

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



**BUDGET
ESTIMATES**

FISCAL YEAR 2019

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 2019
Congressional Submission**

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OMAO Operations, Research, and Facilities

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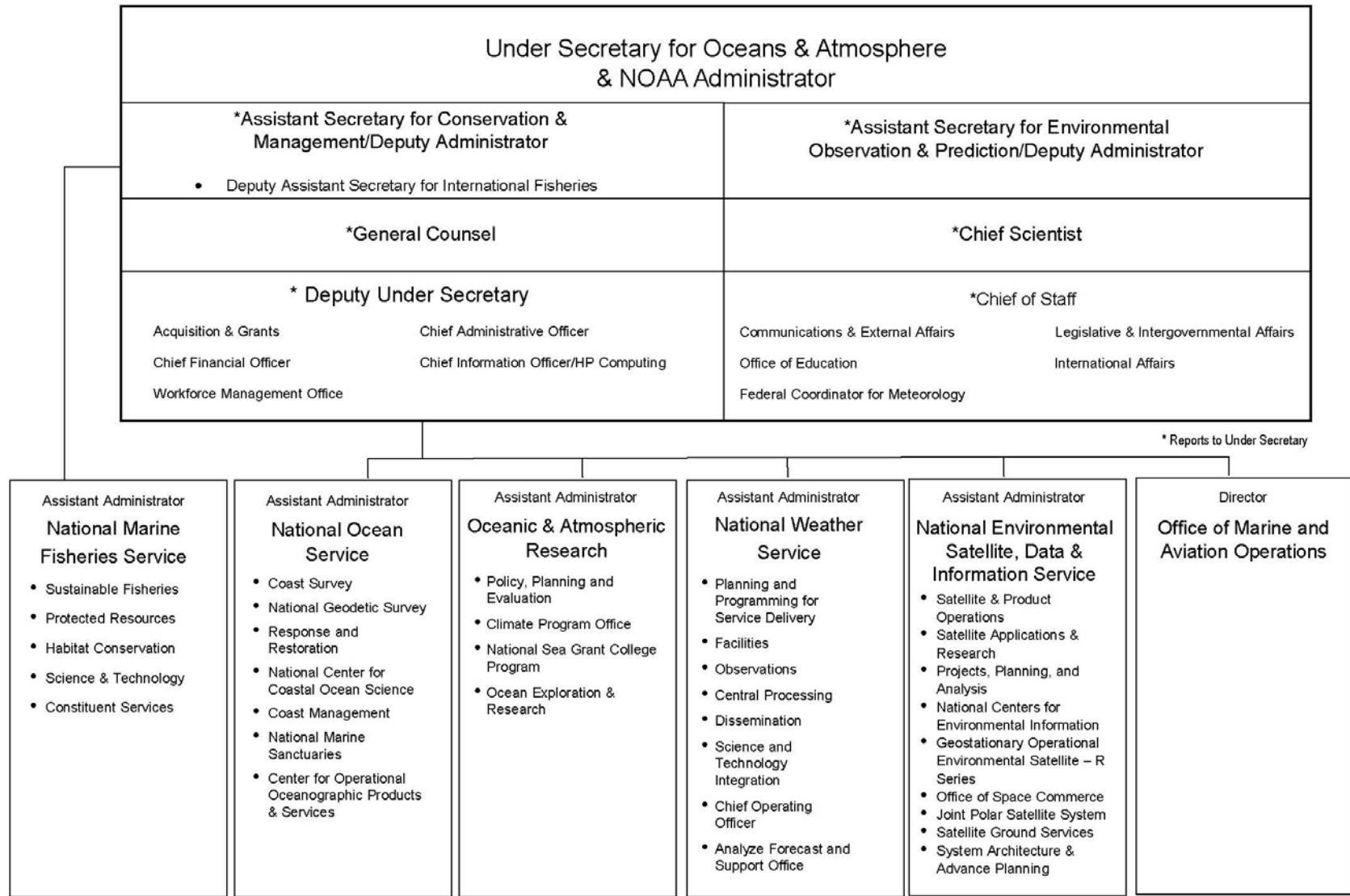
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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION



EXECUTIVE SUMMARY

For Fiscal Year (FY) 2019, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of \$4,562,711,000 in discretionary appropriations, a decrease of \$1,075,798,000 from the FY 2018 Annualized Continuing Resolution level. This budget supports the broad Administration goals of promoting national security, public safety, economic growth, and job creation. As such, NOAA's FY 2019 budget prioritizes core functions that provide the observational infrastructure, capabilities, and staff to produce timely and accurate weather forecasts and warnings; that recapitalize the NOAA fleet to ensure the continued collection of at-sea data vital to the U.S. economy for fisheries management and nautical charting; that support the government's legal obligations to manage and conserve marine resources; and, that foster safe and efficient ocean and coastal navigation. To ensure we can sustain core functions and enable critical enhancements to our priorities in FY 2019, NOAA made tough choices to reduce a number of programs, including external grant programs, arctic research, and marine observations. The termination and re-scaling of programs, while challenging and impactful, is necessary as we move toward a more efficient government model that re-focuses on national security and core government functions.

NOAA operates an integrated observing system of land-based weather platforms, ships, satellites, planes, and *in situ* stations, and leverages partner observations in order to provide data, products, and services that first responders and emergency managers, our armed services, and millions of Americans depend on each day. These products and services include, daily weather warnings and forecasts, navigational tools to support the nearly \$4.6-trillion in economic activity generated at U.S. seaports, management of the Nation's \$208-billion fisheries industry, and disaster response efforts. NOAA provides daily and long-term weather and marine forecasts critical for agricultural planning, emergency response to severe weather that causes an estimated \$485-billion in annual economic impacts, and warning and mitigation of harmful algal blooms that negatively impact public health, tourism and the seafood industry. NOAA puts environmental information into the hands of people and industries to support the U.S. economy and create jobs.

NOAA's FY 2019 budget continues to prioritize development of the current generation of polar orbiting satellites to sustain robust weather forecasting capabilities while also planning for the next generation of weather satellite systems. This budget invests \$877,991,000 in current generation polar weather satellite systems, which provide the primary data for NOAA's Numerical Weather Prediction models. NOAA's successful launch of NOAA -20 in November 2017 is a game change for weather forecasting, as data from this satellite will be used to forecast severe weather like hurricanes, tornadoes and blizzards days in advance, and assess environmental hazards such as droughts, forest fires, poor air quality and harmful coastal waters. NOAA will invest \$408,380,000 in operations and sustainment and development of the GOES-R series program of geostationary weather satellite systems, which support NOAA's weather forecasting, tracking, and monitoring of severe storms. Sustaining these systems is critical to the economy and public demand for high quality, timely, and accurate weather forecasts.

NOAA's FY 2019 budget also continues development of critical at-sea monitoring infrastructure, investing \$75,000,000 in fleet recapitalization, an effort that started in FY 2016. The FY 2019 budget moves NOAA toward construction of a second NOAA Class A vessel to support oceanographic monitoring and research. NOAA will also further plans for Class B and Class C vessels as part of

NOAA's overall fleet recapitalization efforts. Currently, NOAA's fleet includes 16 research and survey ships, which comprise 50 percent of the Federal Oceanographic Fleet. Every year, NOAA's ships conduct more than 100 missions critical to national security, public safety and the national economy. Communities and businesses rely on NOAA data to keep U.S. ports open to commerce, monitor the status of fish stocks, and plan for severe storm events. However, the NOAA ship fleet faces declining capacity without recapitalization. Eight of NOAA's ships currently exceed their design service life and are due to retire by 2028. The loss of these eight ships would undermine NOAA's mission, resulting in reduced mapping capabilities and the inability to conduct fishery stock assessments in multiple regions. NOAA's ships are a vital national infrastructure critical to fulfilling the Nation's primary mission essential functions and legal mandates.

Assessments and monitoring efforts are the backbone of fisheries management. They provide the assurance that NOAA is managing fisheries to maximize fishing opportunity, while maintaining healthy stocks, so that the Nation's fisheries provide the maximum benefit to the U.S. economy and its fishing industry. NOAA is proud of its efforts to rebuild fisheries over the past two decades, rebuilding 43 fisheries stocks since 2000. In addition, overfishing rates are near all-time lows. Each rebuilt stock creates greater economic opportunity in the fishing industry. Recognizing the critical nature of NOAA's fisheries science, assessment, and monitoring efforts, NOAA's FY 2019 budget continues to invest in expansion of and improvements to fisheries stock assessments, which provide the technical basis for regional and local fishery management decisions.

NOAA's FY 2019 budget continues investments in domestic seafood production by supporting marine aquaculture. Currently, the U.S. imports more than 80 percent of its seafood, of which over half is from foreign-produced aquaculture. This reliance on foreign imports moves potential seafood jobs overseas and poses a risk to food security. Given wild fish stocks are at or near maximum harvest levels, the greatest opportunity to increase the seafood supply is through domestic aquaculture. The Nation has a large untapped potential for safe and sustainable aquaculture development, and the seafood industry is increasingly calling for NOAA to take steps to help realize this potential. NOAA's FY 2019 budget invests \$9,327,000 in its National Marine Fisheries Aquaculture program to increase regulatory efficiency for the marine aquaculture sector and encourage sustainable marine aquaculture practices.

NOAA's FY 2019 budget recognizes the need to promote safe and efficient navigation to support and maximize the economic return of marine commerce flowing through the U.S. NOAA surveys and charts the navigationally significant waters of the U.S. Exclusive Economic Zone (EEZ), which extend 200 miles from our coasts. NOAA continually improves hydrography and charting technology through ongoing applied research and development. The importance of accurate charts will only increase given that the volume of traffic, and value of exports and imports via water, in U.S. seaports is expected to double by 2021 and double again shortly after 2030. To support this growing industry, NOAA's FY 2019 budget invests nearly \$200 million in hydrographic survey, charting, mapping, and related efforts.

In addition to sustaining its critical core functions in activities described above, NOAA's FY 2019 budget requests increases in a number of programs to continue development of a compact coronagraph for space weather forecasting, enhance IT security, and improve our ability to get critical weather data into the hands of people at the local level.

**Department of Commerce
National Oceanic and Atmospheric Administration
FY 2019 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)**

Increases

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	Pos.	Budget Authority
NWS-34, 41, 47, 62, 66	ORF	NWS	Restore Core Capabilities	0	12,771
NESDIS-88	PAC	NESDIS	Metop Support and Testing	0	11,509
NWS-39	ORF	NWS	AWIPS Cyclical Refreshment	0	5,130
NESDIS-75	PAC	NESDIS	Compact Coronagraph Development	0	5,034
NESDIS-21	ORF	NESDIS	NESDIS Information Technology Security	0	4,915
NWS-61	ORF	NWS	Enhance the Resilience and Reliability of Integrated Dissemination Program Applications	0	2,287
OMAO-12	ORF	OMAO	Increased costs for NOAA Aircraft facility	0	2,156
NESDIS-24	ORF	NESDIS	DSCOVN Operations	0	1,447
NESDIS-25	ORF	NESDIS	Jason-3 Operations	0	1,274
OMAO-22	PAC	OMAO	Progressive Lifecycle Maintenance	0	1,257
NOS-25	ORF	NOS	Improve Disaster Preparedness	0	1,240
NWS-97	PAC	NWS	Weather Forecast Office and River Forecast Center Relocations	0	1,036
NESDIS-84	PAC	NESDIS	Strengthening NOAA's Future Satellite Capabilities	0	1,026
NESDIS-38	ORF	NESDIS	Facilitate Commercial Space Marketplace	0	1,005
MS-25	PAC	MS	Facilities Planning	0	998
NOS-11	ORF	NOS	Maintenance of Core Geospatial and Oceanographic Data and Products	0	896
NESDIS-34	ORF	NESDIS	Administer Statutory Function	1	608
NESDIS-26	ORF	NESDIS	Facilities Operations	0	543
NESDIS-96	PAC	NESDIS	NESDIS Construction Satellite Command and Data Acquisition Facility Increase	0	237
NWS-93	PAC	NWS	Improve Dissemination Reliability Project	0	167
NOS-16	ORF	NOS	Hydrographic Survey Priorities/Contracts	0	131

Subtotal, Increases

1 55,667

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2019 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

Decreases

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	Pos.	Budget Authority
NESDIS-64	PAC	NESDIS	GOES-R Decrease	0	(334,896)
NESDIS-69	PAC	NESDIS	Polar Weather Satellites Planned Decrease	0	(230,644)
OAR-17	ORF	OAR	Eliminate Climate Competitive Research PPA	(23)	(48,254)
NWS-33	ORF	NWS	Reduce Surface and Marine Observations	0	(15,489)
OAR-62	ORF	OAR	Ocean Exploration Decrease	0	(16,319)
NWS-85	PAC	NWS	Reduce Service Life Extension Program for NEXRAD	0	(16,284)
NWS-48	ORF	NWS	NWS Workforce Savings	(248)	(15,000)
NOS-18	ORF	NOS	Reduce Integrated Ocean Observing System Regional Observation Grants	0	(11,050)
NWS-50	ORF	NWS	Reduce Tsunami Warning Program	(25)	(11,000)
NWS-37	ORF	NWS	Establishment of Regional Enterprise Application Development and Integration Teams	(74)	(10,100)
NMFS-41	ORF	NMFS	National Catch Share Program	0	(5,111)
NWS-65	ORF	NWS	Reduce the Investment in Numerical Weather Prediction Models	0	(5,000)
NMFS-61	ORF	NMFS	Fisheries Habitat Restoration	0	(4,837)
OAR-66	ORF	OAR	Sustained Ocean Observations and Monitoring Decrease	0	(4,662)
NWS-89	PAC	NWS	Eliminate Integrated Water Prediction High Performance Computing	0	(4,172)
NWS-90	PAC	NWS	Reduce R&D HPC	0	(4,000)
NESDIS-31	ORF	NESDIS	Decrease Data Products Developed	0	(3,470)
NWS-67	ORF	NWS	Reduce the Investment in the National Water Model	0	(3,101)
NMFS-38	ORF	NMFS	Cooperative Research Program	0	(2,937)
OAR-64	ORF	OAR	Integrated Ocean Acidification Decrease	0	(2,448)
NESDIS-46	ORF	NESDIS	Regional Climate Centers Reduction	0	(2,399)
NOS-40	ORF	NOS	Eliminate funding support for Integrated Water Prediction	0	(2,290)

**Department of Commerce
National Oceanic and Atmospheric Administration
FY 2019 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)**

NESDIS-78	PAC	NESDIS	Ground System Decrease	0	(2,153)
NWS-40	ORF	NWS	Advanced Hydrologic Prediction System (AHPS) Expansion	0	(2,000)
NWS-68	ORF	NWS	Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Rec.	0	(2,000)
NESDIS-91	PAC	NESDIS	Advance Secure Ingest Capabilities	0	(1,966)
NMFS-43	ORF	NMFS	Genetic Stock Identification and Pacific Salmon Treaty	0	(1,835)
NOS-50	ORF	NOS	Reduce Marine Sanctuaries Operations	0	(1,750)
NMFS-15	ORF	NMFS	Hatchery Genetic Management Plans	0	(1,696)
NESDIS-81	PAC	NESDIS	Satellite Ground Services	0	(1,349)
NWS-52	ORF	NWS	Climate Prediction Center/Weather Prediction Center Consolidation	(8)	(1,200)
NMFS-11	ORF	NMFS	Marine Mammals, Sea Turtle, and Other Species	0	(572)
NOS-26	ORF	NOS	Reduce Marine Debris Program	0	(467)
NOS-56	PAC	NOS	Reduce Marine Sanctuaries Construction Grants	0	(446)

Subtotal, Decreases (378) (770,897)

Terminations

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	Pos.	Budget Authority
NOS-43	ORF	NOS	Eliminate Coastal Zone Management Grants and Regional Coastal Resilience Grants	0	(84,429)
OAR-59	ORF	OAR	National Sea Grant College Program Termination	(18)	(72,131)
NMFS-67	PCSRF	NMFS	Pacific Coastal Salmon Recovery Fund	(2)	(64,559)
NOS-47	ORF	NOS	Eliminate Federal Funding Support for National Estuarine Research Reserve Systems (NERRS)	0	(23,342)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2019 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

MS-16	ORF	MS	NOAA Office of Education	(18)	(19,360)
NMFS-53	ORF	NMFS	Cooperative Enforcement Program	0	(17,837)
OAR-76	PAC	OAR	Mississippi State Partnership Termination	0	(10,134)
NOS-29	ORF	NOS	Eliminate NCCOS competitive funding support for research on ecological threats	0	(9,933)
OAR-45	ORF	OAR	Joint Technology Transfer Initiative (JTTI) Termination	0	(9,933)
MS-19	ORF	MS	NOAA Bay-Watershed Education and Training (B-WET) Regional Program	0	(7,450)
NOS-11	ORF	NOS	Regional Geospatial Modeling Grants	0	(5,960)
OAR-16	ORF	OAR	Arctic Research Elimination	0	(5,685)
OAR-34	ORF	OAR	Unmanned Aircraft Systems Program Office Closure	(3)	(5,339)
NMFS-37	ORF	NMFS	Reef Fish Stock Assessments	0	(5,000)
OAR-35	ORF	OAR	Vortex-Southeast Termination	0	(4,966)
NWS-66	ORF	NWS	Terminate COASTAL Act	0	(4,629)
MS-25	PAC	MS	National Marine Fisheries Service Facilities Initiative	0	(4,526)
OAR-33	ORF	OAR	Air Resources Laboratory Closure	(35)	(4,377)
NMFS-11	ORF	NMFS	Prescott Grant Program	0	(3,029)
NMFS-45	ORF	NMFS	Interjurisdictional Fisheries Grants	(2)	(2,984)
OAR-41	ORF	OAR	Airborne Phased Array Radar (APAR) Termination	0	(2,565)
NOS-11	ORF	NOS	Eliminate Single Year Grant to Joint Ocean and Coastal Mapping Center	0	(1,987)
OAR-55	ORF	OAR	Autonomous Underwater Vehicle Demonstration Testbed Termination	0	(1,923)
NWS-51	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,806)
OAR-56	ORF	OAR	Genomics Termination	0	(1,803)
NOS-54	PAC	NOS	Eliminate Federal Funding Support for National Estuarine Research Reserve Systems (NERRS) Construction	0	(1,689)
NESSDIS-47	ORF	NESSDIS	Big Earth Data Initiative Termination	0	(1,686)
MS-25	PAC	MS	Newport Pier Project	0	(1,490)
NWS-69	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,000)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2019 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

OAR-72	ORF	OAR	Research Transition Acceleration Program Termination	0	(993)
OAR-42	ORF	OAR	Infrasonic Weather Monitoring Research Termination	0	(479)

Total, Terminations (78) (383,024)

Total, Increases, Decreases and Terminations (455) (1,098,254)

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**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL OCEAN SERVICE (NOS)											
	Pos/BA	550	204,588	553	205,310	553	207,720	553	189,750	0	(17,970)
Navigation, Observations and Positioning	FTE/OBL	547	205,286	550	209,465	550	207,720	550	189,750	0	(17,970)
Coastal Science and Assessment	Pos/BA	246	81,760	254	82,045	254	83,202	254	74,042	0	(9,160)
	FTE/OBL	245	82,606	248	82,534	248	83,202	248	74,042	0	(9,160)
Ocean and Coastal Management and Services	Pos/BA	311	225,861	314	226,567	314	228,042	314	116,261	0	(111,781)
	FTE/OBL	309	226,594	309	228,285	309	228,042	309	116,261	0	(111,781)
TOTAL NOS - ORF	Pos/BA	1,107	512,209	1,121	513,922	1,121	518,964	1,121	380,053	0	(138,911)
	FTE/OBL	1,101	514,486	1,107	520,284	1,107	518,964	1,107	380,053	0	(138,911)
TOTAL NOS - PAC	Pos/BA	0	3,667	2	3,676	2	3,676	2	1,541	0	(2,135)
	FTE/OBL	2	3,998	2	4,070	2	3,676	2	1,541	0	(2,135)
Damage Assessment and Restoration Revolving Fund	Pos/BA	32	6,860	15	5,986	15	5,968	15	5,968	0	0
	FTE/OBL	32	29,631	15	115,482	15	52,482	15	52,482	0	0
Sanctuaries Asset Forfeiture Fund	Pos/BA	0	13	0	120	0	120	0	120	0	0
	FTE/OBL	0	46	0	120	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	6,157	1	6,365	1	5,615	1	5,615	0	0
TOTAL NOS	Pos/BA	1,140	522,749	1,139	523,704	1,139	528,728	1,139	387,682	0	(141,046)
	FTE/OBL	1,136	554,318	1,125	646,321	1,125	580,857	1,125	439,811	0	(141,046)

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL MARINE FISHERIES SERVICES (NMFS)											
Protected Resources Science and Management											
	Pos/BA	731	184,490	851	184,517	851	187,112	851	181,615	0	(5,497)
	FTE/OBL	727	183,289	811	189,754	811	187,112	811	181,615	0	(5,497)
Fisheries Science and Management											
	Pos/BA	1,588	538,848	1,803	540,595	1,803	547,151	1,801	529,455	(2)	(17,696)
	FTE/OBL	1,581	536,916	1,716	563,437	1,716	547,151	1,714	529,455	(2)	(17,696)
Enforcement											
	Pos/BA	203	68,518	244	68,536	244	69,332	244	51,495	0	(17,837)
	FTE/OBL	202	65,879	232	73,588	232	69,332	232	51,495	0	(17,837)
Habitat Conservation & Restoration											
	Pos/BA	156	52,104	164	52,171	164	52,756	164	47,919	0	(4,837)
	FTE/OBL	156	60,185	156	53,714	156	52,756	156	47,919	0	(4,837)
TOTAL NMFS - ORF											
	Pos/BA	2,678	843,960	3,062	845,819	3,062	856,351	3,060	810,484	(2)	(45,867)
	FTE/OBL	2,666	846,269	2,915	880,493	2,915	856,351	2,913	810,484	(2)	(45,867)
TOTAL NMFS - PAC											
	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	199	0	1,700	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund											
	Pos/BA	2	64,935	2	64,559	2	64,559	0	0	(2)	(64,559)
	FTE/OBL	2	64,941	2	64,559	2	64,559	0	0	(2)	(64,559)
Fishermen's Contingency Fund											
	Pos/BA	0	350	0	348	0	348	0	349	0	1
	FTE/OBL	0	31	0	348	0	348	0	349	0	1

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Amount	Annualized CR	Amount	Base Program	Amount	Estimate	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	30,764	0	7,997	0	0	0	0	0	0
	FTE/OBL	0	30,764	0	7,997	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	14,909	3	24,500	0	0	0	0	0	0
	FTE/OBL	3	14,012	3	28,206	0	0	0	0	0	0
Environmental Improvement and Restoration Fund	Pos/BA	0	15,049	0	4,848	0	3,813	0	3,813	0	0
	FTE/OBL	0	6,827	0	6,925	0	4,858	0	4,858	0	0
Limited Access System Administration Fund	Pos/BA	40	13,632	40	13,732	40	13,988	40	13,988	0	0
	FTE/OBL	40	11,249	40	15,005	40	15,152	40	15,152	0	0
Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	23	0	23	0	0
Western Pacific Sustainable Fisheries Fund	Pos/BA	0	240	0	494	0	500	0	500	0	0
	FTE/OBL	0	641	0	511	0	500	0	500	0	0
Fisheries Enforcement Asset Forfeiture Fund	Pos/BA	0	2,497	0	4,157	0	4,155	0	4,155	0	0
	FTE/OBL	0	4,196	0	5,207	0	4,155	0	4,155	0	0
North Pacific Observer Fund	Pos/BA	0	3,625	0	3,870	0	3,990	0	3,990	0	0
	FTE/OBL	0	3,542	0	4,015	0	3,990	0	3,990	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Actual	Annualized CR	Annualized CR	Base Program	Base Program	Estimate	Estimate	Personnel	Amount
TOTAL NMFS	Pos/BA	2,723	989,961	3,107	970,324	3,104	947,704	3,100	837,279	(4)	(110,425)
	FTE/OBL	2,711	982,671	2,960	1,014,966	2,957	949,936	2,953	839,511	(4)	(110,425)
OFFICE OCEANIC AND ATMOSPHERIC RESEARCH (OAR)											
Climate Research	Pos/BA	242	156,237	308	156,939	308	152,582	285	98,643	(23)	(53,939)
	FTE/OBL	241	158,625	297	158,155	297	152,582	275	98,643	(22)	(53,939)
Weather & Air Chemistry Research	Pos/BA	208	112,537	262	112,994	262	119,837	224	91,730	(38)	(28,107)
	FTE/OBL	207	110,601	237	117,461	237	119,837	200	91,730	(37)	(28,107)
Ocean, Coastal, and Great Lakes Research	Pos/BA	198	189,801	221	191,526	221	192,430	203	93,144	(18)	(99,286)
	FTE/OBL	197	191,649	211	194,960	211	192,430	193	93,144	(18)	(99,286)
Innovative Research & Technology	Pos/BA	14	13,057	15	13,055	12	13,068	12	12,134	0	(934)
	FTE/OBL	14	13,249	14	13,199	11	13,068	11	12,134	0	(934)
TOTAL OAR - ORF	Pos/BA	662	471,632	806	474,514	803	477,917	724	295,651	(79)	(182,266)
	FTE/OBL	659	474,124	759	483,775	756	477,917	679	295,651	(77)	(182,266)
TOTAL OAR - PAC	Pos/BA	0	36,235	0	36,134	0	36,134	0	26,000	0	(10,134)
	FTE/OBL	0	36,351	0	36,134	0	36,134	0	26,000	0	(10,134)
TOTAL OAR	Pos/BA	662	507,867	806	510,648	803	514,051	724	321,651	(79)	(192,400)
	FTE/OBL	659	510,475	759	519,909	756	514,051	679	321,651	(77)	(192,400)

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Actual	Annualized CR	Annualized CR	Base Program	Base Program	Estimate	Estimate	Personnel	Amount
Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL WEATHER SERVICE (NWS)											
Observations	Pos/BA	691	213,569	777	214,909	777	217,714	777	203,992	0	(13,722)
	FTE/OBL	688	219,458	740	222,233	740	217,714	740	203,992	0	(13,722)
Central Processing	Pos/BA	225	91,982	235	92,166	235	92,886	161	86,620	(74)	(6,266)
	FTE/OBL	224	98,019	224	94,351	224	92,886	150	86,620	(74)	(6,266)
Analyze, Forecast and Support	Pos/BA	2,823	483,050	2,958	484,049	2,958	492,014	2,677	471,792	(281)	(20,222)
	FTE/OBL	2,809	486,281	2,817	495,698	2,817	492,014	2,674	471,792	(143)	(20,222)
Dissemination	Pos/BA	77	46,336	84	46,429	84	47,580	84	50,090	0	2,510
	FTE/OBL	77	48,186	80	48,894	80	47,580	80	50,090	0	2,510
Science and Technology Integration	Pos/BA	419	135,359	440	135,640	440	137,139	440	122,702	0	(14,437)
	FTE/OBL	417	139,875	419	137,473	419	137,139	419	122,7002	0	(14,437)
TOTAL NWS - ORF	Pos/BA	4,235	970,296	4,494	973,193	4,494	987,333	4,139	935,196	(355)	(52,137)
	FTE/OBL	4,215	991,819	4,280	998,649	4,280	987,333	4,063	935,196	(217)	(52,137)
TOTAL NWS - PAC	Pos/BA	33	140,542	26	140,829	26	140,829	26	117,576	0	(23,253)
	FTE/OBL	33	138,439	24	173,016	24	140,829	24	117,576	0	(23,253)
TOTAL NWS	Pos/BA	4,268	1,110,838	4,520	1,114,022	4,520	1,128,162	4,165	1,052,772	(355)	(75,390)
	FTE/OBL	4,248	1,130,258	4,304	1,171,665	4,304	1,128,162	4,087	1,052,772	(217)	(75,390)

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Amount	Annualized CR	Amount	Base Program	Amount	Estimate	Amount	Personnel	Amount
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE (NESDIS)											
Environmental Satellite	Pos/BA	294	165,360	386	162,303	389	175,394	390	181,719	1	6,325
Observing Systems	FTE/OBL	293	151,099	336	179,083	339	175,394	340	181,719	1	6,325
National Environmental Information Office	Pos/BA	177	61,204	200	58,792	200	61,676	200	57,591	0	(4,085)
	FTE/OBL	176	60,941	187	61,170	187	61,676	187	57,591	0	(4,085)
TOTAL NESDIS - ORF	Pos/BA	471	226,564	586	221,095	589	237,070	590	239,310	1	2,240
	FTE/OBL	469	212,040	523	240,253	526	237,070	527	239,310	1	2,240
TOTAL NESDIS - PAC	Pos/BA	274	1,954,286	293	1,966,350	290	1,953,910	290	1,400,711	0	(553,199)
	FTE/OBL	273	1,965,685	262	1,989,399	259	1,953,910	259	1,400,711	0	(553,199)
TOTAL NESDIS	Pos/BA	745	2,180,850	879	2,187,445	879	2,190,980	880	1,640,021	1	(550,959)
	FTE/OBL	742	2,177,725	785	2,229,652	785	2,190,980	786	1,640,021	1	(550,959)
MISSION SUPPORT (MS)											
Executive Leadership	Pos/BA	108	26,836	127	26,818	127	27,610	127	27,879	0	269
	FTE/OBL	107	26,969	121	27,541	121	27,610	121	27,879	0	269
Mission Services and Management	Pos/BA	552	147,494	610	147,392	610	150,417	610	150,417	0	0
	FTE/OBL	548	150,024	592	157,246	592	150,417	592	150,417	0	0
IT Security	Pos/BA	10	9,998	14	9,982	14	10,027	14	10,029	0	2
	FTE/OBL	10	9,828	13	10,328	13	10,027	13	10,029	0	2

**Department of Commerce
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Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Actual	Annualized CR	Annualized CR	Base Program	Base Program	Estimate	Estimate	Personnel	Amount
Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Payment to the DOC Working Capital Fund	Pos/BA	0	57,996	0	42,710	0	55,249	0	55,249	0	0
	FTE/OBL	0	56,965	0	43,703	0	55,249	0	55,249	0	0
Office of Education	Pos/BA	15	32,369	18	26,750	18	26,810	0	0	(18)	(26,810)
	FTE/OBL	15	30,430	17	28,907	17	26,810	0	0	(17)	(26,810)
TOTAL MISSION SUPPORT - ORF	Pos/BA	685	274,693	769	253,652	769	270,113	751	243,574	(18)	(26,539)
	FTE/OBL	680	274,216	743	195,115	743	270,113	726	243,574	(17)	(26,539)
TOTAL MISSION SUPPORT - PAC	Pos/BA	0	7,387	0	6,016	0	6,016	0	998	0	(5,018)
	FTE/OBL	0	88	0	13,660	0	6,016	0	998	0	(5,018)
Spectrum Relocation Fund - ORF	Pos/BA	3	0	0	0	0	0	0	0	0	0
	FTE/OBL	2	1,517	0	2,035	0	1,955	0	1,955	0	0
Spectrum Relocation Fund -PAC	Pos/BA	4	0	0	0	0	0	0	0	0	0
	FTE/OBL	3	19,641	0	19,641	0	58,961	0	58,961	0	0
Spectrum Efficient National Surveillance Radar - ORF	Pos/BA	0	20,627	0	0	0	0	0	0	0	0
	FTE/OBL	0	6,620	0	14,007	0	0	0	0	0	0
Spectrum Pipeline - ORF	Pos/BA	0	0	0	12,013	0	0	0	0	0	0
	FTE/OBL	0	0	0	9,192	0	2,821	0	2,821	0	0
TOTAL MISSION SUPPORT	Pos/BA	692	302,707	769	271,681	769	276,129	751	244,572	(18)	(31,557)
	FTE/OBL	685	302,082	743	326,260	743	339,866	726	308,309	(17)	(31,557)

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)											
Marine Operations & Maintenance	Pos/BA	844	177,121	869	177,636	869	180,192	869	181,170	0	978
	FTE/OBL	840	180,547	840	178,608	840	180,192	840	181,170	0	978
Aviation Operations	Pos/BA	123	34,701	127	32,076	127	32,527	127	34,683	0	2,156
	FTE/OBL	122	35,904	122	32,423	122	32,527	122	34,683	0	2,156
TOTAL OMAO - ORF	Pos/BA	967	211,822	996	209,712	996	212,719	996	215,853	0	3,134
	FTE/OBL	962	216,451	962	211,031	962	212,719	962	215,853	0	3,134
TOTAL OMAO - PAC	Pos/BA	2	86,119	8	86,116	8	86,116	8	87,878	0	1,762
	FTE/OBL	2	25,888	8	221,710	8	86,116	8	87,878	0	1,762
Medicare Eligible Retiree	Pos/BA	0	1,936	0	1,603	0	1,603	0	1,603	0	0
Health Care Fund	FTE/OBL	0	1,635	0	1,603	0	1,603	0	1,603	0	0
NOAA Corps Commissioned Officers Retirement	Pos/BA	0	29,375	0	30,102	0	30,075	0	30,075	0	0
	FTE/OBL	0	27,241	0	30,102	0	30,075	0	30,075	0	0
TOTAL OMAO	Pos/BA	969	329,252	1,004	327,533	1,004	330,513	1,004	335,409	0	4,896
	FTE/OBL	964	271,215	970	464,446	970	330,513	970	335,409	0	4,896

**Department of Commerce
National Oceanic and Atmospheric Administration
Program and Performance: Direct Obligations
(Dollar amounts in thousands)**

Comparison by activity/subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA ORF (Discretionary)	Pos/BA	10,805	3,511,176	11,834	3,456,407	11,834	3,532,967	11,381	3,092,621	(453)	(440,346)
	FTE/OBL	10,752	3,529,405	11,289	3,602,210	11,289	3,560,467	10,977	3,120,121	(312)	(440,346)
NOAA PAC (Discretionary)	Pos/BA	309	2,228,236	329	2,221,121	326	2,213,681	326	1,621,704	0	(591,977)
	FTE/OBL	310	2,170,648	296	2,439,689	293	2,226,681	293	1,634,704	0	(591,977)
NOAA Other	Pos/BA	85	184,185	61	174,329	58	129,119	56	64,561	(2)	(64,558)
(Discretionary and Mandatory)	FTE/OBL	83	222,071	61	317,313	58	247,217	56	182,659	(2)	(64,558)

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Department of Commerce
National Oceanic and Atmospheric Administration
JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

FY 2019 NOAA Cost Recovery Language

SEC. 111. 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.

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.

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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.”

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.”

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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.”

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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.

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(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.”

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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)).

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 ...”

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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.

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)).”

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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.”

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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 ...”

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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

“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.”

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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)

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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.

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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.

**Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS**

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.

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."

**Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS**

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)

	<u>2017</u> <u>Actual</u>	<u>2018</u> <u>Estimate</u>	<u>2019</u> <u>Estimate</u>
Management and Professional Support Services	\$100,555	\$101,427	\$90,669
Studies, Analysis and Evaluations	\$41,254	\$41,612	\$37,198
Engineering and Technical Services	\$116,026	\$117,033	\$104,619
Total	\$257,835	\$260,072	\$232,486

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)

	2017 <u>Actual</u>	2018 <u>Estimate</u>	2019 <u>Estimate</u>
Periodicals	\$1,762	\$1,766	\$1,769
Pamphlets	\$1,269	\$1,272	\$1,274
Audiovisuals	\$602	\$603	\$604
Total	<hr/> \$4,960	<hr/> \$4,784	<hr/> \$4,870

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**Department of Commerce
National Oceanic and Atmospheric Administration
AVERAGE GRADE AND SALARY**

	2017 <u>Actual</u>	2018 <u>Estimate</u>	2019 <u>Estimate</u>
Average executive and SES level pay plans	\$176,092	\$178,909	\$182,309
Average GS/GM grade	12	12	12
Average GS/GM salary	\$98,190	\$99,761	\$101,656
Average Pay Band salary	\$105,455	\$107,142	\$109,178
Average Commissioned Officers salary	\$114,263	\$116,434	\$118,763
Average salary for other positions (FWS/Wage Marine)	\$50,983	\$51,952	\$52,991

Average salaries provided here reflect Federal Civilian and Military pay raises for 2018 and 2019, respectively.

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Department of Commerce
National Oceanic and Atmospheric Administration
Technical Adjustments by PPA
(Dollar amounts in thousands)

Technical adjustments refer to unique or technical adjustments to the base program, for example transfers of base resources between budget lines.

Account	Line Office	PPA	OAR Consolidate Climate Research (See OAR-8)	NESDIS Merge of JPSS and PFO (See NESDIS-3,4)	NESDIS Transfers (GOES-R, Jason-3, DSCOVR, and Satellite Ground Services) (See NESDIS-4-7)	Payment to the DOC Working Capital Fund (See MS-1,2)	Total PPA Technical ATB
ORF	OAR	Climate Laboratories and Cooperative Institutes	14,282				14,282
ORF	OAR	Climate Competitive Research	(19,958)				(19,958)
ORF	OAR	U.S. Weather Research Program (USWRP)	5,676				5,676
ORF	NESDIS	Satellite and Product Operations		923	7,601		8,524
ORF	NESDIS	Product Development Readiness and Application		2,104			2,104
ORF	NESDIS	National Centers for Environmental Information		1,812			1,812
PAC	NESDIS	Geostationary Systems - R		(4,437)			(4,437)
PAC	NESDIS	JASON - 3		(1,040)	(3,288)		(4,328)
PAC	NESDIS	Joint Polar Satellite System (JPSS)		(781,951)			(781,951)
PAC	NESDIS	Polar Follow On		(326,684)			(326,684)
PAC	NESDIS	Polar Weather Satellites		1,108,635			1,108,635
PAC	NESDIS	DSCOVR		(607)	(3,113)		(3,720)
PAC	NESDIS	Satellite Ground Services		1,245	(1,200)		45
ORF	MS	Payment to the DOC Working Capital Fund				11,257	11,257
	Total		0	0	0	11,257	11,257

*The total PPA Technical ATB column aligns with the amounts for each PPA in the Technical ATBs column of the FY 2019 President's Budget Control Table as reflected in the CJ.

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Department of Commerce
National Oceanic and Atmospheric Administration
Research and Development (R&D) Investments
(Dollar amounts in thousands)

The NOAA FY 2019 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 \$450 million for investments (excluding equipment and facilities) in R&D in the FY 2019 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	\$50,918	\$24,250	\$75,168	\$0	\$75,168
NMFS	\$41,166	\$13,740	\$54,906	\$0	\$54,906
OAR	\$244,401	\$33,904	\$278,305	\$43,346	\$321,651
NWS	\$1,145	\$11,320	\$12,465	\$780	\$13,245
NESDIS	\$29,426	\$0	\$29,426	\$0	\$29,426
OMAO	\$0	\$0	\$0	\$129,220	\$129,220
Total	\$367,056	\$83,214	\$450,270	\$173,346	\$623,616

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NOAA Headquarters Administrative Costs

In FY 2019, NOAA's Line/Staff Office Headquarters will use \$335,362,655 and 1232.6 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	\$11,527,000	36	\$13,261,830	37.9	\$6,184,914	24.25	\$13,817,097	59	\$9,914,760	35.5	\$29,657,000	129	\$1,482,023	7.4	\$85,844,624	329.0
Budget & Finance	Includes Budget, Finance and Accounting	\$3,736,000	17	\$7,422,087	24.2	\$2,773,312	18.65	\$6,478,846	25	\$6,301,705	24.8	\$48,811,000	201	\$3,255,214	15.7	\$78,778,164	326.3
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	\$2,077,000	2.5	\$1,129,881	5.2	\$2,578,738	9.19	\$7,412,158	18	\$2,263,806	9.6	\$38,020,000	138	\$1,061,868	0.0	\$54,543,451	182.5
Human Resources	All HR services, including Equal Employment Opportunity	\$914,000	4.5	\$2,276,903	10.9	\$1,242,305	8	\$5,839,259	31	\$3,777,166	10.8	\$21,404,000	82	\$487,736	3.0	\$35,941,369	150.2
Acquisitions and Grants	Contracts, grants and procurement implementation	\$324,000	2	\$899,333	3.5	\$971,611	0	\$0	0	\$562,448	3	\$16,016,000	70	\$210,201	1.0	\$18,983,593	79.5
Information Technology	Includes IT-related expenses and other CIO related activities	\$7,050,000	13	\$7,360,488	18.7	\$1,621,866	5.12	\$5,927,862	19	\$11,399,175	24.9	\$26,168,000	81	\$1,744,063	3.4	\$61,271,454	165.1
Total		\$25,628,000	75.0	\$32,350,524	100.4	\$15,372,744	65.2	\$39,475,222	152.0	\$34,219,060	108.6	\$180,076,000	701.0	\$8,241,105	30.4	\$335,362,655	1,232.6

*Amounts above to not include NOAA's Direct Bill

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NATIONAL OCEAN SERVICE
Direct Obligations
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Navigation, Observations and Positioning																
Navigation, Observations and Positioning	540	537	147,998	0	0	2,410	0	540	537	150,408	0	0	(7,051)	540	537	143,357
Hydrographic Survey Priorities/Contracts	13	13	26,818	0	0	0	0	13	13	26,818	0	0	131	13	13	26,949
IOOS Regional Observations	0	0	30,494	0	0	0	0	0	0	30,494	0	0	(11,050)	0	0	19,444
Total, Navigation, Observations and Positioning	553	550	205,310	0	0	2,410	0	553	550	207,720	0	0	(17,970)	553	550	189,750
Coastal Science and Assessment																
Coastal Science, Assessment, Response and Restoration	254	248	72,112	0	0	1,157	0	254	248	73,269	0	0	773	254	248	74,042
Competitive Research	0	0	9,933	0	0	0	0	0	0	9,933	0	0	(9,933)	0	0	0
Total, Coastal Science and Assessment	254	248	82,045	0	0	1,157	0	254	248	83,202	0	0	(9,160)	254	248	74,042
Ocean and Coastal Management and Services																
Coastal Zone Management and Services	118	116	42,214	0	0	565	0	118	116	42,779	0	0	(2,290)	118	116	40,489
Coastal Management Grants	0	0	84,429	0	0	0	0	0	0	84,429	0	0	(84,429)	0	0	0
Coral Reef Program	19	19	25,925	0	0	78	0	19	19	26,003	0	0	30	19	19	26,033
National Estuarine Research Reserve System	0	0	23,342	0	0	0	0	0	0	23,342	0	0	(23,342)	0	0	0
Sanctuaries and Marine Protected Areas	177	174	50,657	0	0	832	0	177	174	51,489	0	0	(1,750)	177	174	49,739
Total, Ocean and Coastal Management and Services	314	309	226,567	0	0	1,475	0	314	309	228,042	0	0	(111,781)	314	309	116,261
Total, NOS - Discretionary ORF	1,121	1,107	513,922	0	0	5,042	0	1,121	1,107	518,964	0	0	(138,911)	1,121	1,107	380,053
Total, NOS - Discretionary PAC	2	2	3,676	0	0	0	0	2	2	3,676	0	0	(2,135)	2	2	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	1,123	1,109	517,598	0	0	5,042	0	1,123	1,109	522,640	0	0	(141,046)	1,123	1,109	381,594
Total, NOS - Mandatory Accounts	16	16	88,471	0	0	0	(63,768)	16	16	24,703	0	0	0	16	16	24,703
GRAND TOTAL NOS	1,139	1,125	606,069	0	0	5,042	(63,768)	1,139	1,125	547,343	0	0	(141,046)	1,139	1,125	406,297

NATIONAL MARINE FISHERIES SERVICE
Direct Obligations
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Protected Resources Science and Management																
Marine Mammals, Sea Turtles, and Other Species	487	464	110,594	0	0	1,467	0	487	464	112,061	0	0	(3,601)	487	464	108,460
Species Recovery Grants	3	3	6,158	0	0	4	0	3	3	6,162	0	0	(169)	3	3	5,993
Atlantic Salmon	23	22	6,182	0	0	67	0	23	22	6,249	0	0	(31)	23	22	6,218
Pacific Salmon	338	322	61,583	0	0	1,057	0	338	322	62,640	0	0	(1,696)	338	322	60,944
Total, Protected Resources Science and Management	851	811	184,517	0	0	2,595	0	851	811	187,112	0	0	(5,497)	851	811	181,615
Fisheries Science and Management																
Fisheries and Ecosystem Science Programs and Services	625	595	138,551	0	0	1,846	0	625	595	140,397	0	0	788	625	595	141,185
Fisheries Data Collections, Surveys, and Assessments	480	457	162,898	0	0	1,597	0	480	457	164,495	0	0	(7,937)	480	457	156,558
Observers and Training	158	150	43,362	0	0	406	0	158	150	43,768	0	0	0	158	150	43,768
Fisheries Management Programs and Services	466	444	116,264	0	0	1,445	0	466	444	117,709	0	0	(5,111)	466	444	112,598
Aquaculture	26	25	9,237	0	0	90	0	26	25	9,327	0	0	0	26	25	9,327
Salmon Management Activities	33	31	33,275	0	0	84	0	33	31	33,359	0	0	(1,835)	33	31	31,524
Regional Councils and Fisheries Commissions	13	12	34,024	0	0	1,088	0	13	12	35,112	0	0	(617)	13	12	34,495
Interjurisdictional Fisheries Grants	2	2	2,984	0	0	0	0	2	2	2,984	(2)	(2)	(2,984)	0	0	0
Total, Fisheries Science and Management	1,803	1,716	540,595	0	0	6,556	0	1,803	1,716	547,151	(2)	(2)	(17,696)	1,801	1,714	529,455
Enforcement																
Enforcement	244	232	68,536	0	0	796	0	244	232	69,332	0	0	(17,837)	244	232	51,495
Total, Enforcement	244	232	68,536	0	0	796	0	244	232	69,332	0	0	(17,837)	244	232	51,495
Habitat Conservation and Restoration																
Habitat Conservation and Restoration	164	156	52,171	0	0	585	0	164	156	52,756	0	0	(4,837)	164	156	47,919
Subtotal, Habitat Conservation & Restoration	164	156	52,171	0	0	585	0	164	156	52,756	0	0	(4,837)	164	156	47,919
Total, NMFS - Discretionary ORF	3,062	2,915	845,819	0	0	10,532	0	3,062	2,915	856,351	(2)	(2)	(45,867)	3,060	2,913	810,484
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	64,907	0	0	0	0	2	2	64,907	(2)	(2)	(64,558)	0	0	349
Discretionary Total - NMFS	3,064	2,917	910,726	0	0	10,532	0	3,064	2,917	921,258	(4)	(4)	(110,425)	3,060	2,913	810,833
Total, NMFS - Mandatory Accounts	43	43	59,608	(3)	(3)	0	(33,162)	40	40	26,446	0	0	0	40	40	26,446
GRAND TOTAL NMFS	3,107	2,960	970,334	(3)	(3)	10,532	(33,162)	3,104	2,957	947,704	(4)	(4)	(110,425)	3,100	2,953	837,279

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

Direct Obligations
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Climate Research																
Laboratories & Cooperative Institutes																
Laboratories & Cooperative Institutes	236	227	59,597	43	43	1,033	14,282	279	270	74,912	0	0	(1,940)	279	270	72,972
Subtotal, Laboratories & Cooperative Institutions	236	227	59,597	43	43	1,033	14,282	279	270	74,912	0	0	(1,940)	279	270	72,972
Regional Climate Data & Information																
Regional Climate Data & Information	28	27	37,745	(14)	(14)	143	0	14	13	37,888	(8)	(8)	(12,217)	6	5	25,671
Subtotal, Regional Climate Data & Information	28	27	37,745	(14)	(14)	143	0	14	13	37,888	(8)	(8)	(12,217)	6	5	25,671
Climate Competitive Research																
Climate Competitive Research	44	43	59,597	(29)	(29)	143	(19,958)	15	14	39,782	(15)	(14)	(39,782)	0	0	0
Subtotal, Climate Competitive Research	44	43	59,597	(29)	(29)	143	(19,958)	15	14	39,782	(15)	(14)	(39,782)	0	0	0
Total, Climate Research	308	297	156,939	0	0	1,319	(5,676)	308	297	152,582	(23)	(22)	(53,939)	285	275	98,643
Weather & Air Chemistry Research																
Laboratories & Cooperative Institutes																
Laboratories & Cooperative Institutes	252	227	79,462	0	0	1,112	0	252	227	80,574	(38)	(37)	(14,682)	214	190	65,892
Subtotal, Laboratories & Cooperative Institutes	252	227	79,462	0	0	1,112	0	252	227	80,574	(38)	(37)	(14,682)	214	190	65,892
Weather & Air Chemistry Research Programs																
U.S. Weather Research Program (USWRP)	6	6	10,529	2	2	55	5,676	8	8	16,260	0	0	(3,044)	8	8	13,216
Tornado Severe Storm Research / Phased Array Radar	3	3	13,070	(1)	(1)	0	0	2	2	13,070	0	0	(448)	2	2	12,622
Joint Technology Transfer Initiative	1	1	9,933	(1)	(1)	0	0	0	0	9,933	0	0	(9,933)	0	0	0
Subtotal, Weather & Air Chemistry Research Programs	10	10	33,532	0	0	55	5,676	10	10	39,263	0	0	(13,425)	10	10	25,838
Total, Weather & Air Chemistry Research	262	237	112,994	0	0	1,167	5,676	262	237	119,837	(38)	(37)	(28,107)	224	200	91,730
Ocean, Coastal, and Great Lakes Research																
Laboratories & Cooperative Institutes																
Laboratories & Cooperative Institutes	124	118	31,785	0	0	501	0	124	118	32,286	0	0	(3,726)	124	118	28,560
Subtotal, Laboratories & Cooperative Institutes	124	118	31,785	0	0	501	0	124	118	32,286	0	0	(3,726)	124	118	28,560

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

Direct Obligations

(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
National Sea Grant College Program																
National Sea Grant College Program Base	17	17	62,576	0	0	119	0	17	17	62,695	(17)	(17)	(62,695)	0	0	0
Marine Aquaculture Program	1	1	9,436	0	0	0	0	1	1	9,436	(1)	(1)	(9,436)	0	0	0
Subtotal, National Sea Grant College Program	18	18	72,012	0	0	119	0	18	18	72,131	(18)	(18)	(72,131)	0	0	0
Ocean Exploration and Research																
Ocean Exploration and Research	23	22	35,758	0	0	122	0	23	22	35,880	0	0	(16,319)	23	22	19,561
Subtotal, Ocean Exploration and Research	23	22	35,758	0	0	122	0	23	22	35,880	0	0	(16,319)	23	22	19,561
Other Ecosystems Programs																
Integrated Ocean Acidification	17	16	10,429	0	0	32	0	17	16	10,461	0	0	(2,448)	17	16	8,013
Subtotal, Other Ecosystems Programs	17	16	10,429	0	0	32	0	17	16	10,461	0	0	(2,448)	17	16	8,013
Sustained Ocean Observations and Monitoring																
Sustained Ocean Observations and Monitoring	39	37	41,542	0	0	130	0	39	37	41,672	0	0	(4,662)	39	37	37,010
Subtotal, Sustained Ocean Observations and Monitoring	39	37	41,542	0	0	130	0	39	37	41,672	0	0	(4,662)	39	37	37,010
Total, Ocean, Coastal, & Great Lakes Research	221	211	191,526	0	0	904	0	221	211	192,430	(18)	(18)	(99,286)	203	193	93,144
Innovative Research & Technology																
High Performance Computing Initiatives	15	14	12,062	(3)	(3)	13	0	12	11	12,075	0	0	59	12	11	12,134
Research Transition Acceleration Program	0	0	993	0	0	0	0	0	0	993	0	0	(993)	0	0	0
Total, Innovative Research & Technology	15	14	13,055	(3)	(3)	13	0	12	11	13,068	0	0	(934)	12	11	12,134
Total, OAR - Discretionary ORF	806	759	474,514	(3)	(3)	3,403	0	803	756	477,917	(79)	(77)	(182,266)	724	679	295,651
Total, OAR - Discretionary PAC	0	0	36,134	0	0	0	0	0	0	36,134	0	0	(10,134)	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	510,648	(3)	(3)	3,403	0	803	756	514,051	(79)	(77)	(192,400)	724	679	321,651

NATIONAL WEATHER SERVICE
Direct Obligations
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Observations	777	740	214,909	0	0	2,805	0	777	740	217,714	0	0	(13,722)	777	740	203,992
Central Processing	235	224	92,166	0	0	720	0	235	224	92,886	(74)	(74)	(6,266)	161	150	86,620
Analyze, Forecast and Support	2,958	2,817	484,049	0	0	7,965	0	2,958	2,817	492,014	(281)	(143)	(20,222)	2,677	2,674	471,792
Dissemination	84	80	46,429	0	0	1,151	0	84	80	47,580	0	0	2,510	84	80	50,090
Science and Technology Integration	440	419	135,640	0	0	1,499	0	440	419	137,139	0	0	(14,437)	440	419	122,702
Total, NWS - Discretionary ORF	4,494	4,280	973,193	0	0	14,140	0	4,494	4,280	987,333	(355)	(217)	(52,137)	4,139	4,063	935,196
Total, NWS - Discretionary PAC	26	24	140,829	0	0	0	0	26	24	140,829	0	0	(23,253)	26	24	117,576
Total, NWS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NWS	4,520	4,304	1,114,022	0	0	14,140	0	4,520	4,304	1,128,162	(355)	(217)	(75,390)	4,165	4,087	1,052,772

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

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Environmental Satellite Observing Systems																
Office of Satellite and Product Operations (OSPO)																
Satellite and Product Operations	291	255	115,320	3	3	664	8,524	294	258	124,508	0	0	7,636	294	258	132,144
NSOF Operations	1	1	13,707			530		1	1	14,237	0	0	543	1	1	14,780
Subtotal, Office of Satellite and Product Operations (OSPO)	292	256	129,027	3	3	1,194	8,524	295	259	138,745	0	0	8,179	295	259	146,924
Product Development, Readiness & Application																
Product Development, Readiness & Application	84	72	30,792	0	0	1,269	2,104	84	72	34,165	0	0	(3,470)	84	72	30,695
Subtotal, Product Development, Readiness & Application	84	72	30,792	0	0	1,269	2,104	84	72	34,165	0	0	(3,470)	84	72	30,695
Commercial Remote Sensing Regulatory Affairs	5	5	1,192	0	0	0	0	5	5	1,192	1	1	608	6	6	1,800
Office of Space Commerce	5	3	795	0	0	0	0	5	3	795	0	0	1,005	5	3	1,800
Group on Earth Observations (GEO)	0	0	497	0	0	0	0	0	0	497	0	0	3	0	0	500
Total, Environmental Satellite Observing Systems	386	336	162,303	3	3	2,463	10,628	389	339	175,394	1	1	6,325	390	340	181,719
National Centers for Environmental Information																
National Centers for Environmental Information	200	187	58,792			1,072	1,812	200	187	61,676	0	0	(4,085)	200	187	57,591
Total, National Centers for Environmental Information	200	187	58,792	0	0	1,072	1,812	200	187	61,676	0	0	(4,085)	200	187	57,591
Total, NESDIS - Discretionary ORF	586	523	221,095	3	3	3,535	12,440	589	526	237,070	1	1	2,240	590	527	239,310
Total, NESDIS - Discretionary PAC	293	262	1,966,350	(3)	(3)	0	(12,440)	290	259	1,953,910	0	0	(553,199)	290	259	1,400,711
Total, NESDIS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NESDIS	879	785	2,187,445	0	0	3,535	0	879	785	2,190,980	1	1	(550,959)	880	786	1,640,021

**MISSION SUPPORT
Direct Obligations
(\$ in Thousands)**

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Executive Leadership	127	121	26,818	0	0	792	0	127	121	27,610	0	0	269	127	121	27,879
Mission Services and Management	610	592	147,392	0	0	3,025	0	610	592	150,417	0	0	0	610	592	150,417
IT Security	14	13	9,982	0	0	45	0	14	13	10,027	0	0	2	14	13	10,029
Payment to the DOC Working Capital Fund	0	0	42,710	0	0	1,282	11,257	0	0	55,249	0	0	0	0	0	55,249
Office of Education	18	17	26,750	0	0	60	0	18	17	26,810	(18)	(17)	(26,810)	0	0	0
Total, MS - Discretionary ORF	769	743	253,652	0	0	5,204	11,257	769	743	270,113	(18)	(17)	(26,539)	751	726	243,574
Total, MS - Discretionary PAC	0	0	6,016	0	0	0	0	0	0	6,016	0	0	(5,018)	0	0	998
Discretionary Total - MS	769	743	259,668	0	0	5,204	11,257	769	743	276,129	(18)	(17)	(31,557)	751	726	244,572
Total, MS - Mandatory Accounts	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
GRAND TOTAL MS	769	743	271,681	0	0	5,204	(756)	769	743	276,129	(18)	(17)	(31,557)	751	726	244,572

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

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Marine Operations and Maintenance	869	840	177,636	0	0	2,556	0	869	840	180,192	0	0	978	869	840	181,170
Aviation Operations and Aircraft Services	127	122	32,076	0	0	451	0	127	122	32,527	0	0	2,156	127	122	34,683
Total, OMAO - Discretionary ORF	996	962	209,712	0	0	3,007	0	996	962	212,719	0	0	3,134	996	962	215,853
Total, OMAO - Discretionary PAC	8	8	86,116	0	0	0	0	8	8	86,116	0	0	1,762	8	8	87,878
Total, OMAO - Other Discretionary Accounts	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Discretionary Total - OMAO	1,004	970	297,764	0	0	3,007	(333)	1,004	970	300,438	0	0	4,896	1,004	970	305,334
Total, OMAO - Mandatory Accounts	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
GRAND TOTAL OMAO	1,004	970	327,866	0	0	3,007	(360)	1,004	970	330,513	0	0	4,896	1,004	970	335,409

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

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
National Ocean Service	1,121	1,107	513,922	0	0	5,042	0	1,121	1,107	518,964	0	0	(138,911)	1,121	1,107	380,053
National Marine Fisheries Service	3,062	2,915	845,819	0	0	10,532	0	3,062	2,915	856,351	(2)	(2)	(45,867)	3,060	2,913	810,484
Office of Oceanic and Atmospheric Research	806	759	474,514	(3)	(3)	3,403	0	803	756	477,917	(79)	(77)	(182,266)	724	679	295,651
National Weather Service	4,494	4,280	973,193	0	0	14,140	0	4,494	4,280	987,333	(355)	(217)	(52,137)	4,139	4,063	935,196
National Environmental Satellite, Data and Information Service	586	523	221,095	3	3	3,535	12,440	589	526	237,070	1	1	2,240	590	527	239,310
Mission Support	769	743	253,652	0	0	5,204	11,257	769	743	270,113	(18)	(17)	(26,539)	751	726	243,574
Office of Marine and Aviation Operations	996	962	209,712	0	0	3,007	0	996	962	212,719	0	0	3,134	996	962	215,853
SUBTOTAL LO DIRECT DISCRETIONARY ORF OBLIGATIONS	11,834	11,289	3,491,907	0	0	44,863	23,697	11,834	11,289	3,560,467	(453)	(312)	(440,346)	11,381	10,977	3,120,121

ORF ADJUSTMENTS
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
SUBTOTAL ORF DIRECT OBLIGATIONS	11,834	11,289	3,491,907	0	0	44,863	23,697	11,834	11,289	3,560,467	(453)	(312)	(440,346)	11,381	10,977	3,120,121
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	(18,000)	0	0	0	18,000	0	0	0	0	0	0	0	0	0
Total ORF Financing	0	0	(35,500)	0	0	0	8,000	0	0	(27,500)	0	0	0	0	0	(27,500)
SUBTOTAL ORF BUDGET AUTHORITY	11,834	11,289	3,456,407	0	0	44,863	31,697	11,834	11,289	3,532,967	(453)	(312)	(440,346)	11,381	10,977	3,092,621
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	(130,164)	0	0	0	(24,704)	0	0	(154,868)	0	0	0	0	0	(154,868)
Rescission	0	0	18,000	0	0	0	(18,000)	0	0	0	0	0	0	0	0	0
Total ORF Transfers	0	0	(112,164)	0	0	0	(42,704)	0	0	(154,868)	0	0	0	0	0	(154,868)
SUBTOTAL ORF APPROPRIATION	11,834	11,289	3,344,243	0	0	44,863	(11,007)	11,834	11,289	3,378,099	(453)	(312)	(440,346)	11,381	10,977	2,937,753

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

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
NOS																
Construction																
National Estuarine Research Reserve Construction (NERRS)	0	0	1,689	0	0	0	0	0	0	1,689	0	0	(1,689)	0	0	0
Marine Sanctuaries Construction Base	2	2	1,987	0	0	0	0	2	2	1,987	0	0	(446)	2	2	1,541
Subtotal, NOS Construction	2	2	3,676	0	0	0	0	2	2	3,676	0	0	(2,135)	2	2	1,541
Total, NOS - PAC	2	2	3,676	0	0	0	0	2	2	3,676	0	0	(2,135)	2	2	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	36,134	0	0	0	0	0	0	36,134	0	0	(10,134)	0	0	26,000
Subtotal, OAR Systems Acquisition	0	0	36,134	0	0	0	0	0	0	36,134	0	0	(10,134)	0	0	26,000
Total, OAR - PAC	0	0	36,134	0	0	0	0	0	0	36,134	0	0	(10,134)	0	0	26,000
NWS																
Systems Acquisition																
Observations	0	0	32,534	0	0	0	0	0	0	32,534	0	0	(16,284)	0	0	16,250
Central Processing	26	24	66,311	0	0	0	0	26	24	66,311	0	0	(8,172)	26	24	58,139
Dissemination	0	0	34,386	0	0	0	0	0	0	34,386	0	0	167	0	0	34,553
Subtotal, NWS Systems Acquisition	26	24	133,231	0	0	0	0	26	24	133,231	0	0	(24,289)	26	24	108,942
Construction																
Facilities Construction and Major Repairs	0	0	7,598	0	0	0	0	0	0	7,598	0	0	1,036	0	0	8,634
Subtotal, NWS Construction	0	0	7,598	0	0	0	0	0	0	7,598	0	0	1,036	0	0	8,634
Total, NWS - PAC	26	24	140,829	0	0	0	0	26	24	140,829	0	0	(23,253)	26	24	117,576

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

FY 2019 Proposed Operating Plan			FY 2018				Calculated ATBs	Technical ATBs			FY 2019		FY 2019		FY 2019 President's Budget	
	POS	FTE	Annualized CR	POS	FTE	POS			FTE	Base	POS	FTE	Program Changes	POS		FTE
NESDIS																
Systems Acquisition																
Geostationary Systems - R	59	59	747,713	0	0	0	(4,437)	59	59	743,276	0	0	(334,896)	59	59	408,380
Jason-3	1	1	4,328	(1)	(1)	0	(4,328)	0	0	0	0	0	0	0	0	0
Joint Polar Satellite System (JPSS)	65	60	781,951	(65)	(60)	0	(781,951)	0	0	0	0	0	0	0	0	0
Polar Follow On	29	24	326,684	(29)	(24)	0	(326,684)	0	0	0	0	0	0	0	0	0
Polar Weather Satellites	0	0	0	94	84	0	1,108,635	94	84	1,108,635	0	0	(230,644)	94	84	877,991
Cooperative Data and Rescue Services (CDARS)	0	0	497	0	0	0	0	0	0	497	0	0	3	0	0	500
DSCOVR	2	2	3,720	(2)	(2)	0	(3,720)	0	0	0	0	0	0	0	0	0
Space Weather Follow On	1	1	4,966	0	0	0	0	1	1	4,966	0	0	5,034	1	1	10,000
COSMIC 2/GNSS RO	1	1	8,045	0	0	0	0	1	1	8,045	0	0	(2,153)	1	1	5,892
Satellite Ground Services	86	74	53,636	0	0	0	45	86	74	53,681	0	0	(1,349)	86	74	52,332
System Architecture and Advanced Planning	12	10	3,903	0	0	0	0	12	10	3,903	0	0	1,026	12	10	4,929
Projects, Planning and Analysis	37	30	25,030	0	0	0	0	37	30	25,030	0	0	11,509	37	30	36,539
Commercial Weather Data Pilot	0	0	4,966	0	0	0	0	0	0	4,966	0	0	(1,966)	0	0	3,000
Subtotal, NESDIS Systems Acquisition	293	262	1,965,439	(3)	(3)	0	(12,440)	290	259	1,952,999	0	0	(553,436)	290	259	1,399,563
Construction																
Satellite CDA Facility	0	0	2,213	0	0	0	0	0	0	2,213	0	0	237	0	0	2,450
Subtotal, NESDIS Construction	0	0	2,213	0	0	0	0	0	0	2,213	0	0	237	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	293	262	1,966,350	(3)	(3)	0	(12,440)	290	259	1,953,910	0	0	(553,199)	290	259	1,400,711
Mission Support																
Construction																
NOAA Construction	0	0	6,016	0	0	0	0	0	0	6,016	0	0	(5,018)	0	0	998
Subtotal, Mission Support Construction	0	0	6,016	0	0	0	0	0	0	6,016	0	0	(5,018)	0	0	998
Total, Mission Support - PAC	0	0	6,016	0	0	0	0	0	0	6,016	0	0	(5,018)	0	0	998
OMAO																
Fleet Replacement																
Fleet Capital Improvements & Tech Infusion	1	1	11,621	0	0	0	0	1	1	11,621	0	0	1,257	1	1	12,878
New Vessel Construction	7	7	74,495	0	0	0	0	7	7	74,495	0	0	505	7	7	75,000
Subtotal, Fleet Replacement	8	8	86,116	0	0	0	0	8	8	86,116	0	0	1,762	8	8	87,878
Total, OMAO - PAC	8	8	86,116	0	0	0	0	8	8	86,116	0	0	1,762	8	8	87,878
GRAND TOTAL PAC DISCRETIONARY OBLIGATIONS	329	296	2,239,121	(3)	(3)	0	(12,440)	326	293	2,226,681	0	0	(591,977)	326	293	1,634,704

PAC ADJUSTMENTS
(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
SUBTOTAL PAC DIRECT OBLIGATIONS	329	296	2,239,121	(3)	(3)	0	(12,440)	326	293	2,226,681	0	0	(591,977)	326	293	1,634,704
FINANCING																
Deobligations	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	(13,000)
Rescission	0	0	(5,000)	0	0	0	5,000	0	0	0	0	0	0	0	0	0
Total PAC Financing	0	0	(18,000)	0	0	0	5,000	0	0	(13,000)	0	0	0	0	0	(13,000)
SUBTOTAL PAC BUDGET AUTHORITY	329	296	2,221,121	(3)	(3)	0	(7,440)	326	293	2,213,681	0	0	(591,977)	326	293	1,621,704
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	5,000	0	0	0	(5,000)	0	0	0	0	0	0	0	0	0
Total PAC Transfers	0	0	6,302	0	0	0	(5,000)	0	0	1,302	0	0	0	0	0	1,302
SUBTOTAL PAC APPROPRIATION	329	296	2,227,423	(3)	(3)	0	(12,440)	326	293	2,214,983	0	0	(591,977)	326	293	1,623,006

OTHER ACCOUNTS DISCRETIONARY

(\$ in Thousands)

FY 2019 Proposed Operating Plan			FY 2018				Calculated		Technical		FY 2019		FY 2019		FY 2019	
	POS	FTE	Annualized CR	POS	FTE	ATBs	ATBs	POS	FTE	Base	POS	FTE	Program Changes	POS	FTE	President's Budget
NMFS																
Fishermen's Contingency Fund Obligations	0	0	348	0	0	0	0	0	0	348	0	0	1	0	0	349
Fishermen's Contingency Fund Budget Authority	0	0	348	0	0	0	0	0	0	348	0	0	1	0	0	349
Fishermen's Contingency Fund Appropriations	0	0	348	0	0	0	0	0	0	348	0	0	1	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	(130,164)	0	0	0	(24,704)	0	0	(154,868)	0	0	0	0	0	(154,868)
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	64,559	0	0	0	0	2	2	64,559	(2)	(2)	(64,559)	0	0	0
Pacific Coastal Salmon Recovery Fund Budget Authority	2	2	64,559	0	0	0	0	2	2	64,559	(2)	(2)	(64,559)	0	0	0
Pacific Coastal Salmon Recovery Fund Appropriation	2	2	64,559	0	0	0	0	2	2	64,559	(2)	(2)	(64,559)	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
Subtotal, NMFS Other Discretionary Direct Obligations	2	2	64,907	0	0	0	0	2	2	64,907	(2)	(2)	(64,558)	0	0	349
Subtotal, NMFS Other Discretionary Budget Authority	2	2	(65,257)	0	0	0	(24,704)	2	2	(89,961)	(2)	(2)	(64,558)	0	0	(154,519)
Subtotal, NMFS Other Discretionary Appropriation	2	2	64,907	0	0	0	0	2	2	64,907	(2)	(2)	(64,558)	0	0	349
OMAO																
Medicare Eligible Retiree Healthcare Fund Obligations	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Medicare Eligible Retiree Healthcare Fund Budget Authority	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Medicare Eligible Retiree Healthcare Fund Appropriation	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Direct Obligations	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Budget Authority	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Appropriation	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	2	2	66,843	0	0	0	(333)	2	2	66,510	(2)	(2)	(64,558)	0	0	1,952
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	2	2	(63,321)	0	0	0	(25,037)	2	2	(88,358)	(2)	(2)	(64,558)	0	0	(152,916)
TOTAL, OTHER DISCRETIONARY APPROPRIATION	2	2	66,843	0	0	0	(333)	2	2	66,510	(2)	(2)	(64,558)	0	0	1,952

SUMMARY OF DISCRETIONARY RESOURCES

(\$ in Thousands)

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
<u>Direct Discretionary Obligations</u>																
ORF Direct Obligations	11,834	11,289	3,491,907	0	0	44,863	23,697	11,834	11,289	3,560,467	(453)	(312)	(440,346)	11,381	10,977	3,120,121
PAC Direct Obligations	329	296	2,239,121	(3)	(3)	0	(12,440)	326	293	2,226,681	0	0	(591,977)	326	293	1,634,704
OTHER Direct Obligations	2	2	66,843	0	0	0	(333)	2	2	66,510	(2)	(2)	(64,558)	0	0	1,952
TOTAL Direct Discretionary Obligations	12,165	11,587	5,797,871	(3)	(3)	44,863	10,924	12,162	11,584	5,853,658	(455)	(314)	(1,096,881)	11,707	11,270	4,756,777
<u>Discretionary Budget Authority</u>																
ORF Budget Authority	11,834	11,289	3,456,407	0	0	44,863	31,697	11,834	11,289	3,532,967	(453)	(312)	(440,346)	11,381	10,977	3,092,621
PAC Budget Authority	329	296	2,221,121	(3)	(3)	0	(7,440)	326	293	2,213,681	0	0	(591,977)	326	293	1,621,704
OTHER Budget Authority	2	2	(63,321)	0	0	0	(25,037)	2	2	(88,358)	(2)	(2)	(64,558)	0	0	(152,916)
TOTAL Discretionary Budget Authority	12,165	11,587	5,614,207	(3)	(3)	44,863	(780)	12,162	11,584	5,658,290	(455)	(314)	(1,096,881)	11,707	11,270	4,561,409
<u>Discretionary Appropriations</u>																
ORF Appropriation	11,834	11,289	3,344,243	0	0	44,863	(11,007)	11,834	11,289	3,378,099	(453)	(312)	(440,346)	11,381	10,977	2,937,753
PAC Appropriation	329	296	2,227,423	(3)	(3)	0	(12,440)	326	293	2,214,983	0	0	(591,977)	326	293	1,623,006
OTHER Appropriation	2	2	66,843	0	0	0	(333)	2	2	66,510	(2)	(2)	(64,558)	0	0	1,952
TOTAL Discretionary Appropriation	12,165	11,587	5,638,509	(3)	(3)	44,863	(23,780)	12,162	11,584	5,659,592	(455)	(314)	(1,096,881)	11,707	11,270	4,562,711

GRAND TOTAL SUMMARY DISCRETIONARY APPROPRIATIONS
(\$ in Thousands)

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
Operations, Research, and Facilities	11,834	11,289	3,344,243	0	0	44,863	(11,007)	11,834	11,289	3,378,099	(453)	(312)	(440,346)	11,381	10,977	2,937,753
Procurement, Acquisition, and Construction	329	296	2,227,423	(3)	(3)	0	(12,440)	326	293	2,214,983	0	0	(591,977)	326	293	1,623,006
Fisherman's Contingency Fund	0	0	348	0	0	0	0	0	0	348	0	0	1	0	0	349
Foreign Fishing Observer Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund	2	2	64,559	0	0	0	0	2	2	64,559	(2)	(2)	(64,559)	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	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	1,603
GRAND TOTAL DISCRETIONARY APPROPRIATION	12,165	11,587	5,638,509	(3)	(3)	44,863	(23,780)	12,162	11,584	5,659,592	(455)	(314)	(1,096,881)	11,707	11,270	4,562,711

OTHER ACCOUNTS MANDATORY

(\$ in Thousands)

FY 2019 Proposed Operating Plan			FY 2018				Calculated		Technical		FY 2019		FY 2019		FY 2019	
	POS	FTE	Annualized CR	POS	FTE	ATBs	ATBs	POS	FTE	Base	POS	FTE	Program Changes	POS	FTE	President's Budget
NOS																
Damage Assessment and Restoration Revolving Fund Obligations	15	15	81,986	0	0	0	(63,018)	15	15	18,968	0	0	0	15	15	18,968
Damage Assessment and Restoration Revolving Fund Budget Authority	15	15	5,986	0	0	0	(18)	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	6,365	0	0	0	(750)	1	1	5,615	0	0	0	1	1	5,615
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	88,471	0	0	0	(63,768)	16	16	24,703	0	0	0	16	16	24,703
Subtotal, NOS Other Mandatory Budget Authority	16	16	6,106	0	0	0	(18)	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	24,500	(3)	(3)	0	(24,500)	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	3	3	154,664	(3)	(3)	0	204	0	0	154,868	0	0	0	0	0	154,868
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	7,997	0	0	0	(7,997)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	7,997	0	0	0	(7,997)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	7,997	0	0	0	(7,997)	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	4,858	0	0	0	(1,045)	0	0	3,813	0	0	0	0	0	3,813
Environmental Improvement & Restoration Fund Budget Authority	0	0	4,858	0	0	0	(1,045)	0	0	3,813	0	0	0	0	0	3,813
Environmental Improvement & Restoration Fund Appropriation	0	0	5,201	0	0	0	(1,119)	0	0	4,082	0	0	0	0	0	4,082
Limited Access System Administration Fund Obligations	40	40	13,732	0	0	0	256	40	40	13,988	0	0	0	40	40	13,988
Limited Access System Administration Fund Budget Authority	40	40	13,732	0	0	0	256	40	40	13,988	0	0	0	40	40	13,988
Limited Access System Administration Fund Appropriation	40	40	13,773	0	0	0	230	40	40	14,003	0	0	0	40	40	14,003

OTHER ACCOUNTS MANDATORY
(\$ in Thousands)

FY 2019 Proposed Operating Plan			FY 2018				Calculated		Technical		FY 2019		FY 2019		FY 2019	
	POS	FTE	Annualized CR	POS	FTE	ATBs	ATBs	POS	FTE	Base	POS	FTE	Program Changes	POS	FTE	President's Budget
Western Pacific Sustainable Fisheries Fund Obligations	0	0	494	0	0	0	6	0	0	500	0	0	0	0	0	500
Western Pacific Sustainable Fisheries Fund Budget Authority	0	0	494	0	0	0	6	0	0	500	0	0	0	0	0	500
Western Pacific Sustainable Fisheries Fund Appropriation	0	0	500	0	0	0	0	0	0	500	0	0	0	0	0	500
Fisheries Enforcement Asset Forfeiture Fund Obligations	0	0	4,157	0	0	0	(2)	0	0	4,155	0	0	0	0	0	4,155
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	0	0	4,157	0	0	0	(2)	0	0	4,155	0	0	0	0	0	4,155
Fisheries Enforcement Asset Forfeiture Fund Appropriation	0	0	4,155	0	0	0	0	0	0	4,155	0	0	0	0	0	4,155
North Pacific Observer Fund Obligations	0	0	3,870	0	0	0	120	0	0	3,990	0	0	0	0	0	3,990
North Pacific Observer Fund Budget Authority	0	0	3,870	0	0	0	120	0	0	3,990	0	0	0	0	0	3,990
North Pacific Observer Fund Appropriation	0	0	3,850	0	0	0	150	0	0	4,000	0	0	0	0	0	4,000
Subtotal, NMFS Other Mandatory Direct Obligations	43	43	59,608	(3)	(3)	0	(33,162)	40	40	26,446	0	0	0	40	40	26,446
Subtotal, NMFS Other Mandatory Budget Authority	43	43	189,772	(3)	(3)	0	(8,458)	40	40	181,314	0	0	0	40	40	181,314
Subtotal, NMFS Other Mandatory Appropriation	43	43	35,476	(3)	(3)	0	(8,736)	40	40	26,740	0	0	0	40	40	26,740
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	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
Spectrum Pipeline (ORF) Budget Authority	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
Spectrum Pipeline (ORF) Appropriation	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
Subtotal, MS Other Mandatory Direct Obligations	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
Subtotal, MS Other Mandatory Budget Authority	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
Subtotal, MS Other Mandatory Appropriation	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
OMAO																
NOAA Corps Commissioned Officers Retirement Obligations	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
NOAA Corps Commissioned Officers Retirement Budget Authority	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
NOAA Corps Commissioned Officers Retirement Appropriation	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
Subtotal, OMAO Other Mandatory Direct Obligations	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
Subtotal, OMAO Other Mandatory Budget Authority	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
Subtotal, OMAO Other Mandatory Appropriation	0	0	30,102	0	0	0	(27)	0	0	30,075	0	0	0	0	0	30,075
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	59	59	190,194	(3)	(3)	0	(108,970)	56	56	81,224	0	0	0	56	56	81,224
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	59	59	237,993	(3)	(3)	0	(20,516)	56	56	217,477	0	0	0	56	56	217,477
TOTAL, OTHER MANDATORY APPROPRIATION	59	59	77,711	(3)	(3)	0	(20,776)	56	56	56,935	0	0	0	56	56	56,935

NOAA SUMMARY
(\$ in Thousands)

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
TOTAL Direct Obligations (Discretionary & Mandatory)	12,224	11,646	5,988,065	(6)	(6)	44,863	(98,046)	12,218	11,640	5,934,882	(455)	(314)	(1,096,881)	11,763	11,326	4,838,001
TOTAL Budget Authority (Discretionary & Mandatory)	12,224	11,646	5,852,200	(6)	(6)	44,863	(21,296)	12,218	11,640	5,875,767	(455)	(314)	(1,096,881)	11,763	11,326	4,778,886
TOTAL Appropriation (Discretionary & Mandatory)	12,224	11,646	5,716,220	(6)	(6)	44,863	(44,556)	12,218	11,640	5,716,527	(455)	(314)	(1,096,881)	11,763	11,326	4,619,646
Reimbursable Financing	506	506	242,000	0	0	0	0	506	506	242,000	0	0	0	506	506	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	12,730	12,152	6,230,065	(6)	(6)	44,863	(98,046)	12,724	12,146	6,176,882	(455)	(314)	(1,096,881)	12,269	11,832	5,080,001
Offsetting Receipts	0	0	(2,557)	0	0	0	(5,552)	0	0	(8,109)	0	0	0	0	0	(8,109)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	12,730	12,152	6,227,508	(6)	(6)	44,863	(103,598)	12,724	12,146	6,168,773	(455)	(314)	(1,096,881)	12,269	11,832	5,071,892

LINE OFFICE SUMMARY

(\$ in Thousands)

FY 2019 Proposed Operating Plan	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
National Ocean Service																
ORF	1,121	1,107	513,922	0	0	5,042	0	1,121	1,107	518,964	0	0	(138,911)	1,121	1,107	380,053
PAC	2	2	3,676	0	0	0	0	2	2	3,676	0	0	(2,135)	2	2	1,541
OTHER	16	16	88,471	0	0	0	(63,768)	16	16	24,703	0	0	0	16	16	24,703
TOTAL, NOS	1,139	1,125	606,069	0	0	5,042	(63,768)	1,139	1,125	547,343	0	0	(141,046)	1,139	1,125	406,297
National Marine Fisheries Service																
ORF	3,062	2,915	845,819	0	0	10,532	0	3,062	2,915	856,351	(2)	(2)	(45,867)	3,060	2,913	810,484
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	45	45	124,515	(3)	(3)	0	(33,162)	42	42	91,353	(2)	(2)	(64,558)	40	40	26,795
TOTAL, NMFS	3,107	2,960	970,334	(3)	(3)	10,532	(33,162)	3,104	2,957	947,704	(4)	(4)	(110,425)	3,100	2,953	837,279
Oceanic and Atmospheric Research																
ORF	806	759	474,514	(3)	(3)	3,403	0	803	756	477,917	(79)	(77)	(182,266)	724	679	295,651
PAC	0	0	36,134	0	0	0	0	0	0	36,134	0	0	(10,134)	0	0	26,000
TOTAL, OAR	806	759	510,648	(3)	(3)	3,403	0	803	756	514,051	(79)	(77)	(192,400)	724	679	321,651
National Weather Service																
ORF	4,494	4,280	973,193	0	0	14,140	0	4,494	4,280	987,333	(355)	(217)	(52,137)	4,139	4,063	935,196
PAC	26	24	140,829	0	0	0	0	26	24	140,829	0	0	(23,253)	26	24	117,576
TOTAL, NWS	4,520	4,304	1,114,022	0	0	14,140	0	4,520	4,304	1,128,162	(355)	(217)	(75,390)	4,165	4,087	1,052,772
National Environmental Satellite, Data and Information Service																
ORF	586	523	221,095	3	3	3,535	12,440	589	526	237,070	1	1	2,240	590	527	239,310
PAC	293	262	1,966,350	(3)	(3)	0	(12,440)	290	259	1,953,910	0	0	(553,199)	290	259	1,400,711
TOTAL, NESDIS	879	785	2,187,445	0	0	3,535	0	879	785	2,190,980	1	1	(550,959)	880	786	1,640,021
Mission Support																
ORF	769	743	253,652	0	0	5,204	11,257	769	743	270,113	(18)	(17)	(26,539)	751	726	243,574
PAC	0	0	6,016	0	0	0	0	0	0	6,016	0	0	(5,018)	0	0	998
OTHER	0	0	12,013	0	0	0	(12,013)	0	0	0	0	0	0	0	0	0
SUBTOTAL, Mission Support	769	743	271,681	0	0	5,204	(756)	769	743	276,129	(18)	(17)	(31,557)	751	726	244,572
Office of Marine and Aviation Operations																
ORF	996	962	209,712	0	0	3,007	0	996	962	212,719	0	0	3,134	996	962	215,853
PAC	8	8	86,116	0	0	0	0	8	8	86,116	0	0	1,762	8	8	87,878
OTHER	0	0	32,038	0	0	0	(360)	0	0	31,678	0	0	0	0	0	31,678
TOTAL, OMAO	1,004	970	327,866	0	0	3,007	(360)	1,004	970	330,513	0	0	4,896	1,004	970	335,409

LINE OFFICE SUMMARY
(\$ in Thousands)

FY 2019 Proposed Operating Plan																
	POS	FTE	FY 2018 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2019 Base	POS	FTE	FY 2019 Program Changes	POS	FTE	FY 2019 President's Budget
DIRECT DISCRETIONARY OBLIGATIONS																
ORF	11,834	11,289	3,491,907	0	0	44,863	23,697	11,834	11,289	3,560,467	(453)	(312)	(440,346)	11,381	10,977	3,120,121
PAC	329	296	2,239,121	(3)	(3)	0	(12,440)	326	293	2,226,681	0	0	(591,977)	326	293	1,634,704
OTHER	61	61	257,037	(3)	(3)	0	(109,303)	58	58	147,734	(2)	(2)	(64,558)	56	56	83,176
TOTAL, DIRECT DISCRETIONARY OBLIGATIONS	12,224	11,646	5,988,065	(6)	(6)	44,863	(98,046)	12,218	11,640	5,934,882	(455)	(314)	(1,096,881)	11,763	11,326	4,838,001
ORF Adjustments (Deobligations/Rescissions)	0	0	(35,500)	0	0	0	8,000	0	0	(27,500)	0	0	0	0	0	(27,500)
ORF Transfers	0	0	(112,164)	0	0	0	(42,704)	0	0	(154,868)	0	0	0	0	0	(154,868)
PAC Adjustments (Deobligations/Rescissions)	0	0	(18,000)	0	0	0	5,000	0	0	(13,000)	0	0	0	0	0	(13,000)
PAC Transfers	0	0	6,302	0	0	0	(5,000)	0	0	1,302	0	0	0	0	0	1,302
OTHER Discretionary Adjustments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mandatory Accounts Excluded	(59)	(59)	(190,194)	3	3	0	108,970	(56)	(56)	(81,224)	0	0	0	(56)	(56)	(81,224)
TOTAL, DISCRETIONARY APPROPRIATIONS	12,165	11,587	5,638,509	(3)	(3)	44,863	(23,780)	12,162	11,584	5,659,592	(455)	(314)	(1,096,881)	11,707	11,270	4,562,711

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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	Appropriation	Budget Authority	Direct Obligations
2018 Annualized CR	11,834	11,289	3,344,243	3,456,407	3,602,210
less: Carryover	0	0	0	0	(110,303)
plus: 2019 ATBs	0	0	33,856	76,560	68,560
2019 Base	11,834	11,289	3,378,099	3,532,967	3,560,467
plus(or less): 2019 Program Changes	(453)	(312)	(440,346)	(440,346)	(440,346)
2019 Estimate	11,381	10,977	2,937,753	3,092,621	3,120,121

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

Comparison by program		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	1,107	512,209	1,121	513,922	1,121	518,964	1,121	380,053	0	(138,911)
	FTE/OBL	1,101	514,486	1,107	520,284	1,107	518,964	1,107	380,053	0	(138,911)
National Marine Fisheries Service	Pos/BA	2,678	843,960	3,062	845,819	3,062	856,351	3,060	810,484	(2)	(45,867)
	FTE/OBL	2,666	846,269	2,915	880,493	2,915	856,351	2,913	810,484	(2)	(45,867)
Oceanic and Atmospheric Research	Pos/BA	662	471,632	806	474,514	803	477,917	724	295,651	(79)	(182,266)
	FTE/OBL	659	474,124	759	483,775	756	477,917	679	295,651	(77)	(182,266)
National Weather Service	Pos/BA	4,235	970,296	4,494	973,193	4,494	987,333	4,139	935,196	(355)	(52,137)
	FTE/OBL	4,215	991,819	4,280	998,649	4,280	987,333	4,063	935,196	(217)	(52,137)
National Environmental Satellite, Data, & Info Service	Pos/BA	471	226,564	586	221,095	589	237,070	590	239,310	1	2,240
	FTE/OBL	469	212,040	523	240,253	526	237,070	527	239,310	1	2,240
Mission Support	Pos/BA	685	274,693	769	253,652	769	270,113	751	243,574	(18)	(26,539)
	FTE/OBL	680	274,216	743	267,725	743	270,113	726	243,574	(17)	(26,539)
Office of Marine & Aviation Operations	Pos/BA	967	211,822	996	209,712	996	212,719	996	215,853	0	3,134
	FTE/OBL	962	216,451	962	211,031	962	212,719	962	215,853	0	3,134
Less Deobligations/Other	Pos/BA	0	0	0	(35,500)	0	(27,500)	0	(27,500)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	10,805	3,511,176	11,834	3,456,407	11,834	3,532,967	11,381	3,092,621	(453)	(440,346)
	FTE/OBL	10,752	3,529,405	11,289	3,602,210	11,289	3,560,467	10,977	3,120,121	(312)	(440,346)

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

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	10,752	3,529,405	11,289	3,602,210	11,289	3,560,467	10,977	3,120,121	(312)	(440,346)
Total Obligations	10,752	3,529,405	11,289	3,602,210	11,289	3,560,467	10,977	3,120,121	(312)	(440,346)
Adjustments to Obligations:										
Unobligated Balance, SOY	0	(113,800)	0	(110,303)	0	0	0	0	0	0
Deobligations/Prior Year Recoveries	0	(33,784)	0	(17,500)	0	(27,500)	0	(27,500)	0	0
Collections	0	(89)	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	110,303	0	0	0	0	0	0	0	0
Unobligated Balance Expiring	0	1,141	0	0	0	0	0	0	0	0
Unobligated Balance Rescission	0	0	0	(18,000)	0	0	0	0	0	0
Total Budget Authority	10,752	3,493,176	11,289	3,456,407	11,289	3,532,967	10,977	3,092,621	(312)	(440,346)
Financing from Transfers and Other:										
Transfer from P&D to ORF	0	(130,164)	0	(130,164)	0	(154,868)	0	(154,868)	0	0
Transfer from PCSRF to ORF	0	(65)	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	(14,430)	0	0	0	0	0	0	0	0
Transfer from ORF to PAC	0	1,358	0	0	0	0	0	0	0	0
Unobligated Balance Rescission	0	18,000	0	18,000	0	0	0	0	0	0
Net Appropriation	10,752	3,367,875	11,289	3,344,243	11,289	3,378,099	10,977	2,937,753	(312)	(440,346)

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
 (Dollar amounts in thousands)

	Positions	FTE	Appropriation	Budget Authority	Reimbursable Obligations
2018 Annualized CR	506	506	0	242,000	330,200
less: obligations from prior year balances	0	0	0	0	(88,200)
less: 2019 Other Adjustments to Base	0	0	0	0	0
2019 Base	506	506	0	242,000	242,000
less: 2019 Program Changes	0	0	0	0	0
2019 Estimate	506	506	0	242,000	242,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
(Dollar amounts in thousands)

Comparison by program		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	12	17,000	12	24,000	12	24,000	12	24,000	0	0
	FTE/OBL	12	17,499	12	25,979	12	24,000	12	24,000	0	0
National Marine Fisheries Service	Pos/BA	238	123,179	243	95,000	243	95,000	243	95,000	0	0
	FTE/OBL	238	143,763	243	153,219	243	95,000	243	95,000	0	0
Oceanic and Atmospheric Research	Pos/BA	24	38,300	25	50,000	25	50,000	25	50,000	0	0
	FTE/OBL	24	44,667	25	51,144	25	50,000	25	50,000	0	0
National Weather Service	Pos/BA	165	58,400	169	44,000	169	44,000	169	44,000	0	0
	FTE/OBL	165	60,905	169	62,055	169	44,000	169	44,000	0	0
National Environmental Satellite, Data, and Information Service	Pos/BA	32	20,346	33	15,000	33	15,000	33	15,000	0	0
	FTE/OBL	32	26,171	33	22,384	33	15,000	33	15,000	0	0
Program Support	Pos/BA	24	8,991	0	0	0	0	0	0	0	0
	FTE/OBL	24	11,451	0	0	0	0	0	0	0	0
Mission Support	Pos/BA	0	0	23	12,000	23	12,000	23	12,000	0	0
	FTE/OBL	0	0	23	12,645	23	12,000	23	12,000	0	0
Office of Marine and Aviation Operations	Pos/BA	0	0	1	2,000	1	2,000	1	2,000	0	0
	FTE/OBL	0	0	1	2,774	1	2,000	1	2,000	0	0
Total	Pos/BA	495	266,216	506	242,000	506	242,000	506	242,000	0	0
	FTE/OBL	495	304,456	506	330,200	506	242,000	506	242,000	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Reimbursable Obligations	495	304,456	506	330,200	506	242,000	506	242,000	0	0
Total Obligations	495	304,456	506	330,200	506	242,000	506	242,000	0	0
Adjustments to Obligations:										
Unobligated balance, SOY Reimbursable	0	(126,875)	0	(88,200)	0	0	0	0	0	0
Unobligated balance transferred	0	800	0	0	0	0	0	0	0	0
Recoveries of prior year obligations	0	(365)	0	0	0	0	0	0	0	0
Unobligated balance, EOY Reimbursable	0	88,200	0	0	0	0	0	0	0	0
Total Budget Authority	495	266,216	506	242,000	506	242,000	506	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)

	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ (Decrease)
Direct Discretionary Obligation	3,529,405	3,602,210	3,560,467	3,120,121	(440,346)
Direct Mandatory Obligation	35,478	55,336	34,851	34,851	0
Reimbursable Obligation	304,456	330,200	242,000	242,000	0
Total Obligations	3,869,339	3,987,746	3,837,318	3,396,972	(440,346)
Adjustments and Obligations:					
Federal funds	(185,029)	(194,760)	(194,760)	(194,760)	0
Non-Federal Sources	(42,692)	(47,240)	(47,240)	(47,240)	0
Change Uncollected Customer Pmts from Fed.	(38,402)	0	0	0	0
Returned to Treasury	0	304	0	0	0
Deobligation/Recoveries	(33,784)	(17,500)	(27,500)	(27,500)	0
Unobligated balance adjusted, SOY (Direct Disc.)	(113,800)	(110,303)	0	0	0
Unobligated balance adjusted, SOY (Mand.)	(44,037)	(56,780)	(43,255)	(43,255)	0
Unobligated balance, transferred to other accounts	0	0	0	0	0
Unobligated balance, EOY (Direct Disc.)	110,303	0	0	0	0
Unobligated balance, EOY (Mand.)	2,034	2,821	0	0	0
Unobligated balance, deferred	56,780	40,434	38,479	38,479	0
Unobligated balance, Expiring Direct	1,141	0	0	0	0
Unobligated balance, SOY Reimbursable	(126,875)	(88,200)	0	0	0
Unobligated balance, EOY Reimbursable	88,200	0	0	0	0
Unobligated balance, Rescission	0	(18,000)	0	0	0
Total Budget Authority	3,543,178	3,498,522	3,563,042	3,122,696	(440,346)
Financing from Tranfers and Other:					
Transfer from P&D to ORF	(130,164)	(130,164)	(154,868)	(154,868)	0
Transfer from PCSRF to ORF	(65)	0	0	0	0
Transfer from ORF to PAC	1,358	0	0	0	0
Transfer from PAC to ORF	(14,430)	0	0	0	0
NOAA Corps Retirement Pay (Mand)	(29,375)	(30,102)	(30,075)	(30,075)	0
Spectrum Relocation Fund (Mand)	(20,627)	(12,013)	0	0	0
Unobligated balance, Rescission	18,000	18,000	0	0	0
Net Appropriation	3,367,875	3,344,243	3,378,099	2,937,753	(440,346)

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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	3	12,440
Adjustments	(3)	46,757
Financing		<u>(27,500)</u>
Other Changes		
2018 Pay raise		6,980
2019 Military Pay raise		498
Change in compensable days		5,789
Civil Service Retirement System (CSRS)		(1,424)
Federal Employee Retirement System (FERS)		2,595
Thrift Savings Plan		407
Federal Insurance Contribution Act (FICA) - OASDI		1,291
Health Insurance		3,477
Employees Compensation Fund		(13)
Per Diem		323
Rental payments to GSA		5,368
Postage		1
GPO Printing		55
NARA Storage & Maintenance		162
General Pricing Level Adjustment		17,017
Working Capital Fund		1,282
Grants		1,055
Subtotal, other changes		<u>44,863</u>
Total, adjustments to base	<u>0</u>	<u>76,560</u>

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

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	1,075,019	1,127,755	1,137,720	1,125,758	(11,962)
11.3 Other than full-time permanent	6,388	6,354	6,378	6,378	0
11.5 Other personnel compensation	61,244	60,926	61,030	61,030	0
11.6 Leave Surcharge	(4,730)	(4,705)	(4,705)	(4,705)	0
11.7 Military personnel	34,034	34,582	35,279	35,279	0
11.9 Total Personnel Compensation	1,171,955	1,224,912	1,235,702	1,223,740	(11,962)
12 Civilian personnel benefits	382,045	397,498	406,627	402,505	(4,122)
13 Benefits for former personnel	26,044	28,800	28,773	28,773	0
21 Travel and transportation of persons	42,352	42,131	42,454	40,638	(1,816)
22 Transportation of things	15,234	15,155	15,413	14,561	(852)
23.1 Rental payments to GSA	84,226	84,718	90,086	87,361	(2,725)
23.2 Rental payments to others	30,591	30,432	30,949	29,370	(1,579)
23.3 Communications, utilities and miscellaneous charges	74,823	74,436	75,701	75,322	(379)
24 Printing and reproduction	3,224	3,207	3,262	3,214	(48)
25.1 Advisory and assistance services	203,033	201,979	201,979	176,708	(25,271)
25.2 Other services from non-Federal sources	561,515	479,170	475,712	433,406	(42,306)

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

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
25.3 Other goods and services from Federal sources	113,965	113,373	134,017	127,485	(6,532)
25.5 Research and development contracts	19,301	19,200	19,200	12,742	(6,458)
26 Supplies and materials	95,358	94,863	96,476	91,058	(5,418)
31 Equipment	32,085	31,919	32,462	29,700	(2,762)
32 Lands and structures	897	892	892	892	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies, and contributions	708,150	704,473	705,528	377,412	(328,116)
42 Insurance claims and indemnities	19	19	19	19	0
43 Interest and dividends	66	66	66	66	0
44 Refunds	0	0	0	0	0
99 Total Obligations	3,564,883	3,547,243	3,595,318	3,154,972	(440,346)

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

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
Prior Year Recoveries	(33,784)	(17,500)	(27,500)	(27,500)	0
Unobligated Balance, Start of Year	(113,800)	0	0	0	0
Unobligated Balance, Rescission	0	(18,000)	0	0	0
Unobligated Balance, End of Year	110,303	0	0	0	0
Unobligated Balance, Expiring	1,141	0	0	0	0
Collections	(89)	0	0	0	0
Subtotal Budget Authority	3,528,654	3,511,743	3,567,818	3,127,472	(440,346)
Less: NOAA Corps	(27,341)	(30,102)	(30,075)	(30,075)	0
Less: Spectrum Relocation	(8,137)	(25,234)	(4,776)	(4,776)	0
Total Discretionary ORF Budget Authority	3,493,176	3,456,407	3,532,967	3,092,621	(440,346)
Positions	10,805	11,834	11,834	11,381	(453)
FTE	10,752	11,289	11,289	10,977	(312)

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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	Appropriation	Budget Authority	Direct Obligations
2018 Annualized CR	329	296	2,227,423	2,221,121	2,439,689
2019 Adjustments to base:					
Less: Carryover	0	0	0	0	(200,568)
Plus: 2019 Other Adjustments to Base	(3)	(3)	(12,440)	(7,440)	(12,440)
2019 Base	326	293	2,214,983	2,213,681	2,226,681
Plus (or less): 2019 Program Changes	0	0	(591,977)	(591,977)	(591,977)
2019 Estimate	326	293	1,623,006	1,621,704	1,634,704

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

Comparison by activity/subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	2	3,667	2	3,676	2	3,676	2	1,541	0	(2,135)
	FTE/OBL	2	3,998	2	4,070	2	3,676	2	1,541	0	(2,135)
National Marine Fisheries Service	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	199	0	1,700	0	0	0	0	0	0
Oceanic and Atmospheric Research	Pos/BA	0	36,235	0	36,134	0	36,134	0	26,000	0	(10,134)
	FTE/OBL	0	36,351	0	36,134	0	36,134	0	26,000	0	(10,134)
National Weather Service	Pos/BA	33	140,542	26	140,829	26	140,829	26	117,576	0	(23,253)
	FTE/OBL	33	138,439	24	173,016	24	140,829	24	117,576	0	(23,253)
National Environmental Satellite, Data, & Information Service	Pos/BA	274	1,954,286	293	1,966,350	290	1,953,910	290	1,400,711	0	(553,199)
	FTE/OBL	273	1,956,685	262	1,989,399	259	1,953,910	259	1,400,711	0	(553,199)
Mission Support	Pos/BA	0	7,387	0	6,016	0	6,016	0	998	0	(5,018)
	FTE/OBL	0	88	0	13,660	0	6,016	0	998	0	(5,018)
Office of Marine Aviation & Operations	Pos/BA	2	86,119	8	86,116	8	86,116	8	87,878	0	1,762
	FTE/OBL	2	25,888	8	221,710	8	86,116	8	87,878	0	1,762
Less Deobligations/Other	Pos/BA	0	0	0	(18,000)	0	(13,000)	0	(13,000)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	311	2,228,236	329	2,221,121	326	2,213,681	326	1,621,704	0	(591,977)
	FTE/OBL	310	2,161,648	296	2,439,689	293	2,226,681	293	1,634,704	0	(591,977)

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

	2017		2018		2019		2019		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	310	2,161,648	296	2,439,689	293	2,226,681	293	1,634,704	0	(591,977)
Total Obligations	310	2,161,648	296	2,439,689	293	2,226,681	293	1,634,704	0	(591,977)
Adjustments to Obligations:										
Cash Refunds	0	0	0	0	0	0	0	0	0	0
Deobligations/Prior Year Recoveries	0	(12,804)	0	(13,000)	0	(13,000)	0	(13,000)	0	0
Unobligated Balance Expiring	0	365	0	0	0	0	0	0	0	0
Unobligated Balance Rescission Adj BA	0	0	0	(5,000)	0	0	0	0	0	0
Unobligated Balance Adj SOY	0	(126,541)	0	(200,568)	0	0	0	0	0	0
Unobligated balance, Adj EOY	0	200,568	0	0	0	0	0	0	0	0
Total Budget Authority	310	2,223,236	296	2,221,121	293	2,213,681	293	1,621,704	0	(591,977)
Financing from Transfers and Other:										
Unoblig Balance Rescission Adj Appn	0	5,000	0	5,000	0	0	0	0	0	0
Transfer from ORF to PAC	0	(1,358)	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	14,430	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	310	2,242,610	296	2,227,423	293	2,214,983	293	1,623,006	0	(591,977)

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

	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ (Decrease)
Direct Discretionary Obligation	2,161,648	2,439,689	2,226,681	1,634,704	(591,977)
Direct Mandatory Obligation	19,641	73,143	58,961	58,961	0
Total Obligations	2,181,289	2,512,832	2,285,642	1,693,665	(591,977)
Adjustments and Obligations:					
Deobligations	(12,831)	(13,000)	(13,000)	(13,000)	0
Returned to Treasury	0	46	0	0	0
Unobligated balance, adj. SOY (Disc.)	(126,541)	(200,568)	0	0	0
Unobligated balance, adj. SOY (Mand.)	(199,325)	(179,711)	(106,522)	(106,522)	0
Unobligated balance, EOY (Disc.)	200,568	0	0	0	0
Unobligated balance, EOY (Mand.)	74,635	0	0	0	0
Unobligated balance, deferred	105,076	106,522	47,561	47,561	0
Unobligated balance, expiring EOY	365	0	0	0	0
Unobligated Balance, Rescission	0	(5,000)	0	0	0
Total Budget Authority	2,223,236	2,221,121	2,213,681	1,621,704	(591,977)
Financing from Tranfers and Other:					
Transfer from PAC to ORF	14,430	0	0	0	0
Transfer from ORF to PAC	(1,358)	0	0	0	0
Transfer to OIG	1,302	1,302	1,302	1,302	0
Unobligated Balance, Rescission	5,000	5,000	0	0	0
Net Appropriation	2,242,610	2,227,423	2,214,983	1,623,006	(591,977)

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ADJUSTMENTS TO BASE
 (Dollar amounts in thousands)

	FTE	Amount
Transfers	(3)	(12,440)
Adjustments		13,000
Financing		<u>(13,000)</u>
Total, adjustments to base	(3)	(12,440)

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SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollars amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
11 Personnel Compensation					
11.1 Full-time permanent	40,116	37,955	37,637	37,637	0
11.3 Other than full-time permanent	187	198	198	198	0
11.5 Other personnel compensation	1,530	1,622	1,622	1,622	0
11.6 Leave Surcharge	0	0	0	0	0
11.7 Military personnel	0	0	0	0	0
11.9 Total Personnel Compensation	41,833	39,775	39,457	39,457	0
12 Civilian personnel benefits	17,797	17,127	17,127	17,127	0
13 Benefits for former personnel	2	2	2	2	0
21 Travel and transportation of persons	2,290	2,428	2,428	2,428	0
22 Transportation of things	1,479	1,568	1,568	1,568	0
23.1 Rental payments to GSA	5,920	6,038	6,038	6,038	0
23.2 Rental payments to others	29	31	31	31	0
23.3 Communications, utilities and miscellaneous charges	20,818	22,068	22,068	22,068	0
24 Printing and reproduction	409	434	434	434	0

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SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollars amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
25.1 Advisory and assistance services	54,802	58,093	58,093	55,778	(2,315)
25.2 Other services	163,892	173,733	173,733	151,349	(22,384)
25.3 Purchases of goods and services from Govt accounts	1,606,293	1,709,338	1,683,034	1,128,025	(555,009)
25.4 Operation and maintenance of facilities	0	0	0	0	0
25.5 Research and development contracts	24,106	25,553	25,553	25,553	0
26 Supplies and materials	9,125	9,673	9,673	9,673	0
31 Equipment	178,485	189,752	189,752	189,752	0
32 Lands and structures	615	652	652	652	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	53,362	55,966	55,966	43,697	(12,269)
42 Insurance claims and indemnities	0	0	0	0	0
43 Interest and dividends	32	34	34	34	0
44 Refunds	0	0	0	0	0
99 Total Obligations	2,181,289	2,312,264	2,285,642	1,693,665	(591,977)

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SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollars amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase / (Decrease)
Prior Year Recoveries	0	0	0	0	0
Deobligations	(12,804)	(13,000)	(13,000)	(13,000)	0
Unobligated Balance, expiring	365	0	0	0	0
Unobligated Balance, Start of Year	(126,541)	0	0	0	0
Unobligated Balance, End of Year	200,568	0	0	0	0
Unobligated Balance, Rescission	0	(5,000)	0	0	0
Subtotal Budget Authority	2,242,877	2,294,264	2,272,642	1,680,665	(591,977)
Less: Spectrum Relocation	(19,641)	(73,143)	(58,961)	(58,961)	0
Total Discretionary PAC Budget Authority	2,223,236	2,221,121	2,213,681	1,621,704	(591,977)
Positions	311	329	326	326	0
FTE	310	296	293	293	0

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BUDGET PROGRAM: NATIONAL OCEAN SERVICE

For FY 2019, NOAA requests a total of \$406,297,000 and 1,125 FTE for the National Ocean Service, including a net decrease of \$141,046,000 and 0 FTE in program changes.

National Ocean Service Overview

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. Even inland export and import industries 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 creates a constant risk of spills, including catastrophic ones like the Deepwater Horizon 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 of 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.

The National Ocean Service budget program comprises three activities within the Operations, Research, and Facilities (ORF) account:

- Navigation, Observations and Positioning (\$207,720,000 and 550 FTE)
- Coastal Science and Assessment (\$83,202,000 and 248 FTE)
- Ocean and Coastal Management and Services (\$228,042,000 and 309 FTE)

NOS Procurement, Acquisition, and Construction (PAC) activities (\$3,676,000 and 2 FTE) include the National Marine Sanctuaries

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

Construction and National Estuarine Research Reserve Construction Programs.

NOS manages three other accounts:

- NOAA Damage Assessment and Restoration Revolving Fund
- Sanctuaries Enforcement Asset Forfeiture Fund
- Gulf Coast Ecosystem Restoration Science, Observation, Monitoring & Technology Fund

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2019 Base includes a total of \$5,042,000 to account for inflationary adjustments to current programs for NOS activities. This includes inflationary increases for labor and non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)

Activity: Navigation, Observations and Positioning

Comparison by subactivity		2017		2018		2019		2019		Increase/	
		Actual		Annualized CR		Base Program		Estimate		(Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Navigation, Observations and Positioning	Pos/BA	528	147,472	540	147,998	540	150,408	540	143,357	0	(7,051)
	FTE/OBL	525	148,092	537	151,702	537	150,408	537	143,357	0	(7,051)
Hydrographic Survey/Priorities Contracts	Pos/BA	22	26,723	13	26,818	13	26,818	13	26,949	0	131
	FTE/OBL	22	27,170	13	26,818	13	26,818	13	26,949	0	131
IOOS Regional Observations	Pos/BA	0	30,393	0	30,494	0	30,494	0	19,444	0	(11,050)
	FTE/OBL	0	30,024	0	30,945	0	30,494	0	19,444	0	(11,050)
Total Navigation, Observations and Positioning	Pos/BA	550	204,588	553	205,310	553	207,720	553	189,750	0	(17,970)
	FTE/OBL	547	205,286	550	209,465	550	207,720	550	189,750	0	(17,970)

Goal Statement

NOAA carries out the Navigation, Observations and Positioning activity under the Coast and Geodetic Survey Act, the Hydrographic Services Improvement Act, the Integrated Coastal and Ocean Observation System Act, and the Ocean and Coastal Mapping Integration Act. These 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 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 and sets standards for all foundational positioning and geodesy activity.
- **Center for Operational Oceanographic Products and Services (CO-OPS)** produces oceanographic observations and

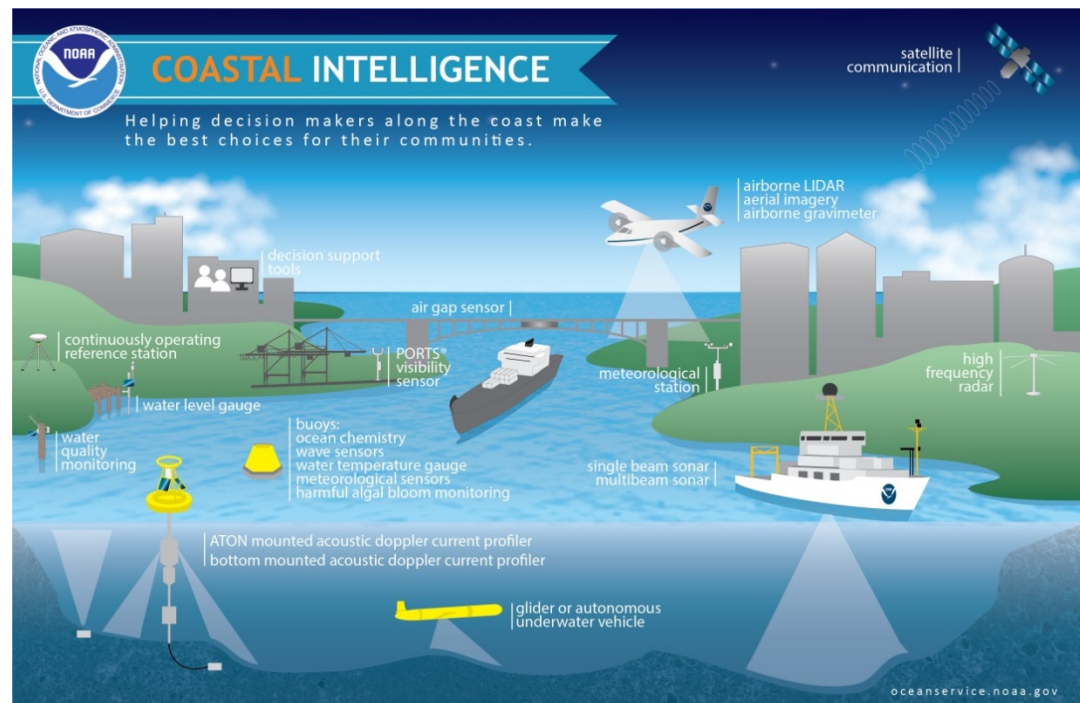
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forecasts of tides, currents, and water levels.

- **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.

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 2016, U.S. seaports moved \$1.46 trillion of goods in international cargo², supporting agriculture, manufacturing, retail trade and other activities. The total economic impact to the national economy exceeds \$4 trillion annually³. Commercial shippers, fishers, the 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



² U.S. Department of Commerce, Census Bureau. (2016). FT920 U.S. Merchandise Trade: Selected Highlights, December 2016. p.1. Retrieved February 24, 2017 from https://www.census.gov/foreign-trade/Press-Release/ft920_index.html

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>

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vessel traffic and cargo value is expected to double between 2015 and 2021 and double again shortly after 2030⁴. NOAA uses all resources available to meet this demand, including through initiatives such as the Integrated Ocean and Coastal Mapping (IOCM) initiative. Through IOCM, NOAA leads the National 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.
- **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. 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 most 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. These data are essential for

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.

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nautical charts and the determination of U.S. maritime boundaries such as the EEZ. NOAA maps the shoreline with tidally coordinated, geo-referenced data from aerial photographs, high-resolution satellite imagery, and aerial topographic-bathymetric (topobathy) LIDAR. LIDAR has the ability to provide shallow water bathymetry in areas difficult 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.

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 support development of a 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 and again to 67 feet in 2017. For every extra foot of draft, tankers can load 40,000 additional barrels of crude oil, valued at \$2 million. The long-term goal is to achieve 69 feet of draft, at which point offshore lightering will no longer be required. Lightering, the ship-to-ship transfer of cargo while underway, is currently a major driver of cost and safety/environmental risk.

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:

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- **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 (2014).
- **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 13 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. For example, on February 14, 2015, water levels in the northern portion of the Chesapeake Bay fell three feet below published predictions. The Chesapeake Bay Operational Forecast System successfully predicted the event and the National Weather Service issued a special marine weather statement to alert ships that might have otherwise been at risk of grounding. These operational forecasts are also the engine for ecological forecasts of harmful algal blooms and other ecological hazards. NOAA plans to operationalize models for the Gulf of Maine in FY 2018 and 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, on April 3, 2016 the water levels in the Delaware River at the Newbold tide station just outside of Philadelphia were 6.29 feet below published predictions. In response to PORTS[®] data readings, the President of the Delaware River Pilots was able to delay the transits of two deep draft ships, thereby averting potential groundings. PORTS[®] systems in operation serve 78 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, 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

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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 2017 NOAA supported the initiation of a new PORTS® in Matagorda Bay as well as several enhancement to existing systems.

The Integrated Ocean Observing System (IOOS) is a unified network of Federal and non-Federal observing assets that serve coastal industries and decision-makers. The NOAA IOOS program serves the dual functions of providing technical and funding support for 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 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. 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 and inundation forecasting. The Ocean Technology Transition (OTT) program supports research, development, testing, and evaluation of new sensor technology and observing strategies, and advances modeling through the Coastal and Ocean Modeling Testbed (COMT). Coordination among the research community and IOOS regional associations ensures that new observations improve operational models and forecasts.

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

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(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.⁵ 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 comprises five major elements:

- **Continuously Operating Reference Stations (CORS) and Passive Infrastructure.** CORS are a publicly available network 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 effort to collect gravity data and build the Nation's gravimetric geoid model. This initiative 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.
- **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. NOAA also runs the Geodetic Advisor Program, which provides training and assistance to state and local geodetic and survey programs, GIS users, and coastal managers.
- **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

⁵ Socio-Economic Benefits Study: Scoping the Value of CORS and GRAV-D, Leveson, 2009.

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measurements. These tools are crucial to scientific and commercial positioning activities.

Statement of Operating Objectives

Schedule and Milestones:

- Complete development of Automated Nautical Charting System II by FY 2022
- Progressively implement data archive capability for ocean mapping data from University-National Oceanographic Laboratory System (UNOLS) and NOAA non-hydrographic vessel projects (FY 2019-2021)
- 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
- 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 published annually
- 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
- 2,279 square nautical miles of hydrographic data
- One third of National Shoreline and Priority Ports Shoreline updated with new aerial imagery and elevation data

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CHANGES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>		<u>Personnel</u>		<u>Personnel</u>	<u>Amount</u>
		Amount		Amount			
Navigation, Observations, and Positioning	Pos./BA	540	150,408	540	143,357	0	(7,051)
	FTE/OBL	537	150,408	537	143,357	0	(7,051)

Eliminate Single-Year Grant to Mississippi Joint Ocean and Coastal Mapping Center (0 FTE/ 0 Positions, -\$1,987) – NOAA proposes to discontinue new funding awards for the joint ocean and coastal mapping center 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 applied research and development of survey, geospatial data management, and cartographic technologies through the Joint Hydrographic Center, the Coast Survey Development Laboratory, and other Navigation, Observation and Positioning programs.

Eliminate Regional Geospatial Modeling Grants (0 FTE/ 0 Positions, -\$5,960) – 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 height modernization, Continuously Operating Reference Stations (CORS), data access and capacity building.

Maintenance of Core Geospatial and Oceanographic Data and Products (0 FTE/ 0 Positions, \$896,000) – NOAA requests an increase to core Navigation, Observations, and Positioning programs. Additional funds will boost the reliability and accuracy of foundational geospatial data and physical oceanographic observations for myriad applications: safe navigation, coastal flood forecasting, emergency response, habitat restoration, fishing, recreation, coastal energy development, and many others. Activities include NOAA’s continued efforts to:

- Modernize the NOAA charting suite. Updating Electronic Navigational Charts (ENC) optimizes their use in electronic navigational systems, meeting the needs of the user communities and the International Maritime Organization’s ENC carry requirement for large vessels. Maintain hydrographic survey equipment. Properly maintained equipment maximizes the collection of hydrographic survey data to maintain chart accuracy for safe maritime navigation.

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- Modernize and improve the National Spatial Reference System (NSRS) the framework and coordinate system for all positioning activities in the Nation. NOAA's Office of National Geodetic Survey (NGS) is updating and integrating the horizontal and vertical datums in order to provide accurate positioning data.
- Maintain NOAA's 210 National Water Level Observation Network (NWLON) stations. Annual maintenance is essential to maintaining system integrity and the reliability of information used to navigate ships and measure sea level trends.

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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 Grant to Mississippi Joint Ocean and Coastal Mapping Center

<u>Object Class</u>	<u>2019 Decrease</u>
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(1,987)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(1,987)

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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

		2019
Object Class		Decrease
11	Personnel compensation	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(5,960)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	(5,960)

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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: Maintenance of Core Geospatial and Oceanographic Data and Products

Object Class	2019 Increase
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	534
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	362
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	896

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INCREASES FOR 2019**
(Dollar amounts in thousands)

	<u>2019 Base</u>		<u>2019 Estimate</u>		<u>Increase</u>	
	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Pos./BA	13	26,818	13	26,949	0	131
FTE/OBL	13	26,818	13	26,949	0	131

Hydrographic Survey Priorities / Contracts (0 FTE/ 0 Positions, \$131) – NOAA requests an increase to acquire critical hydrographic survey data. This will allow NOAA to survey approximately five additional square nautical miles (SNM). The increase will support the core NOAA mission of maintaining the information infrastructure that is essential to safe and efficient maritime commerce. Primary users of NOAA hydrographic data and products include the marine transportation industry, commercial fishers, national security and law enforcement agencies, and recreational boaters. The data is also necessary for other non-navigational applications such as storm surge modeling.

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Performance Measures:					
Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (SNM) (indicator 3.3h)*					
With increase	2,188	2,188	2,188	2,188	2,188
Without increase	2,183	2,183	2,183	2,183	2,183

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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	2019 Increase
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	131
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	131

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DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
IOOS Regional Observations	Pos./BA	0	30,494	0	19,444	0	(11,050)
	FTE/OBL	0	30,494	0	19,444	0	(11,050)

Reduce Integrated Ocean Observing System Regional Observation Grants (0 FTE/ 0 Positions, -\$11,050) – NOAA requests to reduce grants to 11 regional observing systems under the Integrated Coastal and Ocean Observation System Act of 2009.

NOAA proposes to reduce grants to the 11 IOOS Regional Associations under the IOOS Regional Observations Program. NOAA will continue to support the 11 IOOS Regional Associations at the reduced funding level.

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.

The Regional Associations spend these funds to deploy, operate, and maintain 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 transform raw observation data into useful tools. The Regional Associations fill critical ocean observing information gaps providing over 50 percent of the marine data used by the National Weather Service. 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 CHANGES DETAIL BY OBJECT CLASS
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Activity: Navigation, Observations and Positioning
Subactivity: IOOS Regional Observations
Program Change: Reduce Integrated Ocean Observing System Regional Observation Grants

Object Class	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(11,050)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(11,050)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)**

Activity: Coastal Science and Assessment

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Science,	Pos/BA	244	71,855	254	72,112	254	73,269	254	74,042	0	773
Assessment, Response and Restoration	FTE/OBL	243	72,723	248	72,528	248	73,269	248	74,042	0	773
Competitive Research	Pos/BA	2	9,905	0	9,933	0	9,933	0	0	0	(9,933)
	FTE/OBL	2	9,883	0	10,006	0	9,933	0	0	0	(9,933)
Total Coastal Science and Assessment	Pos/BA	246	81,760	254	82,045	254	83,202	254	74,042	0	(9,160)
	FTE/OBL	245	82,606	248	82,534	248	83,202	248	74,042	0	(9,160)

Goal Statement

Under the Coastal Science and Assessment subprogram, NOAA conducts applied research and delivers scientific information for disaster response and management, protection, and restoration of ocean and coastal resources. Communities and businesses that depend on coastal ecosystem services use NOAA data to mitigate adverse effects of natural resource damage and coastal ecosystem changes.

NOAA carries out these activities under the Clean Water Act; Oil Pollution Act; Comprehensive Environmental Response, Compensation, and Liability Act; National Coastal Monitoring Act; Marine Debris Act; and Harmful Algal Bloom and Hypoxia Research and Control Act. The research from this activity also helps to inform NOAA’s activities under the National Marine Sanctuaries Act, Coastal Zone Management Act, and international treaties and conventions.

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.

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- **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 spills, releases from hazardous waste sites, 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.

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 biogeographic assessments, habitat mapping, and research on aquaculture siting and sustainability. Ecological forecasts for hazards such as harmful algal blooms and pathogens help communities safeguard drinking water and fisheries resources. 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 and maintain critical partnerships with users 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 marine protected 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.

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The NCCOS Competitive Research Program conducts research, monitoring, and assessment activities through competitive extramural grants. This program has provided the only national competitive grants that are dedicated 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 habitat loss, extensive 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



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Response Center, to improve National preparedness for and response to all hazard types.

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 \$10.4 billion for restoration from responsible parties at over 175 oil spills, Superfund sites and ship groundings, since 1998. This amount includes \$8.1 billion from the April 2016 settlement with BP for the Deepwater Horizon spill. These funds are reserved for ecosystem restoration and restoration of passive and active recreational use of the damaged resources, and does not include 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.

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, monitoring, emergency response, removal, and regional coordination. NOAA chairs the Interagency Marine Debris Coordinating Committee and is engaged in international coordination as the chair of the United Nations Global Partnership on Marine Litter in support of the G-7 marine litter initiative. NOAA also provides science expertise for severe marine debris events.

Statement of Operating Objectives

Schedule and Milestones:

- Sustain operational ecological forecasting services, develop enhanced capabilities for habitat and pathogens, and initiate transition to operations for limited HAB forecasts (ongoing)
- Develop and distribute high-quality ecological data, information, knowledge, and tools to support science-based decision-making and ecosystem-based management in select NOAA-managed areas. (ongoing)
- Develop Marine Debris Rapid Response plans with partners in the Gulf of Mexico, the southeast, and the northeast as outlined

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in the Marine Debris Act 2012 reauthorization (ongoing)

- Resolve liability for four natural resource damage assessment cases annually (ongoing)
- Release updates to two publicly available emergency response tools annually (ongoing)
- Train 2000 emergency responders annually
- Remove 400 tons of marine debris annually

Deliverables:

- Pathogen forecasts in the Chesapeake Bay, and Pacific Northwest (FY 2019-2020)
- Geospatial data, mapping products, and integrated assessments to inform management, restoration, and research plans in the Gulf of Mexico (FY 2019-2020)
- Up to two research projects funded annually that address marine debris research and development priorities (ongoing)
- Improved spill trajectory models for Beaufort/Chukchi Seas (FY 2019)
- Updated Arctic operational oceanographic and oil fate and behavior models to include oil-in-ice behavior to support oil spill response (FY 2019)
- 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 2019-2023)

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CHANGES FOR FY 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>	
						<u>Amount</u>	
Coastal Science, Assessment, Response and Restoration	Pos./BA	254	73,269	254	74,042	0	773
	FTE/OBL	248	73,269	248	74,042	0	773

Improve Disaster Preparedness (0 FTE/ 0 Positions, +\$1,240) – NOAA requests an increase for the Disaster Preparedness Program.

The 2017 hurricane season, with damages estimated at over \$200 billion, was the most costly in US history. High-intensity storms that produce substantially more rainfall will continue to become more frequent in the future.⁶ To better address these risks, NOS will further expand on activities of the Gulf of Mexico Disaster Response Center. The Disaster Preparedness Program (DPP) bolsters NOS’s emergency responses to coastal storms and other disasters. With additional budgetary resources, the DPP will advance a multi-faceted and dedicated approach to ensure that commerce, communities and natural resources can recover as quickly as possible:

- **Exercises and Training:** The DPP’s top priority is developing a multi-year exercise and training program that improves NOS’s overall response posture. Expanding large-scale exercises and training will give personnel the experience and knowledge to respond to disasters in a manner that is appropriate to the specific challenges of each geographic region. It also ensures a deep bench of experienced responders when disaster strikes.
- **Continuous Improvement:** Each disaster, whether an exercise or actual response, gives NOAA valuable emergency response experience that can spur innovations in procedures and better scientific understanding. The DPP will foster continuous improvement between disasters through after action reviews. Valuable lessons learned can then be applied to make future responses more effective.

⁶ Emanuel, K. (2017) Assessing the present and future probability of Hurricane Harvey’s rainfall. PNAS, November 28, 2017 vol. 114 no. 48 12681-12684

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- **Coordination:** Coordination is critical to the success of all disaster responses. It enables seamless sharing of information and helps responders work better together in times of crisis. To improve coordination, additional funds will help maintain an emergency responder community of practice within NOS, with interagency partners, and local stakeholders. Enhancement of the NOS Incident Management Team, which provides support for operations, planning, logistics and administration/finance during an emergency, will also ensure a deep bench of response-ready staff.

Reduce Marine Debris Program (0 FTE/ 0 Positions, -\$467) – NOAA requests a decrease to the Marine Debris Program. This would align the requested budget with previously requested program levels in the FY 2017 and FY 2018 President’s Budgets. NOAA would continue its important marine debris reduction, prevention, research, monitoring, and removal activity, while balancing its level of budgetary resources with other requirements in the Department.

	2019	2020	2021	2022	2023
Performance Measures:					
Number of responders trained in technical and scientific elements and tools of incident response					
With Increase	2,500	3,000	3,200	3,300	3,400
Without Increase	2,000	2,000	2,000	2,000	2,000
Number of training courses provided and exercises with NOS participation that build response capacity in support of NOS/NOAA mission and the NOAA CONOPS Plan					
With Increase	4	5	5	6	6
Without Increase	3	3	3	3	3

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(Dollar amounts in thousands)

Activity: Coastal Science and Assessment
Subactivity: Coastal Science, Assessment, Response and Restoration
Program Change: Improve Disaster Preparedness

Object Class	2019 Increase
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	20
22 Transportation of things	1
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	4
25.1 Advisory and assistance services	1,215
25.2 Other services	0
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	1,240

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(Dollar amounts in thousands)

Activity: Coastal Science and Assessment
Subactivity: Coastal Science, Assessment, Response and Restoration
Program Change: Reduce Marine Debris Program

<u>Object Class</u>	<u>2019 Decrease</u>
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	(200)
25.2 Other services	0
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(267)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(467)

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Operations, Research, and Facilities
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Competitive	Pos./BA	0	9,933	0	0	0	(9,933)
Research	FTE/OBL	0	9,933	0	0	0	(9,933)

Eliminate NCCOS competitive funding support for research on ecological threats (0 FTE/ 0 Positions, -\$9,933) – NOAA requests a decrease 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 2019 with 26 open awards that received funding in FY 2017. FY 2019 is scheduled to be the final year of funding for 18 of these 26 projects. In addition, NOAA expects to award five to nine new investigations in FY 2018 under the baseline budget. All open projects 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 grants. 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 six programs with 21 projects and 28 associated awards to 25 institutions and over 64 principal investigators. Topics 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;

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- 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.

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, as well as operational HAB bulletins for Lake Erie and the Pacific Northwest. In addition NOAA has experimental research models for HABs, hypoxia and marine pathogens in vulnerable coastal and Great Lakes areas around the country. A number of these capabilities, such as weekly HAB bulletins for the Gulf of Maine and seasonal hypoxia models for the Gulf of Mexico and Chesapeake Bay, would be eliminated under this proposal.

	2019	2020	2021	2022	2023
Performance Measures:					
Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for management (indicator 3.3d; NCCOS contribution only) (with decrease)					
With Decrease	7	7	7	7	7
Without Decrease	11	13	14	14	14
Annual number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management (indicator 3.3c) (with decrease)					
With Decrease	8	8	8	8	8
Without Decrease	10	10	10	10	10

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

Activity: Coastal Science and Assessment
Subactivity: Competitive Research
Program Change: Eliminate NCCOS Competitive Funding Support for research on ecological threats

Object Class	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(9,933)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(9,933)

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Activity: Ocean and Coastal Management and Services

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Coastal Zone Management and Services	Pos/BA	114	42,081	118	42,214	118	42,779	118	40,489	0	(2,290)
	FTE/OBL	113	42,256	116	42,634	116	42,779	116	40,489	0	(2,290)
Coastal Management Grants	Pos/BA	3	84,195	0	84,429	0	84,429	0	0	0	(84,429)
	FTE/OBL	3	83,783	0	85,059	0	84,429	0	0	0	(84,429)
Coral Reef Program	Pos/BA	19	25,833	19	25,925	19	26,003	19	26,033	0	30
	FTE/OBL	19	25,696	19	26,407	19	26,003	19	26,033	0	30
National Estuarine Research Reserve System	Pos/BA	0	23,262	0	23,342	0	23,342	0	0	0	(23,342)
	FTE/OBL	0	23,257	0	23,360	0	23,342	0	0	0	(23,342)
Sanctuaries and Marine Protected Areas	Pos/BA	175	50,490	177	50,657	177	51,489	177	49,739	0	(1,750)
	FTE/OBL	174	51,602	174	50,825	174	51,489	174	49,739	0	(1,750)
Total, Ocean and Coastal Management and Services	Pos/BA	311	225,861	314	226,567	314	228,042	314	116,261	0	(111,781)
	FTE/OBL	309	226,594	309	228,285	309	228,042	309	116,261	0	(111,781)

Goal Statement

Activities and programs under the Ocean and Coastal Management and Services activity 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. NOAA conducts these activities under the Coastal Zone Management Act; the National Marine Sanctuaries Act; the Coastal Zone Act Reauthorization Amendments of 1990 (the Coastal Nonpoint Pollution Control Program); the Department of Commerce, Justice, and State Appropriations Act of 2002; the Omnibus Public Land Management Act; the Ocean Thermal Energy Conversion Act and the Deep Seabed Hard Mineral Resources Act; the Ocean and Coastal Mapping Integration Act; Executive Order 13158 on Marine Protected Areas; and Presidential Proclamations 8031 and 8337.

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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, including technical assistance such as NOAA's Digital Coast Partnership, and the Coral Reef Conservation Program. The office also administers and supports regional partnerships of coastal states and 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. 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.

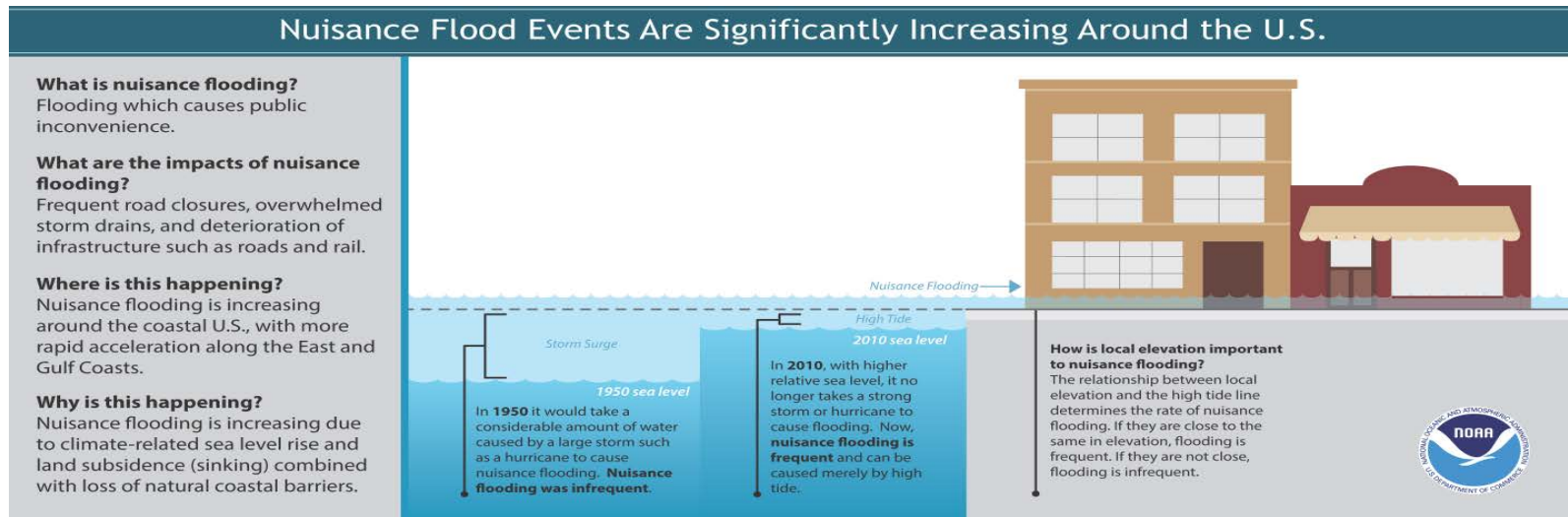
Coastal Zone Management and Services

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.

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

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 actions in state waters 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.⁷ 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

⁷ Projected Benefits and Costs of the Digital Coast. NOAA, 2015. <https://coast.noaa.gov/data/digitalcoast/pdf/benefits-costs.pdf>

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city prioritized future investments that would reduce dramatic economic losses from flooding-related coastal property damage and tourism impacts.

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 infrastructure⁸ and four refineries that produce 800,000 barrels of gasoline a day—a quarter of the state's total refining capacity.⁹ 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 and valued at \$25 billion annually.¹⁰ The 27 Texas refineries represent 29 percent of the Nation's refining capacity at more than 5.1 billion barrels of crude oil per day.¹¹ 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. These are just a few examples. 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.¹²

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 benefitted 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.

National Estuarine Research Reserve System

⁸ 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

⁹ 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>

¹⁰ 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>

¹¹ Texas General Land Office. 2017. Coastal Resiliency Master Plan. Available at <http://www.glo.texas.gov/coastal-grants/projects/files/Master-Plan.pdf>

¹² 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/>

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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 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.¹³

Reserves also serve as “living laboratories” for developing solutions to crucial issues such as climate adaptation, invasive species, habitat protection, and water quality. In 2016, reserves provided 82,000 hours of assistance to coastal decision-makers through 276 training programs. According to annual performance measure data collected by NOAA in 2017, NERRS scientific and technical services reach over 2,500 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.

NOAA and the State of Hawaii designated the system’s 29th reserve in January 2017. The new He’eia National Estuarine Research Reserve covers over 1,000 acres of land and water in Kane’ohe Bay in Oahu, Hawai’i. The University of Hawai’i’s Institute of Marine Biology is managing the site in collaboration with a wide array of state and local partners.

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

¹³ 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](https://doi.org/10.1579/0044-7447(2008)37[241:TVOCWF]2.0.CO;2)

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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.¹⁴ Rapid declines in coral reefs – 19 percent of the world’s reefs are effectively lost¹⁵ and up to 75 percent are seriously threatened – have dire consequences for approximately 1 billion people who depend on coral reefs for their food and livelihoods.¹⁶

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 (MPA) 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 the system encompasses 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.¹⁷

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

¹⁴ 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/>

¹⁵ “Coral Reef Loss Suggests Global Extinction Event.” Available at <http://www.worldwatch.org/node/5960>

¹⁶ United Nations Ocean Conference <https://oceanconference.un.org/coa/CoralReefs>

¹⁷ 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.

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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. A 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, are cornerstones of sanctuary management.

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 (such as webinar series) to improve management capacity of MPA programs. The Center also coordinates internationally with agencies that manage sites that share migratory species or have similar habitat and management challenges. The MPA Federal Advisory Committee advises NOAA and includes representatives of industry, user groups, scientists, and others with expertise in ocean issues.

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 2019-2023)
- Deliver technical assistance to coastal communities to use Digital Coast for decisions (FY 2019-2023)
- Implement best practices to reduce pollutant loadings in U.S. Coral Reef Task Force priority watershed sites and NOAA Habitat Focus Areas (FY 2019-2023)
- Conduct coral reef assessment and monitoring cruises in Pacific and Atlantic/Caribbean (FY 2019-2023)
- Implement additional sentinel monitoring activities to assess impacts of threats (e.g. climate change, biodiversity loss, invasive species) to ONMS resources and detect early warnings of change at national, regional, and local scales (FY 2019-2023)

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- Implement information management protocols, infrastructure, and partnerships for ONMS Sentinel Monitoring Program (FY 2019)
- Complete the boundary modification processes for Flower Garden Banks and Monitor national marine sanctuaries (FY 2019)

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-site and interactive webinar training to introduce successful approaches and best practices to address future risks from coastal storms or other hazards
- Annual updates of Economics - National Ocean Watch data to characterize the economic and job impacts of ocean and coastal activity
- Forecasts and models that enable reef managers' monitoring of and response to coral bleaching events
- Improved coral bleaching forecasts and ocean acidification models
- Management strategies to improve coral reef protection through targeted research to better understand impacts of stressors to coral reefs
- Complete assessments on management effectiveness of 20 Marine Protected Areas (MPAs) in priority coral reef sites
- Marine acoustics programs to determine the distribution of marine mammals and vessel traffic patterns at Stellwagen Bank and Channel Islands sanctuaries
- Education initiatives at all sites to protect marine mammals from vessel strikes
- Rapid response marine mammal disentanglement and rescue operations
- New education, survey, and eradication programs to avoid and mitigate introduction of invasive species in multiple sanctuaries
- Nine natural resource environments managed by ONMS that have stable or improving water, habitat or living resource quality
- 1,182 annual participants in focus area training activities

PROGRAM CHANGES FOR FY 2019:

NOAA requests a net decrease of \$111,781,000 and 0 FTE in FY 2019 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 PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-1).

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		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Coastal Zone Management	Pos./BA	118	42,779	118	40,489	0	(2,290)
and Services	FTE/OBL	116	42,779	116	40,489	0	(2,290)

Eliminate funding support for Integrated Water Prediction (0 FTE/ 0 Positions, -\$2,290) – NOAA proposes to eliminate funding for the NOS portion of the Integrated Water Prediction (IWP) project. NOAA established the IWP program in FY 2017 to develop 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: floods, droughts, water-quality hazards, freshwater shortages, and other risks. With this reduction, NOS would continue to engage in the NOAA Water Team, but would significantly curtail development of new products and services for end users.

NOS is leading the new service delivery model core component of this initiative. This component uses enhanced water predictions to produce “street-level” decision support products. In FY 2017 NOAA added local inundation scenarios to its Digital Coast Sea Level Rise Viewer and enhanced the tool’s functionality. In FY 2018, NOAA will conclude a needs assessment of further decision support tool requirements and will release a pilot water decision support tool for testing. The tool will enable users to better understand the impact of various water levels in coastal communities. The new service delivery model also facilitates integration of modeling across disciplines— atmospheric, riverine, coastal, and terrestrial—to establish common data standards, baseline knowledge, and protocols to ensure that water prediction products meet stakeholder needs. In FY 2018 NOAA is supporting National and regional workshops that will bring together forecasters, developers and external stakeholders, as well as establishing a cloud environment for collaborative model development.

NOS funding for the Integrated Water Prediction project is also advancing development of coupled coastal and terrestrial water models that will lead to the next generation of integrated Earth system models. NOAA expects to complete the first phase of integrating coastal and estuarine models with riverine forecast models in FY 2018.

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	2019	2020	2021	2022	2023
Performance Measures:					
Number of communities with completed analyses and community impact assessments (cumulative)					
With Decrease	4	4	4	4	4
Without Decrease	8	15	25	35	45
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 FY17					
With Decrease	4%	4%	4%	4%	4%
Without Decrease	11%	21%	35%	50%	55%

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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

<u>Object Class</u>	<u>2019 Decrease</u>
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(190)
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	(1,190)
25.2 Other services	(610)
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(300)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(2,290)

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Coastal Zone	Pos./BA	0	84,429	0	0	0	(84,429)
Management Grants	FTE/OBL	0	84,429	0	0	0	(84,429)

Eliminate Coastal Zone Management Grants and Regional Coastal Resilience Grants (0 FTE/ 0 Positions, -\$84,429) – NOAA requests a decrease to eliminate two grant programs that support actions of states and other grantees under the Coastal Zone Management Act.

NOAA proposes to eliminate grants to state governments under the Coastal Zone Management Program and grants to eligible applicants under the Regional Coastal Resilience Grant Program. 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.

NOAA currently provides financial assistance for implementation of states’ CZM programs in the form of Coastal Zone Management Grants. States match most of the CZM Grants on a 1:1 basis. States 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. State expenditures with CZM Grant funding and matching funds include salaries for 935 state government jobs. NOAA allocates the majority of CZM Grant funding using formulas based on shoreline lengths and coastal populations. NOAA also competitively awards a portion of the Coastal Zone Enhancement funding (CZMA Section 309) for projects of special merit.

The Regional Coastal Resilience Grants program provides competitive grants for collaborative activities that build community and ecosystem resilience to extreme weather, hazards and changing conditions. Eligible applicants include collaborative groups of states, tribes, local governments, public/private partnerships and nonprofit organizations.

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(Dollar amounts in thousands)

In FY 2017, States provided \$59.5 million in matching funds for Coastal Zone Management Grants activities and projects, and recipients of Regional Coastal Resilience Grants provided \$8.3 million in matching funds. Matching funds for both grant programs come from States, local governments, and other non-federal entities.

	2019	2020	2021	2022	2023
Performance Measures:					
Number of communities that utilize Digital Coast (indicator 3.3a)					
With Decrease	5,000	5,000	5,000	5,000	5,000
Without Decrease	5,500	5,500	5,500	5,500	5,500
Percentage of U.S. coastal states and territories demonstrating 20 percent or more annual improvement in resilience capacity to weather and climate hazards (indicator 3.3g)					
With Decrease ¹⁸	60%	60%	60%	60%	60%
Without Decrease	77%	77%	77%	77%	77%
Annual number of new or improved public access sites through CZM program					
With Decrease	0	0	0	0	0
Without Decrease	250	250	250	250	250

¹⁸ This level of performance only reflects the impact of the Coastal Management Grants terminations and assumes that both CZM and Stewardship funding within the Coastal Zone Management and Services PPA and the National Sea Grant College Program PPA are supported at FY 2018 Annualized CR levels.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
DECREASES FOR 2019
(Dollar amounts in thousands)

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	105	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

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM 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 and Regional Coastal Resilience Grants

Object Class	2019 Decrease	
11	Personnel compensation	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Govt accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(84,429)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	(84,429)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel Amount</u>	
National Estuarine							
Research Reserve	Pos./BA	0	23,342	0	0	0	(23,342)
System	FTE/OBL	0	23,342	0	0	0	(23,342)

Eliminate Federal Funding Support for NERRS (0 FTE/ 0 Positions, -\$23,342) – NOAA requests to eliminate Federal funding support to states for the operations and management of the National Estuarine Research Reserve System.

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 governments that choose to continue operating the reserves using state funds.

NOAA’s base 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. Matching funds from States for NERRS total approximately \$6.5 million per year for all types of NERRS grants. Reserves employ over 400 professionals.

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 as well as 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. All projects contribute to the national effort to make the coast more resilient to natural and man-made changes. A unique aspect is the community involvement in designing and carrying out each project. The interconnectivity of the reserve system often enables project findings from one reserve to inform conservation at other sites.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
DECREASES FOR 2019
(Dollar amounts in thousands)

	2019	2020	2021	2022	2023
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
Number of communities that utilize Digital Coast (indicator 3.3a)					
With decrease	5,000	5,000	5,000	5,000	5,000
Without decrease	5,500	5,500	5,500	5,500	5,500

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM 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	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(23,342)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(23,342)

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

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries and Marine Protected Areas	Pos./BA	177	51,489	177	49,739	177	(1,750)
	FTE/OBL	174	51,489	174	49,739	174	(1,750)

Reduce Marine Sanctuaries Operations (0 FTE/ 0 Positions, -\$1,750) – NOAA requests a decrease to funding for the Sanctuaries and Marine Protected Areas Program. The program would reduce scalable activities such as vessel operations. At this funding level, NOAA will support the highest priorities of all its authorizations, maintain its unique capabilities, support continued implementation of management plans across the National Marine Sanctuary System, and continue engaging coastal communities and stakeholders to promote science-based stewardship of designated areas.

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

Activity: Ocean and Coastal Management and Services
Subactivity: Sanctuaries and Marine Protected Areas
Program Change: Reduce Marine Sanctuaries Operations

Object Class	2019 Decrease	
11	Personnel compensation	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	(300)
25.2	Other services	(1,250)
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	(200)
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	(1,750)

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

Activity: Construction

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Estuarine Research Reserve Construction	Pos/BA	0	1,685	0	1,689	0	1,689	0	0	0	(1,689)
	FTE/OBL	0	1,691	0	1,699	0	1,689	0	0	0	(1,689)
Marine Sanctuaries Construction	Pos/BA	2	1,982	2	1,987	2	1,987	2	1,541	0	(446)
	FTE/OBL	2	2,303	2	2,031	2	1,987	2	1,541	0	(446)

Goal Statement

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.

NOS administers the Nation’s system of 13 Marine Sanctuaries and the Papahānaumokuākea Marine National Monument under the National Marine Sanctuaries Act. PAC funding supports capital costs of maintaining the Sanctuary Program’s facilities 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 mission effective and to keep their life cycle costs under control.

Base Program

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.

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

The National Marine Sanctuary System's comprehensive facilities plan prioritizes capital investment in facilities, exhibits and collaborative education and visibility projects. 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.

Statement of Operating Objectives

Schedule and Milestones:

- Conduct critical capital construction activities on Sanctuaries 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

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
DECREASES FOR 2019**
(Dollar amounts in thousands)

		<u>2019 Base</u>		<u>2019 Estimate</u>		<u>Decrease</u>	
		<u>Personnel</u>		<u>Personnel</u>		<u>Personnel</u>	
		<u>Amount</u>		<u>Amount</u>		<u>Amount</u>	
National Estuarine							
Research Reserve	Pos./BA	0	1,689	0	0	0	(1,689)
Construction	FTE/OBL	0	1,689	0	0	0	(1,689)

Eliminate Federal Funding Support for NERRS Construction (0 FTE/ 0 Positions, -\$1,689) – 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.

NOAA’s base provides Federal funding support to states for capital construction and land acquisition expenses within the NERRS. States match Federal funding for facilities construction by providing 30 percent of the project cost, with the remaining 70 percent covered by the Federal grant. States match Federal grants for land acquisition 1:1. Matching funds from States for NERRS total approximately \$6.5 million per year for all types of NERRS grants. These activities will be eliminated under this proposal.

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Performance Measures:					
Annual number of NERRS facility construction projects that improve safety or environmental sustainability					
With decrease	0	0	0	0	0
Without decrease	7	7	7	7	7

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

Activity: Construction
Subactivity: National Estuarine Research Reserve Construction
Program Change: Eliminate Federal Funding Support for NERRS Construction

Object Class	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(1,689)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(1,689)

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Marine Sanctuaries	Pos./BA	2	1,987	2	1,541	0	(446)
Construction Base	FTE/OBL	2	1,987	2	1,541	0	(446)

Reduce National Marine Sanctuaries Construction Grants (0 FTE/ 0 Positions, -\$446) – NOAA requests to reduce funding for design and installation of signage, exhibits, and kiosks.

The amount of this program change aligns roughly with the FY 2017 amounts that NOAA awarded to the National Marine Sanctuary Foundation for the design and installation of signage, exhibits, and kiosks. The amount for signage and exhibits varies from year to year based on overall capital requirements of the Sanctuary System, including requirements for major vessel maintenance and facilities construction projects. Therefore, this reduction will also impact NOAA’s flexibility to prioritize resources for critical capital maintenance needs.

NOAA’s base funding provides Federal funding support for 13 Marine Sanctuaries and the Papahānaumokuākea Marine National Monument under the National Marine Sanctuaries Act. PAC funding supports capital costs of maintaining facilities, exhibits and collaborative education, visibility projects, and the small boat fleet. Exhibits, signage, and kiosks are a core function of the Sanctuary program’s efforts to improve public understanding of sanctuary resources. These assets contribute to the protection of the unique natural and cultural resources in NOAA’s charge because most sites within the Sanctuary System achieve voluntary compliance with regulations primarily through public awareness and education.

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

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

Object Class	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(446)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(446)

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**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

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.

Through the Revolving Fund, NOAA does the following:

- Retains 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.
- Ensures 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.

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.

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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
2018 Currently Available	15	15	5,986	115,482
2019 Adjustments to base:				
less: Obligations from prior year balances	0	0	0	0
plus: Technical ATBs	0	0	(18)	(62,610)
2019 Base	15	15	5,968	52,872
plus: program changes	0	0	0	0
2019 Estimate	15	15	5,968	52,872

		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Damage Assessment and Restoration Revolving Fund	Pos/BA	32	6,860	15	5,986	15	5,968	15	5,968	0	0
	FTE/OBL	32	29,631	15	115,482	15	52,872	15	52,872	0	0
Total: Damage Assessment and Restoration Revolving Fund	Pos/BA	32	6,860	15	5,986	15	5,968	15	5,968	0	0
	FTE/OBL	32	29,631	15	115,482	15	52,872	15	52,872	0	0

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

	2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	32	29,631	15	115,482	15	52,872	15	52,872	0	0
Total Obligations	32	29,631	15	115,482	15	52,872	15	52,872	0	0
Adjustments to Obligations:										
Federal funds	0	0	0	0	0	0	0	0	0	0
Offsetting collections, mandatory	0	(16,229)	0	(70,000)	0	(10,000)	0	(10,000)	0	0
Change in uncollected payments, Fed Recoveries	0	23	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(7,430)	0	(1,000)	0	(1,000)	0	(1,000)	0	0
Unobligated balance transferred (from DOI)	0	(118,529)	0	(119,678)	0	(90,182)	0	(90,182)	0	0
Unobligated balance, transferred (to ORF)	0	(286)	0	(3,000)	0	(3,000)	0	(3,000)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	111,671	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	8,007	0	90,182	0	57,278	0	57,278	0	0
Total Budget Authority	32	6,860	15	5,986	15	5,968	15	5,968	0	0
Financing from Transfers:										
Appropriation (previously unavailable)	0	(406)	0	(412)	0	(394)	0	(394)	0	0
Transfer from DOI – CY	0	(6,866)	0	(5,968)	0	(5,968)	0	(5,968)	0	0
Appropriation temporarily reduced	0	412	0	394	0	394	0	394	0	0
Net Appropriation	32	0	15	0	15	0	15	0	0	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)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ Decrease
11.1 Full-time permanent	3,258	1,998	2,038	2,038	0
11.3 Other than full time permanent	549	948	967	967	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	3,807	2,916	3,005	3,005	0
12.1 Civilian personnel benefits	1,277	676	690	690	0
12.2 Military personnel benefits	0	7	7	7	0
21 Travel and transportation of persons	635	1,152	1,152	1,152	0
22 Transportation of things	58	58	54	54	0
23.1 Rental payments to GSA	47	149	149	149	0
23.2 Rental payments to others	20	20	6	6	0
23.3 Comm., util., misc. charges	24	59	59	59	0
24 Printing and reproduction	2	8	8	8	0
25.1 Advisory and assistance services	312	1,458	1,458	1,458	0
25.2 Other services	16,730	16,730	309	309	0
25.3 Other purchases of goods and services from gov't accounts	16	83,680	20,967	20,967	0
26 Supplies and materials	199	643	643	643	0
31 Equipment	567	567	261	261	0
41 Grants, subsidies and contributions	5,937	7,359	7,359	7,359	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	29,631	115,482	52,482	52,482	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)

	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ Decrease
Offsetting Collections Mandatory	(16,229)	(70,000)	(10,000)	(10,000)	0
Recoveries	(7,430)	(1,000)	(1,000)	(1,000)	0
Change in uncollected payments, Fed	23	0	0	0	
Less unobligated balance, SOY	(118,529)	(119,678)	(90,182)	(90,182)	0
Plus unobligated balance transferred	(286)	(3,000)	(3,000)	(3,000)	0
Plus unobligated balance, unapportioned	111,671	0	0	0	0
Plus unobligated balance, EOY	8,007	90,182	57,278	57,278	0
Total Budget Authority	6,860	5,986	5,968	5,968	0
Transfers:					
Appropriation previously unavailable	(406)	(412)	(394)	(394)	
Transfer from DOI	(6,865)	(5,968)	(5,968)	(5,968)	0
Appropriation temporarily reduced	412	394	394	394	0
Net Appropriation	0	0	0	0	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	32	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	32	15	15	15	0
Authorized Positions:					
Full-time permanent	36	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	36	15	15	15	15

**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. 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 RESOURCE REQUIREMENTS
(Dollar amounts in thousands)**

	Positions	FTE	Budget Authority	Direct Obligations
2018 Annualized CR	0	0	120	376
2019 Adjustments to base:				
less: Obligations from prior year balances	0	0	0	(256)
plus: Technical ATBs	0	0	0	0
2019 Base	0	0	120	120
plus: program changes	0	0	0	0
2019 Estimate	0	0	120	120

		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries											
Enforcement Asset Forfeiture Fund	Pos/BA	0	13	0	120	0	120	0	120	0	0
	FTE/OBL	0	46	0	376	0	120	0	120	0	0
Total: Sanctuaries Enforcement Asset Forfeiture Fund	Pos/BA	0	13	0	120	0	120	0	120	0	0
	FTE/OBL	0	46	0	376	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)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	46	0	376	0	120	0	120	0	0
Total Obligations	0	46	0	376	0	120	0	120	0	0
Adjustments to Obligations:										
New offsetting collections	0	(34)	0	0	0	0	0	0	0	0
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(255)	0	(256)	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	0	0	0	0	0	0	0
Unobligated balance, EOY	0	214	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	42	0	0	0	0	0	0	0	0
Total Budget Authority	0	13	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	13	0	120	0	120	0	120	0	0

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	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ Decrease
11.1 Full-time permanent	0	0	0	0	0
11.3 Other than full time permanent	0	0	0	0	0
11.2 Other personnel compensation	0	0	0	0	0
Special personnel services	0	0	0	0	0
11.8 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	35	35	1	1	0
Purchases of goods and services	6	29	29	29	0
25.3 from Gov't accounts	6	29	29	29	0
26 Supplies and materials	4	306	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	46	376	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)

	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ Decrease
Less recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	(255)	0	0	0
Less unobligated balance, adj SOY	0	0	0	0	0
New offsetting collections	(34)	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Plus unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	13	120	120	120	0
Transfers:					
Appropriation previously unavailable	(8)	(8)	(8)	(8)	0
Appropriation temporarily reduced	8	8	8	8	0
Mandatory Appropriation	13	120	120	120	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 Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund provides funding for the NOAA RESTORE Act Science Program. The purpose of this program is to initiate and sustain an integrative, holistic understanding of the Gulf of Mexico ecosystem and support, to the maximum extent practicable, restoration efforts and the long-term sustainability of the ecosystem, including its fish stocks, fishing industries, habitat, and wildlife through ecosystem research, observation, monitoring, and technology development.

Base Program

To ensure the best use of resources the Program will coordinate with existing Federal and state science and technology programs, including other activities funded under the RESTORE Act. Section 1604 of the RESTORE Act authorized funding for the Program using 2.5 percent of the Gulf Coast Restoration Trust Fund.

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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
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2018 Annualized CR	1	1	0	6,403
2019 Adjustments to base:				
less: Obligations from prior year balances	0	0	0	(33)
less: Technical ATBs	0	0	0	(750)
2019 Base	1	1	0	5,615
plus: program changes	0	0	0	0
2019 Estimate	1	1	0	5,615

		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Gulf Coast	Pos/BA	1	0	1	0	1	0	1	0	0	0
Restoration Fund	FTE/OBL	1	6,157	1	6,403	1	5,615	1	5,615	0	0
Total: Gulf Coast	Pos/BA	1	0	1	0	1	0	1	0	0	0
Restoration Fund	FTE/OBL	1	6,157	1	6,403	1	5,615	1	5,615	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)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	1	6,157	1	6,403	1	5,615	1	5,615	0	0
Total Obligations	0	6,157	0	6,403	0	5,615	0	5,615	0	0
Adjustments to Obligations:										
New offsetting collections	0	(6,161)	0	(6,365)	0	(5,615)	0	(5,615)	0	0
Change in Uncollected Payments	0	(1,895)	0	0	0	0	0	0	0	0
Recoveries	0	(44)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(523)	0	(2,467)	0	0	0	0	0	0
Unobligated balance, EOY	0	2,467	0	2,429	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
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ Decrease
11.1 Full-time permanent	113	115	115	115	0
11.3 Other than full time permanent	0	0	0	0	0
11.2 Other personnel compensation	0	0	0	0	0
Special personnel services					
11.8 payments	0	0	0	0	0
11.9 Total personnel compensation	113	115	115	115	0
12.1 Civilian personnel Benefits	42	42	42	42	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	57	57	57	57	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	0	0	0	0
25.1 Advisory and assistance services	0	0	0	0	0
25.2 Other services	41	41	41	41	0
Other purchases of goods and					
25.3 services from Gov't accounts	213	213	213	213	0
26 Supplies and materials	51	51	51	51	0
31 Equipment	0	0	0	0	0
41 Grants, subsidies and contributions	5,639	5,883	5,095	5,095	0
42 Insurance claims and indemnities	0	0	0	0	0
43 Interest and dividends	0	0	0	0	0
99.9 Total Obligations	6,157	6,403	5,615	5,615	0

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

	2017 Actual	2018 Annualized CR	2019 Base Program	2019 Estimate	Increase/ Decrease
Federal Funds	0	0	0	0	0
Less offsetting collections	(6,161)	(6,365)	(5,615)	(5,615)	0
Change in uncollected payments	(1,895)	0	0	0	0
Recoveries	(44)	0	0	0	0
Less unobligated balance, SOY	(523)	(2,467)	0	0	0
Plus unobligated balance, EOY	2,467	2,429	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

BUDGET PROGRAM: NATIONAL MARINE FISHERIES SERVICE

For FY 2019, NOAA requests a total of \$837,279,000 and 2,953 FTE for the National Marine Fisheries Service, including a decrease of \$110,425,000 and 4 FTE in program changes.

National Marine Fisheries Service Overview

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 \$208 billion in sales impact, and support over 1.6 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.

The NMFS budget is organized into four activities under the Operations, Research, and Facilities appropriation account (\$856,351,000 and 2,915 FTE).

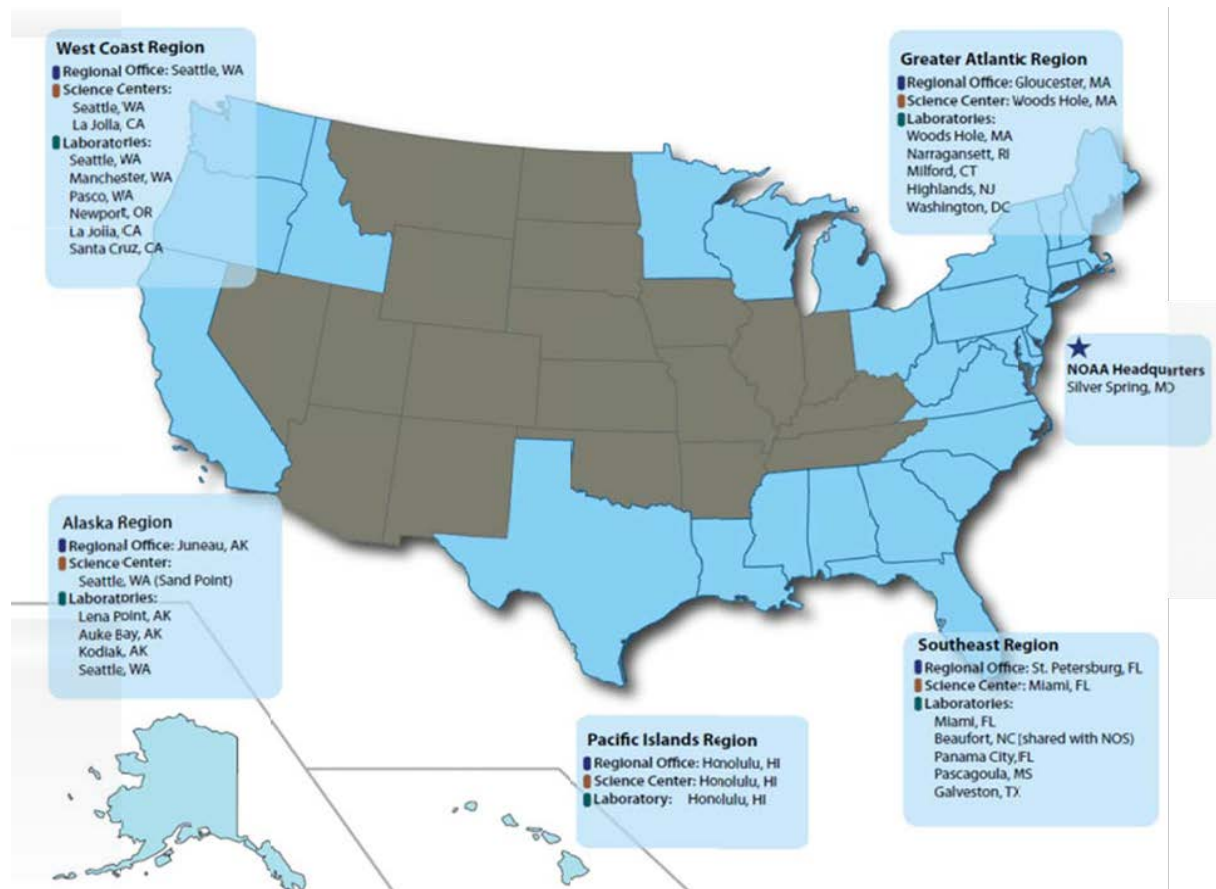
- Protected Resources Science and Management (\$187,112,000 and 811 FTE) includes: Marine Mammals, Sea Turtles, and Other Species; Species Recovery Grants; Atlantic Salmon; and Pacific Salmon
- Fisheries Science and Management (\$547,151,000 and 1,716 FTE) includes: Fisheries and Ecosystem Science Programs and Services; Fisheries Data Collections, Surveys, and Assessments; Observers and Training; Fisheries Management Programs and Services; Aquaculture; Salmon Management Activities; Regional Councils and Fisheries Commissions; and Interjurisdictional Fisheries Grants
- Enforcement (\$69,332,000 and 232 FTE)
- Habitat Conservation and Restoration (\$52,756,000 and 156 FTE)

¹ National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-170. Available at: http://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2015/index.

The NMFS budget also includes the following other accounts:

- Pacific Coastal Salmon Recovery Fund (discretionary)
- Fishermen's Contingency Fund (discretionary)
- Foreign Fishing Observer Fund (discretionary)
- Marine Mammal Unusual Mortality Event Fund (discretionary)
- Fisheries Finance Program Account (discretionary and mandatory)
- Promote and Develop American Fishery Products & Research Pertaining to American Fisheries (discretionary and mandatory)
- Federal Ship Financing Fund (mandatory)
- Environmental Improvement and Restoration Fund (mandatory)
- Limited Access System Administration Fund (mandatory)
- Western Pacific Sustainable Fisheries Fund (mandatory)
- Fisheries Enforcement Asset Forfeiture Fund (mandatory)
- North Pacific Observer Fund (mandatory)

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:



Significant Adjustments:

Calculated Adjustments

NOAA's FY 2019 Base includes a total of \$10,532,000 to account for the full funding requirement for inflationary adjustments to current programs for NMFS activities. This includes inflationary increases for labor and non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

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

Activity: Protected Resources Science and Management

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Mammals, Sea Turtles, and Other Species	Pos/BA	418	110,572	487	110,594	487	112,061	487	108,460	0	(3,601)
	FTE/OBL	416	109,080	464	114,943	464	112,061	464	108,460	0	(3,601)
Species Recovery Grants	Pos/BA	1	6,158	3	6,158	3	6,162	3	5,993	0	(169)
	FTE/OBL	1	6,148	3	6,207	3	6,162	3	5,993	0	(169)
Atlantic Salmon	Pos/BA	21	6,181	23	6,182	23	6,249	23	6,218	0	(31)
	FTE/OBL	21	6,142	22	6,348	22	6,249	22	6,218	0	(31)
Pacific Salmon	Pos/BA	291	61,579	338	61,583	338	62,640	338	60,944	0	(1,696)
	FTE/OBL	289	61,919	322	62,256	322	62,640	322	60,944	0	(1,696)
Total Protected Resources Science and Management	Pos/BA	731	184,490	851	184,517	851	187,112	851	181,615	0	(5,497)
	FTE/OBL	727	183,289	811	189,754	811	187,112	811	181,615	0	(5,497)

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. 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

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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.

Base Program

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 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.

² http://www.nmfs.noaa.gov/stories/2015/05/05_14_15species_in_the_spotlight.html

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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

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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 in Alaska. 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.

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.

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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.

Statement of Operating Objectives

Schedule and Milestones:

FY 2019–2023

- 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

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- 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 2019–2023

- 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

NOAA requests a total decrease of \$5,497,000 and 0 FTE in FY 2019 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 PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-2).

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Marine Mammals, Sea Turtles, and Other Species	Pos./BA	487	112,061	487	108,460	0	(3,601)
	FTE/OBL	464	112,061	464	108,460	0	(3,601)

Marine Mammals, Sea Turtles, and Other Species (0 FTE/0 Positions, -\$572) – This request will reduce the base resources for activities that conserve and recover threatened or endangered species, as well as most marine mammals. NOAA will continue to support research on marine ecosystems affecting protected species and critical habitats, investigations for species listing decisions, critical habitat designations, ESA section 7 interagency consultations, and species recovery planning and implementation. NOAA will continue to permit and authorize activities that may result in the take of protected species under the ESA or MMPA, determine the effects of noise on marine mammals from human-caused sources, and coordinate marine mammal stranding networks.

Prescott Grant Program (0 FTE/0 Positions, -\$3,029) – 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

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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 2017, NOAA awarded 33 grants to members in 13 states. Applicants provide a minimum of 25 percent non-Federal cost match. More information on past accomplishments is available at the program's website.³

Performance Measure:	2019	2020	2021	2022	2023
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%

³ <http://www.nmfs.noaa.gov/pr/health/prescott/>

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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: Marine Mammals, Sea Turtles, and Other Species

Object Class	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	(572)
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(572)

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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	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(3,029)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(3,029)

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 (Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
	Pos./BA	338	62,640	338	60,944	0	(1,696)
Pacific Salmon	FTE/OBL	322	62,640	322	60,944	0	(1,696)

Hatchery Genetic Management Plans (0 FTE/0 Positions, -\$1,696) – This request reduces the additional resources originally provided in the FY 2017 Appropriations Act for the review of Hatchery Genetic Management Plans (HGMPs). Congress provided additional funds to work with partners to help expedite HGMP review. With these resources in FY 2017, NMFS completed review of an additional 71 HGMPs for a total of 193 out of 330. NMFS will continue this work in FY 2019 with available resources.

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.

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PRORAM 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	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	(1,696)
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,696)

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Activity: Fisheries Science and Management

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries and Ecosystem Science Programs and Services	Pos/BA	525	138,288	625	138,551	625	140,397	625	141,185	0	788
	FTE/OBL	522	138,322	595	142,548	595	140,397	595	141,185	0	788
Fisheries Data Collections, Surveys, and Assessments	Pos/BA	451	163,747	480	162,898	480	164,495	480	156,558	0	(7,937)
	FTE/OBL	449	164,224	457	172,943	457	164,495	457	156,558	0	(7,937)
Observers and Training	Pos/BA	128	43,350	158	43,362	158	43,768	158	43,768	0	0
	FTE/OBL	128	41,465	150	46,117	150	43,768	150	43,768	0	0
Fisheries Management Programs and Services	Pos/BA	424	113,908	466	116,264	466	117,709	466	112,598	0	(5,111)
	FTE/OBL	422	114,069	444	120,507	444	117,709	444	112,598	0	(5,111)
Aquaculture	Pos/BA	25	9,253	26	9,237	26	9,327	26	9,327	0	0
	FTE/OBL	25	9,473	25	9,481	25	9,327	25	9,327	0	0
Salmon Management Activities	Pos/BA	25	33,278	33	33,275	33	33,359	33	31,524	0	(1,835)
	FTE/OBL	25	32,447	31	34,144	31	33,359	31	31,524	0	(1,835)
Regional Councils and Fisheries Commissions	Pos/BA	8	34,020	13	34,024	13	35,112	13	34,495	0	(617)
	FTE/OBL	8	33,791	12	34,460	12	35,112	12	34,495	0	(617)
Interjurisdictional Fisheries Grants	Pos/BA	2	3,004	2	2,984	2	2,984	0	0	(2)	(2,984)
	FTE/OBL	2	3,125	2	3,237	2	2,984	0	0	(2)	(2,984)
Total Fisheries Science and Management	Pos/BA	1,588	538,848	1,803	540,595	1,803	547,151	1,801	529,455	(2)	(17,696)
	FTE/OBL	1,581	536,916	1,716	563,437	1,716	547,151	1,714	529,455	(2)	(17,696)

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Goal Statement

The Fisheries Science and Management activity encompasses scientific and management activities to ensure sustainability of the Nation's marine fishery resources. 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 2015, commercial and recreational fisheries in the U.S. generated 1.6 million jobs throughout the national economy. In addition, commercial and recreational fishing generated \$207.6 billion in sales impacts, \$62.4 billion in income impacts, and \$96.6 billion in value-added impacts.⁴ The U.S. aquaculture industry produced \$1.4 billion worth of seafood in 2015, which equals about 21 percent of total U.S. seafood production by value.⁵ 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.

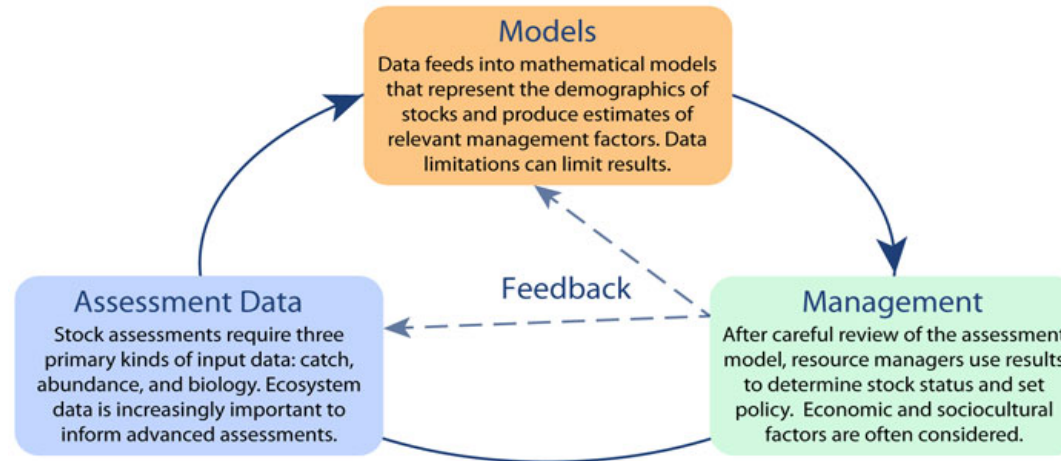
In partnership with the eight Regional Fishery Management Councils and state and Federal partners, NMFS manages marine fisheries, including aquaculture, using the best available science. NMFS actions result in sustainable fisheries harvest and production, rebuilding of depleted fish stocks, conservation 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 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.

⁴ National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-170. Available at: http://www.nmfs.noaa.gov/stories/2017/04/05_feus_sos_reports.html.

⁵ National Marine Fisheries Service. 2017. Fisheries of the United States, 2016. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2016. Available at: <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2016-report>. *Note, due to data availability, aquaculture production data lags the rest of the publication by one year.*

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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.

Base Program

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.

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- *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 2016-2017 (with a target of full implementation in 2019) and the herring and mackerel fisheries in 2018. EM will be implemented in the West Coast whiting midwater trawl and fixed gear fisheries in 2018, and the bottom trawl and non-whiting midwater trawl fisheries in 2019. In Alaska, EM will be implemented in the small boat fixed gear and pot fisheries in 2018. ER will be implemented in the for-hire fisheries in the Mid-Atlantic in 2018, and in the for-hire fisheries in the Gulf of Mexico and South Atlantic in 2019. ER will be implemented in the South Atlantic and Gulf of Mexico commercial fisheries by 2019. ER development will continue in the HMS pelagic longline fishery in 2018, 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 80 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.

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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—5.6 billion pounds of seafood were landed in Alaska, totaling 58 percent of U.S. landings, with a value of \$1.6 billion in 2016⁶—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

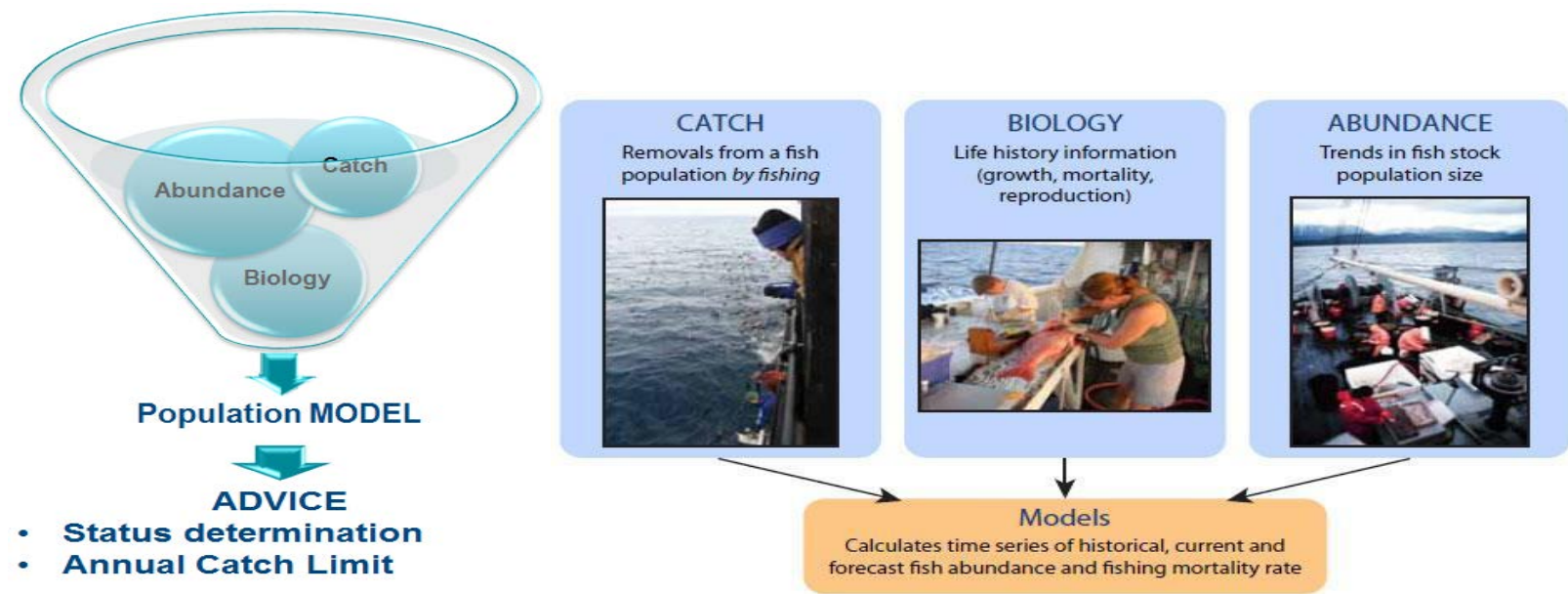
⁶ National Marine Fisheries Service. 2017. Fisheries of the United States, 2016. U.S. Department of Commerce, NOAA Current Fishery Statistics No.2016. Available at: <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2016-report>

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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.



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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)*.

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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.

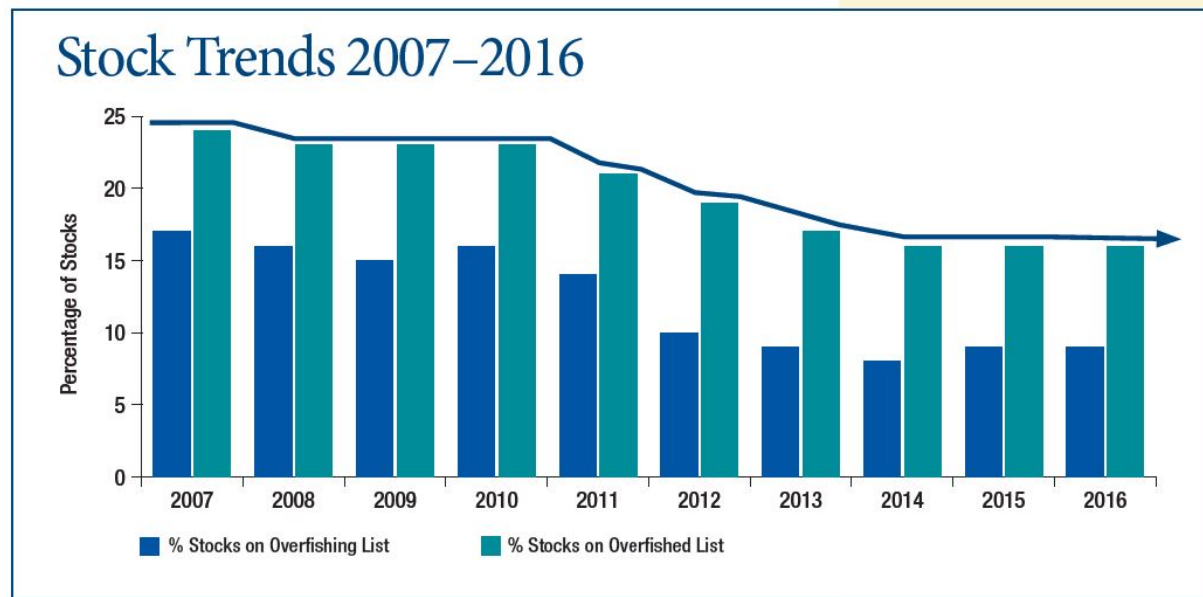
Observers monitor fishing activities for 53 fisheries (including 10 catch share fisheries) across all five NMFS regions, and collect data for a range of conservation and management issues in various fisheries. This includes information on fishing practices, vessel

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and gear characteristics, fishing locations and times, environmental conditions within the fishing grounds, catch and bycatch, and socio-economic data.

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 41 fish stocks have been rebuilt and the number of stocks experiencing overfishing, or determined to be overfished are at near all-time lows.



Change in percentage of stocks subject to overfishing and overfished from 2007 through 2016 as shown in the Annual Report to Congress: Status of Stocks 2016.

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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:

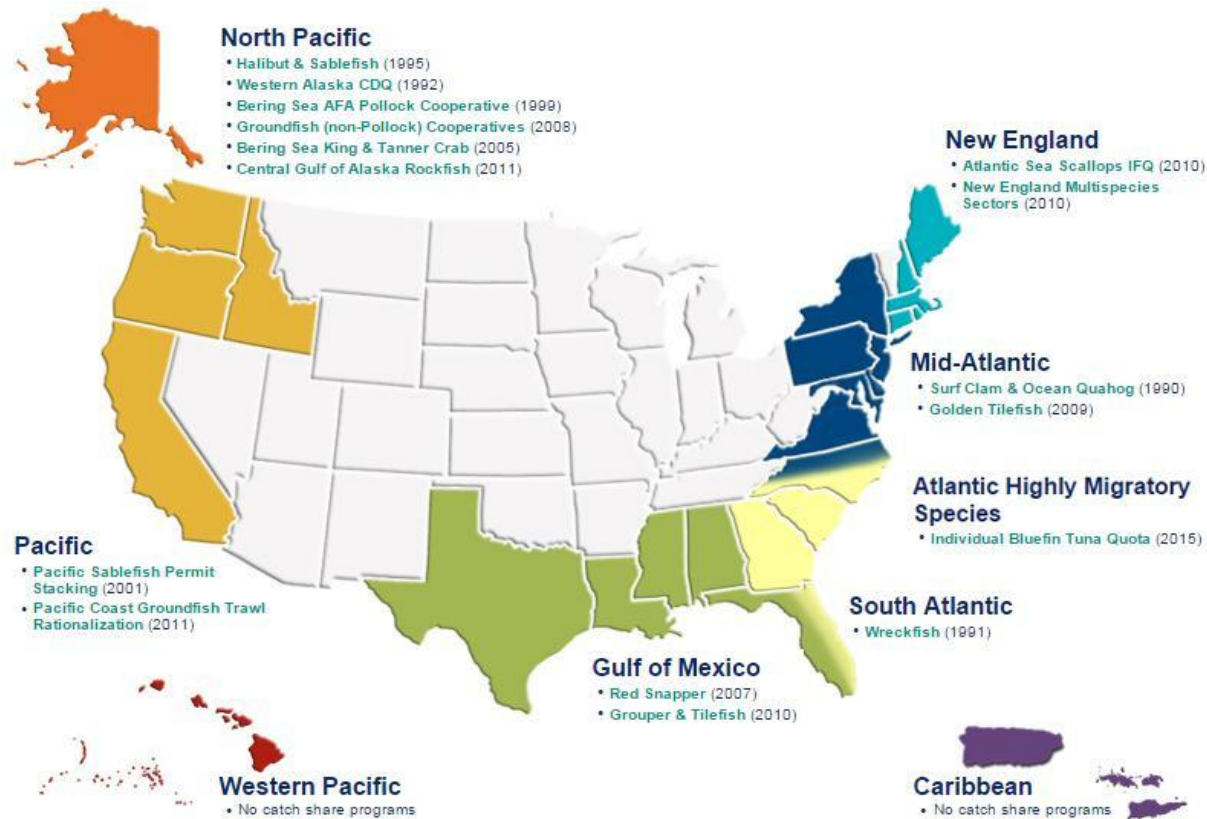
- *Annual Catch Limits (ACLs) and Accountability Measures (AMs)*: ACLs and AMs prevent overfishing. NMFS monitors catch levels for domestic fisheries and makes adjustments to management when those levels are exceeded. NMFS reports on the percent of fish stocks that have exceeded their ACLs, which informs 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. [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.

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.

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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 LAP 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.



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 and the Caribbean

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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

The U.S. is a major consumer of aquaculture products, yet is a minor producer. The Nation imports more than 80 percent of its seafood, of which over half is from foreign-produced aquaculture. This reliance on foreign imports resulted in a \$14 billion seafood trade deficit in 2016 and 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. The Nation has a large untapped potential for sustainable aquaculture development, and seafood industry leaders are increasingly calling for NOAA and other Federal agencies to take steps to help realize this potential.

NMFS' mission includes supporting: growth of domestic marine aquaculture to increase and sustain the nation's seafood supply, job creation in coastal communities, and restoration of fisheries, marine species, and habitats. Agency activities are guided by the Aquaculture Act of 1980, the 2011 Department of Commerce and NOAA Aquaculture Policies, the inter-agency 2014 Strategic Plan for Federal Aquaculture Research, NMFS' FY 2016-2020 Marine Aquaculture Strategic Plan, and DOC's FY 2018-2022 Strategic Plan. The Department of Commerce has highlighted reducing the seafood trade deficit as a priority.

NMFS is one of the three line offices that support NOAA's Marine Aquaculture Program. Each line office has distinct and complementary roles:

- NMFS leads the program and focuses on developing policies, regulations, and science-based tools to support efficient management and 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.

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NMFS' activities are led by the Office of Aquaculture. The Office's FY 2016–2020 Strategic Plan⁷ describes four strategic goals:

- 1) Regulatory efficiency: Develop coordinated, consistent, and efficient regulatory processes for the marine aquaculture sector.
- 2) Tools for sustainable management: Encourage environmentally sustainable marine aquaculture using best available science.
- 3) Technology development and transfer: Develop technologies and provide extension services for the marine aquaculture sector.
- 4) Informed public: Improve public understanding of marine aquaculture.

Examples of specific results to date include:

- An improved regulatory environment for marine aquaculture leading to several new permits and the first ever regional management plan for aquaculture in Federal waters, as well as record-high shellfish production in several states;
- Publication of several scientific articles demonstrating that the environmental effects of aquaculture are minimal when responsibly managed;
- Refinement and application of genetic risk assessment models and tools for aquaculture siting, aiding in key management decisions; and,
- Advancement of rearing techniques for new aquaculture species with high potential for domestic production (e.g., sablefish).

Funds will support:

- Establishment and expansion of regional pilot projects (e.g., kelp and seaweed farming, offshore aquaculture),
- Advancement of Science Center research to support environmentally sound aquaculture practices such as genetics and aquaculture siting tools,
- Improved technical and science-based production tools and techniques (e.g., disease prevention and treatment) in support of the Nation's shellfish farmers; and,
- Development of science-based tools for management that ensure the efficient review of aquaculture permit applications.

In 2015, U.S. marine aquaculture production increased from the prior year by 6.0 million pounds (6.6 percent) and \$7.9 million (2.1 percent),⁸ supporting more jobs in coastal communities (see figure below). This growth is a result, in part, of the investments and

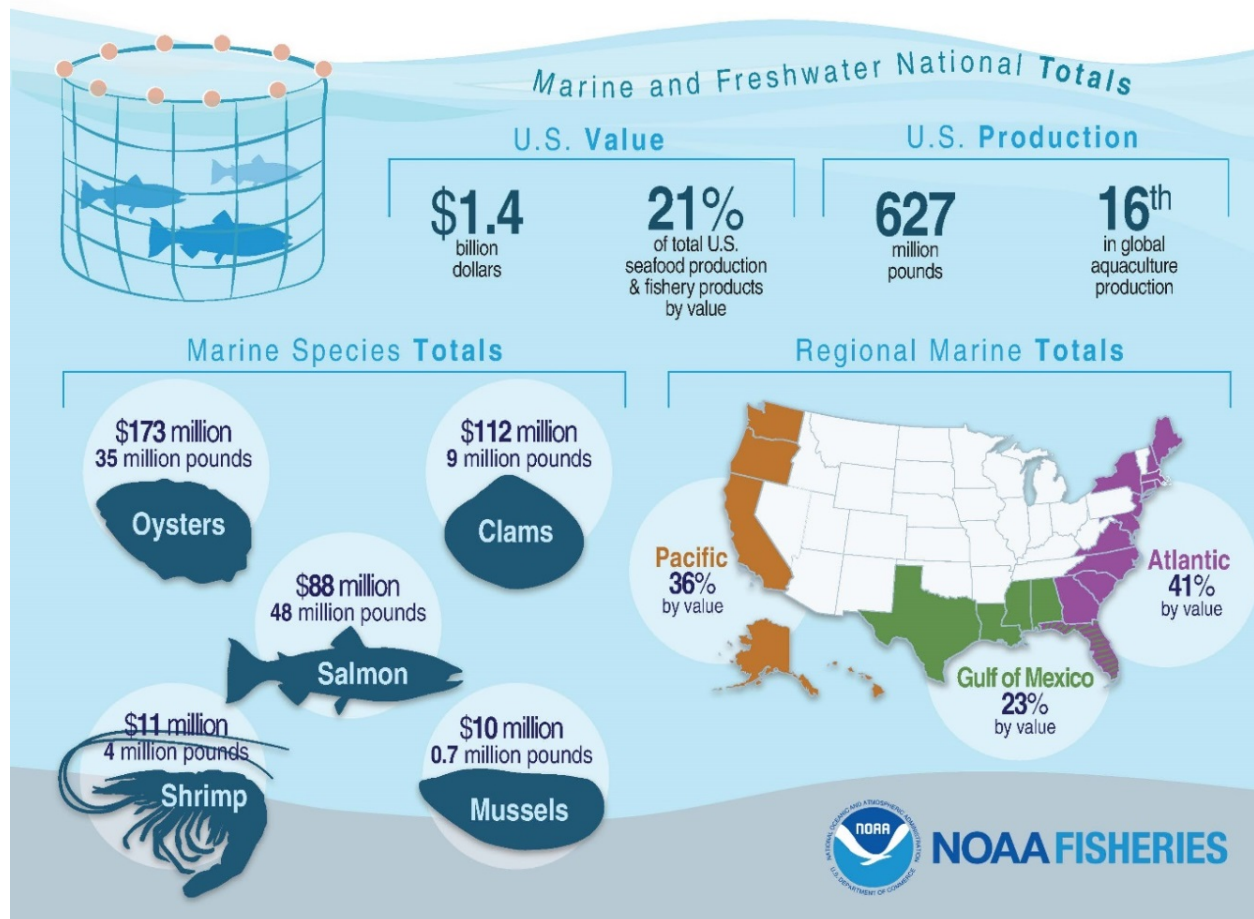
⁷ National Marine Fisheries Service. 2015. Marine Aquaculture Strategic Plan FY 2016-2020. U.S. Department of Commerce. available at: http://www.nmfs.noaa.gov/aquaculture/docs/aquaculture_docs/noaa_fisheries_marine_aquaculture_strategic_plan_fy_2016-2020.pdf

⁸ National Marine Fisheries Service. 2017. Fisheries of the United States, 2016. U.S. Department of Commerce, NOAA Current Fishery Statistics No.2016. Available at: <https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2016-report>. *Note, due to data availability, aquaculture production data lags the rest of the publication by one year.*

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efforts of NOAA and its partners. Significant acceleration in this growth is needed over the next several years to substantially reduce the seafood trade deficit.

2015 Aquaculture Production **Highlights**



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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.

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.

Statement of Operating Objectives

Schedule and Milestones:

Fisheries and Ecosystem Science Programs and Services (FY 2019–2023)

- *Economics and Social Science:* Expand implementation of an integrated Bioeconomic Length-structured Angler Simulation

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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 2019–2023)

- *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 2019–2023)

- Provide coverage in 53 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

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- Coordinate observer program activities at the national level by developing new standards, policies, and procedures to improve observer programs

Fisheries Management Programs and Services (FY 2019–2023)

- *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
- *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 2019–2023)

- 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
- Provide support to the Nation's shellfish farmers through improved technical and science-based production tools and techniques (e.g., disease prevention and treatment)
- Develop science-based tools for management that ensure the efficient review of aquaculture permit applications

Salmon Management Activities (FY 2019–2023)

- 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 2019–2023)

- Continue to revise FMPs and amendments to prevent overfishing, rebuild overfished fisheries, and promote sustainability
- Complete socioeconomic analyses for fishery management actions

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- Work with Councils to implement electronic technologies for fishery monitoring

Deliverables:

Fisheries and Ecosystem Science Programs and Services (FY 2019–2023)

- *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 2019–2023)

- *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.

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Observers and Training (FY 2019–2023)

- 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 2018

Fisheries Management Programs and Services (FY 2019–2023)

- 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
- 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 2019–2023)

- 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 2019–2023)

- 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

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Regional Councils and Commissions (FY 2019–2023)

- Draft amendments to FMPs
- Collection and analysis of socioeconomic data on the impacts of fishery management actions

NOAA requests a net decrease of \$17,696,000 and -2 FTE in FY 2019 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 PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-2)

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DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Data Collections, Surveys, and Assessments	Pos./BA	480	164,495	480	156,558	0	(7,937)
	FTE/OBL	457	164,495	457	156,558	0	(7,937)

Reef Fish Stock Assessments (0 FTE/0 Positions, -\$5,000) - NOAA proposes a reduction of \$5.0 million for development and implementation of agency-independent and alternative approaches to research and stock assessments for reef fish in the Gulf of Mexico. 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. NOAA released a Phase I request for proposals in May 2016 using \$500 thousand of this funding to develop experimental designs for the abundance estimates. In March 2017, NOAA announced a Phase II request for proposals using the remaining \$9.5 million to implement the resulting experimental design. In fall 2017, NOAA issued the final grant using FY 2016 Congressionally directed funding for this assessment work. The independent estimate of red snapper abundance will be complete in 2019.

In FY 2017, Congress provided funding within the Fisheries Data Collections, Surveys, and Assessments PPA to continue agency-independent red snapper stock assessments. NMFS spent \$5.0 million working 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 current quality control procedures with the use of contractor support.

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Cooperative Research Program (0 FTE/0 Positions, -\$2,937) – NOAA proposes to reduce funding for the Cooperative Research program, which will lead to approximately ten fewer projects funded in FY 2019. The program will continue to execute cooperative research with industry, fishermen, and other stakeholders as available funding allows.

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.

Performance Measure:	2019	2020	2021	2022	2023
Number of Cooperative Research projects funded (annual)					
With Decrease	29	29	29	29	29
Without Decrease	39	39	39	39	39

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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	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>0</u>
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
25.1 Advisory and assistance services	(1,000)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(4,000)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	<u>(5,000)</u>

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
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Activity: Fisheries Science and Management
Subactivity: Fisheries Data Collections, Surveys, and Assessments
Program change: Cooperative Research Program

Object Class	2019 Decrease
11 Personnel compensation	
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
25.1 Advisory and assistance services	0
25.2 Other services	(1,468)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(1,469)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	(2,937)

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		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Fisheries Management	Pos./BA	466	117,709	466	112,598	0	(5,111)
Programs and Services	FTE/Obl.	444	117,709	444	112,598	0	(5,111)

National Catch Share Program (0 FTE/0 Positions, -\$5,111) – 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 allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. Catch share programs provide many benefits 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.

Performance Measure:	2019	2020	2021	2022	2023
Number of key objectives met by catch share programs					
With Decrease	19	19	19	19	19
Without Decrease	19	20	20	20	20

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PRORAM 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	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	(2,555)
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(2,556)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(5,111)

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DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Salmon Management	Pos./BA	33	33,359	33	31,524	0	(1,835)
Activities	FTE/OBL	31	33,359	31	31,524	0	(1,835)

Genetic Stock Identification and Pacific Salmon Treaty (0 FTE/0 Positions, -\$1,835) – This request will reduce funding for Mitchell Act hatcheries and implementation of the Pacific Salmon Treaty. At the requested level, NOAA will reduce the additional funding originally provided in the FY 2017 Appropriations Act for genetic stock identification by \$1.0 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 the additional funding originally provided in the FY 2017 Appropriations Act for Pacific Salmon Treaty implementation by \$0.8 million for a total of \$11.1 million. The Pacific Salmon Treaty 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.

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.

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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	2019 Decrease
11.1	0
11.3	0
11.5	0
11.8	0
11.9	0
12.1	0
13	0
21	0
22	0
23	0
23.1	0
23.2	0
23.3	0
24	0
25	0
25.1	0
25.2	(1,000)
25.3	0
25.4	0
25.5	0
25.6	0
25.7	0
25.8	0
26	0
31	0
32	0
33	0
41	(835)
42	0
43	0
44	0
99.9	(1,835)

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National Oceanic and Atmospheric Administration
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DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Interjurisdictional	Pos./BA	2	2,984	0	0	(2)	(2,984)
Fisheries Grants	FTE/OBL	2	2,984	0	0	(2)	(2,984)

Interjurisdictional Fisheries Grants (-2 FTE/-2 Positions, -\$2,984) – This request will eliminate the financial assistance program to promote state activities in the management of interjurisdictional fisheries resources. 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.

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

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

Title	Location	Grade	Number	Annual Salary	Total Salaries
Grants Management Specialist	Various	ZA-4	(2)	93,624	(187,248)
Total			(2)		(187,248)
Less lapse		0.00%	<u>0</u>		<u>0</u>
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			<u>0</u>		
Total			(2)		
Authorized Positions:					
Full-time permanent			(2)		
Other than full-time permanent			<u>0</u>		
Total			(2)		

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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	2019 Decrease
11.1 Full-time permanent	(187)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(187)
12.1 Civilian personnel benefits	(43)
13 Benefits for former personnel	0
21 Travel and transportation of persons	(3)
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	(25)
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(12)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	(33)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,681)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(2,984)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)**

Activity: Enforcement

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Enforcement	Pos/BA	203	68,518	244	68,536	244	69,332	244	51,495	0	(17,837)
	FTE/OBL	202	65,879	232	73,588	232	69,332	232	51,495	0	(17,837)
Total Enforcement	Pos/BA	203	68,518	244	68,536	244	69,332	244	51,495	0	(17,837)
	FTE/OBL	202	65,879	232	73,588	232	69,332	232	51,495	0	(17,837)

Goal Statement

NOAA’s Office of Law Enforcement (OLE) is the only conservation enforcement program (Federal or state) exclusively dedicated to Federal fisheries and marine resource enforcement. OLE enforces NOAA’s natural resource protection laws and improves compliance with Federal regulations to conserve and protect our Nation’s living marine resources and their natural habitat. OLE protects and monitors the world’s largest EEZ including 13 National Marine Sanctuaries, and four Marine National Monuments (Figure 1).



Figure 1. NOAA Office of Law Enforcement's Jurisdiction

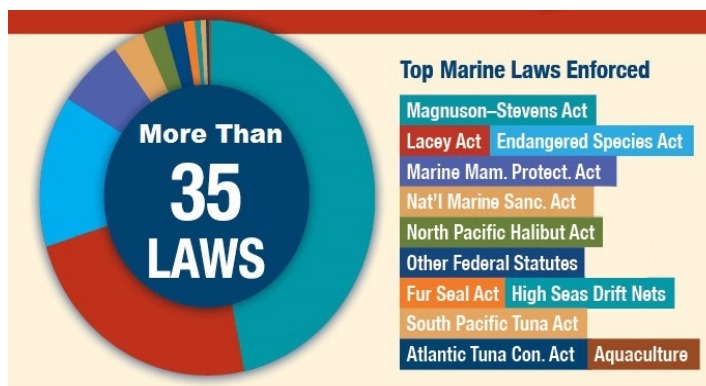


Figure 2. NOAA Enforcement Efforts by Law

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OLE 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 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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Base Program

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 and marine mammals. The capabilities associated with deterring violations and investigating egregious cases 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 2017, JEA partnerships committed to over 130,000 base hours of labor, increasing the number of hours dedicated to Federal marine conservation enforcement activities above what NOAA could have accomplished alone.

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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 vessels to report in the VMS, and it allows OLE to monitor compliance and track violators 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 resources, environmental, and species conservation laws. Prior to VMS implementation, the only methods used to police 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.

Statement of Operating Objectives

Schedule and Milestones:

OLE measures outputs in terms of incidents (documentation of possible violations) initiated, man-hours of patrol for monitoring and inspection work, and man-hours of outreach to the regulated community and the public. In FY 2017 OLE reported over 8,900 incidents related to Protected Resources (PR), Sustainable Fisheries (SF), Illegal, Unreported, Unregulated (IUU), and other violations.

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During FY 2018, 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 and deployment of enforcement personnel at strategic Ports of Entry
- Establish consistent international IUU enforcement training and technical assistance
- Finish implementing the Cooperative Enforcement Program's priorities-based execution model, which will ensure Joint Enforcement Agreements are executed with a focus on Federal priorities

Deliverables:

FY 2019–2023

- 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 Papahānaumokuākea National Monument
- Review of progress toward and determine next set of strategic 5-year national and regional Operational Enforcement Priorities
- Advancement of IUU training course for NOAA, Federal, state, and territory partners based on the FY 2016 Pilot

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
	Pos./BA	244	69,332	244	51,495	0	(17,837)
Enforcement	FTE/OBL	232	69,332	232	51,495	0	(17,837)

Cooperative Enforcement Program (0 FTE/0 Positions, -\$17,837): This request will eliminate funding to support the Cooperative Enforcement Program (CEP). In FY 2019, NOAA will not be able to implement Joint Enforcement Agreements (JEA) with 28 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 2017, JEA partnerships committed to over 130,000 base hours of labor, significantly increasing the number of hours dedicated to Federal marine conservation enforcement above what NOAA could have accomplished alone.

Since these partnerships with states will no longer be available, the remaining balance of the CEP's funding (\$319 thousand) will be used to support programs within Enforcement. These funds will be necessary to sustain NOAA's enforcement capacity through special agents and enforcement officers to deter, detect, investigate, and document any violations of Federal 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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Performance Measure:	2019	2020	2021	2022	2023
Base hours of labor from JEAs*					
With Decrease	130,732	0	0	0	0
Without Decrease	130,732	130,732	130,732	130,732	130,732

* Note: there is a one year lag in funding and implementation, therefore an elimination of funding in FY 2019 will be reflected in FY 2020 hours.

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

Activity: Enforcement
Subactivity: Enforcement
Program Change: Cooperative Enforcement Program

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(17,837)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(17,837)

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(Dollar amounts in thousands)

Activity: Habitat Conservation and Restoration

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual	Actual	Annualized CR	Annualized CR	Base Program	Base Program	Estimate	Estimate	Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Habitat Conservation and Restoration	Pos/BA	156	52,104	164	52,171	164	52,756	164	47,919	0	(4,837)
	FTE/OBL	156	60,185	156	53,714	156	52,756	156	47,919	0	(4,837)
Total Habitat Conservation and Restoration	Pos/BA	156	52,104	164	52,171	164	52,756	164	47,919	0	(4,837)
	FTE/OBL	156	60,185	156	53,714	156	52,756	156	47,919	0	(4,837)

Goal Statement

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 2015, the U.S. commercial and recreational saltwater fishing industries generated more than \$208 billion in sales and supported 1.6 million jobs.⁹

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,

⁹ National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-170. Available at: http://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2015/index.

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snorkeling) of over \$100 billion.¹⁰ 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 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 1998–2004.¹¹ More than 60 percent of coastal rivers and bays are moderately to severely degraded by nutrient runoff,¹² and there are over six million barriers to fish passage within the rivers of the United States.¹³ In addition, each year as many as 150 oil spills and hazardous substance releases¹⁴ 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.

¹⁰ 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/>.

¹¹ 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: http://www.habitat.noaa.gov/pdf/Coastal_Watershed.pdf.

¹² 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/>.

¹³ U.S. Fish and Wildlife Service. 2011. National Fish Passage Program Annual Report and Future Outlook. Available at: <https://www.fws.gov/fisheries/whatwedo/nfpp/nfpp.html>.

¹⁴ Oil Spills. May 2017. U.S. Dept. of Commerce, NOAA, Damage Assessment, Remediation, and Restoration Program. Retrieved from <https://darrp.noaa.gov/oil-spills>.

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Base Program

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,

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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.¹⁵

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.

Statement of Operating Objectives

Schedules and Milestones:

FY 2019–2023

- Develop management options for protecting deep-sea corals in partnership with the Regional Fishery Management Councils and National Marine Sanctuaries
- Participate in the re-licensing process for an estimated 125 hydroelectric projects
- Identify and protect essential fish habitat through consultations and partnerships

¹⁵ 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>.

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- 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 2019–2023

- 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
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Habitat Conservation and Restoration	Pos./BA	164	52,756	164	47,919	0	(4,837)
	FTE/OBL	156	52,756	156	47,919	0	(4,837)

Fisheries Habitat Restoration (0 FTE/0 Positions, -\$4,837) – This request will reduce the number of on-the-ground habitat restoration projects that promote productive and sustainable fisheries, improve the recovery and conservation of protected resources, and sustain healthy ecosystems and resilient communities and economies. NOAA’s Restoration Center creates approximately 17 jobs for every \$1 million spent to restore habitat.¹⁶ 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 significantly reduce financial support for partnerships and grants provided through the Community-based Restoration Program. We will continue to provide technical expertise and leadership to states, tribes, and local communities, as well as other programs and Federal agencies (e.g., NOAA’s Coral Reef Conservation and Protected Species Programs, EPA, Army Corp of Engineers) implementing fishery and coastal habitat restoration projects, 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, NOAA will maintain its core operations and restoration team that allows for quick response and restoration after disasters through the Damage Assessment, Remediation, and Restoration Program (DARRP). This program 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.

¹⁶ 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.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
DECREASES FOR 2019
(Dollar amounts in thousands)

Performance Measures:	2019	2020	2021	2022	2023
Number of habitat acres restored (annual) (Measure 3.4f)					
With Decrease	4,000	3,500	2,200	2,000	2,000
Without Decrease	4,000	4,000	4,000	4,000	4,000
Stream miles made accessible (annual)					
With Decrease	100	90	50	50	50
Without Decrease	100	100	100	100	100

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 Restoration

Object Class	2019 Decrease
11.1	0
11.3	0
11.5	0
11.8	0
11.9	0
12.1	0
13	0
21	0
22	0
23	0
23.1	0
23.2	0
23.3	0
24	0
25	0
25.1	0
25.2	0
25.3	0
25.4	0
25.5	0
25.6	0
25.7	0
25.8	0
26	0
31	0
32	0
33	0
41	(4,837)
42	0
43	0
44	0
99.9	(4,837)

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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. 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 2019. Key accomplishments for PCSRF-funded activities from FY 2000 to 2017 include:

- more than 1,090,000 acres of habitat restored, and
- passage restored to over 12,000 stream miles of salmon habitat.

Base Program

Since 2000, PCSRF has funded more than 13,200 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.

**Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

PCSRF restoration projects have also removed nearly 3,300 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.

PCSRF awards to grantees remain active for up to five years. Consequently, even with the proposed elimination of funding, an estimated 2,300 active projects funded with FY 2013 through FY 2017 appropriations will not be completed until FY 2018 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 2018)
- Washington: Illabot Creek Alluvial Fan Restoration – Phase 2 (end date December 2018)
- Idaho: Mason Meadow Restoration (end date January 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)

**Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Pacific Coastal Salmon	Pos./BA	2	64,559	0	0	(2)	(64,559)
Recovery Fund	FTE/OBL	2	64,559	0	0	(2)	(64,559)

Pacific Coastal Salmon Recovery Fund (PCSRF) (-2 FTE/-2 Positions, -\$64,559) – This reduction will eliminate funding for this grant program in FY 2019. 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.¹⁷

¹⁷http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/pacific_coastal_salmon_recovery_fund.html

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
DECREASES FOR 2019
(Dollar amounts in thousands)

Performance Measure:	2019	2020	2021	2022	2023
Number of habitat acres restored (annual) (Indicator 3.4)					
With Decrease	14,300	12,500	8,500	4,200	1,800
Without Decrease	14,400	14,400	14,400	14,000	14,400
Number of stream miles made accessible for ocean, coastal, and Great Lakes resources (annual)					
With Decrease	460	400	270	130	50
Without Decrease	460	460	460	460	460

**Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
PROGRAM CHANGE PERSONNEL DETAIL**
(Dollar amounts in thousands)

Activity: Pacific Coastal Salmon Recovery Fund
Subactivity: Pacific Coastal Salmon Recovery Fund
Program Change: Pacific Coastal Salmon Recovery Fund

Title	Location	Grade	Number	Annual Salary	Total Salaries
Supervisory Grants Specialist	Portland, OR	ZP-V	(1)	144,428	(144,428)
Grants Specialist	Portland, OR	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)

**Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Pacific Coastal Salmon Recovery Fund
Subactivity: Pacific Coastal Salmon Recovery Fund
Program Change: Pacific Coastal Salmon Recovery Fund

Object Class	2019 Decrease
11.1 Full-time permanent	(253)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>(253)</u>
12.1 Civilian personnel benefits	(86)
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(296)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	(1)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(63,923)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>(64,559)</u>

**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
2018 Annualized CR	2	2	64,559	64,559
less: Obligations from Prior Year Balances	0	0	0	0
plus: Other Adjustments-to- Base	0	0	0	0
2019 Base	2	2	64,559	64,559
plus: 2019 Program Changes	(2)	(2)	(64,559)	(64,559)
2019 Estimate	0	0	0	0

		2017 Actual Personnel Amount	2018 Annualized CR Personnel Amount	2019 Base Program Personnel Amount	2019 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Pacific Coastal Salmon Recovery Fund	Pos/BA	2 64,935	2 64,559	2 64,559	0 0	(2) (64,559)
	FTE/OBL	2 64,941	2 64,559	2 64,559	0 0	(2) (64,559)
Total: Pacific Coastal Salmon Recovery Fund	Pos/BA	2 64,935	2 64,559	2 64,559	0 0	(2) (64,559)
	FTE/OBL	2 64,941	2 64,559	2 64,559	0 0	(2) (64,559)

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	2	64,941	2	64,559	2	64,559	0	0	(2)	(64,559)
Total Obligations	2	64,941	2	64,559	2	64,559	0	0	(2)	(64,559)
Adjustments to Obligations:										
Recoveries	0	(20)	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	(434)	0	0	0	0	0	0	0	0
Unobligated balance, expired	0	163	0	0	0	0	0	0	0	0
Unobligated balance, transferred	0	285	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	64,559	2	64,559	0	0	(2)	(64,559)
Financing from Transfers and Other:										
Transfer to ORF	0	65	0	0	0	0	0	0	0	0
Net Appropriation	2	65,000	2	64,559	2	64,559	0	0	(2)	((64,559))

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	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	253	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	253	253	253	0	(253)
12.1 Civilian personnel benefits	86	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	296	296	296	0	(296)
26 Supplies and materials	0	0	0	0	0
31 Equipment	1	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	64,305	63,923	63,923	0	(63,923)
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	64,941	64,559	64,559	0	(64,559)

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	(20)	0	0	0	0
Plus unobligated balance, transferred	285	0	0	0	0
Unobligated balance, expired	163	0	0	0	0
Less unobligated balance, SOY	(434)	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Total Budget Authority	64,935	64,559	64,559	0	(64,559)

**Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Fishermen's Contingency Fund

For FY 2019, 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). It minimizes financial instability of the fishing industry caused by competing uses of the OCS, and provides for timely resolution of claims by vessel owners.

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. 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.

PROGRAM CHANGES FOR FY 2019:

NOAA requests an increase of \$1,000 and 0 FTE in FY 2019 program changes for the Fishermen's Contingency Fund. This change is less than five percent of the account, and therefore is solely represented in the NOAA Control Table (p. Control Table-14).

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**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
2018 Annualized CR	0	0	348	348
plus: Obligations from prior year balances	0	0	0	0
plus: Other Adjustments-to-Base	0	0	0	0
2019 Base	0	0	348	348
plus: 2019 Program Changes	0	0	1	1
2019 Estimate	0	0	349	349

		2017 Actual Personnel Amount	2018 Annualized CR Personnel Amount	2019 Base Program Personnel Amount	2019 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Fishermen's Contingency Fund	Pos/BA	0	350	0	348	0
	FTE/OBL	0	31	0	348	0
Total: Fishermen's Contingency Fund	Pos/BA	0	350	0	348	0
	FTE/OBL	0	31	0	348	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen’s Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)**

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	31	0	348	0	348	0	349	0	1
Total Obligations	0	31	0	348	0	348	0	349	0	1
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(1,000)	0	(1,319)	0	(1,319)	0	(1,319)	0	0
Unobligated balance, EOY	0	1,319	0	1,319	0	1,319	0	1,319	0	0
Total Budget Authority	0	350	0	348	0	348	0	349	0	1
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	350	0	348	0	348	0	349	0	1

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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	31	348	348	349	1
43 Interest and dividends	0	0	0	0	0
44 Refunds	0	0	0	0	0
99 Total Obligations	31	348	348	349	1

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	(1,000)	(1,319)	(1,319)	(1,319)	0
Less unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	1,319	1,319	1,319	1,319	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	350	348	348	349	1

**Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Foreign Fishing Observer Fund

For FY 2019, 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.

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). This includes longline vessels fishing in the Atlantic billfish and shark fishery and other foreign vessels fishing in the EEZ. 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. The observer program is conducted primarily through contracts with the private sector. 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.

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**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
2018 Annualized CR	0	0	0	0
less: Obligations from prior year balances	0	0	0	0
Plus: 2019 Adjustments to Base	0	0	0	0
2019 Base	0	0	0	0
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	0	0

		2017 Actual Personnel Amount	2018 Annualized CR Personnel Amount	2019 Base Program Personnel Amount	2019 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0
Total: Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	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 to Obligations:										
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
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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

**Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Fisheries Finance Program Account

For FY 2019, 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. The purpose of these loans is to provide stability to at least one aspect of an otherwise volatile industry.

Types of activities for financing include the construction, reconstruction, reconditioning, and, in some cases, the purchasing of fishing vessels, shoreside processing, aquaculture, mariculture facilities, and the purchase of individual fishing quota (IFQ). The FFP also provides fishery-wide financing to ease the transition to sustainable fisheries through its fishing capacity reduction programs and provides 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.

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.

**Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

PROPOSED LEGISLATION:

Subject to section 502 of the Congressional Budget Act of 1974, during fiscal year 2019, 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.

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
2018 Annualized CR	0	0	7,997	7,997
less: 2019 Adjustments to Base	0	0	0	0
less: Negative Subsidy Receipts				
Adjustment	0	0	(7,997)	(7,997)
2019 Base	0	0	0	0
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	0	0

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Fisheries Finance Program Account	Pos/BA	0	30,764	0	7,997	0	0	0	0	0	0
	FTE/OBL	0	30,764	0	7,997	0	0	0	0	0	0
Total: Fisheries Finance Program Account	Pos/BA	0	30,764	0	7,997	0	0	0	0	0	0
	FTE/OBL	0	30,764	0	7,997	0	0	0	0	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)**

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	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	30,764	0	7,997	0	0	0	0	0	0
Total Obligations	0	30,764	0	7,997	0	0	0	0	0	0
Adjustments to Obligations:										
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	30,764	0	7,997	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	30,764	0	7,997	0	0	0	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)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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	30,764	7,997	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	30,764	7,997	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	30,764	7,997	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 2019, NOAA estimates that a total of \$154,867,577 will be transferred from the Department of Agriculture to the Promote and Develop account. This same amount will then be transferred from the Promote and Develop account to the Operations, Research, and Facilities (ORF) account.

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.

Base Program

NOAA will transfer \$154,867,577 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 2019.

The Promote and Develop account funds are derived from a transfer of thirty percent of duties on imported fisheries products from the Department of Agriculture. 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 2017, 41 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.¹⁸

¹⁸ http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm

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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
2018 Annualized CR	3	3	24,500	28,206
less: Obligations from prior year balances	0	0	0	0
plus: 2019 Adjustments to Base	(3)	(3)	(24,500)	(28,206)
2019 Base	0	0	0	0
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	0	0

		2017 Actual Personnel Amount	2018 Annualized CR Personnel Amount	2019 Base Program Personnel Amount	2019 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Promote and Develop Fisheries Products	Pos/BA	3	14,909	3	24,500	0
	FTE/OBL	3	14,012	3	28,206	0
Total: Promote and Develop Fisheries Products	Pos/BA	3	14,909	3	24,500	0
	FTE/OBL	3	14,012	3	28,206	0

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2017		2018		2019		2019		Increase/ (Decrease)	
	FTE	Actual Amount	FTE	Annualized CR Amount	FTE	Base Program Amount	FTE	Estimate Amount	FTE	Amount
Direct Discretionary Obligation	3	14,012	3	28,206	0	0	0	0	0	0
Total Obligations	3	14,012	3	28,206	0	0	0	0	0	0
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(2,414)	0	(3,706)	0	0	0	0	0	0
Recoveries	0	(395)	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	3,706	0	0	0	0	0	0	0	0
Total Budget Authority	3	14,909	3	24,500	0	0	0	0	0	0
Financing from Transfers and Other:										
Transfer from USDA	(3)	(145,175)	(3)	(154,868)	0	(154,868)	0	(154,868)	0	0
Appropriations previously unavailable	0	(9,915)	0	(10,017)	0	(10,221)	0	(10,221)	0	0
Permanently Reduced	0	0	0	0	0	0	0	0	0	0
Temporarily Reduced	0	10,017	0	10,221	0	10,221	0	10,221	0	0
Transfer to ORF	0	130,164	0	130,164	0	154,868	0	154,868	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
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	317	317	0	0	0
11.3 Other than full-time permanent	0	0	0	0	0
11.5 Other personnel compensation	4	4	0	0	0
11.8 Special personnel services payments	0	0	0	0	0
11.9 Total personnel compensation	321	321	0	0	0
12.1 Civilian personnel benefits	80	80	0	0	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	10	10	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
25.2 Other services	374	374	0	0	0
Purchases of Goods/Services					
25.3 from Govt accounts	558	558	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	12,650	26,524	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	14,012	28,206	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less unobligated balance, SOY	(2,414)	(3,706)	0	0	0
Plus unobligated balance, EOY	3,706	0	0	0	0
Recoveries	(395)	0	0	0	0
Total Budget Authority	14,909	24,500	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 2019, 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. These collections are for operations of this program, loans, and for use in case of default.

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.

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**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
2018 Annualized CR	0	0	0	0
2019 Base	0	0	0	0
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	0	0

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) 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

**Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	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 to Obligations:										
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
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

**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 2019, NMFS estimates obligating \$4,858,000 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.

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.

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**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
2018 Annualized CR	0	0	4,858	6,925
less: obligations from prior year balances	0	0	0	0
plus: 2019 Adjustments to Base	0	0	(1,045)	(2,067)
2019 Base	0	0	3,813	4,858
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	3,813	4,858

		2017 Actual Personnel Amount	2018 Annualized CR Personnel Amount	2019 Base Program Personnel Amount	2019 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
	Pos/BA	0	15,049	0	4,858	0
Environmental Improvement and Restoration Fund	FTE/OBL	0	6,827	0	6,925	0
Total: Environmental Improvement and Restoration Fund	Pos/BA	0	15,049	0	4,858	0
	FTE/OBL	0	6,827	0	6,925	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement and Restoration Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	6,827	0	6,925	0	4,858	0	4,858	0	0
Total Obligations	0	6,827	0	6,925	0	4,858	0	4,858	0	0
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	0	0	(8,222)	0	(4,858)	0	(4,858)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adjusted	0	0	0	1,297	0	0	0	0	0	0
Unobligated balance, EOY	0	8,222	0	4,858	0	3,813	0	3,813	0	0
Total Budget Authority	0	15,049	0	4,858	0	3,813	0	3,813	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(1,297)	0	0	0	0	0	0	0	0
Permanently Reduced	0	600	0	343	0	269	0	269	0	0
Net Mandatory Appropriation	0	14,352	0	5,201	0	4,082	0	4,082	0	0

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	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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	6,827	6,925	4,858	4,858	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	6,827	6,925	4,858	4,858	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	0	(8,222)	(4,848)	(4,858)	0
Plus unobligated balance, adjusted	0	1,297	0	0	0
Less unobligated balance, transferred	0	0	0	0	0
Plus unobligated balance, EOY	8,222	4,858	3,813	3,813	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	15,049	4,858	3,813	3,813	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 2019, NMFS estimates obligating \$15,152,000 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.

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. 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 Limited Access System Administration Fund.

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**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
2018 Annualized CR	40	40	13,732	15,005
Adjustments to Base	0	0	0	0
less: Obligations from Prior Year Balances	0	0	256	147
2019 Base	40	40	13,988	15,152
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	40	40	13,988	15,152

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) Personnel Amount	
Limited Access System Administration Fund	Pos/BA	40	13,632	40	13,732	40	13,988	40	13,988	0	0
	FTE/OBL	40	11,249	40	15,005	40	15,152	40	15,152	0	0
Total: Limited Access System Administration Fund	Pos/BA	40	13,632	40	13,732	40	13,988	40	13,327	0	0
	FTE/OBL	40	11,249	40	15,005	40	15,152	40	15,152	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	40	11,249	40	15,005	40	15,152	40	15,152	0	0
Total Obligations	40	11,249	40	15,005	40	15,152	40	15,152	0	0
Adjustments to Obligations:										
Recoveries	0	(83)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(13,731)	0	(16,197)	0	(14,924)	0	(14,924)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	16,197	0	14,924	0	13,760	0	13,760	0	0
Total Budget Authority	40	13,632	40	13,732	40	13,988	40	13,988	0	0
Financing from Transfers and Other:										
Appropriations previously unavailable	0	(690)	0	(868)	0	(909)	0	(909)	0	0
Temporarily Reduced	0	868	0	909	0	924	0	924	0	0
Net Appropriation	40	13,810	40	13,773	40	14,003	40	14,003	0	0

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	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	3,523	3,639	3,639	3,639	0
11.3 Other than full-time permanent	0	0	0	0	0
11.5 Other personnel compensation	418	418	418	418	0
11.8 Special personnel services payments	0	0	0	0	0
11.9 Total personnel compensation	3,941	4,057	4,057	4,057	0
12.1 Civilian personnel benefits	1,524	1,542	1,542	1,542	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	56	88	88	88	0
22 Transportation of things	36	36	36	36	0
23.1 Rental payments to GSA	197	197	197	197	0
23.2 Rental payments to others	5	5	5	5	0
23.3 Commun., util., misc. charges	407	407	407	407	0
24 Printing and reproduction	96	96	96	96	0
25.1 Advisory and assistance services	21	21	21	21	0
25.2 Other services	1,646	4,300	4,447	4,447	0
25.3 Purchases of goods/services from govt account:	0	0	0	0	0
26 Supplies and materials	125	460	460	460	0
31 Equipment	156	757	757	757	0
32 Lands and structures	0	0	0	0	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	3,039	3,039	3,039	3,039	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	11,249	15,005	15,152	15,152	0

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Recoveries	(83)	0	0	0	0
Less unobligated balance, SOY	(13,731)	(16,197)	(14,924)	(14,924)	0
Unobligated balance, unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	16,197	14,924	13,760	13,760	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	13,632	13,732	13,988	13,988	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

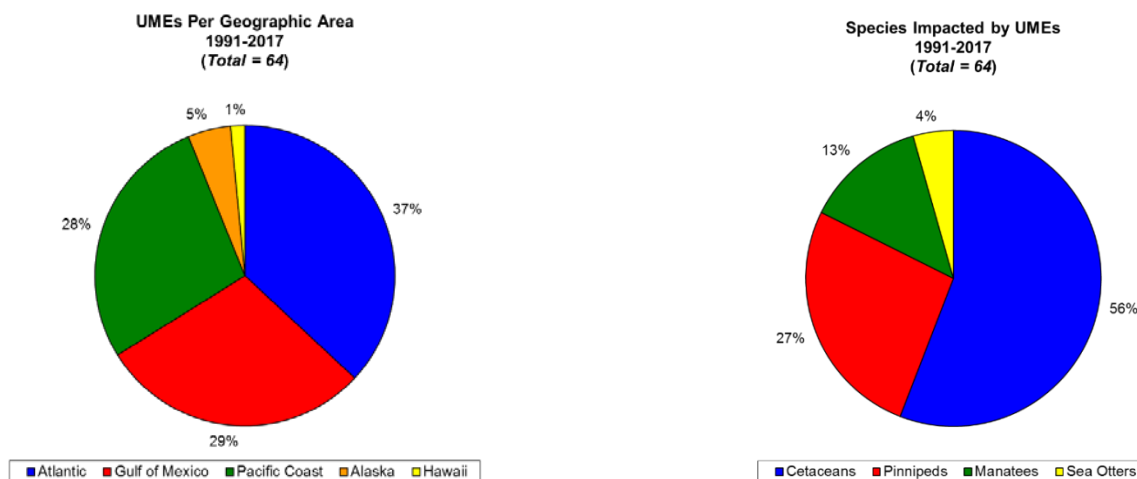
For FY 2019, NMFS estimates obligating \$23,000 from the Marine Mammal Unusual Mortality Event Fund.

Goal Statement

Provide funds to support investigations and responses to unusual marine mammal mortality events.li

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.



Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE

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.”

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 26 years (1991– 2017), NOAA declared 64 UMEs, an average of 2.4 UMEs per year. The highest number of UMEs declared in a year was 5 (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.).

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 2018 and we anticipate obligating \$23,000 from the Marine Mammal Unusual Mortality Event Fund in FY 2019. Additionally, the UME Contingency fund is listed on Pay.gov allowing the public to donate to the Fund year round.

**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
2018 Annualized CR	0	0	0	0
Adjustments to Base	0	0	0	23
2019 Base	0	0	0	23
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	0	23

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) Personnel Amount	
Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	23	0	23	0	0
Total: Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	23	0	23	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	0	23	0	23	0	0
Total Obligations	0	0	0	0	0	0	0	23	0	0
Adjustments to Obligations:										
Recoveries	0	(1)	0	0	0	0	0	0	0	0
Collections	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(24)	0	(25)	0	(25)	0	(25)	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	25	0	25	0	2	0	2	0	0
Total Budget Authority	0	0	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	0	0	0	0	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)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	0	0	23	23	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	23	23	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	(1)	0	0	0	0
Less unobligated balance, SOY	(24)	(25)	(25)	(25)	0
Plus unobligated balance, EOY	25	25	2	2	0
Less collections	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	0	0	0	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 2019, NMFS estimates obligating \$500,000 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.

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.

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:

- 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 Western Pacific Sustainable Fisheries Fund to be used for fisheries enforcement and for

**Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

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 Western Pacific Sustainable Fisheries Fund.

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
2018 Annualized CR	0	0	494	511
Adjustments to Base	0	0	6	(11)
2019 Base	0	0	500	500
plus: 2019 Program				
Changes	0	0	0	0
2019 Estimate	0	0	500	500

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) Personnel Amount	
Western Pacific Sustainable Fisheries Fund	Pos/BA	0	240	0	494	0	500	0	500	0	0
	FTE/OBL	0	641	0	511	0	500	0	500	0	0
Total: Western Pacific Sustainable Fisheries Fund	Pos/BA	0	240	0	494	0	500	0	500	0	0
	FTE/OBL	0	641	0	511	0	500	0	500	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	641	0	511	0	500	0	500	0	0
Total Obligations	0	641	0	511	0	500	0	500	0	0
Adjustments to Obligations:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(418)	0	(17)	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	17	0	0	0	0	0	0	0	0
Total Budget Authority	0	240	0	494	0	500	0	500	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(17)	0	(27)	0	(33)	0	(33)	0	0
Temporarily Reduced	0	27	0	33	0	33	0	33	0	0
Net Appropriation	0	250	0	500	0	500	0	500	0	0

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	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	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	641	511	500	500	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	641	511	500	500	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	(418)	(17)	0	0	0
Plus unobligated balance, EOY	17	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	240	494	500	500	0

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

Activity: Fisheries Asset Forfeiture Fund

For FY 2019, NMFS estimates it will collect \$4,155,000 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.

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. 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.

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

	Positions	FTE	Budget Authority	Direct Obligations
2018 Annualized CR	0	0	4,157	5,207
Adjustments to Base			(2)	423
less: Obligations from Prior Year Balances	0	0	0	0
2019 Base	0	0	4,155	5,630
plus: 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	4,155	5,630

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) Personnel Amount	
Fisheries Asset Forfeiture Fund	Pos/BA	0	2,497	0	4,157	0	4,155	0	4,155	0	0
	FTE/OBL	0	4,196	0	5,207	0	5,630	0	5,630	0	0
Total: Fisheries Asset Forfeiture Fund	Pos/BA	0	2,497	0	4,157	0	4,155	0	4,155	0	0
	FTE/OBL	0	4,196	0	5,207	0	5,630	0	5,630	0	0

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

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	4,196	0	5,207	0	5,630	0	5,630	0	0
Total Obligations	0	4,196	0	5,207	0	5,630	0	5,630	0	0
Adjustments to Obligations:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(16,581)	0	(15,682)	0	(14,632)	0	(14,632)	0	0
Unobligated balance, transferred	0	(800)	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	15,682	0	14,632	0	13,157	0	13,157	0	0
Total Budget Authority	0	2,497	0	4,157	0	4,155	0	4,155	0	0
Financing from Transfers and Other:										
Mandatory Appropriation Temporarily Reduced	0	276	0	274	0	274	0	274	0	0
Appropriations previously unavailable	0	(272)	0	(276)	0	(274)	0	(274)	0	0
Net Appropriation	0	2,501	0	4,155	0	4,155	0	4,155	0	0

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

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	1,480	1,839	1,839	1,839	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	5	12	12	12	0
23.3 Commun., util., misc. charges	2	4	4	4	0
24 Printing and reproduction	10	26	26	26	0
25.1 Advisory and assistance services	148	148	148	148	0
25.2 Other services	367	367	367	367	0
25.3 Purchases of goods/services from govt accounts	1,457	2,036	2,459	2,459	0
26 Supplies and materials	36	50	50	50	0
31 Equipment	691	725	725	725	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	4,196	5,207	5,630	5,630	0

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

Less unobligated balance, SOY	(16,581)	(15,682)	(14,632)	(14,632)	0
Recoveries	0	0	0	0	0
Plus unobligated balance, EOY	15,682	14,632	13,157	13,157	0
Less unobligated balance, transferred	(800)	0	0	0	0
Total Budget Authority	2,497	4,157	4,155	4,155	0

**Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: North Pacific Observer Fund

For FY 2019, NMFS estimates obligating \$3,990,000 for the North Pacific 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.

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. 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 ($\geq 100\%$ 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 \$3.9 million to be collected in fees from the FY 2018 season, to be used in FY 2019 for observer coverage.

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**Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS**
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
2018 Annualized CR	0	0	3,870	4,015
Adjustments to Base	0	0	120	(25)
less: Obligations from Prior Year Balances	0	0	0	0
2019 Base	0	0	3,990	3,990
plus: 2019 Program	0	0	0	0
Changes	0	0	0	0
2019 Estimate	0	0	3,990	3,990

		2017 Actual Personnel Amount		2018 Annualized CR Personnel Amount		2019 Base Program Personnel Amount		2019 Estimate Personnel Amount		Increase/ (Decrease) Personnel Amount	
North Pacific Observer Fund	Pos/BA	0	3,635	0	3,870	0	3,990	0	3,990	0	0
	FTE/OBL	0	3,542	0	4,015	0	3,990	0	3,990	0	0
Total: North Pacific Observer Fund	Pos/BA	0	3,635	0	3,870	0	3,990	0	3,990	0	0
	FTE/OBL	0	3,542	0	4,015	0	3,990	0	3,990	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	3,542	0	4,015	0	3,990	0	3,990	0	0
Total Obligations	0	3,542	0	4,015	0	3,990	0	3,990	0	0
Adjustments to Obligations:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(52)	0	(145)	0	0	0	0	0	0
Unobligated balance, EOY	0	145	0	0	0	0	0	0	0	0
Total Budget Authority	0	3,635	0	3,870	0	3,990	0	3,990	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(231)	0	(274)	0	(254)	0	(254)	0	0
Temporarily Reduced	0	274	0	254	0	264	0	264	0	0
Net Appropriation	0	3,678	0	3,850	0	4,000	0	4,000	0	0

Department of Commerce
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North Pacific Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ (Decrease)
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	3,542	4,015	3,990	3,990	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	3,542	4,015	3,990	3,990	0

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Recoveries	0	0	0	0	0
Less unobligated balance, SOY	(52)	(145)	0	0	0
Plus unobligated balance, EOY	145	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	3,635	3,870	3,990	3,990	0

BUDGET PROGRAM: OCEANIC AND ATMOSPHERIC RESEARCH

For FY 2019, NOAA requests a total of \$321,651,000 and 679 FTE for the Office of Oceanic and Atmospheric Research.

Oceanic and Atmospheric Research Overview:

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.

NOAA manages OAR's budget line items in four sub-programs. This management structure enables improved coordination across budget lines that fall within a single research portfolio, providing great opportunity for collaboration between OAR's labs, programs, cooperative institutes, and extramural partners on shared areas of research. In this way, the OAR budget is organized into the following four Operations, Research, and Facilities (ORF) sub-programs:

- **Climate Research (\$152,582,000 and 297 FTE)** includes foundational long-term observations and research focused on gaining greater understanding of our Earth's system, including research seasonal (3 months – 2 years) and sub-seasonal (2 weeks to 3 months) outlooks, and enhancing communities' ability to respond to climate variability and change.
- **Weather & Air Chemistry Research (\$119,837,000 and 237 FTE)** includes research focused on improving our understanding and forecasting capabilities for near-term (minutes to 2 weeks) severe storm and weather events that endanger lives and property.
- **Ocean, Coastal and Great Lakes Research (\$192,430,000 and 211 FTE)** includes research and grant programs focused on improving understanding of habitats, processes, and resources in the oceanic, coastal, and Great Lakes environments.
- **Innovative Research and Technology (\$13,068,000 and 11 FTE)** includes high performance computing initiatives, which advance computing, communications, and information technologies throughout NOAA.

The OAR budget is organized into one Procurement, Acquisition, and Construction (PAC) sub-program totaling \$36,134,000 and 0 FTE.

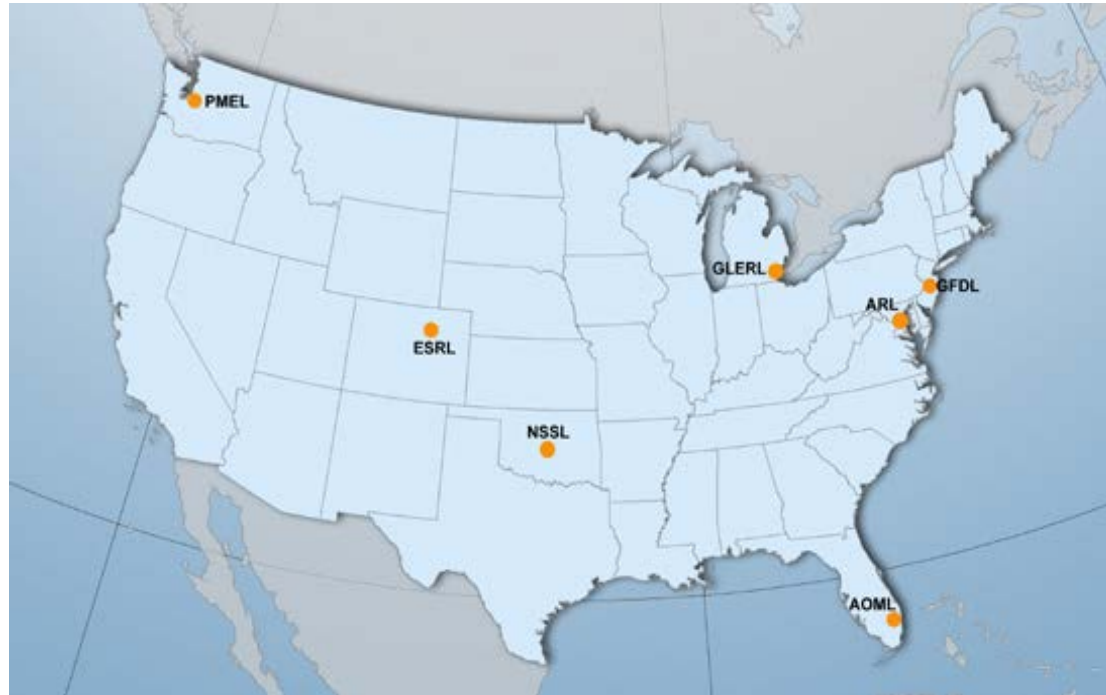
- **Systems Acquisition** includes NOAA's investments in infrastructure for Research and Development High Performance Computing. OAR manages a high performance computing system, which provides a platform to characterize and quantify weather and climate variations and change at a range of temporal and spatial scales.

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.

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 Research Laboratory (CSRL)

CSRL 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 Research Laboratory (GMRL)

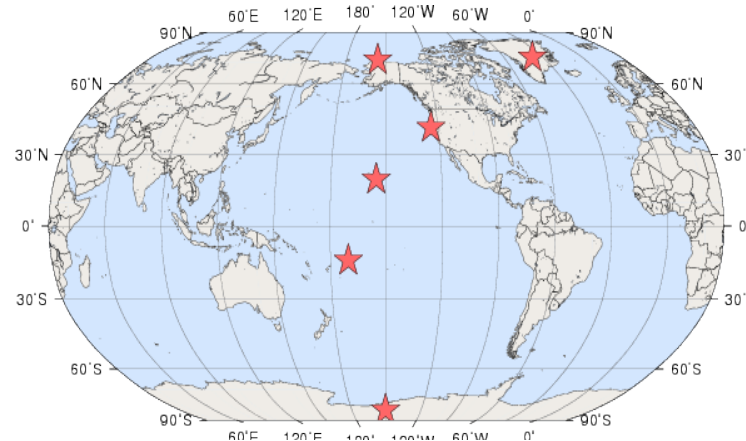
GMRL sustains long-term observation of atmospheric compounds from over 100 sites around the world and identifies emerging trends in compound location and concentration. It also validates the NASA and NOAA satellite data of greenhouse gases, ozone, radiation, aerosols, and many other atmospheric compounds.

Global Systems Research Laboratory (GSRL)

GSRL 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 (PSRL)

PSRL 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.



Among other observation networks, GMRL 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.

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.

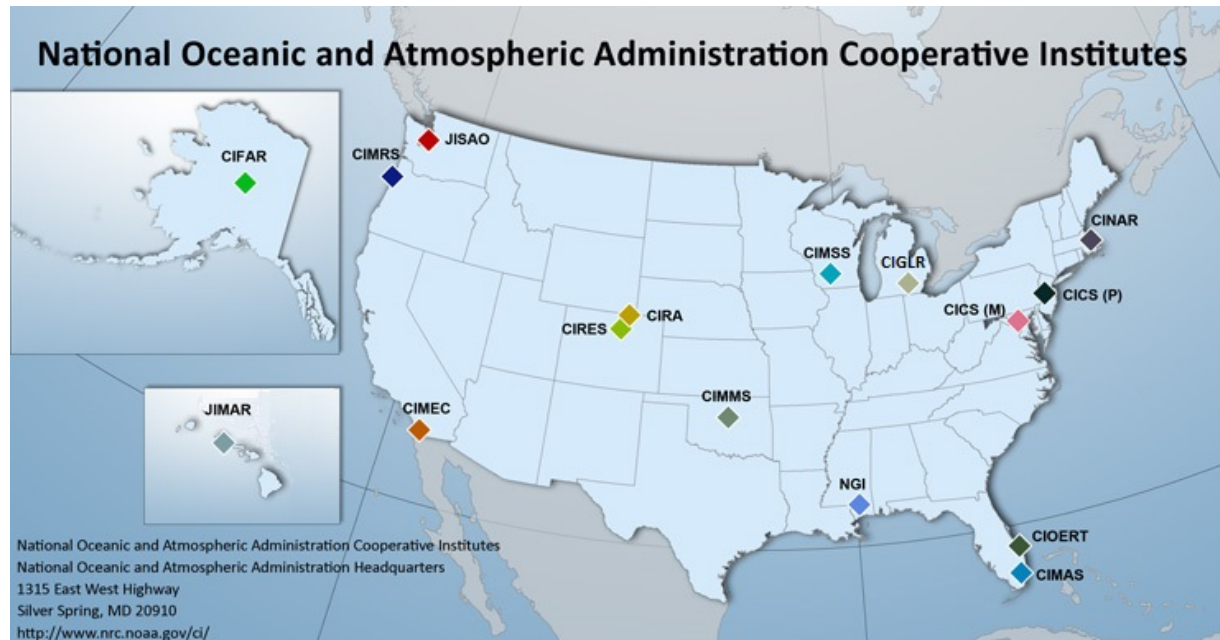
OAR Cooperative Institutes:

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 was competitively selected to address a specific research theme within NOAA's mission, such as weather forecast improvement and 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 Climate Science (CICS-P), 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



Map displaying the location of NOAA's Cooperative Institutes

OAR Programs:

OAR Programs manage competitive and noncompetitive awards for intramural and extramural research that focus on specific topics and emerging areas of research. They also foster collaboration across NOAA, with other agencies, and academic institutions. OAR's programs include:

Climate Program Office (CPO)

CPO supports activities that advance our understanding of Earth's climate system and helps communities apply this knowledge to mitigate risks and improve community resilience and preparedness throughout the Nation.

National Sea Grant College Program (NSGCP)

The National Sea Grant College Program is a Federal-state partnership that focuses on maintaining resilient communities and economies, sustainable fisheries and aquaculture, healthy coastal ecosystems, and environmental literacy and workforce development.

NOAA Ocean Acidification Program (OAP)

The OAP aims to improve understanding of how ocean chemistry is changing, how variable that change is by region, and how ocean acidification affects marine life, people, and the economy.

Ocean Exploration and Research (OER)

OER, the only Federal program dedicated to ocean exploration, leads efforts to explore and characterize deep-water areas of the U.S. and other poorly known ocean areas so the Nation can successfully manage its oceanic resources.

Office of Weather and Air Quality (OWAQ)

OWAQ improves predictions and warnings for the public and weather sensitive U.S. industries by facilitating cutting-edge research and transitioning this research to National Weather Service (NWS) operations.

Unmanned Aircraft Systems (UAS) Program

The UAS program examines innovative UAS technologies that collect data from dangerous or remote areas, such as the poles, oceans, wildlands, volcanic islands, and wildfires to bridge the information gap between instruments on Earth's surface and on satellites.

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.

OAR GPRA measures	FY 2017 Actual	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target	FY 2023 Target
Annual number of peer-reviewed publications related to environmental understanding and prediction (<i>NOAA total</i>)	1678	1100	1100	1100	1100	1100	1100
Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	n/a	42	42	42	42	42	42

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2019 Base includes an increase of \$3,403,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for OAR activities. This includes inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, 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 to the agency:

From Office	PPA	To Office	PPA	Amount / FTE
OAR	Climate Competitive Research	OAR	U.S. Weather Research Program (USWRP)	\$5,676,000 / 0FTE
OAR	Climate Competitive Research	OAR	Climate Research Laboratories & Cooperative Institutes	\$14,282,000 / 0FTE

NOAA requests to transfer \$19,958,000 and 0 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 PPA to the USWRP PPA to support research and development associated with Seasonal to Subseasonal (S2S) atmospheric research. This funding complements S2S funding already located in the USWRP PPA. Additionally, \$14,282,000 will be moved from the Climate Competitive Research PPA to the Climate Research Climate Laboratories & Cooperative Institutes PPA 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. The Climate Competitive Research PPA is proposed for elimination in FY 2019.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)**

Activity: Climate Research

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Climate Research	Pos/BA	172	59,259	236	59,597	279	74,912	279	72,972	0	(1,940)
Laboratories & Cooperative Institutes	FTE/OBL	171	60,166	227	60,295	270	74,912	270	72,972	0	(1,940)
Regional Climate Data & Information	Pos/BA	27	37,605	28	37,745	14	37,888	6	25,671	(8)	(12,217)
	FTE/OBL	27	38,245	27	37,977	13	37,888	5	25,671	(8)	(12,217)
Climate Competitive Research	Pos/BA	43	59,373	44	59,597	15	39,782	0	0	(15)	(39,782)
	FTE/OBL	43	60,214	43	59,883	14	39,782	0	0	(14)	(39,782)
Total Climate Research	Pos/BA	242	156,237	308	156,939	308	152,582	285	98,643	(23)	(53,939)
	FTE/OBL	241	158,625	297	158,155	297	152,582	275	98,643	(22)	(53,939)

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. Although the study of the Earth's climate can span a period of years to decades, NOAA's climate focus is also 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. In 2017, the United States experienced 16 climate and weather disasters, including a historic firestorm in California and three Category 4 hurricanes on the Southeast coast. Combined, these events claimed 362 lives and cost \$306 billion in damages. Businesses, policy leaders, resource managers and citizens are increasingly asking for information to help them address challenges like these. 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. NOAA's climate research activities are authorized under the National Climate Program Act, the Global Change Research Act, and the Weather Research and Forecasting Innovation Act.

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The following three Programs, Projects and Activities (PPA) are included in the Climate Research Portfolio:

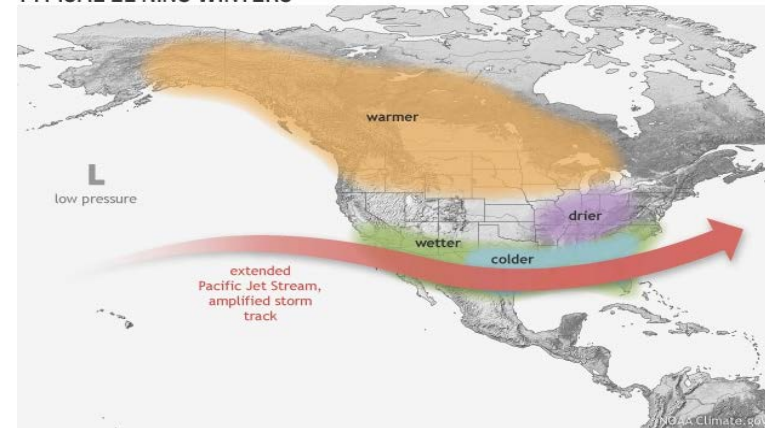
- *Laboratories & Cooperative Institutes:* OAR's Laboratory and Cooperative Institutes primarily support Earth System science research, modeling, and technology development and maintain long-term atmospheric observation networks and infrastructure, including a network of tall towers and the Atmospheric 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's 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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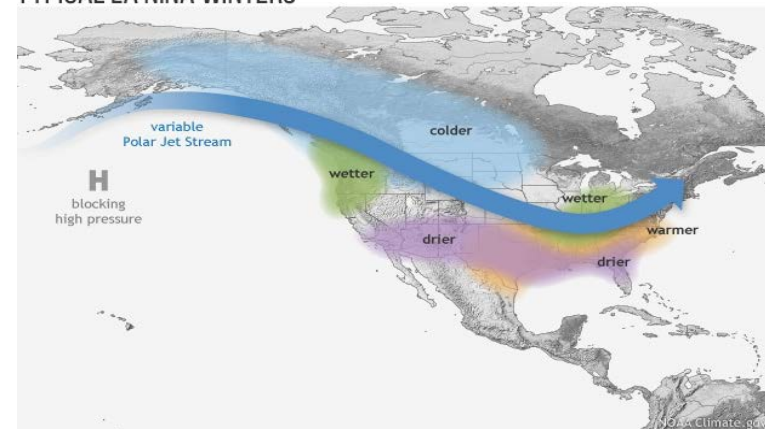
Base Program

In FY 2017, OAR's Climate Research made significant contributions to improving NOAA NWS's operational forecasts for temperature and precipitation more than 2 weeks in advance (in the sub-seasonal to seasonal timeframe), which is the lead time required for key management decisions in most sectors in the U.S. economy as well as national security. Underpinning these advancements in NOAA's climate modeling capabilities, Climate Research sustained 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, thus, 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.

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TYPICAL LA NIÑA WINTERS



NOAA Climate Research

OAR's Climate Research is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities include:

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Global Observations

To better document and understand global processes, OAR provides an array of observational capabilities. For example, OAR's six 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.

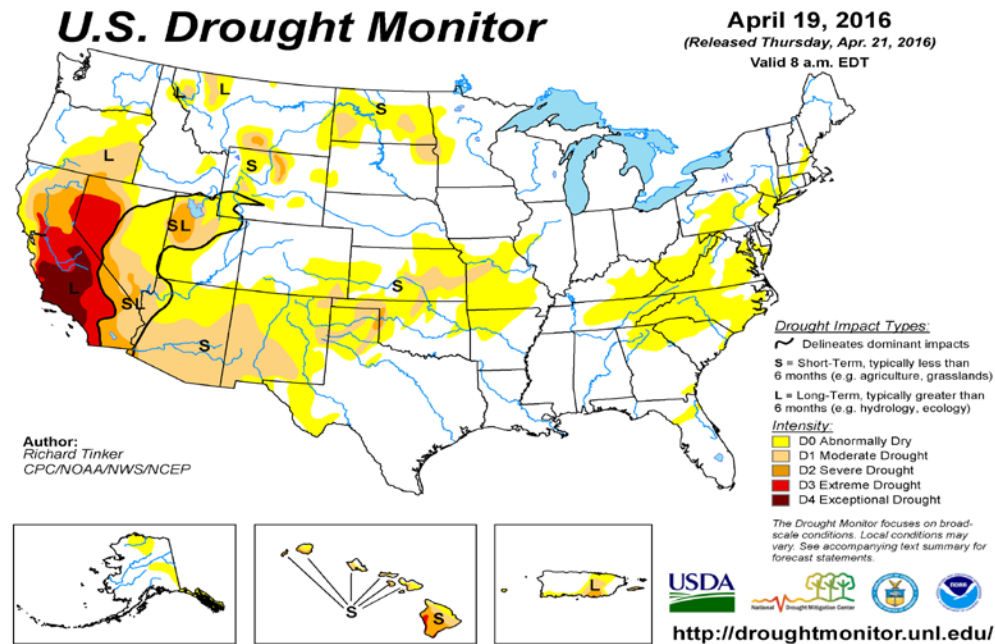
Predicting Future Change

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.

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. 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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Competitive Research

OAR funds high-priority climate science through a competitive selection process focused on four areas to advance the understanding, modeling, and prediction of Earth's climate system and to foster effective decision making:

- Earth System Science provides process-level understanding of NOAA's Earth climate system through observation, modeling, research analysis, and field studies to support the development of improved climate models and predictions.
- Modeling, Analysis, Predictions, and Projections improve models of Earth system processes, and tests model capabilities to make them more relevant to decision makers for topics such as extreme heat, high water levels, drought, and tornado outbreaks.
- Climate and Societal Interactions enables scientists and decision makers to effectively co-produce and utilize climate information in risk management, adaptation and development.
- Climate and U.S. Fish Stocks advances understanding and projection of the impacts of climate variability and change on fish stocks, prey availability, and habitat to support sustainable fisheries management.

Statement of Operating Objectives

Schedule and Milestone Highlights

FY 2019–2023

Laboratories and Cooperative Institutes PPA

- 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 38 existing CO₂ and OA moorings and deploy an average of 1 additional mooring each year to the network
- Complete 1-2 hydrography cruises annually including inventorying climatically important chemistry (e.g. CO₂, etc.), servicing moorings, and monitoring coastal and deep ocean boundary currents
- Long term global records of greenhouse gases, stratospheric ozone, and aerosols

Regional Climate Data & Information PPA

- 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

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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 PPA

- Expand Earth system data collection for cryospheric, boundary layer properties, hydrometeorological, and oceanic process studies
- Increase cumulative number of science-based adaptation tools and technologies that are used by NOAA partners and stakeholders to improve ecosystem-based management of fisheries from two to five

Deliverable Highlights

Laboratories and Cooperative Institutes PPA

- 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 PPA

- 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
- 647K unique visits to NOAA Climate.gov in 2016 (62.5 percent more than previous year)
- Climate training workshops and reports directed to the needs of resource managers

Climate Competitive Research PPA

- In FY 2018, OAR's Climate Program Office (CPO) will award \$38.8 million for 78 new projects (pending availability of appropriations). The projects, ranging from advancing the understanding and prediction of drought to building resilience in coastal communities, will be conducted by universities, other research institutions, and other federal agencies.

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DECREASES FOR 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Climate	Pos./BA	279	74,912	279	72,972	0	(1,940)
Laboratories & CIs	FTE/Obl.	270	74,912	270	72,972	0	(1,940)
Regional Climate	Pos./BA	14	37,888	6	25,671	-8	(12,217)
Data & Information	FTE/Obl.	13	37,888	5	25,671	-8	(12,217)
Climate Competitive	Pos./BA	15	39,782	0	0	-15	(39,782)
Research	FTE/Obl.	14	39,782	0	0	-14	(39,782)

Arctic Research Elimination (0 FTE/ 0 Positions, -\$5,685) – With this reduction, NOAA will eliminate Arctic research within the Office of Oceanic and Atmospheric research (OAR). The Climate Laboratories & Cooperative Institutes PPA will be reduced by \$1,940 and Regional Climate Data & Information PPA will be reduced by \$3,745. NOAA’s budget proposes to terminate improvements to sea ice modeling and predictions that support the safety of fishermen, commercial shippers, cruise ships, and local communities. 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 2019

- Conclude Arctic research activities within OAR
- Reduce program to support highest priority activities within available climate research funding

FY 2020–2023

- Maintain support for highest priority activities within available climate research funding

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Deliverables

Terminate Arctic research activities

Eliminate Climate Competitive Research PPA (-22 FTE/ -22 Positions, -\$48,254) – With this reduction, NOAA will eliminate remaining climate research funding which was originally reduced in the FY 2018 President’s Budget. The Climate Competitive Research will be decreased by \$39,782 and 14 FTE and the Regional Climate Data and Information will be decreased by \$8,472 and 8 FTE. This will result in the termination of 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 dismantle the Climate Program Office (CPO) as it currently exists.

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 the remaining climate funding, OAR will preserve priority activities including 1) Earth System Research within the OAR laboratories [dedicated annual funding will be moved from Climate Competitive Research to Climate Laboratories and CIs PPA]; 2) National Integrated Drought Information Systems (NIDIS) [funding will be maintained in the Regional Climate Data and Information PPA]; 3) Long-term observations and climate records [funding will be maintained in the Climate Laboratories and CIs PPA]; 4) research and development associated with Seasonal to Subseasonal (S2S) atmospheric research [funding currently in both the Climate Laboratories and CIs PPA, which will be maintained, and Climate Competitive Research PPA, which will be moved to U.S. Weather Research Program PPA to consolidate S2S program funds]; and legislatively mandated work on the National Climate Assessment [funding will be maintained in the Regional Climate Data and Information PPA].

Schedule and Milestones

FY 2019

- End 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, the Modeling, Analysis, Predictions, and Projections (MAPP) Program, OAR’s Service Level Agreement with the National Weather Service (NWS) for climate funding, the CPO Fish Stock research, and CPO’s communication, education and engagement activities

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FY 2020–2023

- Maintain support for highest priority activities within available climate research funding

Deliverables

- Terminate funding under the Climate Competitive Research PPA
- Align Earth Systems Research funding within the OAR laboratories
- Consolidate funding for Seasonal to Subseasonal (S2S) atmospheric research

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Activity: Climate Research
Subactivity: Climate Competitive Research
Program Change: Eliminate Climate Competitive Research PPA

Title	Location	Grade	Number	Annual Salary	Total Salaries
Director, Climate Program Office	Silver Spring, MD	SES	(1)	163	(163)
Physical Scientist	Silver Spring, MD	ZP-5	(4)	162	(648)
Supervisory Management & Program Analyst	Silver Spring, MD	ZA-5	(1)	162	(162)
Physical Scientist	Silver Spring, MD	ZP-4	(5)	154	(772)
Program Analyst	Silver Spring, MD	ZA-4	(1)	125	(125)
Physical Scientist	Silver Spring, MD	ZP-3	(1)	110	(110)
Program Analyst	Silver Spring, MD	ZA-3	(1)	110	(110)
Total			(14)		(2,090)
Less lapse		0.00%			
Total full-time permanent (FTE)			(14)		(2,090)
2019 Pay Adjustment (0%)		0.00%			0
Total					(2,090)

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)

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Activity: Climate Research
Subactivity: Regional Climate Data & Information
Program Change: Eliminate Climate Competitive Research PPA

Title	Location	Grade	Number	Annual Salary	Total Salaries
Management & Program Analyst	Silver Spring, MD	ZA-4	(4)	150	(600)
Program Analyst	Silver Spring, MD	ZA-3	(3)	107	(320)
Program Specialist	Silver Spring, MD	ZA-2	(1)	83	(83)
Total			(8)		(1,004)
Less lapse		0.00%			
Total full-time permanent (FTE)			(8)		(1,004)
2019 Pay Adjustment (0%)		0.00%			0
Total					(1,004)

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(8)
Other than full-time permanent	0
Total	(8)

Authorized Positions:

Full-time permanent	(8)
Other than full-time permanent	0
Total	(8)

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PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Climate Research
Subactivity: Climate Laboratories & Cooperative Institutes
Program Change: Arctic Research Elimination

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(20)
22 Transportation of things	(10)
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(25)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(100)
31 Equipment	(27)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(1,758)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,940)

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(Dollar amounts in thousands)

Activity: Climate Research
Subactivity: Regional Climate Data and Information
Program Change: Arctic Research Elimination

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(257)
22 Transportation of things	(102)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	(9)
24 Printing and reproduction	(6)
25 Consulting and other services	
25.1 Advisory and assistance services	(9)
25.2 Other services	(26)
25.3 Purchases of goods & services from Gov't accounts	(102)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(497)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(284)
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,453)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(3,745)

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(Dollar amounts in thousands)

Activity: Climate Research
Subactivity: Climate Competitive Research
Program Change: Eliminate Climate Competitive Research PPA

Object Class	2019 Decrease
11.1 Full-time permanent	(2,090)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(2,090)
12.1 Civilian personnel benefits	(651)
13 Benefits for former personnel	0
21 Travel and transportation of persons	(302)
22 Transportation of things	(126)
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	(769)
23.2 Rental Payments to others	(88)
23.3 Communications, utilities and miscellaneous charges	(404)
24 Printing and reproduction	(14)
25 Consulting and other services	(96)
25.1 Advisory and assistance services	(2,788)
25.2 Other services	(6,138)
25.3 Purchases of goods & services from Gov't accounts	(673)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(1,013)
31 Equipment	(414)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(24,216)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(39,782)

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PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Climate Research
Subactivity: Regional Climate Data & Information
Program Change: Eliminate Climate Competitive Research PPA

Object Class	2019 Decrease
11.1 Full-time permanent	(1,004)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(1,004)
12.1 Civilian personnel benefits	(313)
13 Benefits for former personnel	0
21 Travel and transportation of persons	(64)
22 Transportation of things	(32)
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(14)
25.2 Other services	(57)
25.3 Purchases of goods & services from Gov't accounts	(9)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(319)
31 Equipment	(86)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(6,574)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(8,472)

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Weather & Air Chemistry Research

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Weather & Air Chemistry	Pos/BA	198	78,996	252	79,462	252	80,574	214	65,892	(38)	(14,682)
Research Laboratories & Cooperative Institutes	FTE/OBL	197	79,202	227	81,027	227	80,574	190	65,892	(37)	(14,682)
U.S. Weather Research Program (USWRP)	Pos/BA	6	10,530	6	10,529	8	16,260	8	13,216	0	(3,044)
	FTE/OBL	6	10,688	6	10,672	8	16,260	8	13,216	0	(3,044)
Tornado Severe Storm Research/Phased Array Radar	Pos/BA	3	13,064	3	13,070	2	13,070	2	12,622	0	(448)
	FTE/OBL	3	13,102	3	13,266	2	13,070	2	12,622	0	(448)
Joint Technology Transfer Initiative	Pos/BA	1	9,947	0	9,933	0	9,933	0	0	0	(9,933)
	FTE/OBL	1	7,609	0	12,496	0	9,933	0	0	0	(9,933)
Total Weather & Air Chemistry Research	Pos/BA	208	112,537	261	112,994	262	119,837	224	91,730	-38	-28,107
	FTE/OBL	207	110,601	236	117,461	237	119,837	200	91,730	-37	-28,107

Goal Statement

Weather & Air Chemistry Research in OAR 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 and for the enhancement of the national economy. OAR's weather research laboratories, programs, and partners are key contributors to advancing the National Weather

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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. NOAA's weather research activities are authorized under the Weather Service Modernization Act, the National Oceanic and Atmospheric Administration Authorization Act, and the Weather Research and Forecasting Innovation Act.

The following two sub-activities 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.

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.

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Base Program

In 2017, OAR's Weather Research scientists began working on generating better predictions of dust storms after linking spikes in such storms in the American Southwest to large scale changes in sea surface temperatures in the Pacific Ocean¹; tested a new observation tool to improve local precipitation forecasts that is being tested by NWS for use in day-to-day operations at the National Weather Service (NWS)²; and handed off operational code for a major upgrade to the Meteorological Assimilation Data Ingest System (MADIS) to the NWS, improving forecasts by allowing users to easily access real-time measurements of floods, rivers, and snow amounts in addition to other valuable weather observations³. During the 2017 hurricane season, NOAA research scientists gathered data and improved weather forecasting skill by running and refining experimental models. NOAA's Hurricane Weather Research and Forecasting (HWRF) model proved to be the best numerical hurricane forecasting model for the strongest winds, providing predictions of rapidly intensifying winds in Harvey, Irma and Maria. NOAA's experimental HWRF model improved track forecasts up to seven percent when compared with the operational HWRF. NOAA's experimental Global Forecast System, or fvGFS, exceeded all other models in forecasting the track of Hurricane Maria. Preliminary evaluations of NOAA's experimental High Resolution Rapid Refresh or HRRRX accurately predicted the path of Hurricane Harvey, its location and amount of record rainfall from the storm, as well as Hurricane Irma's landfall location 28 hours in advance. After the loss of the San Juan weather radar, the

OAR's Weather Research Portfolio is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities 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. OAR is working with NWS and the Federal Aviation Administration to demonstrate Multi-function Phased Array Radar (MPAR), one potential application for phased array radar. MPAR has the potential to simultaneously perform aircraft tracking, wind profiling, and weather surveillance in the same radar system.

¹ <http://research.noaa.gov/News/NewsArchive/LatestNews/TabId/684/ArtMID/1768/ArticleID/12166/Research-finds-spike-in-dust-storms-in-American-Southwest-driven-by-ocean-changes.aspx>

² <http://research.noaa.gov/News/NewsArchive/LatestNews/TabId/684/ArtMID/1768/ArticleID/12003/Scientists-test-a-new-tool-to-improve-local-precipitation-forecasts.aspx>

³ <https://www.esrl.noaa.gov/gsd/learn/hotitems/2016/new-madis.html>

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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.

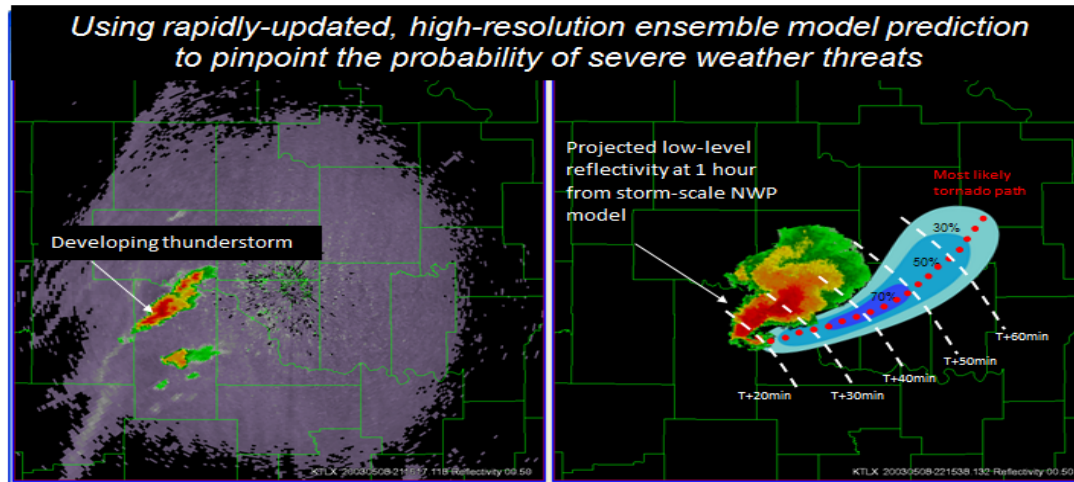
Earlier Warnings

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 13 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.

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 and air quality 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.

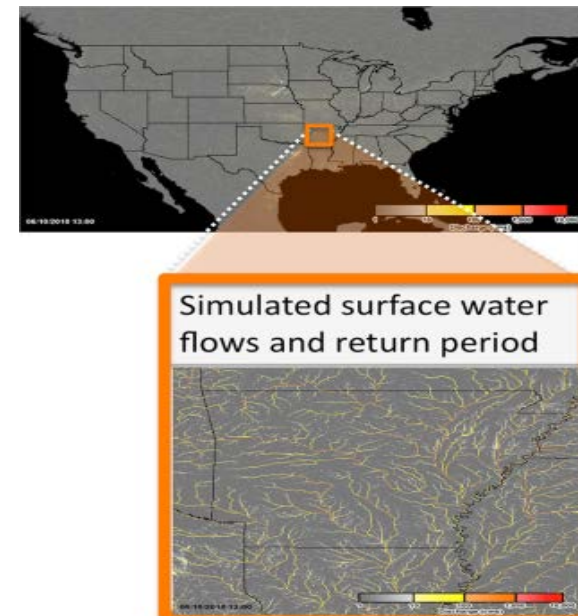
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Improved Flood & Drought Predictions

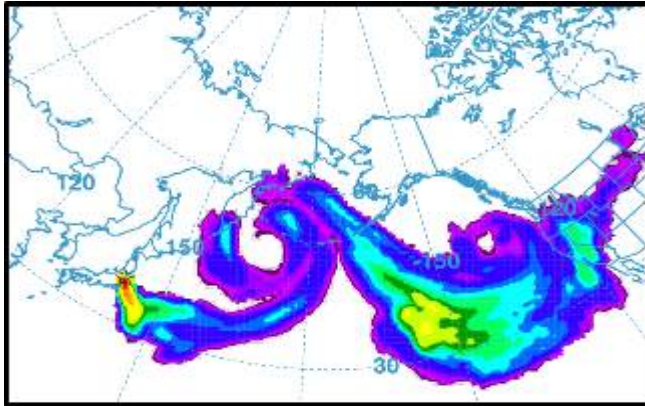
Accurate rain and snowfall predictions help water and emergency managers better balance water supply needs. Partnering with NWS and other Federal, state, and local water resource agencies, OAR researches the extreme precipitation and weather conditions that can lead to flooding by evaluating new observations 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



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to improve the accuracy, timing, and specificity of flash flood warnings in the U.S., thus saving lives and protecting infrastructure.



Example of a specialized HYSPLIT model simulation of radioactive Cesium particles from the Japanese Daiichi Nuclear.

Air Chemistry

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. In 2017, the Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) Model integrated information from NOAA's newest geostationary satellite, GOES-16 to dramatically improve

accuracy and timeliness of plume dispersion forecasts for chemical spills, fires, and nuclear incidents. Use of the HYSPLIT model by outside users including emergency responders has been steadily increasing since 2009.

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 the use of NASA's UAS Global Hawk, to using a thirteen pound Puma UAS to test the potential to provide a rapid response capability for oil spills in the Arctic and for monitoring marine life, possible fishing violations, and conducting marine debris surveys. 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 to improve predictions of hurricane intensification.

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Statement of Operating Objectives

Schedule and Milestone Highlights

FY 2019–2023

Laboratories & Cooperative Institutes PPA

- 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 PPA

- Adapt dual-polarization techniques to advance the Multi-Radar Multi-Sensor (MRMS) in operational use for improved cool season precipitation estimation
- Complete annual competitive grant process to select USWRP-funded and demonstration projects
- Evaluate readiness of OWAQ-supported research to be transitioned into operations
- Build and evaluate Advanced Technology Demonstrator as a proof-of-concept for MPAR
- Review industry proposals for MPAR pre-production contract award, provided that NOAA accepts MPAR as its solution for its future radar system
- Improved tornado warning decision performance evaluated and quantified in collaboration with NWS forecasters within the HWT
- Test/evaluation of dual-polarization panel characteristics and performance on phased array radar systems including the ATD

Deliverable Highlights

Laboratories & Cooperative Institutes PPA

- 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 PPA

- Prototype phased array radar products available for transfer into NOAA operations
- Improved tornado warning decision performance produced in collaboration with NWS forecasters within the NOAA hazardous weather testbed (HWT)

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NOAA requests a total decrease of \$28,107,000 and 0 FTE in FY 2019 program changes for the Weather & Air Chemistry Research activity. Following this section are program change narratives for this activity that represent program changes greater than five percent of a PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-3).

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		2019 Base		2019 Estimate		Decrease	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel Amount</u>	
Weather & Air							
Chemistry Laboratories	Pos./BA	252	80,574	214	65,892	-38	(14,682)
& Cooperative Institutes	FTE/Obl.	227	80,574	190	65,892	-37	(14,682)

The Air Resources Laboratory Closure (-34 FTE/ -34 Positions, -\$4,377) – 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 the termination of the Air Resources Laboratory, 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 PPA and the Climate Research Laboratories and Cooperative Institutes PPA. 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.

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Schedule and Milestones

FY 2019

- Close the Air Resources Laboratory
- Consolidate ARL Climate Research into other NOAA laboratories

FY 2020–2023

- Maintain support for highest priority activities within available weather research funding

Deliverables

- Terminate funding and close the Air Resources Laboratory

The Unmanned Aircraft Systems (UAS) Program Office Closure (-3 FTE/ -3 Positions, -\$5,339) – 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.

Other NOAA programs may continue to independently explore the use of UAS to meet their missions. In accordance with NOAA policy, programs will continue to seek approval from the Office of Marine and Aviation operations for the use of UAS.

Schedule and Milestones

FY 2019

- Close the Unmanned Aircraft Systems Program Office

FY 2020–2023

- Maintain support for highest priority activities within available weather research funding

Deliverables

- Terminate funding and close the Unmanned Aircraft Systems Program Office

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
DECREASES FOR 2019
(Dollar amounts in thousands)

The Vortex-Southeast Termination (0 FTE/ 0 Positions, -\$4,966) – 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 response to forecast information regarding tornadoes in the Southeastern United States. In FY 2019, NOAA proposes to eliminate support for this project in order to fund other priority programs.

Schedule and Milestones

FY 2019

- Terminate Vortex-Southeast (VORTEX-SE)

FY 2020–2023

- Maintain support for highest priority activities within available weather research funding

Deliverables

- Terminate funding for the Vortex-Southeast (VORTEX-SE) project

**Department of Commerce
National Oceanic and Atmospheric Administration
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	Location	Grade	Number	Salary	Salaries
Supervisory Physical Scientist		Various	ZP-5	(4) \$	119 (477)
Physical Scientist/Meteorologist/IT Specialist/Electronics Engineer		Various	ZP-4	(14) \$	86 (1,201)
Management & Program Analyst		Various	ZA-4	(2) \$	86 (172)
Meteorological Technician		Various	ZT-4	(2) \$	60 (120)
Physical Scientist/Meteorologist		Various	ZP-3	(6) \$	60 (361)
Administrative Officer/Program Analyst/Budget Analyst		Various	ZA-3	(5) \$	60 (301)
Program Specialist		Various	ZA-2	(1) \$	41 (41)
Total				(34)	(2,674)
Less lapse		0.00%			
Total full-time permanent (FTE)				(34)	(2,674)
2019 Pay Adjustment (0%)		0.00%			0
Total					(2,674)
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)	

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
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	Location	Grade	Number	Salary	Salaries
Supervisory Physical Scientist		Silver Spri ZP-5	(1)	\$162	(\$162)
Management & Program Analyst		Silver Spri ZA-4	(1)	\$117	(\$117)
Management & Program Analyst		Silver Spri ZA-3	(1)	\$110	(\$110)
Total			<u>(3)</u>		<u>(\$389)</u>
Less lapse	0.00%		<u>0</u>		<u>0</u>
Total full-time permanent (FTE)			(3)		(389)
2019 Pay Adjustment (0%)	0.00%				<u>0</u>
Total					(389)

Personnel Data

Full-time Equivalent Employment					
Full-time permanent			(3)		
Other than full-time permanent			<u>0</u>		
Total			(3)		
Authorized Positions:					
Full-time permanent			(3)		
Other than full-time permanent			<u>0</u>		
Total			(3)		

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
 Subactivity: Weather & Air Chemistry Laboratories & Cooperative Institutes
 Program Change: Air Resources Laboratory Closure

Object Class	2019 Decrease
11 Full-time permanent	(\$2,674)
11.1 Other than full-time permanent	0
11.3 Other personnel compensation	0
11.5 Special personnel services payments	0
11.8 Total personnel compensation	(\$2,674)
11.9 Civilian personnel benefits	(938)
12.1 Benefits for former personnel	0
13 Travel and transportation of persons	(16)
21 Transportation of things	(1)
22 Rent, communications, and utilities	
23 Rental payments to GSA	0
23.1 Rental Payments to others	0
23.2 Communications, utilities and miscellaneous charges	(3)
23.3 Printing and reproduction	(2)
24 Consulting and other services	
25 Advisory and assistance services	(5)
25.1 Other services	(189)
25.2 Purchases of goods & services from Gov't accounts	(157)
25.3 Operation and maintenance of facilities	0
25.4 Research and development contracts	0
25.5 Medical care	0
25.6 Operation and maintenance of equipment	0
25.7 Subsistence and support of persons	0
25.8 Supplies and materials	(157)
26 Equipment	(82)
31 Lands and structures	0
32 Investments and loans	0
33 Grants, subsidies and contributions	(153)
41 Insurance claims and indemnities	0
42 Interest and dividends	0
43 Refunds	0
44 Total obligations	0
99.9	(4,377)

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
 Subactivity: Weather & Air Chemistry Laboratories & Cooperative Institutes
 Program Change: Unmanned Aircraft Systems Program Office Closure

Object Class	FY 2019 Decrease
11.1 Full-time permanent	(\$389)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(\$389)
12.1 Civilian personnel benefits	(121)
13 Benefits for former personnel	0
21 Travel and transportation of persons	(183)
22 Transportation of things	0
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	(37)
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	
25.1 Advisory and assistance services	0
25.2 Other services	(370)
25.3 Purchases of goods & services from Gov't accounts	(1,880)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(1,494)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	(150)
25.8 Subsistence and support of persons	0
26 Supplies and materials	(84)
31 Equipment	(169)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(462)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(5,339)

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
 Subactivity: Weather & Air Chemistry Laboratories & Cooperative Institutes
 Program Change: VORTEX-SE Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(214)
22 Transportation of things	(99)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(497)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	(993)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(3,163)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	0
	(4,966)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>	
						<u>Amount</u>	
U.S. Weather Research	Pos./BA	10	33,587	10	30,543	0	(3,044)
Program (USWRP)	FTE/Obl.	10	33,587	10	30,543	0	(3,044)

Airborne Phased Array Radar (APAR) Termination (0 FTE/ 0 Positions, -\$2,565) – 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, which would provide critical information about severe storms, tropical storms (and hurricanes) and heavy precipitation storms, for more accurate public warnings and forecasts.

NOAA will no longer work with the research community to research on developing a prototype APAR system and 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 limited 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 2019

- Terminate APAR

FY 2020–2023

- 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
DECREASES FOR 2019
(Dollar amounts in thousands)

Infrasonic Weather Monitoring Research Termination (0 FTE/ 0 Positions, -\$479) – With this reduction, NOAA will conclude infrasonic monitoring research. NOAA has completed an evaluation of this technology using congressionally directed funding in FY 2016 and FY 2017.

Schedule and Milestones

FY 2019

- Terminate Infrasonic Weather Monitoring Research

FY 2020–2023

- 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 CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Airborne Phased Array Radar Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(25)
22 Transportation of things	(25)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	(196)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	(31)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,288)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	0
	(2,565)

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

Activity: Weather & Air Chemistry Research
Subactivity: U.S. Weather Research Program
Program Change: Infrasonic Weather Monitoring Research Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(479)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	0
	(479)

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

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Joint Technology Transfer	Pos./BA	0	9,933	0	0	0	(9,933)
Initiative	FTE/Obl.	0	9,933	0	0	0	(9,933)

JTTI Termination (0 FTE/ 0 Positions, -\$9,933) – With this reduction, NOAA will terminate the Joint Technology Transfer Initiative (JTTI). NOAA has used congressionally directed funding to fund demonstration projects in relevant test environments and evaluations for commercial potential or possible patent protections. This proposed budget reduction will end JTTI's funding to transition the latest technological advances due to weather research into products and services actively used by communities and businesses. Current JTTI projects have been fully funded and will be completed, but NOAA will not award funding to new projects through this program.

Schedule and Milestones

FY 2019

- Terminate the Joint Technology Transfer Initiative (JTTI)

FY 2020–2023

- Activities under this PPA will be terminated

Deliverables

- Terminate funding for the Joint Technology Transfer Initiative (JTTI)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL

(Dollar amounts in thousands)

Activity: Weather & Air Chemistry Research
Subactivity: Joint Technology Transfer Initiative
Program Change: Joint Technology Transfer Initiative Termination

Object Class		2019 Decrease
11.1	Full-time permanent	\$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	\$0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(9,933)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	0
		(9,933)

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

Activity: Ocean, Coastal, and Great Lakes Research

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean, Coastal and Great Lakes Research Laboratories & Cooperative	Pos/BA	111	30,219	124	31,785	124	32,286	124	28,560	0	(3,726)
	FTE/OBL	110	31,279	118	32,821	118	32,286	118	28,560	0	(3,726)
National Sea Grant College Program	Pos/BA	18	72,009	18	72,012	18	72,131	0	0	(18)	(72,131)
	FTE/OBL	18	72,372	18	72,239	18	72,131	0	0	(18)	(72,131)
Ocean Exploration and Research	Pos/BA	21	35,749	23	35,758	23	35,880	23	19,561	0	(16,319)
	FTE/OBL	21	35,877	22	37,635	22	35,880	22	19,561	0	(16,319)
Integrated Ocean Acidification	Pos/BA	14	10,426	17	10,429	17	10,461	17	8,013	0	(2,448)
	FTE/OBL	14	10,444	16	10,656	16	10,461	16	8,013	0	(2,448)
Sustained Ocean Observations and Monitoring	Pos/BA	34	41,398	39	41,542	39	41,672	39	37,010	0	(4,662)
	FTE/OBL	34	41,677	37	41,609	37	41,672	37	37,010	0	(4,662)
Total Ocean, Coastal, and Great Lakes Research	Pos/BA	198	189,801	221	191,526	221	192,430	203	93,144	-18	-99,286
	FTE/OBL	197	191,649	211	194,960	211	192,430	193	93,144	-18	-99,286

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. 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.

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The following five PPAs 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.
- Other Ecosystems Programs: Includes Integrated Ocean Acidification, which was 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.
- Sustained Ocean Observations and Monitoring: A global system for observations, modelling, and analysis of marine and ocean variables to support operational ocean services worldwide.

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.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Base Program

In FY 2016 and FY 2017, OAR's Ocean and Coastal Research launched 3 autonomous Saildrones on their first transit through the Bering Strait to measure environmental and acoustic data; began developing a real-time meteotsunami warning system for the Great Lakes; monitored young sea floor development over lava flow after successfully predicting the 2015 eruption of the submarine volcano Axial Seamount⁴; established baseline noise in the deepest part of the Pacific by deploying a full-ocean depth hydrophone for 22 days; explored methane seeps on the U.S. Mid-Atlantic Margin; reported first signs of algal toxins in northern Alaska marine mammals; surveyed ocean acidification impacts in the Gulf of Mexico, inclusive of Mexico and Cuba, for the first time; piloted a satellite-based tool to assess probability of Bluefin tuna larvae; and launched the experimental 5-day forecast Harmful Algal Blooms Tracker in Lake Erie.



OAR is partners with companies like the Saildrone, Inc. to use unmanned vehicles like the one pictured above, to collect ocean measurements year-round in regions that are expensive or logistically challenging to sample. These unmanned vehicles carry sensors that collect a whole suite of environmental and ecosystem data, like temperature or plankton composition. These platforms can operate for months at a time before sailing back to port.

Much of the research performed within OAR's Ocean, Coastal, & Great Lakes Research is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities include:

⁴ https://www.pmel.noaa.gov/eoi/axial_site.html

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

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.

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.



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.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE



1,300
BUSINESSES



7,100
JOBS

In 2016, a federal investment in Sea Grant of \$74 million resulted in

\$611M
ECONOMIC
BENEFIT

Research
Extension
Education

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.

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.

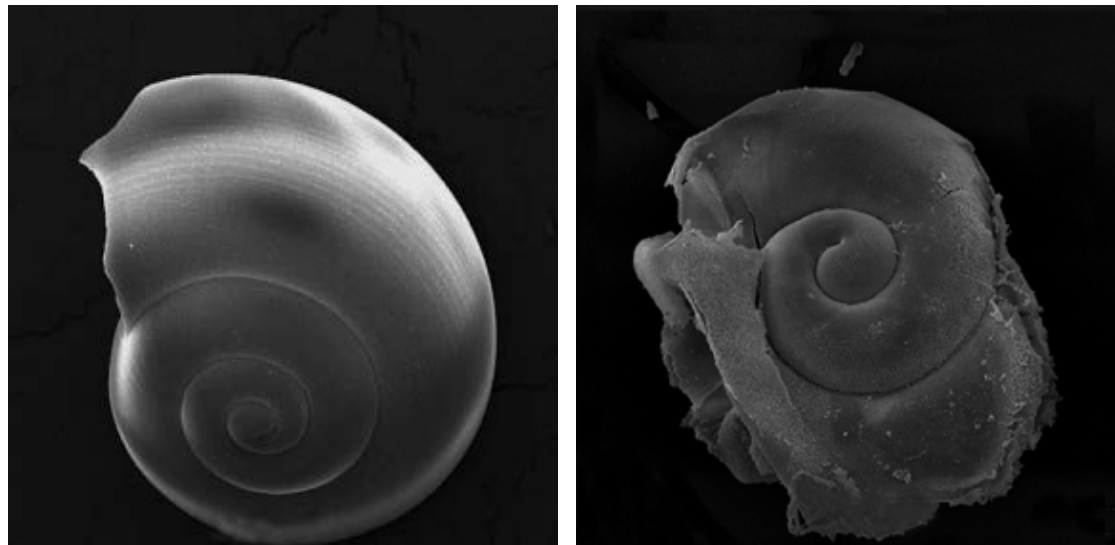


During OER's supported 2017 *Okeanos Explorer* mission to characterize poorly known habitats along the Pacific Remote Islands Marine National Monument, NOAA scientists conducted a series of midwater column transects to characterize the largest habitat on the planet. The water column is one of the most unexplored environments on the planet, supporting organisms like this bioluminescent jellyfish with stinging tentacles.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

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. Ocean Acidification (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.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

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.

Statement of Operating Objectives

Schedule and Milestone Highlights

FY 2019–2023

Laboratories & Cooperative Institutes PPA

- 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

Ocean Exploration and Research PPA

- 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

Other Ecosystems Programs PPA

- Conduct Ocean Acidification 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

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

- Increase number of living marine resources characterized for vulnerability to ocean acidification

Sustained Ocean Observations and Monitoring PPA

- 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 PPA

- 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

Ocean Exploration and Research PPA

- 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

Other Ecosystems Programs PPA

- Regional biogeochemical and ecological models

Sustained Ocean Observations and Monitoring PPA:

- 1,000 drifting buoys deployed annually
- 250 Argo Array Buoys deployed annually

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

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes	Pos./BA	124	32,286	124	28,560	0	(3,726)
	FTE/Obl.	118	32,286	118	28,560	0	(3,726)

Autonomous Underwater Vehicle Demonstration Testbed Termination (0 FTE/ 0 Positions, -\$1,923) – 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.

Schedule and Milestones:

FY 2019

- Terminate the Autonomous Underwater Vehicle Demonstration Testbed

FY 2020–2023

- 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
DECREASES FOR 2019
(Dollar amounts in thousands)

Genomics Termination (0 FTE/ 0 Positions, -\$1,803) – With this reduction, NOAA will eliminate the environmental genomics program at the Atlantic Oceanographic and Meteorological Laboratory (AOML), which 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 2018. 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. Scheduled research included long-term studies to understand how coral genomics are linked to resilience.

Schedule and Milestones

FY 2019

- Terminate the environmental genomics program

FY 2020–2023

- 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
- End work at the Future Reefs lab

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

Activity: Ocean, Coastal, and Great Lakes Research
Subactivity: Ocean, Coastal, and Great Lakes Laboratories & Cooperative Institutes
Program Change: Autonomous Underwater Vehicle Demonstration Testbed Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	(1,731)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(192)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,923)

**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, and Great Lakes Research
 Subactivity: Ocean, Coastal, and Great Lakes Laboratories & Cooperative Institutes
 Program Change: Genomics Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>\$0</u>
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(58)
22 Transportation of things	(38)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(339)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(388)
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(980)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>(1,803)</u>

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

		<u>2019 Base</u>		<u>2019 Estimate</u>		<u>Decrease</u>	
		Personnel Amount		Personnel Amount		Personnel Amount	
National Sea Grant	Pos./BA	18	72,131	0	0	-18	(72,131)
College Program	FTE/Obl.	18	72,131	0	0	-18	(72,131)

National Sea Grant College Program Termination (-18 FTE/ -18 Positions, -\$72,131) – 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 dismantle the network of 33 Sea Grant programs located in coastal States and territories. 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 2019

- 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 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	Location	Grade	Number	Salary	Salaries
Director, National Sea Grant College Program	Silver Spri	SES	(1)	\$168	(\$168)
Supervisory Management & Program Analyst	Various	ZA-5	(1)	\$ 119	(\$119)
Management Analysis Officer	Various	ZA-4	(5)	\$ 86	(\$429)
Management & Program Analyst	Various	ZA-3	(10)	\$ 60	(\$602)
Secretary - Office Administrator	Silver Spri	ZS-4	(1)	\$ 45	(\$45)
Total			<u>(18)</u>		<u>(\$1,363)</u>
Less lapse	0.00%				
Total full-time permanent (FTE)			<u>(18)</u>		<u>(1,363)</u>
2019 Pay Adjustment (0%)	0.00%				<u>0</u>
Total					<u>(1,363)</u>

Personnel Data

Full-time Equivalent Employment	
Full-time permanent	(18)
Other than full-time permanent	<u>0</u>
Total	<u>(18)</u>
Authorized Positions:	
Full-time permanent	(18)
Other than full-time permanent	<u>0</u>
Total	<u>(18)</u>

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Oceans, Coastal, and Great Lakes Research
 Subactivity: National Sea Grant College Program
 Program Change: National Sea Grant College Program Termination

Object Class	2019 Decrease
11.1 Full-time permanent	(\$1,363)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(\$1,363)
12.1 Civilian personnel benefits	(424)
13 Benefits for former personnel	0
21 Travel and transportation of persons	(46)
22 Transportation of things	(100)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	(259)
23.2 Rental Payments to others	(984)
23.3 Communications, utilities and miscellaneous charges	(47)
24 Printing and reproduction	0
25.1 Advisory and assistance services	(831)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	(1,494)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(66,583)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(72,131)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Ocean Exploration	Pos./BA	23	35,880	23	19,561	0	(16,319)
	FTE/Obl.	22	35,880	22	19,561	0	(16,319)

Ocean Exploration Decrease (0 FTE/ 0 Positions, -\$16,319) – With this reduction, NOAA will decrease ocean exploration and research efforts. This decrease will reduce mapping and exploration of unknown and poorly understood areas of the ocean. 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. In addition, OER will limit funding for extramural grants and eliminate financial support for the interagency Biodiversity Observation Network.

NOAA will continue to fund a limited number of days for Extended Continental Shelf mapping and conduct a limited number of exploration missions aboard the NOAA vessel Okeanos Explorer and Ocean Exploration Trust-operated vessel Nautilus. NOAA will prioritize limited resources for activities that have direct impacts on the nation’s security, economy, environmental health, and ability to meet increasing demands for seafood and raw materials.

Schedule and Milestones:

FY 2019

- Decrease ocean exploration and research
- Reduce the Cooperative Institute for Ocean Exploration, Research and Technology and the Global Foundation for Ocean Exploration

FY 2020–2023

- 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
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Oceans, Coastal, and Great Lakes Research
 Subactivity: Ocean Exploration and Research
 Program Change: Ocean Exploration Research Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>\$0</u>
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(60)
22 Transportation of things	(40)
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	(800)
24 Printing and reproduction	0
25.1 Advisory and assistance services	(80)
25.2 Other services	(713)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	(200)
25.8 Subsistence and support of persons	0
26 Supplies and materials	(300)
31 Equipment	(1,200)
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(12,926)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>0</u>
	(16,319)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Integrated Ocean Acidification	Pos./BA	17	10,461	17	8,013	0	(2,448)
	FTE/Obl.	16	10,461	16	8,013	0	(2,448)

Integrated Ocean Acidification Decrease (0 FTE/ 0 Positions, -\$2,448) – 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 FORARM 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 FY19 as planned.

Schedule and Milestones

FY 2019

- Decrease integrated ocean acidification research

FY 2020–2023

- 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 CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Oceans, Coastal, and Great Lakes Research
 Subactivity: Integrated Ocean Acidification
 Program Change: Integrated Ocean Acidification Research Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,448)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	0
	(2,448)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>		<u>Personnel</u> <u>Amount</u>	
Sustained Ocean	Pos./BA	39	41,672	39	37,010	0	(4,662)
Observations and Monitoring	FTE/Obl.	37	41,672	37	37,010	0	(4,662)

Sustained Ocean Observations and Monitoring Decrease (0 FTE/ 0 Positions, -\$4,662) – With this reduction, NOAA will reduce funding for Sustained Ocean Observations and Monitoring (SOOM). NOAA will reduce external grant funding that the Sustained Ocean Observations and Monitoring (SOOM) uses 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’s SOOM 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. The high-quality, long-term SOOM observations serve as a foundation for the information our nation needs to foster a more informed and climate resilient society and to reduce risks for its people, businesses, and assets.

Schedule and Milestones

FY 2019

- Decrease Sustained Ocean Observations and Monitoring

FY 2020–2023

- 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
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Oceans, Coastal, and Great Lakes Research
 Subactivity: Sustained Ocean Observations and Monitoring
 Program Change: Sustained Ocean Observations and Monitoring Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>\$0</u>
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(4,662)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>0</u>
	(4,662)

**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

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
High Performance and Computing Initiatives	Pos/BA	14	12,061	14	12,062	12	12,075	12	12,134	0	59
	FTE/OBL	14	12,261	14	12,198	11	12,075	11	12,134	0	59
Research Transition Acceleration Program	Pos/BA	0	996	0	993	0	993	0	0	0	(993)
	FTE/OBL	0	988	0	1,001	0	993	0	0	0	(993)
Total, Innovative Research & Technology	Pos/BA	14	13,057	14	13,055	12	13,068	12	12,134	0	-934
	FTE/OBL	14	13,249	14	13,199	11	13,068	11	12,134	0	-934

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.

There are two focus areas under the Research Technology and Transition PPA, including:

- High Performance Computing: Supports the computing requirements for NOAA’s modeling and research missions.
- Research Transitions: Programs that promote effective and efficient transition of tested and demonstrated research products into operational or commercial use.

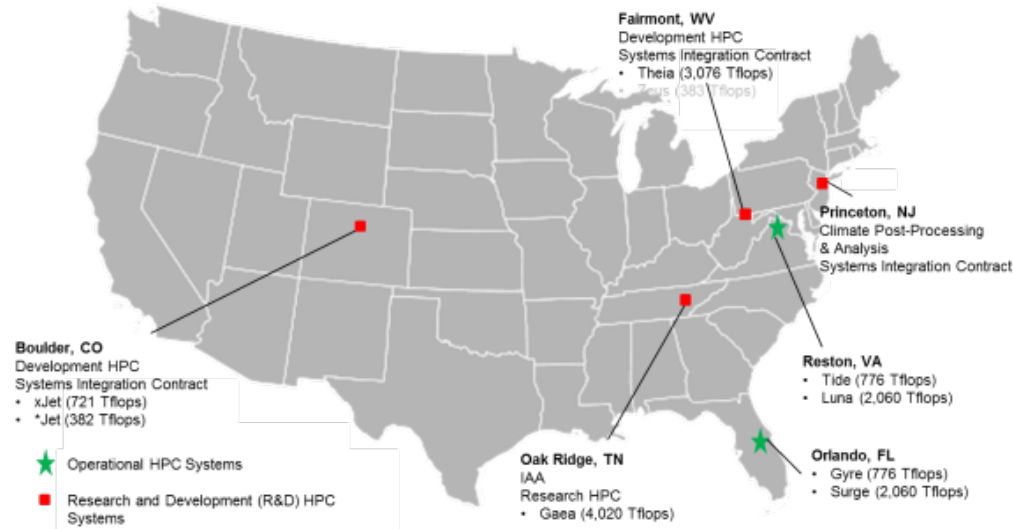
**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Base Program

High Performance Computing

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.



Map of NOAA's High Performance Computing Enterprise

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Research Transitions

OAR focuses on bringing research through to operations and transitioning research products for use. The NOAA Technology Partnerships Office, or TPO, serves the needs of both NOAA inventors and U.S. companies looking to partner with NOAA or license NOAA technologies. TPO oversees both NOAA's Small Business Innovation Research (SBIR) Program and the Technology Transfer Program. The Technology Partnerships Office also provides specific technical and communication/outreach services to all NOAA labs. TPO brings together NOAA inventors and U.S. companies in mutually productive relationships, maximizing the benefit of public money invested in research and development.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- 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 NITRD interagency activities

Deliverable Highlights

- HPC System availability – Maximum number of computational hours made available to scientists
- 11 HPC and advanced networking R&D projects
- New prediction systems with higher resolution transitioned into operational units within NOAA new Earth System model, based on CM4 and called ESM4, used to publish high resolution information on the link between climate and oceanic ecosystems

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

NOAA requests a net decrease of \$934,000 and 0 FTE in FY 2019 program changes for the Innovative Research and Technology activity. Following this section are program change narratives for this activity that represent program changes greater than five percent of a PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-4).

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

		<u>2019 Base</u>		<u>2019 Estimate</u>		<u>Decrease</u>	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Research Transition	Pos./BA	0	993	0	0	0	(993)
Acceleration Program	FTE/Obl.	0	993	0	0	0	(993)

Research Transition Acceleration Program Termination (0 FTE/ 0 Positions, -\$993) –NOAA will terminate the Research Transition Acceleration Program (RTAP). NOAA will no longer support the program designed for the oversight and management of NOAA’s Research technology transitions (R2X) program. This termination will slow the transition of research for the full spectrum of NOAA’s mission requirements (e.g., weather, climate, fisheries management, ocean and coastal stewardship) to application and operations.

Schedule and Milestones

FY 2019

- Terminate RTAP

FY 2020–2023

- Maintain support for highest priority activities within available Innovative Research and Technology research funding

Deliverables

- Terminate RTAP

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Innovative Research & Technology
 Subactivity: Research Transition Acceleration Program
 Program Change: Research Transition Acceleration Program Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>\$0</u>
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(59)
22 Transportation of things	0
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	(22)
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	(2)
24 Printing and reproduction	(7)
25 Consulting and other services	
25.1 Advisory and assistance services	0
25.2 Other services	(21)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(21)
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(861)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>0</u>
	(993)

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Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual		Annualized CR		Base		Estimate		Personnel	Amount
Research	Pos/BA	0	36,235	0	36,134	0	36,134	0	26,000	0	(10,134)
Supercomputing/CCRI	FTE/OBL	0	36,351	0	36,134	0	36,134	0	26,000	0	(10,134)

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 2015-2020.⁵

Base Program

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. The recapitalization effort for Gaea began in FY 2016.
- 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

⁵ http://www.cio.noaa.gov/it_plans/HPCStrategy_Final_Draft_080913.pdf

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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.

Statement of Operating Objectives

Schedule and Milestone and Deliverable Highlights:

FY 2019- 2023

- 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 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

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DECREASES FOR 2019**
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		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Research							
Supercomputing/CCRI	Pos./BA	0	36,134	0	26,000	0	(10,134)
(PAC)	FTE/Obl.	0	36,134	0	26,000	0	(10,134)

Mississippi State Partnership Termination (0 FTE/ 0 Positions, -\$10,134) – With this reduction, NOAA will terminate the Mississippi State 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, 2017, 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 2019

- Terminate the Mississippi State Partnership

FY 2020–2023

- Maintain support for highest priority activities within available Research Supercomputing/CCRI funding

Deliverables:

- Terminate funding for the Mississippi State Partnership

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

Activity: OAR Systems Acquisition
Subactivity: Research Supercomputing/CCRI
Program Change: Mississippi State Partnership Termination

Object Class	2019 Decrease
11.1 Full-time permanent	\$0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	\$0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(10,134)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	0
	(10,134)

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BUDGET PROGRAM: NATIONAL WEATHER SERVICE

For FY 2019, NOAA requests a total of \$1,052,772 and 4,087 FTE for the National Weather Service.

National Weather Service Overview

The National Weather Service (NWS) (www.weather.gov) provides weather, water, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. During life-threatening weather situations, NWS is the United States' sole authoritative source for warnings. NWS forecasters also issue a variety of forecasts and warnings every day affecting and including aviation, marine, fire, weather, climate, space weather, rivers, and floods. NWS disseminates data and products relied upon by the public, other government agencies, the private sector, and the global community.

The FY 2019 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. At current funding levels, the evolution to a WRN involves sixteen distinct projects, but advancements in quality, consistency, and effectiveness across all portfolios are driven by the goal of building a Weather-Ready Nation. In FY 2019, NWS will continue to test and evaluate the efficacy of the Operations and Workforce Analysis (OWA) recommendations, including Impact-Based Decision Support Services (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 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.

The NWS budget is organized into five Operations, Research, and Facilities (ORF) Programs, Projects, and Activities (PPAs):

- **Observations (\$217,714,000 and 740 FTE)** supports the observing systems (such as the Next Generation Weather Radar (NEXRAD), the Automated Surface Observing System (ASOS), and Radiosondes) that collect data necessary to provide weather forecasts, warnings, and outlooks.
- **Central Processing (\$92,886,000 and 224 FTE)** supports the information technology necessary to process weather data and run weather models in support of national centers and field operations. These include the Weather and Climate Operational Supercomputing System (WCOS), the Advanced Weather Interactive Processing System (AWIPS), the Advanced Hydrologic Prediction Service (AHPS), and other hydrology information technology initiatives.
- **Analyze, Forecast, and Support (\$492,014,000 and 2,817 FTE)** supports a distributed network of Weather Forecast Offices (WFO) 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.
- **Dissemination (\$47,580,000 and 80 FTE)** supports operations of the communication infrastructure – such as the Integrated Dissemination Program (IDP) systems, Telecommunications Gateway, Hazcollect Extended, and NOAA Weather Radio – required to distribute forecasts, warnings, and other products to customers and partners and the American public.
- **Science and Technology Integration (\$137,139,000 and 419 FTE)** supports research and research-to-operation activities that advance weather and climate prediction and improve NWS product and information in the future.

The NWS is organized into two Procurement, Acquisition, and Construction (PAC) activities and four PPAs:

- **Systems Acquisition**
 - Observations (\$32,534,000 and 0 FTE) supports enhancement and life-cycle replacement of systems (such as NEXRAD and ASOS) that collect and process observations necessary to provide weather forecasts, warnings, and outlooks.
 - Central Processing (\$66,311,000 and 24 FTE) Processing provides operational and developmental high-performance computing (HPC) capacity and forecast and process improvements within AWIPS.
 - Dissemination (\$34,386,000 and 0 FTE) enhances infrastructure and expands capacity of NWS dissemination systems to meet new satellite and model data requirements, including the Integrated Dissemination Program (IDP), the Telecommunications Gateway, and upgrading select NOAA Weather Radio locations.
- **Construction**
 - Facilities Construction & Major Repairs (\$7,598,000 and 0 FTE) includes upgrades and improvements to NOAA's Forecast Offices and facilities to improve safety and functionality and relocation of forecast offices when opportunities for collaboration with partners present themselves.

NWS forecasts, predicts, provides outlooks, and communicates effects of changing weather, seasonal to sub-seasonal climate, and water 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.

NWS enhances 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.

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 Integrated Dissemination Program (IDP) systems, Telecommunications Gateway, and the OneNWS Network. 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.

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 our workforce.

Building a WRN requires the participation and commitment of a vast nationwide network of partners that comprise the weather and water enterprise including other government agencies, emergency managers, researchers, the media, the private sector and more to assess why the Nation is experiencing such extreme impacts. NWS depends on partners including other NOAA line offices to acquire data, conduct research, provide education and training, help disseminate critical environmental information, and provide advice to make best use of NWS information.

Performance:

NWS is a customer-oriented government agency that delivers weather forecasts, warnings, and advisories every day that are used by virtually every American. As a professional science-based agency, verification of organizational performance is an integral part of NWS' business process. 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.

Performance Goals and Measurement Data:

Performance Measure	FY 2017 Actual	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target	FY 2023 Target
Severe Weather Warnings Tornadoes - Storm Based Lead Time (Minutes)	9	13	13	13	13	13	13
Severe Weather Warnings Tornadoes - Storm Based Accuracy (%)	58	72	72	72	72	72	72
Severe Weather Warnings Tornadoes - Storm Based False Alarm Ratio (%)	72	71	71	71	71	71	71
Severe Weather Warnings for Flash Floods - Lead Time (minutes)	73	63	65	65	65	65	65
Severe Weather Warnings for Flash Floods - Accuracy (%)	77	76	76	76	76	76	76
Hurricane Forecast Track Error (48-Hour) (nautical miles),	56	65	62	59	57	55	53
Hurricane Forecast Intensity Error (48 hour) (knots)	13	12	12	12	11	10	10
Accuracy (%) (Threat score) of Day 1 Precipitation Forecasts	34	33	33	33	33	33	33
Winter Storm Warnings - Lead Time (Hours)	22	20	20	20	20	20	20
Winter Storm Warnings - Accuracy (%)	90	90	90	90	90	90	90
Marine Wind - Percentage of Accurate Forecasts	78	79	79	80	80	80	80
Marine Wave Heights - Percentage of Accurate Forecasts	81	82	82	83	83	83	83
Aviation Ceiling/Visibility Forecast Accuracy Instrument Flight Rules (IFR)	65	65	65	65	65	65	65
Aviation Ceiling/Visibility False Alarm Ratio (%) Instrument Flight Rules (IFR)	38	38	38	38	38	38	38
Geomagnetic Storm Forecast Accuracy (%)	40	56	57	58	59	60	60
U.S. Temperature Forecast Skill	34	26	26	26	27	27	27

Significant Adjustments:*Calculated Adjustments*

NOAA's FY 2019 Base includes a total of \$14,140,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NWS activities. This includes inflationary increases for labor and non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

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Activities: Observations; Central Processing; Analyze, Forecast and Support; Dissemination; Science and Technology Integration

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Actual		Annualized CR		Base		Estimate		Personnel	Amount
Observations	Pos/BA	691	213,569	777	214,909	777	217,714	777	203,992	0	(13,722)
	FTE/OBL	688	219,458	740	222,233	740	217,714	740	203,992	0	(13,722)
Central Processing	Pos/BA	225	91,982	235	92,166	235	92,886	161	86,620	(74)	(6,266)
	FTE/OBL	224	98,019	224	94,351	224	92,886	150	86,620	(74)	(6,266)
Analyze, Forecast and Support	Pos/BA	2,823	483,050	2,958	484,049	2,958	492,014	2,677	471,792	(281)	(20,222)
	FTE/OBL	2,809	486,281	2,817	495,698	2,817	492,014	2,674	471,792	(143)	(20,222)
Dissemination	Pos/BA	77	46,336	84	46,429	84	47,580	84	50,090	0	2,510
	FTE/OBL	77	48,186	80	48,894	80	47,580	80	50,090	0	2,510
Science and Technology Integration	Pos/BA	419	135,359	440	135,640	440	137,139	440	122,702	0	(14,437)
	FTE/OBL	417	139,875	419	137,473	419	137,139	419	122,702	0	(14,437)
Total Central Processing; Analyze, Forecast and Support; Dissemination; Science and Technology Integration	Pos/BA	4,235	970,296	4,494	973,193	4,494	987,333	4,139	935,196	-355	-52,137
	FTE/OBL	4,215	991,819	4,280	998,649	4,280	987,333	4,063	935,196	-217	-52,137

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The objectives of these activities include the following:

- Provide timely and accurate weather forecasts, warnings, and outlooks to the Nation;
- Support the emergency management community;
- Engage in outreach and education activities to support public decisions;
- Maintain the operations of systems that collect observations necessary to provide weather forecasts, warnings, and outlooks to the Nation;
- Maintain processing systems necessary to generate weather forecasts, warnings, and outlooks to the Nation; and
- Improve services by integrating new advances in science and technology.

NWS has 4,520 positions in 122 WFOs, 13 River Forecast Centers (RFC), 8 National Centers for Environmental Prediction (NCEP), and other support offices around the country. NWS supports a national infrastructure to gather and process data worldwide from the land, sea, air and space. This infrastructure collects data from technologies such as Doppler weather radars, satellites operated by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), marine data buoys, surface observing systems, and instruments for monitoring space weather. These data feed sophisticated models running on high-speed supercomputers. A highly trained and skilled workforce uses powerful workstations to analyze these data and issue forecasts and warnings. High-speed communications unify the infrastructure and enable forecast and warning dissemination to the public.

Trained community volunteers also enhance NWS operations. Cooperative observers collect weather data that become part of the Nation's climate records and citizen storm spotters provide visual confirmation of severe weather events. As environmental information becomes more sophisticated and accessible, the environmental literacy of the public becomes more important. NWS outreach and education activities seek to ensure public understanding of NWS' information and its effective integration into decision making.

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Activity: 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 2018, NWS is maintaining an average, cross platform buoy data availability rate of 85 percent, a NEXRAD system availability rate of 99 percent and an ASOS system availability rate of 98 percent. In FY 2019, NWS will continue to maintain its critical observing systems while improving their sustainability through configuration management.

Funding from this PPA 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 the Observations PPA include:

- Manage operations and maintenance of NWS observational systems;
- Provide holistic, on-going 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.

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Base Program

To achieve these goals, NWS maintains the following programs:

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 possessions, 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.

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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 and the Tropical Atmosphere Ocean (TAO) Array.

- The Weather and Ocean Platform is a network of 149 meteorological and ocean observing platforms that provide real-time marine meteorological, oceanographic, and geophysical observations. The network includes 101 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. 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 US. The array consists of 55 moored ocean buoys and four Acoustic Doppler Current Profilers (ADCP) in the equatorial Pacific.
- DART® stations, 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

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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, as well as informs local surface conditions. The VOS program is supported by Port Meteorological Officers (PMO) located at twelve major port cities across the country.

Systems Engineering and Support provides systems acquisition, engineering and logistics support for NWS mission critical observing systems as well as 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 stocking levels and ensuring procurement of initial and replenishment spares for depot-level stock;
- Provide maintenance, repair, quality assurance, and warehousing of new and reconditioned parts;
- Develop and maintain software for Surface and Upper Air systems; and,
- Perform system and operational tests and evaluation of alternative systems.

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Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Maintain the tri-agency NEXRAD radar network
- Maintain the tri-agency ASOS system
- Operate and maintain weather/ocean buoy, C-MAN, and TAO array
- Sustain data processing of the National Solar Observatory's GONG and observatory support
- Maintain paperless reporting of COOP data
- Deploy NEXRAD Radar Product Generator (RPG) and Radar Data Acquisition (RDA) Software Builds
- Develop and test NEXRAD RPG and RDA Software Builds
- Develop, test, and deploy TDWR SPG Builds
- Develop, test, and deploy NOAA Profiler Network Software Builds

Deliverables

- Support operations of 102 radiosonde stations in the United States and possessions, Caribbean, and Pacific Island nations
- Maintain National Mesonet Program Office
- Leverage data flow from aircraft observations commercial data purchases
- Support operations of three Wind Profiler systems in Alaska
- Support operations of 122 NEXRAD systems at 96 percent availability
- Support operations of 45 TDWR Supplemental Product Generator (SPG) systems
- Support operations of 309 NWS ASOS units and maintenance of 570 FAA ASOS units under a reimbursable funding arrangement
- Hourly marine weather wind speed and direction, air and sea temperature, atmospheric pressure, and detailed wave information
- Support operations of 39 DART® 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)
- Support operations of 101 CWB systems at 80 percent data availability (assumes adequate ship time provided by the U.S. Coast Guard)
- Support operations of 48 C-MAN stations at 80 percent data availability
- Continuity of GONG data to the Space Weather Prediction Center

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Activity: Central Processing

Goal Statement

Central Processing is the next step in the NWS forecast process. Through this PPA, NWS ingests data obtained from observing infrastructure, and delivers it in a usable form to NWS modelers and meteorologists. Activities 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.

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 2018, NWS continues to integrate new forecast capabilities into AWIPS and model improvements onto WCOSS.

In general, activities in the Central Processing portfolio include the following:

- 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.

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Base Program

To achieve these goals, NWS maintains the following programs:

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.

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;
- Process and displays 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 NOAAs data.

Hydrology Information Technology Initiatives gather advanced and localized information about water resource concerns including drought and flooding.

- 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.
- Community Hydrologic Prediction System (CHPS) is the information technology infrastructure that all 13 RFCs use to access hydrologic models. These tools enable products that community leaders and emergency managers use to effectively respond to flooding events.

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National Centers and Regional IT Infrastructure maintain 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.

Statement of Operating Objectives

Schedule and Milestones

FY 2019-2023

- 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

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Activity: 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) PPA leverages the Observations and Central Processing PPAs outputs by applying expertise to the observed data and model outputs, resulting in forecasts, warnings, and Impact-based Decision Support Services (IDSS) for the Nation.

NWS' distributed network of forecast offices, specialized centers, and associated workforce of meteorologists, hydrologists, climatologists, and space physicists is supported through the AFS PPA. 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 in 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. Alerts, 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 response strategies. Warnings for high impact, rapidly evolving hazards such as solar storms, tornadoes, tsunamis, flash floods or volcanic eruptions enable decision makers to keep the public out of harm's way to protect their lives and livelihoods.

NOAA's network of WFOs, RFCs, and specialized 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 is conducting facility condition assessments (FCAs) for all leased and owned facilities. With nearly all of the of the assessments complete, 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. The NWS continues to prioritize and address (within base resources) deferred maintenance and capital expenditures.

In 2017, the Office of Water Prediction (OWP) created a fifth division, the Water Prediction Operations Division (WPOD), and began staffing this division at the National Water Center (NWC) as directed in the FY 2017 appropriations bill. Staffing the initial 12 positions continued during FY 2018. Early 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 works with NCEP Centers,

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Regional Operations Centers, River Forecast Centers (RFCs), Weather Forecast Offices (WFOs), and other federal agency core partners (i.e. USGS, USACE, FEMA) to establish a common operating picture to ensure coordinated decision support services. WPOD also provides routine feedback on rapid analysis and verification of the National Water Model (NWM) and provides RFC backup capability.

The FY 2018 NWM upgrade implemented an expanded domain, including Hawaii 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 and simulates conditions for 2.7 million stream reaches nationwide every hour (a 700-fold increase over the ~3600 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.

Also in FY 2017, NWS met or exceeded all but two of its 16 field-based GPRA performance measures. In addition, NOAA operationalized tropical storm surge watches and warnings which provides decision makers with even more details about impacts of landfalling tropical storms and hurricanes. NOAA also operationalized new products which provides advanced warning for tropical storms that have not yet developed, but could rapidly intensify and impact land within evacuation thresholds. 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.

To achieve all of its goals, NWS maintains the following programs:

Weather and Climate Services and Warnings provide real-time meteorological and climatological 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 24/7 at multiple time scales, from alerting for immediate threats, to monthly climate reports. These 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

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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 government officials and emergency managers and provide IDSS to support their decision making both remotely and during hazardous conditions at their operations centers.

- Weather Service Offices (WSO) are located within Alaska and Pacific Regions and provide 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 run 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.

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 PPA, model output from Central Processing's supercomputers, and innovations from the Science and Technology Integration PPA 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 warnings, 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 PPA supports six 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 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 weeks two-to-four 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.

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billions of dollars in damage costs¹. 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), and increases understanding of these hazards. NHC also provides marine forecasts for a large part of the southwest North Atlantic, Caribbean Sea, Gulf of Mexico and the eastern North Pacific.
- 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 and storm warnings for the Atlantic and Pacific Oceans, north of 30 Degrees North.
- 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.

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 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 is a new business model for interagency collaboration consisting of a consortium of Federal agencies including NOAA, the U.S. Army Corps of Engineers (USACE), the U.S. Geological Survey (USGS), and the Federal Emergency Management

¹ <https://www.ncdc.noaa.gov/billions/>

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Agency (FEMA) with complementary missions in water science, observation, management, prediction and response. IWRSS' overarching objective is to enable a broad, integrative national water resources information system to serve as a reliable and authoritative means for water-related planning, preparedness and response activities.

- The OWP 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 (NWM). 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. 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 DART® moorings from the observations program as critical input and verification of tsunami forecasts.

Tsunami forecast modeling research seeks to develop faster and more reliable tsunami forecasts. Inundation modeling assists communities with their efforts to assess risk and mitigate potential impacts.

Tsunami hazard mitigation grants have enabled partner states to support coastal communities with life-saving products and services such as coastal inundation maps, evacuation plans and maps, preparedness training and mitigation workshops, evacuation drills, warning infrastructure (e.g., sirens), and tsunami evacuation signs.

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. Ongoing work in the Tsunami Warning Program includes

- performing innovative research 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

increasing community preparedness and public tsunami education through the TsunamiReady™ program and outreach.

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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.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for subseasonal and seasonal events and develops foundational data sets
- Operate the NWC to support water resource decision making across the Nation
- Train and certify Incident Meteorologists (IMETs) for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Operate Tsunami Warning Centers (TWCs) to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact

Deliverables

- Operations and maintenance of all WFOs, RFCs, National Centers, and Tsunami Warning Centers
- Operations and maintenance of field operational support from National Headquarters
- Operations and maintenance of OCONUS WSOs that provide weather warnings, forecasts, and observation services to participants of the Pacific Island Compact and remote portions of Alaska
- Improved hydrologic forecasts
- Improved forecasts of space weather conditions
- Improved forecasts of hurricanes, blizzards, heat waves and severe storms
- Continuity of timely and accurate weather and water forecasts and warnings

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- Aviation weather forecasts for all identified airports and air routes
- Deployments of IMETs to support decision makers at wildland fires
- Continued support of StormReady® and TsunamiReady™ communities
- Street-level water information for every stream reach in the CONUS, at 2.7 million locations, touching virtually every citizen's local stream
- 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

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Activity: 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 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.

Funding from this PPA is used to support the NOAA Weather Radio Program and the Integrated Dissemination Program (IDP). Dissemination maintains communication technology required by NWS for the collecting, tailoring, and distribution of data and products. The resilient IDP infrastructure, located in Boulder, CO and College Park, MD, collects and distributes data products internally and externally and transmits experimental and developmental model products to enable research to operations (R2O) for NWS' STI and AFS Portfolios. 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 include the NWS Telecommunications Gateway (NWSTG) integrated with each IDP system, the OneNWS Network, 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.

In 2018, NWS continues 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 augment infrastructure as needed to support requirements, retain and preserve existing IDP capabilities and resilience, and optimize NextGen IT Web and GIS-based Services to accommodate additional data providers and increased data throughput. In 2019, NWS will continue to augment infrastructure as needed to support requirements and provide 24x7 support to maintain existing infrastructure and operational dissemination services.

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the NWS organized this PPA 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;
- Build, maintain, and support a scalable and geographically diverse redundant NWS dissemination architecture (IDP), consistent with and part of the emerging NOAA enterprise architecture; and,

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- Maintain a strategy to maximize effectiveness while minimizing cost.

Base Program

To achieve these goals, Dissemination maintains the following programs:

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.

- The NWSTG is the Nation's hub for the collection and distribution of weather data and products. The NWSTG automatically collects and distributes a wide variety of environmental data such as observations, analysis, and forecast products. 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.
- The Next Generation Air Transportation System (NextGen) is a multi-agency collaborative effort spanning FAA, NOAA, Department of Defense, and the National Aeronautics and Space Administration with the goal of increasing the capacity, efficiency, and safety of the Nation's air traffic system. NOAA's NextGen IT Web 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 both internal and external partners. NWS operates and maintains critical terrestrial and satellite networking capabilities.

- NWS manages a distributed network of terrestrial telecommunication circuits, satellite communications space segments, wireless, broadband and wireless capabilities that span the Nation, including the Pacific and Alaskan regions, delivering essential NOAA data known as the OneNWS Network.
- The Satellite Broadcast Network (SBN) transmits critical weather data from satellites, models, observations systems and other sources, to all field office forecasters and external partners across the northwestern hemisphere. The SBN offers the capability to provide internal and external users with open access to much of NOAA's real-time environmental data.

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:

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- 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 access to a set of NWS warnings, watches, forecasts, and other products.
- NOAA Weather Wire Service (NWWS) is a satellite data collection and dissemination system that provides 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.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Maintain NWR service at 96 percent availability
- Maintain IDP/NWSTG services and GISC services
- 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

FY 2019

- Conduct (first year) of five year refresh of Dissemination Infrastructure hardware
- Maintain Dissemination Infrastructure to support existing operational applications
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain Geospatial Enterprise Services
- Maintain data services to the international community under the auspices of the WMO (on-going)

FY 2020

- Conduct (second year) of five year refresh of Dissemination Infrastructure hardware
- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain Geospatial Enterprise Services

FY 2021

- Conduct (third year) of five year refresh of Dissemination Infrastructure hardware

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- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain Geospatial Enterprise Services

FY 2022

- Conduct (fourth year) of five year refresh of Dissemination Infrastructure hardware
- Maintain Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain Geospatial Enterprise Services

FY 2023

- Conduct (fifth year) of five year refresh of Dissemination Infrastructure hardware
- Maintain Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain Geospatial Enterprise Services

Deliverables

- NWSTG functionality and continued 24x7 support at 99.8 percent availability
- Achieve a maximum transit time for warning messages less than one second
- NWR service availability at 96 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

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Activity: 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 PPA leverages the entire weather enterprise including users, research communities, partner agencies, and industry to provide improved weather forecast guidance for the Nation. This includes engaging 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 2017, NWS upgraded the Hurricane Weather Research and Forecasting (HWRF) model, continuing global coverage for tropical cyclone predictions. Additionally, NWS implemented significant enhancements to its Global Forecast System (GFS) and Global Data Assimilation System (GDAS) computer numerical weather prediction (NWP) systems. The GFS/GDAS upgrades are anticipated to produce more accurate forecasts out to ten days at high resolution and out to 16 days at lower resolution. In 2018, NWS continues to link the terrestrial and coastal water models to improve ability to assess flood risk nationwide. For FY 2019, key actions included in the STI portfolio include the following:

- Accelerate applications of advanced observing capabilities including data assimilation;
- Continue to develop and implement advanced operational numerical forecast models and applications of HPC capabilities;
- Develop the next generation warning and forecast guidance paradigm, taking into account users perspectives about warning and forecast information;
- Use testbeds and proving grounds to enable the research community to leverage operational infrastructure to conduct research, thus accelerating R2O transition;
- Continue development of advanced training approaches to enable the workforce to keep pace with advanced science and technologies; and,
- Rapidly develop solutions to address regional and local forecast issues through partnership with the university research community.

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Base Program

To achieve these goals, NWS maintains the following programs:

Weather-Ready Nation is a nationwide initiative to build community resilience in the face of increasing vulnerability to extreme weather, water, and climate events. WRN empowers emergency managers, first responders, government officials, businesses, and the public to make faster, smarter decisions to save lives and protect livelihoods. Key STI actions that enable implementation of the WRN 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 better conveying forecast risk and uncertainty.
- Transition new aviation weather science and develop high-resolution probabilistic weather information consistent across space and time for all National Airspace System managers 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.
- Under the provisions of the Coastal Act, develop the capability to make a post-storm determination that damages were caused by either water or wind.
- Improve space weather warning and forecast 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.

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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) 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 forecasts 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 Environmental Protection Agency, and the 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.

Hydrology and Water Resource Programs leverage NOAA partnerships for 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 for 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 capability that provides integrated decision support tools that offers 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 hydrologic conditions from floods to droughts.
- Under this program NWS initiated an effort in FY 2015 to develop and test new centralized national hydrologic modeling and forecast capabilities to be deployed at the NWC.

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.

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

- Identify and address local training needs, facilitate professional development, and address individual strengths and weaknesses of the local forecast staff; and,
- Ensure 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 transition at the local level including applications that improving 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 to improve NWS services.
- Leverage testbeds and operational proving grounds to establish a Centralized Development and Testing Environment (CDTE) enabling applications in real time; and,
- Provide operational platforms for broad research and development community across NWS, academia, core partners, and the weather enterprise to conduct demonstration, simulation, verification, and validation of new science and service capabilities.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Conduct testing, demonstration and validation for new science and service capability 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 2019

- Implement the operational Next Generation Global Modeling System (NGGPS) Version 1.0
- Implement version 12 of the operational Global Ensemble Forecast System

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- Implement results from the workforce analysis

FY 2020

- Implement first upgrade to the NNGPS Version 1.0, Version 2.0
- Complete transition of Operational Models to next-generation HPC systems
- Implement results from workforce analysis
- Implement operational seasonal Arctic sea ice outlook
- Implement version 3 of the operational Seasonal Forecast System
- Implement results from workforce analysis

FY 2021

- Run transitioned Operational Models on next-generation HPC systems
- Implement version 13 of the Global Ensemble Forecast System Forecast System
- Implement results from workforce analysis
- Implement NNGPS Version 3.0

FY 2022

- Implement results from workforce analysis
- Implement NNGPS Version 4.0

FY 2023

- Run operational probability-based forecasts of high impact weather for extended ranges (weeks 3 and 4)
- Implement NNGPS Version 5.0
- Implement Version 14 of the Global Ensemble Forecast System

Deliverables

- Annual upgrades to operational NOAA Hurricane Forecast 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, 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 map)

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- Upgraded probabilistic storm surge guidance
- Coupled ocean-atmosphere-wave-sea ice forecast system for Arctic ocean
- 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
- Global operational coupled atmosphere-ocean-land-wave-sea ice prediction system extending today's operational weather outlooks from 16 days out to 30 days
- Improved forecasts are provided to the Nation's critical infrastructure to ensure lives and property are protected from the effects of space weather
- Comprehensive analyses of workforce
- Evaluation of NWS testing/demonstration plans and results
- Improved public access to Federal water information
- Atmosphere, coastal, and terrestrial modeling components integrated into the community WRF-Hydro Earth system modeling framework

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CHANGES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Observations	Pos./BA	777	217,714	777	203,992	0	(13,722)
	FTE/OBL	740	217,714	740	203,992	0	(13,722)

Reduce Surface and Marine Observations (0 FTE/ 0 Positions, -\$15,489) – This program change reduces the scope and operations of surface and marine observations platforms.

NOAA will reduce the National Mesonet Program (within the Surface Observations Program), Tropical Atmosphere Ocean (TAO), and Weather and Oceans Platforms. Specific changes include the following:

Surface Observations Program (decrease of \$11,489): 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.

The Marine Observations Program (decrease of \$4,000):

Tsunami’s 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 Deep-ocean Assessment and Reporting of Tsunamis (DART®) moorings to support the tsunami mission but will terminate support for the NOAA Water Level Observation Network (NWLON) and as well as the U.S. Geological Survey Seismic network which also support the tsunami mission. NOAA will eliminate funding (\$1.5 million) for the targeted seismic and water level data.

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The Weather and Ocean Platform network provides forecasters with frequent, high-quality marine observations for forecast and warning preparation (including for hurricanes) and verifies forecasts after they are produced. NOAA will eliminate seven buoys (\$1.2 million) that are farthest from U.S. shores in the Atlantic Ocean and the most costly to operate while maintaining 80 percent network availability for the remaining network of 142 meteorological and ocean observing platforms. The ocean surface data provided by these buoys currently is the only ground-truth measurement of surface weather conditions in tropical cyclones. Instead, NOAA would rely on satellite and aircraft data to obtain this information.

The TAO array studies and monitors climactic variations 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 2019-2023

- Reduce scope of the National Mesonet Program to highest priority geographic extent and observations that support severe weather watches and warnings
- Terminate seismic, and water level gage support, most particularly in Alaska, Hawaii, and Puerto Rico
- Reduce Weather and Ocean Platform network by seven buoys and maintain the remaining 142 at 80 percent availability
- Reduce TAO Array by 15 buoys, maintaining the remaining 40 at 80 percent availability

Restore Core Capabilities (0 FTE/ 0 Positions, +\$1,767) – To continue meeting the Observation (OBS) 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 address core capabilities that were used to fully fund the FY 2018 civilian pay raise of 1.9 percent (\$1,767).

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

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National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Observations
 Subactivity: Observations
 Program Change: Reduce Surface and Marine Observations

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	(85)
22 Transportation of things	(195)
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	(1,131)
23.2 Rental Payments to others	(507)
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	(5,510)
25.1 Advisory and assistance services	0
25.2 Other services	(6,522)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	(949)
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(590)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(15,489)

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Observations
Subactivity: Observations
Program Change: Restore Core Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	1,317
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>1,317</u>
12.1 Civilian personnel benefits	450
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>1,767</u>

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

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Central	Pos./BA	235	92,886	161	86,620	-74	(6,266)
Processing	FTE/OBL	224	92,886	150	86,620	-74	(6,266)

Establishment of Regional Enterprise Application Development and Integration Teams (-74 FTE/ -74 Positions, -\$10,100) –

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 NWS forecast offices.

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 2019, 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 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, currently under competitive acquisition, 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 seeks 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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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 2019. 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 2019-2023

- 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

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CHANGES FOR 2019
(Dollar amounts in thousands)

Advanced Weather Interactive Processing System Cyclical Refreshment (0 FTE/ 0 Positions, +\$5,130) – This program change will fully fund the cyclical refreshment of Advanced Weather Interactive Processing System (AWIPS) Information Technology (IT) hardware.

AWIPS integrates and displays meteorological, hydrological, satellite, and radar data at NWS field offices. AWIPS enables increasingly accurate weather predictions and dispenses time-sensitive, highly reliable warnings and advisories. This request provides the funding levels required for minimal AWIPS IT cyclical replacement including servers, workstations, monitors, and printers. Without increased funding, NWS will induce risk by extending cyclical hardware replacement from three-to-five years out to six-to-eight years.

Schedule and Milestones

FY 2019-2023

- AWIPS cyclical hardware replacement interval of three-to-five years

Deliverables

- AWIPS hardware availability of 98 percent

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CHANGES FOR 2019
(Dollar amounts in thousands)

Slow Advanced Hydrologic Prediction Services Expansion (0 FTE/ 0 Positions, -\$2,000) – 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 will forgo the additional development needed to address limitations in the first version of HEFS – 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.

	2019	2020	2021	2022	2023
Performance Measures:					
Number of AHPS forecast locations with HEFS integration					
With Decrease	834	1,058	1,279	1,500	1,500
Without Decrease	964	1,739	2,109	2,482	2,734

Schedule and Milestones

FY 2019-2023

- Sustain existing support to continue HEFS implementation
- Maintain HEFS services

Deliverables

- HEFS services at 1,500 water forecast service locations

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(Dollar amounts in thousands)

Restore Core Capabilities (0 FTE/ 0 Positions,+ \$704) – 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 address core capabilities that were used to fully fund the FY 2018 civilian pay raise of 1.9 percent (\$704).

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

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PROGRAM CHANGE PERSONNEL DETAIL**

Activity: Central Processing
 Subactivity: Central Processing
 Program Change: Establishment of Regional Enterprise Application Development and Integration Teams

Title	Location	Grade	Number	Annual Salary	Total Salaries
Information Technology Officer	Various	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
2019 Pay Adjustment (0%)		0.00%			0
Total					7,654,190

Personnel Data

Full-time Equivalent Employment					
Full-time permanent			74		
Other than full-time permanent			0		
Total			74		

Authorized Positions:					
Full-time permanent			74		
Other than full-time permanent			0		
Total			74		

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing
Program Change: Establishment of Regional Enterprise Application Development and Integration Teams

Object Class	2019 Decrease
11.1 Full-time permanent	(7,654)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>(7,654)</u>
12.1 Civilian personnel benefits	(2,446)
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>(10,100)</u>

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing
Program Change: Advanced Weather Interactive Processing System Cyclical Refreshment

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	575
25.2 Other services	1,880
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	425
31 Equipment	2,250
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	5,130

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Activity: Central Processing
 Subactivity: Central Processing
 Program Change: Slow Advanced Hydrologic Prediction Services Expansion

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(2,000)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(2,000)

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PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Activity: Central Processing
Subactivity: Central Processing
Program Change: Restore Core Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	526
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	526
12.1 Civilian personnel benefits	178
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	704

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Operations, Research, and Facilities
CHANGES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos./BA	2,958	492,014	2,677	471,792	-281	(20,222)
	FTE/OBL	2,817	492,014	2,674	471,792	-143	(20,222)

Restore Core Capabilities (0 FTE/ 0 Positions, +\$8,784) – To continue meeting the Analyze, Forecast and Support (AFS) 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 address core capabilities that were used to fully fund the FY 2018 civilian pay raise of 1.9 percent (\$7,635) and non-labor increases (\$1,149) to operating costs that are not reflected in AFS’ baseline operating budget. These non-labor costs include increases to rent, communications and utilities.

Currently, non-discretionary operating costs represent 95 percent of AFS’ overall operating budget resulting in insufficient discretionary funds available to absorb the FY 2018 labor increases and escalating facility rent, utility and facility maintenance costs. Without these additional funds, there will be an unavoidable increase to program operating risk since fewer resources are available to support the program’s ability to meet its baseline performance requirements.

Deliverables

- Continuity of timely and accurate weather and water forecasts and warnings

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
CHANGES FOR 2019
(Dollar amounts in thousands)

NWS Workforce Savings (-110 FTE/ -248 Positions, -\$15,000) – 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 2019, 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.

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Operations, Research, and Facilities
CHANGES FOR 2019
(Dollar amounts in thousands)

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 2019, 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 2019, 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 2019. 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.

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
CHANGES FOR 2019
(Dollar amounts in thousands)

Reduce Tsunami Warning Program (-25 FTE/ -25 Positions, -\$11,000) – This program change streamlines NOAA’s Tsunami Research and Operational Warning 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 tsunami program components to ensure high-quality tsunami watches, warnings, and advisories. This reduction eliminates partner funding for education and awareness programs including grant funding to local education, awareness, and inundation and evacuation map development. 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 as the National Centers for Environmental Prediction.²

Schedule and Milestones

FY 2019-2023

- Operate Tsunami Warning Center
- Operate the International Tsunami Information Center and the Caribbean Tsunami Warning Program
- Sustain TsunamiReady™ Program

Deliverables

- Operational Tsunami Warning Center
- Operational International Tsunami Information Center and Caribbean Tsunami Warning Program

² <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
CHANGES FOR 2019
(Dollar amounts in thousands)

Terminate Aviation Science Research to Operations (0 FTE/ 0 Positions, -\$1,806) – This program change terminates aviation science research and development and R2O transition efforts. This program change is in coordination with the decrease aviation science R2O termination request from the Science and Technology Integration PPA.

With this reduction, NOAA will be able maintain current levels of operational aviation weather forecast products and services. However, NOAA will terminate efforts to develop and implement key aviation tools and capabilities required by the Federal Aviation Administration (FAA) to support the Next Generation Air Transportation System (NextGen). NWS will be unable to satisfy current and future requirements set by domestic (FAA) and international (ICAO) stakeholders.

Schedule and Milestones

FY 2019–2023

- Maintain currently deployed aviation products and services

Deliverables

- N/A – no new innovations transitioned to operations

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
CHANGES FOR 2019
(Dollar amounts in thousands)

Consolidate Climate Prediction Center/Weather Prediction Center Functions (-8 FTE/ -8 Positions, -\$1,200) – This program change 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 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 provide information that can lead to understanding of international phenomena like flood and drought that could impact food supplies. These global forecast products 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 2019-2023

- Weather Prediction Center provides a continuum of products and services from near term through sub-seasonal to seasonal timeframes

Deliverables

- Operations of the Weather Prediction Center providing weather and climate predictions from near term through sub-seasonal to seasonal timeframes

**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	Location	Grade	Number	Annual Salary	Total Salaries
Meteorologist	Various	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)
2019 Pay Adjustment (0%)		0.00%			0
Total					(12,251,910)
Personnel Data					
Full-time Equivalent Employment					
Full-time permanent			(110)		
Other than full-time permanent			0		
Total			(110)		
Authorized Positions:					
Full-time permanent			(248)		
Other than full-time permanent			0		
Total			(248)		

**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	Location	Grade	Number	Annual Salary	Total Salaries
Admin Support Assistant	TBD	GS-08	(1)	64,461	(64,461)
Computer Scientist	TBD	GS-13	(1)	121,756	(121,756)
Director	TBD	GS-15	(1)	170,613	(170,613)
Electronics Systems Analyst	TBD	GS-13	(1)	121,756	(121,756)
Electronics Technician	TBD	GS-12	(1)	103,249	(103,249)
Electronics Technician	TBD	GS-11	(1)	86,140	(86,140)
Geophysicist	TBD	GS-14	(2)	144,065	(288,130)
IT Specialist	TBD	GS-13	(2)	121,756	(243,512)
Oceanographer	TBD	GS-14	(1)	144,065	(144,065)
Oceanographer	TBD	GS-13	(2)	121,756	(243,512)
Oceanographer	TBD	GS-12	(1)	103,249	(103,249)
Physical Scientist	TBD	GS-14	(3)	144,065	(432,195)
Physical Scientist	TBD	GS-13	(7)	121,756	(852,292)
Tsunami Warning Science Officer	TBD	GS-14	(1)	144,065	(144,065)
Total			<u>(25)</u>		<u>(3,118,995)</u>
Less lapse		0.00%	<u>0</u>		<u>0</u>
Total full-time permanent (FTE)			(25)		(3,118,995)
2019 Pay Adjustment (0%)		0.00%			<u>0</u>
Total					<u>(3,118,995)</u>

Personnel Data

Full-time Equivalent Employment

Full-time permanent	(25)
Other than full-time permanent	<u>0</u>
Total	(25)

Authorized Positions:

Full-time permanent	(25)
Other than full-time permanent	<u>0</u>
Total	(25)

**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	Location	Grade	Number	Annual Salary	Total Salaries
Director	Maryland	SES	(1)	175,835	(175,835)
Lead Physical Scientist	Maryland	GS-14	(2)	130,875	(261,750)
Physical Scientist	Maryland	GS-13	(4)	110,628	(442,512)
Admin Assistant	Maryland	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)
2019 Pay Adjustment (0%)		0.00%			0
Total					(937,800)

Personnel Data

Full-time Equivalent Employment

Full-time permanent	(8)
Other than full-time permanent	0
Total	(8)

Authorized Positions:

Full-time permanent	(8)
Other than full-time permanent	0
Total	(8)

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support
Program Change: Restore Core Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	5,958
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>5,958</u>
12.1 Civilian personnel benefits	1,677
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	1,149
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>8,784</u>

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PRORAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support
Program Change: NWS Workforce Savings

Object Class	2019 Decrease
11.1 Full-time permanent	(12,252)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(12,252)
12.1 Civilian personnel benefits	(2,748)
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(15,000)

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

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support
Program Change: Reduce Tsunami Warning Program

Object Class	2019 Decrease
11.1 Full-time permanent	(3,119)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(3,119)
12.1 Civilian personnel benefits	(381)
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(1,500)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(6,000)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(11,000)

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

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support
Program Change: Terminate Aviation Science Research to Operations

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	(1,806)
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,806)

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

Activity: Analyze, Forecast and Support
Subactivity: Analyze, Forecast and Support
Program Change: Consolidate Climate Prediction Center/Weather Prediction Center Functions

Object Class	2019 Decrease
11.1 Full-time permanent	(938)
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	(938)
12.1 Civilian personnel benefits	(262)
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,200)

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Dissemination	Pos./BA	84	47,580	84	50,090	0	2,510
	FTE/OBL	80	47,580	80	50,090	0	2,510

Enhance the Resilience and Reliability of Integrated Dissemination Program Applications (0 FTE/ 0 Positions, +\$2,287) –

This program change will fund upgrades and enhancements to operational applications on the Integrated Dissemination Program (IDP) systems in College Park, MD and Boulder, CO.

The Integrated Dissemination Program systems funded within the Information Technology (IT) Infrastructure and Virtualized Applications project provide scalable, robust, secure, and commonly shared IT infrastructure to ensure resilience and reliability during critical weather events. This request addresses the operations and maintenance of the IDP infrastructure as well as the contractor services required to sustain web and GIS services and enhancements of existing applications. Most importantly, the requested funding will help integrate targeted mission-critical applications into the dissemination infrastructure providing a higher level of redundancy and reliability than what exists currently for our partners and customers.

By increasing and enhancing the resilience of these existing applications – designed to protect life and property and enhance the national economy – the entire weather enterprise will benefit, with operational dissemination services running within a 24x7 supported environment.

Schedule and Milestones

FY 2019-2023

- IDP systems providing mission-critical dissemination services to support WRN

Deliverables

- Providing 99.8 percent uptime capability of IDP systems

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
INCREASES FOR 2019
(Dollar amounts in thousands)

Restore Core Capabilities (0 FTE/ 0 Positions, +\$223) – 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. Funding will address core capabilities that were used to fully fund the FY 2018 civilian pay raise of 1.9 percent (\$223).

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

Activity: Dissemination
Subactivity: Dissemination
Program Change: Enhance the Resilience and Reliability of Integrated Dissemination Program Applications

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	2,287
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	2,287

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

Activity: Dissemination
Subactivity: Dissemination
Program Change: Restore Core Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	171
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>171</u>
12.1 Civilian personnel benefits	52
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	<u>0</u>
99.9 Total obligations	<u>223</u>

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

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Science and Technology Integration	Pos./BA	440	137,139	440	122,702	0	(14,437)
	FTE/OBL	419	137,139	419	122,702	0	(14,437)

Reduce the Investment in Numerical Weather Prediction Modeling (0 FTE/ 0 Positions, -\$5,000) – 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) including reducing support to the unified data assimilation development; eliminating support to the development of the Unified Global Coupled System; reducing support to the collaborative research activities for the Hurricane Forecast Improvement Project (HFIP); reducing support to NOAA’s testbeds including the Development Test Center, Global Modeling Test Bed, and Joint Center for Satellite Data Assimilation; and slowing the effort to transition new physics into the global forecast system and hurricane forecast system. NOAA also will reduce the development of the NOAA Environmental Modeling System (NEMS) infrastructure by 20 percent. NEMS streamlines the interaction of analysis, forecast, and post-processing systems within NCEP.

Deliverables

- Implement Next Generation Global Modeling System
- Complete transition of Operational Models to next-generation High Performance Computing Systems

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
CHANGES FOR 2019
(Dollar amounts in thousands)

Terminate Coastal Act (0 FTE/ 0 Positions, -\$4,629) – This program change will terminate actions associated with the implementation of the Consumer Option for an Alternative System To Allocate Losses (COASTAL) Act of 2012.

NOAA proposes to terminate efforts associated with the COASTAL Act implementation within NWS. 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.

Restore Core Capabilities (0 FTE/ 0 Positions, +\$1,293) – 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 address core capabilities that were used to fully fund the FY 2018 civilian pay raise of 1.9 percent (\$1,293).

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
CHANGES FOR 2019
(Dollar amounts in thousands)

Reduce the Investment in the National Water Model (0 FTE/ 0 Positions, -\$3,101) – This program change recognizes large prior year investments and thus will reduce investment in the National Water Model.

In FY 2016, NOAA launched the first centralized operational National Water Model. In 2018, NOAA will slow upgrades to the National Water Model resulting in re-phasing the development of centralized water prediction products and services at the National Water Center. NOAA will prioritize achieving its FY 2018-2019 Agency Priority Goal by September 30, 2019 to *Mitigate Flood Impacts by demonstrating Improved Decision Support Services to Emergency Managers*. The Agency Priority Goal will improve decision support services by 1) demonstrating a new flood inundation mapping capability serving 25 million people residing in flood-vulnerable freshwater basins; and 2) delivering an enhance excessive rainfall outlook product that extends the lead time of High Risk predictions from two to three days.

Schedule and Milestones

FY 2019–2023

- Demonstrate high resolution large watershed modeling with nested hyper-resolution modeling - Reduced from three regional areas to one regional area.
- Initial provision of national water prediction products (based on National Water Model)
- Develop atmosphere, coastal, and terrestrial modeling components for community national water modeling framework, with one-way coupling for demonstration regions
- Develop medium range forecasts with zero to three day ensemble-based guidance into the framework to produce predictions out zero to seven days

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(Dollar amounts in thousands)

Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Recommendations (0 FTE/ 0 Positions, -\$2,000) – This program change will shift NOAA's efforts to the testing, evaluation, and implementation phases of the Operations and Workforce Analysis (OWA).

NOAA completed its OWA with FY 2017 resources and proposes to conduct testing, evaluation, and implementation of the recommendations, with particular emphasis on the three recommendations that have the highest likelihood of success. NOAA will use its current staffing and capacity for the Operations Proving Ground (OPG) to conduct testing, demonstration, and transition into operations of new operational and forecast processes, workflows, and supporting tools and technologies. NOAA will prioritize field demonstrations aimed at supporting consistent implementation of Impact-Based Decision Support Services (IDSS).

Schedule and Milestones

The first set of actions for consideration includes initiating the following:

- Auto-Launchers beginning in Alaska
- Deliver tools for demonstration
- Begin implementation of enhanced, consistent IDSS
- Collaborative Forecast Process
- GS 5-12 Career Progression

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(Dollar amounts in thousands)

Terminate Aviation Science Research to Operations (0 FTE/ 0 Positions, -\$1,000) – This program change will eliminate NOAA's aviation science research-to-operations (R2O) effort.

NOAA proposes to terminate aviation science research and development and R2O transition efforts within NWS. This program change is in coordination with the decrease aviation science R2O termination request in the Analyze, Forecast and Support PPA.

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 CWSU, WFOs and FAA; and
- Integrated support for impacted air-traffic environment (INSITE) tool supporting Aviation Weather Center and ATCSCC to improve management of National Airspace System.

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

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration
Program Change: Reduce the Investment in Numerical Weather Prediction Modeling

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(3,000)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,000)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(5,000)

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PROGRAM CHANGE DETAIL BY OBJECT CLASS**

(Dollar amounts in thousands)

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration
Program Change: Terminate Coastal Act

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(3,000)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(1,629)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(4,629)

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

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration
Program Change: Restore Core Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	971
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	971
12.1 Civilian personnel benefits	322
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,293

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

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration
Program Change: Reduce the Investment in the National Water Model

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(601)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(2,500)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(3,101)

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

Activity: Science and Technology Integration
Subactivity: Science and Technology Integration
Program Change: Reduce Testing, Evaluation, and Implementation of OWA Recommendations

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(1,500)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(500)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(2,000)

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Activity: Science and Technology Integration
 Subactivity: Science and Technology Integration
 Program Change: Terminate Aviation Science Research to Operations

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	<u>0</u>
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(500)
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	(500)
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	<u>(1,000)</u>

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Activity: Systems Acquisition

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos/BA	1	27,487	0	32,534	0	32,534	0	16,250	0	(16,284)
	FTE/OBL	1	8,872	0	58,479	0	32,534	0	16,250	0	(16,284)
Central Processing	Pos/BA	31	66,172	26	66,311	26	66,311	26	58,139	0	(8,172)
	FTE/OBL	31	74,864	24	66,832	24	66,311	24	58,139	0	(8,172)
Dissemination	Pos/BA	0	39,307	0	34,386	0	34,386	0	34,553	0	167
	FTE/OBL	0	42,294	0	36,413	0	34,386	0	34,553	0	167
Total Systems Acquisition	Pos/BA	32	132,966	26	133,231	26	133,231	26	108,942	0	-24,289
	FTE/OBL	32	126,030	24	161,724	24	133,231	24	108,942	0	-24,289

The objectives of the Systems Acquisition activity are to:

- Enhance NOAA's operational observational suite;
- Provide High Performance Computing capacity operations and development;
- Develop forecaster tools for improved decision support; and
- Enhance NOAA's dissemination capabilities for weather and climate services and products.

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Activity: Systems Acquisition/Observations

Goal Statement

The Observations Programs, Projects, and Activities (PPA) supports the life-cycle of all NWS observing system investments by providing technical solutions to address 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 FY 2019, NWS will continue its Next Generation Weather Radar (NEXRAD) SLEP, continuing pedestal and transmitter refurbishments and initiating shelter refurbishments to extend overall service life and reduce average time between failures. NWS will also continue the Automated Surface Observing System (ASOS) Service Life Extension Program (SLEP) with ongoing 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, Federal Aviation Administration (FAA) and Department of Defense (DOD).

Specifically with the PAC appropriation, the funds in the Observations PPA 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.

Base Program

To achieve these goals, NWS maintains the following programs:

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 DOD and Transportation (DOT). Though the system is nearing end of life, the Federal government is 20-25 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.

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

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transmissions; provides greater safety, data consistency, and accuracy; and allow for remote and cost effective maintenance, logistics, and training. ASOS is tri-agency effort supporting meteorological observational requirements of DOC, DOD and DOT.

In FY 2018, NWS focused on awarding the Pedestal Refurbishment contract for the NEXRAD SLEP and awarding the production contract for the Acquisition Control Unit (ACU) and Data Collection Package (DCP) for the ASOS SLEP.

Statement of Operating Objectives

Schedule and Milestones

FY 2019-2023

NEXRAD SLEP

- Complete modification of radar transmitters
- Complete pedestal refurbishments
- Complete refurbishment of radar shelters

ASOS SLEP

- Completed production and installation of ACU-DCP Upgrades
- Implementing telecommunications architecture upgrade (50 percent complete)

Deliverables:

NEXRAD SLEP

- Refurbished pedestals with expected service life to at least 2030
- Refurbished transmitters with expected service life to at least 2030
- Refurbished radar shelters

ASOS SLEP

- Total refreshment of ACU-DCU with expected service life to at least 2040
- Increased data flow and remote maintenance capabilities

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Activity: Systems Acquisition/Central Processing

Goal Statement

The Central Processing PPA 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 FY 2018, NWS upgraded its HPC capacity from 2,800 trillion floating point operations per second (TeraFLOPS) to 4,200 TFLOPS. In FY 2019, NWS will continue to develop new Advanced Weather Interactive Processing System forecast capabilities.

Base Program

Central Processing objectives are achieved through the following programs:

WCROSS 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.

WCROSS 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 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 Protection plans, implementation and maintenance of a redundant WCROSS architecture ensures uninterrupted flow of weather and climate data and products, such as storm watch and warning services to the public.

WCROSS also provides NWS access to developmental computing systems through the NOAA-wide enterprise Research and Development High Performance Computing 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 meteorological and hydrological data, satellite, and radar data at NWS field offices;

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- Acquires and processes data from sensors and local sources;
- Provides computational and display functions at operational sites;
- 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 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.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Provide Operations and Maintenance support for WCOSS
- Provide Operations and Maintenance support for NOAA's R&D HPC System

FY 2019

- Development of integrated training capabilities within AWIPS infrastructure
- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2020

- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2021

- Transition to a new WCOSS computing configuration
- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2022

- Phased implementation of new forecast tools and capabilities into AWIPS

Deliverables

- Operational WCOSS with full backup capability
- Production Suite On-Time Product Generation at 99 percent

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- Sustained WCOSS capacity at 4.2 TFLOPS, in each the primary and backup systems
- New forecast tools and capabilities for IDSS/WRN operations
- Weather Event Simulator integration into AWIPS

Activity: Systems Acquisition/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 elevated to Congressional levels and highlighted the urgent need for organizational change and the development of a reliable and scalable NWS dissemination infrastructure to sustain 24x7 mission operations.

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the Dissemination PPA is organized around infrastructure, networks, web services and warning dissemination services.

In FY 2018, NWS is extending current effort and further preserve the IDP capabilities and resilience by improving stability, scalability, and enhancements of the IDP systems. Furthermore, in FY 2018, NWS will finalize the completion of the network capacity upgrades to take full advantage of GOES-16 and JPSS in support of the Ground Readiness Program (GRP) and prepare for the mandated Federal Government transition to the next generation of telecommunications and IT infrastructure services called Enterprise Infrastructure Solutions (EIS).

Specific to the PAC appropriation, funding within the Dissemination PPA:

- Procures NWS' IT dissemination infrastructure and services
- Closes NWS' dissemination requirements and gaps
- Enhances NWS' dissemination system capabilities
- Maintain and operate NWS' dissemination system capabilities including IDP and NWS networks at 99% operational availability.
- Builds a scalable NWS dissemination architecture as part of the emerging NOAA enterprise architecture.
- Develops a strategy to maximize effectiveness while minimizing cost

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Base Program

To achieve these goals, NWS manages the following programs:

NWS Telecommunications Gateway (NWSTG)

Within the IDP systems, the NWSTG is the NWS communications hub for collecting and distributing weather data and products. NWSTG provides national and global collection and distribution of environmental data and forecast products to NWS field units and external users. However, current technology has delays in the collecting and disseminating of data. Maintaining the NWSTG will ensure reliable delivery of NWS products to users and will capitalize on better observation data and prediction models to improve services.

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. Therefore, NWSTG was identified as an essential government resource in *Presidential Decision Directive 67 – Enduring Constitutional Government and Continuity of Government Operations*.

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 2017, NWS completed the refurbishment of all obsolete vacuum tube technology at NWR transmitter sites. Newer, solid-state transmitters have a mean time between failures of over 1,000 hours, a 67 percent improvement of over the older models.

Ground Readiness Project (GRP)

The GRP enables NWS to utilize an expected three-fold increase in environmental satellite, radar, and model data that will accompany the operational GOES-16 satellite, radar upgrades, and planned model improvements. These advances in geostationary weather satellites, polar-orbiting satellites, satellite ground systems, and numerical weather prediction supercomputing systems came online in 2017 and will lead to great improvements in weather warnings and forecasts. This data increase far exceeds the capacity of NWS current IT infrastructure to transmit the data to forecast offices, between systems, and to customers. NWS is thus updating its information technology (IT) infrastructure with the GRP to ensure adequate processing, delivery and exploitation of new environmental satellite, model, and radar data. Without these upgrades, NWS would not be able to use the new data to improve the accuracy and timeliness of weather warnings and forecasts.

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NWS is taking a holistic, enterprise-based approach to managing and integrating the necessary IT infrastructure redesign and upgrades. NWS primary dissemination capabilities include extensive terrestrial communication circuits, NOAA Weather Radio, web and GIS services, and enabling Wireless Emergency Alerts.

In FY 2018, Full Operating Capability (FOC) of the GOES-16 imagery and products will be 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 2019, NWS will continue to sustain and operate the infrastructure to meet the NWS mission.

Improve Dissemination Reliability Project

The improved dissemination reliability project mitigates risk to mission operations during severe weather events by upgrading network capabilities to reduce single points of failure and increase website capacity. Many NWS field networks and websites have little or no redundancy, resulting in outages, such as when a communication line is damaged. As a result, events between 2013 and 2015 led to numerous outages, delaying NWS' ability to disseminate its forecasts and warnings to emergency managers, first responders and the public. By acquiring upgraded communication paths to NWS Field Offices and increasing website capacity, NWS will make network infrastructure more resilient and robust while decreasing the risk of network 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 two physical network paths at a subset of mission-critical NWS locations.
- **Providing Robust and High Capacity Websites:** Increase website capacity for NWS Field Offices at the primary and back-up integrated dissemination sites to ensure the Field Office websites keep up with growing requirements and increased use during severe weather events. NWS will acquire computing and storage to augment the IT dissemination infrastructure currently being stood-up at the primary and back-up IDP sites providing 100 percent backup capabilities.

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Statement of Operating Objectives

Schedule and Milestones

FY 2019-2023

- Provide processing and storage resources to support WRN
- Operate and maintain IDP Systems
- Operate and maintain NWS networks
- Phased implementation of new applications and capabilities into IDP
- Upgrade NWR telecoms to digital Enterprise Systems
- Replace obsolete transmitter site monitoring equipment
- Begin to implement alternative communication paths to NWS Field Offices
- Integrate website operations to College Park, MD and Boulder, CO
- Transition from the GSA Networkx contract to GSA Enterprise Infrastructure Solutions contract based on the budget

Deliverables

- 100 percent solid state transmitter network for all 1029 stations
- Replacement of obsolete and end-of-life NWR site components
- 96 percent or better NWR station availability
- Operate and maintain IDP Systems at 99 percent or better
- Continue maintenance and support of NWS network
- Robust and high capacity websites for NWS Field Offices
- Improve reliability of enterprise GIS capabilities on IDP
- Enable AWIPS access to IDP services

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Observations	Pos./BA	0	32,534	0	16,250	0	(16,284)
	FTE/OBL	0	32,534	0	16,250	0	(16,284)

Reduce Service Life Extension Program for Next Generation Weather Radar (0 FTE/ 0 Positions, -\$16,284) – This program change reflects the planned program decrease for the Service Life Extension Program (SLEP) to sustain aging Next Generation Weather Radar (NEXRAD) infrastructure. The proposed funding also reflects an additional \$4,424 in reductions to the Observation Portfolio.

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.³ Investment in this SLEP mitigates high operational risk by extending the useful life of the radars.

³ Derived from "The Federal Plan for Meteorological Services and Supporting Research", FY 1980-2000.

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(Dollar amounts in thousands)

Schedule and Milestones

FY 2019

Transmitter

- 40 transmitters modified

Pedestal

- 38 pedestals rebuilt

Shelter

- Release RFP and award contracts
- Begin shelter refurbishment via contract
- Refurbish shelters at 9 radar sites

FY 2020

Transmitter

- 55 transmitters modified

Pedestal

- 60 pedestals rebuilt

Shelter

- Refurbish shelters at 26 radar sites

FY 2021

Transmitter

- 87 transmitters modified

Pedestal

- 83 pedestals rebuilt

Shelter

- Refurbish shelters at 47 radar sites

FY 2022

Transmitter

- Complete modifications of 122 transmitters

Pedestal

- 106 pedestals rebuilt

Shelter

- Refurbish shelters at 68 radar sites

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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

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

Activity: Systems Acquisition
Subactivity: Observations
Program Change: Reduce Service Life Extension Program for Next Generation Weather Radar

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(16,284)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(16,284)

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DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel</u>	<u>Amount</u>
Central	Pos./BA	26	66,311	26	58,139	0	(8,172)
Processing	FTE/OBL	24	66,311	24	58,139	0	(8,172)

Eliminate Integrated Water Prediction High Performance Computing (0 FTE/ 0 Positions, -\$4,172) – 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.

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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Reduce Research and Development High Performance Computing (0 FTE/ 0 Positions, -\$4,000) – 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.

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 2019

- 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

Deliverables

- Sustain existing National Water Model capability

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

Activity: Systems Acquisition
Subactivity: Central Processing
Program Change: Reduce Weather and Climate Operational Supercomputing

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(4,172)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(4,172)

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

Activity: Systems Acquisition
Subactivity: Central Processing
Program Change: Reduce Research and Development High Performance Computing

Object Class	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	(4,000)
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(4,000)

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INCREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Dissemination	Pos./BA	0	34,386	0	34,553	0	167
	FTE/OBL	0	34,386	0	34,553	0	167

Improve Dissemination Reliability Project (0 FTE/ 0 Positions, +\$167) – This program change will provide additional resources to the improved dissemination reliability project.

The improved dissemination reliability project mitigates risk to mission operations during severe weather events by upgrading network capabilities to reduce single points of failure and increase website capacity. Many NWS field networks and websites have little or no redundancy, resulting in outages, such as when a communication line is damaged. As a result, events between 2013 and 2015 led to numerous outages, delaying NWS’ ability to disseminate its forecasts and warnings to emergency managers, first responders and the public. By acquiring upgraded communication paths to NWS Field Offices and increasing website capacity, NWS will make network infrastructure more resilient and robust while decreasing the risk of network outages.

Schedule and Milestones

FY 2019-2023

- Phased implementation of new applications and capabilities into Integrated Dissemination Program

Deliverables

- Operational Integrated Dissemination Program with full backup and failover capability
- Completion of OneNWS Network upgrades

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

Activity: NWS Acquisition
Subactivity: Dissemination
Program Change: Improve Dissemination Reliability Project

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	167
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	167

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**
(Dollar amounts in thousands)

Activity: NWS Construction

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Facilities Construction and	Pos/BA	1	7,576	0	7,598	0	7,598	0	8,634	0	1,036
Major Repairs	FTE/OBL	1	12,409	0	11,292	0	7,598	0	8,634	0	1,036

Goal Statement

FACILITIES CONSTRUCTION & MAJOR REPAIRS:

The objective of the Construction activity is to construct and provide for major repairs to forecast offices and other government-owned weather facilities.

To support its mission, the NWS operates and maintains 122 WFO, 13 RFC, 18 Weather Service Offices (WSO) and associated employee housing units, and 8 National Centers. Of the WFOs and WFO/RFCs, 37 are leased. To support these facilities, the Facilities Construction & Major Repairs PPA 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 Forecast Offices and Centers;
- Maintain structural integrity through capital improvements; and
- Maintain compliance with Federal law and national and local building codes.

Base Program

NWS facilities are reaching and exceeding twenty five years in 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 not only maintaining compliance with Federal law and national and local building codes, but also ensuring uninterrupted forecasts for local communities. In addition, recent NWS investments in facilities have addressed

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**

required tenant improvements and moving costs associated with expiring forecast office leases. A select number of expiring forecast office leases have resulted in forced relocations.

In 2017, WFO Davenport moved to its new location in Davenport, IA and NWS began building out WFO Boston in its new location. In FY 2018, NWS will re-initiate efforts to relocate Cleveland and Burlington WFOs and begin building out these two WFOs in a new location. In FY 2018, NWS also is focusing on major system replacement at government owned facilities to address deferred maintenance and identify additional government owned WFOs requiring recapitalization. In FY 2019, NWS will initiate the forced relocation of WFO Albany, identify WFOs requiring recapitalization, perform major facilities upgrades at the sites identified in FY 2018, and continue to address deferred maintenance through major system replacement.

Statement of Operating Objectives

Schedule and Milestones

FY 2019–2023

- Award contracts for highest priority facilities for the replacement of multiple major systems
- Design and build out tenant improvements for relocation of five WFOs

Deliverables

- Up to twelve (12) highest priority major system replacements annually to ensure continued operational stability and service delivery capability
- Select WFOs and WFO/RFCs operating in newly leased facilities

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Facilities							
Construction	Pos./BA	0	7,598	0	8,634	0	1,036
and Major	FTE/OBL	0	7,598	0	8,634	0	1,036
Repairs							

Weather Forecast Office and River Forecast Center Relocations (0 FTE/ 0 Positions, +\$1,036) – This program change will provide tenant improvements (TI) and move costs associated with Weather Forecast Office (WFO) and River Forecast Center (RFC) relocations due to unacceptable conditions at facilities that will impact operations.

Investment in the WFO and RFC relocations mitigates operational risks as these improvements are needed for the continuity of weather forecast and warning operations and compliance with weather office standards. Standards of structural integrity, maintenance, security, temperature control, and adequate utilities ensure that forecasters, and the computing and system resources they rely on, meet regulations for issuing weather forecasts and warnings. Further, these facilities are located in severe weather areas, such as tornados and hurricanes, where citizens, emergency managers, and local officials count on the timely and accurate delivery of weather warnings.

For leased facilities, NWS will pursue Build-to-Suit leases. Under a Build-to-Suit lease, the offeror constructs a facility to NWS specifications and then leases the land and facility to the NWS. The Build-to-Suit strategy provides: flexibility, customization and reduced upfront budgetary resource requirements. NWS is seeking tenant improvements (TI) and associated move costs for these facilities. NWS would align lease terms to ensure flexibility for future needs.

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INCREASES FOR 2019
(Dollar amounts in thousands)

General Services Administration's (GSA) policy requires agencies to breakout mission unique requirements above the standard "Warm lit shell." These unique requirements are known as TIs and according to GSA policy should be funded separately from the lease. NWS mission unique requirements include:

- Critical circuits and Communications
- Information Technology requirements - raised flooring; additional heating, ventilating, and air conditioning (HVAC) for Computer Room
- Tornado Shelter, as required
- Upper Air Inflatable Shelter, as required
- Security Equipment and Access Control (HSPD-12)
- Uninterruptible power supply (UPS) / Emergency Generator / Fuel Tank

Relocating a facility requires considerable costs. These costs include:

- Installation of dedicated, remote communications to existing Next Generation Weather Radar (NEXRAD)
- Relocation of all communication circuitry
- Relocation of entire Information Technology suite, including the OneNWS Network, Advanced Weather Interactive Processing System (AWIPS) and Upper Air systems
- Parallel operation of dual AWIPS equipment during transition
- Relocation of office furniture and fixtures

Schedule and Milestones

FY 2019-2023

- Relocate multiple WFO and WFO/RFC's

Deliverables

- WFO's and WFO/RFC's under new facilities

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

Activity: NWS Construction
Subactivity: Facilities Construction and Major Repairs
Program Change: Weather Forecast Office and River Forecast Center Relocations

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	1,036
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,036

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BUDGET PROGRAM: NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE

For FY 2019, NOAA requests a total of \$1,640,021,000 and 786 FTE for the National Environmental Satellite, Data and Information Service (NESDIS) including a net decrease of \$550,959,000 and an increase of 1 FTE 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. To fulfill its responsibilities, NESDIS procures, launches, and manages the Nation's civil operational environmental satellites. Along with managing and operating satellites in real time, NESDIS develops and distributes products and information based on satellite data. 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. NOAA satellite data underpin weather and other environmental forecasts, saving lives and property. NESDIS also works toward developing the next generation of satellites in order to continue meeting primary mission essential functions without incurring gaps in data coverage.

NOAA satellites are essential to the agency's integrated observing system, which is the foundation of the environmental intelligence that the agency provides. NESDIS maintains primary constellations of environmental satellites in the polar and geostationary orbits, and in deep space at Lagrange point 1. Along with operating its satellites in real time, NESDIS manages the global data gathered by these satellites and 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, provide uninterrupted global coverage critical for generating short- 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.

The NESDIS budget is organized into two Operations, Research, and Facilities (ORF) activities: (1) Environmental Satellite Observing Systems (\$175,394,000 and 339 FTE); and (2) National Centers for Environmental Information (\$61,676,000 and 187 FTE).

The *Environmental Satellite Observing Systems* activity: (1) provides secure and efficient command and control of NOAA and non-NOAA operational environmental satellites; and (2) ensures secure, timely, and uninterrupted delivery of data to users, including product processing, development, and distribution. Below are the Programs, Projects, and Activities (PPAs) included in the

Environmental Satellite Observing Systems activity:

- Satellite and Product Operations
- NSOF Operations
- Product Development, Readiness & Application
- Commercial Remote Sensing Regulatory Affairs
- Office of Space Commerce
- Group on Earth Observations

The *National Centers for Environmental Information* activity includes the National Centers for Environmental Information PPA. The National Centers for Environmental Information are the Nation's leading authority for historical and near-real time atmospheric, space weather, climate, coastal, oceanographic, and geophysical environmental data and information.

The NESDIS budget is organized into two Procurement, Acquisition, and Construction (PAC) activities: (1) Systems Acquisition (\$1,952,999,000 and 259 FTE) and (2) Construction (\$2,213,000 and 0 FTE).

The *Systems Acquisition* activity acquires satellites and related instruments for all NOAA satellite programs to maintain long-term satellite data continuity. It includes the following PPAs:

- Geostationary Systems – R
- Joint Polar Satellite System (JPSS)
- Polar Follow On
- Cooperative Data and Rescue Services (CDARS)
- Space Weather Follow On
- COSMIC 2/GNSS RO
- Satellite Ground Services
- System Architecture and Advanced Planning
- Projects, Planning and Analysis
- Commercial Weather Data Pilot

The *Construction* activity includes the Satellite CDA Facility PPA and supports the operation and critical infrastructure at satellite command and data acquisition facilities.

Management of Observing System Delivery

The primary focus for NESDIS is providing uninterrupted, accurate, calibrated, and validated satellite observations supporting high impact environmental intelligence products and services. NESDIS is focused on delivering, among the rest of our products and services, the highly capable Geostationary Operational Environmental Satellite-R (GOES-R) Series and Joint Polar Satellite System

(JPSS), of which both programs have launched one satellite with the remaining satellites currently in advanced stages of development and testing to ensure their continued services in the near term. NESDIS has conducted a comprehensive architecture analysis to define the observing system options and programmatic approaches for the future. The sustained observing system of the future will likely feature significant changes from our present system, including an evolving mix of government and commercial assets, and small, medium, and large satellites to meet observing needs. The NESDIS strategic approach will enable efficient transitions of research or innovative concepts to operational status, ensuring the NOAA observing portfolio includes current technology while providing continuous service to the Nation. Managing our observing system delivery and development within a constrained topline NESDIS budget is a long term imperative to supporting this approach.

NESDIS seeks to manage its existing observing system commitments within and across the NOAA satellite budget portfolio in order to ensure resources are being maximized. Looking into the future NESDIS will, for future commitments, work to manage programs' budgets so they do not peak at the same time and are appropriately phased. This will reduce significant year to year peaks across the NESDIS top line budget requirements, ensure robustness and minimize risk across the constellation with advanced planning, and provide programmatic flexibility to enable long term continuity in satellite observations. Future budgets organized to thematic, rather than hardware based, portfolios would further enable NESDIS to be flexible, responsive, and sustainable.

In the FY 2019 budget, NOAA will continue to work towards ensuring the reliability and continuity of performance from the polar and geostationary constellations through continuous and rigorous risk management of the observing system portfolios. NOAA expects such active risk management could include some reallocation of resources across complementary components within the separate polar and geostationary constellations, in response to issues and opportunities. As a preliminary step in this direction, this FY 2019 budget proposes to combine the Joint Polar Satellite System (JPSS) program of record and the Polar Follow On (PFO) PPA into a new PPA for the full JPSS series of satellites. Merging these two PPAs would ensure both cost and programmatic efficiencies, and ensure that there is enough flexibility to minimize risk in the developmental stages of the JPSS satellites. Furthermore, NOAA will begin to assess new categorization of its programs, projects, and activities that aligns with NESDIS's new strategic plan, while providing sufficient transparency, and offering an appropriate level of flexibility to execute more efficient portfolio management decisions.

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2019 Base includes a total of \$3,535,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NESDIS activities. This includes inflationary increases for labor and non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

NOAA requests to merge the two major polar satellite PPAs, the Joint Polar Satellite System (JPSS) Program of Record and Polar

Follow On (PFO), into a new PPA called Polar Weather Satellites (PWS). With PFO being the continuation of the JPSS program of record, merging these two PPAs will ensure both cost and programmatic efficiencies, and ensure that there is enough flexibility to minimize risk in the developmental stages of the JPSS satellites. The new Polar Weather Satellites PPA has a total of \$1,108,635 and 84 FTEs and is a first step towards NESDIS organizing the NESDIS budget by thematic portfolios rather than hardware based portfolios, with the goal of maximizing NESDIS' ability to be flexible, responsive, and sustainable.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Joint Polar Satellite System (JPSS)	NESDIS	Polar Weather Satellites (PWS)	\$781,951,000/ 60 FTE
NESDIS	Polar Follow On (PFO)	NESDIS	Polar Weather Satellites (PWS)	\$326,684,000/ 24 FTE

NOAA requests a technical adjustment to transfer \$3,288,000 and 1 FTE from the Jason-3 PPA and \$3,113,000 and 2 FTE from the Deep Space Climate Observatory (DSCOVR) PPA to the Satellite and Product Operations PPA in NESDIS. Following the successful launches of the DSCOVR satellite on February 11, 2015, and the Jason-3 satellite on January 17, 2016, NOAA will consolidate and streamline the satellite post-anomaly support through one budget line and one servicing organization. These responsibilities include assessing satellite and ground station anomalies and supporting appropriate recovery actions for those anomalies.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Jason-3 (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$3,288,000/ 1 FTE
NESDIS	DSCOVR (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$3,113,000/ 2 FTE

NOAA requests a technical adjustment to move \$1,200,000 and 0 FTE from the Satellite Ground Services PPA in PAC to the Satellite and Product Operations PPA in ORF. This adjustment transfers the funding to operate and maintain the backup facility at Wallops, VA, in the event of a failure to the NSOF Environmental Satellite Processing Center. This back-up facility was completed and became operational at the end of FY 2017. This technical adjustment in FY 2019 along with the operational phase requirements in each out-year will be reduced from the Satellite Ground Services profile.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Satellite Ground Services (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$1,200,000/ 0 FTE

In the FY 2017 President's Budget NESDIS requested Operational Phase Transfers (OPTs) from the GOES-R Series, Jason-3, and DSCOVR PPAs in PAC to Satellite and Product Operations (SPO), NSOF Operations, Product Development, Readiness & Application (PDR&A), and National Centers for Environmental Information (NCEI) in ORF.

The FY 2017 Omnibus Appropriation included most of the transfers, and the remainders were approved in an FY 2017 Reprogramming package. As the FY 2019 President's Budget is based on an FY 2018 annualized Continuing Resolution, which is based on the FY 2017 enacted budget, the OPTs included in the approved FY 2017 reprogramming package were not captured. In order to restore the PPA distribution as captured in the FY 2017 Reprogramming package, NOAA is proposing the following series of transfers.

In the GOES-R, Jason, and DSCOVR life cycle cost (LCC) tables, the FY 2018 and Prior columns capture both the enacted and reprogrammed OPTs for FY 2017. For that same column, the FY 2018 amount is the Annualized CR which, again, excludes the reprogrammed OPTs.

GOES-R Series:

NOAA requests a technical adjustment to move \$4,437,000 and 0 FTE from the Geostationary Systems - R PPA in PAC to the following PPAs within ORF: Satellite and Product Operations (\$923,000); Product Development, Readiness and Application (\$2,104,000); and the National Centers for Environmental Information (\$1,410,000). This adjustment will transfer the funding currently budgeted in the GOES-R Series life cycle cost from the PAC to the ORF account. In addition to the one time technical adjustment in FY 2019, the GOES-R Series profile will be reduced by the transfer amount in each outyear through FY 2036 to fund operational requirements through the projected GOES-R Series mission life. Please see NESDIS-9 for a detailed breakout of the GOES-R Series life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$923,000/ 0 FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	Product Development, Readiness & Application (ORF)	\$2,104,000/ 0 FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$1,410,000/ 0 FTE

Jason-3:

NOAA requests a technical adjustment to move \$50,000 and 0 FTE from the Jason-3 PPA in PAC to the National Centers for Environmental Information PPA within ORF. This adjustment will transfer the operational phase funding currently budgeted in the Jason-3 life cycle cost from the PAC to the ORF account. In addition to the one-time technical adjustment in FY 2019, the Jason-3 profile will be reduced by the operational transfer amount in each outyear through FY 2022 to fund operational requirements through the projected Jason-3 mission life. Please see NESDIS-10 for a detailed breakout of the Jason-3 life cycle cost by PPA.

In addition, NOAA requests a technical adjustment to transfer \$990,000 and 0 FTE from the Jason-3 PPA in PAC to the Satellite Ground Services (SGS) PPA within PAC, to transition the support of the Jason-3 ground system to SGS. The current ground system is over 5-years old, and is in need of a technical refresh, which SGS will support. In addition to the one-time technical adjustment in FY 2019, the Jason-3 profile will also be reduced in FY 2020 to complete the ground system refresh. Please see NESDIS-10 for a detailed breakout of the Jason-3 life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Jason-3 (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$50,000/ 0 FTE
NESDIS	Jason-3 (PAC)	NESDIS	Satellite Ground Services (PAC)	\$990,000/ 0 FTE

DSCOVER:

NOAA requests a technical adjustment to move \$352,000 and 0 FTE from the DSCOVER PPA in PAC to the National Centers for Environmental Information PPA within ORF. This adjustment will transfer the operational phase funding currently budgeted in the

DSCOVR life cycle cost from the PAC to the ORF account. In addition to the one-time technical adjustment in FY 2019, the DSCOVR profile will be reduced by the operational transfer amount in each outyear through FY 2022 to fund operational requirements through the projected DSCOVR mission life. Please see NESDIS-11 for a detailed breakout of the DSCOVR life cycle cost by PPA.

NOAA also requests a technical adjustment to transfer \$255,000 and 0 FTE from the DSCOVR PPA to transition the support of the DSCOVR ground system to Satellite Ground Services PPA. Please see NESDIS-11 for a detailed breakout of the DSCOVR life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	DSCOVR (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$352,000/ 0 FTE
NESDIS	DSCOVR (PAC)	NESDIS	Satellite Ground Services (PAC)	\$255,000/ 0 FTE

These transfers are critical to ensure that Satellite and Product Operations, NOAA Satellite Operations Facility, Product Development, Readiness & Application, National Centers for Environmental Information, and Satellite Ground Services have sufficient funding to support their respective responsibilities to operate the GOES-16 satellite and sustain the Jason-3 and DSCOVR ground systems.

Life Cycle Costs:

The following tables provide the details of the total life cycle costs of NOAA satellites that have planned technical adjustments and Operational Phase Transfers.

GOES-R Life Cycle Cost (LCC)* (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total GOES-R LCC as presented in the FY 2019 President’s Budget submission.

GOES-R LCC	FY 2018 & Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	CTC	Total
GOES-R LCC (PAC & ORF)	8,494,371	442,280	337,956	326,400	326,400	283,900	616,752	10,828,059
<i>Procurement, Acquisition, and Construction (PAC)</i>								
Total PAC	8,431,008	408,380	304,056	292,500	292,500	250,000	176,052	10,154,496
GOES-R Series	8,431,008	408,380	304,056	292,500	292,500	250,000	176,052	10,154,496
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF	63,363	33,900	33,900	33,900	33,900	33,900	440,700	673,563
Satellite and Product Operations (SPO)	42,457**	21,690	21,690	21,690	21,690	21,690	281,970	432,877
NSOF Operations	9,600	4,800	4,800	4,800	4,800	4,800	62,400	96,000
Product Development, Readiness & Application (PDR&A)	9,896**	6,000	6,000	6,000	6,000	6,000	78,000	117,896
National Centers for Environmental Information (NCEI)	1,410**	1,410	1,410	1,410	1,410	1,410	18,330	26,790

** This number reflects the FY 2017 Spend Plan after the approved Reprogramming.

*Jason-3 Life Cycle Cost** (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total Jason-3 life cycle cost as presented in the FY 2019 President's Budget, including the completion of the FY 2019 technical adjustment, Operational Phase Transfer, and program change.

Jason-3 LCC	FY 2018 & Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	CTC	Total
Jason-3 LCC (PAC & ORF)	173,155	8,483	7,718	7493	7493	0	0	204,340
<i>Procurement, Acquisition, and Construction (PAC)</i>								
Total PAC	167,343	990	225	0	0	0	0	168,558
Jason-3	167,343	0	0	0	0	0	0	167,343
Satellite Ground Services (SGS)	0	990	225	0	0	0	0	1,215
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF	5,812	7,493	7,493	7,493	7,493	0	0	35,782
Satellite and Product Operations (SPO) additional base transfer	0	4,562	4,562	4,562	4,562	0	0	18,246
Satellite and Product Operations (SPO) previous OPT	3,554	1,777	1,777	1,777	1,777	0	0	10,662
Product Development, Readiness & Application (PDR&A)	2,208	1,104	1,104	1,104	1,104	0	0	6,624
National Centers for Environmental Information (NCEI)	50**	50	50	50	50	0	0	250

** This number reflects the FY 2017 Spend Plan after the approved Reprogramming.

DSCOVER Life Cycle Cost* (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total DSCOVER life cycle cost as presented in the FY 2019 President's Budget, including the completion of the FY 2019 Operational Phase Transfer and program change.

DSCOVER LCC	FY 2018 & Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	CTC	Total
DSCOVER LCC (PAC & ORF)	113,290	5,723	5,723	5,723	5,723	0	0	136,181
<i>Procurement, Acquisition and Construction (PAC)</i>								
Total PAC	111,826	255	255	255	255	0	0	112,846
DSCOVER	111,826	0	0	0	0	0	0	111,826
Satellite Ground Services (SGS)	0	255	255	255	255	0	0	1,020
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF	1,464	5,468	5,468	5,468	5,468	0	0	23,335
Satellite and Product Operations (SPO) additional base transfer	0	4,560	4,560	4,560	4,560	0	0	18,240
Satellite Product Operations (SPO) previous OPT	1,112	556	556	556	556	0	0	3,336
National Centers for Environmental Information (NCEI)	352**	352	352	352	352	0	0	1,760

** This number reflects the FY 2017 Spend Plan after the approved Reprogramming.

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Activity: Environmental Satellite Observing System

Comparison by activity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Office of Satellite and Product Operations	Pos/BA	219	130,601	292	129,027	295	138,745	295	146,924	0	8,179
	FTE/OBL	218	118,511	256	142,452	259	138,745	259	146,924	0	8,179
Product Development, Readiness & Application	Pos/BA	67	32,273	84	30,792	84	34,165	84	30,695	0	(3,470)
	FTE/OBL	67	30,266	72	33,795	72	34,165	72	30,695	0	(3,470)
Commerical Remote Sensing Regulatory & Affairs	Pos/BA	5	1,193	5	1,192	5	1,192	6	1,800	1	608
	FTE/OBL	5	1,080	5	1,442	5	1,192	6	1,800	1	608
Office of Space Commerce	Pos/BA	3	796	5	795	5	795	5	1,800	0	1,005
	FTE/OBL	3	754	3	880	3	795	3	1,800	0	1,005
Group on Earth Observations	Pos/BA	0	497	0	497	0	497	0	500	0	3
	FTE/OBL	0	488	0	514	0	497	0	500	0	3
Total Environmental Satellite Observing Systems	Pos/BA	294	165,360	386	162,303	389	175,394	390	181,719	1	6,325
	FTE/OBL	293	151,099	336	179,083	339	175,394	340	181,719	1	6,325

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.

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 2017 alone, there were 16 weather and climate disaster events with losses exceeding \$1 billion each across the United States and directly resulting in over 362 deaths and totaling over \$306 billion.¹ Businesses, communities,

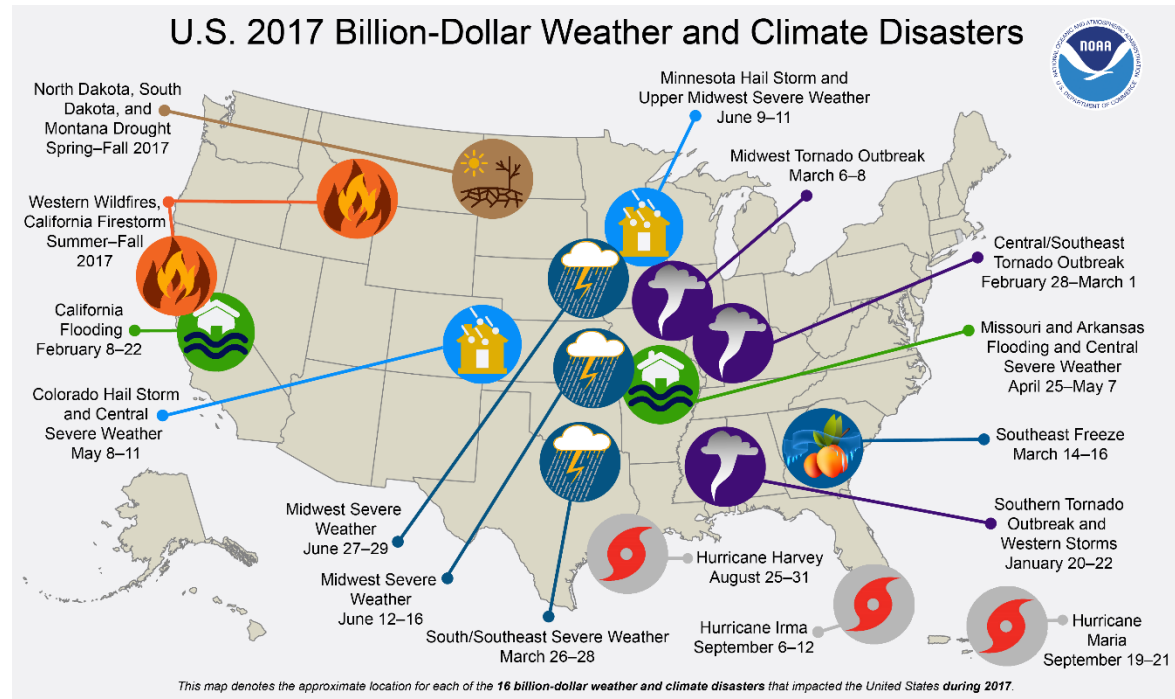
¹ Credit National Centers for Environmental Information (NCEI): <http://www.ncdc.noaa.gov/billions/>

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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.

The goals of NOAA's Environmental Satellite Observing Systems activity 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.

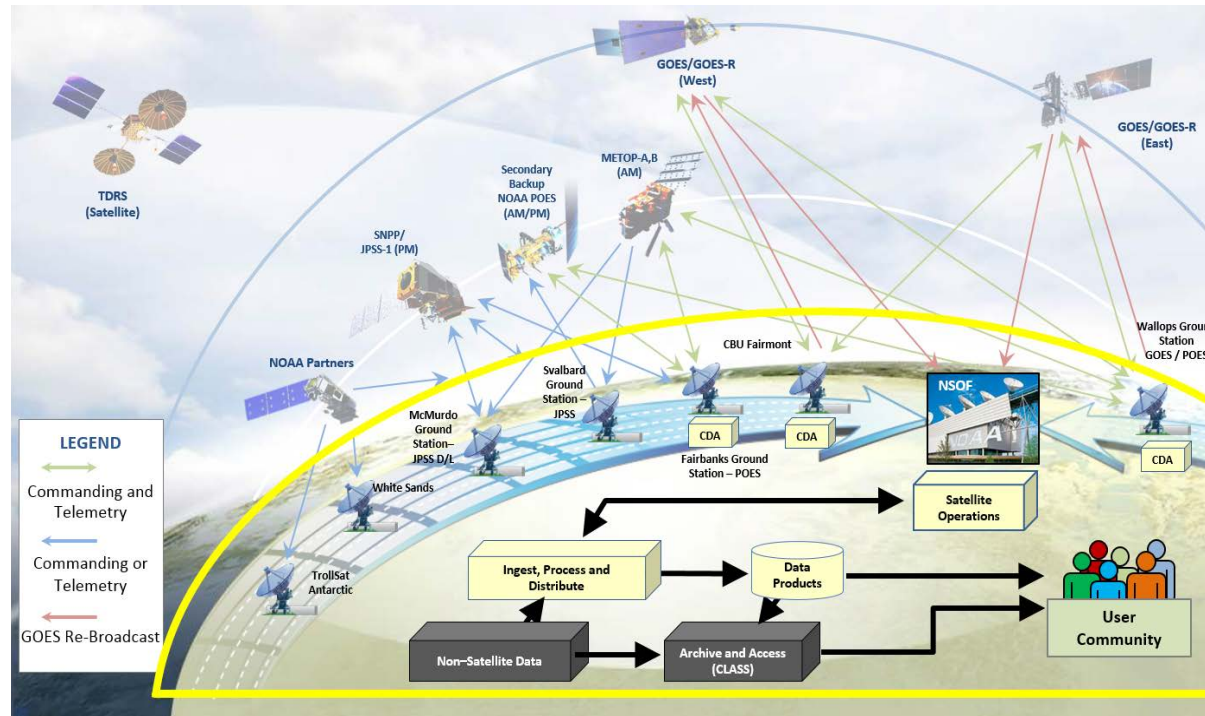


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Base Program

Office of Satellite and Product Operations (<http://www.ospo.noaa.gov/>)

Office of Satellite and Product Operations (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 numerical weather prediction models.



Maintaining the operations and data acquisition from NOAA and our partner satellites is a 24/7 process. OSPO manages and directs operation of the central ground facilities which ingest, process, and distribute environmental satellite data and derived products to users.

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In FY 2017, OSPO operated a total of 16 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); Department of Defense (DOD) Defense Meteorological Satellite Program (DMSP); Deep Space Climate Observatory (DSCOVR); as well as other non-NOAA operational environmental satellites.

OSPO's role in satellite operations is to monitor satellite health and safety; satellite operations and data acquisition to meet user needs; provide support during launch, activation, and evaluation of new satellites; assess satellite and ground station anomalies; and support appropriate recovery actions for those anomalies.

OSPO supports:

- NOAA Satellite Operations Facility (NSOF), the home 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 16 billion bytes of environmental satellite raw data from on-orbit NOAA and DOD satellites including Jason-3 and DSCOVR. With the transition of GOES-16, GOES-S and NOAA 20(formerly JPSS-1) into operations, the data rises to 25-40 terabytes per day.
- NOAA's Search and Rescue Satellite Aided Tracking (SARSAT) system and coordinates participation in the international COSPAS-SARSAT Program.
- The Comprehensive Large Array data Stewardship System (CLASS) Operations Systems supporting 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).
- The Satellite Operations Control Center (SOCC)/Command and Data Acquisition (CDA) facilities serving 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.
- The CDA at Wallops, Virginia, the Fairbanks Command and Data Acquisition (FCDAS) and the Fairmont, West Virginia consolidated backup provide infrastructure and computing resources necessary to operate the Local Area Network (LAN). This separate LAN is necessary to ensure low level day-to-day functions do not impact the high availability systems delivering mission critical satellite data.
- NOAA's contribution to the U.S. National Ice Center (NIC) monitoring global sea ice conditions in the polar regions, Great Lakes, Arctic, and North Atlantic waters to support safe and effective transportation for the civil and military maritime communities. The NIC is a multi-agency operational center operated by NOAA, the United States Navy, and United States Coast Guard.

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Product Development, Readiness & Application (<http://www.star.nesdis.noaa.gov/star/index.php>)

Product Development, Readiness & Application (PDR&A) capitalizes on NOAA's investment in the acquisition and management of the Nation's operational environmental satellites by offering state-of-the-art satellite-based information. PDR&A enables transformation of raw observations and data feeds from partner and commercial satellite missions into information products for NOAA and partner users. 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. PDR&A supports resolution of instrument anomalies either pre-launch or on-orbit through compensating changes to data product algorithms and tables. PDR&A fills the critical role of combining NOAA's environmental satellite measurements with other available information to create fit for purpose blended data, products, and services.

The data products enabled by PDR&A 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. PDR&A 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 further 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.

Commercial Remote Sensing Regulatory Affairs (<http://www.nesdis.noaa.gov/CRSRA/>)

NOAA's authority to regulate private remote sensing systems is found in the National and Commercial Space Programs Act, which has been codified in Title 51 of the U.S. Code ["the Act"]. The Act provides that, in consultation with other appropriate United States Government agencies, the Secretary of Commerce is authorized to issue regulations and to license commercial sector parties to operate remote sensing space systems.¹ The statutory authority to issue licenses has been delegated from the Secretary of Commerce to the NOAA Administrator and re-delegated to the Assistant Administrator for Satellite and Information Services.²

Commercial Remote Sensing Regulatory Affairs (CRSRA) directly supports the Administrations National Space Council's strategic framework to ensure U.S. leadership, preeminence, and freedom-of-action in space. This includes managing the interagency coordination review of license applications, amendments, and foreign agreements as well as enforcement and compliance of the licenses with periodic audits and on-site inspections. In accordance with the Secretary of Commerce and the National Space Council, the office is currently committed to several actions to reduce regulatory impediments to the commercial remote sensing space

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industry. The office also serves on Presidential policy groups such as space transportation, marine domain awareness, and the upcoming review and redrafting of National Space Policy Directives. CRSRA is also an integral part of National Security Presidential Directive 27 ([NSPD-27](#)), the President's Commercial Remote Sensing Policy. CRSRA directly supports the Department of State during international engagement meetings on space policy at domestic and international locations.

Office of Space Commerce (<http://www.space.commerce.gov>)

Recognizing the growing impact that space commerce has on our national interests, the Office of Space Commerce (OSC) was established by law ([51 U.S.C. § 50702](#)) to serve as an advocate, resource, and voice for the U.S. commercial space industry within the Executive branch. To streamline the process for easier engagement with NOAA, OSC was designated by the NOAA Commercial Space Policy as the single point of entry for commercial providers.

The U.S. Commercial Space Launch Competitiveness Act of 2015, and the 2010 National Space Policy call on the U.S. Government to explore the use of commercial based space products and services to fulfill government needs and encourage a pro-growth environment for developing the commercial space industry through private sector investment and partnerships. Furthermore, the Vice President, at the first meeting of the reconstituted National Space Council, called for a full review of the US regulatory framework for commercial space enterprise. Through OSC, the Department of Commerce (DOC) responds to these Administration priorities and legislative requirements to promote the U.S. Government as a customer of commercial space goods and services. As private sector roles evolve, OSC will continue to play a critical role in creating a robust and responsive U.S. commercial space industry that is internationally competitive.

Since 2005, OSC has upheld a statutory responsibility to provide support to Federal Government organizations working on Space-based Positioning, Navigation, and Timing (PNT) policy. This includes the National Coordination Office for the National Executive Committee for PNT, which is currently hosted at DOC. Established by presidential directive, this entity coordinates Global Positioning System-related matters across multiple Federal agencies to ensure the system addresses national priorities as well as military requirements.

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Group on Earth Observations

The intergovernmental Group on Earth Observations (GEO) is a voluntary partnership of 105 governments, the European Commission, and 109 participating organizations comprised of international bodies that strives to improve the world's observation systems and provide policy makers and scientists with accurate and insightful information to enable informed decisions and benefit society. Participation in GEO provides the U.S. with a cost-effective mechanism to increase the scientific, financial, policy, and political return on investment in Earth observations. Earth observations are vital tools of science diplomacy: advancing policy priorities and objectives; facilitating international cooperation and coordination; driving innovation and business development; enabling joint pursuits and cost-sharing; and supporting coalition building among nations. With these program funds, NOAA supports the activities of the GEO Secretariat in Geneva, Switzerland, which provides daily coordination and management of GEO's activities.

Program resources also 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. Comprised of thirteen Federal departments and agencies, USGEO 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 GEO.

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Statement of Operating Objectives

OSPO

Schedule and Milestones

FY 2019 - FY 2023

- Maintain Satellite Operation Facilities at Suitland, MD; Wallops, VA; Fairbanks, AK; and Fairmont, WV
- Process and distribute environmental data from Geostationary Operational Environmental Satellites (GOES-R Series, and legacy GOES - 13, 14, 15), Polar-Orbiting Operational Environmental Satellites (POES - NOAA 19, 18,15, Suomi NPP, and NOAA 20 (formerly JPSS-1)), JPSS-2 and Metop-A, B, and C
- 24/7 operations and anomaly support for geostationary satellites, polar-orbiting, the DSCOVR and Jason-3 satellites, and backup up operations for Jason CS

FY 2019

- Command and control 11 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA 20, legacy GOES, POES, and Metop data
- Accept handover of GOES-S after completion of on-orbit testing
- Maintain infrastructure for 12 National/Mission High and Moderate Critical IT Systems

FY 2020

- Command and control 11 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA 20, legacy GOES, POES, and Metop data
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

FY 2021

- Command and control 11 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute GOES-R Series, Suomi NPP, NOAA 20, legacy GOES, 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 12 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute new JPSS products to users
- Process and distribute GOES-R Series, Suomi NPP, NOAA 20, legacy GOES, POES, and Metop data
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

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FY 2023

- Command and control 10 NOAA satellites and support 6 non-NOAA satellites
- Process and distribute new JPSS products to users
- Process and distribute GOES-R Series, Suomi NPP, NOAA 20, legacy GOES, POES, and Metop 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, POES, DSCOVR, Metop data and products to users

PDR&A

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

CRSRA

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

OSC

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

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GEO

Schedule and Milestones

FY 2019 – FY 2023

- Support the development and growth of U.S. programmatic contributions to the GEO Work Programme 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 and annual GEO Plenary sessions
- 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

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		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>	<u>Amount</u>
Office of Satellite and Product Operations	Pos./BA	294	138,745	294	146,924	0	8,179
	FTE/OBL	259	138,745	259	146,924	0	8,179

NESDIS Information Technology Security (0 FTE/ 0 Positions, +\$4,915) – This program change is needed to improve data flow resiliency across NOAA’s critical Information Technology (IT) systems and infrastructure and to maintain that level of resiliency. This initiative will implement 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 the National Weather Service by:

- Ensuring compliance with NOAA and Department of Commerce (DOC) IT security regulations and implement security controls necessary to protect the information systems and ensure data integrity in support of NOAA’s Mission.
- Maintaining sustained, timely compliance with the Federal Information Security Modernization Act (FISMA) requirements and NESDIS Web Policy, and implement improved resiliency and security separation in NESDIS public service segment (public web site).
- Reducing system failure risk by conducting timely refresh and integration with enterprise service providers.
- Migrating NESDIS non-satellite control high impact systems to enterprise security services.
- Moving NESDIS non-satellite control high impact networks into NOAA’s Office of the Chief Information Officer's secure active directory.
- Automating patching and continuous monitoring through NOAA-wide enterprise services.
- Addressing current and predicted personnel as necessary for some testing of patches, DOC Top-5 documentation, and Assessment and Authorization (A&A) requirements.

While NOAA continues to work to fully implement the action plan on its IT systems in response to the 2014 Commerce OIG report, full funding of this request is essential to NOAA’s efforts to safeguard our mission critical IT systems.

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Schedule and Milestones

FY 2019 – FY 2023

- Conduct annual penetration testing on all IT systems
- Continuously monitor all IT Systems
- Assess and authorize required IT Systems
- Update the Office of Satellite and Product Operations (OSPO) enterprise policy, processes, procedures and standards
- Support the maintenance of the continuity of operations and disaster recovery plan and procedures
- Enhance centralized monitoring of mission critical systems including the migration of NESDIS non-satellite control high impact systems to enterprise security services
- 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
- On-time delivery of Plan of Action and Milestones

Deliverables

- Annual penetration testing reports
- Annual Authority to Operate (ATO) package for each OSPO system
- OSPO Configuration Management Plan, Incident Response Plan and policies and procedures
- OSPO COOP documentation and annual testing
- Simplified process for conducting testing and monitoring systems

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	2019	2020	2021	2022	2023
Performance Measures:					
Number of IT Mission Systems supporting Primary Mission Essential Functions (PMEF)					
With Increase	14	14	14	14	12
Without Increase	11	11	11	11	11
Percent of System Availability, "Up Time" for satellite command and control, data received, processed, and distributed					
With Increase	98.5%	98.5%	98.5%	98.5%	98.5%
Without Increase	90%	90%	90%	90%	90%

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DSCOVR Operations (0 FTE/ 0 Positions, +\$1,447) – This program change will fully fund on-orbit support for the DSCOVR satellite. The DSCOVR satellite was successfully handed over from NASA to NOAA for operational command and control on October 28, 2015. Anomalies on the DSCOVR satellite, which have been more frequent than anticipated, have resulted in an increase in the day to day anomaly support required to continue operations of the DSCOVR satellite. This request mitigates the risk of a delay or disruption in the flow of real-time solar wind data due to anomalies by having the resources to conduct timely recovery actions when an anomaly occurs. The delays in bringing the spacecraft and instruments back online after anomalies are the main threat to SWPC’s ability to warn of incoming storms and gauge their severity.

Schedule and Milestones

FY 2019 – FY 2023

- 24/7 operations and anomaly support for the DSCOVR Satellite

Deliverables

- Provide timely access to operational solar wind data for geomagnetic storm warnings

	2019	2020	2021	2022	2023
Performance Measures:					
Error in Geomagnetic Storm magnitude warning (G-scale)					
With Increase	±0.5	±0.5	±0.5	±0.5	±0.5
Without Increase	±1.5	±1.5	±1.5	±1.5	±1.5
Percentage of warnings issued prior to geomagnetic storm					
With Increase	100%	100%	100%	100%	100%
Without Increase	80%	80%	80%	80%	80%

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

Jason-3 Operations (0 FTE/ 0 Positions, +\$1,274) – This program change will fully fund on-orbit support for the Jason-3 satellite. The additional funding requested will be used for technical and engineering assistance, to monitor U.S. instruments, and to conduct a planned system refresh on the current ground system, which was built and implemented as part of the Jason-2 mission. With Jason-3 in orbit and operational, the planned system refresh of this ground system is critical to ensure the continuity of ground operations from one satellite mission to the other. Technical and engineering assistance, monitoring of U.S. instruments, continued on-orbit support along with the planned ground system refresh are critical to maintaining the production of Jason-3 altimetry products and ensure the continuity of the 20-year record of sea level observations.

Schedule and Milestones

FY 2019 – FY 2023

- NASA’s Jet Propulsion Laboratory continues to monitor performance of U.S. instruments on Jason-3

Deliverables

- Continue more than 20 years of sea level observations, a critical climate monitoring variable, and provide operational ocean weather products using Jason-3 observations

	2019	2020	2021	2022	2023
Performance Measures:					
Number of ocean science products produced					
With Increase	5	5	5	5	5
Without Increase	3	3	3	3	3

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
INCREASES FOR 2019
(Dollar amounts in thousands)

Facilities Operations (0 FTE/ 0 Positions, +\$543) – This funding is needed to upgrade and maintain the state-of-the art facility and infrastructure that houses high-technology equipment allowing NOAA to operate the ground systems that command, control, and acquire data from on-orbit satellites. In the short-term, this funding will support the ongoing replacement of outdated UPS (Uninterruptible Power Supply) modules, which are an essential part of providing continuous power to the data center to maintain 24/7 satellite operations. It will further be used to facilitate modifications to the data center power and cooling infrastructure in support of satellite technology refreshes, and other improvements essential to preserve the critical infrastructure that is required to ensure the availability and reliability of environmental satellite data.

Schedule and Milestones:

FY 2019-2023

- Maintain Satellite Operation Facilities at Suitland, MD; Wallops, VA; and Fairmont, WV

Deliverables:

- Maintain infrastructure for National/Mission High and Moderate Critical IT Systems

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Office of Satellite Product and Operations
Program Change: NESDIS IT Security

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	4,915
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	4,915

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Office of Satellite Product and Operations
Program Change: DSCOVN Operations

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	1,447
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,447

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Office of Satellite Product and Operations
Program Change: Jason-3 Operations

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	1,274
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,274

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Office of Satellite Product and Operations
Program Change: Facility Operations

Object Class		2019 Increase
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	543
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	543

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

Product	2019 Base		2019 Estimate		Decrease		
	<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel</u>	<u>Amount</u>	
Development, Readiness & Application	Pos./BA	84	34,165	84	30,695	0	(3,470)
	FTE/OBL	72	34,165	72	30,695	0	(3,470)

Decrease Data Products Developed: (0 FTE/ 0 Positions, -\$3,470) - This program change will reduce the number of Product Development, Readiness & Application (PDR&A) Program data products, applications, techniques and systems developed in order to fully support other existing NOAA priorities and requirements within the Operations, Research, and Facilities appropriations account. PDR&A will continue, at a reduced pace, to identify new requirements for satellite data and environmental information, determine what information is necessary to meet those requirements, and conduct research to provide those answers and support new sensor technology, products and applications. NESDIS will continue to focus on calibration and validation in order to provide accurate products to customers.

Schedule and Milestones

FY 2019

- Transition of post GOES-16 launch updates to Office of Satellite and Product Operations (OSPO)
- Perform post-launch checkout, including instrument and/or product quality assessment for GOES-S
- Perform post-launch checkout, including instrument and/or product quality assessment for JPSS-1
- Complete integration of GOES-16 Advanced Baseline Imager observations into PDR&A's Integrated Calibration/Validation System
- Complete calibration of NOAA sensors on Metop-C

FY 2020

- Transition of post GOES-S launch updates to OSPO
- Complete validation of COSMIC-2 data for NOAA operations
- Deliver initial operational processing system for commercially delivered data
- Complete Marine Optical Buoy structural refresh for Visible Infrared Imaging Radiometer Suite (VIIRS) sensors

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

FY 2021

- Complete checkout and intensive validation of GOES-T data products
- Perform post-launch checkout, including instrument and/or product quality assessment of GOES-T

FY2022

- Transition of post GOES-T launch updates to OSPO

FY2023

- Perform post-launch checkout, including instrument and/or product quality assessment for JPSS-2

Deliverables

- Produce and maintain algorithms to translate raw data into useful products
- Complete instrument and product quality assessment for recently launched satellites
- Deliver JPSS-2 Sensor Data Record/Environmental Data Record algorithm software packages to Ground System

	2019	2020	2021	2022	2023
Performance Measures:					
Number of products, applications, techniques, systems developed and/or transitioned to operations per year					
With Decrease	11	11	11	11	11
Without Decrease	14	14	14	14	14

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Product Development, Readiness & Application
Program Change: Decrease Data Products Developed

Object Class	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	(3,470)
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(3,470)

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

Commercial Remote Sensing Regulatory Affairs		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
	Pos./BA	5	1,192	6	1,800	1	608
	FTE/OBL	5	1,192	6	1,800	1	608

Administer Statutory Function (1 FTE/ 1 Position, +\$608) – The increase in funding will allow CRSRA to administer and better fulfill its statutory function, delegated by the Secretary of Commerce, to regulate private remote sensing systems. The number of users, licensees, and applicants has increased non-linearly, and this increase will enable CRSRA to keep up with the required regulatory efforts associated with that increase. Additional funding will greatly increase the number of audits the office can perform annually, and the number of licensing actions the office can perform. It will also increase the number of onsite inspections CRSRA will be able to perform annually, and it will allow the CRSRA team to review and propose revisions to the regulatory compliance approach. All of this is in accordance with the National and Commercial Space Programs Act. Additionally, the increase will allow CRSRA to abide by the increased regulations posed to imaging restrictions in a more efficient, customer-oriented regulatory structure, such as Geographic Exclusion Areas.

Schedule and Milestones

FY 2019 - FY 2023

- Hire staff to support essential CRSRA activities
- Develop and implement new enforcement plans for new national security license conditions as directed by the Administration
- Review regulations and update if appropriate; publish any new regulations
- Review the National and Commercial Space Policy Act and recommend to Congress changes needed to address today's industry

Department of Commerce
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INCREASES FOR 2019
(Dollar amounts in thousands)

Deliverables

Licensing deliverables

- Issuance of new licenses, waivers, and/or amendments to licenses
- Review and approval of foreign agreements and data protection plans

Compliance deliverables

- Quarterly and annual audits
- Annual on-site inspections
- Technical reviews of operations based on emergent CY 2017 & 2018 national security concerns

	2019	2020	2021	2022	2023
Performance Measures:					
Number of annual licensing actions for private sector partners to operate private remote sensing space systems					
With Increase	19	20	21	22	23
Without Increase	15	15	15	15	15
Number of annual paper audits performed in accordance with the National and Commercial Space Programs Act					
With Increase	70	75	80	85	90
Without Increase	60	60	60	60	60
Number of annual site inspections performed in accordance with the National and Commercial Space Programs Act					
With Increase	60	62	64	68	70
Without Increase	25	25	25	25	25

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM CHANGE PERSONNEL DETAIL**

Activity: NESDIS Systems Acquisition
Subactivity: Commercial Remote Sensing Regulatory Affairs
Program Change: Administer Statutory Function

Title	Location	Grade	Number	Annual Salary	Total Salaries
Program Analyst	Silver Spring, MD	GS-12	1	97,858	97,858
Total			1		97,858
Less lapse		25.00%	0		(24,465)
Total full-time permanent (FTE)			1		73,393
2019 Pay Adjustment (0%)		0.00%			0
Total					73,393

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

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

Activity: NESDIS Systems Acquisition
Subactivity: Commercial Remote Sensing Regulatory Affairs
Program Change: Administer Statutory Function

Object Class		2019 Increase
11.1	Full-time permanent	73
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	73
12.1	Civilian personnel benefits	22
13	Benefits for former personnel	0
21	Travel and transportation of persons	40
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	473
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	608

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

		2019 Base		2019 Estimate		Increase		
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>		<u>Amount</u>
Office of Space	Pos./BA	5	795	5	1,800	0	1,005	
Commerce	FTE/OBL	3	795	3	1,800	0	1,005	

Facilitate Commercial Space Marketplace (0 FTE/ 0 Positions, \$1,005) - This increase will enable OSC to encourage a robust and transparent marketplace for commercial space businesses to provide environmental data and other space services to the U.S. Government (USG).

The NOAA Commercial Space Policy² designates OSC as a single point of entry for commercial providers to streamline the process for easier engagement with DOC. The additional funds will provide OSC the resources necessary to:

- Collect and publish NOAA requirements, standards, and other information that commercial providers need to enter the marketplace for commercial space solutions.
- Organize industry workshops and meetings to discuss business models with commercial providers.
- Conduct technical evaluations and trade studies of commercial solutions.
- Travel to vendor sites, partners, stakeholders, and relevant conferences.

The requested funding will improve OSC’s ability to serve as the USG entry point for commercial data providers. The USG stands to gain significant economic benefits from the use of commercial space services as a supplement to its development and operation of government owned satellite systems.

The requested funding will also enable OSC to execute contract(s) to conduct technical evaluations and trade studies of commercial solutions and ensures OSC can satisfy its expanded statutory functions providing support to the National Coordination Office for

² http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_217/217-109.html

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
INCREASES FOR 2019
(Dollar amounts in thousands)

Space-Based Positioning, Navigation, and Timing. These funds will enable OSC to ensure the responsibilities of the Director are being fulfilled. Funding also includes necessary rent and contract escalation costs.

Schedule and Milestones

FY 2019 – FY 2023

- Assess technical feasibility of at least one commercial data proposal annually
- Renew Memorandum of Agreements and contracts to support National Coordination Office operations
- Organize one government-industry workshop annually
- Participate in one to two major policy decisions per quarter
- Coordinate space commerce policy issues and actions within NOAA and DOC

Deliverables

- Support the technical evaluation team that publishes NOAA Commercial Weather Data Pilot requirements and assesses the merits of competing industry proposals to support contract awards.
- Opportunities for commercial solutions for key NOAA and other civil government data acquisition requirements
- Online publication of NOAA requirements, standards, and other information needed by commercial data providers and required by NOAA Commercial Space Policy
- Report on industry workshop
- Report on technical assessments
- Fulfill statutory functions in support of the National Coordination Office
- Create an environment that enables increased space commerce investment
- Coordinate between government and industry on space-related issues and enhanced engagement in inter-agency space-related policy activities

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

Activity: NESDIS Environmental Satellite Observing Systems
Subactivity: Office of Space Commerce
Program Change: Facilitate Commercial Space Marketplace

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	40
22 Transportation of things	0
23 Rent, communications, and utilities	45
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	610
25.2 Other services	310
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,005

**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

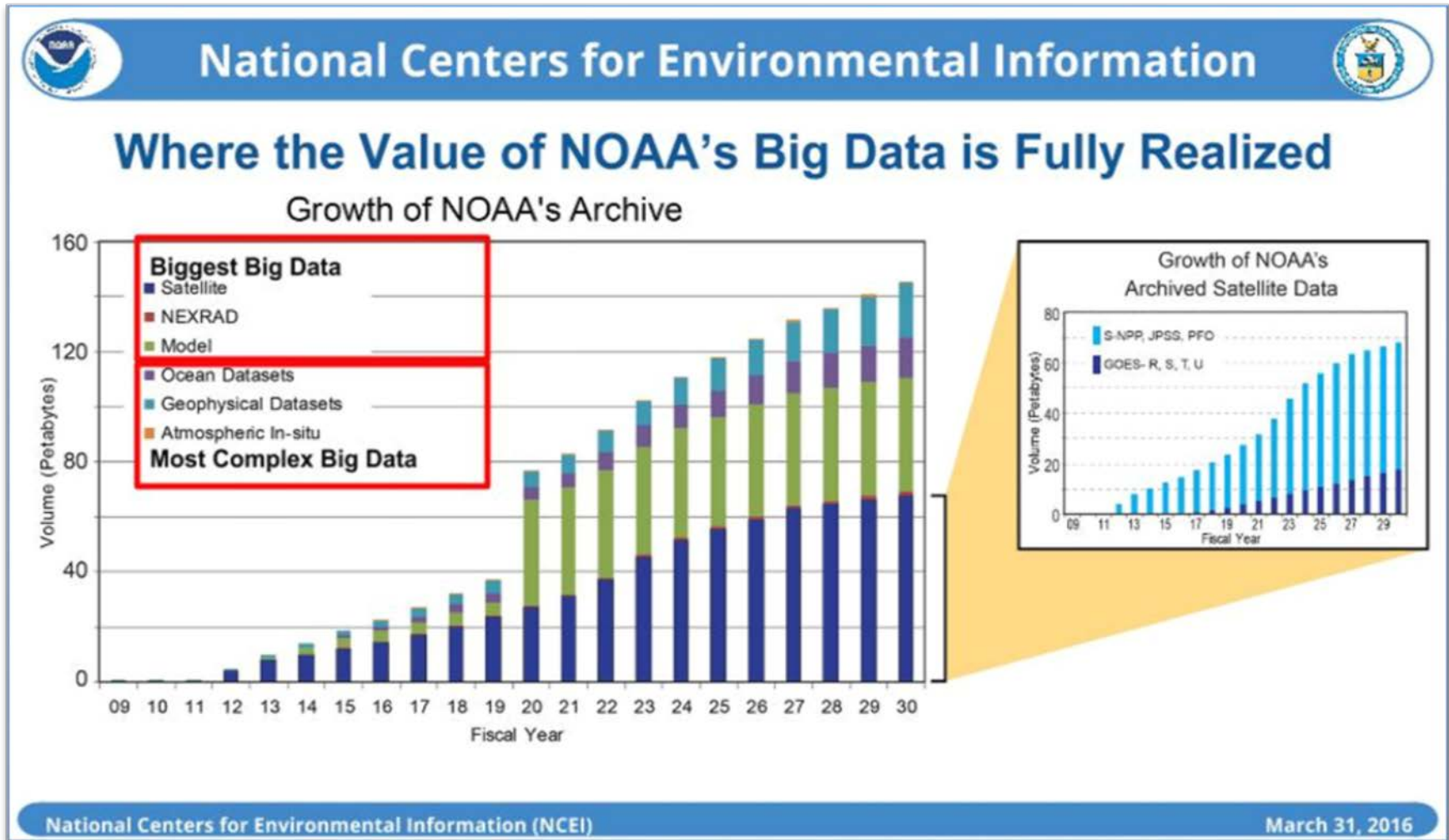
Comparison by activity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Centers for	Pos/BA	177	61,204	200	58,792	200	61,676	200	57,591	0	(4,085)
Environmental Information	FTE/OBL	176	60,941	187	61,170	187	61,676	187	57,591	0	(4,085)

Goal Statement

NOAA’s National Centers for Environmental Information (NCEI) are responsible for hosting and providing access to one of the most significant environmental archives on earth, with comprehensive historical to near-real time oceanic, atmospheric, and geophysical data and information. The Nation’s wide range of business, education, and government needs, including policies and decisions that have an impact on water and energy management, manufacturing, transportation, defense, food production, public health, coastal resource management, and many other socio-economic issues, are dependent on access to these reliable and accurate long-term records. NCEI’s authoritative data and information puts today’s environmentally driven events into perspective, allowing decision makers to make confident, data- and information-driven determinations.

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.

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 JUSTIFICATION OF PROGRAM AND PERFORMANCE



The actual and expected growth of NCEI-stewarded data shows that data holdings are increasing in both volume and complexity.

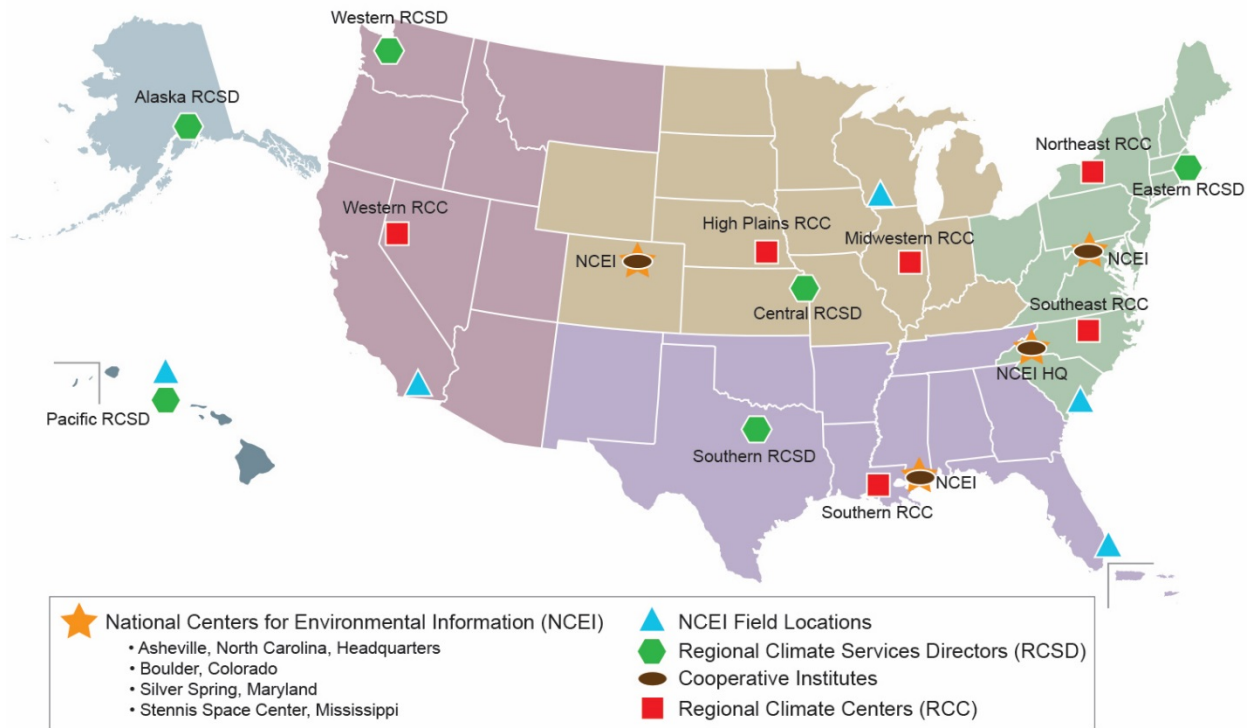
**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Base Program

NCEI

(<https://www.ncei.noaa.gov/>)

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.

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Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE

By preserving, stewarding, and maximizing the utility of the Federal government's billion-dollar investment in high-quality environmental data, NCEI remains committed to providing products and services to private industry, governments, academia, and the general public. NCEI:

- 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.
- 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.

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Statement of Operating Objectives

NCEI

Schedule and Milestones

FY 2019 – FY 2023

- 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-S once it is successfully launched
- 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 2019 – FY 2023

- Continue to archive and provide access for basic products from GOES-16, Suomi NPP, Jason, and DSCOVR
- Archive and provide access to GOES-16 and Suomi NPP data and derived data products
- Develop the capabilities needed to provide archive of and access to new NOAA 20 (formerly JPSS-1) and GOES-S data
- Continue to archive and provide access to regional and Large Marine Ecosystem data
- Expand products, including climatologies, across all NOAA's designated Regional Ecosystems, excluding the Great Lakes

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

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel</u>	<u>Amount</u>
National Centers for Environmental Information	Pos./BA	200	61,676	200	57,591	0	(4,085)
	FTE/OBL	187	61,676	187	57,591	0	(4,085)

Regional Climate Centers Reduction (0 FTE/ 0 Positions, -\$2,399) - NOAA requests a decrease of \$2,399 for the Regional Climate Centers (RCC) Program. This decrease will enable NOAA to fully support other existing NOAA priorities. Located at major research institutions, RCCs are designed to respond quickly to emerging issues, such as droughts and floods. The RCCs respond annually to millions of requests for data and information from citizens, state and federal agencies, and weather-sensitive businesses (agriculture, transportation, risk management, etc.), especially through RCC online data systems. Information is tailored to specific regional needs. NOAA will prioritize the efforts under the Regional Climate Service Directors and RCCs to provide the most efficient approach with reduced funding to produce and deliver climate data, information, and knowledge for decision makers and other users at the local, state, regional, and national levels. NOAA will make a determination on program delivery upon analysis of historical and projected requests, aligned with the overall NOAA management of Regional Services.

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DECREASES FOR 2019
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Big Earth Data Initiative Termination (0 FTE/ 0 Positions, -\$1,686) - NOAA requests a decrease of \$1,686 for the termination of the Big Earth Data Initiative (BEDI) program. The termination of the BEDI will enable NOAA to fully support other existing NOAA data stewardship priorities in NOAA's Environmental Data Management (EDM) Framework. The BEDI was proposed in FY 2014 to increase the accessibility and interoperability of NOAA's high-value environmental observations in concert with other federal agencies. NOAA is proposing to leverage other existing programs and partnerships to continue to improve data discovery, access, compatibility, and documentation. Prior year appropriations were used to develop the architecture, technical requirements, and interoperability approach necessary to start the BEDI, begin prioritizing high-value data sets, and set up contracts and cooperative agreements with NOAA partners to initiate the implementation of BEDI.

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

Activity: National Centers for Environmental Information
Subactivity: National Centers for Environmental Information
Program Change: Regional Climate Centers Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	(2,399)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(2,399)

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

Activity: National Centers for Environmental Information
Subactivity: National Centers for Environmental Information
Program Change: Big Earth Data Initiative Termination

Object Class	2019 Decrease	
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	(4)
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	0
25.2	Other services	(1,682)
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(1,686)

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(Dollar amounts in thousands)**

Activity: Systems Acquisition

Comparison by activity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Geostationary Systems - R	Pos/BA	68	739,333	59	747,713	59	743,276	59	408,380	0	(334,896)
	FTE/OBL	68	742,645	59	748,779	59	743,276	59	408,380	0	(334,896)
Jason-3	Pos/BA	0	4,353	1	4,328	0	0	0	0	0	0
	FTE/OBL	0	4,357	1	4,820	0	0	0	0	0	0
Joint Polar Satellite System	Pos/BA	94	778,579	65	781,951	0	0	0	0	0	0
	FTE/OBL	93	778,602	60	787,373	0	0	0	0	0	0
Polar Follow On	Pos/BA	19	325,147	29	326,684	0	0	0	0	0	0
	FTE/OBL	19	325,114	24	328,052	0	0	0	0	0	0
Polar Weather Satellites	Pos/BA	0	0	0	0	94	1,108,635	94	877,991	0	(230,644)
	FTE/OBL	0	0	0	0	84	1,108,635	84	877,991	0	(230,644)
Cooperative Data and Rescue Services	Pos/BA	0	500	0	497	0	497	0	500	0	3
	FTE/OBL	0	548	0	794	0	497	0	500	0	3
DSCOVR	Pos/BA	1	3,741	2	3,720	0	0	0	0	0	0
	FTE/OBL	1	3,937	2	3,750	0	0	0	0	0	0
Space Weather Follow On	Pos/BA	0	4,995	1	4,966	1	4,966	1	10,000	0	5,034
	FTE/OBL	0	4,833	1	5,306	1	4,966	1	10,000	0	5,034
COSMIC 2/GNSS RO	Pos/BA	2	8,038	1	8,045	1	8,045	1	5,892	0	(2,153)
	FTE/OBL	2	7,624	1	13,896	1	8,045	1	5,892	0	(2,153)
Satellite Ground Services	Pos/BA	61	53,421	86	53,636	86	53,681	86	52,332	0	(1,349)
	FTE/OBL	61	56,003	74	55,829	74	53,681	74	52,332	0	(1,349)
System Architecture and Advanced Planning	Pos/BA	6	3,925	12	3,903	12	3,903	12	4,929	0	1,026
	FTE/OBL	6	3,794	10	4,344	10	3,903	10	4,929	0	1,026
Projects, Planning and Analysis	Pos/BA	23	25,098	37	25,030	37	25,030	37	36,539	0	11,509
	FTE/OBL	23	25,280	30	25,859	30	25,030	30	36,539	0	11,509
Commercial Weather Data Pilot	Pos/BA	0	4,995	0	4,966	0	4,966	0	3,000	0	(1,966)
	FTE/OBL	0	1,755	0	9,156	0	4,966	0	3,000	0	(1,966)
Total NESDIS Systems Acquisition	Pos/BA	274	1,952,125	293	1,965,439	290	1,952,999	290	1,399,563	0	-553,436
	FTE/OBL	273	1,954,492	262	1,987,958	259	1,952,999	259	1,399,563	0	-553,436

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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.

The FY 2019 request enables NOAA satellite programs to continue to meet milestones, as well as to plan for future programs and comprehensive engineering solutions.

Base Program

Geostationary Systems - R (<http://www.goes-r.gov>)

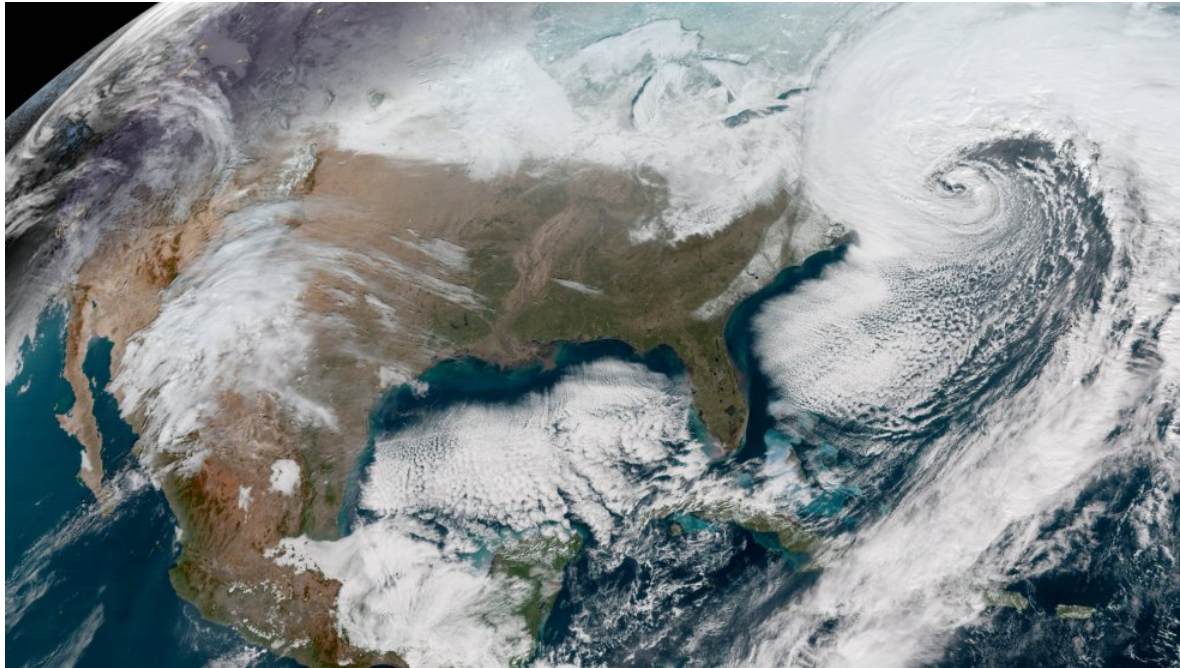
Geostationary Operational Environmental Satellites – R (GOES-R) Series observations will provide coverage of the western hemisphere from a geostationary orbit, allowing continuous monitoring from the same angle during the tracking/detection of severe storms, tropical cyclones, volcanic eruptions, fire 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 OSAAP 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 first satellite on November 19, 2016. GOES-R, which became GOES-16 when it reached geostationary orbit, became operational as GOES-East on December 18, 2017. It provides significant enhancements to 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,

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quality, and accuracy of satellite data that the GOES-R Series will provide will enable NWS to issue improved and timely weather advisories to the public, protecting life and property.



On January 4, 2018, a powerful 'bomb cyclone' winter storm hit the United States East Coast with heavy snow and strong winds. GOES-East captured the full path of the winter storm exhibiting a rare and extremely rapid rate of intensification with some of the coldest wind chills of the season and near zero visibility in the snow bands.

The GOES-R Series will provide data that will enhance 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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Polar Weather Satellites

NOAA's major polar satellite program, the Polar Weather Satellites (PWS) merges NOAA's existing Joint Polar Satellite System (JPSS) Program of Record (POR) and Polar Follow On (PFO) programs into one centrally managed program. The merging of the programs allows NOAA to increase both cost and programmatic efficiencies, and ensure that there is enough flexibility to minimize risk in the developmental stages of the JPSS satellites. A single program management team will be responsible for Polar Weather Satellites, thus eliminating any duplicative program management costs that existed as a result of managing the JPSS POR and PFO as separate programs. Additional benefits from merging the two programs include improvement in the program's reserves posture and creating critical synergies between JPSS-2 and JPSS-3 and JPSS-4. This is especially critical as the JPSS-2 satellite enters its integration and test phase preparing for launch and the JPSS-3 spacecraft is under development. Having a single program can provide protection against catastrophic events (e.g., impacts to the supply chain, launch failure, on-orbit failure) by minimizing the time and management effort necessary to swap instruments and reserves across programs, or have a spacecraft ready at an earlier time. It also allows spares, hardware, software, staff, and other JPSS capacity that become available to be deployed seamlessly, efficiently and effectively across programs to reduce costs and avoid a launch delay if necessary, as seen on the GOES-R series. This consolidation of the program lines in FY 2019 reflects NOAA's commitment to more cost effectively manage the satellite programs. NESDIS will continue to identify opportunities to reduce lifecycle costs throughout the duration of the program.

NOAA will continue the development, operations, maintenance, and sustainment of the ground system for the JPSS and complementary satellites used for weather forecasting, update ground infrastructure and conduct risk reduction efforts to support current and future polar data acquisition requirements. 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 a major redevelopment of the JPSS ground segment, as well as operations, maintenance, and support of the JPSS POR missions through FY 2025. PFO extends the operations of the NOAA polar satellite systems through FY 2038 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. The JPSS-2, -3, and -4 satellites provide hosting accommodations for NASA's Radiation Budget Instrument (RBI), continuing the mission configuration agreed to with NASA for the Suomi-NPP and JPSS-1 missions.

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

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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
- Assessment of long-term global environmental change

This program also supports risk reduction efforts for future polar requirements as part of its continuing work with OSAAP on future Low Earth Orbiting (LEO) architecture efforts.

JPSS 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.

Cooperative Data and Rescue Services (<http://www.sarsat.noaa.gov/>) (<http://www.noaasis.noaa.gov/ARGOS/>)

The Cooperative Data and Rescue Services (CDARS) program supports the space-based components of the Argos Advanced Data Collection System (Argos A-DCS) and the Search and Rescue Satellite Aided Tracking (SARSAT). The satellite instruments that are currently meeting the requirements for these systems are onboard legacy polar orbiting satellites (e.g. Metop-A, NOAA-15, 18, and 19) that are operating past their design lives.

The SARSAT system is employed to detect and locate mariners, aviators, and recreational enthusiasts in distress almost anywhere in the world at any time and in almost any condition. The SARSAT system provides a means to collect beacon alerts from remote locations to support the COSPAS-SARSAT international satellite program that is coordinated by the United States, Russia, France,

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and Canada with 39 other countries and organizations. 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 polar-orbiting satellite constellation with a GPS-based system with satellite assets deployed by the United States Air Force (USAF), as well as similar constellations deployed by Europe and others. These satellites will support the future Medium Earth Orbiting Search and Rescue (MEOSAR) System. In order to accelerate the utilization of the MEOSAR System and avoid a gap in search and rescue capability, NOAA is preparing to add two additional ground stations in South America and South Africa in order to provide the required global coverage.

The Argos system provides worldwide coverage that gives the satellite the unique ability to geographically locate a data source from anywhere on earth. The Argos A-DCS collects, processes, and disseminates environmental data from fixed and mobile platforms worldwide. Each month, this system provides key environmental data from more than 21,000 active Argos platforms globally. In order to avoid a possible gap in services, as well as possible data loss, which will jeopardize critical environmental data records, NOAA is pursuing multiple risk mitigation strategies provide continuity for data collection services. They are maximizing the lifetime of legacy systems, NOAA 15, 18, & 19, and working on developing partnerships for gap mitigation and future smallsat capability options for A-DCS.

Space Weather Follow On

NOAA's Space Weather Follow On (SWFO) program established the continuity of space weather observations beyond the current generation of missions, DSCOVR and NASA's Solar and Heliophysics Observatory (SOHO). Observations required to forecast space weather warnings require imagery of coronal mass ejections (CME) and measurement of solar wind plasma. There are two major types of space weather events: solar radiation storms and geomagnetic storms. Satellites are mostly impacted by solar radiation storms. Commercial airlines are grounded during both radiation and/or geomagnetic storms. These storms cause a communication blackout 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 and solar wind, are critical to providing accurate and early warnings of potentially destructive space weather events.

The most pressing concern that SWFO addresses is the very high risk of a loss of CME imagery. The only current source, the SOHO mission was launched in 1995, and is significantly past its mission design lifetime. 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 started developing a flight compact coronagraph (CCOR) to obtain CME imagery in 2017. NOAA will continue to work with Naval Research Laboratory (NRL) to obtain the quickest possible delivery of the CCOR instrument, funding the NRL work on a reimbursable basis.

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NOAA plans to host the CCOR on the GOES-U satellite, planned for launch in 2024, or another partnership mission. The GOES-U satellite provides a sun-pointing platform that can support the CCOR. Operating in Geostationary Earth orbit, GOES-U will provide an uninterrupted view of the Sun, except for brief periods at the spring and fall equinoxes.

For solar wind data, NOAA uses its Deep Space Climate Observatory (DSCOVR) stationed at Earth-Sun LaGrange point 1 (L1). DSCOVR is a research-grade satellite, and is 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 provide short-term warnings (15-45 minutes) of space weather storms. NOAA is exploring a partnership with NASA to fly a NOAA SWFO spacecraft as a rideshare with the NASA 2024 Interstellar Mapping and Acceleration Probe (IMAP) launch to L1. As a part of this effort, NOAA will conduct assessments on potential instruments for a solar wind mission.

Constellation Observing System for Meteorology, Ionosphere, and Climate/Global Navigation Satellite System Radio Occultation

NOAA participates in a joint collaboration between Taiwan, National Science Foundation, NASA, United States Air Force (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. At the time, it was a research effort to explore a new and inexpensive atmospheric sounding technique, Global Navigation Satellite System Radio Occultation (GNSS RO), to obtain global atmospheric temperature profiles which were not available from other sources. The results of the research were so positive that NOAA started using GNSS RO data operationally. 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, resulting in weather forecasts that are more accurate.

COSMIC-2 is a continuation of that partnership to produce an operational constellation of GNSS RO satellites. A six-satellite COSMIC-2 constellation is scheduled to be launched to the equatorial orbit by the USAF no earlier than June 13, 2018. 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. NOAA will supplement COSMIC-2 and partner data with data from commercial sources following the success of the Commercial Weather Data Pilot (CWDP).

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Satellite Ground Services

Satellite Ground Services (SGS) will continue to support operational satellite ground services and enterprise distribution and archive services. This includes periodic technology refresh and hardware/software upgrades to the existing unique ground systems, as well as those in development. These refresh cycles and upgrades are more significant, but happen less frequently than more minor changes addressed as part of routine satellite operations. Each year projects may include antennas, command and control, data ingest, product generation, product distribution, and archival activities.

SGS also actively supports the GOES-R Series and Polar Weather Satellites Program offices by providing staff who perform engineering and project management for the design, development, integration, and testing of the each new GOES-R Series and JPSS ground systems.

System Architecture and Advanced Planning

System Architecture and Advanced Planning (SAAP) provides NOAA with the comprehensive analysis, technical recommendations, risk assessment, and systems engineering guidance necessary to inform decisions for current and future NOAA satellite architectures and end to end system integration. As NESDIS chief systems architect, SAAP makes recommendations to the NOAA Assistant Administrator for Satellite and Information Services for refining future satellite architecture choices for the NESDIS enterprise. SAAP makes enterprise recommendations by taking and defining requirements in coordination with all NESDIS programs and uses the results from the NOAA Satellite Observing System Architecture Study as a guide. SAAP will also recommend roadmaps for translation of requirements into the formulation of next generation satellite programs.

SAAP identifies opportunities to streamline functions to provide best value for current and future NOAA space enterprise investments and works with programs across NESDIS to ensure future architecture investments are appropriate. SAAP fulfills the critical role of overseeing change and configuration management to ensure that the basic requirements of the NESDIS enterprise are met in support of NOAA's environmental intelligence mission. To accomplish this, SAAP evaluates observation requirements, current satellite systems, ground systems, flight operations, product generation and distribution, data management, IT infrastructure, end user validation, emerging technologies and commercial opportunities, and enterprise system integration. As an outcome of these analyses, SAAP may suggest elimination, consolidation, or restructure of the architecture of current programs and systems to adopt forward-looking approaches to NESDIS' space-based observational requirements and data management.

SAAP provides guidance, potential approaches, and the initiation of new and evolved missions or measurements that will succeed

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the current NOAA observing system programs of record. SAAP will work with partners such as NASA and with industry to direct pre-formulation and technical evaluation activities to advance the maturity of measurements, missions, and data procurements to meet NOAA's defined mission requirements.

Additionally, SAAP develops and documents the essential NESDIS Quality Management System practices and processes, codifying the systems engineering and project and program management practices NESDIS will apply to all its missions and programs.

Projects, Planning, and Analysis

Projects, Planning, and Analysis (PPA) evaluates and develops space-based earth and solar observation collection methods that advance NOAA's various missions, working in collaboration with domestic and foreign organizations when appropriate. The PPA mission scope includes managing the flight projects and partnerships for Space Weather Follow On, radio occultation (COSMIC), legacy geostationary (GOES-N Series), and the legacy polar (POES/Metop) satellite missions.

PPA integrates systems engineering, mission assurance, science planning, and product development into its missions, with guidance on these matters coming from the Office of the Satellite Architecture and Advanced Planning (OSAAP).

PPA houses the Technology, Planning, and Integration for Observations (TPIO) Office, which is responsible for the implementation of the NOAA Administrative Order 212-16 "Observing Systems Portfolio Management", validation of NOAA observation requirements, conducting observing system impact and portfolio analyses. TPIO is an essential requirements management and evaluation office supporting all branches of NOAA and specifically reporting to the NOAA Observing Systems Council (NOSC). TPIO also manages the NOAA Observing System Integrated Analysis (NOSIA) which is used to inform current and future observing system investments. This is used to manage NOAA's observing system architecture.

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PPA's core responsibilities include:

- Project management and execution of flight projects that deliver unique environmental observations such as radio occultation and detection of solar geomagnetic storms not made available by the GOES-R Series and JPSS Program satellites.
- Conceptual and detailed engineering for these flight project activities.
- Acquisition of partnership-based flight and ground project systems (e.g., spacecraft, instruments, launch services, and data acquisition services).
- Conducting pre-formulation activities to match available technologies with observational requirements.
- Support OPMA-managed flight projects through validation and transition to operations
- Integration, installation, and acceptance of NOAA civil operational environmental satellites systems for flight projects and partnerships.
- Provides comprehensive assessments for integration, optimization, and sustainment of NOAA's Observing System Portfolio Management capability

PPA's role in developing and maintaining our partnership-based flight project systems is increasingly important as U.S. forecasting continues to depend on the collaborations and contributions of the world's space agencies to the global observing system. Our long-standing international partnership with EUMETSAT, for example, 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. This partnership makes up the majority of data used by both the U.S. and European weather models and has been so successful that EUMETSAT and NOAA recently signed the Joint Polar System Agreement to continue to share the responsibility of operating polar weather satellites in their respective orbits for the next twenty years.

Commercial Weather Data Pilot

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. The NESDIS Commercial Space Activities Assessment Process calls for NESDIS to regularly conduct 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, and in FY 2017 initiated an expanded CWDP Round 2. The focus of both CWDP Round 1 and Round 2 acquisition contracts was radio occultation (RO) data.

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The CWDP will continue to assess new types of data and capabilities that are available on the commercial market. 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, through the Office of Systems Architecture and Advance Planning (SAAP) will pursue the potential of the commercial system to provide an ongoing operational service as part of the NOAA observation architecture. In FY 2018, NESDIS has committed to exploring other sources and/or types of data and capabilities available in the commercial sector.

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, 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.

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Statement of Operating Objectives

GOES- R

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

PWS

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

CDARS

Schedule and Milestones

FY 2019

- Develop acquisition plan for MEOSAR ground stations
- Determine options to fly the Argos A-DCS instrument on a small sat

Deliverables

- Updated MESOAR ground station acquisition plan for two operational ground stations
- Updated Argos A-DCS plan that addresses potential launch options and risk mitigation efforts

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Mission	Launch Readiness Date (LRD)*	Launch Commitment Date (LCD)	Target Launch Date (LD)**
CDARS (Argos mission)	TBD	TBD	TBD

*Launch Readiness and Launch Commitment dates will be determined based on CDARS outyear funding.

**The Target Launch date is only known after coordination with the launch services provider.

Outyear Funding Estimates*

CDARS	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	3	TBD	TBD	TBD	TBD	N/A	N/A
Total LCC Request	8,800	500	TBD	TBD	TBD	TBD	TBD	TBD

*Outyears are TBD until an implementation plan is complete and the associated funding requirement is identified.

SWFO

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

COSMIC-2/ GNSS RO

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

SGS

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
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

SAAP

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

PPA

See the Program Change for the proposed schedule, milestones, deliverables, performance goals and measurement data and the budget profile.

CWDP

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
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>	
						<u>Amount</u>	
Geostationary	Pos./BA	59	743,276	59	408,380	0	(334,896)
Systems - R	FTE/OBL	59	743,276	59	408,380	0	(334,896)

GOES-R Series Decrease (0 FTE/ 0 Positions, -\$334,896) - This planned decrease will continue satellite engineering development, production, integration, and launch activities as part of the four-satellite Geostationary Operational Environmental Satellite - R (GOES-R) Series program.

Following the successful launch of the GOES-16 satellite on November 19, 2016, NOAA proposes a planned reduction of \$334,896 to the GOES-R Series program in FY 2019. The requested funding will continue the development and delivery of the GOES-R Series satellites, including the check out and transition to operational status of the GOES-S satellite, which is scheduled to launch no later than Q4 FY 2018. NESDIS will continue the development activities for the GOES-T and GOES-U satellites, including ground system check out and a flight ready spare Advanced Baseline Imager (ABI). Following a NOAA acquisition decision in mid-FY 2018, FY 2019 funds will be used to initiate GOES-R Series recapitalization including replacement of IBM servers.

Schedule and Milestones

FY 2019

- Complete GOES-S product validation and transition GOES-S to operations
- Complete GOES-T Integration and Test (I&T) and store spacecraft
- Continue GOES-U spacecraft I&T

FY 2020

- Ship GOES-T to launch base, launch GOES-T, and conduct post launch checkout and calibration activities
- Continue GOES-U I&T

FY 2021

- Complete GOES-T product validation and transition GOES-T to operations

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

- Continue GOES-U I&T
- FY 2022
- GOES-U Testing
- FY 2023
- Operate GOES-16 (GOES-East) and GOES-S (will be GOES-17)
 - Maintain GOES-T (will be GOES-18) as on-orbit spare
 - GOES-U Testing

Deliverables

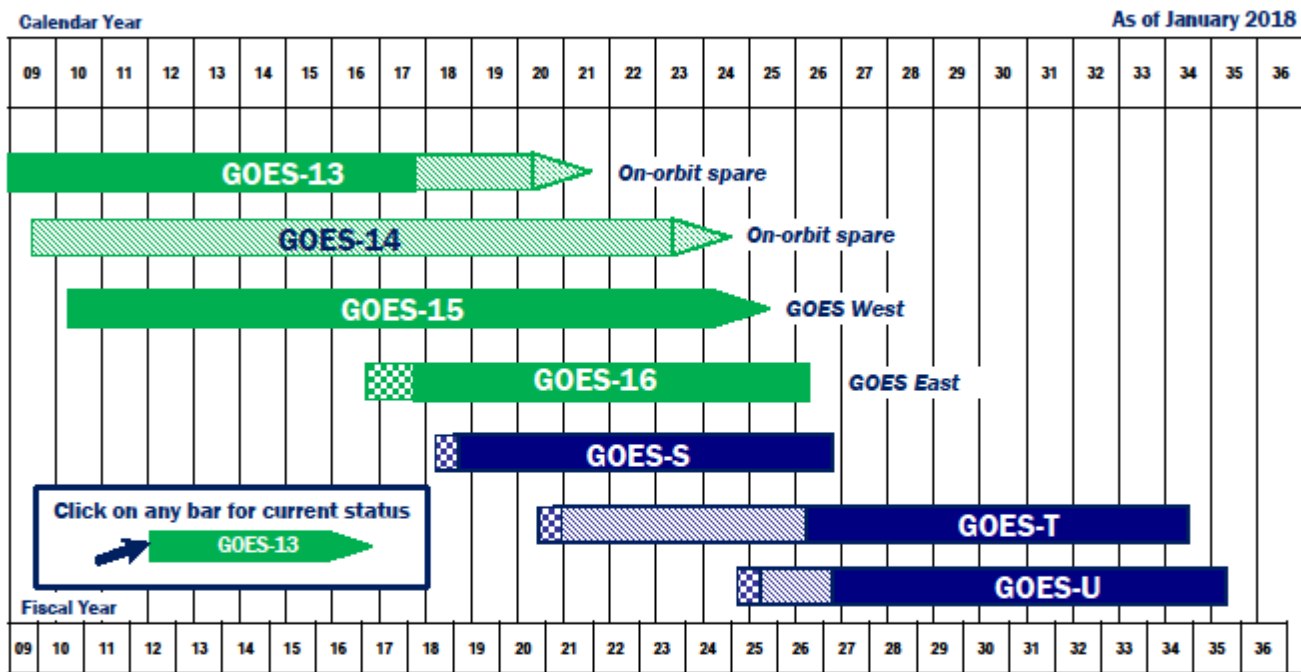
Spacecraft	Launch Readiness Date (LRD)	Launch Commitment Date	Target Launch Date*
GOES-S	Q4 FY 2018	Q4 FY 2018	March 2018
GOES-T	Q3 FY 2020	Q4 FY 2020	June 2020
GOES-U	Q1 FY 2021	Q1 FY 2025	TBD

*The **Target Launch** date will be identified after coordination with the launch services provider and will be determined based on the health and performance of on-orbit assets.

Department of Commerce
 National Oceanic and Atmospheric Administration
 Procurement, Acquisition and Construction
DECREASES FOR 2019
 (Dollar amounts in thousands)



NOAA Geostationary Satellite Programs Continuity of Weather Observations



Approved: 
 Assistant Administrator for Satellite and Information Services

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

Outyear Funding Estimates*

GOES-R Series	2018 & Prior**	2019	2020	2021	2022	2023	CTC *	Total*
Change from 2019 Base	N/A	(334,896)	(439,220)	(450,776)	(450,776)	(493,276)	N/A	N/A
Total GOES-R Series PAC Request	8,431,008	408,380	304,056	292,500	292,500	250,000	176,052	10,154,496
Total GOES-R Series ORF Request	63,363	33,900	33,900	33,900	33,900	33,900	440,700	673,563
GOES-R Series LCC	8,494,371	442,280	337,956	326,400	326,400	283,900	616,752	10,828,059

* Outyears are estimates. Future requests will be determined through the annual budget process. The LCC will most likely require an increase based on the requirement to replace the IBM servers used in the GOES-R series Ground System due to 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.

** The FY 2018 & Prior column has been adjusted for deobligations and reprogrammings in FY 2017, and reflects the GOES-R Series budget profile. The differences have been restored in 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: NESDIS Systems Acquisition
Subactivity: Geostationary Systems-R
Program Change: GOES-R Series Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	(334,896)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(334,896)

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
Polar Weather	Pos./BA	94	1,108,635	94	877,991	0	(230,644)
Satellites	FTE/OBL	84	1,108,635	84	877,991	0	(230,644)

Polar Weather Satellites Planned Decrease (0 FTE/ 0 Positions, -\$230,644) – This request combines a planned decrease to what was previously the Joint Polar Satellite System (JPSS) Program of Record with an increase to what was previously the Polar Follow On Program which will enable NOAA to maintain the original Launch Readiness Dates for JPSS-3 and JPSS-4. The FY 2019 funding will be used to operate and sustain the Suomi National Polar-orbiting Partnership (Suomi NPP) and NOAA 20 (formerly JPSS-1) satellites. The FY 2019 funds will also be used to continue the development of the ATMS, CrIS, VIIRS, and OMPS instruments for JPSS-2, JPSS-3 and JPSS-4. NOAA will strengthen the programmatic and technical synergies of JPSS-3 and JPSS-4 with JPSS-2 to increase cost efficiencies across the JPSS missions. The FY 2019 funds will complete the build of the JPSS-2 instruments and spacecraft, and will be used to develop essential spacecraft subsystems for JPSS-3. NOAA will continue the development, operations, maintenance, and sustainment of the ground system for JPSS.

To keep NOAA’s commitment to build a robust polar orbiting weather satellite program as rapidly as possible, during FY 2019 NOAA will focus its efforts on maintaining the JPSS-2 launch commitment date (LCD) of Q1 FY 2022.

Schedule and Milestones

FY 2019

- Complete build of JPSS-2 instruments and spacecraft
- Integrate JPSS-2 instruments onto spacecraft bus
- Continue build and assembly of JPSS-3 and JPSS-4 ATMS, CrIS, VIIRS, and OMPS instruments
- Initiate JPSS-3 ATMS instrument level environmental testing
- Develop the JPSS-3 spacecraft

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)

- Implement technology refresh and security updates to JPSS ground system
- Update the Ground Infrastructure and risk reduction efforts
- Sustain and maintain operations of Suomi NPP and JPSS-1

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
- Initiate JPSS-3 CrIS instrument level environmental testing
- Continue assembly, integration and test of JPSS-3 spacecraft

FY 2021

- Deliver JPSS-2 satellite to launch site
- Begin launch site integration and test in preparation for JPSS-2 launch
- Conduct pre-ship reviews for JPSS-3 VIIRS and OMPS instruments
- Conduct JPSS-3 VIIRS and OMPS instrument level environmental testing
- Conduct JPSS-4 ATMS and CrIS instrument level environmental testing
- Complete JPSS-3 spacecraft level integration and testing
- First year of operational support for EUMETSAT SG and JPSS-1 using the renovated and upgraded Communications Infrastructure
- Sustain and maintain operations of Suomi NPP and JPSS-1

FY 2022

- Launch, commission and operate JPSS-2
- Deliver JPSS-3 ATMS and CrIS instruments
- Conduct JPSS-4 VIIRS instrument level environmental testing
- Integrate and test JPSS-3 instruments onto the JPSS-3 satellite
- Start JPSS-4 spacecraft procurement activities and initiate assembly of essential spacecraft subsystems
- Sustain and maintain operations of Suomi NPP, JPSS-1, and JPSS-2
- Sustain and maintain ground system to support Suomi NPP, JPSS-1, JPSS-2

FY 2023

- Conduct System Integration Review for JPSS-3
- Deliver JPSS-3 VIIRS and OMPS instruments
- Conduct JPSS-4 OMPS instrument level environmental testing

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

- Initiate procurement of JPSS-3 launch services
- Sustain and maintain operations of Suomi NPP, JPSS-1, and JPSS-2
- Sustain and maintain ground system to support Suomi NPP, JPSS-1, JPSS-2

Deliverables

- On-orbit support for Suomi NPP and JPSS-1
- Complete build of JPSS-2 instruments and spacecraft

Spacecraft	Launch Readiness Date (LRD)*	Launch Commitment Date*	Target Launch Date**
JPSS-2	Q4 FY 2021	Q1 FY 2022	TBD
JPSS- 3	Q2 FY 2024	Q4 FY 2026	TBD
JPSS-4	Q4 FY 2026	Q4 FY 2031	TBD

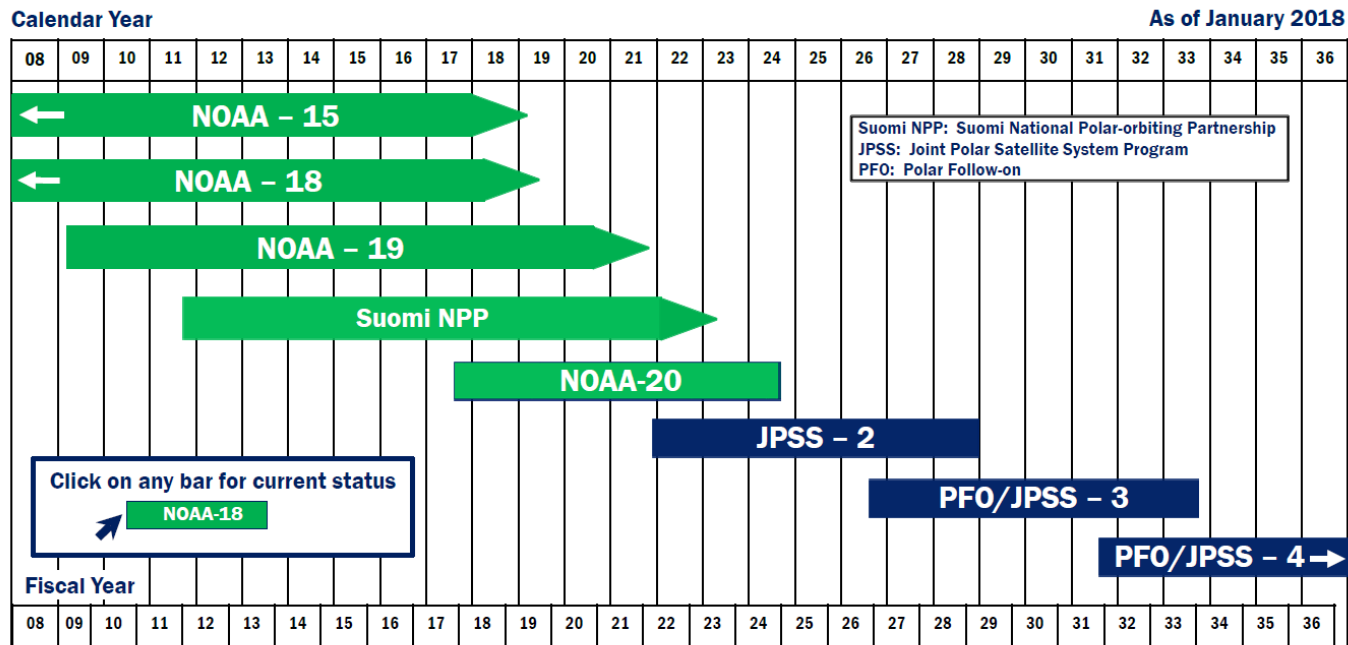
* **Launch Readiness and Launch Commitment dates** will be re-evaluated based on annual appropriations, the performance of on-orbit assets, and in light of current budget constraints.

** The **Target Launch** date is only known after coordination with the launch services provider.

Department of Commerce
 National Oceanic and Atmospheric Administration
 Procurement, Acquisition and Construction
DECREASES FOR 2019
 (Dollar amounts in thousands)



NOAA Polar Satellite Programs Continuity of Weather Observations



Approved:
 Assistant Administrator for Satellite and Information Services

	In orbit and operating		Planned Mission Life, from Planned Launch Date
	Launched before Jan 2008		Planned Mission Life Beyond 2036
	Reliability analysis-based extended weather observation life estimate (60% confidence) for satellites on orbit for a minimum of one year – Most recent analysis: September 2017		

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

Outyear Funding Estimates*

PWS	2018 & Prior**	2019	2020	2021	2022	2023	CTC *	Total*
Change from 2019 Base	N/A	(230,644)	(247,553)	(267,199)	(433,622)	(519,114)	N/A	N/A
Total PWS Request	10,229,946	877,991	861,082	841,436	675,013	589,521	4,820,136	18,895,125
JPSS POR LCC	9,209,825	548,035	445,082	383,436	263,013	154,521	318,213	11,322,125
PFO LCC	1,020,121	329,956	416,000	458,000	412,000	435,000	4,501,923	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.

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

Activity: NESDIS Systems Acquisition
Subactivity: Polar Weather Satellites
Program Change: Polar Weather Satellites Planned Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	(230,644)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(230,644)

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
INCREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Increase			
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>		<u>Amount</u>	
Space Weather	Pos./BA	1	4,966	1	10,000	0	5,034		
Follow On	FTE/OBL	1	4,966	1	10,000	0	5,034		

Compact Coronagraph Development (0 FTE/ 0 Positions, \$5,034) – This program increase will continue work with the Naval Research Laboratory (NRL) to develop the compact coronagraph (CCOR) for launch by 2024. NASA’s Solar and Heliophysics Observatory (SOHO), launched in 1995 and significantly past its mission design lifetime, currently provides coronal mass ejection imagery used operationally by the National Weather Service’s Space Weather Prediction Center for geomagnetic storm watches. The CCOR would continue these observations. While SOHO is relatively healthy at the moment, the solar arrays are degrading. CCOR will be hosted on the NOAA Geostationary Operational Environmental Satellite system (GOES)-U Sun-pointing platform, or another partnership mission.

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.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
INCREASES FOR 2019
(Dollar amounts in thousands)

Schedule and Milestones

FY 2019

- Continue development of compact coronagraph to support CME imager
- Develop plans for accommodation of solar wind instruments on a partnership mission

FY 2020

- Continue development of compact coronagraph to support CME imager
- Initiate development/accommodation plans of the rideshare satellite
- Initiate solar wind development strategies

FY 2021

- CCOR instrument available for spacecraft integration on GOES-U or other partnership options
- Continue solar wind development strategies

FY 2022

- Integrate CCOR on GOES-U or partnership mission
- Continue solar wind development strategies

Deliverables

- Provide timely access to operational solar wind data and CME imagery for short and long-term warnings of geomagnetic storms

Outyear Funding Estimates*

Space Weather FO	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	5,034	5,034	5,034	5,034	5,034	N/A	N/A
Total Request**	11,862	10,000	10,000	10,000	10,000	10,000	TBD	TBD

*Outyears are estimates only. Future requests will increase as we refine NOAA's space weather follow on development plans.

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

Activity: NESDIS Systems Acquisition
Subactivity: Space Weather
Program Change: Compact Coronagraph Development

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	5,034
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	5,034

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
COSMIC 2							
Global							
Navigation							
System Satellite	Pos./BA	1	8,045	1	5,892	0	(2,153)
Radio	FTE/OBL	1	8,045	1	5,892	0	(2,153)
Occultation							

Ground System Decrease (0 FTE/ 0 Positions, -\$2,153) - This one-time decrease to FY 2019 funding reflects the delay in launch of the COSMIC -2 mission. Funding will support ground system operation for the COSMIC-2 constellation in the equatorial low earth orbit. COSMIC-2 data will be received by a combination of international ground stations (Taiwan, Brazil, Australia), Air Force Mark IV-B ground stations (Hawaii, Honduras, Guam, Kuwait) and commercial ground stations (Ghana and Mauritius). Data latency, or the time it takes to receive the data, is greatly improved for weather applications with each additional ground reception station.

Schedule and Milestones

FY 2019-2023

- Reception and processing of equatorial low Earth orbit satellite RO data from COSMIC-2 mission
- Reception and processing of mid and high latitude low Earth orbit satellite RO data from partner missions

Deliverables

- Processed RO data; improved quality control algorithms for GNSS RO data in NWS operational data assimilation systems
- GNSS RO data for assimilation into the NWS predictive weather models

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

Outyear Funding Estimates*

COSMIC-2	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	(2,153)	55	55	55	55	N/A	N/A
Total COSMIC 2 Request	39,902	5,892	8,100	8,100	8,100	8,100	TBD	TBD

*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: NESDIS Systems Acquisition
Subactivity: COSMIC 2 Global Navigatoin Satellite System Radio Occultation
Program Change: Ground System Decrease

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	(2,153)
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(2,153)

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Decrease			
		<u>Personnel</u>		<u>Amount</u>		<u>Personnel</u>		<u>Amount</u>	
Satellite Ground	Pos./BA	86	53,681	86	52,332	0	(1,349)		
Services	FTE/OBL	74	53,681	74	52,332	0	(1,349)		

Satellite Ground Services (0 FTE/ 0 Positions, -\$1,349) - This request will continue the funding needed to provide ground system support, including technology refresh and hardware and software, for both legacy missions and GOES-R. In order to fully support other existing NOAA priorities within the Procurement Acquisition and Construction (PAC) portfolio, NOAA will decrease the Ground Enterprise activities that transition NOAA’s individual ground system into an enterprise-wide solution.

**Schedule and Milestones
FY 2019**

- Begin transition and support of GOES-R Ground Segment
- Continue to support operational satellite ground services
- Continue to support enterprise distribution and archive services
- Initiate Operating Capability of Mission Science Network

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)

FY 2020

- Continue to support operational satellite ground services
- Continue to support enterprise distribution and archive services
- Final Operating Capability of Mission Science Network

FY 2021-23

- Continue to support operational satellite ground services
- Continue to support enterprise distribution and archive services

Deliverables

- Continued support of operational satellite ground services
- Continued support of enterprise distribution and archive services

Outyear Funding Estimates*

SGS	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	(1,349)	(1,349)	(1,349)	(1,349)	(1,349)	N/A	N/A
Total Request*	N/A	52,332	52,332	52,332	52,332	52,332	N/A	Recurring

*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: NESDIS Systems Acquisition
Subactivity: Satellite Ground Services
Program Change: Satellite Ground Services Sustainment

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(1,349)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,349)

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
INCREASES FOR 2019**
(Dollar amounts in thousands)

System		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Architecture and							
Advanced	Pos./BA	12	3,903	12	4,929	0	1,026
Planning	FTE/OBL	10	3,903	10	4,929	0	1,026

Strengthening NOAA’s Future Satellite Capabilities (0 FTE/ 0 Positions, \$1,026) – This increase will allow the Office of Systems Architecture and Advance Planning (SAAP) to initiate selected critical investments informed by the National Satellite Observing System Architecture (NSOSA) study, including pre-acquisition activities such as selected technology studies, targeted analyses of alternatives, industry and commercial sector engagement, and program planning. SAAP will develop detailed implementation options and roadmaps to specify the evolution of the satellite architecture, better manage and prioritize implementation of validated satellite observation requirements, and govern the end-to-end NESDIS product lifecycle to satisfy these requirements. This will be done through enterprise architecture planning, capability demonstration, program management standardization, risk and opportunity balancing, and operational capability validation.

Through these efforts, SAAP’s will be able to lead the implementation of the NESDIS strategic plan, manage NESDIS requirements, develop and manage policies and processes governing program implementation, lead the NESDIS enterprise risk and opportunities management process, and validate that the delivered products and services effectively and efficiently meet the needs of the NOAA customer community. This leadership will only be made possible through this additional investment, without which NESDIS will lack sufficient analytic capability to identify and mitigate enterprise-wide inefficiencies and will miss opportunities to deliver greater capability within available budgets. Insufficient funding will also compromise NESDIS’ ability to begin formulation of follow-on polar, geostationary and space weather programs beyond the current programs of record to meet NOAA’s defined mission and measurement requirements.

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
INCREASES FOR 2019
(Dollar amounts in thousands)

Schedule and Milestones

FY 2019

- Complete NESDIS Enterprise level Requirements Documents
- Complete Analysis of Alternatives to refine NSOSA study results
- Initiate next generation Low Earth Orbit (LEO)/polar mission pre-formulation
- Continue planning collaboration efforts between NESDIS and NASA in technology/operational demonstrations

FY 2020

- Initiate demonstration of capabilities favored by NSOSA study results
- Continue next generation LEO mission formulation
- Begin implementation of technology insertion/maturation plans
- Implement Decadal Survey guided collaborative NESDIS and NASA technology/operational demonstrations
- Plan and implement latest security controls and monitoring capabilities for NESDIS systems

FY 2021

- Continue demonstration of capabilities favored by NSOSA study results
- Continue next generation LEO mission formulation
- Initiate next generation geostationary(GEO) mission formulation
- Oversee Decadal Survey guided collaborative NESDIS and NASA technology/operational demonstrations, phased by need date
- Develop Requirements documentation for follow-on programs
- Execute latest security controls and monitoring capabilities for NESDIS systems

FY 2022

- Continue next generation GEO mission formulation
- Initiate additional elements of next generation architecture based on AoAs, demonstrations, and formulation progress to date
- Oversee the previously initiated technology development efforts
- Initiate next phase of technology development efforts
- Complete Requirements documentation for follow-on programs
- Execute latest security controls and monitoring capabilities for NESDIS systems

FY 2023

- Continue next generation GEO mission formulation
- Govern the implementation of the new NESDIS architecture as the observational, ground, data products, and service-providing systems are being developed to meet the plan
- Initiate new tech development efforts as needed

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
INCREASES FOR 2019**
(Dollar amounts in thousands)

- Execute latest security controls and monitoring capabilities for NESDIS systems

Deliverables

- NESDIS Program End-to-End Mission Validation reports and lessons learned
- NESDIS Enterprise Requirements Documents
- Fully populated NESDOCS library, including configuration control of enterprise policies and procedures
- Preliminary Requirements Documents for the next generation of programs in pre-formulation
- Active enterprise risk management
- Active enterprise configuration control/management

Outyear Funding Estimates*

SAAP	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	1,026	1,026	1,026	1,026	1,026	N/A	N/A
Total Request	N/A	4,929	4,929	4,929	4,929	4,929	N/A	Recurring

*Outyears are estimates. Future requests will increase based upon the results of the analysis and determination of NOAA's future architecture.

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

Activity: NESDIS Systems Acquisition
Subactivity: System Architecture and Advanced Planning
Program Change: Strengthening NOAA's Future Satellite Capabilities

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	1,026
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	1,026

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
INCREASES FOR 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Increase	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel</u>	<u>Amount</u>
Projects, Planning, and Analysis	Pos./BA	37	25,030	37	36,539	0	11,509
	FTE/OBL	30	25,030	30	36,539	0	11,509

Metop Support and Testing (0 FTE/ 0 Positions, \$11,509) – This request is critical to support the ongoing use of Metop data in NOAA’s weather prediction function. Activities will include sensor activation, verification, data validation and transition into operations – activities that turn data from the U.S. instruments on Metop-C into usable information for weather forecasting by the National Weather Service (NWS). In addition, European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) will launch their Metop Second Generation Satellites, Metop-SG 1A and 1B, in 2021 and 2022 respectively. Funding in FY 2019 will allow NOAA to begin preparations to ingest Metop-SG data including preparation for the future development of ground infrastructure, processing and distribution capability for Metop-SG 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). 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. Together, the Metop and JPSS satellite constellations provide data from two different complementary orbits (mid-morning and afternoon) that forecasters rely on to produce the 3-7 day outlook. Therefore, delay, loss of access, or reduced data quality from Metop satellites in the mid-morning orbit would directly impact the quality of Numerical Weather Prediction model forecasts.

**Department of Commerce
National Oceanic and Atmospheric Administration
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INCREASES FOR 2019
(Dollar amounts in thousands)**

Schedule and Milestones

FY 2019

- Metop-C launch in Kourou, French Guiana
- Perform Metop-C Satellite In-Orbit Verification and post-launch evaluation of U.S. instruments
- Perform intensive calibration and validation of data products from U.S. instruments
- Begin preparations to ingest Metop-SG data

FY 2020 – FY 2023

- Provide engineering services to support on-orbit anomalies of U.S. instruments on Metop
- Perform calibration and validation of satellite and instruments

Deliverables

- Engineering support for the on-orbit POES satellites and support to EUMETSAT for U.S. instruments for the on-orbit Metop satellites
- Support to EUMETSAT for U.S. instruments for the on-orbit Metop satellites

Outyear Funding Estimates*

PPA	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	11,509	(9,339)	(9,339)	(9,339)	(9,339)	N/A	N/A
Total Request	N/A	36,539	27,200	27,200	27,200	27,200	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: NESDIS Systems Acquisition
Subactivity: Projects, Planning and Analysis
Program Change: Metop-C Launch Support and Testing

Object Class	2019 Increase
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	4,604
25.3 Purchases of goods & services from Gov't accounts	6,905
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	11,509

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
DECREASES FOR 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Commercial							
Weather Data	Pos./BA	0	4,966	0	3,000	0	(1,966)
Pilot	FTE/OBL	0	4,966	0	3,000	0	(1,966)

Advance Secure Ingest Capabilities (0 FTE/ 0 Positions, -\$1,966) – This decrease request adjusts the Commercial Weather Data Pilot funding to a level appropriate for the scope of work expected to be performed in FY 2019. This level of funding will allow NESDIS to test commercially available data and capabilities based on market research conducted in FY 2018 to assess the accuracy, value and impact of the commercial industry. CWDP will continue to advance ground system capabilities to securely ingest commercial data. CWDP will continue to assess new types of data and capabilities, and once available, deliver assessment report(s) on the viability of the pilot data set(s) which meet NOAA observation requirements.

Schedule and Milestones

FY 2019

- Conduct the assessment phase of CWDP Round 2
- Demonstrate the ability to securely ingest data from commercial sources

FY 2020 – FY2023

- Develop findings on the results of CWDP Round 2
- Explore additional sources/types of data and capabilities available from the commercial sector through market research
- Pending Round 3 market research (FY 2018), pursue Round 3 data and/or capability evaluation

**Department of Commerce
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DECREASES FOR 2019
(Dollar amounts in thousands)**

Deliverables

- Results of market research conducted
- Complete evaluation of new data and capabilities and report results of those evaluations
- Prepare for establishing operational services contracts with commercial providers

Outyear Funding Estimates*

CWDP	2018 & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base	N/A	(1,966)	(1,966)	(1,966)	(1,966)	(1,966)	N/A	Recurring
Total LCC Request	N/A	3,000	3,000	3,000	3,000	3,000	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: NESDIS Systems Acquisition
Subactivity: Commercial Weather Data Pilot
Program Change: Advance Secure Ingest Capabilities

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	(1,966)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(1,966)

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

Activity: NESDIS Construction

Comparison by activity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NESDIS Construction	Pos/BA	0	2,161	0	2,213	0	2,213	0	2,450	0	237
	FTE/OBL	0	2,193	0	2,743	0	2,213	0	2,450	0	237

Goal Statement

The objectives of the Satellite CDA Facility PPA are to:

- Support repairs and renew facilities that contain critical infrastructure;
- Maintain structural integrity through capital improvements; and
- Ensure availability of power and cooling necessary for NOAA’s satellite ground system.

Base Program

Satellite Command and Data Acquisition (CDA) Facility

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 Command and Data Acquisition (CDA) Stations at Fairbanks, AK and Wallops, VA; NOAA Satellite Operations Facility (NSOF) at Suitland, MD; and the NESDIS Consolidated Backup (CBU) at Fairmont, WV. These facilities provide power and cooling to the satellite ground systems uninterrupted 24 hours per day, 365 days per year.

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Statement of Operating Objectives

Satellite Command and Data Acquisition (CDA) Facility

Schedule and Milestones

FY 2019

- Replace Hot Water Boiler at Fairbanks CDA Station Facilities Building
- Replace Water Treatment System at Fairbanks CDA Station Facilities Building
- Provide Automatic Transfer Switches at Fairbanks CDA Station Antennas
- Re-Configure Power Feeds to Critical Motors at Fairbanks CDA Station Powerhouse
- Replace Roof at Wallops CDA Station Operations Building
- Replace Physical Access Control and closed circuit television at Wallops CDA Station
- Replace Computer Room Air Conditioner at Wallops CDA Station

FY 2020 – FY 2023

- Replace Uninterrupted Power Supply (UPS) Battery (All Locations)
- Replace UPS Capacitor (All Locations)
- Repair paving at Fairbanks CDA Station
- Building Automation Upgrade (Fairmont CBU and Suitland 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
- UPS battery and capacitor replacements at all CDA facilities

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
INCREASES FOR 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Satellite Command and Data Acquisition Facility	Pos./BA	0	2,213	0	2,450	0	237
	FTE/OBL	0	2,213	0	2,450	0	237

Satellite CDA Facility Increase (0 FTE/ 0 Positions, \$237) – This funding will allow NESDIS to repair and renew Satellite Command and Data Acquisition (CDA) infrastructure at a sustainable rate. Known and anticipated requirements are similar to improvements that have been completed at other CDA facilities, such as server room air conditioners, asphalt road repair, fuel tank replacements, and boiler replacements. These repairs and maintenance have contributed to improved reliability and ensure power and cooling necessary for NOAA’s satellite operations is available 24/7.

Outyear Funding Estimates*

Satellite CDA	2018 & Prior	2019	2020	2021	2022	2022	CTC	Total
Change from FY 2019 Base	N/A	237	237	237	237	237	N/A	N/A
Total Request	30,401	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.

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

Activity: NESDIS Construction
Subactivity: Satellite Command and Data Acquisition Facility
Program Change: Satellite CDA Facility Increase

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	0
25.2 Other services	0
25.3 Purchases of goods & services from Gov't accounts	237
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	237

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BUDGET PROGRAM: NOAA MISSION SUPPORT

For FY 2019, NOAA requests a total of \$244,572,000 and 726 FTE for Mission Support, including a net decrease of \$31,557,000 and 17 FTE in program changes.

Mission Support Overview

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.

The Mission Support budget is organized into five activities within the Operations, Research and Facilities (ORF) account (\$270,113,000 and 743 FTE).

- Executive Leadership (\$27,610,000 and 121 FTE) provides centralized executive management as well as policy formulation and direction.
- Mission Services and Management (\$150,417,000 and 592 FTE) includes such activities as financial reporting, budgeting, information technology, acquisition and grants, human resource services, and facilities management.
- IT Security (\$10,027,000 and 13 FTE) leads priority cyber security initiatives.
- Payment to the DOC Working Capital Fund (\$55,249,000 and 0 FTE) provides centralized services to NOAA's Line Offices and Staff Offices.
- Office of Education (\$26,810,000 and 17 FTE) 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 (\$6,061,000 and 0 FTE) provides for restoration of capital assets including alteration or modification of properties.

Significant Inflationary Adjustments:

Calculated Adjustments

NOAA's FY 2019 Base includes a net increase of \$5,204,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for Mission Support activities. This includes inflationary increases for labor and non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

NOAA's FY 2019 Base includes a technical adjustment of \$11,257,000 and 0 FTE to account for increases for the Payment to the DOC Working Capital Fund.

Department of Commerce Enterprise Services Initiative:

Department of Commerce's leadership set a goal to improve customer service and enhance the delivery of the Human Resources, Acquisition, Financial Management and Information Technology mission-enabling functional areas with Human Resources (HR) being the first functional area to transition to the Enterprise Services model. In late FY 2016, NOAA's Workforce Management Office (WFMO) 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 allows WFMO to provide strategic workforce planning and solutions to the NOAA Line and Staff Offices. WFMO will continue to provide expert consultative services in the areas of executive resources management, quality assurance, program performance, detailed HR data modeling and analytics, employee and labor relations, retirement counseling and benefits, and prevention of sexual assault and sexual harassment. As a result, WFMO will focus its efforts on strategic solutions that strengthen mission delivery and improve overall customer service.

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

Activities: Executive Leadership, Mission Services and Management, IT Security Payment to the DOC Working Capital Fund and Office of Education

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Executive Leadership	Pos/BA	108	26,836	127	26,818	127	27,610	127	27,879	0	269
	FTE/OBL	107	26,969	121	27,541	121	27,610	121	27,879	0	269
Mission Services and Management	Pos/BA	552	147,494	610	147,392	610	150,417	610	150,417	0	0
	FTE/OBL	548	150,024	592	157,246	592	150,417	592	150,417	0	0
IT Security	Pos/BA	10	9,998	14	9,982	14	10,027	14	10,029	0	2
	FTE/OBL	10	9,828	13	10,328	13	10,027	13	10,029	0	2
DOC Working Capital Fund	Pos/BA	0	57,996	0	42,710	0	55,249	0	55,249	0	0
	FTE/OBL	0	56,965	0	43,703	0	55,249	0	55,249	0	0
Education	Pos/BA	11	26,695	18	26,750	18	26,810	0	0	(18)	(26,810)
	FTE/OBL	11	26,682	17	26,931	17	26,810	0	0	(17)	(26,810)
Hollings Scholarship	Pos/BA	4	5,674	0	0	0	0	0	0	0	0
	FTE/OBL	4	3,748	0	1,976	0	0	0	0	0	0
Total Mission Support	Pos/BA	685	274,693	769	253,652	769	270,113	751	243,574	(18)	(26,539)
	FTE/OBL	680	274,216	743	267,725	743	270,113	726	243,574	(17)	(26,539)

Goal Statement

The objectives of these Mission Support activities are to:

- Develop policies regarding the administration of NOAA programs with Federal agencies, the Congress, and private industry; and
- Develop and implement policy, planning, and program oversight.

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Base Program

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' relationships 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.

**Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Mission Services and Management

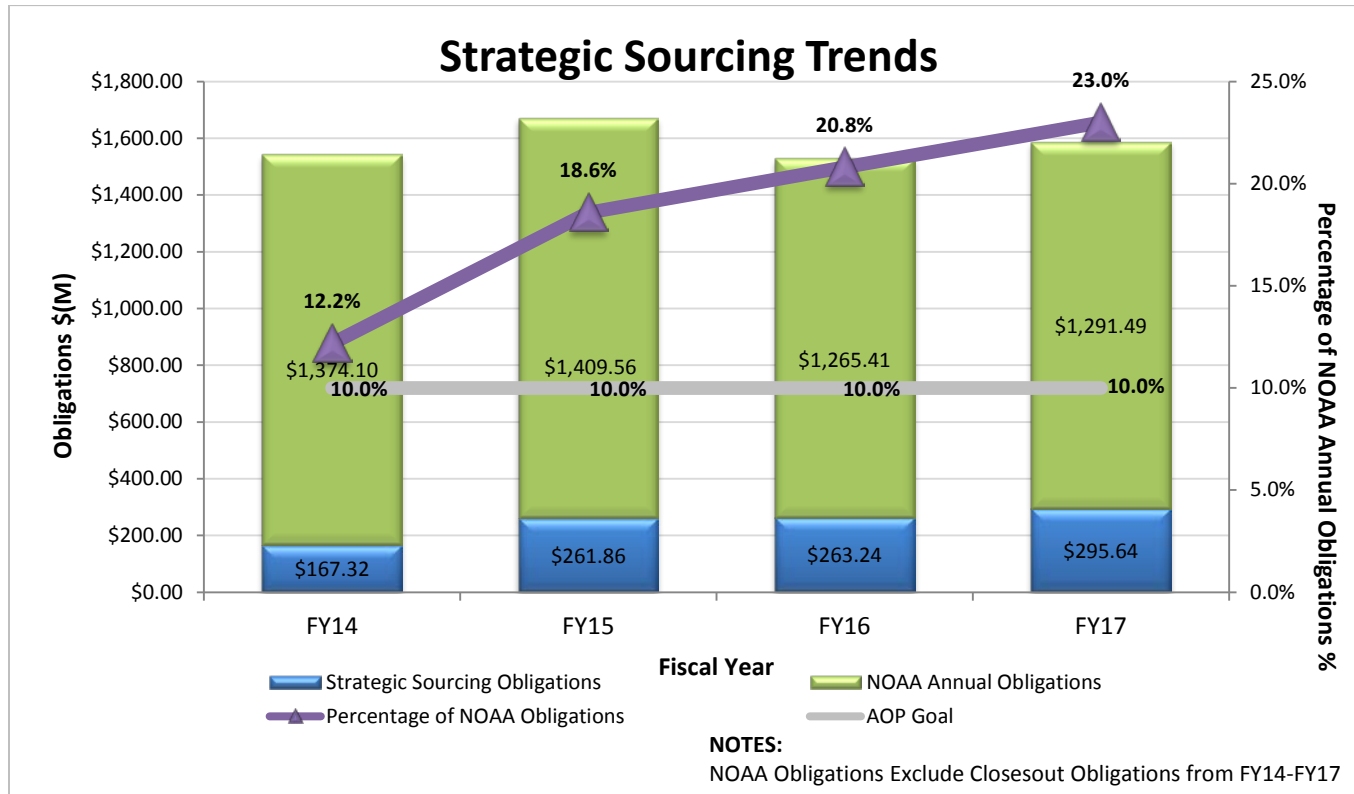
Mission Services and Management is the mission-enabling arm of NOAA that supports all operational activities and is essential to its success.

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 27,000 acquisition and financial assistance transactions annually. NOAA's ability to accomplish its mission and achieve its goals depends significantly on AGO's ability to process over \$2.3 billion annually in accordance with statutory and regulatory requirements. In FY 2017 for example, \$1.291 billion was obligated via 11,702 acquisition transactions and \$1.018 billion was obligated via 4,068 financial assistance transactions.

In addition, NOAA continued its strong support of small businesses in FY 2017, obligating approximately \$698 million out of \$1.3 billion to small businesses equating to a 54.9 percent overall small business achievement for the year. AGO also continued to place emphasis on NOAA's two key strategic sourcing initiatives NOAA Link program and ProTech Acquisition Initiative to improve efficiency and reduce costs. In FY 2017, 23 percent of NOAA dollars were awarded via strategic sourcing vehicles.

With strong support from the Office of the Chief Financial Officer, AGO moved to a partial fee for service funding model in FY 2017. The Acquisition Fee for Service model provides greater transparency and efficiency, and aligns AGO staff and resources more closely to client needs. With the support of the NOAA Line and Staff offices and a robust change management program, the transition has been very successful. Acquisition Fee for Service now provides a significant portion of the funding required to provide acquisition services to NOAA Clients.

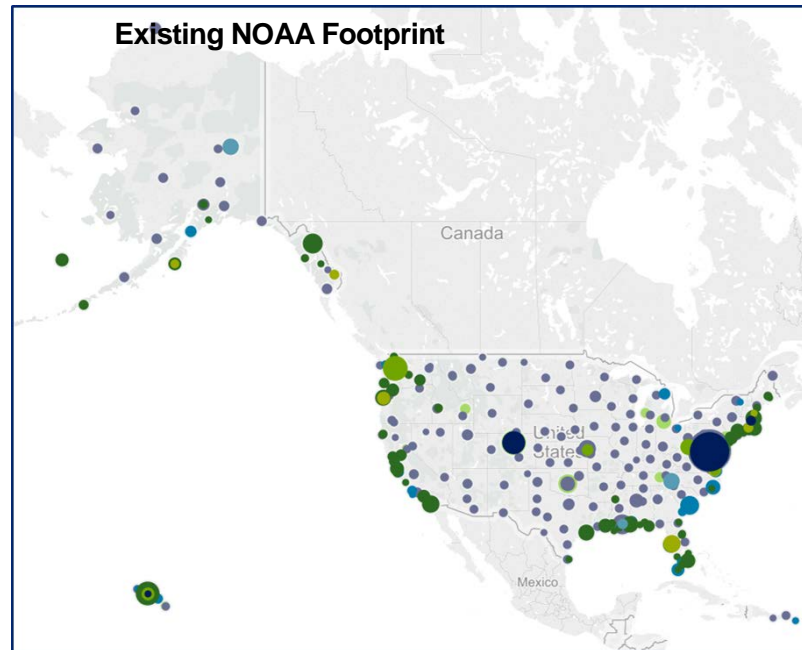
**Department of Commerce
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Office of Chief Administrative Officer (OCAO):

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 over \$5 billion in owned and leased facilities, with 730 buildings and seven million square feet of occupied space; and administers a personal property portfolio, including 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.

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In FY 2017, OCAO working with an extremely aggressive schedule planned, coordinated and awarded a 10-year lease to the City of Lakeland, Florida, to house the NOAA Aircraft Operations Center (AOC) at Lakeland Linder Regional Airport. As a result, AOC was opened and operational in time for the 2017 hurricane season. The facility serves as the main base for NOAA's aircraft fleet, including the "hurricane hunter" planes, supporting hurricane research, reconnaissance and response operations. OCAO also negotiated an agreement to end the Pribilof Islands lawsuit continuing from 1984 to October 2016. The agreement with TDX (native Alaskan Corporation) transfers the remaining property on St. Paul Island, Alaska, to TDX as prescribed under the Two Party Agreement.

On behalf of NOAA, OCAO signed an Inter-Agency Agreement with the United States Army Corps of Engineers in FY 2017 to implement the Corps' BUILDER™ Sustainment Management System. Implementation of this system will provide a clearer understanding of facility condition enabling NOAA to decide when, where, and how to best maintain real property assets within existing resources.

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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 currently migrating to Oracle Webcenter, the replacement for the Oracle Portal software. In addition, DOC has a plan in place to upgrade 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.

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.

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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 2017, OCIO implemented a 2000 core fine-grain system with 800 graphical processing units (GPU) as an augmentation of the Theia High Performance Computing System (HPCS), which almost tripled peak performance from 1.1 petaflops to 3 petaflops; the system is being used to advance NOAA environmental modeling research and to explore the performance of NOAA models on a new architecture at a large scale. NOAA ESRI Central Support System handled over 1,100 support tickets from across all NOAA Line Offices with greater than 95 percent satisfaction rate. OCIO published the Unmanned Aircraft Systems (UAS) Privacy Policy, and integrated the Silver Spring Network Operations Center (NOC) with the GlobalNOC 24x7 Tier-1 support; all calls, emails, and trouble are reported to the GlobalNOC with quality check from the Silver Spring NOC engineers.

Workforce Management Office (WFMO): WFMO provides human capital policies, programs, consultative services, and processes that facilitate the development and retention of a diverse, highly skilled, motivated, and effective workforce capable of accomplishing the Agency's mission. This office provides NOAA-wide leadership in 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 programs, training and career development, human resources data management, and HR information technology systems. WFMO also oversees staffing, classification, recruitment and hiring actions, personnel action request processing services, 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 2019. These services were outsourced to provide focused, efficient and cost-effective products to NOAA organizations and employees. WFMO has implemented the NOAA Strategic Human Capital Management Plan; transitioned human capital services to a new service delivery model; engaged new vendors and partners and provided detailed and improved personnel staffing support; instituted new

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technologies including 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. WFMO has also taken distinct actions to improve employee and labor relations for NOAA to include supporting the National Weather Service as it renegotiates the 2001 National Weather Service/(National Weather Service Employee Organization Collective Bargaining Agreement and eliminating a large historical backlog of inquiries from employees based on allegations of harassment.

In FY 2018, NOAA continued the process of charging customers (Line and Staff Offices) directly for transactional services identified under the Enterprise Services model. WFMO will continue to implement a robust consultative services approach which provides human capital expert advisors dedicated to each Line and Staff office to ensure mission alignment, unity of purpose and customer satisfaction. In addition, WFMO has developed specific centers of expertise to advance strategic development in workforce strategy, performance culture and learning, and human resource analytics to support all of NOAA and will continue to mature and expand its legislatively mandated Sexual Assault and Sexual Harassment Prevention Program.

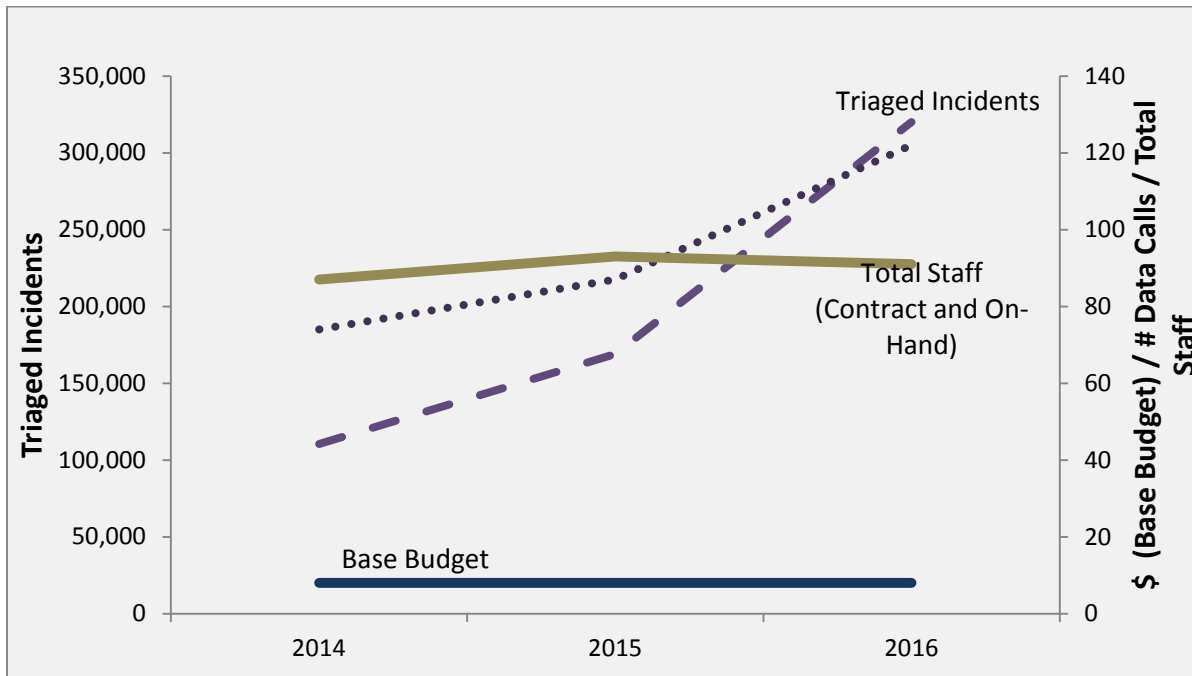
IT Security

NOAA's IT Security Program has the mission to defend NOAA's data, networks, equipment, intellectual property and personnel against threats from hackers, nation states, and non-nation state groups who wish to do harm to NOAA interests. Hackers could potentially damage or degrade NOAA's ability to keep 330 million Americans, as well as others, safe and informed of weather, environmental, and economic events. The cyber security environment reduces the cost of espionage, and is a low cost, low risk, effective way to steal hard-won research information.

IT Security's interconnected nature poses particular risks to IT equipment and infrastructure. Through a vulnerability management and risk based approach, OCIO implements NOAA's IT Security Program 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 1.4 trillion events in FY 2017) and is not likely to decrease in the foreseeable future. Over the last three years every measure of the threat (events, incidents, number of systems being monitored) has grown (see chart below), while budget for incident response has remained essentially the same. Current high priority risks include national/international/non-state actors, social engineering, advanced persistent threats, botnets, and precision targeted malware. Future considerations include insider threats, classified environments, distributed denial of service attacks, DHS dashboards and risk scoring. Initiatives include Trusted Internet Connection (TIC) capability and use, continuous monitoring of Federal information systems, and strong authentication using government issued identity credentials. During FY 2017, the IT Security Program became more efficient at base-level functionality, which resulted in a significant reduction of the number of

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triaged events. Other accomplishments included dramatically improving perimeter protection for NOAA by limiting the number of public internet access points, and fully activating three of five Trusted Internet Connection Access Providers (TICAPs) in Seattle, Dallas, and Honolulu. The IT Security Program also implemented a defense-in-depth risk-based approach via common mitigation strategies and solutions, and completed the external requirement validation, primary mission essential function (PMEF) revalidation information collection, and cyber capabilities maturity assessment in accordance with the NOAA Cyber Security Roadmap.



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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, Bay-Watershed Education and Training Program, and Education Council and Interagency working group efforts.

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 1,900 degrees granted to higher education students in NOAA mission fields since 2001
- 75 percent of graduates are from underrepresented minority groups
- 250 PhDs granted in NOAA mission disciplines
- 439 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.

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Based on the FY 2019 Request of \$4.56 billion, NOAA estimates it will have \$4.6 million for scholarships. Actual funding will be determined as provided in statute at one-tenth of one percent of the annual appropriation. 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:

- \$70 million provided through 124 awards since the program's inception in 2005.
- In FY 2017, more than 150 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 2017, more than 46 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 2017, more than 200,000 youth and adults participated in NOAA-supported, informal education programs that enhance ecosystem stewardship and promote informed decision making.
- In FY 2017, more than 3,000 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 48,000 students and 2,500 teachers in 2017 through 134 new and continuing awards.
- Since the program's inception in 2002 NOAA has awarded over \$75 million to support more than 670 projects.

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- 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.

Statement of Operating Objectives

Schedule and Deliverables:

CFO

Description of Milestone	Planned Completion Date
Submit final Annual Performance Plan Report (APPR) for President’s Budget submission within 5 days of due date	Q2 Annually
Identify corrective action plans for Audit Findings	1-30 days after receipt of Final Findings, annually
Complete Congressional Budget Submission	Q2 Annually
Execution review and analysis	Monthly

OCIO

Activity	Description of Milestone	Planned Completion
Portfolio Management	Prepare OCIO Annual Operating Plan	Annually
	Update NOAA Information Resource Management Strategic Plan	Annually
	Maintain and/or improve the overall ratings of NOAA Major Investments on the Federal IT Dashboard	Quarterly

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Activity	Description of Milestone	Planned Completion
Cyber Security	Update NOAA Cyber Security Roadmap	Annually
	Complete Contingency Plan updates and testing in accordance with DOC policy, NIST guidance, and NOAA policy	Quarterly
	Administer annual NOAA IT security awareness training	Annually
	Complete annual FISMA Report	Annually
Enterprise Architecture	Facilitate implementation of an enterprise-wide data management architecture	Quarterly
	Update Data Center Optimization Initiative (DCOI) Inventory and Implementation Plan	Annually
Shared Services	Deliver cost-effective, customer-focused IT services for the enterprise	Quarterly
	Update NOAA Enterprise IT Service Catalog	Annually
Homeland Security	Plan & conduct annual NOAA HQ Continuity of Operations (COOP) exercise	Annually
	Update NOAA COOP Plan	Annually

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DECREASES FOR 2019
(Dollar amounts in thousands)**

		2019 Base		2019 Estimate		Decrease	
		<u>Personnel Amount</u>		<u>Personnel Amount</u>		<u>Personnel Amount</u>	
Office of Education	Pos./BA	18	26,810	0	0	(18)	(26,810)
	FTE/OBL	17	26,810	0	0	(17)	(26,810)

NOAA Office of Education (-17 FTE/ -18 Positions, - \$19,360) -- NOAA proposes to eliminate funding for the Office of Education. This will terminate coordination activities provided by the Office of Education (\$2,047) as well as the Competitive Education Grants Program (\$2,980) and the Educational Partnership Program for Minority Serving Institutions (EPP/MSI) (\$14,334).

The Office of Education coordinates education efforts across the agency through the Education Council and Education Working Group. The Office participates in 10 annual STEM education conferences that reach approximately 20,000 formal and informal educators and participates at the National Science and Engineering Fair, as well as at over 250 regional high school science fairs.

The Competitive Education Grants Program supports 150 institutions per year that advance its 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.

Each year NOAA's EPP/MSI program supports cooperative agreements with four EPP Cooperative Science Centers (CSCs) at Minority Serving Institutions, including funds for 28 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.

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	2019	2020	2021	2022	2023
Performance Measures:					
Competitive Education Grants					
Number of people that visit informal learning institutions with a NOAA-funded exhibit or program that integrates NOAA sciences, data, and other information (in thousands)					
With Decrease	0	0	0	0	0
Without Decrease	200,000	200,000	200,000	200,000	200,000
Institutions served by Competitive Education Grants					
With Decrease	0	0	0	0	0
Without Decrease	18	21	21	21	21
K-12 teachers and staff served by Competitive Education Grants					
With Decrease	0	0	0	0	0
Without Decrease	3,000	3,000	3,000	3,000	3,000
K-12 students served by Competitive Education Grants					
With Decrease	0	0	0	0	0
Without Decrease	9,000	9,000	9,000	9,000	9,000

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	2019	2020	2021	2022	2023
EPP/MSI					
Number of EPP students supported with NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees					
With Decrease	0	0	0	0	0
Without Decrease	130	130	130	130	130
Number of EPP students from underrepresented communities supported by NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees					
With Decrease	0	0	0	0	0
Without Decrease	100	100	100	100	100
Number of EPP students hired by NOAA, NOAA contractors and other natural resource and science agencies at the Federal, state, local, and tribal levels; private sector and academia					
With Decrease	0	0	0	0	0
Without Decrease	60	60	60	60	60
Number of collaborative research projects undertaken between NOAA and EPP in support of NOAA mission					
With Decrease	0	0	0	0	0
Without Decrease	200	200	200	200	200

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NOAA Bay-Watershed Education and Training (B-WET) Regional Program (0 FTE/ 0 Positions, -\$7,450) - NOAA requests to terminate the Bay-Watershed Education and Training (B-WET) Regional Program. NOAA's operating plan for FY 2017 provided \$7,450 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.

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PROGRAM CHANGE PERSONNEL DETAIL**

Activity: Office of Education
Subactivity: Office of Education
Program Change: Office of Education

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Office Director	Washington, DC/Silver Spring, MD	ES	(1)	186,995	(186,995)
Supervisory Program Manager	Washington, DC/Silver Spring, MD	ZA-V	(2)	157,665	(315,330)
Program Specialist	Washington, DC/Silver Spring, MD	ZA-IV	(2)	137,413	(274,826)
Policy Analyst	Washington, DC/Silver Spring, MD	ZA-IV	(5)	137,413	(687,065)
Administrative Specialist	Washington, DC/Silver Spring, MD	ZA-II	(1)	72,832	(72,832)
Senior Policy Analyst	Washington, DC/Silver Spring, MD	ZA-IV	(2)	137,413	(274,826)
Outreach Specialist	Washington, DC/Silver Spring, MD	ZA-IV	(1)	96,970	(96,970)
IT Specialist	Washington, DC/Silver Spring, MD	ZP-III	(1)	97,574	(97,574)
Secretary	Washington, DC/Silver Spring, MD	ZS-IV	(1)	64,822	(64,822)
Budget Analyst	Washington, DC/Silver Spring, MD	ZA-IV	(1)	96,970	(96,970)
Total			<u>(17)</u>		<u>(2,168,210)</u>
less Lapse		0%	<u>0</u>		<u>0</u>
Total full-time permanent (FTE)			(17)		(2,168,210)
TOTAL					<u>(2,168,210)</u>

Personnel Data	Number
Full-Time Equivalent Employment	
Full-time permanent	(17)
Other than full-time permanent	<u>0</u>
Total	(17)
Authorized Positions:	
Full-time permanent	(18)
Other than full-time permanent	<u>0</u>
Total	(18)

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

Activity: Office of Education
Subactivity: Office of Education
Program Change: Office of Education

Object Class	2019 Decrease
Personnel compensation	
Full-time permanent	(2,168)
Other than full-time permanent	0
Other personnel compensation	0
Special personnel services payments	0
Total personnel compensation	(2,168)
Civilian personnel benefits	(468)
Benefits for former personnel	0
Travel and transportation of persons	(200)
Transportation of things	0
Rental payments to GSA	0
Rental Payments to others	(500)
Communications, utilities and miscellaneous charges	0
Printing and reproduction	(23)
Advisory and assistance services	0
Other services	(4,281)
Purchases of goods & services from Govt accounts	0
Operation and maintenance of facilities	0
Research and development contracts	0
Medical care	0
Operation and maintenance of equipment	0
Subsistence and support of persons	0
Supplies and materials	(150)
Equipment	(200)
Lands and structures	0
Investments and loans	0
Grants, subsidies and contributions	(11,370)
Insurance claims and indemnities	0
Interest and dividends	0
Refunds	0
Total obligations	(19,360)

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PRORAM CHANGE DETAIL BY OBJECT CLASS
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Activity: Office of Education
Subactivity: Office of Education
Program Change: BWET

<u>Object Class</u>	<u>2019 Decrease</u>
Personnel compensation	
Full-time permanent	0
Other than full-time permanent	0
Other personnel compensation	0
Special personnel services payments	0
Total personnel compensation	0
Civilian personnel benefits	0
Benefits for former personnel	0
Travel and transportation of persons	0
Transportation of things	0
Rental payments to GSA	0
Rental Payments to others	0
Communications, utilities and miscellaneous charges	0
Printing and reproduction	0
Advisory and assistance services	(886)
Other services	0
Purchases of goods & services from Govt accounts	0
Operation and maintenance of facilities	0
Research and development contracts	0
Medical care	0
Operation and maintenance of equipment	0
Subsistence and support of persons	0
Supplies and materials	0
Equipment	0
Lands and structures	0
Investments and loans	0
Grants, subsidies and contributions	(6,564)
Insurance claims and indemnities	0
Interest and dividends	0
Refunds	0
Total obligations	(7,450)

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Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE
(Dollar amounts in thousands)**

Activity: Construction

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Construction	Pos/BA	0	7,398	0	6,016	0	6,016	0	998	0	(5,018)
	FTE/OBL	0	88	0	13,660	0	6,016	0	998	0	(5,018)
Total Construction	Pos/BA	0	7,398	0	6,016	0	6,016	0	998	0	(5,018)
	FTE/OBL	0	88	0	13,660	0	6,016	0	998	0	(5,018)

Goal Statement

The Construction activity ensures that NOAA has safe and modern facilities to support NOAA’s critical science, service, and stewardship mission. NOAA’s facilities constitute a significant capital investment with over 700 different facilities (both owned and leased) with a current replacement value (CRV) of over \$5 billion. Of that, more than 50 percent (455) are owned and operated by NOAA, with a CRV of approximately \$2.4 billion. These facilities require maintenance, repair, and investment to keep them safe and secure.

Base Program

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.

Constructing new facilities and reinvesting in existing facilities ensures NOAA facilities align with the mission and facility conditions improve. 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 to make them easier to maintain.

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Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

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. NOAA will:

- Continue project management of the Office of Marine and Aviation Operations U.S. Naval Station Newport Pier project initiative in Newport, Rhode Island
- Continue preliminary work on the National Marine Fisheries Service's Northwest Fisheries Science Center in Mukilteo, Washington

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CHANGES FOR 2019
(Dollar amounts in thousands)**

		<u>2019 Base</u>		<u>2019 Estimate</u>		<u>Decrease</u>	
		Personnel	Amount	Personnel	Amount	Personnel	Amount
	NOAA	Pos./BA	0	6,016	0	998	0 (5,018)
	Construction	FTE/OBL	0	6,016	0	998	0 (5,018)

National Marine Fisheries Service Facilities Initiative (0 FTE/ 0 Positions, -\$4,526) – In FY 2017, NOAA requested funding to prepare for the replacement of the Northwest Fisheries Science Center facility in Mukilteo, Washington. The proposal included pre-construction activities such as project management; site preparation and fill; shoreline protection; NEPA process, consultations, and assessments; and, contract services for building design. The funding was provided in the FY 2017 Appropriations Act, and is sufficient to complete these activities. While this facility remains a priority because of its structural condition, construction costs are not requested in FY 2019 due to other needs across the agency.

Newport Pier Project (0 FTE/ 0 Positions, -\$1,490) – NOAA requests a decrease of \$1,490 to conclude planning and design for a pier at NAVSTA Newport. Funds provided under a FY 2018 Annualized Continuing Resolution will be sufficient to complete the design phase of the pier.

Facilities Planning (0 FTE/ 0 Positions, +\$998) - NOAA requests an increase of \$998 for the NOAA Construction program to conduct planning and other activities including regional analyses focused on consolidation and colocation opportunities on a region such as National Capital, Southeast, Northeast, Mid-Atlantic, Gulf Coast, Great Lakes, Pacific Northwest, Alaska, Southwest, Southern California, or the Midwest/Great Plains.

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(Dollar amounts in thousands)

Activity: Construction
Subactivity: NOAA Construction
Program Change: National Marine Fisheries Service Facilities Initiative

Object Class	2019 Decrease
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12.1 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23 Rent, communications, and utilities	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25 Consulting and other services	0
25.1 Advisory and assistance services	(3,885)
25.2 Other services	(641)
25.3 Purchases of goods & services from Gov't accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99.9 Total obligations	(4,526)

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PRORAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)**

Activity: Construction
Subactivity: NOAA Construction
Program Change: Newport Pier Project

Object Class		2019 Decrease
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	(1,490)
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	(1,490)

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

Activity: Construction
Subactivity: NOAA Construction
Program Change: Facilities Planning

Object Class		2019 Increase
11.1	Full-time permanent	0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12.1	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23	Rent, communications, and utilities	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25	Consulting and other services	0
25.1	Advisory and assistance services	998
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	0
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99.9	Total obligations	998

BUDGET PROGRAM: OFFICE OF MARINE AND AVIATION OPERATIONS

For FY 2019, NOAA requests a total of \$335,409,000 and 970 FTE for the Office of Marine and Aviation Operations, including an increase of \$4,896,000 and 0 FTE in program changes.

Office of Marine and Aviation Operations Overview

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 in 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 the four engine WP-3D, capable of penetrating hurricanes, to the De Havilland 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 readily 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 commands and supports the NOAA fleet, and 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 flag officers.

OMAO’s budget has two activities under the Operations, Research, and Facilities (ORF) account:

- Marine Operations and Maintenance (\$180,192,000 and 840 FTE)
- Aviation Operations and Aircraft Services (\$32,527,000 and 122 FTE)

OMAO’s budget has one activity in the Procurement, Acquisition, and Construction account:

- Fleet Replacement (\$86,116,000 and 8 FTE), which includes the Fleet Capital Improvements and Technology Infusion and the New Vessel Construction Program, Project, or Activity (PPA) lines.

The OMAO budget also includes the following other mandatory and discretionary accounts:

- NOAA Commissioned Officer Corps Retirement Pay
- Medicare-Eligible Retiree Healthcare Fund

Significant Inflationary Adjustments:

Calculated Adjustments

NOAA’s FY 2019 Base includes a total of \$3,007,000 to account for inflationary adjustments to current programs for OMAO activities. This includes the estimated 2019 military pay raise of 2.6 percent as well as inflationary increases for non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

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JUSTIFICATION OF PROGRAM AND PERFORMANCE**
(Dollar amounts in thousands)

Activity: Marine Operations and Maintenance

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Marine Operations and Maintenance	Pos/BA	844	177,121	869	177,636	869	180,192	869	181,170	0	978
	FTE/OBL	840	180,547	840	178,608	840	180,192	840	181,170	0	978
Total Marine Operations and Maintenance	Pos/BA	844	177,121	869	177,636	869	180,192	869	181,170	0	978
	FTE/OBL	840	180,547	840	178,608	840	180,192	840	181,170	0	978

Goal Statement

The Marine Operations and Maintenance sub-activity goals are to:

- Support present and future NOAA data collection by securing operational readiness and maximum capability of the NOAA Fleet.
- Extend the service life of ships through general maintenance and repair of ships.
- Expand vessel productivity by installing emergent technology for data collection and improving ship infrastructure.
- Provide properly trained personnel to meet project schedules and user requirements aboard NOAA vessels.
- Support NOAA’s priorities by carrying out the annual ship allocation schedule approved by the NOAA Fleet Council.
- Increase utilization of the Fleet through efficient management and coordination of project schedules, port services, operating procedures, and engineering support for NOAA’s ships.
- Plan periodic depot-level capital investments across the Fleet by prioritizing tasks and determining ship availability for dockside and dry dock repairs.
- Achieve operational safety while facilitating self-sufficiency at sea by training and qualifying NOAA divers, including employees, volunteers and contractors diving in support of NOAA’s mission.
- Provide a safe field environment through training and certifying NOAA Corps officers, crew, and scientists in at-sea safety requirements for their positions.

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- Ensure the safety of NOAA's small-boat operations through the enforcement of the safety program policy, reducing risk and promoting standardization.

Marine Operations and Maintenance supports centralized management for NOAA's 16 active 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.

Base Program

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 area(s) of each vessel.

Given the diverse portfolio of NOAA program requirements and responsibilities, no one vessel type meets all of NOAA's mission requirements. The Marine Operations and Maintenance program makes sure the right ship is ready where and when NOAA needs it. This includes working through NOAA's Fleet Council, with input from across NOAA, to balance ship schedules.

In FY 2019, OMAO plans to provide approximately 2,625 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, outfitting, fuel, (assuming a price of \$2.63 per gallon), and other costs necessary to support ship operations. As ships age, unscheduled maintenance can occur, increasing the cost of operation, while at the same time decreasing the number of DAS NOAA can execute. Additional DAS may be funded by programs as determined during the year of budget execution, based on the availability of vessels and funds. Program funded days at sea (PFD) are established through Service Level Agreements (SLA) with NOAA programs as well as reimbursable agreements with other agencies, such as the Environmental Protection Agency and Bureau of Ocean Energy Management.

Marine operations and maintenance provides funds for routine operational maintenance and repair of NOAA ships, as well as the critical scientific and technical equipment necessary to meet ongoing stakeholder requirements. Regular maintenance is non-critical but necessary repairs required for proper preventive maintenance. It allows NOAA ships to meet the rigorous demands of NOAA's scientific, regulatory, and scientific missions. Operational maintenance, including unscheduled maintenance, is required to ensure operational readiness, and is increasing due to NOAA's aging fleet. Unscheduled maintenance costs are typically reported as the

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Ship	Length	Class	Primary Mission	Homeport	Ship Age (years)
<i>Rainier</i>	231 ft.	Ocean	2	Newport, OR	49
<i>Fairweather</i>	231 ft.	Ocean	2	Ketchikan, AK	49
<i>Oregon II</i>	170 ft.	Regional	1	Pascagoula, MS	49
<i>Hi'ialakai</i>	224 ft.	Ocean	1, 2, 3	Honolulu, HI	32
<i>Oscar Elton Sette</i>	224 ft.	Ocean	3	Honolulu, HI	29
<i>Okeanos Explorer</i>	224 ft.	Ocean	1, 2	Davisville, RI	28
<i>Gordon Gunter</i>	224 ft.	Ocean	1	Pascagoula, MS	27
<i>Nancy Foster</i>	187 ft.	Ocean	1	Charleston, SC	26
<i>Thomas Jefferson</i>	208 ft.	Ocean	2	Norfolk, VA	25
<i>Ronald H. Brown</i>	274 ft.	Global	3	Charleston, SC	20
<i>Oscar Dyson</i>	209 ft.	Ocean	1	Kodiak, AK	13
<i>Henry B. Bigelow</i>	209 ft.	Ocean	1	Newport, RI	11
<i>Pisces</i>	209 ft.	Ocean	1	Pascagoula, MS	9
<i>Bell M. Shimada</i>	209 ft.	Ocean	1	Newport, OR	8
<i>Ferdinand R. Hassler</i>	124 ft.	Regional	2	New Castle, NH	7
<i>Reuben Lasker</i>	209 ft.	Ocean	1	San Diego, CA	4

Mission 1: Assessment and Management of Living Marine Resources
Mission 2: Charting and Mapping
Mission 3: Oceanographic Monitoring, Research, and Modeling

costs associated with repairing mechanical casualties that occur while a ship is underway during the field season. In FY 2017, this cost was approximately \$5.5 million, an increase of \$0.9 million or 20 percent from FY 2016, and a loss of 396 operational days at sea.

The NOAA fleet must adhere to various requirements and regulations related to safety and emissions put forth by three Federal organizations. The American Bureau of Shipping (ABS) certifies ships as seaworthy. OMAO uses ABS rules to design its

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maintenance program and conduct Ship Structure and Machinery Evaluations (SSME) on the NOAA Fleet. Under the Clean Air Act, the Environmental Protection Agency (EPA) issues regulations governing airborne emissions that affect ship engine and exhaust components. The U.S. Coast Guard (USCG) issues regulations on all discharges from ships so that 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 (NDCSB), 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, operational safety, and facilitate self-sufficiency at sea.

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.

Statement of Operating Objectives

Schedule and Milestones/Deliverables:

- Annual ship schedules and milestones are governed by the Fleet Allocation Plan (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.
- All ships have a set drydock and dockside repair maintenance period based on ABS scheduling by ship class.
- OMAO plans to provide approximately 2,625 DAS and a 71 percent utilization rate for 16 active ships.

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- Program-Funded DAS as scheduled.
- 2,283 Square Nautical Miles surveyed.
- More detailed deliverables are determined on a project-by-project basis as documented in sailing instructions.

PROGRAM CHANGES FOR FY 2019:

NOAA requests an increase of \$978,000 and 0 FTE in FY 2019 program changes for the Marine Operations and Maintenance activity. No program change narrative is provided for this activity as this program change represents less than five percent of a PPA. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-8).

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Activity: Aviation Operations and Aircraft Services

Comparison by subactivity		2017		2018		2019		2019		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Aviation Operations and Aircraft Services	Pos/BA	123	34,701	127	32,076	127	32,527	127	34,683	0	2,156
	FTE/OBL	122	35,904	122	32,423	122	32,527	122	34,683	0	2,156
Total Aviation Operations and Aircraft Services	Pos/BA	123	34,701	127	32,076	127	32,527	127	34,683	0	2,156
	FTE/OBL	122	35,904	122	32,423	122	32,527	122	34,683	0	2,156

Goal Statement

Aviation Operations and Aircraft Services activity goals are to:

- Provide NOAA with centralized aircraft systems management and coordination of airborne flight time;
- Support NOAA’s priorities by carrying out the annual aircraft allocation schedule approved by the NOAA Fleet Council;
- Create a workforce of specially-trained civilians and NOAA Corps officers trained to modify, maintain, and operate aircraft to meet data collection requirements;
- Maintain the airworthiness and operating standards of aircraft for optimum safety;
- Operate aircraft in compliance with Federal Aviation Administration (FAA) regulations;
- Standardize scientific systems whenever possible and develop and operate prototype and operational scientific-research instrumentation aboard NOAA aircraft;
- Provide training, engineering and technical support, certification and oversight, and standards and policy development for NOAA’s Unmanned Aircraft Systems operations;
- Arrange for safe commercial aviation services for NOAA programs when using contracted aircraft by providing centralized expertise.

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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 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.

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.

NOAA Hurricane Hunter crews and scientists flew over 300 hours in Hurricanes Harvey, Maria and Irma aboard one of NOAA's WP-3D and Gulfstream IV, collecting vital data that was used by NOAA researchers, modelers and forecasters to predict Harvey's path and forecast its catastrophic rainfall. NOAA air crews aboard the agency's King Air and a Twin Otter used sophisticated equipment to take aerial images of damaged communities to help homeowners and emergency managers plan for recovery.

AOC's support of NOAA's missions also includes the oversight of Unmanned Aircraft Systems (UAS). 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

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unmanned aircraft, and designates responsibility to AOC for their management and operational control. AOC ensures that safety and compliance with aviation regulations and policy is maintained.

With current resources, AOC will support approximately 3,090 OMAO-funded flight hours in support of NOAA scientific airborne requirements in FY 2019. This represents 20 percent fewer hours than NOAA could plan for without these higher operating costs. NOAA's new facility in Lakeland requires AOC to make monthly lease payments and pay higher fuel costs than were required when AOC was located at MacDill Air Force Base in Tampa, FL. 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.

NOAA's Aircraft Fleet detail for FY 2019, including information for the current program, is provided on the following page. NOAA is also developing an aircraft recapitalization plan that addresses the current and future airborne observational infrastructure required to meet its mission. Without recapitalization and reductions of single points of failure, the potential loss of NOAA aircraft may impact the ability to plan for and respond to the Nation's most damaging and deadly weather events, agricultural security and water security.

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 3,090 flight hours, which includes 2,675 mission hours to support NOAA's highest priority requirements and 415 hours for training, maintenance flights, and calibration testing
- 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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Aircraft	Type	Mission	Location	Status
HEAVY: (2) Lockheed WP-3D	4-engine turbo prop	Air quality (OAR) Hurricane research (OAR) Hurricane reconnaissance (NWS) Ocean winds (NESDIS, NWS) Hurricane intensity forecasting (NWS) Atmospheric research (OAR)	Lakeland Linder Regional Airport, FL	N42: Active N43: Active
MID: (1) Gulfstream G-IV	2-engine turbo jet	Hurricane surveillance (NWS) Hurricane intensity forecasting (NWS) Atmospheric research (OAR)	Lakeland Linder Regional Airport, FL	N49: Active
LIGHT: (4) Dehavilland Twin Otter DHC-6	2-engine turbo prop	Aerial surveys (NMFS) Atmospheric research (OAR) Snow/Water Resources Surveys (NWS)	Lakeland Linder Regional Airport, FL	N46: Active N48: Active N55: Active N57: Active
(1) King Air	2-engine turbo prop	Photogrammetry (NOS) Multi-spectral scanner (NOS) Airborne bathymetric LIDAR (NOS, NWS) Post-storm damage assessment (NOS)	Lakeland Linder Regional Airport, FL	N68: Active
(1) Jet Prop Commander AC/695	2-engine turbo prop	Fisheries observations (NMFS) Marine mammal observations (NMFS) Snow/Water Resources Surveys (NWS)	Lakeland Linder Regional Airport, FL	N45: Active

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(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Aviation Operations and Aircraft Services	Pos./BA	0	32,527	0	34,683	0	2,156
	FTE/OBL	0	32,527	0	34,683	0	2,156

Increased costs for NOAA Aircraft facility (0 FTE/ 0 Positions, +\$2,156) -- NOAA requests an increase to accommodate lease and fuel costs for NOAA's Aircraft Operations Center (AOC) at Lakeland Linder Regional Airport.

AOC aircraft are flown in support of NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment and provide scientists with the airborne platforms necessary to collect the environmental and geographic data essential to their research. NOAA provides a wide range of specialized airborne data collection capabilities vital to understanding the Earth, conserving and managing coastal and marine resources, and protecting lives and property. NOAA's aircraft operate throughout the United States and around the world; over open oceans, mountains, coastal wetlands, and Arctic pack ice.

On February 1, 2016, the United States Air Force (USAF) notified NOAA that they needed the AOC's current hangar at the MacDill Air Force Base to meet Department of Defense mission requirements. NOAA relocated to the Lakeland Linder Regional Airport and has been operating there since mid-2017. NOAA incurs higher operational costs at the Lakeland site because it is required to make monthly lease payments and because access to military fuel prices are not as readily available resulting in higher fuel costs. The cost increase has caused reductions to the funding available to support NOAA' flight operations in FY 2018.

Operating costs for AOC are funded through the Aviation Operations and Aircraft Services PPA. This PPA supports OMAO's flight hours and pays the fuel, maintenance, travel, premium pay and other costs associated with the many NOAA projects conducted on OMAO's aircraft. NOAA must balance all of these activities within available resources under this PPA. NOAA estimates additional operational funding will support 790 more flight hours than could be supported within current resources due to the increased lease and fuel costs. This increase will support NOAA products and services that affect American health, safety, and local economies. Flight hours support research to improve hurricane forecast models and critical storm tracking operations needed to alert people in danger of being in a hurricane's path; soil moisture and snow projections, which are critical for decisions on water supply and flood

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prediction; emergency response for events including flooding and tornadoes; coastal mapping, integral to safe navigation and efficient transport of commercial products; and protected species surveys of seabirds, sea turtles and the marine mammals. Planned flight hours are contingent upon approval by NOAA's Fleet Council. The number of hours planned depends on the aircraft and mission, with heavy aircraft, such as the P-3 and GIV, costing almost five times more per hour than the smaller, lighter aircraft.

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Performance Measures:					
OMAO Funded Flight Hours					
With Increase	3,880	3,880	3,880	3,880	3,880
Without Increase	3,090	3,090	3,090	3,090	3,090

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollars in thousands)

Activity: Aviation Operations and Aircraft Services
Subactivity: Aviation Operations and Aircraft Services
Program Change: Increased Costs for NOAA Aircraft Facility

Object Class	2019 Increase
11 Personnel compensation	
11.1 Full-time permanent	0
11.3 Other than full-time permanent	0
11.5 Other personnel compensation	0
11.8 Special personnel services payments	0
11.9 Total personnel compensation	0
12 Civilian personnel benefits	0
13 Benefits for former personnel	0
21 Travel and transportation of persons	0
22 Transportation of things	0
23.1 Rental payments to GSA	0
23.2 Rental Payments to others	0
23.3 Communications, utilities and miscellaneous charges	0
24 Printing and reproduction	0
25.1 Advisory and assistance services	0
25.2 Other services	2,156
25.3 Purchases of goods & services from Govt accounts	0
25.4 Operation and maintenance of facilities	0
25.5 Research and development contracts	0
25.6 Medical care	0
25.7 Operation and maintenance of equipment	0
25.8 Subsistence and support of persons	0
26 Supplies and materials	0
31 Equipment	0
32 Lands and structures	0
33 Investments and loans	0
41 Grants, subsidies and contributions	0
42 Insurance claims and indemnities	0
43 Interest and dividends	0
44 Refunds	0
99 Total obligations	2,156

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

Activity: Fleet Replacement

Comparison by subactivity		2017 Actual		2018 Annualized CR		2019 Base		2019 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Fleet Capital Improvements & Tech Infusion	Pos/BA	1	11,625	1	11,621	1	11,621	1	12,878	0	1,257
	FTE/OBL	1	11,609	1	11,882	1	11,621	1	12,878	0	1,257
New Vessel Construction	Pos/BA	1	74,494	7	74,495	7	74,495	7	75,000	0	505
	FTE/OBL	1	14,279	7	209,772	7	74,495	7	75,000	0	505
Total Fleet Replacement	Pos/BA	2	86,119	8	86,116	8	86,116	8	87,878	0	1,762
	FTE/OBL	2	25,888	8	221,654	8	86,116	8	87,878	0	1,762

Goal Statement

Fleet Replacement activity goals are to:

- Ensure that NOAA will have the necessary aircraft and ship platforms in support of NOAA's airborne and at-sea data requirements.
- Maintain NOAA's current fleet at a higher state of readiness; extending service life, and avoiding mechanical, structural, and mission equipment obsolescence.
- Address the growing backlog of deferred maintenance on NOAA's vessels.
- Advance coastal and worldwide ocean survey and data collection through investment in new vessel construction, promoting global environmental assessment, prediction, and stewardship of the Earth's environment.
- Provide aircraft and ship platforms designed specifically for NOAA data requirements, maximizing Flight Hour and Days at Sea efficiency and effectiveness.

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Base Program

FLEET CAPITAL IMPROVEMENTS AND TECHNOLOGY INFUSION

The Fleet 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 fleet. It ensures that the required upgrades to aircraft and ship-board systems and mission equipment are in line with both safety requirements and the needs of the programs. During the maintenance cycle, 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.

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 manufacture provided Service Life Extension 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.

OMAO monitors the material condition of the ships using a Ship Structure and Machinery Evaluation (SSME), which captures the ship's condition. The SSME documents the results of inspections and identifies future work requirements, which guides future capital investment decision making. At the same time, OMAO uses manufacturer-provided information for new ships to develop maintenance profiles. In FY 2018, OMAO will complete ship material condition assessments performed by the American Bureau of Shipping. The data from these assessments will be critical to maximizing future maintenance investments.

To better maintain NOAA's ships, OMAO conducts progressive lifecycle maintenance. Progressive lifecycle maintenance is a stabilized capital investment that proactively maintains vessels before systems fail. It addresses needed repairs that improve the material condition of the ships, and provides sustained critical technology refresh. Progressive maintenance ensures NOAA ships remain capable of collecting environmental data to support NOAA's mission to provide accurate and reliable information to the public.

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The chart below lists the types of capital investments that will 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 Environmental equipment replace	Space renovation Government furnished equipment	Propulsion & generation systems overhaul Re-piping Fire suppression upgrades Machinery monitoring upgrades	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

Statement of Operating Objectives

Schedule and Milestones:

- Conduct service life and material condition assessments for NOAA vessels
- Perform phased overhauls, upgrades, and replacements of ship’s systems through infrastructure improvement plans
- Develop long range ship maintenance plans

Deliverables:

- Ensure the continued capability of the NOAA Fleet
- Attain the planned operational service life of all vessels

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Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

- Decrease deferred maintenance backlog

NEW VESSEL CONSTRUCTION

The New Vessel Construction program includes both vessel acquisition and instrumentation and 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 capability (platform) requirements, preliminary costs and timelines. Acquisition of new ships is the best way for NOAA to reliably and consistently sustain its at-sea data collection capability. 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.

Eight of NOAA's ships have exceeded their design service life and are currently due to retire by 2028. In October 2016, NOAA released the Fleet Plan that assesses NOAA's current and future (2016-2028) at-sea observational infrastructure needs in 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.

In contrast to the wide variety of vessel types that currently comprise the NOAA Fleet, the future NOAA Fleet will consist of three to five¹ distinct vessel types that each focus on a core mission with secondary missions that make the best use of the vessel's capabilities. These vessels are described in the table on the next page.

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 costs.

¹This will depend on the ability to leverage aspects of previous ship class designs, such as the FSV and AGOR to meet mission requirements, regulatory and environmental requirements, regionally driven specifications, and acquisition regulations.

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Ship	Primary Mission	Secondary Mission(s)
N/V CLASS A	Oceanographic Monitoring, Research & Modeling	Assessment and Management of Living Marine Resources (no trawl), Charting and Surveying
N/V CLASS B	Charting and Surveying	Assessment and Management of Living Marine Resources (no trawl), Oceanographic Monitoring, Research & Modeling
N/V CLASS C	Assessment and Management of Living Marine Resources (trawl-capable, shallow-draft)	Charting and Surveying
N/V CLASS D	Assessment and Management of Living Marine Resources (trawl capable, near-shore and deep ocean, longer endurance)	Charting and Surveying, Oceanographic Monitoring, Research & Modeling

Planning for future fleet needs begins with Force Architecture. Force Architecture includes defining vessel characteristics at a very high level. From there, 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. Funding in FY 2016 and FY 2017 enabled NOAA to enter into an Interagency Agreement with the Navy for programmatic support to begin the acquisition of the first class of vessels - an NOAA Vessel (N/V) Class A AGOR variant. FY 2018 funding allowed NOAA to obligate funds to the Navy for the Detail Design and Construction of the first vessel, and includes funding for the acquisition of a second vessel. FY 2018 funding also supports Force Architecture efforts to inform characteristics of Class B and C vessels, based on the continued requirements analysis, feasibility studies, and analysis of alternatives. FY 2019 funds will allow NOAA to continue funding for the acquisition of the second N/V Class A and continue performing the necessary analyses and feasibility studies for the Class B and C vessels.

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Statement of Operating Objectives

Schedule and Milestones:²

2019

- Award the N/V Class A (NOAA AGOR Variant) Preliminary Design Competition
- Continue efforts to better inform Class B and C Vessel characteristics through continued requirements analysis feasibility studies and analysis of alternatives
- Review, assess, and update the Fleet Recapitalization Plan

2020

- Begin N/V Class A Detail Design and Construction
- Continue analyses/studies for Class B
- Continue concept development efforts for Class C
- Force Architecture efforts continue to define vessel characteristics.

2021

- Award funding for construction of the second N/V Class A
- Complete analyses/studies and begin concept development efforts for Class B
- Complete concept development efforts and initiate preliminary design competition for Class C
- Force Architecture efforts continue to define vessel characteristics.

2022

- Begin construction of second N/V Class A
- Continue concept development efforts and initiate acquisition documentation for Class B
- Begin Detail Design and Construction for Class C
- Force Architecture efforts continue to define vessel characteristics

2023

- Deliver first N/V Class A
- Complete concept development efforts and initiate preliminary design competition for Class B
- Begin construction of second N/V Class C
- Force Architecture efforts continue to define vessel characteristics.

² Obligations will be timed for the efficient and timely completion of activities listed.

**Department of Commerce
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Procurement, Acquisition, and Construction
JUSTIFICATION OF PROGRAM AND PERFORMANCE**

Deliverables:

- Two N/V Class A AGOR, adapted for NOAA's at-sea data collection (2023 and 2024)
- N/V Class B and/or C (2025 and beyond)
- Additional deliverables TBD

Out-year Funding Estimates (\$ in Thousands):

Fleet Recapitalization	2018 Annualized CR & Prior	2019	2020	2021	2022	2023	CTC	Total
Change from 2019 Base³	0	505	505	505	505	505	TBD	TBD
Total Request	229,545	75,000	75,000	75,000	75,000	75,000	TBD	TBD

PROGRAM CHANGES FOR FY 2019:

NOAA requests a total increase of \$1,762,000 and 0 FTE in FY 2019 program changes for the OMAO Fleet Replacement activity. Following this section are program change narratives for this activity that represent program changes greater than five percent of a PPA and/or are new starts or terminations. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-12).

³ No Exhibit 13 is provided because this change from the FY 2019 Base is less than 5% of the PPA.

**Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
INCREASES FOR 2019**
(Dollar amounts in thousands)

		2019 Base		2019 Estimate		Increase	
		<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>	<u>Personnel</u>	<u>Amount</u>
Fleet Capital							
Improvements and Tech	Pos./BA	0	11,621	0	12,878	0	1,257
Infusion	FTE/OBL	0	11,621	0	12,878	0	1,257

Progressive Lifecycle Maintenance (0 FTE/ 0 Positions, +\$1,257) – NOAA requests an increase to support capital repairs to NOAA’s ship fleet through Progressive Lifecycle Maintenance.

The increase will provide funds to extend the service life of its ships and address the backlog of needed repairs. NOAA’s backlog continues to grow and was almost \$29 million in the first quarter of FY 2018. Progressive Lifecycle Maintenance addresses repairs that improve the material condition of the ships and provides sustained critical technology refresh. It stabilizes capital investment that proactively maintains vessels before systems fail which can result in unscheduled maintenance. In FY 2017, NOAA spent approximately \$5.5 million on unscheduled maintenance, which resulted in 396 lost days at sea. Days were lost for missions such as nautical charting off the Florida and Alaska coast as well as fish and marine mammal surveys in New England.

Progressive Lifecycle Maintenance funds ensure ships remain capable of collecting data to support NOAA’s mission of providing accurate and reliable information to the public. To maintain this capability and extend the operational service life of each ship, the majority of the ship’s integrated systems will require significant upgrades or full replacements as these systems approach the end of their intrinsic service life. Funding in FY 2019 will allow NOAA to continue replacing unsupported navigational equipment, propulsion control, drive systems and crane and ship control systems. The chart below lists the types of capital investments that will vary from year-to-year based on the results of Ship Structure and Machinery Evaluations (SSMEs) that assess the material condition of the ships and determine priority repairs.

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

Activity: OMAO Fleet Replacement
Subactivity: Fleet Capital Improvements and Tech Infusion
Program Change: Progressive Lifecycle Maintenance

<u>Object Class</u>	<u>2019 Increase</u>
Personnel compensation	
Full-time permanent	0
Other than full-time permanent	0
Other personnel compensation	0
Special personnel services payments	0
Total personnel compensation	0
Civilian personnel benefits	0
Benefits for former personnel	0
Travel and transportation of persons	0
Transportation of things	0
Rental payments to GSA	0
Rental Payments to others	0
Communications, utilities and miscellaneous charges	0
Printing and reproduction	0
Advisory and assistance services	0
Other services	1,257
Purchases of goods & services from Govt accounts	0
Operation and maintenance of facilities	0
Research and development contracts	0
Medical care	0
Operation and maintenance of equipment	0
Subsistence and support of persons	0
Supplies and materials	0
Equipment	0
Lands and structures	0
Investments and loans	0
Grants, subsidies and contributions	0
Insurance claims and indemnities	0
Interest and dividends	0
Refunds	0
Total obligations	1,257

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**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

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.

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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
2018 Annualized CR	0	0	30,102	30,102
2019 Plus: Inflationary Adjustments to Base			(27)	(27)
2019 Base	0	0	30,075	30,075
plus 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	30,075	30,075

		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Corps Retirement Pay	Pos/BA	0	29,375	0	30,102	0	30,075	0	30,075	0	0
	FTE/OBL	0	27,341	0	30,102	0	30,075	0	30,075	0	0
Total: NOAA Corps Retirement Pay	Pos/BA	0	29,375	0	30,102	0	30,075	0	30,075	0	0
	FTE/OBL	0	27,341	0	30,102	0	30,075	0	30,075	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	27,341	0	30,102	0	30,075	0	30,075	0	0
Total Obligations	0	27,341	0	30,102	0	30,075	0	30,075	0	0
Adjustments to Obligations:										
Unobligated balance	0	2,034	0	0	0	0	0	0	0	0
Total Budget Authority	0	29,375	0	30,102	0	30,075	0	30,075	0	0
Financing from Transfers:										
Net Appropriation	0	0	0	0	0	0	0	0	0	0
	0	29,375	0	30,102	0	30,075	0	30,075	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ Decrease
13 Benefits for former personnel	26,875	27,602	27,575	27,575	0
25.3 Purchases of goods and services from Gov't accounts	2,500	2,500	2,500	2,500	0
99.9 Total Obligations	27,341	30,102	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	2,034	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	29,375	30,102	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 Healthcare Fund Contribution – NOAA Corps
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

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. For FY 2019, payments to the accrual fund are estimated at \$1,603,000.

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**Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Healthcare Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)**

	Positions	FTE	Budget Authority	Direct Obligations
2018 Annualized CR	0	0	1,603	1,603
plus: 2018 Adjustments to Base	0	0	0	0
2019 Base	0	0	1,603	1,603
plus 2019 Program Changes	0	0	0	0
2019 Estimate	0	0	1,603	1,603

		2017 Actual		2018 Annualized CR		2019 Base Program		2019 Estimate		Increase/Decrease	
		Personne	Amount	Personn	Amount	Personne	Amount	Personne	Amount	Personne	Amou
Medicare Eligible	Pos/BA	0	1,936	0	1,603	0	1,603	0	1,603	0	0
Healthcare Fund Contribution	FTE/OB L	0	1,365	0	1,603	0	1,603	0	1,603	0	0
Total: Medicare Eligible	Pos/BA	0	1,936	0	1,603	0	1,603	0	1,603	0	0
Retiree Healthcare Fund	FTE/OB L	0	1,365	0	1,603	0	1,603	0	1,603	0	0

**Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Healthcare Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)**

	2017		2018		2019		2019		Increase/ Decrease	
	Actual		Annualized CR		Base		Estimate			
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	1,365	0	1,603	0	1,603	0	1,603	0	0
Total Obligations	0	1,365	0	1,603	0	1,603	0	1,603	0	0
Adjustments to Obligations:										
Unobligated balance	0	571	0	0	0	0	0	0	0	0
Total Budget Authority	0	1,936	0	1,603	0	1,603	0	1,603	0	0
Financing from Transfers and Other:										
Net Appropriation	0	1,365	0	1,603	0	1,603	0	1,603	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

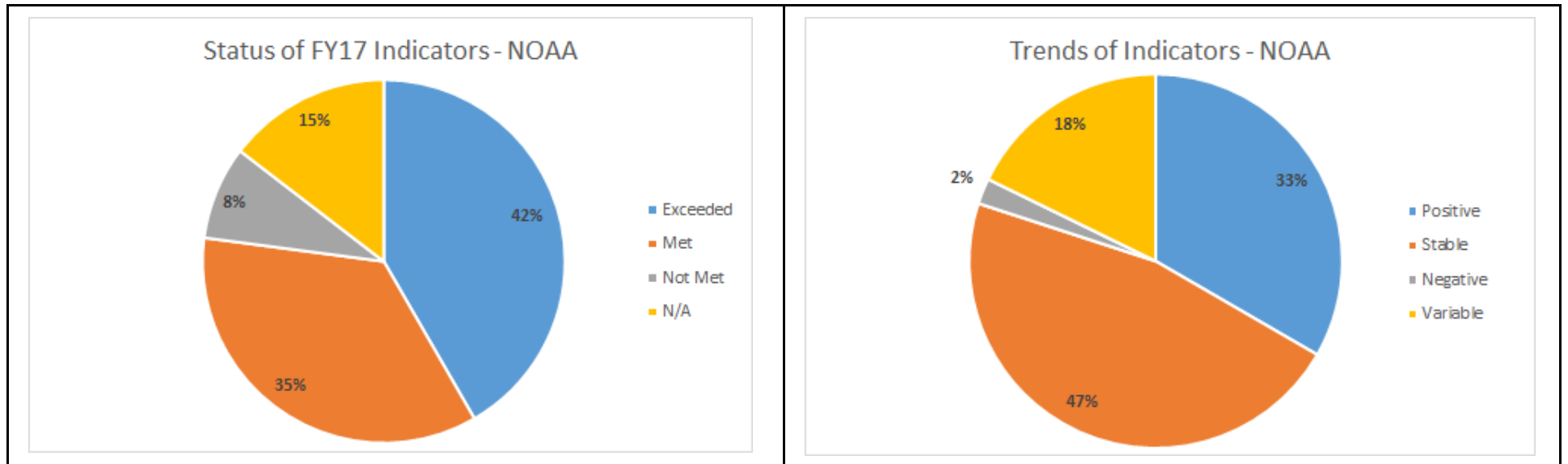
Object Class	2017 Actual	2018 Annualized CR	2019 Base	2019 Estimate	Increase/ Decrease
25.3 Purchases of goods and services from Gov't accounts	1,365	1,603	1,603	1,603	0
99.9 Total Obligations	1,365	1,603	1,603	1,603	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	571	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	1,936	1,603	1,603	1,603	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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FY 2019/2017 Annual Performance Plan and Report
(National Oceanic and Atmospheric Administration – NOAA)

Performance Indicator Information

Summary of Indicator Performance



Overall, 20 (42%) indicators Exceeded targets, 17 (35%) Met targets, and 4 (8%) had Not Met targets in FY17. Seven (15%) measures did not have targets. Of the indicators presented here, 45 had at least three years of data and thus have a Trend result. Of the indicators with a Trend, 15 (33%) had a Positive trend, 21 (47%) had a Stable trend, 1 (2%) had a Negative trend, and 8 (18%) had a trend status of Varying.

FY 2019/2017 Annual Performance Plan and Report
(National Oceanic and Atmospheric Administration – NOAA)

Summary of FY 2017 Indicator Performance

INDICATOR	FY17 TARGET	FY17 ACTUAL	STATUS	TREND
Annual number of peer-reviewed publications related to environmental understanding and prediction	1700	1678	MET	Variable
Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (reported by each individual Sea Grant College)	20,770	7,100	NOT MET	Variable
Key milestones completed on time for satellites and ship deployments	2	2	MET	Stable
Base Funded Days-at-Sea for NOAA Ships	2,985	2,554	NOT MET	Positive
Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	65	65	MET	Stable
Number of fishermen, seafood processors and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety.	N/A*	19,900	N/A**	N/A***
Increase annual number of NOAA partnerships with the private sector (# of Cooperative Research and Development Agreements executed)	N/A	14	N/A	Variable
Percentage of data processed and delivered to operational users (NWS and other NOAA line offices, US military and operational partners) from NOAA-managed satellites.	98.5%	99.49%	EXCEEDED	Stable

FY 2019/2017 Annual Performance Plan and Report
(National Oceanic and Atmospheric Administration – NOAA)

The cumulative number of NOAA datasets made openly available via Partners' cloud platforms to the public, America's Weather Enterprise and other environmental information stakeholders.	N/A	6	N/A	N/A
Reduction in gap between high-performance computing deployed and what is needed to meet modeling requirements	N/A	13	N/A	N/A
U.S. Temperature Forecast Skill	26	34	EXCEEDED	Stable
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
Severe Weather Warnings Tornadoes - Storm Based Lead Time (Minutes)	13	9	NOT MET	Stable
Severe Weather Warnings Tornadoes - Storm Based Accuracy (%)	72%	58%	NOT MET	Stable
Severe Weather Warnings Tornadoes - Storm Based False Alarm Ratio (%)	71%	72%	MET	Stable
Severe Weather Warnings for Flash Floods - Lead Time (minutes)	63	73	EXCEEDED	Variable
Severe Weather Warnings for Flash Floods - Accuracy (%)	76%	77%	EXCEEDED	Stable
Hurricane Forecast Track Error (48-Hour) (nautical miles)	68	56****	EXCEEDED	Variable
Hurricane Forecast Intensity Error (48 hour) (knots)	12	13	MET	Variable
Accuracy (%) (Threat Score) of Day 1 Precipitation Forecasts	33%	34%	EXCEEDED	Positive

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Winter Storm Warnings - Lead Time (Hours)	20	22	EXCEEDED	Stable
Winter Storm Warnings - Accuracy (%)	90	87	MET	Stable
Marine Wind - Percentage of Accurate Forecasts	78%	81%	EXCEEDED	Positive
Marine Wave Heights - Percentage of Accurate Forecasts	81%	84%	EXCEEDED	Positive
Aviation Ceiling/Visibility Forecast Accuracy Instrument Flight Rules (IFR)	65%	63%	MET	Stable
Aviation Ceiling/Visibility False Alarm Ratio (%) Instrument Flight Rules (IFR)	38%	37%	EXCEEDED	Positive
Geomagnetic Storm Forecast Accuracy (%)	40%	65%	EXCEEDED	Positive
American Customer Satisfaction Index for NOAA's National Weather Service	80	82	N/A	Stable
Number of Storm Ready Communities	N/A	2750	N/A	Positive
Number of Tsunami Ready Communities	N/A	249	N/A	Positive
Number of communities that utilize Digital Coast	5500	7040	EXCEEDED	Positive
Annual number of Coastal, Marine, and Great Lakes Ecological Characterizations that Meet Management Needs	48	100	EXCEEDED	Stable
Cumulative number of coastal, marine and Great Lakes issue-based forecasting capabilities developed and used for management	113	108	MET	Positive
Percentage of Tools, Technologies, and Information Services that are used by	91%	94%	EXCEEDED	Stable

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NOAA Partners/Customers to Improve Ecosystem-based Management				
Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards	66%	69%	EXCEEDED	Positive
Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles)	2287	2480	EXCEEDED	Variable
Percent of top 175 U.S. seaports with access to Physical Oceanographic Real-Time Systems (PORTS®), which improves the safety and efficiency of marine transportation	35%	37%	EXCEEDED	Stable
Cumulative percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data	62%	64%	EXCEEDED	Positive
Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts	23%	23%	MET	Stable
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
Fish Stock Sustainability Index (FSSI)	754	756.5	MET	Positive
Percent of Stocks For Which Catch is below the Specified Annual Catch Limit (ACL)	82%	91.9%	EXCEEDED	Stable
Percentage of FSSI Fish Stocks with Adequate Population Assessments and Forecasts	63.8%	63.3%	MET	Stable

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Percentage of Protected Species Stocks with Adequate Population Assessments and Forecasts	19.9%	19.3%	MET	Positive
Number of Protected Species Designated as Threatened, Endangered or Depleted with Stable or Increasing Population Levels	30	30	MET	Stable
Number and Percentage of Actions Ongoing or Completed to Recover Endangered and Threatened Species	48.7%	48%	MET	Positive
Number of Habitat Acres Restored	11,050	10,207	MET	Negative
Annual Number of Coastal, Marine, and Great Lakes Habitat Acres Acquired or Designated for Long-term Protection	800	6782	EXCEEDED	Variable

* N/A in the Target field denotes a performance measure created for FY18. FY17 targets do not exist, while baseline performance data may exist.

** N/A in the Status field denotes a new measure that does not have an FY17 target.

*** 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.

**** CY 2017 figure is preliminary. Final values will be available in April 2018.

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Recurring Indicators:

Indicator	NEW: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>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. The stages are defined as:</p> <ol style="list-style-type: none"> 1. <u>Development</u>: when OAR research is used to start or enhance significant new development activities (e.g., modeling efforts begin to incorporate OAR field study findings into a predictive model.) 2. <u>Demonstration</u>: when a demonstration of OAR research and/or development starts with the purpose of demonstrating that the R&D is appropriate for transition to operation or other applications (e.g., a new version of a tool for forecasters begins evaluation in a NOAA testbed.) 3. <u>Application</u>: Examples of applications and the types of products transitioned include the following: <ul style="list-style-type: none"> • Transitions to operations (e.g., new observing technologies enter operations, updated models enter operations) • Providing information for decision-makers (e.g., completion of peer-reviewed assessments, external development of resource management policies based on OAR research findings). • Transition to commercial applications(e.g., patent, new technology used in a commercial product) <p>Note that this measure counts the number of products that advance, not the number of uses of those products. If a product advances through 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.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	n/a	n/a	n/a	65	65	65	42	42
Actual	n/a	n/a	66	72	65	65	TBD	
Status				Exceeded	Met	Met		NEW
Trend	Stable							
Explanation (if not met in FY 2016)	n/a							

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Actions to be taken / Future Plans	None
Adjustments to targets	None
Notes	This is a pilot measure. As the measure is developed and implemented, changes will be made to refine it. FY2017 is the projected full-year.

Indicator	NEW: Number of fishermen, seafood processors and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety.							
Category	Key (Strategic Plan)							
Type	Output							
Description	<p>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.</p> <p>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. Interactions with industry personnel should result in a behavioral change. Thus, conferences, social media, or handouts on fishing practices should not count unless there is evidence of behavioral change (e.g., survey or personal communication).</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target								60,000
Actual	35,000	184,000	53,000	62,200	40,243	19,900	TBD	
Status (i.e. Exceeded, Met, Not Met)								NEW
Trend	Varying							
Explanation (if Target not met in FY 2017)	New metric for FY 2019.							
Actions to be Taken / Future Plans	None							
Adjustments to Targets	New metric for FY 2019.							

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Notes	Historical data exists for FY2010 through FY2017. This metric is new in FY2019 APP as part of the FY 2018 DOC Strategic Plan.
Information Gaps	None

Indicator	NEW: Increase annual number of NOAA partnerships with the private sector (# of Cooperative Research and Development Agreements executed)							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	<p>A Cooperative Research and Development Agreement (CRADA) is a written agreement between a private company and NOAA to work together on a project. Created as the result of the Stevenson-Wydler Technology Innovation Act of 1980, as amended by the Federal Technology Transfer Act of 1986, 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.</p> <p>CRADAs are one of the principal mechanisms used by NOAA laboratories to engage in collaborative efforts with non-federal partners to achieve the goals of technology transfer. 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.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target								8
Actual	4	1	5	14	5	14	TBD	
Status (i.e. Exceeded, Met, Not Met)								NEW
Trend	Varying							
Explanation (if Target not met in FY 2017)	New metric for FY 2019.							
Actions to be Taken / Future Plans	None							
Adjustments to Targets	New metric for FY 2019.							

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Notes	Historical data exists for FY2010 through FY2017. This metric is new in FY2019 APP as part of the FY 2018 DOC Strategic Plan.
Information Gaps	None

Indicator	Annual number of peer-reviewed publications related to environmental understanding and prediction							
Category	Key							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	1200	1200	1200	1500	1500	1700	1100	1050
Actual	1800	1676	1759	1860	1697	1678		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Trend	Varying							
Explanation (if not met in FY 2016)	n/a							
Actions to be taken / Future Plans	None							
Adjustments to targets	The FY2015 target was increased to 1500 due to exceeding the FY2012-2014 target of 1200. The FY17 target was increased to 1700 due to exceeding the FY2015-2016 target of 1500. FY2017 is the actual full-year. The FY19 target was decreased to 1050 to reflect the FY19 President's Budget submission.							
Notes	NOAA-wide data collection began in FY2011 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.							

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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 (Non-Strategic Plan)							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	4,000	4,000	9,600	9,600	9,600	20,770	0	0
Actual	3,800	15,000	17,500	10,700	20,770	7,100		
Status	Not Met	Exceeded	Exceeded	Exceeded	Exceeded	Not Met		
Trend	Varying							
Explanation (if not met in FY 2017)	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.							
Actions to be taken / Future Plans	None							
Adjustments to targets	None							
Notes	FY2017 showing actual full-year.							
Information Gaps	Current efforts are focused on better defining the measure standards.							

Indicator	NEW: The cumulative number of NOAA datasets made openly available via Partners' cloud platforms to the public, America's Weather Enterprise and other environmental information stakeholders.
Category	Supporting FY18-22 DOC Strategic Plan

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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 Q2FY19.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target					NA	NA	15	20
Actual					3	6		
Status	NA	NA	NA	NA	NA	NA		
Trend	Not enough data to determine trend.							
Explanation (if Target not met in FY 2017)	New performance measure for FY18.							
Actions to be Taken / Future Plans	The Big Data Project's experimental phase has been extended through Q2FY19. 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.							

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Notes	Associated with the NOAA Big Data Project
Information Gaps	The NOAA Big Data Project formally began in FY15 but data were not publicly served through Partners' cloud platforms until FY16.

Indicator	Reduction in gap between high-performance computing deployed and what is needed to meet modeling requirements							
Category	Key							
Type	Outcome							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target						13PF	16PF (30%)	17PF (5.8%)
Actual						13PF		
Status						MET		
Trend	N/A							
Explanation (if Target not met in FY 2017)	New Indicator, no target for FY17							
Actions to be Taken / Future	Continue to pursue recapitalization efforts. Larger recapitalization effort to begin in 2020							

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Plans	
Adjustments to Targets	New indicator, no adjustments
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.
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.

Indicator	U.S. Temperature Forecasts Skill							
Category	Key							
Type	Output							
Description	<p>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.</p> <p>This is 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</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	21	22	23	24	25	26	26	26
Actual	29	26	26	25	24	34		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2017)	n/a							
Actions to be taken /	The following actions are being undertaken to meet outyear goals 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							

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Future Plans	<p>improvements in seasonal climate prediction.</p> <p>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 through formal Announcements of Opportunity in support of the CTB.</p> <p>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.</p>
Adjustments to targets	<p>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.</p>
Notes	<p>NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1995 to present.</p>
Information Gaps	<p>None</p>

Indicator	Key milestones completed on time for satellites and ship deployments							
Category	Key							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target			SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 2 SHIPS: 2	SAT: 1 SHIPS: 2
Actual			SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0	SAT: 2 SHIPS: 0		
Status			Met	Met	Met	Met		
Notes	SHIPS: FY 2018 Q2: Issue Request for Proposal (RFP) for preliminary NAV ship design. FY 2018 Q3: Complete Milestone #2 (Project Approval) documentation; submit to DOC. FY 2019 Q4: Complete N/V Class A AGOR Variant Preliminary Design Phase, Continue Force Architecture efforts on the requirements analysis and concept design for Class B and C Vessels.							
Information Gaps								

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Indicator	Base Funded Days-at-Sea for NOAA Ships							
Category	Supporting							
Type	Output							
Description	Days-At-Sea 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 in 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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target (base funded)	2,725	2,443	2,702	2,980	2,802	2,985	2,783	2,710
Actual (base funded)	2,623	2,199	2,159	2,498	2,414	2,554		
Status	Not Met	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	POSITIVE: (FY15: 84%, FY16: 86%, FY17: 86%)							
Explanation	Unscheduled ship systems repairs and loss of days due to weather.							
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, initiating new ship construction to replace aging vessels.							
Adjustments to Targets	NONE							
Notes	Data available for planned/actual DAS through 2007 Methodology has not changed over time.							
Information Gaps	NONE							
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							

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Description	Ensures that NOAA provides real time (or near real time) availability of critical satellite data and products without gaps.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%
Actual	99.60%	99.50%	99.7%	99.35%	99.3%	99.49%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Notes	On time data and imagery provided increases timeliness and accuracy of public warnings and forecasts of climate and weather events							
Information Gaps								

Indicator	Severe Weather Warnings Tornadoes - Storm Based Lead Time (Minutes), Accuracy (%), and False Alarm Ratio (%)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	<p>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. Metrics includes all warned tornado events and all unwarned tornado events.</p> <p>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.</p> <p>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)</p>

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	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.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Lead Time (min)								
Target	13	13	13	13	13	13	13	13
Actual	11	9	9	8	9	9		
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	69	57	60	58	61	58		
Status	Met	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	Directional: Stable							
False Alarm Ratio (%)								
Target	72	72	72	72	71	71	71	71
Actual	73	74	70	70	69	72		
Status	Met	Met	Met	Met	Met	Met		
Trend	Directional: Stable							
Explanation (if not met in FY 2017)	August and September of 2017 will likely be remembered more for land-falling tropical cyclones than tornadoes. However, with well over 400 Tornado Warnings issued (431) as a direct result of Hurricanes Harvey and Irma, there was a substantial statistical impact on the performance metrics for tornadoes in this FY. With around 2,400 Tornado Warnings issued across the country in FY17 before either of these hurricanes made landfall, just under 20% of the total Tornado Warnings in this FY were issued between these two tropical cyclones. Before landfall of either Harvey or Irma, the NWS Tornado Warning Probability of Detection							

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	(POD) and average Lead Time (LT) were already under their respective goals. The False Alert Ratio (FAR) however, at 70%, was just under the goal of 71%. In the aftermath of both Harvey and Irma, with only 76 reported tornadoes that resulted from these tropical systems, the FAR rose to 72% when combining these events with the rest of the FY. Nationally, outside of the Hurricane Irma, only a handful of tornadoes were reported during the month of September 2017, which did not substantially impact these metrics.
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
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
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.
Information Gaps	None

Indicator	Severe Weather Warnings for Flash Floods - Lead Time (minutes) and Accuracy (%)
Category	Supporting (Non-Strategic Plan)
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. 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

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	percentage, in both space and time, for which a flash flood event was warned.							
	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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Lead Time (min)								
Target	42	58	60	61	61	63	63	65
Actual	53	63	54	64	72	73		
Status	Exceeded	Exceeded	Met	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Accuracy (%)								
Target	74	74	74	76	76	76	76	76
Actual	76	78	78	79	80	77		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2017)	N/A							
Actions to be taken / Future Plans	<p>In FY2012, 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 FY2008 through Q3 and part of Q4 (July 31), FY2012. 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:</p> <p>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. (FY2018-FY2020)</p> <p>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</p>							

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	<p>tools to improve forecaster situational awareness, rapid-onset flood risk analysis, warning decision support tools, and simplified messaging. (FY2017-FY2018)</p> <p>Continued training on 1) precipitation estimation techniques, software enhancements and water resources modeling capabilities, and 2) decision support.</p> <p>Note the current and out-year national average flash flood warning accuracy goals remain consistent with those originally proposed in FY2010.</p>
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
Notes	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.
Information Gaps	None

Indicator	Hurricane Forecast Track Error (48-Hour)							
Category	Supporting (Non-Strategic Plan)							
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. 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.							
	FY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
Target	84	83	81	77	71	68	65	62
Actual	69	103	65	77	61	56*		
Status	Exceeded	Not Met	Exceeded	Met	Exceeded	Exceeded		

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Trend	Variable
Explanation (if not met in FY 2016)	CY 2017 figure is preliminary. Final values will be available in April 2018.
Actions to be taken / Future Plans	TBD
Adjustments to targets	Targets for FY 2017 and beyond were adjusted to reflect the FY 2015 and FY 2017 decreases in the HFIP. These revised targets additionally reflect recent performance trends and improvements in Hurricane Weather Research and Forecasting model.
Notes	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. * Annual Hurricane Season begins June 1 and ends November 30. The final values are produced after a verification and validation period. Calendar Year (CY) 2017 Hurricane GPRA will be available in April 2018.
Information Gaps	None

Indicator	Hurricane Forecast Intensity Error (48 hour)							
Category	Supporting (Non-Strategic Plan)							
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). 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.							
	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
Target	15	12	12	12	12	12	12	12
Actual	12	10.5	10	11	10	13		

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Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Trend	Variable							
Explanation (if not met in FY 2016)	CY 2017 figure is preliminary. Final values will be available in April 2018							
Actions to be taken / Future Plans	TBD							
Adjustments to targets	Targets for FY 2017 and beyond were adjusted to reflect performance trends, anticipated impacts of model upgrades and FY 2017 decreases in the HFIP.							
Notes	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. * Annually Hurricane Season begins June 1 and ends November 30. The final values are produced after a verification and validation period. Calendar Year (CY) 2017 Hurricane GPRA will be available in April 2018.							

Indicator	Accuracy (%) (Threat Score) of Day 1 Precipitation Forecasts							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	Precipitation forecasts and other foundational general weather guidance developed by the Weather Prediction Center are used extensively by the weather enterprise, the military, international interests, and NWS WFOs and RFCs to inform daily weather forecast. This information is used by government entities, economic sectors, and the general public to manage daily lives and activities and make resource decisions. 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. Through this measure, the WPC focuses on relatively heavy amounts of precipitation because of the major safety and economic impacts such heavy precipitation can have in producing flooding, alleviating drought, and affecting river navigation.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	31	31	32	32	32	33	33	33
Actual	33	33	33	33	36	34		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		

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Trend	Positive
Explanation (if not met in FY 2017)	N/A
Actions to be taken / Future Plans	<p>The following actions are being undertaken to meet outyear goals for this measure:</p> <ol style="list-style-type: none"> 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. During the next several years, 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. 4. NCEP established a Hydrometeorological Testbed at WPC beginning in FY 2006 for the purpose of improving precipitation forecasts.
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
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.
Information Gaps	None

Indicator	Winter Storm Warnings - Lead Time (Hours) and Accuracy (%)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	A winter storm warning provides NOAA customers and partners advanced notice of a hazardous winter weather event that

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	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. Improving the accuracy and advance warnings of winter storms enables the public to take the necessary steps to prepare for disruptive winter weather conditions.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Lead Time (hours)								
Target	19	20	20	20	20	20	20	20
Actual	18	22	22	21	21	22		
Status	Met	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Accuracy (%)								
Target	90	90	90	90	90	90	90	90
Actual	89	89	89	85	85	87		
Status	Not Met	Met	Met	Met	Met	Met		
Trend	Stable							
Explanation (if not met in FY 2017)	Winter storm statistics for FY17 are available through September 2017. The latest accuracy (POD) is 87% (vs. 90% FY17 goal), and the lead time (LT) was 22 hours (FY 17 goal of 20 hours). These numbers are consistent with the last several winters and either close to or above targeted values. Lead times continue to outpace the goal, which may be having a small impact on somewhat lower POD numbers. In addition, a somewhat uneven application of more impact based verification vs snowfall amounts may also be impacting these statistics. However, overall trends are steady.							
Actions to be taken / Future Plans	<ol style="list-style-type: none"> 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	No changes were made to this indicator since the previous Congressional submission.							

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targets	
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.
Information Gaps	None.

Indicator	Marine Wind - Percentage of Accurate Forecasts & Marine Wave Heights - Percentage of Accurate Forecasts							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>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. Since FY2014, 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.</p> <p>For the Day 1 wave height forecast, errors less than 2 feet are defined as accurate. Since FY2014, 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.</p> <p>These measures use complex skill scores to analyze individual wind speed and wave height components.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Wind (%)								
Target	71	74	74	75	78	78	79	79
Actual	76	76	78	80	80	81		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Wave Height (%)								
Target	75	75	76	76	81	81	82	82
Actual	78	81	84	84	85	84		

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Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Explanation (if not met in FY 2017)	N/A							
Actions to be taken / Future Plans	Implementation of increased training opportunities detailed on Performance Website.							
Adjustments to targets								
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.							
Information Gaps	None							

Indicator	Aviation Ceiling/Visibility Forecast Accuracy & False Alarm Ratio (%) Instrument Flight Rules (IFR)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	<p>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. 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.</p>

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	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Accuracy (%)								
Target	65	65	65	65	65	65	65	65
Actual	61	62	62	65	63	63		
Status	Not Met	Not Met	Met	Met	Met	Met		
Trend	Stable							
False Alarm Ratio (%)								
Target	40	38	38	38	38	38	38	38
Actual	39	37	36	34	38	37		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2017)								
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.							
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.							
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.							
Information Gaps	None							

Indicator	Geomagnetic Storm Forecast Accuracy (%)
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Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>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. 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.</p> <p>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.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target			51	53	53	40	56	57
Actual			40	57	68	65		
Status			Not Met	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2017)	N/A							
Actions to be taken / Future Plans	<p>Methods to improve performance for FY17-20:</p> <ul style="list-style-type: none"> - 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. 							

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Adjustments to targets	The FY17 target was established in FY14 when NOAA was failing to meet performance goals. Since then, the performance of this measure has recovered and new goals for FY18 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.
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.
Information Gaps	None

Indicator	Customer Satisfaction Index (CSI)							
Category	Key							
Description	<p>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.</p> <p>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.</p> <p>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.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Actual	84	82	84	80	82	82		
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.							

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Information Gaps	None
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Indicator	Number of communities that utilize Digital Coast							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	<p>Digital Coast is a web-platform providing coastal geospatial information. This measure, obtained via web statistics, provides a level of depth beyond traditional measures, such as number of visits or page views, which allows the effort to 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 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.</p> <p>In 2015, new green infrastructure tools were added to help coastal communities consider natural and nature-based systems to absorb and filter excess water and reduce flooding. These tools include an interactive interface, a guide for spatial analysts and a cost-benefit algorithm to determine solutions providing the best value for financial investment.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	2,807	3,275	4,750	5,375	5,500	5,500	5,500	5,000
Actual	4,663	5,221	5,249	6,330	5,043	7,040		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans	None							
Adjustments to targets	FY19 target reflect impacts from program changes in FY19.							
Notes	Data goes back to FY2011.							
Information Gaps	None							

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Indicator	Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards							
Category	Key							
Type	Outcome							
Description	This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It quantifies NOAA's contributions to this important goal across NOAA's coastal programs, measuring how NOAA is improving the Nation's capacity for resilience to hazards and is contributing significantly to NOAA's efforts to improve integration of its coastal programs, and expanding beyond the three coastal integration programs providing inputs to the measure. An index of a range of activities to mitigate coastal community risk and vulnerability to coastal hazards. It measures improvement in the Nation's capacity for end to end preparedness, response, recovery and resilience to hazards.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	34%	40%	46%	51%	60%	66%	71%	51%
Actual	46%	57%	54%	60%	74%	69%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans	NOS may need to relook at future targets if the trend for exceeding continues. A NOAA team will continue to engage state and local partners to critique and improve data collection, verification, and reporting for the measure.							
Adjustments to targets	FY19 target reflect the cumulative impact of multiple program changes in FY19.							
Notes	Data goes back to FY2011.							
Information Gaps	None							

Indicator	Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts.							
Category	Supporting (Non-Strategic Plan)							
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							

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	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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	TBD	18%	18%	18%	18%	23%	23%	23%
Actual	18%	18%	18%	18%	18%	23%		
Status		Met	Met	Met	Met	Met		
Trend	Stable							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans								
Adjustments to targets								
Notes	Data goes back to FY2009.							
Information Gaps	None.							

Indicator	NEW: Percent of top 175 U.S. seaports with access to Physical Oceanographic Real-Time Systems (PORTS®), which improves the safety and efficiency of marine transportation
Category	Supporting (Strategic Plan)
Type	Outcome
Description	<p>According to the U.S. Army Corps of Engineers, who tracks the number of vessel transits and cargo tonnage that pass through the 300 or so ports in the U.S. on an annual basis, over 95 percent of all annual U.S. cargo tonnage passes through the nation's top 175 seaports. This measure is the percentage of the top 175 U.S. seaports that benefit from NOAA's PORTS® a real-time integrated system of sensors working together to provide mariners with accurate and reliable information about environmental conditions in the seaport. Economic studies show PORTS® can provide a 50% or more reduction in accidents and over \$50M in economic benefits.</p> <p>NOAA's Center for Operational Oceanographic Products and Services (CO-OPS), collects and disseminates real-time information on tides, water levels, currents, and other coastal observations that help improve the safety and efficiency of marine transportation, as well as providing important information to the coastal management community.</p> <p>Achieving this Strategic Goal is dependent upon partner coordination and availability of partner funding.</p>

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	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target				35%	35%	35%	38%	39%
Actual				35%	35%	37%		
Status				Met	Met	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans								
Adjustments to targets								
Notes								
Information Gaps	None.							

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 (Non-Strategic Plan)
Type	Output
Description	<p>NOAA conducts hydrographic surveys to determine the bathymetry of primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of wrecks and obstructions with side scan and multi-beam sonar technology. NOAA uses the data to produce nautical charts in a variety of formats for safe and efficient navigation, in addition to the commercial shipping industry, other user communities that benefit from actionable information include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, marine spatial and emergency planners. Targets for this measure are set by formula, based on available contract funds and expected days at sea. However, actual area collected will vary depending on the location and characteristics (depth, bottom complexity) of the areas surveyed.</p> <p>Presently NOAA has the capacity to survey roughly 3,000 SNM of navigationally significant Exclusive Economic Zone (EEZ) waters, evaluate 12% of priority port area shoreline for change each year, and map 3% of the 95,000 miles of U.S. open coastal shoreline; this capacity does fall short of the 10,000 SNM and 20% to 10% total annual requirement.</p> <ul style="list-style-type: none"> • The 50-year re-survey cycle is revised to consider that in addition to re-survey areas, the Nation's need to

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	<p>define emerging critical areas. In 2004, NOAA created this category to allow for designation of areas that currently meet the definition of critical area, but can be tracked separately from the 43,000 SNM estimate. NOAA delineated emerging critical areas in the Gulf of Mexico and in Alaskan waters surrounding Kodiak Island which had areas which were survey in the 1800's using leadline technology and are now experiencing an increase in commercial traffic.</p> <ul style="list-style-type: none"> NOAA is assessing emerging survey needs of the Arctic that had not been considered in previous assessments of the Hydrographic Priorities (approx. 1 million SNM. Arctic maritime community plan to address this vast (40,000 SNM) critical area survey requirement and efforts to understand changing requirements, have precluded integration of these Arctic SNM into priority areas described in NOAA's Hydrographic Survey Priorities (http://www.nauticalcharts.noaa.gov/hsd/docs/NHSP_2011.pdf), but is working to add them. 							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	2,200	3,000	2,671	2,556	2,509	2,287	2,279	2,279
w/supplemental		120	258					
Total Target	2,200	3,120	2,929	2,556	2,509	2,287	2,279	2,279
Actual (Original)	2,947	2,285	2,207	3,135	3,296	2,480		
Impact of Recovery Funds								
Total Actual (Adjustments reflecting Original and Recovery Act Funds)	2,947	2,285	2,207	3,135	3,296	2,480		
Status	Exceeded	Not Met	Not Met	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans	None							
Adjustments to targets								
Notes	This performance measure is shared with OMAO. Data goes back to FY2003.							
Information Gaps	None							

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Indicator	Cumulative percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data							
Category	Supporting (Non-Strategic Plan)							
Type	Outcome							
Description	<p>This measure tracks progress of NOAA’s National Geodetic Survey toward completing the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) initiative and implementation of a new National Vertical Datum for a wide variety of applications including improved inundation management. This improved vertical reference system is critical for all observing systems and activities requiring accurate heights and is a key component of the enhanced geospatial framework required for success in achieving NOAA’s strategic priorities. The need for foundational coast to coast intelligence networks is particularly important for community resilience by determining where water flows in order to make accurate inundation models and assessments as well as better management and planning decisions with improved water level predictions based on accurate elevations. In FY15, LIDAR data was collected to update charted depths for St. Croix, US Virgin Islands, along a shoreline last charted 35 years ago.</p> <p>“Enabled” is technically defined as having GRAV-D data necessary to support a 1 cm geoid supporting 2 cm orthometric heights (heights relative to sea-level) necessary to define a new national vertical datum. NGS will calculate the percentage of area enabled with regards to a pre-defined total area that includes U.S. territorial land and adjacent land and water areas necessary for final determination of a national vertical reference system. As progress is made, each survey area will be represented by a polygon that will define the completed areas. The performance measure will be tracked as a percent of the total area that is identified as complete.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	20%	28%	36%	45%	53%	62%	70%	79%
Actual	23.9%	31%	36%	45%	55%	64%		
Status	Exceeded	Exceeded	Met	Met	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans	None							
Adjustments to								

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targets	
Notes	Data goes back to FY2010.
Information Gaps	None

Indicator	Fish Stock Sustainability Index (FSSI) (cumulative)							
Category	Key (Strategic Plan)							
Type	Outcome							
Description	<p>NMFS measures the performance of U.S. Federal fisheries through the Fish Stock Sustainability Index (FSSI). The FSSI is an index of sustainability for domestic commercial and recreational fish stocks in the U.S. The index is comprised of 199 stocks, representing 85% of the total catch of all stocks. These 199 stocks were selected for their importance to commercial and recreational fisheries, including considerations of economic, ecological and social value. The index is scored on a 1,000-point scale, with each stock given a score between 0 and 4 (0=status unknown; 4=meets all sustainable fishing criteria). The FSSI increases when NMFS determines that the status of a stock has improved: it is either no longer subject to overfishing, is no longer overfished, its biomass has increased to at least 80 percent of target, or it is rebuilt. These are all factors that contribute to sustainably managed fisheries. For more information: http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target (FSSI 1)*	603.5	617.0	NA					
Actual (FSSI 1)*	606.0	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)	769.5 (612.5/796)
Actual (FSSI 2)*	689 (548.5/796)	719 (572.5/796)	746 (594/796)	761.5 (606.5/796)	754 (600.5/796)	756.5 (602.5/796)		
Status	Exceeded	Exceeded	Met	Exceeded	Not Met	Met		
Trend	Positive							

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Explanation (if not met in FY 2016)	
Actions to be taken / Future Plans	
Adjustments to targets	
Notes	<p>* 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.</p> <p>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.</p>
Information Gaps	

Indicator	Percent of Stocks For Which Catch is below the Specified Annual Catch Limit (ACL) (cumulative)							
Category	Supporting							
Type	Intermediate Outcome							
Description	<p>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</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target				79.5%	81%	82%	83%	84%
Actual			91%	89.7%	90.7%	91.9%		
Status				Exceeded	Exceeded	Exceeded		
Trend	Stable							
Explanation (if								

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not met in FY 2016)	
Actions to be taken / Future Plans	
Adjustments to targets	
Notes	
Information Gaps	

Indicator	Percentage of FSSI Stocks with Adequate Population Assessments and Forecasts (cumulative)							
Category	Supporting (Non-Strategic Plan)							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	57.4%* (132/230)	57.0%* (131/230)	64.8% (129/199)	67.3% (134/199)	61.3% (122/199)	63.8% (127/199)	64.8% (129/199)	64.3% (128/199)
Actual	56.1%* (129/230)	58.3%* (134/230)	63.3% (126/199)	64.3% (128/199)	62.3% (124/199)	63.3% (126/199)		
Status	Met	Exceeded	Met	Met	Exceeded	Met		
Trend	Stable							
Explanation (if not met in FY								

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2016)	
Actions to be taken / Future Plans	
Adjustments to targets	
Notes	<p>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.</p> <p>Actuals for FY 14-15 were updated following the discovery of reporting errors in the data.</p>
Information Gaps	

Indicator	Percentage of Protected Species Stocks with Adequate Population Assessments and Forecasts (cumulative)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>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.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	19.5% (78/400)	22.0% (88/400)	18.9% (78/412)	21.6% (89/412)	20.7% (89/429)	19.9% (85/428)	21.7% (93/429)	24.9% (107/429)
Actual	19.3% (77/400)	19.0%	15.0%	18.7%	19.2%	19.3%		

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		(76/400)	(62/412)	(77/412)	(82/428)	(83/429)		
Status	Met	Not Met	Not Met	Not Met	Not Met	Met		
Trend	Increasing							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets								
Notes								
Information Gaps								

Indicator	Number of Protected Species Designated as Threatened, Endangered or Depleted with Stable or Increasing Population Levels (cumulative)							
Category	Key							
Type	Outcome							
Description	This measure tracks progress toward the recovery of endangered, threatened, or depleted protected species under NMFS' jurisdiction. These species are listed as threatened or endangered under the Endangered Species Act (ESA) or as depleted under the Marine Mammal Protection Act (MMPA). 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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	28	27	28 (84)	34 (74)	31 (90)	30 (90)	30 (92)	30 (92)
Actual	29	30	37 (84)	31 (73)	31 (89)	30 (90)		
Status	Exceeded	Exceeded	Exceeded	Met	Met	Met		
Trend	Stable							
Explanation (if not met in FY 2016)								

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Actions to be taken / Future Plans	
Adjustments to targets	The total number of species was reduced from 95 to 90 due to information showing that 5 species live primarily in international waters. In FY 2018 we will begin tracking two newly listed species.
Notes	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.
Information Gaps	

Indicator	Number and Percentage of Actions Ongoing or Completed to Recover Endangered and Threatened Species (Cumulative)							
Category	Supporting (Strategic Plan)							
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). The ESA requires NMFS to prepare recovery plans for each endangered or threatened species. The plans include a list of actions necessary to remove species from the ESA. These recovery actions may include items that can be completed in a year; or other actions, including monitoring, that may take many years to complete or are ongoing. Recovery of threatened or endangered species is a gradual process that can take decades, and completed recovery actions can show incremental progress made in achieving recovery. Denominators are shown as a reference.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
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	48.8% 2,270/4,653
Actual	44.3%	45.1%	45.2%	48.1%	49.2%	48.0%		

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	(1,862/4,202)	(1,897/4,202)	(2,013/4,457)	(2,157/4,482)	(2,233/4,542)	(2,183/4,545)		
Status		Exceeded	Exceeded	Exceeded	Met	Met		
Trend	Positive							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets	The revised targets for FY 17-19 target have been adjusted for numerous errors discovered during a transition of all recovery action tracking from the FWS Recovery Online Activity Reporting (ROAR) database to the NMFS Recovery Action Mapping Tool (RAMT). These errors resulted in 63 fewer actions included as Ongoing or Complete. In addition, a duplicate recovery plan was included in the FY 2017 targets with a total of 299 actions targeted to be Ongoing or Completed. Finally, during a quality review of the data, NMFS discovered that many of the thousands of actions appear in multiple plans but are the same action (benefiting multiple species) and so were being counted multiple times. As a result, the denominator in the outyear targets was much too high. The revised targets (including FY 17) reflect rectification of these errors and are comparable to the previous targets. With data tracking consolidated into a single NMFS database, these errors should not recur.							
Notes	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. The total number of actions increased from 4,542 in 2016 to 9,575 in 2017 due to a number of new salmon recovery plans that added thousands of new actions to the total that need to be completed.							
Information Gaps								

Indicator	Number of Habitat Acres Restored (annual)
Category	Supporting (Strategic Plan)
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, including the Great Lakes region, and are supportive of anadromous species (i.e., species that migrate from the sea to

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	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. This measure does not include restoration conducted through the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	80,007 (6,007 RC + 74,000 PCSRF)	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)	22,300 (8,000 RC + 14,300 PCSRF)
Actual	58,120 (8,242 + 49,878 PCSRF)	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)		
Status	Not Met	Not Met	Not Met	Not Met	Not Met	Met		
Trend	Negative							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets	Targets for FY2019 have not been set because retiring this measure is under consideration, pending completion of the DOC FY2018-22 Strategic Plan.							
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). 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.							
Information Gaps								

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Indicator	NEW: 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 (Strategic Plan)							
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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target						9	9	10
Actual				9	9	9		
Status						Met		
Trend	Stable							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans								
Adjustments to targets								
Notes								
Information Gaps	None.							

Indicator	Annual Number of Coastal, Marine, and Great Lakes Habitat Acres Acquired or Designated for Long-term Protection.
Category	Supporting (Strategic Plan)
Type	Outcome
Description	In the FY14-FY18 DOC Strategic Plan the measures “Number of Habitat Acres Restored” and “Annual Number of Coastal, Marine, and

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	Great Lakes Habitat Acres Acquired or Designated for Long-term Protection” are combined as “Habitat Acres Conserved.”							
	NOAA protects and restores key habitats that provide critical ecosystem functions through and in support of the statutory responsibilities enhance coastal and marine resource conservation through place based management. 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 protect additional key habitats by purchasing land from willing sellers. This <i>long-term protection</i> 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), and the number of acres designated for long-term protection by NOAA or by state partners, such as through the Office of National Marine Sanctuaries Program (ONMS) and National Estuarine Research Reserve System (NERRS). This measure is used to show one of the many ways in which NOAA provides protection to important habitats.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	69,550	2,500 (CELCP)	1,300 (CELCP)	250 (CELCP)	1650	800	800	200
Actual	8,694,070	2,772	5,673	4,250,256	283,384,171	6,782		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans								
Adjustments to targets	FY19 target reflect the impact of FY19 program changes.							
Notes	Data goes back to FY2006. 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.							
Information Gaps	None							

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OTHER INDICATORS

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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	98%	98%	98%	98%	98%	98%	98%	98%
Actual	99%	99%	99%	100%	98%	98%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	Met		
Notes	Consistent long-term stewardship of NOAA's geophysical, oceans, coastal, weather and climate data							
Information Gaps								

Indicator	Number of StormReady Communities
Description	<p>Americans live in the most severe weather-prone country on Earth. StormReady and TsunamiReady support a Weather-Ready Nation by preparing communities for the occurrence of high impact environmental events. On an annual basis NWS target 100 new StormReady Communities and 10 new TsunamiReady communities pending funding availability.</p> <p>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.</p> <p>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.</p> <p>*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</p>

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	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 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Actual (cumulative):	1,909	2,090	2,242	2,409	2,597	2,750		
Notes								
Information Gaps	None							

Indicator	Number of TsunamiReady Communities							
Description	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 <i>Describe the indicator including how the indicator reflects the bureau’s program. It may be that there are significant changes between years as a result of additional funding in a given year. Note that change in the description.</i>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Actual (cumulative)	122	155	177	189	199	249		
Notes								
Information Gaps	None							

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NON-RECURRING INDICATORS

The following indicators are discontinued.

Indicator	Annual number of Coastal, Marine, and Great Lakes Ecological Characterizations that Meet Management Needs							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>Sound management of coastal, marine, and Great Lakes ecosystems require scientifically based-information on their condition. To provide this information, ecosystem characterizations are: 1) inclusive of the identification of the ecosystem boundaries, spatial extent, and biological, chemical, and physical characteristics that improve understanding of the history, current state, and future condition of ecosystems, cornerstones to ecosystem-based approaches to management; 2) the basis for many coastal and ocean forecasts, assessments, and management plans; and 3) conducted in response to user community demand and priorities, including NOAA management programs, significance of issue, and consequences of management action or inaction.</p> <p>Key parameters for characterizing conditions and developing assessments of their present “health” will be identified with the key indicator being characterizations <i>that meet management needs</i> (whether conducted in essential fish habitat, National Marine Sanctuaries, National Estuarine Research Reserves, the Great Lakes, the depths of the oceans, the coastal zone, and coral reef ecosystems, where there are different management needs and associated ecological characterizations). “Management” is defined as Federal, state, local, regional, territorial, or other entities that need accurate, useful data to make science-based, ecologically sound decisions when conducting comprehensive ocean and coastal planning and management, including coastal and marine spatial planning multiple uses of ocean and coastal resources. As a result, the American public can better improve the long-term protection and management of coastal, marine, and Great Lakes resources.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	51	48	48	48	48	48	Retired	Retired
Actual	51	48	48	48	48	100		
Status	Met	Met	Met	Met	Met	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2017)								
Actions to be	NOAA will retire this measure in FY18. Due to the wide range of types of characterizations performed by different NOAA							

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taken / Future Plans	programs, combining these various activities into a single measure has not proved to add value for management purposes.
Adjustments to targets	
Notes	Actual. Data goes back to FY2006.
Information Gaps	None

Indicator	Cumulative number of coastal, marine and Great Lakes issue-based forecasting capabilities developed and used for management							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	Geographically specific forecasts will allow resource managers to: make decisions based on predicted environmental and socioeconomic impacts; predict the impacts of ecosystem stressors; and evaluate the potential options to mitigate those stressors to better manage ecosystem use and condition.							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	55	63	69	73	92	113	Retired	Retired
Actual	58	63	69	73	91	108		
Status	Exceeded	Met	Met	Met	Met	Met		
Trend	Positive							
Explanation (if not met in FY 2017)								
Actions to be taken / Future Plans	NOAA is replacing this measure with “Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts.”							
Adjustments to targets	FY2017 target revised based on reassessment of capacity of NOS to develop and support additional forecasts.							

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Notes	Actual. Data goes back to FY2006.
Information Gaps	None

Indicator	Percentage of Tools, Technologies, and Information Services that are used by NOAA Partners/Customers to Improve Ecosystem-based Management							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>This measure tracks NOAA’s success in providing tools, technologies, and information services such as those for coastal and marine resource managers that enable progress toward the principles of ecosystem-based management (considering ecological, economic, social, and security concerns) for coastal, marine, and Great Lakes ecosystems. By cataloging and tracking each fiscal year the existing and new tools, technologies, and information services authorized and developed to meet stakeholders’ needs (50 to 100), NOAA encourages their completion and use to advance ecosystem-based management. NOAA can also then ensure investments in the most effective programs and products for the Nation. NOAA partners and customers include Federal, state, local and tribal authorities who must make intelligent decisions affecting resources in the U.S. coastal zone, and other users impacting the condition of coastal ecosystems (e.g., private industry). In 2015, NOS developed the Lake Level Viewer to portray the impacts of lake level change on coastal areas and resources, enabling NOAA partners and customers to better address sustainability, planning for infrastructure, conserving habitat, and zoning restrictions.</p> <p>Actuals are derived by dividing the number of tools/services developed by the end of the year by the number proposed at the beginning of the year. Targets are established based on historical patterns and the amount of funds being requested. Services can include on-line courses for managers, enhanced websites, broadcasts of live events, and workshops and other training techniques. New tools are developed with partners and customers that improve our products and services for ecosystem managers. The number of available tools changes annually via development or retirement, therefore the percentage for a given year doesn’t automatically suggest a 100% target.</p> <p>Benefits of better management of the Nation’s coastal, marine, and Great Lakes resources accrue to all citizens through sustainable ecosystems that provide jobs, products and services that are unique to coastal and ocean areas.</p>							
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Target	88%	89%	90%	87%	91%	91%	Retired	Retired
Actual	88%	91%	100%	89%	100%	94%		
Status	Met	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		

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Trend	Stable
Explanation (if not met in FY 2017)	
Actions to be taken / Future Plans	NOAA will retire this measure in FY18. In implementation, this measure has not proved to add value for management.
Adjustments to targets	None
Notes	Actual. Data goes back to FY2007.
Information Gaps	None