into six distinct population segments (DPS), while one globally listed species of humpback whale has been separated into three DPS's for a net increase of six listed species.							

FY 2020/2018 Annual Performance Plan and Report

(National Oceanic and Atmospheric Administration – NOAA)

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percentage of actions ongoing or completed to recover endangered and threatened species (cumulative)**							
Category	Supporting							
Type	Output							
Description	This measure tracks the progress of ongoing or completed recovery actions included in NMFS approved recovery plans for species listed as threatened or endangered under the Endangered Species Act (ESA). Recovery plans include a list of actions necessary to de-list the species. These include actions that may be completed in a year or that may take many years to complete or are ongoing. Recovery of a species may take decades. Completed recovery actions shows incremental progress.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	44.6% (1,875/4,202)	44.4% (1,979/4,457)	46.2% (2,070/4,482)	49.1% (2,229/4,542)	48.7% (2,213/4,545)	48.2% (2,241/4,653)	49.9% (2,330/4,674)	50.4% (2,357/4,674)
Actual	45.1% (1,897/4,202)	45.2% (2,013/4,457)	48.1% (2,157/4,482)	49.2% (2,233/4,542)	48.0% (2,183/4,545)	48.4% (2,234/4,613)		
Status	Exceeded	Exceeded	Exceeded	Met	Met	Exceeded		
Trend	Positive							
Adjustments to targets	In FY 2018 the number of actions being tracked was reduced to remove actions that are no longer targeted for completion due to species delisting. The FY 2019 and FY 2020 number of actions being tracked is increased to include 61 new actions from new recovery plans.							
Actions to achieve FY20 target	Develop and implement recovery plans. Designate critical habitat. Minimize bycatch of marine mammals and sea turtles. Conduct consultations to ensure mitigation measures reduce the impact of activities that take threatened, endangered, or depleted species.							
Notes	Denominators are shown as a reference. The numbers in parentheses are the raw numbers used to derive the percentages. The numerator is the total number of actions targeted or accomplished. The denominator is the total number of actions in all recovery plans during that fiscal year. The denominators illustrate the increasing number of total actions across all recovery plans, resulting mostly from an increasing number of plans.							

Strategic Goal	**Enhance Job Creation**
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**
Indicator	**Number of natural resource environments managed by the Office of National Marine Sanctuaries in which water, habitat, and living resource quality is stable or improving**
Category	Supporting
Type	Outcome
Description	Each natural resource protection site within the National Marine Sanctuary System periodically assesses the condition of those natural resources. The Office of National Marine Sanctuaries (ONMS) works with

	independent experts to identify and document resource trends in Condition Reports produced during the management plan review cycle. This measure reports the number of environments, defined for each site in its respective Condition Report (e.g., nearshore, offshore, entire site), rated as having "stable" or "improving" water, habitat, and living resource quality in their most current evaluation. An environment is considered to be maintaining or improving water, habitat and living resource quality if trends for no more than 20% of Condition Report questions have been rated as declining.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target					9	9	10	10
Actual			9	9	9	9		
Status					Met	Met		
Trend	Stable							
Actions to achieve FY20 target	Increase staffing as well as the development and implementation of site-specific education, outreach, and science materials. Continue production of sanctuary condition reports.							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Annual number of peer-reviewed publications related to environmental understanding and prediction**							
Category	Supporting							
Type	Output							
Description	The annual number of peer reviewed publications is an indicator of productivity and relevance and is tracked using online resources. Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	1,200	1,200	1,500	1,500	1,700	1,700	3,387*	2,370*
Actual	1,676	1,759	1,860	1,697	1,678	1,794		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	Exceeded		
Trend	Varying							
Adjustments to targets	The FY 2018 target was increase from 1,100 to 1,700 due to the annual appropriation being higher than the FY 2018 President's Budget submission. * FY 2019 is the first year that we are reporting on both NOAA-authored publications (previously the only type of publication measured) and NOAA-funded publications. Per NOAA Research Council guidance, the out year targets are based on an average of actuals from the 3 previous years including both NOAA-authored and NOAA-funded publications (although not previously reported, the latter information is available from the NOAA Central Library).							

Actions to achieve FY20 target	The FY20 target was set at 2,370 to reflect the FY 2020 President's Budget submission.
Notes	NOAA-wide data collection began in FY 2011 through the DOC Balanced Scorecard reporting. Budget narrative performance measures are chosen as the best indicators of progress in execution of a particular program, project, or activity (PPA) Budget Category. Their targets may contribute to a broader NOAA-wide corporate measure that is tracking a strategic goal or enterprise objective (captured and evaluated within a line or staff office annual operating plan). As such, the publications measure components found in the budget submission are only a subset of the NOAA total count shown.
Information Gaps	The publication count is not currently capturing publications produced with NOAA grant support, NOAA's cooperative institutes, book chapters, and conference proceedings. In addition, publications not found in Thomson Reuters Web of Science or produced prior to FY 2011 have not been captured.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Number of NOAA datasets made openly available via partners' cloud platforms to the public, America's Weather Enterprise and other environmental information stakeholders (cumulative)**							
Category	Supporting							
Type	Output							
Description	The measure is the cumulative number of instances of NOAA datasets made openly available via partners' cloud platforms through collaborations with selected industry partners. In this developmental phase, NOAA does not determine which datasets or how many datasets to make available on partner's cloud platforms, but the partners do so with NOAA experts' support. Future measures are highly dependent upon the partners' investments, including whether or not the project continues past Q2 FY 2019.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target						15	60	100
Actual				3	6	40		
Status						Exceeded		
Trend	Not enough data to determine trend.							
Explanation (if Target not met in FY 2018)	New performance measure for FY 2018.							
Actions to be Taken / Future Plans	The Big Data Project's experimental phase has been extended through Q2 FY 2019. The status of the project beyond that date is TBD.							

Adjustments to Targets	Targets are to be achieved on a best-effort basis through Cooperative Research And Development Agreements (CRADAs) with selected industrial partners, and thus may be subject to changes beyond NOAA control. The FY 2019 target (cumulative) was adjusted upwards to account for exceeding the target in FY 2018.
Actions to achieve FY20 target	Achieve sustainable operations by building business cases; analyzing alternatives to fulfill Line Office requirements; and determining the appropriate funding mechanism.
Notes	Associated with the NOAA Big Data Project
Information Gaps	The NOAA Big Data Project formally began in FY 2015 but data were not publicly served through partners' cloud platforms until FY 2016.

Strategic Goal	**Strengthen US Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**U.S. Temperature forecasts skill**							
Category	Supporting							
Type	Output							
Description	Seasonal outlooks are used by sectors of the U.S. economy, such as energy, agriculture, transportation, etc. as one factor in resource decision making. Seasonal outlooks are reported as the probability of temperature being above normal, near normal, below normal or, where no definite seasonal guidance can be provided, equal chances.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	22	23	24	25	26	26	26	26
Actual	26	26	25	24	34	43		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission. This indicator is based on a 4-year running mean of the annual score. Because of natural variability of climate regimes, the skill score can fluctuate considerably from one season to another. For example, for the periods influenced by a strong El Niño Southern Oscillation (ENSO) forcing, the skill score tends to be high. To reduce the effects of natural variability, this measure is based on averaging 48 consecutive individual seasons. The upgraded version of the NWS climate forecast system (CFS) was placed into operation during FY 2011. This version is being run at higher resolution and is anticipated to contribute to improve NWS performance.							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve seasonal predictions: 1. CPC has established a Climate Test Bed (CTB) and has redirected nearly 25% of its federal and contract staff to accelerate improvements in seasonal climate prediction. 2. Increased collaboration with EMC, CDC, GFDL and the reorganized NOAA/OAR and its Climate Program Office is expected to enhance opportunities for model diagnostics and testing by teams of internal and external scientists though formal Announcements of Opportunity in support of the CTB.							

	3. CPC will continue the successful collaborative forecast process, which includes scientists from ESRL and IRI and their experimental forecast tools in CPC's operational seasonal forecast discussions each month. This exposes the CPC operational process to the best nationwide expertise, and an advanced look at cutting-edge science.
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1995 to present. The seasonal outlooks are the cumulative skill calculated for regions where predictions are made. These forecasts are verified using a 48 month running mean of Heidke Skill score computed for seasonal outlooks for each 3-month seasonal mean (e.g., January-February-March mean; February-March-April mean; March-April-May mean; and so on). Specific calculations for this measure may be found at: http://www.cpc.ncep.noaa.gov/products/predictions/90day/skill_exp.html and http://www.cpc.noaa.gov/products/predictions/long_range/tools/briefing/seas_veri.grid.php
Information Gaps	None

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Key milestones completed on time for satellites and ship deployments**							
Category	Supporting							
Description	Key activities for the development and launch of weather satellites and fleet modernization and products are identified and tracked using a project management system.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target (# of Milestones)		SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 2 SHIPS: 2	SAT: 2 SHIPS: 1	SAT: 2 SHIPS: 3
Actual (# of Milestones)		SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 2 SHIPS:2		
Status		Met	Met	Met	Met	Met		
Actions to achieve FY20 target	**SHIPS**: Continue planned procurement activities with the Navy for new N/V Class A AGOR ship acquisition program. Consult with DOC Office of Acquisition Management and brief NOAA PMC periodically. **SATELLITES**: FY 19: Test commercially available capabilities to assess the accuracy, value, and impact of the commercial data or service (Q3); manage cloud computing pilot projects and assess enterprise architecture implications of an operational cloud migration with project results (Q4).							
Adjustments to Targets	SHIPS: N/V Class A AGOR Variant project schedule adjusted for Navy approvals and administration resulting in FY 2019 milestone to occur in FY 2020. The following interim milestone will be met in FY 2019 Q3: Award N/V Class A AGOR Variant Preliminary Contract Design Phase.							
Notes	SHIPS: FY 2018 Milestone 1, Q2: Issue Request for Proposal (RFP) for preliminary NAV ship design. Status: Met milestone in FY 2018; scheduled late Q2 but occurred in early Q3 when Navy changed contracting officers, with no change in final schedule. FY 2018 Milestone 2, Q3: Complete Milestone #2 (Project Approval) - documentation; submit to DOC. Status: Met milestone in FY 2018 Q3. FY 2019 Milestone 1, Q3: Award N/V Class A AGOR Variant Preliminary Contract Design Phase. FY 2020 Milestone 1, Q2: Complete N/V Class A AGOR Variant Preliminary Designs (competing contractors). FY 2020 Milestone 2, Q4: Complete Downselect							

	N/V Class A AGOR Variant Preliminary Design. FY 2020 Milestone 3, Q4: Award N/V Class A AGOR Variant Detailed Design. SATELLITES: FY 2018 Milestones Q3: Release the Commercial Weather Data Pilot Round 2 Request for Proposal; Q4: Identify initial actions for future satellite architecture and define roadmap forward.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Base funded Days-At-Sea for NOAA ships**							
Category	Supporting							
Type	Output							
Description	Days-At-Sea (DAS) is the unit used to annually plan mission time aboard NOAA ships. Approximately 100 survey and research missions are planned and executed each year. A DAS is a day is which the ship is underway, under its own power, for greater than one hour, conducting mission operations, training, sea trials, or calibration. Also included are days in which hydrographic ships are not underway but are conducting operations aboard one or more ship-based launches.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target (base funded)	2,443	2,702	2,980	2,802	2,985	2,783	2,152	2,625*
Actual (base funded)	2,199	2,159	2,498	2,414	2,554	2,352		
Status	Not Met	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	POSITIVE: (FY15: 84%, FY16: 86%, FY17: 86%, FY18: 84.5%)							
Explanation	Prior to FY 2018: Unscheduled ship systems repairs and loss of days due to weather. FY 2018 Status: Target not met. Aging fleet continued to experience unscheduled maintenance and repairs, with 538 DAS lost (FY 2018 total) due to the unscheduled maintenance and repairs.							
Actions to be Taken / Future Plans	Execution of progressive maintenance on all ships, completing service life assessments on 12 of 16 ships to evaluate capacity for extended service, starting material condition assessments, initiating new ship construction to replace aging vessels.							
Adjustments to Targets	FY 2019 target (Base Funded) DAS updated after NOAA Fleet Council signed the FY19 Fleet Allocation Plan (FAP) on Aug 20, 2018 for 2,152 DAS. *Note: FY 2020 target (Base Funded) DAS revision in process after decision to remove NOAA ship from operational service (engineering assessment).							

Actions to achieve FY20 target	Prepare and implement multi-year maintenance plan for ships.
Notes	Data available for planned/actual DAS through 2007 Methodology has not changed over time.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce extreme weather impacts**							
Indicator	**Percentage of data processed and delivered to operational users (NWS and other NOAA line offices, US military and operational partners) from NOAA-managed satellites.**							
Category	Supporting							
Description	Ensures that NOAA provides real time (or near real time) availability of critical satellite data and products without gaps.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%
Actual	99.50%	99.7%	99.35%	99.3%	99.49%	99.45%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Actions to achieve FY20 target	- Command and control 11 NOAA satellites and support 10 non-NOAA satellites - Process and distribute GOES-R Series, Suomi NPP, NOAA-20, legacy GOES and POES, and MetOp data - Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems							
Notes	On time data and imagery provided increases timeliness and accuracy of public warnings and forecasts of climate and weather events							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Severe weather warnings tornadoes - Storm based lead time (Minutes), accuracy (%), and false alarm ratio (%)**							
Category	Supporting							
Type	Output							
Description	Tornado Warnings are issued to enable the public to get out of harm's way and mitigate preventable loss. NWS forecasters issue approximately 2,900 Tornado Warnings per year, primarily between the Rockies and Appalachian Mountains. Tornado Warning statistics are based on a comparison of warnings issued and weather spotter observations of tornadoes and/or storm damage surveys from Weather Forecast Offices in the United States.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Lead Time (min)								
Target	13	13	13	13	13	13	13	13
Actual	9	9	8	9	9	8		
Status	Not Met	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	Directional: Stable							
Accuracy (%)								

Target	72	72	72	72	72	72	72	72
Actual	57	60	58	61	58	57		
Status	Not Met	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	Directional: Negative							
False Alarm Ratio (%)								
Target	72	72	72	71	71	71	71	71
Actual	74	70	70	69	72	69		
Status	Met	Met	Met	Met	Met	Met		
Trend	Directional: Stable							
Explanation (if not met in FY 2018)	The trend in not meeting the Tornado Warning lead time and accuracy metric is likely due to the lack of recent tornado outbreaks with numerous EF2 or stronger tornadoes. More frequently updating lowest angle radar scans from the WSR-88Ds, on the order of 1-2 minutes in certain instances, may also be providing forecasters with the ability to identify more imminent tornadic activity than in previous years, namely before 2014 when MESO-SAILS (Multiple Elevation Scan Option for Supplemental Adaptive Intra-Volume Low-Level Scan) was implemented. However, this has led to a decrease in lead time.							
Actions to be taken / Future Plans	Improvements in NWS national Tornado average lead-time and accuracy goals are based on: - Upgrading high resolution models for forecaster situational awareness - Enabling GIS for Partners - Operationally implementing tools such Multi-Radar Multi-Sensor System (MRMS), and the advanced radar scanning methods Automated Volume Scan Evaluation and Termination (AVSET) and Supplemental Adaptive Intra-Volume Low-Level Scan (SAILS) - Training NWS forecasters as to use new forecast tools and guidance products							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY20 target for this measure and improve tornado predictions: - Upgrading high resolution models for forecaster situational awareness - Enabling GIS for Partners - Operationally implementing tools such Multi-Radar Multi-Sensor System (MRMS), and the advanced radar scanning methods Automated Volume Scan Evaluation and Termination (AVSET) and Supplemental Adaptive Intra-Volume Low-Level Scan (SAILS) - Training NWS forecasters as to use new forecast tools and guidance products							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with Government Performance and Results Act (GPRA) for 1993. These data are available from 1986 to present. Historically, tornado warnings were issued and verified on a countywide basis. Starting in FY 2008, the storm-based warnings were implemented with verification based solely for the areas impacted by the warning and event. Lead Time (LT) for a Tornado Warning is the difference between the time the warning was issued and the time the tornado occurred (based on certified reports), assuming the tornado tracked within the bounds of the warned area. Lead Times for all tornado occurrences within the U.S. are averaged to get this statistic for a given fiscal year. This average includes all warned events with zero lead times and all unwarned events. Accuracy or probability of detection (POD) is the percentage of time a tornado actually occurred in an area that was covered by a tornado warning. The difference between the accuracy percentage figure and 100% represents the percentage of events occurring without warning. The false alarm ratio (FAR) is the percentage of times a tornado warning was issued, but no tornado occurrence was verified. Lead Time is calculated down to the minute for individual Tornado Warnings and tornadic events. Although the timing of the warning transmission is recorded to the nearest second, typically there is only an estimate to the nearest minute of when a tornado touches down. Additionally, even though we can compute the average tornado warning lead time to a precision of 30 second increments or less, the reporting of this value implies greater accuracy in the data based on scientific and logistical restrictions on tornado reporting and surveying. Most tornadoes cannot be visually tracked from beginning to end and post-storm damage surveying is the official method with which the NWS categorizes tornado characteristics (intensity, path length & width) but must rely on radar data to estimate the timing of the tornado track.							

	The annual variation of Tornado Warning lead time, accuracy (POD), and false alarm ratio is closely tied to the variation in storm type during a given year. Discrete, persistent long track tornadic supercell storms, often associated with tornado outbreaks, are usually easier to detect and track on radar than tornadoes that develop within squall lines, tropical storms, or disorganized storm systems. There is considerable year-to-year variability in tornado outbreaks, and years with more frequent outbreaks, such as 2011, typically exhibit better performance. Changes in performance can be detected over a period of several years although they can be influenced by the frequency of tornado outbreak occurrence.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Severe weather warnings for flash floods - Lead time (minutes) and accuracy (%)**							
Category	Supporting							
Type	Output							
Description	For each reported flash flood event, the flash flood warning lead-time is the difference in minutes between the issuance of a flash flood warning and the onset of a geographically corresponding flash flood event. Both flash flood warning lead-time and accuracy metrics are cumulative over the fiscal year and, when reported prior to the end of the year, represent the year-to-date performance.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Lead Time (min)								
Target	58	60	61	61	63	63	65	65
Actual	63	54	64	72	73	62		
Status	Exceeded	Met	Exceeded	Exceeded	Exceeded	Met		
Trend	Variable							
Accuracy (%)								
Target	74	74	76	76	76	76	76	76
Actual	78	78	79	80	77	78		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Trend	Stable							
Explanation (if not met in FY 2018)	N/A							
Actions to be taken / Future Plans	In FY 2012, the NWS reevaluated the current and out-year national average flash flood warning lead-time goals based on the current storm-based flash flood warnings data from FY 2008 through Q3 and part of Q4 (July 31), FY 2012. The NWS Flash Flood Average lead-time goal increases to 58-min for FY 2013 is a result of this evaluation. Subsequent increases to out-year NWS national Flash Flood Warning average lead-time and accuracy goals are based on: Implementation of new water resource capabilities including distributed hydrologic modeling which will provide stream-flow predictions at ungaged locations. Current flash flood detection capabilities are largely based on decision assistance tools which utilize precipitation estimates, rather than overland and streamflow modeling. (FY 2018-2020) Recommendations and requirements delivered by the Evolving Rapid-Onset Flooding Services Requirements and Operations Concept Team on how to enhance the ability of the NWS to deliver services for rapid-onset flooding using existing and emerging tools to improve forecaster situational awareness, rapid-onset flood risk analysis, warning decision support tools, and simplified messaging. (FY 2017-2018) Continued training on 1) precipitation estimation techniques, software enhancements and water resources modeling capabilities, and 2) decision support. Note the current and out-year national average flash flood warning accuracy goals remain consistent with those originally proposed in FY 2010.							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve flash flood predictions:							

	● Implementation of new water resource capabilities including distributed hydrologic modeling which will provide streamflow predictions at engaged locations. Current flash flood detection capabilities are largely based on decision assistance tools which utilize precipitation estimates, rather than overland and streamflow modeling. ● Continued training on 1) precipitation estimation techniques, software enhancements and water resources modeling capabilities, and 2) decision support
Notes	The lead times for all flash flood events, within the United States and territories served by the National Weather Service, are averaged to calculate the national average flash flood warning lead-time metric for a given fiscal year. This average includes all warned events with zero lead times and all unwarned events. The flash flood warning accuracy (probability of detection for storm-based warnings) represents the percentage, in both space and time, for which a flash flood event was warned. NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with GPRA. These data are available from 1986 to present. Historically, flash flood warnings were issued and verified on a countywide basis. Starting in FY 2010, the storm-based warnings were implemented with verification based solely for the areas impacted by the warning and event.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Hurricane forecast track error (48 hour)**							
Category	Supporting							
Type	Output							
Description	The public, private sectors, emergency managers, and government institutions at all levels in this country and abroad use NOAA tropical cyclone forecasts to make decisions regarding the protection of life and property. This goal measures the difference between the projected and actual location of the center of tropical cyclones in nautical miles (nm) for the Atlantic Basin, averaged over all the 48-hour forecasts occurring during the calendar year.							
	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Target	83	81	77	71	68	65	62	59
Actual	103	65	77	61	56	*TBD		
Status	Not Met	Not Met	Met	Exceeded	Exceeded	TBD		
Trend	Variable							
Adjustments to targets	Targets for CY 2017 and beyond were adjusted to reflect the CY 2015 and CY 2017 decreases in the HFIP. These revised targets additionally reflect recent performance trends and improvements in Hurricane Weather Research and Forecasting model.							
Actions to achieve FY20 target	Actions include the Hurricane Forecast Improvement Project (HFIP) which has a goal of improving average track errors by 50% over 10 years. This goal is being achieved through improvements in modeling to the GFS and HWRF models as well as the HWRF ensemble. Improvements to the models include development and tuning of physics packages for hurricane models at a high resolution. Additionally, the goals will be achieved through improving initialization and data assimilation systems and improvements to model genesis of tropical systems, as well as the post processing of modeling output improvements. These improvements along with the work of the Joint Hurricane Testbed (JHT) efforts which encompass not only modeling efforts but include identification of new techniques, observing systems improvements, the establishment of an infrastructure to facilitate the transfer of research applications to operational computing and communications, testing in a quasi-operational environment of tools, techniques and preparing the documentation and training of successfully transferred products to facilitate the ease of use in operations are vital to meeting these goals. Additionally another effort to improve modeling, not related to either of the before mentioned projects, includes the FV 3 model relating to tropical system							
Notes	**** Annual Hurricane Season begins June 1 and ends November 30. The final values are produced after a verification and validation period. Calendar Year (CY) 2018 Hurricane GPRA will be available in April 2019.*** NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1970 to present. CY 2017 GPRA final values will be available after the verification period.							

	Because tropical cyclones are relatively rare events, this measure can show significant annual volatility. Projecting the long-term trend, and basing out-year goals on that trend, is preferred over making large upward or downward changes to the targets each year.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Hurricane forecast intensity error (48 hour)**							
Category	Supporting							
Type	Output							
Description	The public, private sectors, emergency managers, and government institutions at all levels in this country and abroad use NOAA tropical cyclone forecasts to make decisions regarding the protection of life and property. This measure represents the difference between the projected intensity of these storms and the actual intensity in knots (kt) for Atlantic Basin tropical cyclones (i.e., tropical depressions, tropical storms, and hurricanes).							
	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Target	12	12	12	12	12	12	12	12
Actual	10.5	10	11	10	13	*TBD		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	TBD		
Trend	Variable							
Actions to be taken / Future Plans	In the ongoing 10 year effort to reduce rapid intensification of hurricanes through the HFIP goals of 50% in 10 years for days 1 through 5. Increase the probability of detection (POD) for rapid intensification (RI) to 90% at day 1 decreasing linearly to 60% at day 5, and decrease the false alarm ratio (FAR) for rapid intensity change to 10% for day 1 increasing linearly to 30% at day 5. The focus on rapid intensity change is the highest-priority forecast challenge identified by NHC. These goals are to meet through the HFIP project via methods mentioned earlier along the continuing efforts of the JHT and modeling of the FV 3. However, the CY 2017 intensity error was not met due to nearly twice as much rapid intensification during the Atlantic tropical season. The models do not handle rapid intensification well.							
Adjustments to targets	Targets for CY 2017 and beyond were adjusted to reflect performance trends, anticipated impacts of model upgrades and CY 2017 decreases in the HFIP.							
Actions to achieve FY20 target	In the ongoing 10 year effort to reduce rapid intensification of hurricanes through the HFIP goals of 50% in 10 years for days 1 through 5. Increase the probability of detection (POD) for rapid intensification (RI) to 90% at day 1 decreasing linearly to 60% at day 5, and decrease the false alarm ratio (FAR) for rapid intensity change to 10% for day 1 increasing linearly to 30% at day 5. The focus on rapid intensity change is the highest-priority forecast challenge identified by NHC. These goals are met through the HFIP project via methods mentioned earlier along the continuing efforts of the JHT and modeling of the FV 3. However the FY 2017 intensity error was not met due to nearly twice as much rapid intensification during the Atlantic tropical season. The models do not handle rapid intensification well.							
Notes	**** Annual Hurricane Season begins June 1 and ends November 30. The final values are produced after a verification and validation period. Calendar Year (CY) 2018 Hurricane GPRA will be available in April 2019.*** The measure is validated by computing the average difference (error) for all the 48-hour forecasts occurring during a calendar year. Because tropical cyclones are relatively rare events, this measure can show significant annual volatility. Projecting the long-term trend, and basing out-year goals on that trend, is preferred over making large upward or downward changes to the targets each year. NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1970 to present CY 2017 GPRA final values will be available after the verification period.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Accuracy (%) (threat score) of Day 1 precipitation forecasts**
Category	Supporting
Type	Output

Description	Precipitation forecasts and other foundational general weather guidance developed by the Weather Prediction Center are used extensively by the weather enterprise. This performance measure tracks the ability of the weather forecasters of NOAA's Weather Prediction Center (WPC) to predict accurately the occurrence of one inch or more of precipitation (rain or the water equivalent of melted snow or ice pellets) twenty-four hours in advance across the contiguous U.S.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	31	32	32	32	33	33	33	34
Actual	33	33	33	36	34	36		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve precipitation predictions: 1. The NCEP Central Computer System will continue to be upgraded in its computational speed and memory storage capabilities allowing the running of more sophisticated numerical modeling systems of the hydrosphere. 2. NCEP will implement a number of numerical weather prediction enhancements aimed at improving heavy precipitation forecasts, including increasing numerical model resolution, increasing the number of ensemble forecast members for both short- and medium-range forecast models, and improving the assimilation of satellite and other observational data used as the starting point for the numerical forecasts. 3. Training by the WPC staff and visiting scientists on the use of new model information (e.g., ensembles) will assist the WPC forecasters in making improved precipitation predictions.							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with GPRA. These data are available from 1993 to present. This information is used by government entities, economic sectors, and the general public to manage daily lives and activities and make resource decisions.							
Information Gaps	None							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Winter storm warnings - Lead time (hours) and accuracy (%)**							
Category	Supporting							
Type	Output							
Description	A winter storm warning provides NOAA customers and partners advanced notice of a hazardous winter weather event that endangers life or property, or provides an impediment to commerce. Winter storm warnings are issued for winter weather phenomena like blizzards, ice storms, heavy sleet, and heavy snow. This performance indicator measures the accuracy and advance warning lead time of winter storm events.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Lead Time (hours)								
Target	20	20	20	20	20	20	20	20
Actual	22	22	21	21	22	18		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Not Met		
Trend	Negative							
Accuracy (%)								
Target	90	90	90	90	90	90	90	90
Actual	89	89	85	85	87	80		
Status	Met	Met	Met	Met	Met	Not Met		
Trend	Negative							
Explanation (if not met in FY 2018)	Winter storm statistics for FY 2018 are available through September 2018. The latest accuracy (POD) is 80% (vs. 90% FY 2018 goal), and the lead time (LT) was 18 hours (FY 2018 goal of 20 hours). These numbers are slightly lower compared to the last several winters likely due to a higher occurrence of unusual winter storms in the southern U.S. and as there were a number of winter storm events with tight gradients of snow/ice accumulations. In addition, a somewhat uneven application of more impact based verification vs snowfall amounts may also be impacting these statistics.							

Actions to be taken / Future Plans	1. As forecasters work with higher resolution models such as Weather Research and Forecasting (WRF) model, they learn more about model tendencies, allowing more precise and timely warnings. 2. Deploy advanced ensemble modeling techniques. Ensemble techniques provide forecasters with probabilistic information applicable to issuing winter storm warnings. 3. Dual polarization radars, satellite upgrades, and access to Terminal Doppler Weather Radar (TDWR) – Enables forecasters to observe the formation/dissipation of mesoscale snow bands, which result in locally higher snow accumulation (i.e., lake effect snow). 4. Develop additional training and coordination support with National Centers.
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve winter storm predictions: 1. As forecasters work with higher resolution models such as Weather Research and Forecasting (WRF) model, they learn more about model tendencies, allowing more precise and timely warnings. 2. Deploy advanced ensemble modeling techniques. Ensemble techniques provide forecasters with probabilistic information applicable to issuing winter storm warnings. 3. Dual polarization radars, satellite upgrades, and access to Terminal Doppler Weather Radar (TDWR) – Enables forecasters to observe the formation/dissipation of mesoscale snow bands, which result in locally higher snow accumulation (i.e., lake effect snow).
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2001. These data are available from 1998 to present. From 1998 through 2006 statistics were calculated manually. Automated verification with additional quality control began in October 2007 to present. Improving the accuracy and advance warnings of winter storms enables the public to take the necessary steps to prepare for disruptive winter weather conditions**.**

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Marine wind - Percentage of accurate forecasts (%) Marine wave heights - Percentage of accurate forecasts (%)**							
Category	Supporting							
Type	Output							
Description	These performance indicators measure the accuracy of wind speed and wave height forecasts, which are important for marine commerce. These measures represent the percentage of accurate forecasts; accuracy is defined in terms of error. For the Day 1 marine wind speed forecast, errors less than 5 knots are defined as accurate.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Wind (%)								
Target	74	74	75	78	78	79	79	80
Actual	76	78	80	80	81	82		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Wave Height (%)								
Target	75	76	76	81	81	82	82	83
Actual	81	84	84	85	84	85		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Actions to be taken / Future Plans	Implementation of increased training opportunities detailed on Performance Website.							
Actions to achieve FY20 target	The following action is being undertaken to meet the FY 2020 target for this measure and improve marine weather predictions: ● Implementation of increased training opportunities detailed on Performance Website							

Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2001. Legacy statistics are available from FY 1994 through FY 2012. New marine verification program began FY 2013. Beginning in FY 2013, Wind and Wave verification extended out to 5 and 7 days respectively, while the legacy program was limited to verifying Day 1. Since FY 2014, a higher threshold of forecast errors has been used to define correct forecasts whenever higher wind speeds have occurred. Hence, wind speed forecasts with errors less than (7 knots, 10 knots, 15 knots) are accurate forecasts when the observed wind speed equals or exceeds (20 knots, 34 knots, 48 knots) respectively. For the Day 1 wave height forecast, errors less than 2 feet are defined as accurate. Since FY 2014, a higher threshold of forecast errors has been used to define correct forecasts whenever higher waves have occurred. Hence, all wave height forecasts with errors less than (4 feet, 6 feet) are accurate forecasts when the observed wave height equals or exceeds (10 feet, 20 feet) respectively. These measures use complex skill scores to analyze individual wind speed and wave height components.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Aviation ceiling/visibility forecast accuracy & false alarm ratio (%) Instrument Flight Rules (IFR)**							
Category	Supporting							
Type	Output							
Description	Visibility and cloud ceiling forecasts are critical for aircraft safety and efficient operations. When visibility or cloud ceilings are low, pilots rely on instruments to navigate instead of visual reconnaissance. The Federal Aviation Administration establishes Instrument Flight Rule (IFR) thresholds—visibility less than three statute miles and/or cloud ceilings at, or below, 1000 feet—for safety.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Accuracy (%)								
Target	65	65	65	65	65	65	65	65
Actual	62	62	65	63	63	63		
Status	Not Met	Met	Met	Met	Met	Met		
Trend	Stable							
False Alarm Ratio (%)								
Target	38	38	38	38	38	38	38	38
Actual	37	36	34	38	37	35		
Status	Exceeded	Exceeded	Exceeded	Met	Exceeded	Exceeded		
Trend	Positive							
Actions to be taken / Future Plans	Operational emphasis focuses on detecting IFR conditions and making accurate and precise forecasts. Results of improvements to TAF products at 30 busiest airports indicate focused attention on the TAF improves the accuracy. Additional training and coordination on impact of the TAF on air traffic will continue to highlight the importance of providing timely and accurate forecasts. Other efforts are centering on refining performance measures, such as lead time to occurrence and cessation, impacts to operations measures, and other quantitative methods to reveal ways to improve forecast skill and technique. Significant improvement in forecast skill is not achievable without infusion of new science and technology.							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve aviation weather predictions: ● Additional training and coordination on impact of the TAF on air traffic will continue to highlight the importance of providing timely and accurate forecasts ● Refining performance measures, such as lead time to occurrence and cessation, impacts to operations measures, and other quantitative methods to reveal ways to improve forecast skill and technique							
Notes	NWS began reporting accuracy and false alarm rates for aviation forecast metrics for ceiling and visibility in its Congressional Justification beginning in FY 2001. Data for aviation performance measure with IFR thresholds—visibility less than three statute miles and/or cloud ceilings at, or below, 1000 feet are available since 2005. NWS assesses the quality of IFR threshold forecasts in response to these requirements. Fundamental statistical metrics, specifically Probability of Detection (POD) and False Alarm Ratio (FAR), are used to track IFR forecast							

	performance. Probability of Detection (POD), also known as Accuracy, is a ratio that describes the number of times IFR is correctly forecasted compared to the total number of IFR occurrences. FAR is a ratio that describes the number of IFR forecasts when IFR was not observed compared to the total number of forecast attempts. These two metrics must always be used in conjunction, as one can be improved at the expense of the other. Greater accuracy and a minimized FAR result in safer flights and fewer flight delays; conversely, poorer accuracy and an increased FAR result in a greater incidence of unnecessary flight delays.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Geomagnetic storm forecast accuracy (%)**							
Category	Supporting							
Type	Output							
Description	This performance measure tracks the ability of forecasters at NOAA's Space Weather Prediction (SWPC) to accurately predict geomagnetic storms, which potentially disrupt power systems, spacecraft operations, and navigation systems. The NOAA geomagnetic storm scale (G-scale) ranges from the G1 or minor level where weak power grid fluctuations can occur to the G5 or extreme level.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target		51	53	53	40	56	57	58
Actual		40	57	68	65	60		
Status		Not Met	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Actions to be taken / Future Plans	Methods to improve performance for FY 2017-2020: - WSA-Enlil Solar Wind Model Enhancements; - Forecaster Training and Improved Model Interpretation and Application; - WSA-Enlil Solar Wind Model Continuing Validation and Improvement; - Implementation of ensemble modeling techniques; - Interpretation and Application of NASA Solar Terrestrial Relations Observatory (STEREO) Observations. - Note STEREO has a finite mission lifetime due to nature of its orbit and one of the two STEREO spacecraft is potentially lost and no longer providing observations.							
Adjustments to targets	The FY 2017 target was established in FY 2014 when NOAA was failing to meet performance goals. Since then, the performance of this measure has recovered and new goals for FY 2018 and beyond have been set to better reflect the longer-term performance of this measure. This measure has shown strong variability over time. Some of that variability can be explained by the variability of geomagnetic storm intensity and frequency over both the solar cycle and between solar cycles. Big storms, of which the current solar cycle has been largely devoid of, can be more obvious and easier to forecast.							
Actions to achieve FY20 target	The following actions are being undertaken to meet the FY 2020 target for this measure and improve geomagnetic storm predictions: - WSA-Enlil Solar Wind Model Enhancements - Forecaster Training and Improved Model Interpretation and Application - WSA-Enlil Solar Wind Model Continuing Validation and Improvement; - Implementation of ensemble modeling techniques - Interpretation and Application of NASA Solar Terrestrial Relations Observatory (STEREO) Observations							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2013. In FY 2013, this measure was the average over 30 storms and represented the percentage of days that a geomagnetic storm event at Earth was correctly forecast by the Space Weather Prediction Center (SWPC). These data are available from 2009 to present. During a G5 event, where aurora may be visible over most of the United States, the power grid can experience equipment damage causing system collapse or blackout; significant satellite damage can occur; and global positioning systems may be inaccurate or temporarily unavailable. Geomagnetic Storm Forecast Accuracy is a percentage that reflects the amount of time that the SWPC geomagnetic storm forecast is correct over a 24-hour period. The 24 hour geomagnetic storm forecast is considered accurate if a G1 or greater storm event was correctly predicted. This calculation also includes geomagnetic storms which were not forecast. This measure is verified based on ground-based magnetometer							

	observations. This measure is averaged over the 60 most recent geomagnetic storms to maintain statistical significance.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Number of communities that utilize Digital Coast**							
Category	Supporting							
Type	Output							
Description	Digital Coast is a web-based platform that provides geospatial data, tools, and training to coastal communities. This measure, obtained via web statistics, provides a locational context that allows the effort to broadly assess where its users are coming from. Given that the Digital Coast effort is national in scope, yet local in its approach to providing geospatial information to address coastal issues, such as coastal resilience, this measure provides valuable information that is used to direct outreach efforts and support content development. The number of communities using Digital Coast is based on Census-designated places within coastal states, including all Census-defined cities, towns, townships, boroughs, and incorporated municipalities.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	3,275	4,750	5,375	5,500	5,500	5,500	5,000	5,000
Actual	5,221	5,249	6,330	5,043	7,040	6,903		
Status	Exceeded	Exceeded	Exceeded	Met	Exceeded	Exceeded		
Trend	Positive							
Adjustments to targets	FY 2019 and FY 2020 targets reflect impacts from program changes in FY 2019.							
Actions to achieve FY20 target	Continue to improve data, mapping, tools, and information resources made available through Digital Coast to address competing uses of coastal resources and adaptation to coastal hazards. Deliver technical assistance to coastal communities to use Digital Coast for decisions.							
Notes	Data goes back to FY 2011.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards**
Category	Supporting
Type	Outcome

Description	This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It does this by using an index that incorporates a range of NOAA-sponsored activities, including training and technical assistance that communities have engaged in to mitigate their susceptibility to coastal hazards. This measure illuminates how NOAA is improving integration of its coastal programs and the Nation's capacity for end to end preparedness, response, recovery and resilience to hazards.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	40%	46%	51%	60%	66%	71%	77%	77%
Actual	57%	54%	60%	74%	69%	74%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Adjustments to targets	FY 2019 and FY 2020 targets reflect the cumulative impact of multiple program changes in FY 2019.							
Actions to achieve FY20 target	Make significant scientific expertise and data capabilities available to state and local decision-makers through Coastal Zone Management and Services.							
Notes	Data goes back to FY 2011.							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts**							
Category	Supporting							
Type	Outcome							
Description	This measure tracks the communities (currently using operational forecasts) within a coastal region vulnerable to harmful algal blooms (HAB) and the utility and accuracy of HAB forecasts. Utility and accuracy are verified through customer feedback responses before and after a forecast HAB event. This measure informs on-going NOAA efforts to characterize causes of HABs and their impacts to humans and coastal ecosystems, develop products that detect and forecast HAB species and toxins, and collaborate with stakeholders to develop HAB mitigation strategies. NCCOS, CO-OPS, and partners are developing operational forecasts to meet the needs of all vulnerable communities throughout the coastal U.S.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	18%	18%	18%	18%	23%	23%	23%	23%
Actual	18%	18%	18%	18%	23%	23%		
Status	Met	Met	Met	Met	Met	Met		
Trend	Stable							

Actions to achieve FY20 target	Sustain operational ecological forecasting services; develop enhanced forecasting capabilities for HABs, habitat, and pathogens; and continue transition to operations for limited HAB forecasts.
Notes	Data goes back to FY 2009.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles)**							
Category	Supporting							
Type	Output							
Description	NOAA conducts hydrographic surveys in U.S. waters to determine bathymetry; this includes the detection, location, and identification of wrecks and obstructions with side scan and multibeam sonar technology. NOAA uses the data to produce nautical charts and other products to ensure safe and efficient navigation. Targets for this measure are set by a formula, calculated from available contract funds and expected days at sea. Actual area collected each year will vary depending on the location and characteristics (depth, bottom complexity) of the areas surveyed.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	3,000	2,671	2,556	2,509	2,287	2,279	2,279	2,279
Actual	2,285	2,207	3,135	3,296	2,480	3,403		
Status	Not Met	Not Met	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Actions to achieve FY20 target	Conduct 120 hydrographic surveys (led by NOAA survey units, contractors, and other sources). Enhance procedures and technology to improve hydrographic survey efficiency.							
Notes	This performance measure is shared with OMAO. Data goes back to FY 2003. Targets and actuals for FY 2013 and FY 2014 include activities performed with Recovery Act funding.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data (cumulative)**
Category	Supporting
Type	Outcome

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Description	This measure tracks progress of NOAA's National Geodetic Survey toward completing gravity observations for the Redefinition of the American Vertical Datum (GRAV-D) initiative and implementation of a new National Vertical Datum. The measure indicates the percentage of the U.S. for which NOAA has airborne gravity data necessary to support the new National Vertical Datum. This improved vertical reference system is critical for all observing systems and activities requiring accurate heights. For example, this system is important for helping determine where water flows in order to make accurate inundation models and assessments.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	28%	36%	45%	53%	62%	70%	79%	87%
Actual	31%	36%	45%	55%	64%	72%		
Status	Exceeded	Met	Met	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Actions to achieve FY20 target	Collect airborne gravity data and update Continuously Operating Reference Stations coordinates and velocities.							
Notes	Data goes back to FY 2010.							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).**							
Category	Supporting							
Type	Output							
Description	The measure captures the count of significant and discrete OAR research and development products that have transitioned to development, demonstration, or an application. Products include transitions occurring within OAR and applying group(s) outside of OAR. This includes research, development, and demonstration performed and supported by OAR as well as utilization of OAR R&D products by external parties.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	NA	NA	65	65	65	65	65	42
Actual	n/a	66	72	65	65	66		
Status			Exceeded	Met	Met	Exceeded		
Trend	Stable							
Adjustments to targets								

Actions to achieve FY20 target	None
Notes	This measure counts the number of products that advance, not the number of uses of those products. If a product advances the # of rough multiple stages in a year, it may be listed for each stage to which it advances. If multiple OAR labs/programs contribute to an advancement (including providing financial resources), they can each count the advancement.

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Reduction in gap between high-performance computing deployed and what is needed to meet modeling requirements**							
Category	Supporting							
Type	Output							
Description	The indicator shows the overall growth, in petaflops (PF), of the operational and research and development High Performance Computing capability. Our current enterprise supplies 16PF to support modeling requirements across NOAA. Growth in capacity will lessen the gap in current modeling requirement and provide additional capability to the modeling community within NOAA.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target					13PF	16PF (23%)	17PF (6.25%)	18PF (5.8%)
Actual					13PF	16.4		
Status						Exceeded		
Trend	New Indicator – Not enough data							
Actions to achieve FY20 target	Continue to pursue recapitalization efforts. Larger recapitalization effort to begin in FY 2020.							
Notes	The indicator is the overall capacity growth, measured in petaflops, in the operational and research and development HPC enterprise. This growth is attained by procurement or replacement of aging computational components. Percentages noted reflect overall growth over the previous year's target.							
Information Gaps	Growth Rate will be generally tied to the overall budget. Flat budget conditions may result in a loss of capacity due to rising maintenance costs.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**

Indicator	**Percentage of ingested environmental data safely archived to ensure consistent long-term stewardship and usability of the data (per National Archives and Records Administration (NARA) standards)**							
Description	Ensures that NOAA safely archives critical data and information according to NARA standards.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	98%	98%	98%	98%	98%	98%	98%	98%
Actual	99%	99%	100%	98%	98%	98%		
Status	Exceeded	Exceeded	Exceeded	Met	Met	Met		
Trend	Stable							
Notes	Consistent long-term stewardship of NOAA's geophysical, oceans, coastal, weather and climate data							
Information Gaps								

PROPOSED NEW INDICATORS

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.1 Increase Aquaculture Production**							
Indicator	**Number of fishermen, seafood processors and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety.**							
Category	Supporting							
Type	Output							
Description	This measure tracks Sea Grant's success in assisting industry personnel with the adoption of responsible harvesting and processing techniques that improve social, economic, and ecological sustainability. Industry personnel include recreational, commercial (wild and cultured), and subsistence fishery participants, processors, and retailers. Practices include techniques, technologies and best management practices adopted. Fisheries sustainability and seafood safety refers to any combination of the ability of the ecosystem to remain diverse and productive; the social, cultural, and economic resilience of the fishing community; personal or crew safety; and quality and safety of the seafood product.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							15,000	0
Actual	184,000	53,000	62,200	40,243	19,900	17,796		
Status							NEW	
Trend	New Indicator – Historical Data Varying							
Explanation	New metric for FY 2019.							

(if Target not met in FY 2018)	
Actions to be Taken / Future Plans	None
Adjustments to Targets	New metric for FY 2019 APPR.
Actions to achieve FY20 target	Sea Grant was terminated in the FY 2020 President's Budget. Therefore, Sea Grant has no targets for FY 2020.
Notes	Historical data exists for FY 2010 through FY 2017. This metric is new in FY 2019 APPR as part of the FY 2018 DOC Strategic Plan Objective 2.1 Increase Aquaculture Production.
Information Gaps	None

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.1 Increase Aquaculture Production**							
Indicator	**Reduction in time to review, consult, or approve aquaculture permits**							
Category	Strategic Plan							
Type	Output							
Description	This measure is under development.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target								TBD
Actual								
Status								NEW
Trend	New Indicator – Not enough data							
Actions to achieve FY20 target								
Notes	NOAA has regulatory and stewardship authority for fisheries, marine sanctuaries, marine mammals, threatened and endangered species, and habitat conservation. NOAA also engages in consultations with other agencies that issue permits for aquaculture activities in state and federal waters.							
Reason for New Indicator	Expediting aquaculture permits is a priority for the administration.							
Indicator being replaced	This indicator does not replace any existing indicator.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.1 Increase Aquaculture Production**							
Indicator	**Annual number of aquaculture research products transitioned to a new stage (development, demonstration, or application)**							
Category	Strategic Plan							
Type	Output							
Description	This measure is under development.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target								TBD
Actual								
Status								NEW
Trend	New Indicator – Not enough data							
Reason for New Indicator	Aquaculture research is a priority for the administration.							
Indicator being replaced	This indicator does not replace any existing indicator.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.1 Increase Aquaculture Production**							
Indicator	**Annual economic and societal benefits from Sea Grant activities as measured by businesses created/retained and economic benefits ($M dollars) (reported by each individual Sea Grant College)**							
Category	Supporting							
Type	Customer Service							
Description	This measure highlights change in jobs that communities or businesses generate or save due to Sea Grant assistance (i.e., providing information to help communities, industries or businesses expand, make better decisions or avoid mistakes). Sea Grant provides the information and training that informs business decisions, and in some cases firms create or sustain jobs as a result. A job created is a new position created and filled as a result of Sea Grant activities. An existing position that is filled with a Sea Grant-trained applicant should not be reported in this measure. A job sustained is an existing, filled position that is sustained as a direct result of Sea Grant activities. A job cannot be reported as both created and sustained in the same year.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY2020
Target							2,000 $400M	0
Actual	3,400 $485M	6,500 $450M	2,220 $450M	2,903 $575M	1,300 $475M	2,450 $536M		
Status							NEW	
Trend	New Indicator – Historical Data Varying							
Adjustments to targets	None							

Actions to achieve FY20 target	Sea Grant was terminated in the FY 2020 President's Budget. Therefore, Sea Grant has no targets for FY 2020.
Notes	FY 2020 targets reflect current budget priorities.
Information Gaps	Current efforts are focused on better defining the measure standards.

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.2 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Average number of days to complete informal ESA Section 7 consultations**							
Category	Supporting							
Type	Output							
Description	This measure shows the average number of days to complete an informal ESA Section 7 consultation. Federal agencies must consult with NOAA when any project or action might affect an ESA-listed marine species or a critical habitat. The process begins as informal consultation, but if it is determined that the action is likely to adversely affect a listed species and/or its critical habitat, the consultation must be formal. A large majority of consultations are handled informally.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							50	47
Actual	122*	122*	122*	122*	53	45		
Status							NEW	
Trend	New Indicator – Not enough data							
Actions to achieve FY20 target	Provide technical assistance, review permits, conduct formal and informal consultations, process incidental take authorization requests, and conduct post-project implementation monitoring and adaptive management to ensure project improvements. Engage with applicants to identify additional streamlining improvements.							
Notes	*122 days is the average time to completion for the years 2013-16.							
Reason for new indicator	Improving customer service by reducing delays and streamlining permit approval processes is a major priority of the Administration.							
Indicator(s) being replaced	This indicator does not replace any existing indicator.							

Strategic Goal	**Enhance Job Creation**
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**
Indicator	**Number of environmental reviews that exceed regulatory or statutory deadlines**
Category	Supporting
Type	Output

Description	This measure shows the number of environmental reviews (ESA Section 7 formal consultation, MMPA incidental harassment authorization, EFH consultation) that exceed regulatory, statutory, or otherwise agreed-upon deadlines. Under the ESA and MSA, Federal agencies must consult with NOAA when any project or action might affect an ESA-listed marine species or a critical habitat. Under the MMPA, NMFS issues incidental harassment authorizations, which allow for the otherwise prohibited incidental "take" of marine mammals resulting from lawful activities (such as military readiness training, seismic surveys, or coastal construction).							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							50	50
Actual								
Status							NEW	
Trend	New Indicator – Not enough data							
Actions to achieve FY20 target	Conduct consultations, process incidental take authorization requests, and conduct post-project implementation monitoring and adaptive management to ensure project improvements. Engage with applicants to identify additional streamlining improvements.							
Notes								
Reason for new indicator	Improving customer service by reducing delays and streamlining permit approval processes is a major priority of the Administration.							
Indicator(s) being replaced	This indicator does not replace any existing indicator.							

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Percent of Seafood Import Monitoring Program (SIMP) import records that are compliant**							
Category	Supporting							
Type	Output							
Description	SIMP audits select a random sample of consignments to a target statistical validity. Each consignment is audited for completeness and verified accuracy of documentation. Once this evaluation is complete, any concern with the consignment is forwarded to the Office of Law Enforcement for further investigation. This measure shows the percentage of audited consignments with documentation that is sufficiently complete and verified accurate to not warrant further investigation.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target								TBD
Actual								
Status								NEW
Trend	New Indicator – Not enough data							

Actions to achieve FY20 target	
Notes	The SIMP program was established January 1, 2018, so FY 2019 will be the first full fiscal year of operation. The program is still ramping up and has not yet achieved sufficient capacity to audit the targeted statistically significant sample.
Information Gaps	
Reason for new indicator	
Indicator(s) being replaced	This indicator does not replace any existing indicator.

Strategic Goal	**Enhance Job Creation**							
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Number of youth participating in hands-on learning in national marine sanctuaries**							
Category	Supporting							
Type	Output							
Description	Each site within the National Marine Sanctuary System conducts education through formal education, informal education, and outreach for education. K-12 student participation is tracked in both formal and informal education programs by counting the number of students participating in these programs. Data is collected yearly from each site and summarized system wide. Using these methods we can track the number of K-12 students, including those from underserved communities, engaged in formal or informal education and stewardship programs.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							40,000	53,000
Actual	32,295	32,839	39,613	56,385	95,863	42,259		
Status							NEW	
Trend	New indicator – Historical Data Varying							
Action(s) to achieve FY 2020 target	Utilize a virtual classroom that increases the accessibility of science-based learning for sanctuary communities.							
Notes	The large increase in numbers in FY 2017 was due to a one-time event, which is not anticipated to happen again.							
Reason for new indicator	Engagement is critical for increasing understanding of oceans and appreciation for national marine sanctuaries.							

Strategic Goal	**Enhance Job Creation**

Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**							
Indicator	**Number of volunteer hours supporting science, education, and public engagement programs to raise awareness and meet science needs of national marine sanctuaries**							
Category	Supporting							
Type	Output							
Description	Volunteers are a critical part of national marine sanctuaries and help support science, education, and conservation priorities. Volunteers assist in many projects, such as citizen science, monitoring, education support, and marine debris cleanups. Volunteer hours can also be assigned a value through the widely used nonprofit organization, Independent Sector, which provides a yearly estimate of what a volunteer hour is worth. Using this number, each year ONMS calculates how much in-kind support our volunteers provide.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							133,000	135,000
Actual	127,704	140,370	149,795	137,088	130,280	127,983		
Status							NEW	
Trend	New indicator – Historical Data Varying							
Action(s) to achieve FY 2020 target	Maintain robust volunteer program, including citizen science initiatives (projects in which volunteers partner with scientists), as well as a robust public process to solicit and respond to communities input.							
Notes	Volunteer hours vary from year to year due to staff changes, volunteer projects ending, and volunteer interest and time. Volunteers are not only managed by ONMS staff, but also by various partner organizations.							
Reason for new indicator	In-kind support from volunteers is critical for the national marine sanctuary system, and shows the leveraged value provided by sanctuaries funding.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Annual number of NOAA partnerships with the private sector (# of Cooperative Research and Development Agreements executed)**
Category	Supporting
Type	Output

Description	A Cooperative Research and Development Agreement (CRADA) is a written agreement between a private company and NOAA to work together on a project. A CRADA allows NOAA and non-Federal partners to optimize their resources, share technical expertise in a protected environment, share intellectual property emerging from the effort, and speed the commercialization of NOAA developed technology. The CRADA, which is not an acquisition or procurement vehicle, is designed to be a relatively easy mechanism to implement, requiring less time and effort to initiate than previous methods for working with non-government organizations.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							8	4
Actual	1	5	14	5	14	16		
Status							NEW	
Trend	New Indicator – Historical Data Varying							
Actions to achieve FY20 target	Engage a broad spectrum of stakeholders and audiences through education and outreach; develop and Nurturing Lab/Center Innovation; increasing external awareness and recognition for NOAA's technology transfer; improving Staff Understanding and Utilization of Technology Transfer; streamlining policy and management for technology transfer in NOAA. The FY20 target is set at 4 to reflect the FY20 President's Budget submission.							
Notes	Historical data exists for FY 2010 through FY 2017. This metric is new in FY 2020 APPR as part of the FY 2018 DOC Strategic Plan.							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Subseasonal temperature skill score**							
Category	Supporting							
Type	Output							
Description	Temperature outlooks are used by sectors of the U.S. economy, such as energy, agriculture, transportation, etc. as one factor in resource decision making. Temperature outlooks are reported as the probability of temperature being above normal or below normal or, where no definite guidance can be provided, equal chances. This is the cumulative skill calculated for regions where predictions are made.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							35	36
Actual						36		
Status							NEW	
Trend	New Indicator – Not enough data							
Action(s) to achieve FY 2020 target	Additional skill to the product should be provided by two projects focusing on links between the stratosphere and U.S. surface temperature and the development of a new consolidation tool combining statistical and dynamical guidance.							
Notes	The Heidke Skill Score will be used for week 3-4 temperature. Heidke Skill Score values range from -100 to 100. A score of 100 indicates a perfect forecast and a score of -100 indicates a perfectly incorrect forecast. Scores greater than 0 indicate improvement compared to a random forecast and indicate skill.							
Reason for new indicator	Indicator is needed to monitor progress in meeting requirements of Title II of the Weather Research and Forecasting Innovation Act of 2017 which focuses on subseasonal (between two weeks and three months) and seasonal (between three months and two years) forecasting and improvement.							
Indicator(s) being replaced	None							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Global Ensemble Forecast System (GEFS) length of forecast considered accurate**							
Category	Supporting							
Type	Output							
Description	The measure is a proxy for the useful forecast lead time of the GEFS beyond the current forecasts skill (9.5 days) and is computed over the range of forecast days. Extending lead time in prediction of future weather events allows people to make informed choices and enables protection of life, property, and enhancement of the National economy. The 500 hPA Anomaly Correlation will be used.							
	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020
Target							9.5	10.0
Actual						10		
Status							NEW	
Trend	New Indicator – Not enough data.							
Action(s) to achieve FY 2020 target	FY 2019- Implement global forecast system (NGGPS version 1.0). FY 2020- Implement global ensemble forecast system (FV3 GEFS) version 1.0 extending beyond the current 16 days to 35 days (weeks 3-4).							
Notes	NOAA also reports the indicator as an average from the previous three years to minimize the influence of year-to-year variations of climate patterns and predictability, thus the performance indicator could better reflect the trends in improvements of the model performance.							
Reason for new indicator	Indicator will track improvement in overall weather forecast model accuracy which will enable more accurate, consistent, longer lead time for specific weather event forecasts and warnings.							
Indicator(s) being replaced	None.							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Annual number of ocean acidification observations collected by the National Ocean Acidification Observing Network**							
Category	Supporting							
Type	Efficiency							
Description	The National Ocean Acidification Observing Network (NOA-ON) is comprised of a suite of sensor assets. Each sensor tracks the daily cycle of ocean carbonate chemistry, which allows us to characterize Ocean Acidification in accordance with the Federal Ocean Acidification Research and Monitoring (FOARAM) Act. This network provides the capacity to track long-term changes in ocean chemistry and to alert stakeholders and industry partners about corrosive events impacting the Nation's blue economy.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							7,817	7,300
Actual	6,277	7,266	7,452	7,044	6,747	6,930		
Status							NEW	
Trend	New Indicator – Historical Data Varying							
Action(s) to achieve FY 2020 target	This metric indicates the functional status of the NOA-ON. A missed target indicates a malfunction in the network. There are two additional moorings deployed (one in FY 2018 and another in FY 2019) to replace moorings that went offline in FY 2016 and FY 2017.							
Notes	Optimally, each NOA-ON sensor asset, with a fully functioning sensor suite, should provide for the determination of a minimum 8 observations per 24 hours. The minimal suite of sensors contained on a NOA-ON asset comprises temperature, salinity, and seawater carbon dioxide (partial pressure) sensors. Thus, a single NOA-ON asset deployed for a full year should optimally yield 365 observing days when all sensors are operating. For example, a single NOA-ON sensor asset should yield 365 observing days per year. Therefore, as coverage of the NOA-ON is extended (i.e. additional assets are bought online), this observation indicator increases accordingly.							
Information Gaps	Currently, the actual values for observing days are derived by determining the days for which quality assured archived data are available, per mooring, through NCEI. However, there remains considerable latency between the							

	real-time data streams and the quality assured archived data (up to several years). Therefore, NOAA is currently working to acquire more real-time data with a latency of less than three months which will allow for quarterly determination.
Reason for new indicator	This indicator supports the NOAA Blue Economy Initiative, which represents the sustainable use of ocean resources in support of national, economic, and environmental security, providing for jobs and economic growth, improved livelihoods, and ocean ecosystem health. This metric indicates the functional status of the NOA-ON.
Indicator(s) being replaced	None

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Annual number of ocean acidification observations transmitted to NOAA**							
Category	Supporting							
Type	Input							
Description	This indicator reflects the number of National Ocean Acidification - Observing Network (NOA-ON) observations that are successfully transmitted to NOAA. This occurs when a NOA-ON sensor asset successfully transmits a minimum of 8 observations within a 24 hour day. Ideally, the number of transmitted observations should equal 100% of observations collected.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							70%	70%
Actual	69%	78%	77%	69%	82%	63%		
Status							NEW	
Trend	New Indicator – Not enough data							
Action(s) to achieve FY 2020 target	Sustained annual servicing and maintenance.							
Notes	Each NOA-ON asset requires sustained annual servicing and maintenance. No NOA-ON sensor asset will successfully report a full 365 observing days per year as they may be taken off-line for a period of days to weeks to complete servicing and maintenance. As a result, 80% network-wide is a suitable objective for the NOA-ON.							
Information Gaps	The indicator is derived using real-time-data initially and as such makes no attempt at capturing the quality of the data obtained from a NOA-ON assets.							
Reason for new indicator	This indicator supports the NOAA Blue Economy Initiative, which represents the sustainable use of ocean resources in support of national, economic, and environmental security, providing for jobs and economic growth, improved livelihoods, and ocean ecosystem health.							
Indicator(s) being replaced	Not Applicable							

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Percent of deepwater ocean (>200m) U.S. Exclusive Economic Zone (EEZ) mapped (cumulative)**							
Category	Supporting							
Type	Output							
Description	This measure tracks the cumulative percent of the U.S. Exclusive Economic Zone deeper than 200m that is mapped to Seabed 2030 resolution standards (100m2).							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							53%	55%
Actual	37%	40%	43%	47%	50%	51%		
Status							NEW	
Trend	New Indicator – Historical Data Varying							

Action(s) to achieve FY 2020 target	None
Notes	Not Applicable
Information Gaps	None
Reason for new indicator	This indicator supports the NOAA Blue Economy Initiative, which represents the sustainable use of ocean resources in support of national, economic, and environmental security, providing for jobs and economic growth, improved livelihoods, and ocean ecosystem health.
Indicator(s) being replaced	Not Applicable

Strategic Goal #	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Annual number of sites characterized in the U.S. Exclusive Economic Zone (EEZ)**							
Category	Supporting							
Type	Output							
Description	This measure tracks the annual number of sites whose oceanographic, archaeological, or cultural resource properties have been characterized to enable efficient, sustainable use of the nation's undersea resources. Characterizations are performed by ROV dive with video and/or photographic analysis and physical, biological, geological, or chemical sampling; by photogrammetric survey and environmental sample collection by autonomous underwater vehicles (AUVs); or through similar advanced technological techniques.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							100	100
Actual	119	104	149	157	196	101		
Status							NEW	
Trend	New Indicator – Historical Data Varying							
Action(s) to achieve FY 2020 target	Conduct interdisciplinary expeditions to characterize new ocean areas and phenomena; conduct systematic exploration and developing standard products from the NOAA Ship Okeanos Explorer; develop new underwater technologies to increase the pace and efficiency of ocean exploration and research; develop new databases and data dissemination tools..							
Notes	This measure was a pilot measure with FY 2019 being the first year for official tracking and reporting in the FY 2019 APR. As the measure is developed and implemented, changes will be made to refine it.							
Information Gaps	None							
Reason for new indicator	This indicator supports the NOAA Blue Economy Initiative, which represents the sustainable use of ocean resources in support of national, economic, and environmental security, providing for jobs and economic growth, improved livelihoods, and ocean ecosystem health.							
Indicator(s) being replaced	Not applicable							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Number of forecast and mission improvements, based on The Weather Research and Forecasting Innovation Act of 2017, to weather applications at operational U.S. weather services and in the U.S. weather commercial sector.**
Category	Supporting
Type	Process
Description	The measure captures the count of significant and discrete NOAA research and development products that have transitioned to application at operational U.S. weather services and in the U.S. weather commercial sector. In addition, these weather products support NOAA contributions to the Weather Research and Forecasting Innovation Act of 2017.

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							15	15
Actual						15		
Status							NEW	
Trend	New Indicator – Not enough data.							
Action(s) to achieve FY 2020 target	None							
Notes	This is a pilot measure. As the measure is developed and implemented, changes will be made to refine it.							
Information Gaps	None							
Reason for new indicator	This measure supports NOAA contributions to the Weather Research and Forecasting Innovation Act of 2017. The Weather Research and Forecasting Innovation Act of 2017 (H.R. 353) is a law providing for weather research and forecasting improvement, weather satellite and data innovation, and federal weather coordination.							
Indicator(s) being replaced	Not Applicable							

OTHER INDICATORS

Strategic Goal	**Strengthen U.S. Economic and National Security**							
Objective #	**3.3 Reduce Extreme Weather Impacts**							
Indicator	**Customer Satisfaction Index (CSI)**							
Category	Strategic Plan							
Description	Weather information users are surveyed continuously by means of a web-based, pop-up survey on NWS web pages throughout the Nation. A sample size of approximately 6,000 responses is collected quarterly for a maximum of 24,000 annual responses. The Customer Satisfaction Index (CSI) score is calculated as a weighted average of three survey questions that measure different facets of satisfaction with NWS services. American Customer Satisfaction Index (ACSI) researchers use proprietary software technology to estimate the weighting. The three questions include the overall satisfaction of NWS services, expectations of service, and a comparison to an ideal organization. Indexes are reported on a 0 to 100 scale. The ACSI was started in the United States in 1994 by researchers at the University of Michigan, in conjunction with the American Society for Quality in Milwaukee, Wisconsin, and CFI Group in Ann Arbor, Michigan. The Index was developed to provide information on satisfaction with the quality of products and services available to consumers. The survey data serve as inputs to an econometric model that benchmarks customer satisfaction with more than 300 companies in 43 industries and 10 economic sectors, as well as various services of federal and local government agencies.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target							80	80
Actual	82	84	80	82	82	85		
Notes	Scores in the 80s are considered excellent by CFI Group. The NWS exceeded those scores. Additionally, scores are based on public opinion and calculated at and/or near the end of the calendar year.							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Number of StormReady Communities**
Description	Americans live in the most severe weather-prone country on Earth. StormReady Communities support a Weather-Ready Nation by preparing for the occurrence of high impact environmental events. On an annual basis NWS targets 100 new StormReady Communities pending funding availability.

	StormReady supports NWS' disaster risk reduction strategy and is offered to provide guidance and incentive to officials who want to improve their hazardous weather and flood operations. A long-term goal for the program is to make every county or county-equivalent in the United States StormReady. The 2010 U.S. Census identifies 3,234 county or county-equivalents in the United States. We are 34 percent of the way there with 1,092 county or county-equivalents currently recognized as StormReady. A StormReady Community is defined as a local government* entity or facility** that has the authority and ability to adopt the StormReady recognition guidelines for the residents and visitors within its jurisdiction. *The term "local government" means – (A) A county, parish, borough, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; (B) An Indian tribe or authorized tribal organization, or Alaska Native village or organization; and a rural community, unincorporated town or village, or other public entity, which has the ability to achieve StormReady recognition. **The term "facility" for a StormReady community exclusively means - universities, military installations, state/national parks, power plants/utilities, transportation centers (e.g., airports), theme parks/entertainment complex, and large event venues (e.g. stadiums).

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Actual (cumulative)	2,090	2,242	2,409	2,597	2,750	2,886		
Information Gaps	None							

Strategic Goal	**Strengthen U.S. Economic and National Security**
Objective #	**3.3 Reduce Extreme Weather Impacts**
Indicator	**Number of TsunamiReady Communities**
Description	Americans live in the most severe weather-prone country on Earth. TsunamiReady Communities support a Weather-Ready Nation by preparing for the occurrence of high impact environmental events. On an annual basis NWS targets 50 new and renewed TsunamiReady communities pending funding availability. A TsunamiReady County or Community or Tribe is defined as a coastal local government entity* that has the authority and ability to adopt the TsunamiReady recognition guidelines for the residents and visitors within its jurisdiction. *The term "local government" here means – (A) a county, parish (LA), borough (AK), or municipality (PR) (B) an incorporated municipality, city, town, or township (C) an Indian tribe or authorized tribal organization, or Alaska Native village or organization (D) a military installation

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Actual (cumulative)	155	177	189	199	203	210		
Information Gaps	None							

NON-RECURRING INDICATORS *(not reported after FY 2018)*

Strategic Goal	**Enhance Job Creation**
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**

Indicator	**Number of Habitat Acres Restored (annual)**							
Category	Supporting							
Type	Output							
Description	NOAA restores habitat areas lost or degraded as a result of development and other human activities, as well as specific pollution incidents and sources. Activities are geared toward NOAA trust resources found across the marine environment and are supportive of anadromous species (i.e., species that migrate from the sea to freshwater to spawn). The intent of this measure is to summarize or project the geographic area over which ecosystem function has been or will be improved as the direct result of habitat restoration efforts.							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	60,228 (8,228 RC + 52,000 PCSRF)	40,820 (11,820 RC + 29,000 PCSRF)	32,460 (9,460 RC + 23,000 PCSRF)	23,922 (8,522 RC + 15,400 PCSRF)	11,050 (4,153 RC + 6,760 PCSRF)	17,280 (4,400 RC + 12,880 PCSRF)	DISCONTINUED	DISCONTINUED
Actual	46,656 (9,005 RC + 37,712 PCSRF – 61 joint)	31,311 (9,354 RC + 22,007 PCSRF – 50 joint)	22,975 (10,363 RC + 12,688 PCSRF – 76 joint)	21,232 (8,844 RC + 12,388 PCSRF)	10,207 (4,153 RC + 6,054 PCSRF)	16,541 (4251 RC + 12,290 PCSRF)		
Status	Not Met	Not Met	Not Met	Not Met	Met	Met		
Trend	Negative							
Notes	Acres reported for this measure are restored under two programs, the NMFS Habitat Program Restoration Center (RC) and the Pacific Coastal Salmon Recovery Fund (PCSRF). Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage. The numbers in parentheses report the individual total acres targeted or restored for these programs. In some cases, there were acres restored by both programs together, which have been reported as joint acres in order to eliminate double counting. Prior to FY 2011, PCSRF acres were not comparable to RC acres and so were not reported together. This measure does not include restoration conducted through the Species Recovery Grants.							
Reason for Discontinuing	The President's Budget requests significant reductions in funding for the grants that support this measure. It is not closely linked to Agency priorities.							

Strategic Goal	**Enhance Job Creation**
Objective #	**2.3 Strengthen Domestic Commerce and the U.S. Industrial Base**
Indicator	**Annual number of coastal, marine, and Great Lakes habitat acres acquired or designated for long-term protection.**
Category	Supporting
Type	Outcome
Description	NOAA protects and restores key habitats that provide critical ecosystem functions. These habitats support the health of endangered or threatened species and essential fish habitat, reduce coastal pollution, buffer the impacts of coastal storms and flooding, and provide the public with recreational access to the coast among other societal or economic benefits. NOAA maintains the health of coastal, marine and Great Lakes habitats by designating and managing important areas for long-term conservation and by providing support to state and local governments to purchase and protect additional key habitats. This *long-term protection* measure tracks the number of acres

	acquired with NOAA funds by state or local government agencies from willing sellers, particularly through the Coastal and Estuarine Land Conservation Program (CELCP) and Coastal Zone Management Program (CZMP). The number of acres designated for long-term protection by NOAA or by state partners is tracked through the Office of National Marine Sanctuaries Program (ONMS) and National Estuarine Research Reserve System (NERRS).							
	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Target	2,500 (CELCP)	1,300 (CELCP)	250 (CELCP)	1,650	800	800	DISCONTINUED	DISCONTINUED
Actual	2,772	5,673	4,250,256	283,384,171	6,782	5,857		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Notes	Data goes back to FY 2006. In some years, designations of monuments and expansion of sanctuaries have been much larger than other contributions of acreage; such designations and expansions are difficult to predict.							
Reason for Discontinuing	Measure did not prove useful for management, due to challenges in target setting and variable schedules for designation processes.							

SECTION SIX

Resource Requirements Tables

Past Funding from FY 2013 to FY 2017

	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual
APPLICABLE STRATEGIC GOALS FROM THE FY 2014 – FY 2018 STRATEGIC PLAN: 3.1, 3.2, 3.3, 3.4, 5.4					
Total Budget Authority					
Direct	5,242,017	5,521,857	5,663,575	5,989,965	5,921,234
Reimbursable	260,124	217,112	204,254	241,430	304,456
Total	5,502,141	5,738,969	5,867,829	6,231,395	6,225,690
Total Positions	13,001	12,564	11,800	11,725	11,699

Funding from FY 2018 to FY 2020

	FY 2018 Enacted*	FY 2019 Estimate	FY 2020 Base	Increase / Decrease	FY 2020 Request
APPLICABLE STRATEGIC GOALS FROM THE FY 2018 – FY 2022 STRATEGIC PLAN: 1.1, 2.1, 3.3					
Total Budget Authority					

Direct	6,139,228	4,778,886	4,828,304	(133,866)	4,686,335
Reimbursable	350,332	242,000	242,000	0	242,000
Total	6,489,560	5,020,886	5,068,137	(133,866)	4,928,335
Total Positions	12,782	12,269	12,258	(36)	12,222

APPENDIX A

President's Management Agenda - Cross Agency Priority Goals

CAP GOAL	BUREAU(S)	STRATEGIC OBJECTIVES	OTHER AGENCIES
IT Modernization	OS/CIO, All Bureaus and Offices	3.2 – Enhance the Nation's Cybersecurity 5.2 – Accelerate Information Technology Modernization	DOA, Fed CIO
Data Accountability & Transparency	BEA, Census, NOAA, USPTO	2.3 – Strengthen Domestic Commerce and the U.S. Industrial Base 4.1 – Conduct a Complete and Accurate Decennial Census 4.2 – Provide Accurate Data to Support Economic Activity	SBA, Office of Science and Technology Policy (OSTP). Fed CIO, Chief Statistician
People – Workforce for the 21st Century	OS/OHRM, All Bureaus and Offices	5.1 – Engage Commerce Employees	OPM, DOD, OMB
Improving Customer Experience	OS/OHRM, All Bureaus and Offices	2.3 – Strengthen Domestic Commerce and the U.S. Industrial Base 5.1 – Engage Commerce Employees	VA, U.S. Digital Service, OMB
Shifting from Low-Value to High-Value Work	OS, All Bureaus and Offices	2.2 – Reduce and Streamline Regulations	HUD, OMB
Results-Oriented Accountability for Grants	OS/CIO, OAM, Bureaus with Grants	5.2 – Accelerate Information Technology Modernization	HHS, Education, OMB
Federal IT Spending Transparency	OS/CIO, Bureau CIOs	5.2 – Accelerate Information Technology Modernization	OMB. GSA, Education

Improve Management of Major Acquisitions	OS/ ES, OAM	5.3 – Consolidate Functions for Cost Savings	OMB
Modernize Infrastructure Permitting	OS, NOAA	2.1 – Increase Aquaculture Production 2.2 – Reduce and Streamline Regulations	OMB, Council on Environmental Quality, Federal Permitting Improvement Steering Council
Lab-to-Market	NIST, USPTO	1.2 – Advance Innovation 1.3 – Strengthen Intellectual Property Protection	OSTP

STRATEGIC PLAN GOALS AND OBJECTIVES AND BUREAUS ASSIGNED TO EACH

		OS	OIG	EDA	CENSUS	BEA	ITA	BIS	MBDA	NOAA	USPTO	NIST	NTIS	NTIA
Goal 1 – Accelerate American Leadership	1.1 – Expand Commercial Space Activities	■								■				■
	1.2 – Advance Innovation	■								■	■	■	■	■
	1.3 – Strengthen Intellectual Property Protection	■					■		■		■	■		■
Goal 2 – Enhance Job Creation	2.1 – Increase Aquaculture Production	■								■				
	2.2 – Reduce and Streamline Regulations	■			■	■	■	■	■	■	■	■	■	■
	2.3 – Strengthen Domestic Commerce and the U.S. Industrial Base	■		■	■	■	■	■	■	■	■	■	■	■
	2.4 – Increase U.S. Exports	■			■	■	■		■			■		
	2.5 – Increase Inward Investment into the United States	■				■	■		■					
Goal 3 – Strengthen	3.1 – Enforce the Nation's Trade Laws and Security Laws	■					■	■		■	■			■

U.S. Economic and National Security	3.2 – Enhance the Nation's Cybersecurity													
	3.3 – Reduce Extreme Weather Impacts													
	3.4 – Deploy Public Safety Broadband													
Goal 4 - Fulfill Constitutional Requirements and Support Economic Activity	4.1 – Conduct a Complete and Accurate Decennial Census													
	4.2 – Provide Accurate Data to Support Economic Activity													
Goal 5 – Deliver Customer-Centric Service Excellence	5.1 – Engage Commerce Employees													
	5.2 – Accelerate Information Technology Modernization													
	5.3 – Consolidate Functions for Cost Savings													

AGENCY PRIORITY GOALS

Bureau	Priority Goal	Goal Statement
CENSUS	Prepare to Conduct a Complete and Accurate 2020 Decennial Census	The U.S. Census Bureau will prepare to conduct a complete and accurate 2020 Decennial Census U.S. population count by conducting the 2018 End-to-End Census Test and analyzing and incorporating the results, initiating In-Field Address Canvassing by September 30, 2019, and designing for optimal self-response with a nationwide target of 60.5% in 2020.[1]
ITA	Remove Foreign Trade Barriers	ITA will facilitate fair competition in international trade for U.S. firms and workers by improving the number of trade barriers reduced, removed, or prevented by 10 percent annually in fiscal years 2018 and 2019.
NOAA	Mitigate Flood Impacts	By September 30, 2019, NOAA National Weather Service will improve decision support services by demonstrating a new flood inundation mapping capability serving 25 million people (i.e., 8 percent of the U.S. continental population) residing in flood-vulnerable freshwater basins and delivering an enhanced excessive rainfall outlook product that extends the lead time of high risk predictions from two to three days.

USPTO	Accelerate Patent Processing	By September 30, 2019, the U.S. Patent and Trademark Office will reduce patent pendency to less than 15 months for first action pendency and less than 24 months for total pendency from end of fiscal year 2017 results of 16.3 months and 24.2 months, respectively.