

Cover Images These images display the breadth of the NOAA mission to enrich life through science. NOAA's reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them. Photos starting top left, clockwise: researchers capture a tornado crossing the road near Bushnell, Nebraska as they complete three weeks of research, Cook Inlet beluga whales as seen from the air, three storms captured by the Japan Meteorological Agency's (JMA) Himawari-8 satellite (Typhoon Kilo, Tropical Storm Ignacio, and Hurricane Jimena) in the Pacific Ocean using a nearly identical imager to the one aboard NOAA's GOES-R satellite (Credit NOAA/JMA), Black sea bass in Gray's Reef National Marine Sanctuary, and New Hampshire Sea Grant conducts research they hope will lead to ocean acidification-resistant oysters.



NOAA Budget Summary 2019



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National Ocean Service
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National Marine Fisheries Service
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Office of Oceanic and Atmospheric Research
www.research.noaa.gov

National Weather Service
www.weather.gov

National Satellite and Information Service
www.nesdis.noaa.gov

Office of Marine and Aviation Operations
www.omaop.noaa.gov



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Photo Credit: Many of the photos appearing in this publication were taken by NOAA employees, usually during the normal conduct of NOAA activities (unless otherwise noted). Their contribution to this report is gratefully acknowledged.

Layout Design: Tiffany Small



NOAA employees launch a balloon in Antarctica for ozone measurements.

Terminology

The reader should be aware of the specific meaning of several terms as they are used throughout this budget summary:

FY 2017 Spend Plan

Fiscal Year (FY) 2017 Consolidated Appropriations Act, 2017 (P.L. 115-31).

FY 2018 Annualized Continuing Resolution (CR)

A full-year 2018 appropriation was not enacted at the time the FY 2019 Budget was prepared; therefore, the Budget is built off of the Further Extension of Continuing Appropriations Act, 2018 (P.L. 115-123). The amounts included for 2018 reflect the annualized level provided by the continuing resolution. All other comparisons and discussions of the budget request and policy will use the Annualized CR as the base.

Adjustments-to-Base

Includes the estimated FY 2019 military pay raise of 2.6 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from GSA. In addition, ATBs include unique/technical adjustments to the base program, for example transfers of base resources between budget lines.

FY 2019 Base

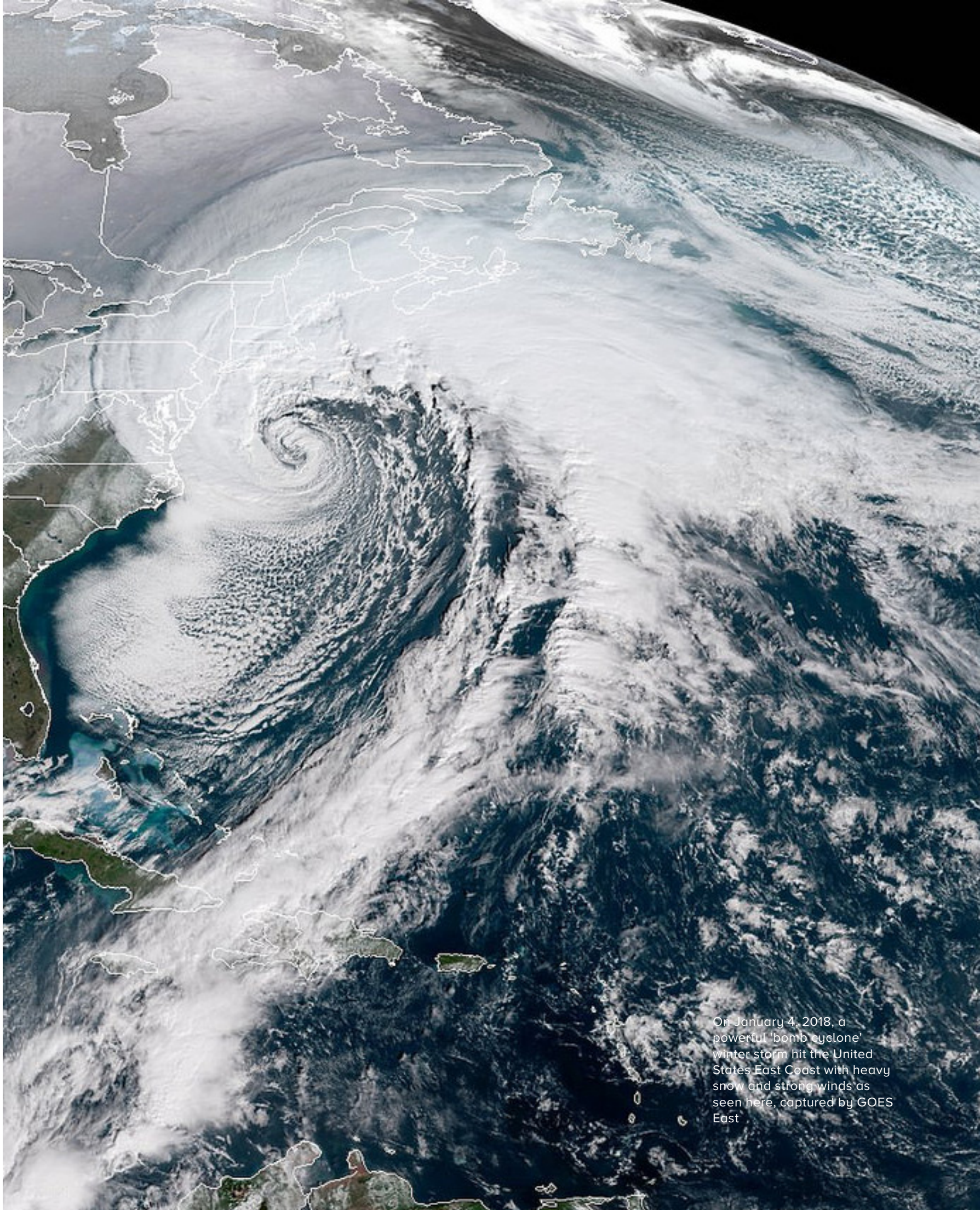
FY 2018 CR plus Adjustments-To-Base.

Program Change

Requested increase or decrease over the FY 2019 base.

FY 2019 Request

FY 2019 base plus Program Changes.



On January 4, 2018, a powerful 'bomb cyclone' winter storm hit the United States East Coast with heavy snow and strong winds as seen here, captured by GOES East

Introduction

NOAA's FY 2019 request includes \$4,562,711,000 in discretionary appropriations, a \$1,075,798,000 reduction from the FY 2018 Annualized Continuing Appropriations level, and supports NOAA's mission: 1) to understand and predict changes in climate, weather, oceans, and coasts; 2) to share that knowledge and information with others; and 3) to conserve and manage coastal and marine ecosystems and resources. The FY 2019 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 government 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 US 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. More information about NOAA's specific FY 2019 initiatives is provided in the chapters and appendices that follow as well as in NOAA's FY 2019 Congressional Justification (<http://www.corporateservices.noaa.gov/nbo/>).

NOAA appreciates the continued support of Congress, the Administration, and our broad and diverse base of stakeholders. We will continue to monitor major milestones and accomplishments of our programs and activities to evaluate progress and demonstrate success. Below are some of NOAA's top accomplishments from 2017, which we could not have achieved without Congress; our partners in other Federal and state agencies; and our partners in the research, academic, industry, and conservation communities:



NOAA Ship *Okeanos Explorer*
in port on Ford Island, Pearl
Harbor, Hawaii.

NOAA RESPONDS TO A RECORD-BREAKING YEAR OF HURRICANES

Devastation from the 2017 Atlantic hurricane season was unprecedented with Hurricanes Harvey, Irma, Maria and Nate impacting roughly 26 million people, and Harvey and Irma making landfall as Category 4 hurricanes, the first in 12 years. NOAA responded with its most accurate track predictions for a hurricane season while providing outstanding support to emergency managers and first responders before, during and after the storm. From the use of its aircraft, response teams, and operational models to experimental technologies, NOAA mobilized all of its assets to meet the challenge of these hurricanes. The combined work of NOAA resulted in saving thousands of lives despite Hurricanes Harvey, Irma and Maria becoming 3 of the top 5 costliest hurricanes on record.

Before and During

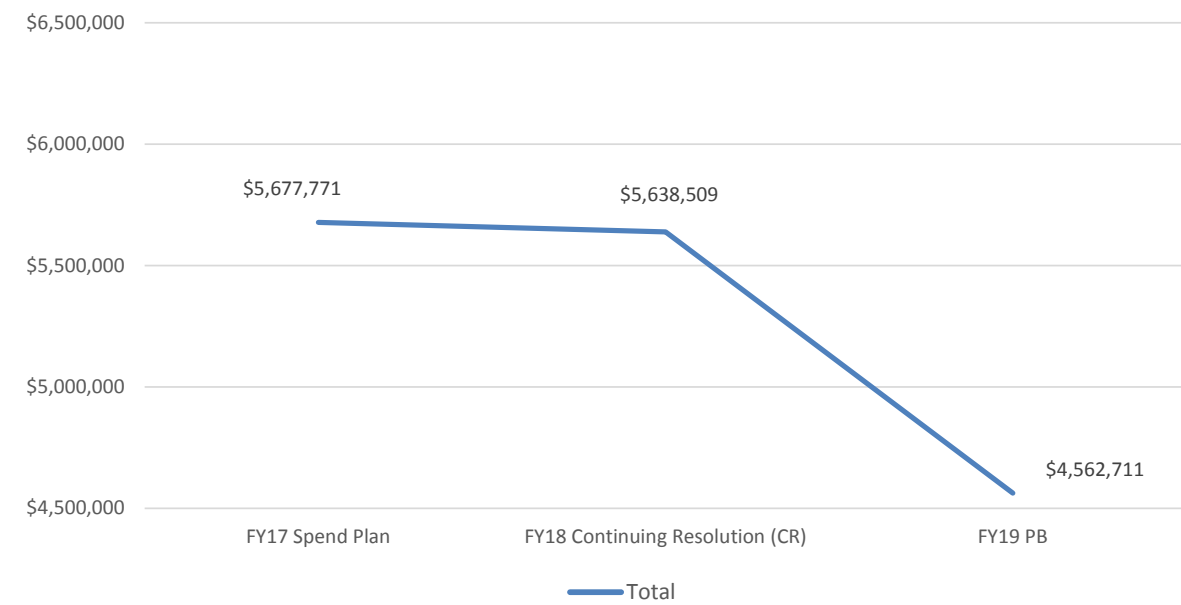
NOAA made its most accurate track predictions for a hurricane season. Armed with this information, state and county officials implemented precautions to protect communities, critical infrastructure, and general welfare.

NOAA's suite of operational and experimental models stood ready. For wind forecasts, the operational Hurricane Weather Research and Forecasting (HWRF) model proved to be the best numerical hurricane forecasting model for the strongest winds. It provided predictions of rapidly intensifying winds giving forecasters the best available estimates for wind speed. NOAA's experimental Global Forecast

Damage to facilities at the Mission-Aransas National Estuarine Research Reserve in Texas following Hurricane Harvey.



NOAA Discretionary Appropriation Budget (FY 2017–2019)
(\$ thousands)



System (fvGFS) exceeded all other models in forecasting the track of Hurricane Maria. The fvGFS is powered by the NOAA-developed Finite-Volume on a Cubed-Sphere Dynamical Core or FV3, which is transitioning to operations to become NOAA's next generation Global Forecast Model. Preliminary evaluations of NOAA's experimental High Resolution Rapid Refresh or HRRRX accurately predicted the track 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.

These accurate predictions were driven by the constant collection of data from NOAA's observational infrastructure. NOAA's Hurricane Hunter crews and scientists, in close coordination with the Air Force 53d Weather Reconnaissance Squadron, flew numerous missions, deploying drones and collecting vital data to inform models. Dropsonde data collected on these flights improved track forecasts by up to 15 percent. GOES-16 satellite data also informed accurate flood warnings and improved hurricane modeling.

Facing these unprecedented storms, NOAA staff across the impacted area provided outstanding Impacted-Based Decision Support Services to their communities. NOAA staff in Houston waded through knee to waist deep water to report to work and provide critical forecast information during historic flooding. In Lake Charles, timely forecasts by the local NWS office allowed the safe evacuation of approximately 30,000 residents and the orderly shutdown of refineries. In Key West, the NWS office provided critical on-site recovery support as the island became isolated from the mainland after Irma. In Puerto Rico, forecasters used satellite data to provide flood warnings during a breach of a major lake, maintaining constant support to emergency management during the recovery operations.

After the Storms

In the aftermath of the hurricanes, NOAA provided information that helped communities begin to recover. Rapidly mobilizing to provide data for decisions, NOAA helped communities better understand impacts and reopen ports.

Following the storms, NOAA collected more than 65,000 aerial images, covering more than 24,000 square kilometers aboard the agency's King Air aircraft, uploading the images within 24 hours of their capture. In many cases, these images were the only thing that alerted homeowners they still had a home or the extent of damage. NOAA added this imagery and much more to Gulf of Mexico Environmental Response Management Application (ERMA®), a web-based GIS tool, as soon as it was available. ERMA® integrated hurricane tracks, flood forecasts, post-storm imagery, and potential pollution threats into a single map. This allowed responders to make fast and informed decisions like how to respond to numerous oil and chemical spills left by Hurricane Harvey's flooding.

NOAA rapidly updated nautical charts, protecting lives and property from any underwater dangers that might have entered waterways. Quick navigation response and mobile integrated survey teams allowed the Port of Miami to reopen within days. Throughout the Caribbean, NOAA Ship *Thomas Jefferson* surveyed ports for damage, allowing the re-opening of 18 ports in as many days, ensuring mobility of essential relief supplies into heavily impacted areas across the region.

Today, NOAA continues to help communities bounce back. NOAA's online Digital Coast platform is providing coastal communities with information and resources including lidar, elevation, and land cover data; risk and vulnerability assessment methods; and sea level rise maps, all of which can be used in recovery planning efforts. NOAA is also working with coastal management programs, research reserves, and other partners to identify needs to hasten short- and long-term recovery.

LAUNCHED JPSS-1 SATELLITE, A GAME-CHANGER FOR WEATHER FORECASTING

NOAA successfully launched the JPSS-1 satellite on November 18, 2017. Now known as NOAA-20, the satellite represents a vital piece of our national security and observing system infrastructure, improving the accuracy of three to seven-day weather forecasts. Eighty-five percent of the data that feed weather forecast models comes from polar-orbiting satellites. NOAA-20 includes the Advanced Technology Microwave Sounder and the Cross-track Infrared Sounder, which provide critical data for weather and climate applications, as well as the Ozone Mapping and Profiler Suite which will track the health of the ozone layer, and the Visible Infrared Imaging Radiometer Suite which provides imagery and measurements for monitoring of land, sea, and atmospheric phenomenon. Data from NOAA-20, along with the rest of NOAA's satellite fleet, provide information that help keep our airplanes flying and our ships on course, help farmers decide when to plant, manufacturers decide when to ship merchandise, and first responders prepare for and respond to severe weather events such as hurricanes, tornadoes, and wildfires. NOAA-20 is the first spacecraft in the JPSS series of four new NOAA polar-orbiting weather satellites.



NOAA INVESTMENTS SUPPORT NEW BUSINESSES AND VISTAS FOR SUSTAINABLE AQUACULTURE TO HELP FEED AMERICA AND SUPPORT LOCAL JOBS

In 2017, NOAA and partners conducted research, development, and outreach in support of new and existing marine aquaculture businesses and state initiatives across the nation. Five new shellfish and seaweed farms were established with the help of the Connecticut Sea Grant Extension Program. The farms are developing striped bass strains for the hybrid striped bass industry, and advancing kelp aquaculture in Alaska and Connecticut. Using knowledge gained at the Sea Grant-supported Univ. of Wisconsin Stevens Point Aquaponics Innovation Center, investors opened Superior Fresh, a new aquaponics business in northwestern Wisconsin, which is one of North America's first on-land salmon-rearing facilities. NOAA's Northwest Fisheries Science Center produced over 8,000 all-female sablefish by employing cutting-edge aquaculture techniques developed over the past six years. This work supports a pilot-scale study of commercial-scale sablefish production by Native American tribes in the Puget Sound region. Along with working with other state initiatives, NOAA supported Connecticut and Rhode Island's new shellfish initiatives modeled after the NOAA National Shellfish Initiative. The initiatives seek to increase the number of oysters, clams, and mussels through commercial production and restoration. As aquaculture continues to expand, NOAA research on pathogen forecasting, potential impacts, benefits and best management practices has been used to inform sustainable aquaculture development across the country. To capture this information, NOAA's new Coastal Aquaculture Planning Portal provides over 20 coastal planning tools designed to assist managers, planners, and industry with sustainable aquaculture development.

The Joint Polar Satellite System-1, first of the JPSS series, launched from Vandenberg Air Force Base, California, on November 18, 2017. It will gather measurements of atmospheric, terrestrial and oceanic conditions, including sea and land surface temperatures, vegetation, clouds, rainfall, snow and ice cover, fire locations and smoke plumes, atmospheric temperature, water vapor and ozone.



A Landsat satellite image of Lake Erie used to estimate extent of harmful algal blooms. Credit: NASA

NOAA IMPROVES FORECASTS OF WILDFIRES AND SMOKE

NOAA plays a critical role in fighting wildfires. NOAA's newest Geostationary satellite, GOES 16, provides an unprecedented look at our Nation from the sky, constantly monitoring for "hot-spots." In the spring of 2017, NOAA forecasters used GOES 16 images to alert Texas and Oklahoma firefighters to fires that had started in remote area, allowing them to take immediate action and contain the fires. Throughout the 2017 near record-setting wildfire season in the west, NOAA forecasters provided on-site support to Incident Management Teams during large wildfires. These specially-trained Incident Meteorologists (IMETS) provided detailed weather forecasts to the teams as they made plans to attack the wildfire.

The IMETS use NOAA's HYSPLIT plume model to determine the areas significantly impacted by wildfire smoke to aid in decision-making to save life and property. In 2017, the HYSPLIT Model developed by NOAA's Air Resources Laboratory, had dramatic improvement in its accuracy and timeliness by integrating information from NOAA's newest geostationary satellite, GOES-16. HYSPLIT is also used by NOAA forecasters to respond to local emergency responder requests for plume dispersion forecasts for chemical spills, fires, and nuclear incidents. In collaboration with Sandia National Laboratories and the Nuclear Regulatory Commission, HYSPLIT is being integrated into a System that analyzes consequences of an accidental atmospheric release of radioactive material.

PACIFIC NORTHWEST HARMFUL ALGAL BLOOM FORECAST GOES OPERATIONAL

A NOAA bulletin to inform communities and combat the impacts of harmful algal blooms (HABs) in the Pacific Northwest went operational in 2017, facilitating a

record-setting clam harvest. The Pacific Northwest HAB bulletin forecast that a future spike in algal toxins could necessitate closing the fishery for the remainder of the season. The bulletin gave Washington Department of Fish and Wildlife confidence to take the unprecedented step of increasing the bag limit on razor clams before toxin levels rose. The decision generated \$7M in local revenue trips in 11 days, as locals and tourists flocked to the beach to take advantage of the shorter season and higher limits. The HAB forecast is supported by data from U.S. Integrated Ocean Observing System; the University of Washington's LiveOcean model; sampling by state and tribal groups; data from an Environmental Sample Processor; and other real-time observations. NOAA and its partners also provide HAB forecasts for Lake Erie, the Gulf of Maine, and the Gulf of Mexico.

RESEARCH TO OPERATIONS TRANSITION PROJECTS IMPROVE SEASONAL FORECASTS AND EXPLORE SUB-SEASONAL PREDICTION

NOAA is working to bridge the forecast gap between existing two-week predictions to seasonal time range, providing wide swaths of users, including transportation, commerce, public utilities, tourism industries, with the potential for the longer term weather information they need to anticipate the months ahead. The North American Multi-Model Ensemble System (NMME) seasonal forecast system, transitioned to operational use in 2016, and is used to support NOAA's Climate Prediction Center (CPC) operational monthly and seasonal temperature and precipitation outlooks. The NMME is generally the most skillful tool available on the seasonal timescale, though it is used in conjunction with other tools in forecast preparation.

For the sub-seasonal range (weeks 3 to 4), NOAA developed the joint SubX research initiative (Sub-seasonal Prediction Experiment), with other agencies to test the skill of research models at this time scale. SubX combines North American global models from NOAA, NASA, Environment Canada, the U.S. Navy, and National Center for Atmospheric Research to produce experimental forecasts looking three to four weeks ahead. NOAA Operations is rigorously evaluating the SubX models to see if they add value over existing operational models. Farmers and ranchers, public health officials and water resource managers find value in seasonal forecasts, such as drought outlooks or El Niño Southern Oscillation (ENSO) predictions.

NATIONAL STANDARD 1 REVISIONS FURTHER STABILIZE U.S. FISHERIES

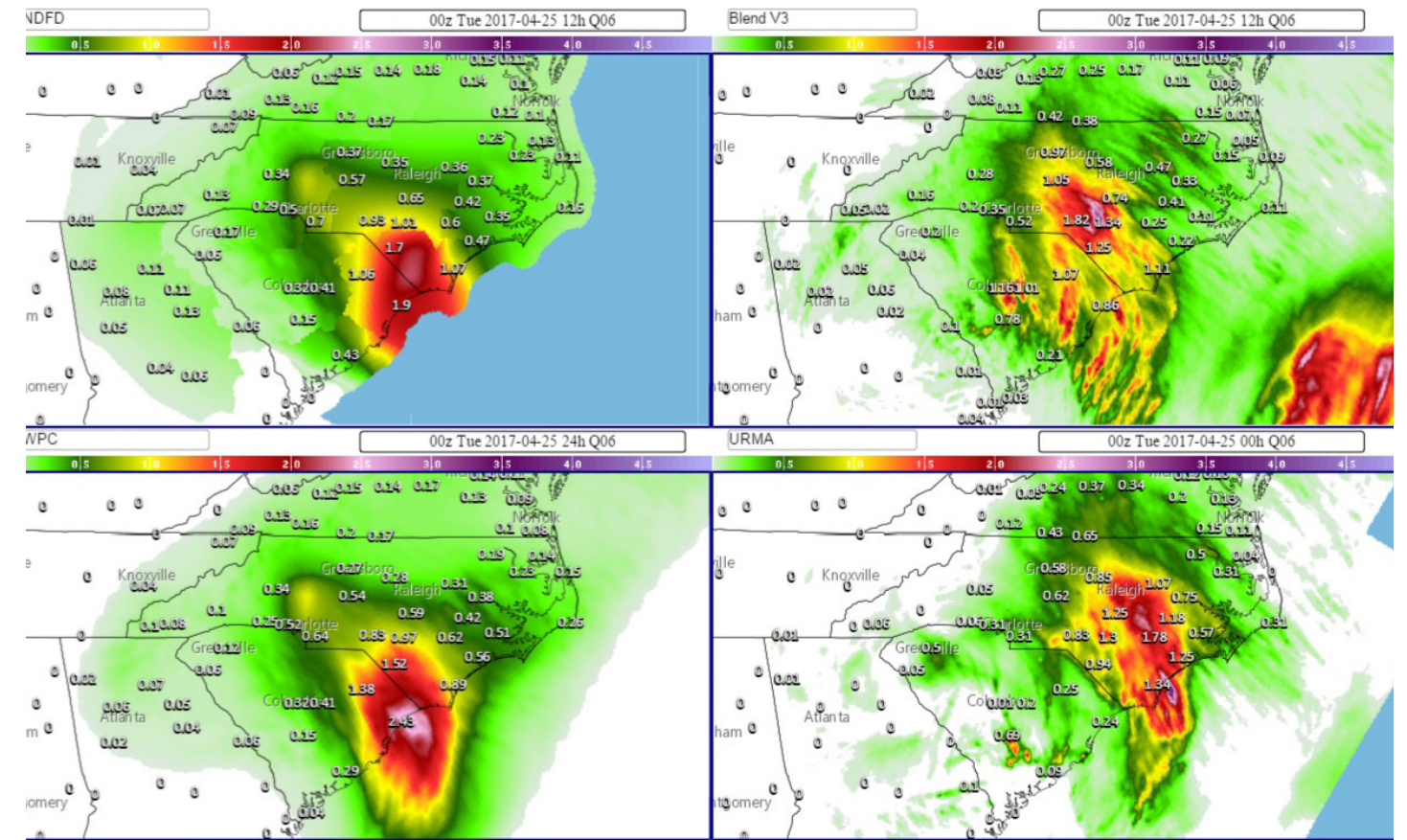
Fisheries, whether for commerce or recreation, play an enormous role in the U.S. economy. Fishermen, processors, ice houses, restaurants, grocery stores, bait and tackle shops, fuel stations, and many other businesses benefit from healthy commercial and recreational fishing. These fishing activities generated \$208 billion in sales impacts, \$62 billion in income impacts, and \$97 billion in value-added impacts.¹ A critical component driving the success of sustainable fisheries management is a set of guidelines under the Magnuson-Stevens Act (MSA) called the

¹ National Marine Fisheries Service. 2017. Fisheries Economics of the United States, 2015. U.S. Dept. Commerce, NOAA Tech. Memo. NMFSF/SPO170. Available at: http://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2015/index.

National Standard 1, or NS1. In 2017, NOAA published a revision of the NS1 that provides tools to increase stability and flexibility in fishery management while not establishing any new requirements to revise current management plans. Tools include the ability to establish multi-year overfishing status determination criteria and to phase in catch reductions, as well as further guidance on carryover of unused quota. The revised guidelines also help the U.S maintain our progress ending and preventing overfishing.

IMPROVED CONSISTENCY AND SKILL OF FORECASTS WITH THE NATIONAL BLEND OF MODELS

In July 2017, NOAA implemented a new version of the National Blend of Models (NBM). The NBM concept was first developed by NOAA’s National Weather Service (NWS) field offices, for the field offices in order to provide a consistent starting point for NWS forecast products. The NBM project is to provide that same blend of models, but at a national scale. NBM version 3.0 upgrade incorporates additional weather elements such as temperature and winds, as well as more global and mesoscale models, over the entire U.S. and runs hourly, instead of only twice per day. Version 3.0 also produces precipitation forecasts. The extra models contributing to the inputs, weather elements, and increased availability provide a consistent national forecast starting point for NWS forecasters from local Weather Forecast Offices to National Centers. NBM’s post-processed guidance supports and enhances Impact-based Decision Support Services (IDSS) by freeing forecasters in times of high-impact weather to provide full-time attention to decision support for its customers. NBM is a critical part of NOAA’s efforts to evolve NWS capabilities to achieve a Weather-Ready Nation. The first version of the NBM was released January 6, 2016 following efforts to develop a blended model approach spurred by the impacts of Super Storm Sandy in 2012.



National Blend of Models v 3.0 went live in July. Upgrades to the blend continue, improving the consistency and skill of forecasts and warnings across the nation.

Chapter 2

National Ocean Service

NOAA's National Ocean Service (NOS) enables safe, sustainable, and efficient use of marine and coastal resources. It does so by gathering oceanographic observations and providing data to users; conducting and applying research for sustainable management, protection, and restoration of ocean and coastal resources; and using place-based approaches to achieve sound resource management. NOS's science-based products and services support coastal economic activity, reduce risk to life and property on the coast, and promote more effective protection and use of coastal resources.



NOAA diver injects a crown-of-thorns starfish with ox bile that kills the creature, a species known to threaten coral.

FY 2019 REQUEST \$406,297,000

NOAA requests a total of \$406,297,000 in discretionary and mandatory funds for NOS mission functions. This total includes Operations, Research, and Facilities (ORF); Procurement, Acquisition, and Construction (PAC); and other mandatory accounts and includes a net decrease of \$141,046,000 in FY 2019 program changes. This program change total includes a net increase of \$144,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3.

The FY 2019 request prioritizes NOS’s core functions: mapping and charting; oceanographic observations and earth positioning data; ecological science and monitoring; response and restoration; and protection of key marine resources. The request reduces extramural grants; however, NOS will continue to provide partners with national-level coordination and technical assistance.

FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$380,053,000 to support the Operations, Research, and Facilities activities of the NOS, reflecting a net decrease of \$138,911,000 in FY 2019 program changes.

ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

NOS collected more than 65,000 images following Hurricanes Harvey, Irma, and Maria to understand the impacts and facilitate the response. This image shows an area of the U.S. Virgin Islands.



NOS Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



NAVIGATION, OBSERVATIONS AND POSITIONING \$189,750,000

NOAA requests a net decrease of \$17,970,000 in program changes for a total of \$189,750,000 in the Navigation, Observations, and Positioning activity. Program changes include:

Navigation, Observations and Positioning: Eliminate Single Year Grant to Joint Ocean and Coastal Mapping Center: NOAA requests a decrease of \$1,987,000 to discontinue single-year cooperative agreements with academic institutions for joint ocean and coastal mapping centers. NOAA will continue to support research and development of survey, geospatial data management, and cartographic technologies through the Joint Hydrographic Center, the Coast Survey Development Laboratory, and other Navigation, Observations, and Positioning programs.

Navigation, Observations and Positioning: Regional Geospatial Modeling Grants: NOAA requests a decrease of \$5,960,000 to terminate the Regional Geospatial Modeling Grants program. NOAA will continue to support a range of regional geospatial requirements through NOS’s Coastal Zone Management and Services and Navigation, Observations and Positioning program activities. These regionally significant activities include height modernization, Continuously Operating Reference Stations, data access, and capacity building.

IOOS Regional Observations: Reduce Integrated Ocean Observing System (IOOS) Regional Observation Grants: NOAA requests a decrease of \$11,050,000 to reduce grants to 11 regional observing systems under the IOOS Regional Observation Program. NOAA will continue to support the 11 IOOS Regional Associations at the reduced funding level.

COASTAL SCIENCE AND ASSESSMENT \$74,042,000

NOAA requests a net decrease of \$9,160,000 in program changes for a total of \$74,042,000 in the Coastal Science and Assessment activity. Program changes include:

Coastal Science, Assessment, Response and Restoration: Improve Disaster Preparedness: NOAA requests an increase of \$1,240,000 for the Disaster Preparedness Program (DPP), which further expands activities of the Disaster Response Center. The DPP bolsters NOS's emergency responses to coastal storms and other disasters by supporting exercises, training, continuous improvement, and coordination for emergency response.

Competitive Research: NOAA proposes a reduction of \$9,933,000 to terminate competitive grants to academic research institutions for ecological research. NOAA will continue its related intramural research program that addresses specific coastal management issues, such as harmful algal blooms, by bringing together academic institutions, businesses and government laboratories.

OCEAN AND COASTAL MANAGEMENT AND SERVICES \$116,261,000

NOAA requests a decrease of \$111,781,000 in program changes for a total of \$116,261,000 in the Ocean and Coastal Management and Services activity. Program changes include:

Recreational razor clam harvesters in Long Beach, Washington, set a record for one-day digger trips (17,800 diggers) on April 30, 2017.



Coastal Zone Management and Services: Integrated Water Prediction: NOAA requests a decrease of \$2,290,000 to eliminate funding for the NOS portion of the Integrated Water Prediction project. The reduction will curtail development of new products and services for end users, including using enhanced water predictions to produce decision support products for users and efforts to link coastal and terrestrial water models.

Coastal Management Grants: NOAA requests a decrease of \$84,429,000 to terminate the Coastal Zone Management (CZM) Grants Program and the Regional Coastal Resilience Grants Program. States and other grantees have used these grants to support a broad range of activities, including coastal planning, habitat conservation and restoration, protection of life and property from coastal hazards, enhancement of public access to the coast for recreation, and urban waterfront and port revitalization. NOAA will continue to support states' participation in the National CZM program by supporting implementation of states' management plans, supporting Federal consistency reviews, and providing technical assistance services.

National Estuarine Research Reserves System (NERRS): NOAA requests a decrease of \$23,342,000 to terminate Federal funding support to states for the management of the National Estuarine Research Reserve System. The NERRS is a network of 29 state-managed coastal sites designated to protect and study estuarine systems. NERRS matching funds from states total approximately \$6.5 million per year. 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.

Sanctuaries and Marine Protected Areas: Reduce Marine Sanctuaries Operations: NOAA requests a decrease of \$1,750,000 to reduce scalable activities such as vessel operations. NOAA will continue to 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.

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$1,541,000 to support the Procurement, Acquisition, and Construction activities of the NOS, reflecting a decrease of \$2,135,000 in FY 2019 program changes.

PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.



He'eia, in Hawaii, is the nation's newest National Estuarine Research Reserve. Over 13,000 acres of unique and diverse habitats joins 29 other sites protected for long-term research, water-quality monitoring, education, and coastal stewardship.

NOS CONSTRUCTION \$1,541,000

NOAA requests a decrease of \$2,135,000 in program changes for a total of \$1,541,000 in the NOS Construction activity. Program changes include:

National Estuarine Research Reserve System (NERRS) Construction: NOAA requests a decrease of \$1,689,000 to eliminate the NERRS Construction and Land Acquisition Program. Reserves are publicly owned lands and onsite facilities that provide opportunities for researchers as well as the public to better understand these estuarine areas. NOAA competitively awards these funds to states for capital construction and land acquisition in or around reserve sites.

MANDATORY FUNDS

DAMAGE ASSESSMENT AND RESTORATION REVOLVING FUND

The Damage Assessment and Restoration Revolving Fund was established in 1990 under Section 1012(a) of the Oil Pollution Act to facilitate (1) natural resources damage assessments and (2) restoration, replacement, or acquisition 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 a trustee. The fund receives proceeds from claims against responsible parties as determined through court settlements or agreements.



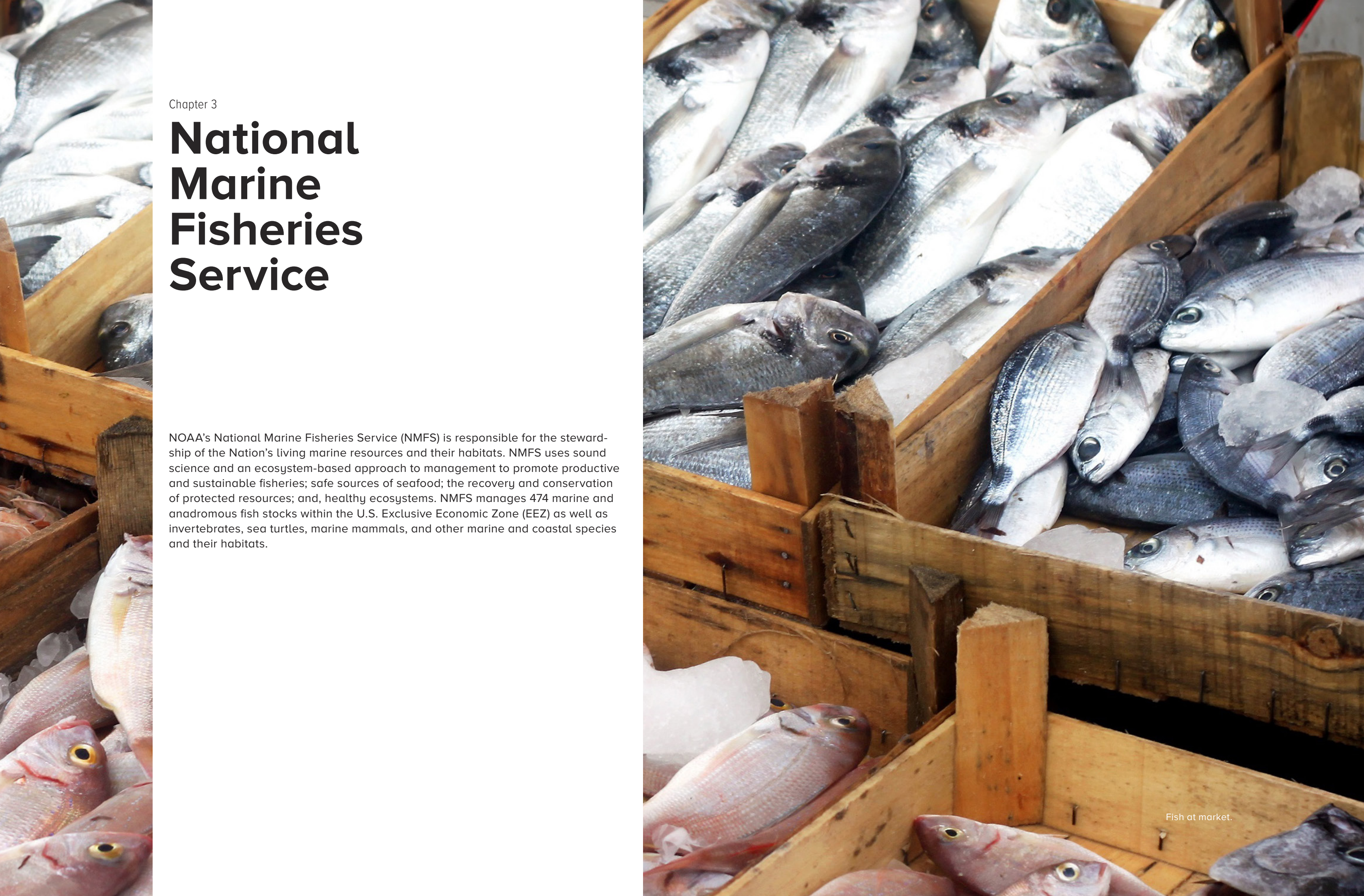
SANCTUARIES ENFORCEMENT ASSET FORFEITURE FUND

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. Penalties received are spent on resource protection within a sanctuary in which the violation occurred.

GULF COAST ECOSYSTEM RESTORATION SCIENCE, OBSERVATION, MONITORING, AND TECHNOLOGY FUND

The Gulf Coast Ecosystem Restoration Science, Observation, Monitoring, and Technology Fund provides funding for the NOAA RESTORE Act. The purpose of this program is to initiate and sustain an integrative, holistic understanding of the Gulf of Mexico ecosystem and support restoration efforts and the long-term sustainability of the ecosystem.

NOAA Marine Debris Program staff conduct a shoreline marine debris survey as part of the NOAA Marine Debris Monitoring and Assessment Project.



Chapter 3

National Marine Fisheries Service

NOAA's National Marine Fisheries Service (NMFS) is responsible for the stewardship of the Nation's living marine resources and their habitats. NMFS uses sound science and an ecosystem-based approach to management to promote productive and sustainable fisheries; safe sources of seafood; the recovery and conservation of protected resources; and, healthy ecosystems. NMFS manages 474 marine and anadromous fish stocks within the U.S. Exclusive Economic Zone (EEZ) as well as invertebrates, sea turtles, marine mammals, and other marine and coastal species and their habitats.

Fish at market.

FY 2019 REQUEST \$837,279,000

NOAA requests a total of \$837,279,000 in discretionary and mandatory funds for NMFS mission functions. This total includes Operations, Research, and Facilities (ORF) and other accounts, and represents a net decrease of \$110,425,000 in FY 2019 program changes. This program change total includes a net decrease of \$600,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3.

FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$810,484,000 to support the Operations, Research, and Facilities activities of NMFS, reflecting a net decrease of \$45,867,000 in FY 2019 program changes.

ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

PROTECTED RESOURCES SCIENCE AND MANAGEMENT \$181,615,000

NOAA requests a decrease of \$5,497,000 in program changes for a total of \$181,615,000 in the Protected Resources Science and Management activity. Program changes include:

Marine Mammals, Sea Turtles, and Other Species: Prescott Grants Program:

NOAA proposes a decrease of \$3,029,000 to eliminate funding for the John H. Prescott Marine Mammal Rescue Assistance Grants program in FY 2019. With this

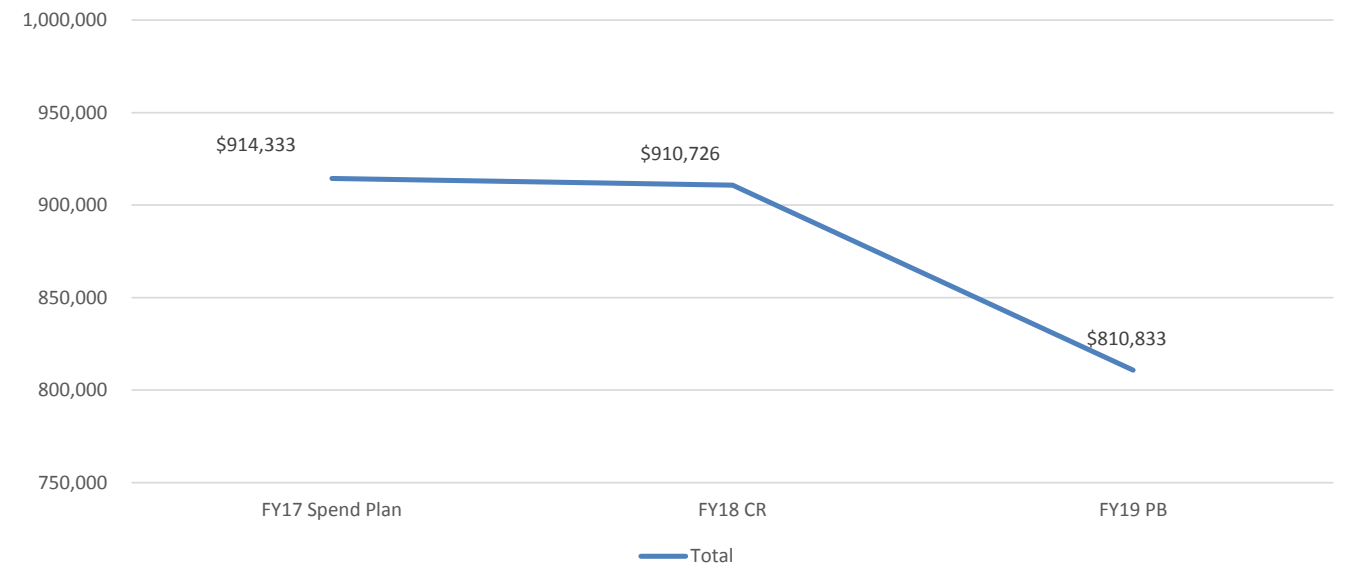


Hawaiian monk seals are one of the most endangered animal species in the world.

reduction, there would be no funding for competitive grants to marine mammal stranding network organizations to rescue, rehabilitate, or investigate sick or injured marine mammals and to determine the cause of death of marine mammals. This is the only Federal funding source for the stranding network; however, some network members may still operate in the absence of Prescott Grants, depending on the availability of private funding. Eliminating funding for this program will also decrease data and resources from the stranding network, which helps NOAA establish links between marine mammal health and the condition of coastal ecosystems.

Pacific Salmon: Hatchery Genetic Management Plans: NOAA requests a decrease of \$1,696,000, which represents the additional resources originally provided in the FY 2017 Appropriations Act to expedite the review of Hatchery Genetic

NMFS Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



Management Plans (HGMPs). NOAA uses HGMPs to determine if an individual hatchery program meets Endangered Species Act standards and incorporates best practices. With these resources in FY 2017, NMFS completed review of an additional 71 HGMPs for a total of 193 out of 330, and will continue this work in FY 2019 with available resources.

FISHERIES SCIENCE AND MANAGEMENT \$529,455,000

NOAA requests a net decrease of \$17,696,000 in program changes for a total of \$529,455,000 in the Fisheries Science and Management activity. Program changes include:

Fisheries Data Collections, Surveys, and Assessments: Reef Fish Stock Assessments:

NOAA requests a decrease of \$5,000,000 for development and implementation of agency-independent and alternative approaches to research and stock assessments for reef fish in the Gulf of Mexico. Congress provided funding for this work in FY 2016 and 2017. NOAA will continue to produce stock assessments for the Gulf of Mexico reef fish complex as part of its national stock assessment process.

Fisheries Data Collections, Surveys, and Assessments: Cooperative Research:

NOAA requests a decrease of \$2,937,000 for its Cooperative Research program, which will reduce the number of projects from approximately 39 to 29 in FY 2019. The Cooperative Research program enables commercial and recreational fishermen to participate in the collection of fundamental fisheries information that supports the development and evaluation of management options. NOAA values cooperative research as an important part of fisheries data collection and will continue to execute this research with industry, fishermen, and other stakeholders with available funding.

Fisheries Management Programs and Services: National Catch Share Program:

NOAA requests a decrease of \$5,111,000 for its National Catch Share Program, which will reduce efforts to improve data collection in catch share fisheries and implementation of new catch share programs. “Catch share” programs allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. The national program implements management improvements requested by the fishing industry and Regional Councils. NOAA will continue to provide support for the 16 programs currently under catch share management.

Salmon Management Activities: Genetic Stock Identification and Pacific Salmon Treaty: NOAA requests a decrease of \$1,835,000, which represents the additional funding originally provided in the FY 2017 Appropriations Act for genetic stock identification within the Mitchell Act hatchery program and implementation of the

Pacific Salmon Treaty. Genetic stock identification research identifies the location and movement of Federally protected stocks in the wild to improve salmon management and avoid harvest of weak salmon stocks. 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.

Interjurisdictional Fisheries Grants: NOAA requests a decrease of \$2,984,000 to eliminate funding for the Interjurisdictional Fisheries Grants program in FY 2019. With this reduction, grants to states and territories to aid in inter-

jurisdictional fisheries management would be terminated. This program supports the management of interjurisdictional fisheries resources throughout their habitat range, and research used to inform ecosystem approaches to conservation and management.

ENFORCEMENT \$51,495,000

NOAA requests a decrease of \$17,837,000 in program changes for a total of \$51,495,000 in the Enforcement activity.

Enforcement: Cooperative Enforcement Program: NOAA requests a decrease of \$17,837,000 for the Cooperative Enforcement Program (CEP), which would eliminate funding for Joint Enforcement Agreements (JEA) with 28 state and U.S. territory partners. JEAs provide funds to state and U.S. territorial law enforcement agencies to perform enforcement services in support of Federal regulations. Since 2001, NOAA has capitalized on this approach to address challenges associated with

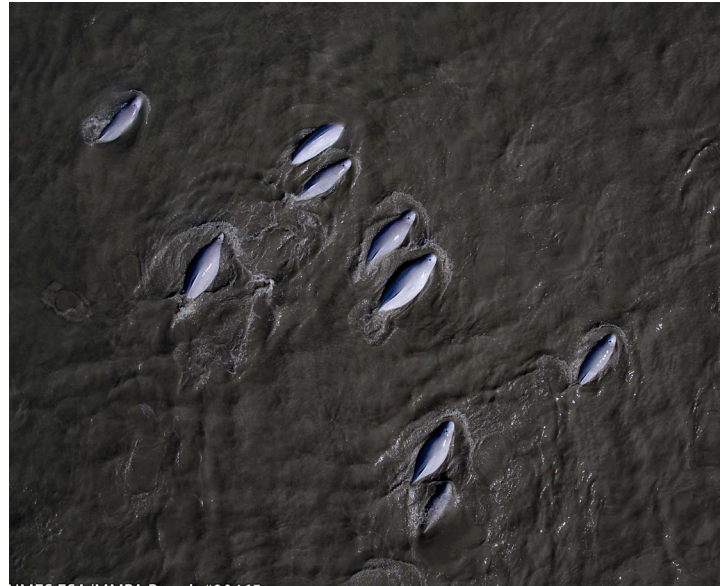


Image of beluga whales taken with hexacopter. Credit: Hollis Europe and Jacob Barbaro, NMFS



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 has also allowed NOAA to concentrate on the investigation and resolution of more serious violations.

HABITAT CONSERVATION AND RESTORATION \$47,919,000

NOAA requests a decrease of \$4,837,000 in program changes for a total of \$47,919,000 in the Habitat Conservation and Restoration activity. Program changes include:

Habitat Conservation and Restoration: Fisheries Habitat Restoration: NOAA requests a decrease of \$4,837,000 for partnerships and grants provided through the Community-based Restoration Program (CRP) within the NOAA Restoration Center. These grants support on-the-ground habitat restoration projects (e.g., wetlands, rivers, coral reefs, oysters) that promote productive and sustainable fisheries, improve the recovery and conservation of protected resources, and sustain healthy ecosystems and resilient communities and economies. NOAA will continue to provide technical expertise and leadership to states, Tribes, and local communities, as well as other programs and Federal agencies as resources allow.

NOAA scientists using a hexacopter to take images of beluga whales. Credit: Tamara McGuire, Cook Inlet Beluga Photo Identification Project.

DISCRETIONARY FUNDS

PACIFIC COASTAL SALMON RECOVERY FUND

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. NOAA requests a decrease of \$64,559,000 to 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.

FISHERMEN'S CONTINGENCY FUND

The Fishermen's Contingency Fund allows NOAA to compensate U.S. commercial fishermen for damage or loss of fishing gear, vessels, or revenues caused by oil and gas-related obstructions in any area of the Outer Continental Shelf (OCS). The funds are derived from fees collected annually by the Secretary of the Interior.

FOREIGN FISHING OBSERVER FUND

The Foreign Fishing Observer Fund is financed through fees collected from owners and operators of foreign fishing vessels fishing within the U.S. EEZ. The fund is used by NOAA to pay salaries, administrative costs, data editing and entry costs, and other costs incurred for observers.

FISHERIES FINANCE PROGRAM ACCOUNT

The Fisheries Finance Program is a national loan program that makes long-term, fixed-rate financing available to U.S. citizens who otherwise qualify for financing or refinancing for the construction, reconstruction, reconditioning, or the purchasing of fishing vessels, shoreside processing, aquaculture, mariculture facilities, or individual fishing quota.

MARINE MAMMAL UNUSUAL MORTALITY EVENT FUND

An unusual mortality event 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." This fund supports efforts to examine carcasses and live stranded animals allowing understanding of threats and stressors and the ability to determine when a situation is "unusual."

MANDATORY FUNDS

PROMOTE AND DEVELOP AMERICAN FISHERY PRODUCTS & RESEARCH PERTAINING TO AMERICAN FISHERIES FUND

NOAA will transfer \$154,868,000 from the Promote and Develop account to offset NMFS' appropriations within the 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. With this transfer, no funds will be available for the Saltonstall-Kennedy (S-K) 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.

FISHERIES FINANCE PROGRAM ACCOUNT

The mandatory component of the Fisheries Finance Program Account authority is subject to the Federal Credit Reform Act of 1990 (FCRA) (2 U.S.C. 661). The FCRA requires estimated loan costs to be appropriated in cash when Congress authorizes annual credit ceilings.

FEDERAL SHIP FINANCING FUND

This account manages the loan guarantee portfolio that existed prior to the enactment of the FCRA.

ENVIRONMENTAL IMPROVEMENT AND RESTORATION FUND

The Environmental Improvement and Restoration Fund was created by the Department of the Interior and Related Agencies Appropriations Act of 1998 for the purpose of carrying out marine research activities in the North Pacific.

LIMITED ACCESS SYSTEM ADMINISTRATION FUND

Under the authority of the Magnuson-Stevens Act (MSA) Section 304(d)(2)(A), NMFS must collect a fee to recover incremental costs of management, data collection, and enforcement of Limited Access Privilege programs. Fees are deposited into the Limited Access System Administration Fund. Fees shall not exceed three percent of the ex-vessel value of fish harvested under any such program.

WESTERN PACIFIC SUSTAINABLE FISHERIES FUND

Section 204(e) of the 2006 amendments to the MSA authorizes the establishment of the Western Pacific Sustainable Fisheries Fund to allow foreign fishing within the U.S. EEZ in the Western Pacific through a Pacific Insular Area Fishery Agreement.

FISHERIES ASSET FORFEITURE FUND

Section 311(e)(1) of the MSA authorizes the Secretary of Commerce 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. NOAA has established a Civil Monetary Penalty/Asset Forfeiture Fund.

NORTH PACIFIC OBSERVER FUND

The North Pacific Groundfish Observer Program places all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two observer coverage categories: (1) a full coverage category, and (2) a partial coverage category. In the partial coverage category, landings from all vessels will be assessed a 1.25 percent fee on standard ex-vessel prices of the landed weight of groundfish and halibut. Money generated by this fee will pay for observer coverage in the partial coverage category in the following year.

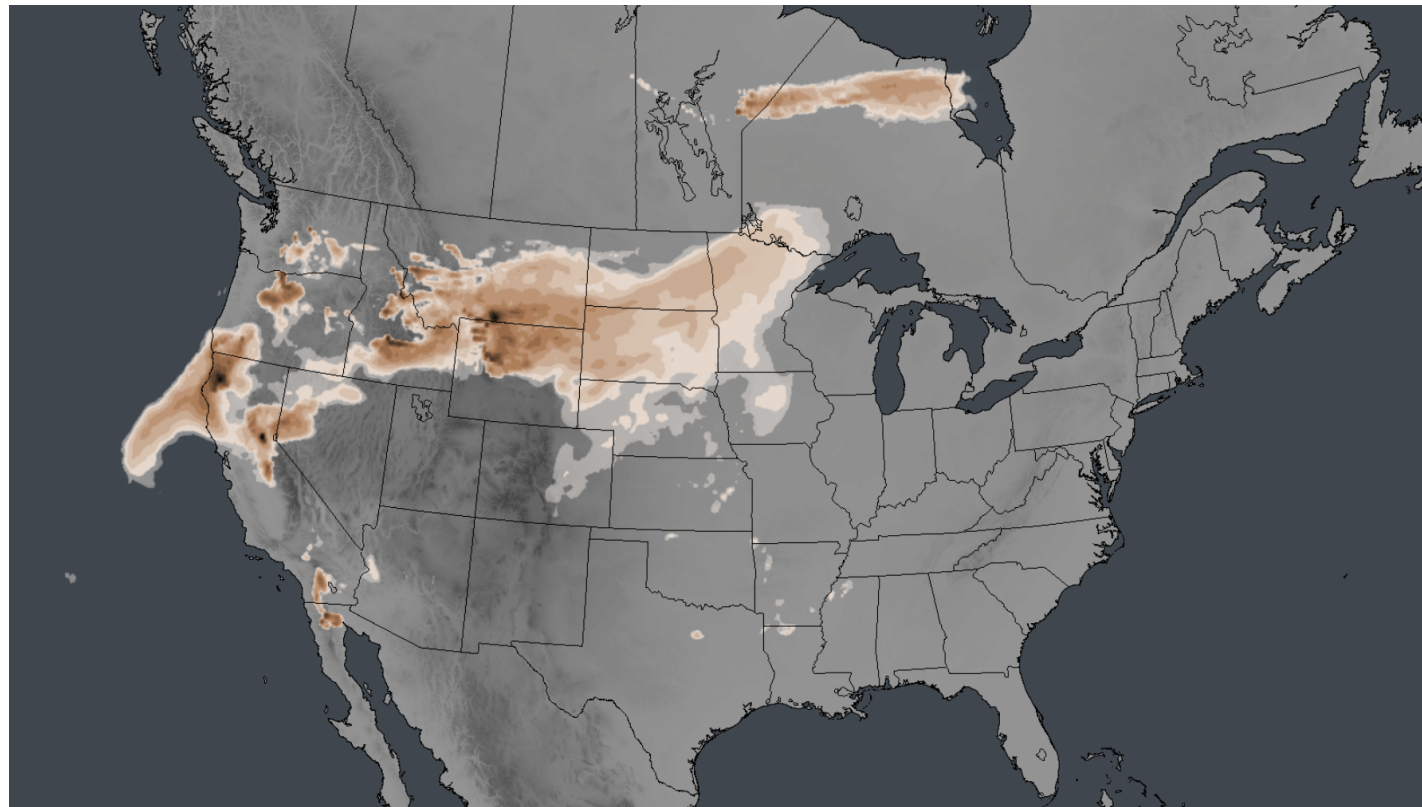
Chapter 4

Office of Oceanic and Atmospheric Research

NOAA's Office of Oceanic and Atmospheric Research (OAR) conducts and integrates research across NOAA. OAR's interdisciplinary research promotes better understanding of the Earth and its scientific results improve NOAA science and services and strengthen decision-making across the country. OAR research improves the accuracy of weather forecasts; enables communities to plan for and respond to short- and long-term weather-related events, such as tornadoes and drought; and enhances the protection and management of the Nation's coastal and ocean resources.



Saildrones begin a six month, over 4,000 nautical mile, round trip mission to the equator to test if Saildrones can collect a variety of measurements. They may become a powerful tool to provide key observations for weather forecasts. Credit: Saildrone, Inc.



When toxic plumes from wildfires or volcanoes are released, NOAA's HYSPLIT model is used to answer questions: where will it go and how concentrated will it be?

FY 2019 REQUEST \$321,651,000

In FY 2019, NOAA requests a total of \$321,651,000 to support OAR's continued and sustained operations. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts and includes a net decrease of \$192,400,000 in FY 2019 program changes. This program change total includes a net decrease of \$1,382,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3.

OAR's FY 2019 request prioritizes OAR's core functions and reduces extramural grants. OAR will continue to provide robust science that is instrumental to preventing the loss of human life, managing natural resources, and maintaining a strong economy.

FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$295,651,000 to support the Operations, Research, and Facilities activities of OAR, reflecting a net decrease of \$182,266,000 in FY 2019 program changes.

ORF PROGRAM CHANGES FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

OAR Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



CLIMATE RESEARCH \$98,643,000

NOAA requests a decrease of \$53,939,000 in program changes for a total of \$98,643,000 in the Climate Research activity. Program changes include:

Climate Research: Eliminate Climate Competitive Research PPA: NOAA requests decreases of \$8,472,000 from Regional Climate Data and Information and \$39,782,000 from Climate Competitive Research to eliminate competitively funded climate research. This will reduce NOAA's funding for Cooperative Institutes, universities, NOAA laboratories, and other partners that advance understanding of the Earth's climate system. NOAA will no longer have a Climate Competitive Research PPA.

Climate Research: Eliminate Arctic Research: NOAA requests decreases of \$1,940,000 from Climate Laboratories and Cooperative Institutes and \$3,745,000 from Regional Climate Data and Information. This reduction will terminate Arctic research focused on improvements to sea ice modeling and predictions that support fishermen, commercial shippers, cruise ships, and local communities. NOAA will also terminate modeling of ecosystem and fisheries vulnerabilities.

WEATHER & AIR CHEMISTRY RESEARCH \$91,730,000

NOAA requests a decrease of \$28,107,000 in program changes for a total of \$91,730,000 in the Weather and Air Chemistry Research activity. Program changes include:

Weather and Air Chemistry Laboratories and Cooperative Institutes: Close the Air Resources Laboratory: NOAA requests a decrease of \$4,377,000 to close the Air Resources Laboratory (ARL). ARL's research on air chemistry, mercury deposi-

tion, and atmospheric dispersion of harmful materials will be terminated, and its remaining research functions will be consolidated into other NOAA laboratories. NOAA will also no longer support upgrades to the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model, a particle model that has emergency response applications, including tracking mercury deposition and anthrax bioterrorism.

Weather and Air Chemistry Laboratories and Cooperative Institutes: Close the Unmanned Aircraft Systems Program Office: NOAA requests a decrease of \$5,339,000 to terminate the Unmanned Aircraft Systems (UAS) Program Office. This program office coordinates UAS research and development, and provides intramural grants to explore the use of UAS for current and future weather, polar, and marine observing operations across NOAA.

Weather and Air Chemistry Laboratories and Cooperative Institutes: End Vortex-Southeast: NOAA requests a decrease of \$4,966,000 to terminate Vortex-Southeast, a program used to detect, respond to, and warn against tornadoes in the Southeastern United States.

U.S. Weather Research Program: End Support for Airborne Phased Array Radar: NOAA requests a decrease of \$2,565,000 to terminate research and development on Airborne Phased Array Radar. NOAA will no longer work with the research community on developing a prototype system to examine methods of aircraft-based hazardous weather observation.

Joint Technology Transfer Initiative: Terminate the Joint Technology Transfer Initiative: NOAA requests a reduction of \$9,933,000 to terminate the Joint Technology Transfer Initiative (JTTI) used to transition the latest technological advances in weather research into products and services for communities and businesses.

OCEAN, COASTAL & GREAT LAKES RESEARCH \$93,144,000

NOAA requests a decrease of \$99,286,000 in program changes for a total of \$93,144,000 in the Ocean, Coastal, and Great Lakes Research activity. Program changes include:

Ocean, Coastal and Great Lakes Laboratories and Cooperative Institutes: Eliminate Autonomous Underwater Vehicle Demonstration Testbed: NOAA requests a decrease of \$1,923,000 to eliminate the autonomous underwater vehicle demonstration testbed. NOAA will retain its fleet of autonomous vehicles, but will reduce funding for ongoing development, testing, and evaluation.

Ocean, Coastal and Great Lakes Laboratories and Cooperative Institutes: End Genomics Research: NOAA requests a decrease of \$1,803,000 to eliminate the environmental genomics program at the Atlantic Oceanographic and Meteorological Laboratory (AOML), which studies genetic material to better understand how organisms are distributed and how they are affected by changing ocean conditions. This research supports coral monitoring and restoration, fisheries assessments for species such as Bluefin tuna larvae, and recruitment models of endangered species.



At University of Wisconsin - Stevens Point, Sea Grant supports a public/private industry partnership with Riverence, LLC to expand the sustainable production of Atlantic salmon using land-based water recirculating systems.

National Sea Grant College Program: Terminate the National Sea Grant Program: NOAA requests decreases of \$62,695,000 in the National Sea Grant College Program base and \$9,436,000 in Marine Aquaculture to terminate the National Sea Grant College Program. This decrease will end Federal support for the network of 33 Sea Grant programs located in coastal States and territories and terminates Sea Grant's Marine Aquaculture Program.

Ocean Exploration and Research: Reduce Ocean Exploration: NOAA requests a decrease of \$16,319,000 to reduce mapping and exploration of unknown and poorly understood areas of the ocean. With its \$19,561,000 request in FY 2019, the same as the FY 2018 Budget request, NOAA will continue to fund a limited number of days for Extended Continental Shelf mapping and conduct a limited number

of exploration missions. NOAA will prioritize ocean exploration program activities that support the nation's security, economy, environmental health, and increasing seafood demand.

Integrated Ocean Acidification: Reduce Integrated Ocean Acidification: NOAA requests a decrease of \$2,448,000 to reduce funding for the Integrated Ocean Acidification Program that conducts research to improve our understanding of ocean and coastal acidification and its impacts on marine resources, coastal communities, and economies.

Sustained Ocean Observations and Monitoring: Reduce Sustained Ocean Observations and Monitoring: NOAA requests a decrease of \$4,662,000 to reduce funding for Sustained Ocean Observations and Monitoring (SOOM). NOAA will reduce external grant funding that the SOOM uses to leverage partnerships to develop a global ocean observing system.

INNOVATIVE RESEARCH & TECHNOLOGY \$12,134,000

NOAA requests a net decrease of \$934,000 in program changes for a total of \$12,134,000 in the Innovative Research & Technology activity.

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$26,000,000 to support the Procurement, Acquisition, and Construction activities for OAR, reflecting a decrease of \$10,134,000 in FY 2019 program changes.

PAC PROGRAM CHANGES FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project and Activity (PPA) is located in Appendix 3. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2019 Congressional Justification.

SYSTEMS ACQUISITION \$26,000,000

NOAA requests a decrease of \$10,134,000 in program changes for a total of \$26,000,000 in the Systems Acquisition activity. Program changes include:

Research Supercomputing: Terminate Mississippi State HPC Partnership: NOAA requests a decrease of \$10,134,000 to terminate the Mississippi State Partnership established by congressionally directed requirements to develop a dedicated high performance computing facility



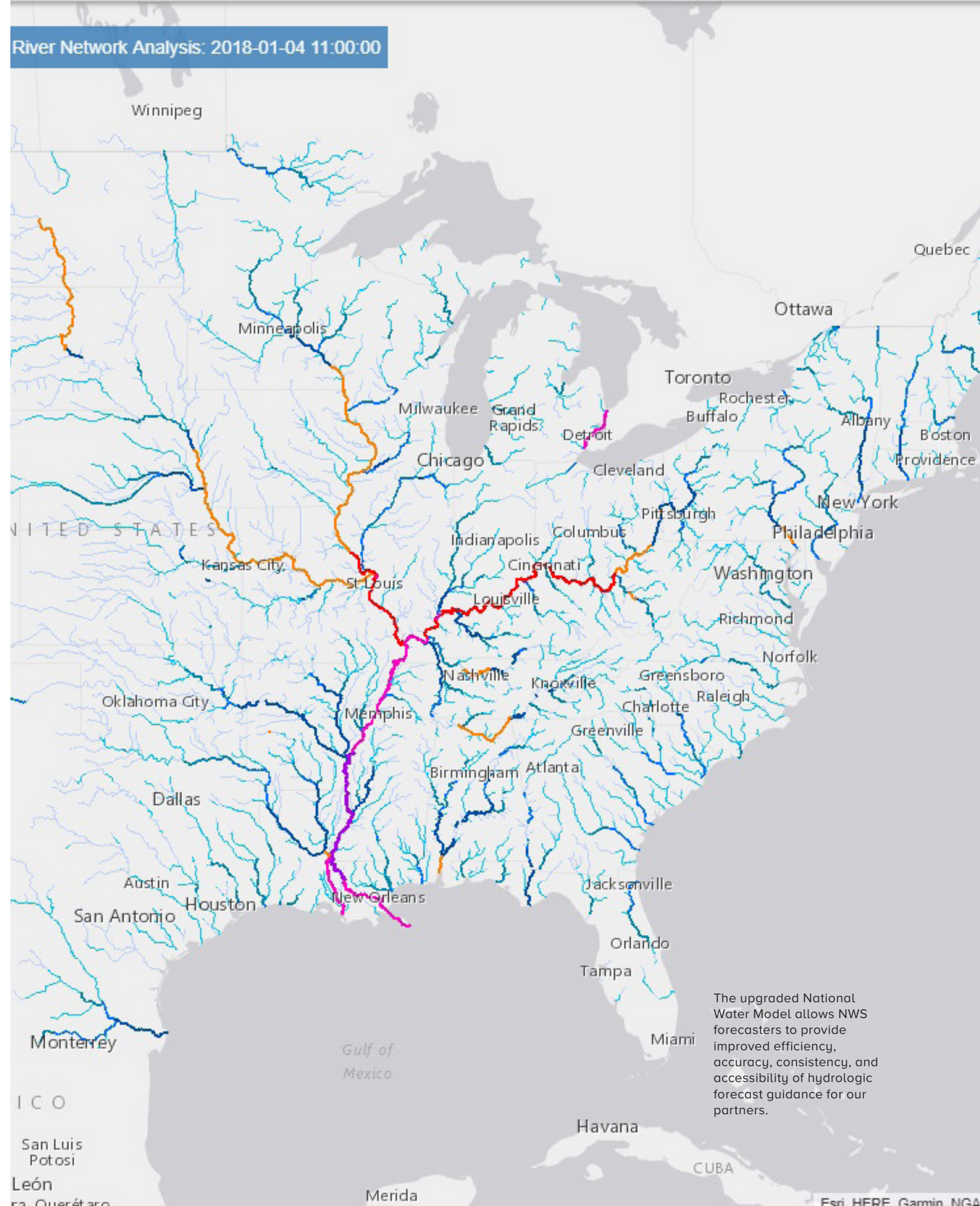
Line of tsunami buoys ready for deployment at the National Data Buoy Center (NDBC) facility in Mississippi.



Chapter 5

National Weather Service

NOAA's National Weather Service (NWS) is the official government authority for issuing warnings during life-threatening weather events. Every day, NWS forecasters issue public, aviation, marine, fire weather, climate, space weather, river, and flood forecasts and warnings for the protection of life, property, and the enhancement of the national economy. NWS forecasters work with local partners and communities to understand and manage risk, formulate emergency response plans, and promote community preparedness and public safety. Each year, NWS collects approximately 76 billion observations and issues approximately 1.5 million forecasts and 50,000 warnings. NWS data and products are publicly available through a national information infrastructure used by the public, governmental agencies, the private sector, and the global community.



FY 2019 REQUEST \$1,052,772,000

In FY 2019, NOAA requests a total of \$1,052,772,000 to focus on NWS's core mission, which is to provide weather, water, and climate forecasts and warnings that protect lives and property. NWS will continue to pursue its Weather-Ready Nation goals, including activities to improve forecast accuracy and consistency and enhance forecast collaboration with core partners. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts and includes a net decrease of \$75,390,000 in program changes. This program change total includes an increase of \$1,094,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3.

NWS's FY 2019 request prioritizes NWS's core functions. NWS will continue to provide weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy.

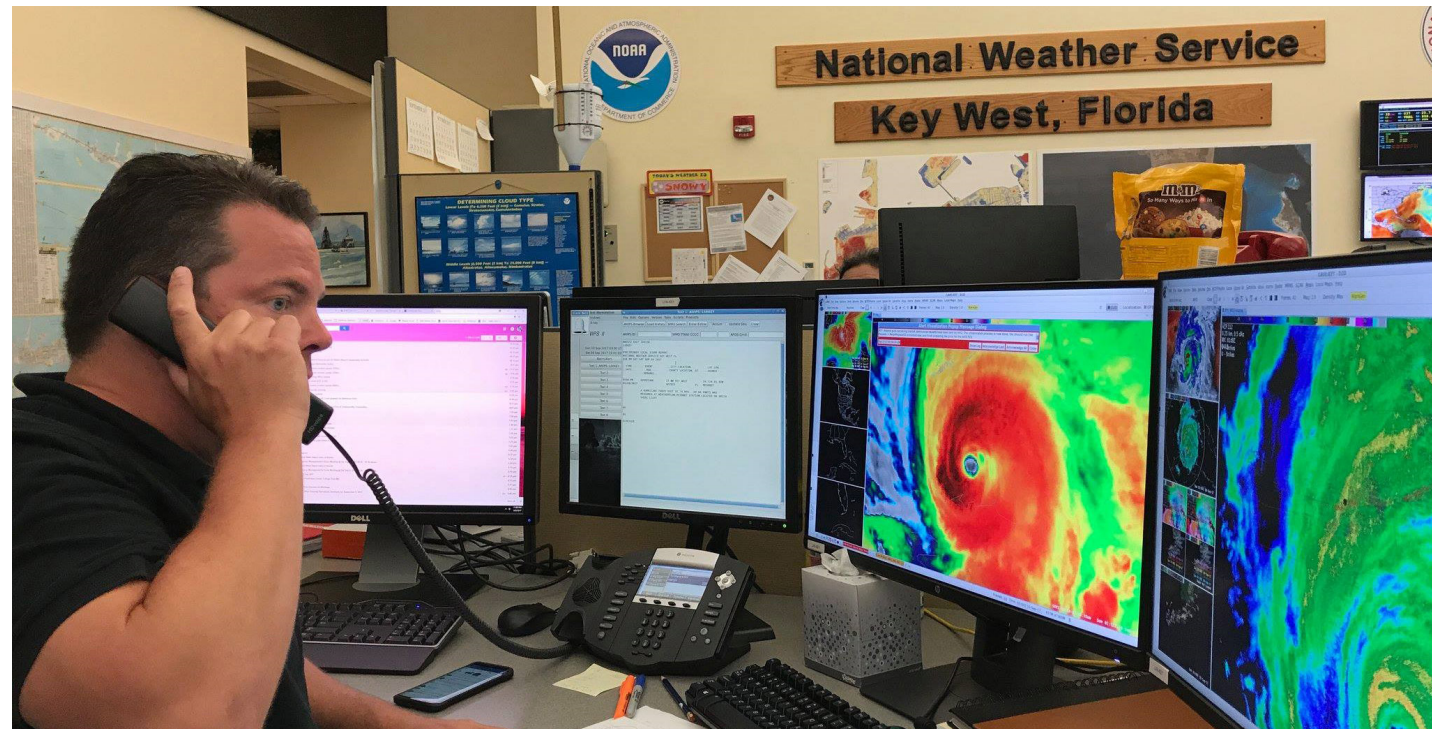
FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$935,196,000 to support the Operations, Research, and Facilities activities of the NWS, reflecting a net decrease of \$52,137,000 in program changes.

ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are included in the NOAA FY 2019 Congressional Justification.

NWS Key West meteorologists monitor Hurricane Irma as it approaches.



NWS Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



OBSERVATIONS \$203,992,000

NOAA requests a net decrease of \$13,722,000 in program changes for a total of \$203,992,000 in the Observations activity. Program changes include:

Reduce Surface and Marine Observations: NOAA will reduce surface and marine observations by \$15,489,000, including the National Mesonet Program, Weather and Ocean Platform, and the Tropical Atmosphere Ocean (TAO) array. This reduction limits mesoscale meteorological observations to only the highest-priority geographic areas. This decrease also lessens marine observations that inform forecasts and warnings and reduces observations of global environmental patterns (such as El Niño) that inform seasonal forecasts.

Restore Core Capabilities: NOAA requests an increase of \$1,767,000 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.

CENTRAL PROCESSING \$86,620,000

NOAA requests a net decrease of \$6,266,000 in program changes for a total of \$86,620,000 in the Central Processing activity. Program changes include:

Advanced Weather Interactive Processing System Cyclical Refreshment: NOAA requests an increase of \$5,130,000 to restore the minimal funding levels required for Advanced Weather Interactive Processing System (AWIPS) cyclical replacement

for AWIPS servers, workstations, monitors, and printers. AWIPS is the interactive computer system that integrates all meteorological and hydrological data, all satellite and radar data, and that forecasters use to prepare and issue accurate and timely forecasts and warnings. This investment will reduce the risk of hardware failure and component degradation, which results in system downtime that can impede critical weather forecasts and warnings.

Establishment of Regional Enterprise Application Development and Integration Teams: NOAA requests a decrease of \$10,100,000 to reflect significant efficiencies that can be achieved by transitioning to a new information technology (IT) service delivery model for Weather Forecast Offices (WFO). Consolidating IT support functions (along with upgrading systems and new technologies) is a critical part of evolving the NWS, including a right-sized workforce and appropriate organizational structure.

Slow Advanced Hydrologic Prediction Services Service Expansion: NOAA requests a decrease of \$2,000,000 to forgo additional development and implementation of the Hydrologic Ensemble Forecast Service (HEFS) at Advanced Hydrologic Prediction Services (AHPS) locations. The HEFS improves the reliability of ensemble forecasts of precipitation, temperature, and streamflow by providing a better understanding of uncertainty ranges for hydrologic forecasts at all time scales. This effort will enable better informed decisions regarding water management risk.

ANALYZE, FORECAST, AND SUPPORT \$471,792,000

NOAA requests a net decrease of \$20,222,000 in program changes for a total of \$471,792,000 in the Analyze, Forecast, and Support activity. Program changes include:

Restore Core Capabilities: NOAA requests an increase of \$8,784,000 to maintain current level of services and ongoing operations necessary to issue warnings and forecasts to protect life and property. Funding will address the FY 2018 civilian pay raise of 1.9 percent (\$7,635,000) and non-labor increases (\$1,149,000) to operating costs that are not reflected in the Analyze, Forecast, and Support baseline operating budget. These non-labor costs include increases to rent, communications and utilities.

Currently, non-discretionary operating costs represent 95 percent of the Analyze, Forecast, and Support 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.

NWS Workforce Savings: NOAA requests a decrease of \$15,000,000 through operating efficiencies by implementing recommendations outlined in NWS' Operations

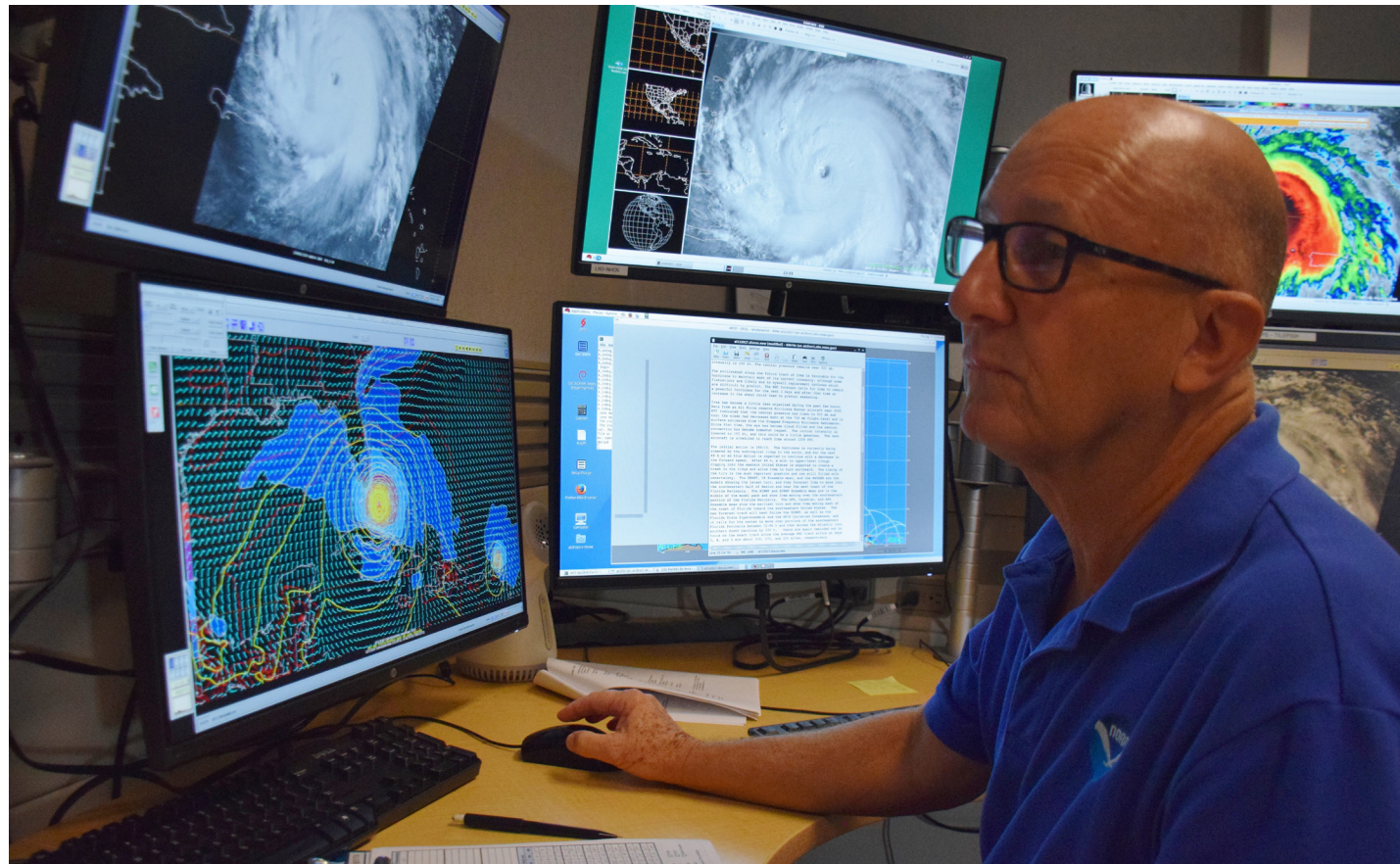


Meteorologists from NWS Houston survey flood damage following Hurricane Harvey.

and Workforce Analysis (OWA), which will enable NWS to continue to evolve and build a Weather-Ready Nation. The OWA recognizes inherent hurdles associated with the structure of NWS and provides various Impact-Based Decision Support Service (IDSS) 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 to include a reduction in forecast personnel. NWS will immediately begin implementing a series of operational reforms aimed at increasing staffing flexibility to best match service demands with available resources.

Reduce Tsunami Warning Program: NOAA requests a decrease of \$11,000,000 to reduce or eliminate components of NOAA's Tsunami Research and Operational Warning program. This reduction will affect monitoring, reporting, modeling research, and support to partners. NOAA will retain limited forecast and warning capacity through one operational Tsunami Warning Center. Support for preparedness education, outreach, and innovation research will cease.

Terminate Aviation Science Research to Operations: NOAA requests a decrease of \$1,806,000 to terminate its aviation science research-to-operations (R2O) effort. NOAA will be able to maintain the current level of operational aviation weather forecast products and services provided to users. However, NOAA will curtail further efforts to develop and implement aviation tools and capabilities needed by the Federal Aviation Administration to support the Next Generation Air Transportation System (NextGen). This program change is consistent with the aviation science R2O termination request from the Science and Technology Integration PPA.



National Hurricane Center (NHC) hurricane specialist Dr. Lixion Avila at the forecast desk monitoring Hurricane Irma.

Consolidate Climate Prediction Center/Weather Prediction Center Functions:

NOAA requests a decrease of \$1,200,000 to consolidate National Centers for Environmental Prediction functions of the Climate Prediction Center (CPC) into the Weather Prediction Center (WPC). This consolidation will result in a more continuous suite of products and greater consistency in presentation of data and forecast information at one national center. NOAA will continue base products, such as routine monthly and seasonal predictions of temperature and precipitation and El Nino/La Nina products will also continue.

DISSEMINATION \$50,090,000

NOAA requests an increase of \$2,510,000 in program changes for a total of \$50,090,000 in the Dissemination activity. Program changes include:

Enhance the Resilience and Reliability of Integrated Dissemination Program

Applications: NOAA requests an increase of \$2,287,000 to fund upgrades and enhancements to the Integrated Dissemination Program (IDP) systems in College Park, MD and Boulder, CO. IDP systems provide scalable, robust, secure, and commonly shared IT infrastructure to ensure resilience and reliability during critical weather events. The requested funding will help NOAA integrate mission-critical applications and enhance systems reliability.

SCIENCE AND TECHNOLOGY INTEGRATION \$122,702,000

NOAA requests a net decrease of \$14,437,000 in program changes for a total of \$122,702,000 in the Science and Technology Integration activity. Program changes include:

Reduce Investment in Numerical Weather Prediction Modeling: NOAA requests a reduction of \$5,000,000 to slow the transition of advanced modeling research into operations for improved warnings and forecasts. This affects the Next Generation Global Prediction System, Hurricane Forecast Improvement Program, NOAA Environmental Modeling System, and other model coupling, data assimilation, and collaborative research efforts.

Consumer Option for an Alternative System to Allocate Losses Act: NOAA requests a decrease of \$4,629,000 to terminate actions associated with the implementation of the Consumer Option for an Alternative System to Allocate Losses (COASTAL) Act of 2012. The COASTAL Act requires NOAA to produce detailed “post-storm assessments” in the aftermath of a damaging tropical cyclone that strikes the United States or its territories. NWS will continue to further COASTAL Act objectives to the extent possible with existing resources and will continue to make available observational and model data related to land-falling tropical cyclones.

Restore Core Capabilities: NOAA requests an increase of \$1,293,000 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 (\$1,293,000). Currently these liabilities are being funded through cuts to its existing base requirements adding risk to operational continuity and readiness.

Reduce Investment in the National Water Model: NOAA requests a reduction of \$3,101,000 to slow the incorporation of upgrades into the National Water Model by several years. In FY 2016, NOAA launched the first operational National Water Model, which represented a massive improvement in flood forecasting. NOAA will continue to provide valuable river forecast guidance to emergency managers and the public.

Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Recommendations: NOAA requests a decrease of \$2,000,000 to limit testing, evaluation, and potential implementation of recommendations from the Operations and Workforce Analysis (OWA). 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.

Terminate Aviation Science Research to Operations: NOAA requests a decrease of \$1,000,000 to terminate aviation science research and development and R2O efforts within NWS. NOAA will be able to maintain the current level of operational aviation weather forecast products and services provided to users. However, NOAA will terminate efforts to further develop and implement key aviation tools and capabilities required by the Federal Aviation Administration to support the Next Generation Air Transportation System (NextGen). This program change is consistent with the aviation science R2O termination request from the Analyze, Forecast, and Support PPA.

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$117,576,000 to support the Procurement, Acquisition, and Construction activities of the NWS, reflecting a net decrease of \$23,253,000 in program changes.

PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by PPA is located in Appendix 3. Detailed descriptions of all program changes provided below are included in the NOAA FY 2019 Congressional Justification.

SYSTEMS ACQUISITION \$108,942,000

NOAA requests a net decrease of \$24,289,000 in program changes for a total of \$108,942,000 in the Systems Acquisition activity. Program changes include:

Observations: Reduce Service Life Extension Program for Next Generation

Weather Radar: NOAA requests a decrease of \$16,284,000 to support a planned decrease to its portion of the Service Life Extension Program (SLEP) on the aging Next Generation Weather Radar (NEXRAD), which underpins the severe weather forecast and warning services for high-impact events that are critical to maintaining a Weather-Ready Nation. The proposed funding also reflects an additional \$4,424,000 in reductions to the Observation Portfolio. Difficult decisions and tradeoffs must be made among program priorities to ensure that NOAA most effectively meets its mission mandates and supports stakeholders.

Central Processing: Reduce Research and Development High Performance Computing: NOAA requests a decrease of \$4,000,000 to reduce the overall computational capacity of NOAA's Research and Development High Performance Computing system. This decrease will eliminate one of NOAA's supercomputing systems (Jet) located in Boulder, CO and reduce NWS's supercomputing use 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 no longer have use of the supercomputing system in Boulder, CO and will have reduced computing allocation in Fairmont, WV.


Central Processing: Eliminate Integrated Water Prediction High Performance Computing: NOAA requests a decrease of \$4,172,000 to eliminate high performance computing for continued improvement of the Nation's first Integrated Water Prediction (IWP) capability. NOAA will not 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.

CONSTRUCTION \$8,634,000

NOAA requests an increase of \$1,036,000 in program changes for a total of \$8,634,000 in the Construction activity. Program changes include:

Facilities Construction and Major Repairs: Weather Forecast Office and River

Forecast Center Relocations: NOAA requests an increase of \$1,036,000, to continue tenant improvements and support costs associated with Weather Forecast Office (WFO) and River Forecast Center (RFC) relocations as well as structural repairs to improve conditions at WFOs and RFCs.

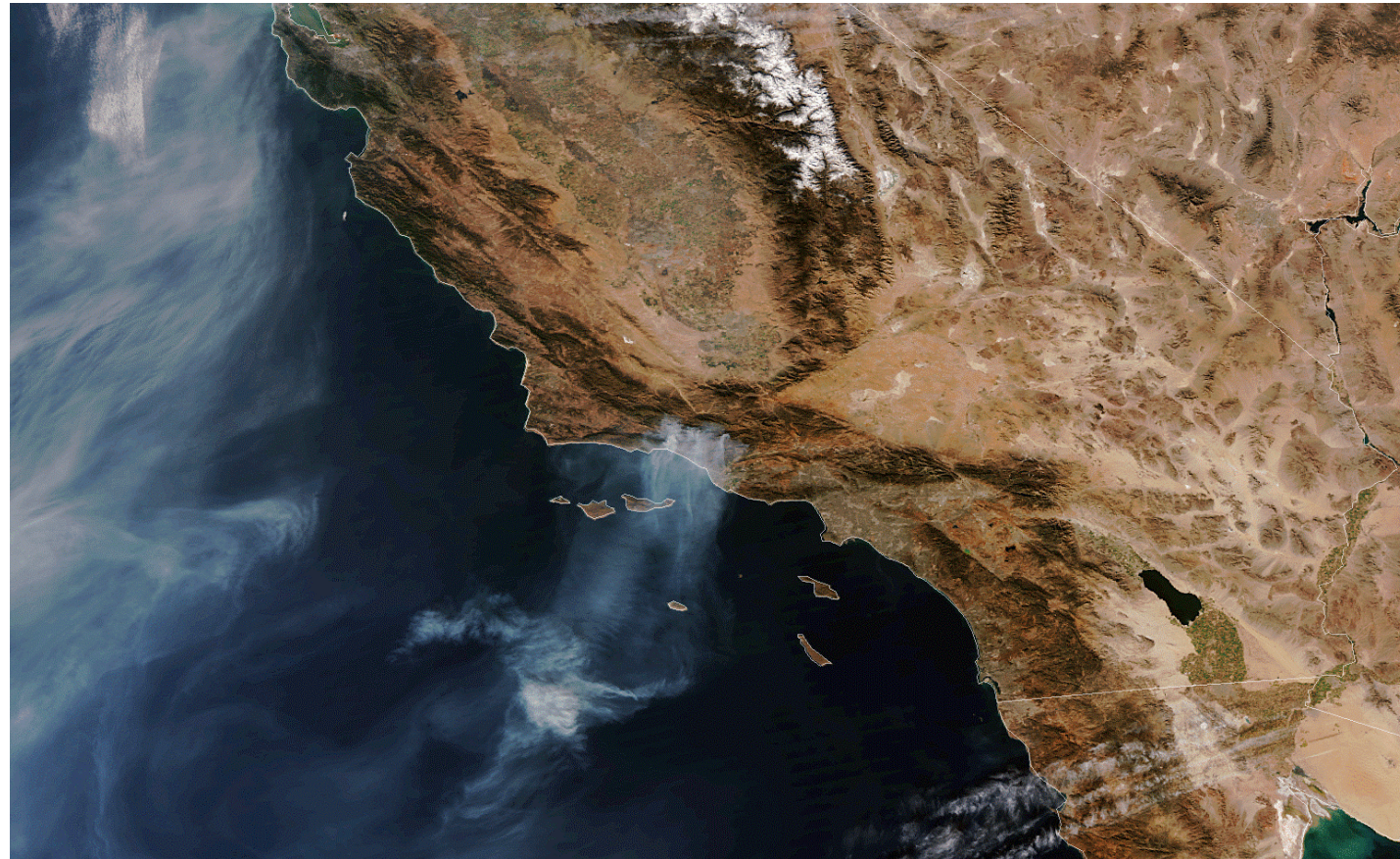
A satellite image of the Earth showing a large, well-defined hurricane system over the Atlantic Ocean. The hurricane has a clear eye and a dense, swirling cloud structure. The surrounding ocean is dark blue, and the landmasses of North and South America are visible in shades of green and brown. The image is taken from a high angle, looking down at the planet.

Chapter 6

National Environmental Satellite, Data and Information Service

The National Environmental Satellite, Data, and Information Service (NESDIS) provides timely access to global environmental data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life. Along with launching and operating NOAA's satellites, NESDIS manages the product development and distribution of vast amounts of environmental data. NOAA satellites support the weather forecasting enterprise by providing timely, high quality data for model outputs and publicly disseminated weather forecasts. NESDIS also works to develop the next generation of satellites to avoid gaps in satellite coverage that could affect NOAA's primary mission essential functions.

On September 8, 2017, GOES-16 captured this geocolor image of Hurricane Katia, Hurricane Irma, and Hurricane José in the tropical Atlantic. Hurricane Katia made landfall in Mexico that night, Hurricane Irma was passing between Cuba and the Bahamas, and Hurricane José was churning in the open ocean.



On December 13, 2017, only twenty-five days after JPSS-1 (NOAA-20) launched, it sent back this image which captures the Thomas Fires in Southern California.

FY 2019 REQUEST \$1,640,021,000

NOAA requests a total of \$1,640,021,000 to support the continued and enhanced operations of NESDIS. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts and includes a net decrease of \$550,959,000 in FY 2019 program changes. This program change total includes an increase of \$1,391,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3. Of particular note, this request includes continued support for development of NOAA's polar-orbiting and geostationary satellite programs, and increased support for satellite operations, Commercial Remote Sensing Regulatory Affairs, and the Office of Space Commerce.

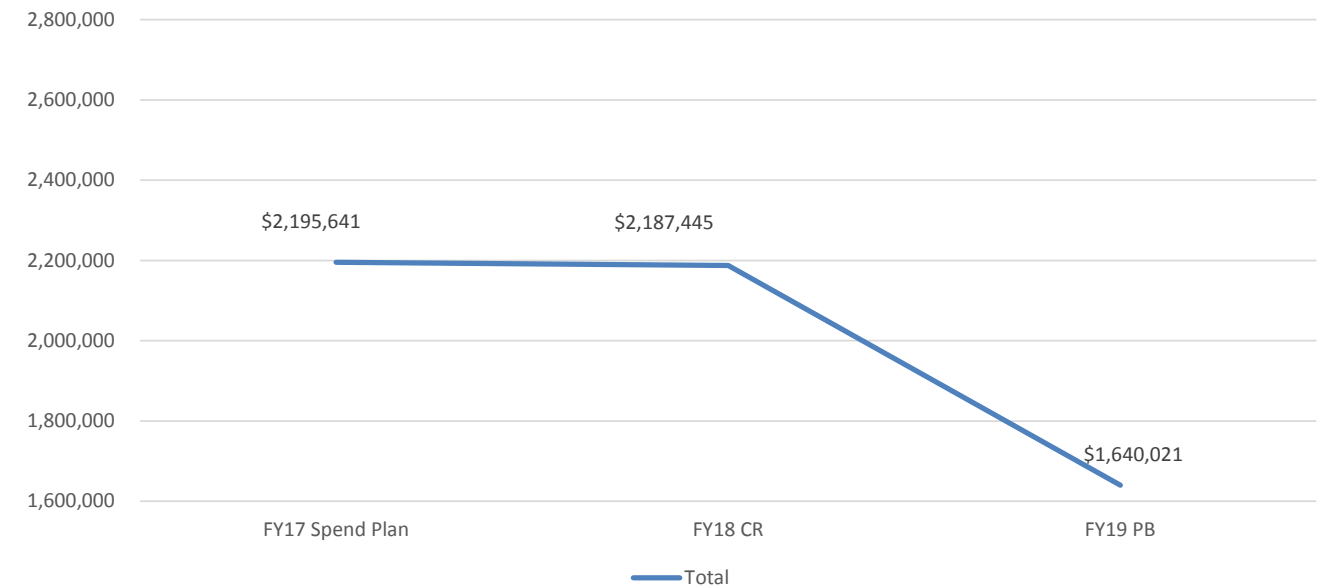
FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$239,310,000 to support the Operations, Research, and Facilities activities of NESDIS, reflecting a net increase of \$2,240,000 in FY 2019 program changes.

ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

NESDIS Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS \$181,719,000

NOAA requests a net increase of \$6,325,000 for a total of \$181,719,000 in the Environmental Satellite Observing Systems activity. Program changes include:

Satellite and Product Operations: NESDIS Information Technology Security:

NOAA requests an increase of \$4,915,000 to improve data flow resiliency across critical information technology (IT) systems and infrastructure. Specifically, this request will fund the Office of Satellite and Product Operations' efforts to identify and mitigate vulnerabilities affecting the availability, integrity, security, and delivery of NOAA's data. NOAA will use these funds to ensure compliance with NOAA and DOC IT security regulations, and FISMA requirements. NOAA uses complex IT systems to produce weather forecasts; issue advisories, watches, and warnings; and disseminate environmental information. IT system failures caused by cyber-attacks, equipment malfunctions, or disasters threaten NOAA's ability to collect and process raw meteorological data, analyze and model weather, and disseminate the information and warnings that save lives and preserve property.

Satellite and Product Operations: DSCOVR Operations:

NOAA requests an increase of \$1,447,000 to continue on-orbit support for the DSCOVR satellite, which launched on February 11, 2015 and was handed over from NASA to NOAA for operational command 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.

Satellite and Product Operations: Jason-3 Operations: NOAA requests an increase of \$1,274,000 for continued on-orbit support for the Jason-3 satellite which launched January 17, 2016. 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, and 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.

Product Development, Readiness & Application: Decrease Data Products Developed: NOAA requests a decrease of \$3,470,000, which will reduce the number of Product, Development, Readiness & Application (PDR&A) Program data products, applications, techniques, and systems developed. Funding at the proposed level will require NESDIS to be more targeted in its efforts to identify new requirements for satellite data and environmental information, conduct necessary research, and validate the accuracy of products disseminated to customers.

Office of Space Commerce: Facilitate Commercial Space Marketplace: NOAA requests an increase of \$1,005,000 to 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 also enables NOAA to collect and publish 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.

NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION \$57,591,000
NOAA requests a decrease of \$4,085,000 for a total of \$57,591,000 in the National Centers for Environmental Information activity. Program changes include:

National Centers for Environmental Information: Regional Climate Centers Reduction: NOAA requests a decrease of \$2,399,000 to the Regional Climate Centers (RCC) program. Located at major research institutions, RCCs are designed to respond quickly to emerging issues, such as droughts and floods. 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 knowl-

edge for decision makers and other users at the local, state, regional, and national levels.

National Centers for Environmental Information: Termination of Big Earth Data Initiative: NOAA requests a decrease of \$1,686,000 to terminate the Big Earth Data Initiative (BEDI) program. BEDI was initiated to maximize the discoverability and accessibility of NOAA's environmental observations. The FY 2019 proposal will not affect NOAA's support of other data stewardship priorities in the Environmental Data Management Framework, and NOAA will continue to leverage other partnerships and programs within NCEI to continue to improve data discovery, access, compatibility, and documentation

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$1,400,711,000 to support the Procurement, Acquisition, and Construction activities of NESDIS, reflecting a net decrease of \$553,199,000 in FY 2019 program changes.

PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2019 Congressional Justification.

SYSTEMS ACQUISITION

NOAA requests a net decrease of \$553,436,000 for a total of \$1,399,563,000 in the Systems Acquisition activity. Program changes include:

Geostationary Systems-R: GOES-R Series Decrease: NOAA requests a planned decrease of \$334,896,000 in the Geostationary Operational Environmental Satellites - R (GOES-R) Series program after GOES-16 became operational as GOES-East on December 18, 2018. The remaining funding of \$408,380,000 is needed to continue satellite engineering development, production, integration, and launch activities to ensure the continuity of the GOES-R Series program geostationary observing platforms. The GOES program, which has provided essential observational data since 1975, supports the National Weather Service (NWS) in forecasting, tracking, and monitoring severe storms. The GOES-R Series will provide observational data continuity through 2036 and significant enhancements to legacy GOES data to all operational users of geostationary observations. GOES-R Series observations provide coverage of the western hemisphere from a geostationary orbit, allowing continuous monitoring from the same angle during the detection and tracking of tropical cyclones, volcanic eruptions, fire hot spots, cloud and atmospheric moisture changes, lightning, currents flow dynamics, and atmospheric smoke and dust.

Geostationary Systems-R*	
BUDGET AUTHORITY IN THOUSANDS	
FY 2019 Request	\$408,380
FY 2020	\$304,056
FY 2021	\$292,500
FY 2022	\$292,500
FY 2023	\$250,000

*This profile reflects the PAC budget for the GOES-R Series program. Operational Phase Transfers beginning in FY 2017 are included in the appropriate ORF PPAs.

Polar Weather Satellites

BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$877,991
FY 2020	\$861,082
FY 2021	\$841,436
FY 2022	\$675,013
FY 2023	\$589,521

Polar Weather Satellites: Polar Weather Satellites Planned

Decrease: NOAA combined the Joint Polar Satellite System (JPSS) and the Polar Follow On PPAs and requests a net decrease of \$230,644,000 in the Polar Weather Satellites PPA that includes increased funding to maintain the original Launch Readiness Dates for JPSS-3 and JPSS-4. JPSS-1 successfully launched on November 18, 2018. The \$877,991,000 will be used to operate and sustain the Suomi National Polar-orbiting Partnership (Suomi NPP) and NOAA 20 (formerly JPSS-1) satellites; continue development of the instruments for JPSS-2, JPSS-3

and JPSS-4, as well as to continue the development, operations, maintenance, and sustainment of the ground system for the satellites in this series. The primary purpose of the JPSS series is to provide global meteorological observations to enable short-term (0-3 days), and mid-range (3-7 days) warnings of severe weather events critical for emergency managers and communities to make timely decisions to protect life and property. In addition, global environmental observations are provided for short term, mid-range, and seasonal monitoring and forecasting of weather and a wide variety of environmental phenomena.

Space Weather Follow On

BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$10,000
FY 2020	\$10,000
FY 2021	\$10,000
FY 2022	\$10,000
FY 2023	\$10,000

Space Weather Follow On: Compact Coronagraph Development:

NOAA requests an increase of \$5,034,000 for this program, which will enable NOAA to continue work with Naval Research Laboratory (NRL) to develop the compact coronagraph (CCOR) for launch by 2024. The CCOR will provide coronal mass ejection imagery used operationally by the National Weather Service's Space Weather Prediction Center for geomagnetic storm watches. 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.

COSMIC-2

BUDGET AUTHORITY IN THOUSANDS

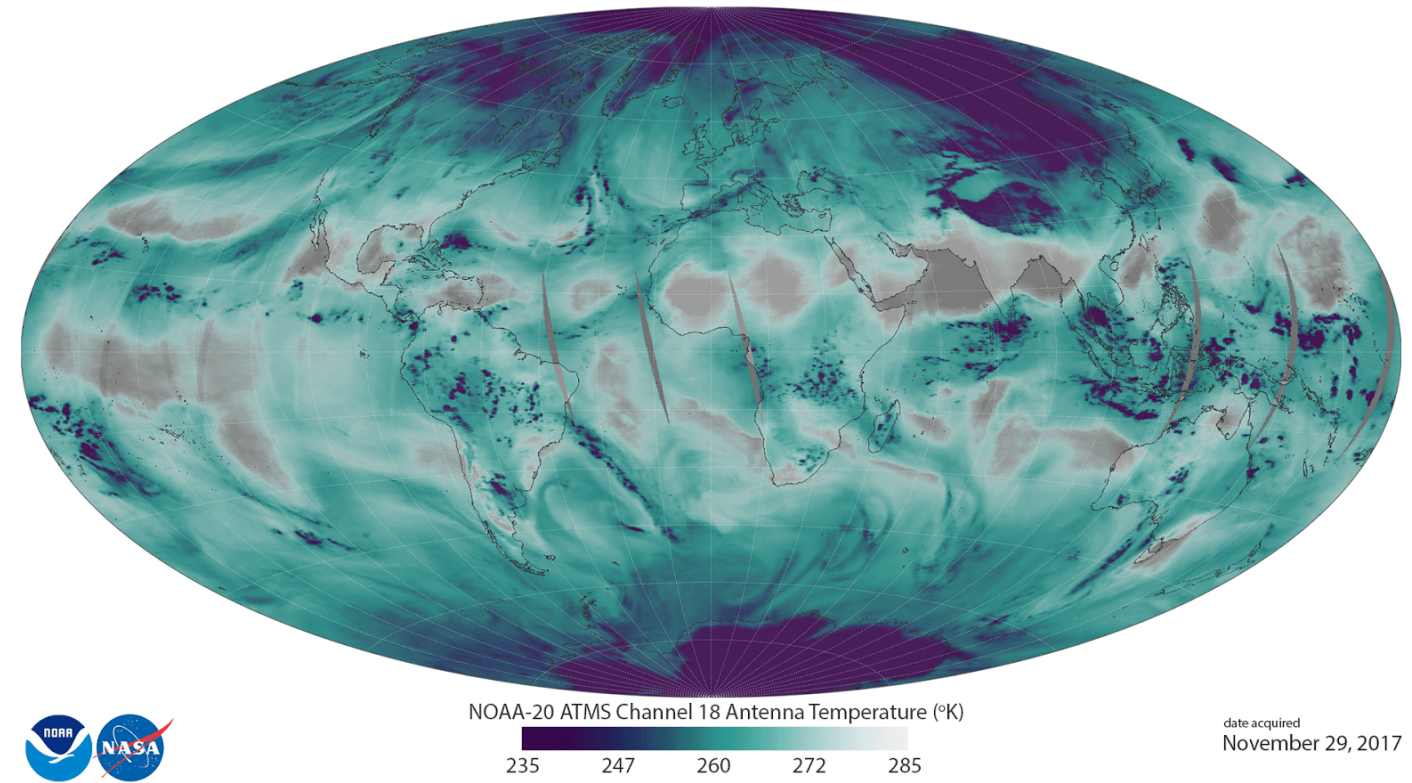
FY 2019 Request	\$5,892
FY 2020	\$8,100
FY 2021	\$8,100
FY 2022	\$8,100
FY 2023	\$8,100

Constellation Observing System for Meteorology, Ionosphere and Climate -2 (COSMIC-2)/ Global Navigation Satellite System Radio Occultation (GNSS RO): Ground System Decrease:

NOAA requests a decrease of \$2,153,000 for this program, the remaining 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.

Satellite Ground Services (SGS): Satellite Ground Services Sustainment: NOAA requests a decrease of \$1,349,000, which will continue the funding needed to provide ground system sustainment, including technology refresh and hardware and software for both legacy missions and GOES-R. It will also enable SGS to proceed



The Joint Polar Satellite System-1 (NOAA-20) sent this Advanced Technology Microwave Sounder data depicting the location and abundance of water vapor as part of a series of instrument checks. Prior to full operational mode.

with the Mission Science Network (MSN) as planned. In order to fully support other existing NOAA priorities within the Procurement Acquisition and Construction (PAC) portfolio, NOAA will decrease the Ground Enterprise Architecture Services (GEARS) activities that transition NOAA's individual ground system into an enterprise-wide solution.

System Architecture and Advanced Planning: Strengthening NOAA's Future Satellite Capabilities: NOAA requests an increase of \$1,026,000 to better manage and prioritize implementation of validated satellite observation requirements and govern the end-to-end NESDIS product lifecycle to satisfy these requirements through enterprise architecture planning, capability demonstration, program management standardization, risk and opportunity balancing, and operational capability validation. With the completion of the NOAA Satellite Observing System Architecture (NSOSA) study, SAAP will now transition to develop detailed implementation options and roadmaps to specify the evolution of the satellite architecture. SAAP will initiate selected critical investments informed by the NSOSA study, including pre-acquisition activities such as selected technology studies, targeted analyses of alternatives, industry and commercial sector engagement, and program planning.

Satellite Ground Services

BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$52,332
FY 2020	\$52,332
FY 2021	\$52,332
FY 2022	\$52,332
FY 2023	\$52,332

System Architecture and Advanced Planning

BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$4,929
FY 2020	\$4,929
FY 2021	\$4,929
FY 2022	\$4,929
FY 2023	\$4,929

Metop-C

BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$36,539
FY 2020	\$27,200
FY 2021	\$27,200
FY 2022	\$27,200
FY 2023	\$27,200

Projects, Planning and Analysis: MetOp-C Launch Support and Testing: NOAA requests an increase of \$11,509,000 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. Funding in FY 2019 will allow NOAA to begin preparations to ingest MetOp Second Generation data including preparation for the future development of ground infrastructure, processing and distribution capability for MetOp-SG data. 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.

Commercial Weather Data

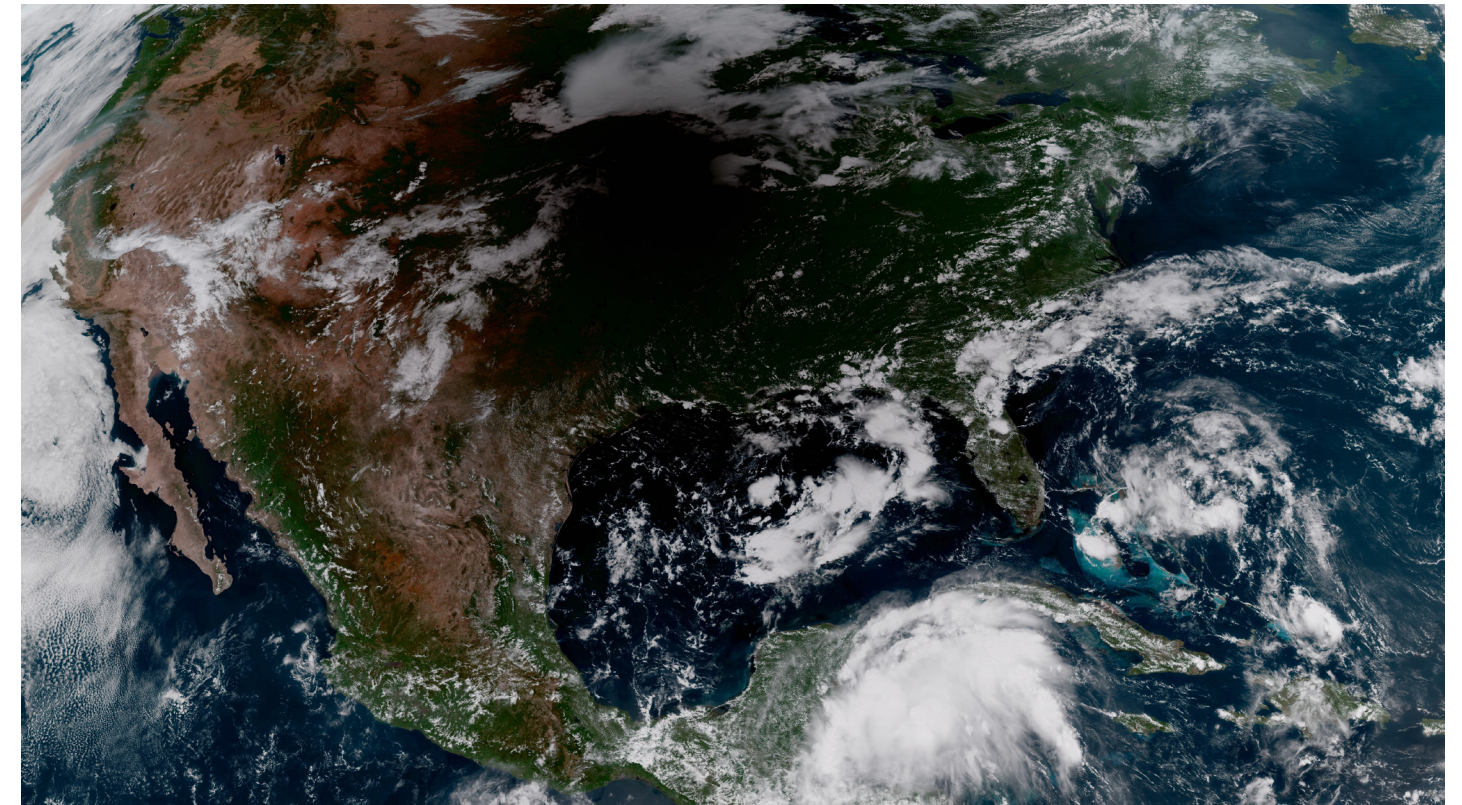
BUDGET AUTHORITY IN THOUSANDS

FY 2019 Request	\$3,000
FY 2020	\$3,000
FY 2021	\$3,000
FY 2022	\$3,000
FY 2023	\$3,000

Commercial Weather Data Pilot: Advance Secure Ingest Capabilities: NOAA requests a decrease of \$1,966,000 to adjust 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 also 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.

CONSTRUCTION \$2,450,000

NOAA requests an increase of \$237,000 in program changes for a total of \$2,450,000 in the Construction activity.



On August 21, 2017, GOES-16 captures the total solar eclipse over the United States. In the image, the moon’s shadow covers the Central Plains, halfway through its path across the continental United States. Credit: CIRA



GOES-R undergoes testing.

Chapter 7

Mission Support

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 support that are essential to the efficient and effective execution of NOAA's mission. NOAA will continue transitioning its mission services to the Enterprise services model, a new Department-wide customer-focused, service delivery model that will increase efficiencies related to acquisitions, financial management, human resources, and information technology (IT) services. Specifically, in FY 2017, NOAA's Workforce Management Office (WFMO) outsourced staffing, classification, recruitment and hiring actions as well as personnel action through the Department's new Enterprise Services model of human resources delivery. This 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.

Goatfish on a shallow reef.

FY 2019 REQUEST \$244,572,000

NOAA requests a total of \$244,572,000 to position NOAA’s Mission Support for more effective execution of NOAA’s diverse mission. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts and includes a net decrease of \$31,557,000 in FY 2019 program changes. This program change total includes an increase of \$1,269,000 for smaller program changes not described below, but represented in the NOAA Control Table in Appendix 3

FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$243,574,000 to support the Operations, Research, and Facilities activities of Mission Support, reflecting a net decrease of \$26,539,000 in FY 2019 program changes.

ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

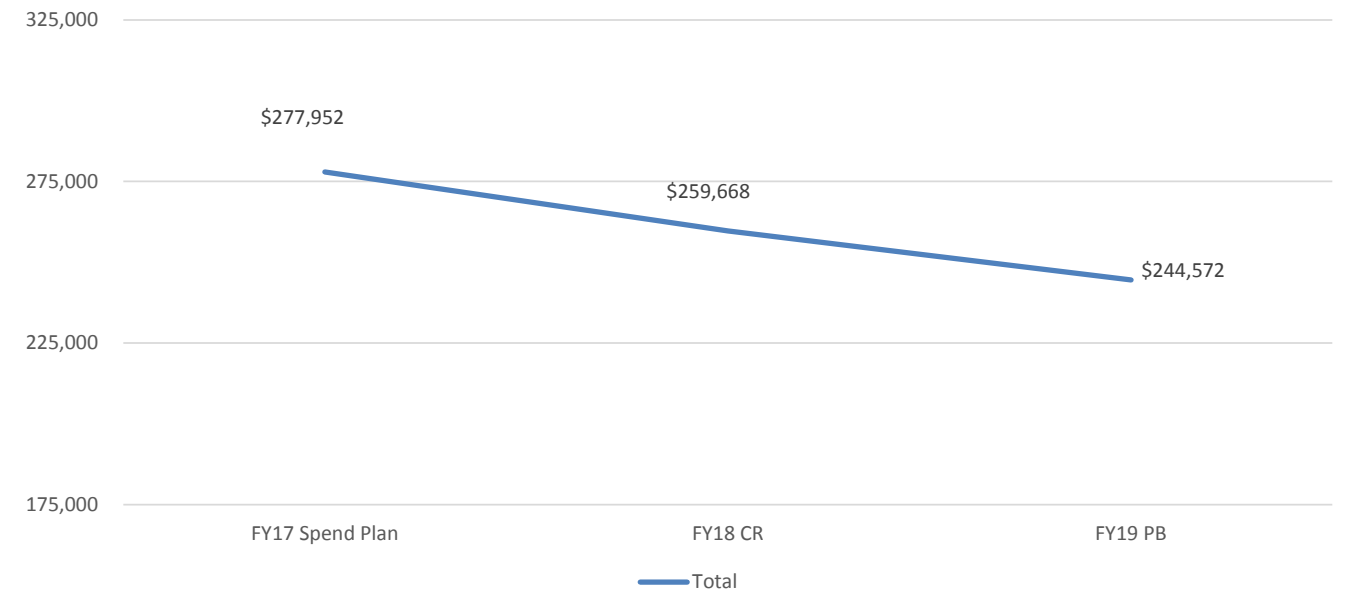
EXECUTIVE LEADERSHIP \$27,879,000

NOAA requests an increase of \$269,000 in program changes for total of \$27,879,000 in the Executive Leadership activity.

Federal, state, and local officials cut the ribbon on the new NOAA Aircraft Operations Center facility in Lakeland, Florida, on June 2, 2016.



MS Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



MISSION SERVICES AND MANAGEMENT \$150,417,000

NOAA requests a total of \$150,417,000 for the Mission Services and Management activity. There are no program changes in this activity.

IT SECURITY \$10,029,000

NOAA requests an increase of \$2,000 in program changes for a total of \$10,029,000 in the IT Security activity.

PAYMENT TO DOC WORKING CAPITAL FUND \$55,249,000

NOAA requests total of \$55,249,000 for the Payment to the DOC Working Capital Fund activity after adjustments of \$11,257,000. There are no program changes in this activity.

OFFICE OF EDUCATION \$0

NOAA requests a decrease of \$26,810,000 in program changes for a total of \$0 in the Office of Education activity. Program changes include:

Office of Education: NOAA requests a decrease of \$5,027,000 to terminate NOAA’s Competitive Education Grants program and the NOAA Office of Education. These terminations will limit NOAA’s education and outreach coordination effort across the agency and with external partners.

Office Of Education: Educational Partnership Program with Minority Serving Institutions (EPP/MSI) Grants: NOAA requests a decrease of \$14,334,000 to terminate the Educational Partnership Program with Minority Serving Institutions (EPP/MSI) grants program. This termination will discontinue NOAA grants focused on



Students engage in hands on Science, Technology, Engineering, and Math (STEM) education opportunities. Here students plant a rain garden to reduce run off from their school's roof. Credit: Clare Tallon Ruen

increasing the number of students, particularly from underrepresented groups, who are trained and earn degrees in NOAA mission sciences. Each year NOAA's EPP/MSI program supports cooperative agreements with four EPP Cooperative Science Centers (CSCs) at Minority Serving Institutions, and provides funds to students in Minority Serving Institutions.

Office of Education: NOAA Bay-Watershed Education and Training (B-WET)

Regional Programs: NOAA requests a decrease of \$7,450,000 to terminate the Bay-Watershed Education and Training (B-WET) Program. In FY 2019, NOAA will continue to provide watershed educational experiences for students through other programs, including National Marine Sanctuaries.

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$998,000 to support the Procurement, Acquisition, and Construction activities of Mission Support, reflecting a net decrease of \$5,018,000 in FY 2019 program changes.

PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descrip-

tions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

NOAA CONSTRUCTION \$998,000

NOAA requests a net decrease of \$5,018,000 in program changes for a total of \$998,000 in the NOAA Construction activity. Program changes include:

NOAA Construction: National Marine Fisheries Service Facilities Initiative: NOAA requests a decrease of \$4,256,000 in funding provided for the replacement of the Northwest Fisheries Science Center facility in Mukilteo, Washington. This funding supported pre-construction activities such as project management; site preparation and fill; shoreline protection; NEPA process, consultations, and assessments; and, contract services for building design and is sufficient to complete this work. 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.

NOAA Construction: Newport Pier Project: NOAA requests a decrease of \$1,490,000 to conclude planning and design for a pier at NAVSTA Newport. Funds provided under an FY 2018 Annualized Continuing Resolution will be sufficient to complete the design phase of the pier.

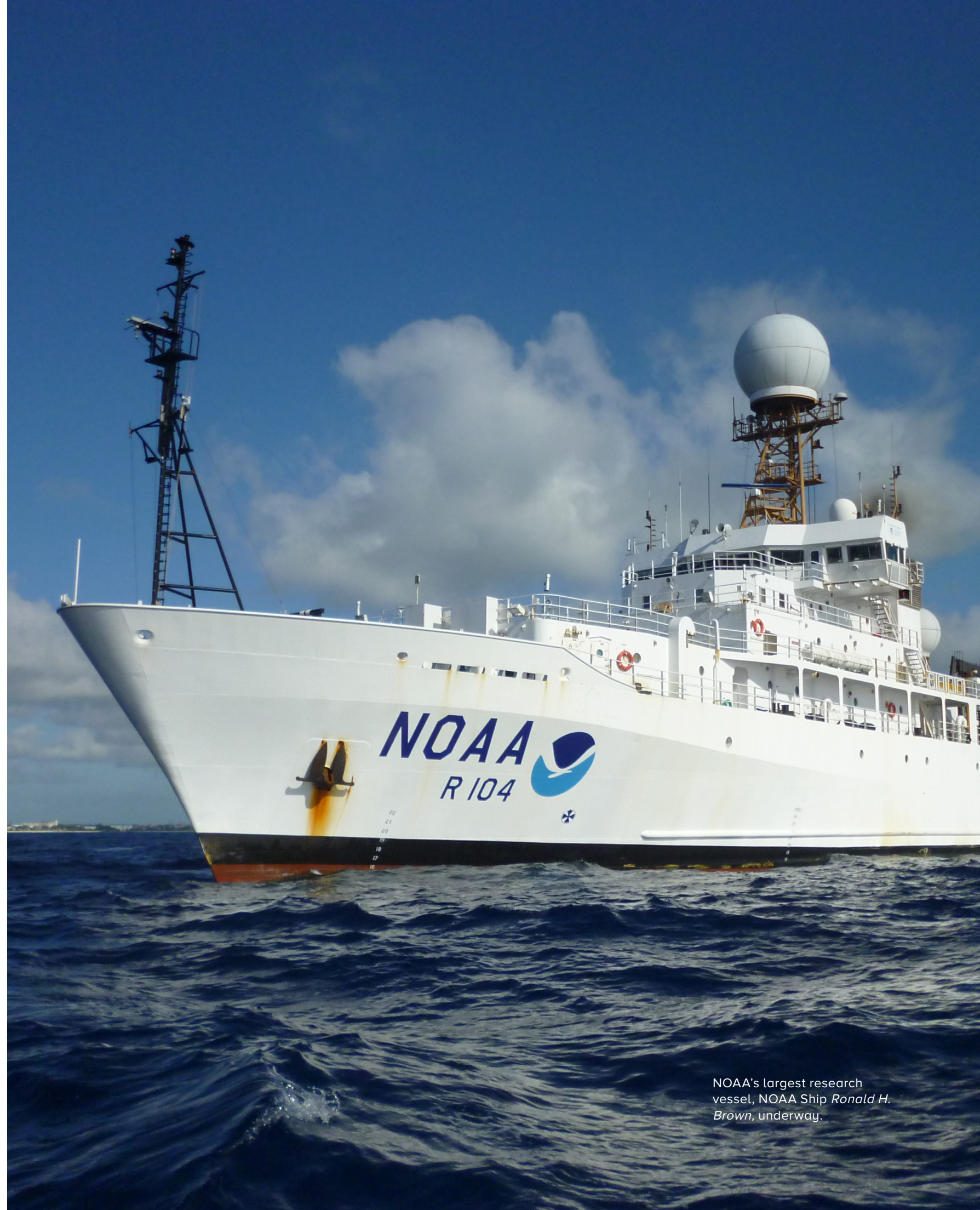


Green turtle.

Chapter 8

Office of Marine and Aviation Operations

NOAA's Office of Marine and Aviation Operations (OMAO) supports an array of specialized ships and aircraft that gather oceanographic, atmospheric, hydrographic, and fisheries data in support of NOAA's public safety, environmental stewardship, and scientific missions, which are vital to the Nation's economic security. OMAO includes civilians, mariners, and officers of the NOAA Commissioned Officer Corps, one of the seven uniformed services of the United States. NOAA is currently authorized for 321 Corps officers, excluding flag officers. OMAO civilians and NOAA Corps officers operate, manage, and maintain NOAA's active fleet of 16 research and survey ships and nine specialized aircrafts.



NOAA's largest research vessel, NOAA Ship *Ronald H. Brown*, underway.

FY 2019 REQUEST \$335,409,000

NOAA requests a total of \$335,409,000 in discretionary and mandatory funds to support the continued operations of OMAO. This total includes Operations, Research, and Facilities (ORF); Procurement, Acquisition, and Construction (PAC); and other accounts and represents a net increase of \$4,896,000 in FY 2019 program changes. This program change total includes an increase of \$1,483,000, not described below, but represented in the NOAA Control Table in Appendix 3.

OMAO's FY 2019 budget request sustains NOAA's data collection capabilities at sea and in the air. With these investments, OMAO will continue to invest in NOAA's ship fleet and support NOAA aircraft operations that provide observations our nation depends on to predict hurricanes, droughts, and other severe storms.

FY 2019 ORF BUDGET SUMMARY

NOAA requests a total of \$215,853,000 to support the Operations, Research, and Facilities activities of OMAO, reflecting an increase of \$3,134,000 in FY 2019 program changes.

ORF PROGRAM CHANGE HIGHLIGHT FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

The flight deck of NOAA Lockheed WP-3D Orion Hurricane Hunter during a flight into Hurricane Harvey.



OMAO Discretionary Budget Trends (FY 2017–2019)
(\$ thousands)



MARINE OPERATIONS AND MAINTENANCE \$181,170,000

NOAA requests an increase of \$978,000 in program changes for a total of \$181,170,000 in the Marine Operations and Maintenance activity.

AVIATION OPERATIONS AND AIRCRAFT SERVICES \$34,683,000

NOAA requests an increase of \$2,156,000 in program changes for a total of \$34,683,000 in the Aviation Operations and Aircraft Services activity. Program changes include:

Aviation Operations and Aircraft Services: Increased Costs for NOAA Aircraft Facility: NOAA requests an increase of \$2,156,000 to accommodate lease and fuel costs for NOAA's Aircraft Operations Center (AOC) at Lakeland Linder Regional Airport. NOAA relocated to the Lakeland Linder Regional Airport and has been operating there since mid-2017. Lease and fuel costs are more expensive at the Lakeland site than NOAA's previous MacDill AFB location in Tampa, Florida. The program increase will allow NOAA to cover these increased costs while supporting 3,880 planned flight hours. This will enable NOAA to continue its observations for hurricane surveillance, flood and drought prediction, and extreme weather forecasts.

FY 2019 PAC BUDGET SUMMARY

NOAA requests a total of \$87,878,000 to support the Procurement, Acquisition, and Construction activities of OMAO, reflecting an increase of \$1,762,000 in FY 2019 program changes.

PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2019:

Program changes above \$1,000,000 are highlighted below. A summary of funding by Program, Project, and Activity (PPA) is located in Appendix 3. Detailed descriptions of the program changes below are located in the NOAA FY 2019 Congressional Justification.

OMAO FLEET REPLACEMENT \$87,878,000

NOAA requests an increase of \$1,762,000 in program changes for a total of \$87,878,000 in the OMAO Fleet Replacement activity. Program changes include:

Fleet Capital Improvements and Technology Infusion: Progressive Lifecycle Maintenance Program: NOAA requests an increase of \$1,257,000 to increase capital repairs to NOAA's ship fleet under the Progressive Lifecycle Maintenance Program. Progressive lifecycle maintenance is a core component of NOAA's October 2016 report, *The NOAA Fleet Plan: Building a 21st Century Fleet*,¹ which describes the need for regular capital investment to proactively maintain vessels before systems fail. Funding will allow NOAA to help extend the service life of NOAA ships, provide sustained critical technology refresh, and address its backlog of needed repairs.

DISCRETIONARY FUNDS**MEDICARE-ELIGIBLE RETIREE HEALTHCARE FUND CONTRIBUTION**

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 healthcare benefits of present, active-duty NOAA officers and their dependents and annuitants. FY 2019 payments to the accrual fund are estimated to be \$1,603,000.

MANDATORY FUNDS**NOAA CORPS COMMISSIONED OFFICERS RETIREMENT**

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 is mandated by Federal statutes under Title 10, United States Code. NOAA transfers retirement pay funds to the U.S. Coast Guard, which handles the payment function for retirees and annuitants. Health care funds for non-Medicare-eligible retirees, dependents, and annuitants are transferred to the U.S. Public Health Service, which administers the health care program.

¹ More information about the 2016 NOAA Fleet Plan can be found at: https://www.oma.noaa.gov/sites/default/files/documents/The%20NOAA%20Fleet%20Plan_Final_31OCT.pdf

Proposed Changes to General Provisions

NOAA seeks the following changes to the General Provisions in its FY 2019 budget submission. For a more detailed discussion of the justification for these proposed changes, please consult the FY 2019 Congressional Justification.

1. 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 related to permitting and other regulatory activities.

Technical Adjustments by PPA

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	NESDIS Merge of JPSS and PFO	NESDIS Transfers (GOES-R, Jason-3, DSCOVR, and Satellite Ground Services)	Payment to the DOC Working Capital Fund	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			8,524		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	Goestationary Systems-R			(4,437)		(4,437)
PAC	NESDIS	JASON-3			(4,328)		(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			(3,720)		(3,720)
PAC	NESDIS	Satellite Ground Services			45		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.

**Note that the FY 2019 Total ATBs column in the Blue Book Control Table includes both Calculated (Inflationary) ATBs and Technical ATBs so it includes the amounts in the table above but does not match these amounts for all PPAs.

National Ocean Service Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Navigation, Observations and Positioning						
Navigation, Observations and Positioning	148,375	147,998	2,410	150,408	(7,051)	143,357
Hydrographic Survey Priorities/Contracts	26,887	26,818	0	26,818	131	26,949
IOOS Regional Observations	30,574	30,494	0	30,494	(11,050)	19,444
Total, Navigation, Observations and Positioning	205,836	205,310	2,410	207,720	(17,970)	189,750
Coastal Science and Assessment						
Coastal Science, Assessment, Response and Restoration	72,296	72,112	1,157	73,269	773	74,042
Competitive Research	9,960	9,933	0	9,933	(9,933)	0
Total, Coastal Science and Assessment	82,256	82,045	1,157	83,202	(9,160)	74,042
Ocean and Coastal Management and Services						
Coastal Zone Management and Services	42,326	42,214	565	42,779	(2,290)	40,489
Coastal Management Grants	84,660	84,429	0	84,429	(84,429)	0
Coral Reef Program	25,990	25,925	78	26,003	30	26,033
National Estuarine Research Reserve System	23,402	23,342	0	23,342	(23,342)	0
Sanctuaries and Marine Protected Areas	50,789	50,657	832	51,489	(1,750)	49,739
Total, Ocean and Coastal Management and Services	227,167	226,567	1,475	228,042	(111,781)	116,261
Total, NOS - Discretionary ORF	515,259	513,922	5,042	518,964	(138,911)	380,053
Total, NOS - Discretionary PAC	3,691	3,676	0	3,676	(2,135)	1,541
Total, NOS - Other Discretionary Accounts	0	0	0	0	0	0
Discretionary Total - NOS	518,950	517,598	5,042	522,640	(141,046)	381,594
Total, NOS - Mandatory Accounts	63,797	88,471	(63,768)	24,703	0	24,703
GRAND TOTAL NOS	582,747	606,069	(58,726)	547,343	(141,046)	406,297

National Marine Fisheries Service Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Protected Resources Science and Management						
Marine Mammals, Sea Turtles, and Other Species	111,342	110,594	1,467	112,061	(3,601)	108,460
Species Recovery Grants	6,200	6,158	4	6,162	(169)	5,993
Atlantic Salmon	6,224	6,182	67	6,249	(31)	6,218
Pacific Salmon	62,000	61,583	1,057	62,640	(1,696)	60,944
Total, Protected Resources Science and Management	185,766	184,517	2,595	187,112	(5,497)	181,615
Fisheries Science and Management						
Fisheries and Ecosystem Science Programs and Services	139,261	138,551	1,846	140,397	788	141,185
Fisheries Data Collections, Surveys, and Assessments	164,000	162,898	1,597	164,495	(7,937)	156,558
Observers and Training	43,655	43,362	406	43,768	0	43,768
Fisheries Management Programs and Services	114,719	116,264	1,445	117,709	(5,111)	112,598
Aquaculture	9,300	9,237	90	9,327	0	9,327
Salmon Management Activities	33,500	33,275	84	33,359	(1,835)	31,524
Regional Councils and Fisheries Commissions	34,254	34,024	1,088	35,112	(617)	34,495
Interjurisdictional Fisheries Grants	3,004	2,984	0	2,984	(2,984)	0
Total, Fisheries Science and Management	541,693	540,595	6,556	547,151	(17,696)	529,455
Enforcement						
Enforcement	69,000	68,536	796	69,332	(17,837)	51,495
Total, Enforcement	69,000	68,536	796	69,332	(17,837)	51,495
Habitat Conservation and Restoration						
Habitat Conservation and Restoration	52,524	52,171	585	52,756	(4,837)	47,919
Subtotal, Habitat Conservation & Restoration	52,524	52,171	585	52,756	(4,837)	47,919
Total, NMFS - Discretionary ORF	848,983	845,819	10,532	856,351	(45,867)	810,484
Total, NMFS - Discretionary PAC	0	0	0	0	0	0
Total, NMFS - Other Discretionary Accounts	65,350	64,907	0	64,907	(64,558)	349
Discretionary Total - NMFS	914,333	910,726	10,532	921,258	(110,425)	810,833
Total, NMFS - Mandatory Accounts	73,316	59,608	(33,162)	26,446	0	26,446
GRAND TOTAL NMFS	987,649	970,334	(22,630)	947,704	(110,425)	837,279

Office of Oceanic and Atmospheric Research Direct Obligations

DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Climate Research						
Laboratories & Cooperative Institutes						
Laboratories & Cooperative Institutes	59,833	59,597	15,315	74,912	(1,940)	72,972
Subtotal, Laboratories & Cooperative Institutes	59,833	59,597	15,315	74,912	(1,940)	72,972
Regional Climate Data & Information						
Regional Climate Data & Information	37,765	37,745	143	37,888	(12,217)	25,671
Subtotal, Regional Climate Data & Information	37,765	37,745	143	37,888	(12,217)	25,671
Climate Competitive Research						
Climate Competitive Research	59,627	59,597	(19,815)	39,782	(39,782)	0
Subtotal, Climate Competitive Research	59,627	59,597	(19,815)	39,782	(39,782)	0
Total, Climate Research	157,225	156,939	(4,357)	152,582	(53,939)	98,643
Weather & Air Chemistry Research						
Laboratories & Cooperative Institutes						
Laboratories & Cooperative Institutes	79,647	79,462	1,112	80,574	(14,682)	65,892
Subtotal, Laboratories & Cooperative Institutes	79,647	79,462	1,112	80,574	(14,682)	65,892
Weather & Air Chemistry Research Programs						
U.S. Weather Research Program (USWRP)	10,571	10,529	5,731	16,260	(3,044)	13,216
Tornado Severe Storm Research / Phased Array Radar	13,122	13,070	0	13,070	(448)	12,622
Joint Technology Transfer Initiative	9,973	9,933	0	9,933	(9,933)	0
Subtotal, Weather & Air Chemistry Research Programs	33,666	33,532	5,731	39,263	(13,425)	25,838
Total, Weather & Air Chemistry Research	113,313	112,994	6,843	119,837	(28,107)	91,730
Ocean, Coastal, and Great Lakes Research						
Laboratories & Cooperative Institutes						
Laboratories & Cooperative Institutes	30,554	31,785	501	32,286	(3,726)	28,560
Subtotal, Laboratories & Cooperative Institutes	30,554	31,785	501	32,286	(3,726)	28,560

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Office of Oceanic and Atmospheric Research Direct Obligations cont.

DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
National Sea Grant College Program						
National Sea Grant College Program Base	62,825	62,576	119	62,695	(62,695)	0
Marine Aquaculture Program	9,474	9,436	0	9,436	(9,436)	0
Subtotal, National Sea Grant College Program	72,299	72,012	119	72,131	(72,131)	0
Ocean Exploration and Research						
Ocean Exploration and Research	35,901	35,758	122	35,880	(16,319)	19,561
Subtotal, Ocean Exploration and Research	35,901	35,758	122	35,880	(16,319)	19,561
Other Ecosystems Programs						
Integrated Ocean Acidification	10,471	10,429	32	10,461	(2,448)	8,013
Subtotal, Other Ecosystems Programs	10,471	10,429	32	10,461	(2,448)	8,013
Sustained Ocean Observations and Monitoring						
Sustained Ocean Observations and Monitoring	41,576	41,542	130	41,672	(4,662)	37,010
Subtotal, Sustained Ocean Observations and Monitoring	41,576	41,542	130	41,672	(4,662)	37,010
Total, Ocean, Coastal, & Great Lakes Research	190,801	191,526	904	192,430	(99,286)	93,144
Innovative Research & Technology						
High Performance Computing Initiatives	12,111	12,062	13	12,075	59	12,134
Research Transition Acceleration Program	997	993	0	993	(993)	0
Total, Innovative Research & Technology	13,108	13,055	13	13,068	(934)	12,134
Total, OAR - Discretionary ORF	474,447	474,514	3,403	477,917	(182,266)	295,651
Total, OAR - Discretionary PAC	36,379	36,134	0	36,134	(10,134)	26,000
Total, OAR - Other Discretionary Accounts	0	0	0	0	0	0
Discretionary Total - OAR	510,826	510,648	3,403	514,051	(192,400)	321,651

National Weather Service Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Observations	214,881	214,909	2,805	217,714	(13,722)	203,992
Central Processing	92,545	92,166	720	92,886	(6,266)	86,620
Analyze, Forecast and Support	486,039	484,049	7,965	492,014	(20,222)	471,792
Dissemination	46,619	46,429	1,151	47,580	2,510	50,090
Science and Technology Integration	136,198	135,640	1,499	137,139	(14,437)	122,702
Total, NWS - Discretionary ORF	976,282	973,193	14,140	987,333	(52,137)	935,196
Total, NWS - Discretionary PAC	141,412	140,829	0	140,829	(23,253)	117,576
Total, NWS - Other Discretionary Accounts	0	0	0	0	0	0
Discretionary Total - NWS	1,117,694	1,114,022	14,140	1,128,162	(75,390)	1,052,772

National Environmental Satellite Data and Information Service Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Environmental Satellite Observing Systems						
Office of Satellite and Product Operations (OSPO)						
Satellite and Product Operations	117,023	115,320	9,188	124,508	7,636	132,144
NSOF Operations	13,800	13,707	530	14,237	543	14,780
Subtotal, Office of Satellite and Product Operations (OSPO)	130,823	129,027	9,718	138,745	8,179	146,924
Product Development, Readiness & Application						
Product Development, Readiness & Application	33,104	30,792	3,373	34,165	(3,470)	30,695
Subtotal, Product Development, Readiness & Application	33,104	30,792	3,373	34,165	(3,470)	30,695
Commercial Remote Sensing Regulatory Affairs	1,200	1,192	0	1,192	608	1,800
Office of Space Commerce	800	795	0	795	1,005	1,800
Group on Earth Observations (GEO)	500	497	0	497	3	500
Total, Environmental Satellite Observing Systems	166,427	162,303	13,091	175,394	6,325	181,719
National Centers for Environmental Information						
National Centers for Environmental Information	61,317	58,792	2,884	61,676	(4,085)	57,591
Total, National Centers for Environmental Information	61,317	58,792	2,884	61,676	(4,085)	57,591
Total, NESDIS - Discretionary ORF	227,744	221,095	15,975	237,070	2,240	239,310
Total, NESDIS - Discretionary PAC	1,967,897	1,966,350	(12,440)	1,953,910	(553,199)	1,400,711
Total, NESDIS - Other Discretionary Accounts	0	0	0	0	0	0
Discretionary Total - NESDIS	2,195,641	2,187,445	3,535	2,190,980	(550,959)	1,640,021

Mission Support Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Executive Leadership	27,000	26,818	792	27,610	269	27,879
Mission Services and Management	148,390	147,392	3,025	150,417	0	150,417
IT Security	10,050	9,982	45	10,027	2	10,029
Payment to the DOC Working Capital Fund	58,257	42,710	12,539	55,249	0	55,249
Office of Education	26,857	26,750	60	26,810	(26,810)	0
Total, MS - Discretionary ORF	270,554	253,652	16,461	270,113	(26,539)	243,574
Total, MS - Discretionary PAC	7,398	6,016	0	6,016	(5,018)	998
Discretionary Total - MS	277,952	259,668	16,461	276,129	(31,557)	244,572
Total, MS - Mandatory Accounts	20,627	12,013	(12,013)	0	0	0
GRAND TOTAL MS	298,579	271,681	4,448	276,129	(31,557)	244,572

Office of Marine and Aviation Operations Direct Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Marine Operations and Maintenance	178,208	177,636	2,556	180,192	978	181,170
Aviation Operations and Aircraft Services	34,893	32,076	451	32,527	2,156	34,683
Total, OMAO - Discretionary ORF	213,101	209,712	3,007	212,719	3,134	215,853
Total, OMAO - Discretionary PAC	86,700	86,116	0	86,116	1,762	87,878
Total, OMAO - Other Discretionary Accounts	1,936	1,936	(333)	1,603	0	1,603
Discretionary Total - OMAO	301,737	297,764	2,674	300,438	4,896	305,334
Total, OMAO - Mandatory Accounts	29,375	30,102	(27)	30,075	0	30,075
GRAND TOTAL OMAO	331,112	327,866	2,647	330,513	4,896	335,409

ORF Summary Line Office Direct Discretionary Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
National Ocean Service	515,259	513,922	5,042	518,964	(138,911)	380,053
National Marine Fisheries Service	848,983	845,819	10,532	856,351	(45,867)	810,484
Office of Oceanic and Atmospheric Research	474,447	474,514	3,403	477,917	(182,266)	295,651
National Weather Service	976,282	973,193	14,140	987,333	(52,137)	935,196
National Environmental Satellite, Data and Information Service	227,744	221,095	15,975	237,070	2,240	239,310
Mission Support	270,554	253,652	16,461	270,113	(26,539)	243,574
Office of Marine and Aviation Operations	213,101	209,712	3,007	212,719	3,134	215,853
SUBTOTAL LO DIRECT DISCRETIONARY ORF OBLIGATIONS	3,526,370	3,491,907	68,560	3,560,467	(440,346)	3,120,121

ORF Adjustments DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
SUBTOTAL ORF DIRECT OBLIGATIONS	3,526,370	3,491,907	68,560	3,560,467	(440,346)	3,120,121
FINANCING						
Deobligations	(17,500)	(17,500)	(10,000)	(27,500)	0	(27,500)
Rescission	(18,000)	(18,000)	18,000	0	0	0
Total ORF Financing	(35,500)	(35,500)	8,000	(27,500)	0	(27,500)
SUBTOTAL ORF BUDGET AUTHORITY	3,490,870	3,456,407	76,560	3,532,967	(440,346)	3,092,621
TRANSFERS						
Transfer from ORF to PAC	1,358	0	0	0	0	0
Transfer from PAC to ORF	(12,189)	0	0	0	0	0
Transfer from P&D to ORF	(130,164)	(130,164)	(24,704)	(154,868)	0	(154,868)
Rescission	18,000	18,000	(18,000)	0	0	0
Total ORF Transfers	(122,995)	(112,164)	(42,704)	(154,868)	0	(154,868)
SUBTOTAL ORF APPROPRIATION	3,367,875	3,344,243	33,856	3,378,099	(440,346)	2,937,753

Procurement, Acquisition, and Construction Direct Discretionary Obligations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
NOS						
Construction			0			
National Estuarine Research Reserve Construction (NERRS)	1,696	1,689	0	1,689	(1,689)	0
Marine Sanctuaries Construction Base	1,995	1,987	0	1,987	(446)	1,541
Subtotal, NOS Construction	3,691	3,676	0	3,676	(2,135)	1,541
Total, NOS - PAC	3,691	3,676	0	3,676	(2,135)	1,541
Total, NMFS - PAC	0	0	0	0	0	0
OAR						
Systems Acquisition						
Research Supercomputing/ CCRI	36,379	36,134	0	36,134	(10,134)	26,000
Subtotal, OAR Systems Acquisition	36,379	36,134	0	36,134	(10,134)	26,000
Total, OAR - PAC	36,379	36,134	0	36,134	(10,134)	26,000
NWS						
Systems Acquisition						
Observations	27,669	32,534	0	32,534	(16,284)	16,250
Central Processing	66,585	66,311	0	66,311	(8,172)	58,139
Dissemination	39,528	34,386	0	34,386	167	34,553
Subtotal, NWS Systems Acquisition	133,782	133,231	0	133,231	(24,289)	108,942
Construction						
Facilities Construction and Major Repairs	7,630	7,598	0	7,598	1,036	8,634
Subtotal, NWS Construction	7,630	7,598	0	7,598	1,036	8,634
Total, NWS - PAC	141,412	140,829	0	140,829	(23,253)	117,576
NESDIS						
Systems Acquisition						
Geostationary Systems - R	745,102	747,713	(4,437)	743,276	(334,896)	408,380
Jason-3	4,357	4,328	(4,328)	0	0	0
Joint Polar Satellite System (JPSS)	784,612	781,951	(781,951)	0	0	0

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Procurement, Acquisition, and Construction Direct Discretionary Obligations cont. DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Polar Follow On	327,668	326,684	(326,684)	0	0	0
Polar Weather Satellites	0	0	1,108,635	1,108,635	(230,644)	877,991
Cooperative Data and Rescue Services (CDARS)	500	497	0	497	3	500
DSCOVR	3,745	3,720	(3,720)	0	0	0
Space Weather Follow On	5,000	4,966	0	4,966	5,034	10,000
COSMIC 2/GNSS RO	8,100	8,045	0	8,045	(2,153)	5,892
Satellite Ground Services	53,835	53,636	45	53,681	(1,349)	52,332
System Architecture and Advanced Planning	3,929	3,903	0	3,903	1,026	4,929
Projects, Planning and Analysis	25,123	25,030	0	25,030	11,509	36,539
Commercial Weather Data Pilot	5,000	4,966	0	4,966	(1,966)	3,000
Subtotal, NESDIS Systems Acquisition	1,966,971	1,965,439	(12,440)	1,952,999	(553,436)	1,399,563
Construction						
Satellite CDA Facility	2,228	2,213	0	2,213	237	2,450
Subtotal, NESDIS Construction	2,228	2,213	0	2,213	237	2,450
Transfer to OIG	(1,302)	(1,302)	0	(1,302)	0	(1,302)
Total, NESDIS - PAC	1,967,897	1,966,350	(12,440)	1,953,910	(553,199)	1,400,711
Mission Support						
Construction						
NOAA Construction	7,398	6,016	0	6,016	(5,018)	998
Subtotal, Mission Support Construction	7,398	6,016	0	6,016	(5,018)	998
Total, Mission Support - PAC	7,398	6,016	0	6,016	(5,018)	998
OMAO						
Fleet Replacement						
Fleet Capital Improvements & Tech Infusion	11,700	11,621	0	11,621	1,257	12,878
New Vessel Construction	75,000	74,495	0	74,495	505	75,000
Subtotal, Fleet Replacement	86,700	86,116	0	86,116	1,762	87,878
Total, OMAO - PAC	86,700	86,116	0	86,116	1,762	87,878
GRAND TOTAL PAC DISCRETIONARY OBLIGATIONS	2,243,477	2,239,121	(12,440)	2,226,681	(591,977)	1,634,704

PAC Adjustments DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
SUBTOTAL PAC DIRECT OBLIGATIONS	2,243,477	2,239,121	(12,440)	2,226,681	(591,977)	1,634,704
FINANCING						
Deobligations	(13,000)	(13,000)	0	(13,000)	0	(13,000)
Rescission	0	(5,000)	5,000	0	0	0
Total PAC Financing	(13,000)	(18,000)	5,000	(13,000)	0	(13,000)
SUBTOTAL PAC BUDGET AUTHORITY	2,230,477	2,221,121	(7,440)	2,213,681	(591,977)	1,621,704
TRANSFERS						
Transfer from ORF to PAC	(1,358)	0	0	0	0	0
Transfer from PAC to ORF	12,189	0	0	0	0	0
Transfer to OIG	1,302	1,302	0	1,302	0	1,302
Unobligated balance, Rescission	0	5,000	(5,000)	0	0	0
Total PAC Transfers	12,133	6,302	(5,000)	1,302	0	1,302
SUBTOTAL PAC APPROPRIATION	2,242,610	2,227,423	(12,440)	2,214,983	(591,977)	1,623,006

Other Accounts Discretionary DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
NMFS						
Fishermen's Contingency Fund Obligations	350	348	0	348	1	349
Fishermen's Contingency Fund Budget Authority	350	348	0	348	1	349
Fishermen's Contingency Fund Appropriations	350	348	0	348	1	349
Foreign Fishing Observer Fund Obligations	0	0	0	0	0	0
Foreign Fishing Observer Fund Budget Authority	0	0	0	0	0	0
Foreign Fishing Observer Fund Appropriation	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	0	0	0	0
Promote and Develop Fisheries Obligations	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	(130,164)	(130,164)	(24,704)	(154,868)	0	(154,868)
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund Obligations	65,000	64,559	0	64,559	(64,559)	0
Pacific Coastal Salmon Recovery Fund Budget Authority	65,000	64,559	0	64,559	(64,559)	0
Pacific Coastal Salmon Recovery Fund Appropriation	65,000	64,559	0	64,559	(64,559)	0
Marine Mammal Unusual Mortality Event Fund Obligations	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Budget Authority	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Appropriation	0	0	0	0	0	0
Subtotal, NMFS Other Discretionary Direct Obligations	65,350	64,907	0	64,907	(64,558)	349
Subtotal, NMFS Other Discretionary Budget Authority	(64,814)	(65,257)	(24,704)	(89,961)	(64,558)	(154,519)
Subtotal, NMFS Other Discretionary Appropriation	65,350	64,907	0	64,907	(64,558)	349
OMAO						
Medicare Eligible Retiree Healthcare Fund Obligations	1,936	1,936	(333)	1,603	0	1,603
Medicare Eligible Retiree Healthcare Fund Budget Authority	1,936	1,936	(333)	1,603	0	1,603
Medicare Eligible Retiree Healthcare Fund Appropriation	1,936	1,936	(333)	1,603	0	1,603

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Other Accounts Discretionary cont. DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Subtotal, OMAO Other Discretionary Direct Obligations	1,936	1,936	(333)	1,603	0	1,603
Subtotal, OMAO Other Discretionary Budget Authority	1,936	1,936	(333)	1,603	0	1,603
Subtotal, OMAO Other Discretionary Appropriation	1,936	1,936	(333)	1,603	0	1,603
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	67,286	66,843	(333)	66,510	(64,558)	1,952
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	(62,878)	(63,321)	(25,037)	(88,358)	(64,558)	(152,916)
TOTAL, OTHER DISCRETIONARY APPROPRIATION	67,286	66,843	(333)	66,510	(64,558)	1,952

Summary Discretionary Resources Budget DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Direct Discretionary Obligations						
ORF Direct Obligations	3,526,370	3,491,907	68,560	3,560,467	(440,346)	3,120,121
PAC Direct Obligations	2,243,477	2,239,121	(12,440)	2,226,681	(591,977)	1,634,704
OTHER Direct Obligations	67,286	66,843	(333)	66,510	(64,558)	1,952
TOTAL Direct Discretionary Obligations	5,837,133	5,797,871	55,787	5,853,658	(1,096,881)	4,756,777
Discretionary Budget Authority						
ORF Budget Authority	3,490,870	3,456,407	76,560	3,532,967	(440,346)	3,092,621
PAC Budget Authority	2,230,477	2,221,121	(7,440)	2,213,681	(591,977)	1,621,704
OTHER Budget Authority	(62,878)	(63,321)	(25,037)	(88,358)	(64,558)	(152,916)
TOTAL Discretionary Budget Authority	5,658,469	5,614,207	44,083	5,658,290	(1,096,881)	4,561,409
Discretionary Appropriations						
ORF Appropriation	3,367,875	3,344,243	33,856	3,378,099	(440,346)	2,937,753
PAC Appropriation	2,242,610	2,227,423	(12,440)	2,214,983	(591,977)	1,623,006
OTHER Appropriation	67,286	66,843	(333)	66,510	(64,558)	1,952
TOTAL Discretionary Appropriation	5,677,771	5,638,509	21,083	5,659,592	(1,096,881)	4,562,711

Grand Total Summary Discretionary Appropriations DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Operations, Research, and Facilities	3,367,875	3,344,243	33,856	3,378,099	(440,346)	2,937,753
Procurement, Acquisition, and Construction	2,242,610	2,227,423	(12,440)	2,214,983	(591,977)	1,623,006
Fisherman's Contingency Fund	350	348	0	348	1	349
Fisheries Finance Program Account	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund	65,000	64,559	0	64,559	(64,559)	0
Marine Mammal Unusual Mortality Event Fund	0	0	0	0	0	0
Medicare Eligible Retiree Health Care Fund	1,936	1,936	(333)	1,603	0	1,603
GRAND TOTAL DISCRETIONARY APPROPRIATION	5,677,771	5,638,509	21,083	5,659,592	(1,096,881)	4,562,711

Other Accounts Mandatory DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
NOS						
Damage Assessment and Restoration Revolving Fund Obligations	56,962	81,986	(63,018)	18,968	0	18,968
Damage Assessment and Restoration Revolving Fund Budget Authority	5,962	5,986	(18)	5,968	0	5,968
Damage Assessment and Restoration Revolving Fund Appropriation	0	0	0	0	0	0
Sanctuaries Enforcement Asset Forfeiture Fund Obligations	120	120	0	120	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Budget Authority	120	120	0	120	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Appropriation	120	120	0	120	0	120
Gulf Coast Ecosystem Restoration Fund Obligations	6,715	6,365	(750)	5,615	0	5,615
Gulf Coast Ecosystem Restoration Fund Budget Authority	0	0	0	0	0	0
Gulf Coast Ecosystem Restoration Fund Appropriation	0	0	0	0	0	0
Subtotal, NOS Other Mandatory Direct Obligations	63,797	88,471	(63,768)	24,703	0	24,703
Subtotal, NOS Other Mandatory Budget Authority	6,082	6,106	(18)	6,088	0	6,088
Subtotal, NOS Other Mandatory Appropriation	120	120	0	120	0	120
NMFS						
Promote and Develop Fisheries Obligations	14,909	24,500	(24,500)	0	0	0
Promote and Develop Fisheries Budget Authority	145,073	154,664	204	154,868	0	154,868
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	30,764	7,997	(7,997)	0	0	0
Fisheries Finance Program Account Budget Authority	30,764	7,997	(7,997)	0	0	0
Fisheries Finance Program Account Appropriation	30,764	7,997	(7,997)	0	0	0
Federal Ship Financing Fund Obligations	0	0	0	0	0	0
Federal Ship Financing Fund Budget Authority	0	0	0	0	0	0
Federal Ship Financing Fund Appropriation	0	0	0	0	0	0
Environmental Improvement & Restoration Fund Obligations	6,451	4,858	(1,045)	3,813	0	3,813
Environmental Improvement & Restoration Fund Budget Authority	6,451	4,858	(1,045)	3,813	0	3,813
Environmental Improvement & Restoration Fund Appropriation	6,451	5,201	(1,119)	4,082	0	4,082

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Other Accounts Mandatory cont. DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Limited Access System Administration Fund Obligations	13,218	13,732	256	13,988	0	13,988
Limited Access System Administration Fund Budget Authority	13,218	13,732	256	13,988	0	13,988
Limited Access System Administration Fund Appropriation	13,457	13,773	230	14,003	0	14,003
Western Pacific Sustainable Fisheries Fund Obligations	622	494	6	500	0	500
Western Pacific Sustainable Fisheries Fund Budget Authority	622	494	6	500	0	500
Western Pacific Sustainable Fisheries Fund Appropriation	650	500	0	500	0	500
Fisheries Enforcement Asset Forfeiture Fund Obligations	3,537	4,157	(2)	4,155	0	4,155
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	3,996	4,157	(2)	4,155	0	4,155
Fisheries Enforcement Asset Forfeiture Fund Appropriation	4,000	4,155	0	4,155	0	4,155
North Pacific Observer Fund Obligations	3,815	3,870	120	3,990	0	3,990
North Pacific Observer Fund Budget Authority	3,815	3,870	120	3,990	0	3,990
North Pacific Observer Fund Appropriation	3,850	3,850	150	4,000	0	4,000
Subtotal, NMFS Other Mandatory Direct Obligations	73,316	59,608	(33,162)	26,446	0	26,446
Subtotal, NMFS Other Mandatory Budget Authority	203,939	189,772	(8,458)	181,314	0	181,314
Subtotal, NMFS Other Mandatory Appropriation	59,172	35,476	(8,736)	26,740	0	26,740
MS						
Spectrum Efficient National Surveillance Radar (ORF) Obligations	20,627	0	0	0	0	0
Spectrum Efficient National Surveillance Radar (ORF) Budget Authority	20,627	0	0	0	0	0
Spectrum Efficient National Surveillance Radar (ORF) Appropriation	20,627	0	0	0	0	0
Spectrum Pipeline (ORF) Obligations	0	12,013	(12,013)	0	0	0
Spectrum Pipeline (ORF) Budget Authority	0	12,013	(12,013)	0	0	0
Spectrum Pipeline (ORF) Appropriation	0	12,013	(12,013)	0	0	0
Subtotal, MS Other Mandatory Direct Obligations	20,627	12,013	(12,013)	0	0	0
Subtotal, MS Other Mandatory Budget Authority	20,627	12,013	(12,013)	0	0	0
Subtotal, MS Other Mandatory Appropriation	20,627	12,013	(12,013)	0	0	0

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Other Accounts Mandatory cont. DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
OMAO						
NOAA Corps Commissioned Officers Retirement Obligations	29,375	30,102	(27)	30,075	0	30,075
NOAA Corps Commissioned Officers Retirement Budget Authority	29,375	30,102	(27)	30,075	0	30,075
NOAA Corps Commissioned Officers Retirement Appropriation	29,375	30,102	(27)	30,075	0	30,075
Subtotal, OMAO Other Mandatory Direct Obligations	29,375	30,102	(27)	30,075	0	30,075
Subtotal, OMAO Other Mandatory Budget Authority	29,375	30,102	(27)	30,075	0	30,075
Subtotal, OMAO Other Mandatory Appropriation	29,375	30,102	(27)	30,075	0	30,075
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	187,115	190,194	(108,970)	81,224	0	81,224
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	260,023	237,993	(20,516)	217,477	0	217,477
TOTAL, OTHER MANDATORY APPROPRIATION	109,294	77,711	(20,776)	56,935	0	56,935

NOAA Summary DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
TOTAL Direct Obligations (Discretionary & Mandatory)	6,024,248	5,988,065	(53,183)	5,934,882	(1,096,881)	4,838,001
TOTAL Budget Authority (Discretionary & Mandatory)	5,918,492	5,852,200	23,567	5,875,767	(1,096,881)	4,778,886
TOTAL Appropriation (Discretionary & Mandatory)	5,787,065	5,716,220	307	5,716,527	(1,096,881)	4,619,646
Reimbursable Financing	367,012	242,000	0	242,000	0	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	6,391,260	6,230,065	(53,183)	6,176,882	(1,096,881)	5,080,001
Offsetting Receipts	(390)	(2,557)	0	(8,109)	0	(8,109)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	6,390,870	6,227,508	(53,183)	6,168,773	(1,096,881)	5,071,892

Line Office Summary DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
National Ocean Service						
ORF	515,259	513,922	5,042	518,964	(138,911)	380,053
PAC	3,691	3,676	0	3,676	(2,135)	1,541
OTHER	63,797	88,471	(63,768)	24,703	0	24,703
TOTAL, NOS	582,747	606,069	(58,726)	547,343	(141,046)	406,297
National Marine Fisheries Service						
ORF	848,983	845,819	10,532	856,351	(45,867)	810,484
PAC	0	0	0	0	0	0
OTHER	138,666	124,515	(33,162)	91,353	(64,558)	26,795
TOTAL, NMFS	987,649	970,334	(22,630)	947,704	(110,425)	837,279
Oceanic and Atmospheric Research						
ORF	474,447	474,514	3,403	477,917	(182,266)	295,651
PAC	36,379	36,134	0	36,134	(10,134)	26,000
TOTAL, OAR	510,826	510,648	3,403	514,051	(192,400)	321,651
National Weather Service						
ORF	976,282	973,193	14,140	987,333	(52,137)	935,196
PAC	141,412	140,829	0	140,829	(23,253)	117,576
TOTAL, NWS	1,117,694	1,114,022	14,140	1,128,162	(75,390)	1,052,772
National Environmental Satellite, Data and Information Service						
ORF	227,744	221,095	15,975	237,070	2,240	239,310
PAC	1,967,897	1,966,350	(12,440)	1,953,910	(553,199)	1,400,711
TOTAL, NESDIS	2,195,641	2,187,445	3,535	2,190,980	(550,959)	1,640,021
Mission Support						
ORF	270,554	253,652	16,461	270,113	(26,539)	243,574
PAC	7,398	6,016	0	6,016	(5,018)	998
OTHER	20,627	12,013	(12,013)	0	0	0
SUBTOTAL, Mission Support	298,579	271,681	4,448	276,129	(31,557)	244,572

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Line Office Summary cont. DOLLARS IN THOUSANDS

FY 2019 Proposed Operating Plan	FY 2017 Spend Plan	FY 2018 Annualized CR	Total FY 2019 ATBs	FY 2019 Base	FY 2019 Program Changes	FY 2019 President's Budget
Office of Marine and Aviation Operations						
ORF	213,101	209,712	3,007	212,719	3,134	215,853
PAC	86,700	86,116	0	86,116	1,762	87,878
OTHER	31,311	32,038	(360)	31,678	0	31,678
TOTAL, OMAO	331,112	327,866	2,647	330,513	4,896	335,409
DIRECT OBLIGATIONS						
ORF	3,526,370	3,491,907	68,560	3,560,467	(440,346)	3,120,121
PAC	2,243,477	2,239,121	(12,440)	2,226,681	(591,977)	1,634,704
OTHER	254,401	257,037	(109,303)	147,734	(64,558)	83,176
TOTAL, DIRECT OBLIGATIONS	6,024,248	5,988,065	(53,183)	5,934,882	(1,096,881)	4,838,001
ORF Adjustments (Deobligations/Rescissions)	(35,500)	(35,500)	8,000	(27,500)	0	(27,500)
ORF Transfers	(122,995)	(112,164)	(42,704)	(154,868)	0	(154,868)
PAC Adjustments (Deobligations/Rescissions)	(13,000)	(18,000)	5,000	(13,000)	0	(13,000)
PAC Transfers	12,133	6,302	(5,000)	1,302	0	1,302
OTHER Discretionary Adjustments	0	0	0	0	0	0
Mandatory Accounts Excluded	(187,115)	(190,194)	108,970	(81,224)	0	(81,224)
TOTAL, DISCRETIONARY APPROPRIATIONS	5,677,771	5,638,509	21,083	5,659,592	(1,096,881)	4,562,711