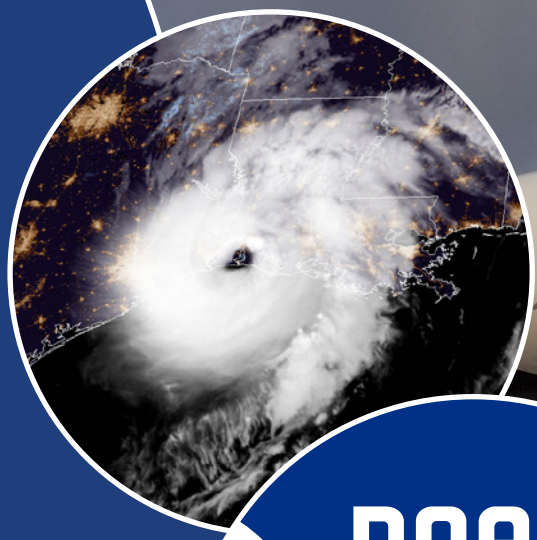


Budget Summary

FY2023

A small boat is deployed by a team of all women from the NOAA Ship *Fairweather.*

Table of Contents

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.

NOAA Ship *Rainier* is a hydrographic survey ship that maps the ocean to aid maritime commerce, improves coastal resilience, and studies the marine environment. The ship primarily operates in Alaska and Pacific Northwest.

Letter from the Administrator

Richard Spinrad, Ph.D., Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

Dear NOAA Partners,

I am delighted to share NOAA's Fiscal Year 2023 budget request of $6.9 billion. This budget represents a strong investment in our continued efforts to deliver world-class products and services that help protect lives, livelihoods, and lifestyles. It will allow us to scale up efforts to develop and deliver climate products and services to all Americans by building on our research, observations, forecasts, and restoration and resilience efforts. We will also continue to center equity in the way we carry out our budget: from developing our workforce to ensuring all communities are able to co-develop, utilize, and benefit from our resources.

At NOAA, science, service, and stewardship aren't merely the words that drive our mission; they're the ethos we bring to the whole-of-government approach that's necessary to address the climate crisis. At NOAA, as an integral part of the Department of Commerce, it's an additional point of pride that our work to monitor and forecast climate change and enhance economic opportunity through data-driven product development are highlighted as key priorities for the department's new strategic plan. To paraphrase Secretary Raimondo, NOAA's science, observations, and forecasts will help the United States lead the world toward a resilient future that will create millions of good-paying jobs.

The next decade is a critical time to address the climate crisis. We have a small window to shift to a carbon neutral economy and hold climate impacts in check. With increased climate funding, we have a once-in-a-generation opportunity to advance climate services across the nation. To that end, NOAA's climate ready nation initiative will target investments to address climate risks and build climate resilience, especially in our most vulnerable communities.

The New Blue Economy is also a primary component of building a climate ready nation. The ocean plays a key role in signaling the impacts of climate change and is also one of our greatest sources for climate change mitigation. A foundational aspect of the New Blue Economy is comprehensive ocean and coastal observations and the translation of these observations into information that is useful for decision makers. NOAA can help our Nation respond to and thrive in the face of changing conditions through a next-generation ocean economy fueled by ocean data and American ingenuity.

Fundamentally, the decisions we make today about our future should be shaped by the best available science and knowledge on how climate change will affect our way of life. The FY 2023 budget request supports NOAA's crucial work to ensure our climate data and information is accurate, useful, and usable for decision-making by the public, local officials, private sectors, and underserved communities. Increased investment in our work now will pay numerous dividends by building the climate ready nation of tomorrow.

Thank you for your interest in, and support of, NOAA's mission.

Crew members Bryce Dewees and Jon Sharp deploy a water sampling device from NOAA Ship *Ronald H. Brown.*

Terminology

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

FY 2021 Enacted

Fiscal Year (FY) 2021 Consolidated Appropriations Act, 2021 (P.L. 116-260).

FY 2022 Annualized Continuing Resolution (CR)

Fiscal Year (FY) 2022 Extension of Continuing Appropriations Act (P.L. 117-95).

Adjustments-to-Base

Includes the estimated FY 2023 civilian pay raise of 4.6 percent and military pay raise of 4.6 percent. Program totals will provide inflationary increases for labor and 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 2023 Base

FY 2022 Annualized CR plus Adjustments-To-Base.

Program Change

Requested increase or decrease over the FY 2023 base.

FY 2023 Request

FY 2023 base plus Program Changes.

It doesn't get much prettier than the East River Basin in Colorado's West Elk Mountains, where NOAA's SPLASH field mission hopes to discover insights that will improve precipitation and runoff forecasts.

Chapter 1

Introduction

For Fiscal Year (FY) 2023, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of $6,884,137,000 in discretionary appropriations, an increase of $1,444,339,000 from the FY 2022 Continuing Resolution (CR). The FY 2023 request supports the following NOAA's goals:

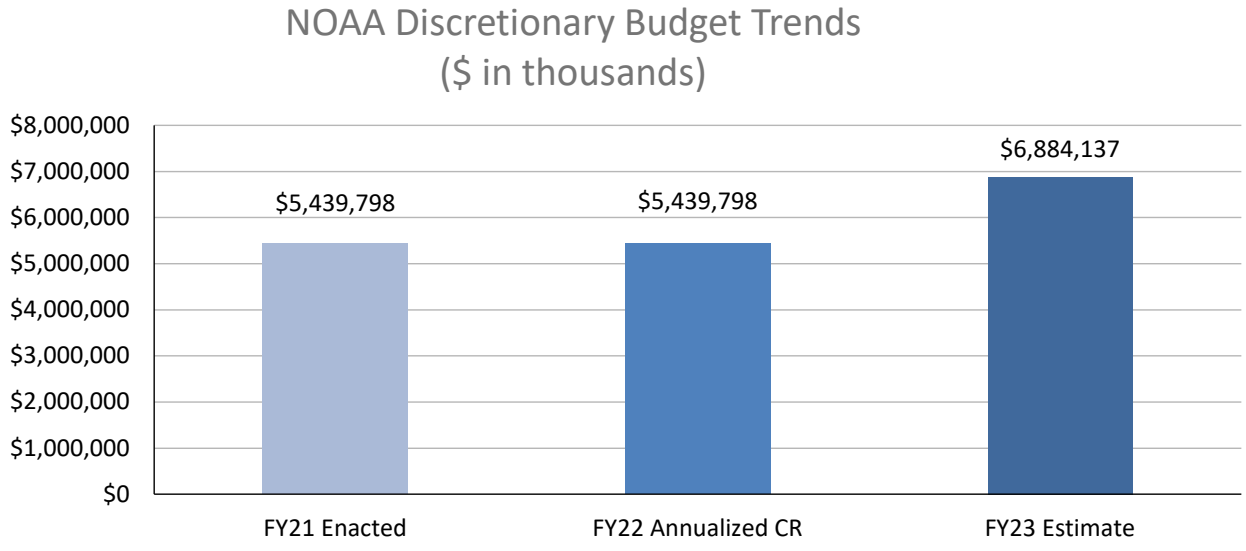
Develop and Deliver Climate Products and Services—NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and restoration and resilience.

Economic Development—NOAA will continue to foster environmental stewardship and sustainable economic development, with a particular focus on the New Blue Economy: new business development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses.

Equity and Workforce—NOAA will advance diversity, equity, and inclusion within our workforce, partnerships, and communities we serve, as well as in the development and delivery of NOAA's products and services.

Satellites—Crucial, time-sensitive investments in satellites reinforce NOAA's commitment to ensure that the Nation's next-generation satellite systems expand service delivery of earth system data to meet the needs of the American public.

Facilities—Safe and modern facilities are vital to support NOAA's mission of science, service, and stewardship. NOAA's facilities and infrastructure are vulnerable to the full range of weather and climate impacts.



Homes burning in Superior, Colorado during the Marshall fire, sparked by downed power lines and high winds on December 30, 2021. Credit: iStock

Develop and Deliver Climate Products and Services

Our Nation is at a critical point in responding to the climate crisis. Communities around the country are struggling with the effects of extreme events like hurricanes, floods, droughts, wildfires, and fisheries collapse. The U.S. has sustained 310 weather and climate disasters from 1980 to 2021, where overall damages reached or exceeded costs of $1 billion (including Consumer Price Index adjustment to 2021), totaling more than $2.155 trillion. Of these, there were 20 weather/climate disaster events in the U.S. in 2021 with losses exceeding $1 billion each.[1] This includes exceptional warmth—with December 2021 being the warmest December on record for the contiguous U.S.; the second-largest fire in California history—the Dixie Fire, which consumed nearly 964 thousand acres; the third most active Atlantic hurricane season; the heat dome in the Pacific Northwest; and the deadliest December tornado outbreak on record. These events alone resulted in the deaths of almost 2,000 people and had significant economic effects on the areas impacted. These deadly and costly disasters are also happening more frequently: average time between billion-dollar disasters in the U.S. has dropped to just 18 days, compared to 82 days in the 1980s. In addition, the U.S. could see a rise in sea level of one foot or more on average by 2050[2] without significant global actions to address climate change.

The FY 2023 Budget Request paves the way for NOAA's role in building a climate ready nation—a thriving Nation whose prosperity, health, safety, and continued growth benefit from a shared understanding of and collective action on climate change. In FY 2023, NOAA requests an additional $350.4 million to implement Executive Order (EO) 14008 on *Tackling the Climate Crisis at Home and Abroad*. Funding will support an earth system approach to enhance NOAA's authoritative climate products and services. NOAA's work directly impacts communities across the Nation and around the globe, from supporting climate-resilient communities to improving forecasts and response to climate-related natural disasters.

In FY 2023, NOAA will strengthen core research capabilities to develop and deliver data, tools, and services. We will improve our understanding of climate change on time scales beginning at two weeks through the next several decades. We will build on this understanding to improve precipitation and sea level rise forecasts, and identify impacts of climate change on fisheries, protected species, and living marine resources to improve management.

NOAA will invest additional resources to improve predictions and projections in a research environment. In particular, NOAA will improve precipitation predictions across weather and climate timescales for transition to operations through the Precipitation Prediction Grand Challenge Initiative. This cross-NOAA effort to advance subseasonal-to-seasonal and seasonal-to-decadal forecasts will be conducted in collaboration with our academic research partners, and will

1 NOAA National Centers for Environmental Information, U.S. 2021 Billion-Dollar Weather and Climate Disasters, (2021), https://www.ncdc.noaa.gov/billions/

2 NOAA National Ocean Service, 2022 Sea Level Rise Technical Report. (2022), https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html

lead to improved precipitation forecasts using NOAA's Unified Forecast System. In addition, NOAA will develop a global high resolution model to improve the understanding and prediction of extreme weather and climate events. Developing and delivering the next generation modeling systems for weather and climate prediction will be supported by crucial investments to maintain and expand high performance computing for research and development.

As we increase our understanding of the changing climate in the short and long term, we will simultaneously research and develop new and improved tools for decision makers to address climate impacts. For example, NOAA will enhance our Effects of Sea Level Rise extramural grant program in partnership with the Department of Transportation, which provides communities with scientific capacity to evaluate vulnerability to sea level rise, flooding, and inundation threats, and assess the effectiveness of mitigation solutions.

Our research will also address the needs of tourism, recreation, commercial fishing, and more. The NOAA Climate and Fisheries Initiative will significantly increase fisheries surveys, sampling, and analysis capabilities to deliver information on the distribution and abundance of commercially and recreationally valuable species to decision makers to determine best management strategies. In addition, NOAA will build a national ocean/ecosystem modeling and prediction system spanning U.S. coastal waters, the Arctic, and the Great Lakes. This research will develop tools for decision makers to prepare for changing conditions in the ocean and Great Lakes, reduce climate impacts, and increase the resilience of all living marine and Great Lakes resources and the communities that depend on them.

NOAA provides timely and actionable environmental observations on a global, national, regional, and local level from satellites, radar, surface systems, atmospheric greenhouse gas sampling stations, ocean buoys, uncrewed systems, aircraft, and ships. In FY 2023, NOAA will continue to invest in these platforms to meet the increasing demand for observations required for NOAA climate products and services. We will continue tracking marine ecosystem conditions to provide critical information for marine industries like fisheries, shipping, and offshore wind. We will also continue to track local environmental conditions that inform farming, forestry, building and construction, resource planning, disaster preparedness, and more. NOAA's local weather stations, climate monitoring stations, and research facilities across the country will continue to maintain long-standing climate records, such as temperature and rainfall observations, taken by experts and community scientists. These records are made publicly available and used to prepare, plan, and execute critical decisions at the local level. NOAA uses these data to establish a baseline normal state against which to compare new environmental states over time.

In FY 2023, NOAA will continue to serve as a global leader in monitoring long-term atmospheric and climate change trends. This request will allow NOAA to support and maintain long-term atmospheric observations, which serve as a baseline and record of trends for carbon dioxide, methane, other important greenhouse gases, and other atmospheric aerosols and particles that affect climate, weather, and human health. NOAA will also invest in critical maintenance on our two P-3 Hurricane Hunter aircraft, which have unique airborne data collection tools.

Wildfires are influenced by the weather and climate, and the weather and climate are influenced by wildfires. Of particular interest to NOAA in FY 2023 is fire product research, development, transition, and sustainment. In 2020, wildfires burned over 10 million acres in the U.S., approximately 154% of the 10-year average. California and Colorado

had their largest wildfires on record in 2020.[3] Fires are increasing in occurrence and spreading more aggressively at a time when the wildland/exo-urban interface is expanding. In FY 2023, NOAA will pursue a series of short-term and long-term fire product development activities that address critical gaps in the fire product lifecycle, including products developed with funding in the FY2022 *Extending Funding and Emergency Assistance Act* (P.L. 117-43) and the *Infrastructure Investment and Jobs Act* (P.L. 117-58).

NOAA's weather and climate predictions and information must be reliably delivered to users to impact decision making. The FY 2023 request includes a critical investment in the National Weather Service's (NWS) Integrated Dissemination Program plan to address reliability and capacity issues necessary to ensure the provision of weather and climate predictions, forecasts, and warnings to the public, emergency management partners, and the U.S. weather enterprise. NOAA will invest in dissemination of rapidly increasing open data, especially related to satellite data, and establish a NOAA Cloud Program to streamline and accelerate the transition of all NOAA mission areas to the cloud. This, in conjunction with the evolution of NOAA's Open Data Dissemination, will provide worldwide cloud access to NOAA climate and earth system dynamics data that is crucial to improve climate modeling.

Forty percent of the U.S. population lives and works in coastal counties,[4] making a disproportionate segment of our society and economy at increasing risk from such hazards as hurricanes and coastal inundation. Therefore, in FY 2023, NOAA will invest in community resilience as integral to NOAA's climate strategy. There is an increasing need for NOAA to create and foster natural and economic resilience along our coasts through our direct financial support, expertise, robust, on-the-ground partnerships, and place-based conservation activities. These activities would support America the Beautiful, a national conservation effort that reflects the Administration's determination to combat the climate crisis and address environmental injustice while also growing our economy.

NOAA's active engagement and partnerships with regional users and climate service delivery providers facilitate the uptake and application of NOAA's authoritative information. NOAA's Regional Integrated Sciences and Assessments program will work with communities to co-produce and operationalize lasting and equitable climate resilience plans in 50 cities around the Nation, prioritizing underserved communities particularly vulnerable to a changing climate. NOAA's FY 2023 request supports locally driven management decisions regarding NOAA trust resources through increased engagement with partners, underrepresented communities, Tribes, and local indigenous groups to strengthen conservation outcomes. For example, in national marine sanctuaries, NOAA will double climate vulnerability assessments, promote climate resilience, and enhance work with states and local communities to achieve on-the-ground conservation goals.

3 Congressional Research Service, Wildfire Statistics. (2021), https://sgp.fas.org/crs/misc/IF10244.pdf

4 NOAA Office of Coastal Management and U.S. Census Bureau, American Community Survey Five-Year Estimates. (2017), https://coast.noaa.gov/digitalcoast/data/acs.html

Develop and Deliver Climate Products and Services

Budget Program	PPA	Program Change Title	Program Change	Page Number
NOS	Navigation, Observations and Positioning	Enterprise Infrastructure Solutions (EIS)	1,000	27
NOS	Coastal Science, Assessment, Response and Restoration	Enterprise Infrastructure Solutions (EIS)	900	28
NOS	Competitive Research	Nature-based Solutions to Enhance the Resilience of Coastal Communities and Ecosystems	14,500	28
NOS	Coastal Zone Management and Services	Enterprise Infrastructure Solutions (EIS)	300	29
NOS	Sanctuaries and Marine Protected Areas	Assessing Place-based Climate Vulnerability for Conservation Action	24,063	29
NOS	Sanctuaries and Marine Protected Areas	Fostering Ecological Resilience Through Conservation Action	2,000	29
NOS	Sanctuaries and Marine Protected Areas	Enterprise Infrastructure Solutions (EIS)	800	29
NMFS	Species Recovery Grants	Species Recovery Grants Program	10,000	35
NMFS	Fisheries and Ecosystem Science Programs and Services	Climate-Ready Fisheries: Climate-Informed Fisheries Assessments and Management Strategies for Changing Oceans	10,000	35
NMFS	Fisheries and Ecosystem Science Programs and Services	Enterprise Infrastructure Solutions (EIS)	200	37
NMFS	Fisheries Data Collections, Surveys and Assessments	Climate-Ready Fisheries: Advancing Fisheries Survey Capacity for Commercially and Recreationally Valuable Species	11,562	38
OAR	Climate Laboratories & Cooperative Institutes	Sustained Atmospheric Observations Increase	20,261	47
OAR	Climate Laboratories & Cooperative Institutes	Global-Nested High-Resolution Model Increase	10,000	47
OAR	Regional Climate Data & Information	Enhancing Regional and Community Resilience by Scaling Up RISA Program and "Climate-Smart" Communities Initiative	10,000	47
OAR	Climate Competitive Research	Marine Ecosystem Responses to Climate Change Increase	10,000	48
OAR	Climate Competitive Research	Providing Climate Change Projections out to 2050 to Inform Risk Management Increase	9,000	48
OAR	Climate Competitive Research	Precipitation Prediction Grand Challenge Increase	7,000	48
OAR	Uncrewed Systems	Uncrewed Systems Increase	4,000	50
OAR	Research Supercomputing/CCRI	Research and Development (R&D) High Performance Computing (HPC)	25,000	50
NWS	Observations (ORF)	Enterprise Infrastructure Solutions (EIS)	750	54
NWS	Dissemination	Optimize and Upgrade the Integrated Dissemination Program	25,000	55
NWS	Dissemination	Enterprise Infrastructure Solutions (EIS)	11,400	55
NWS	Observations (PAC)	Enterprise Infrastructure Solutions (EIS)	470	55

Develop and Deliver Climate Products and Services continued

Budget Program	PPA	Program Change Title	Program Change	Page Number
NWS	Observations (PAC)	Automated Surface Observing System Service Life Extension Program	8,040	55
NESDIS	Office of Satellite and Product Operations	Satellite and Product Operations Deferred and Extended Maintenance	7,500	60
NESDIS	Office of Satellite and Product Operations	Enterprise Infrastructure Solutions (EIS)	1,500	60
NESDIS	Product Development, Readiness & Application	Advance Core Activities	8,000	60
NESDIS	Product Development, Readiness & Application	Ocean Remote Sensing	6,505	61
NESDIS	Product Development, Readiness & Application	Advancing Fire Weather Priorities	4,000	61
NESDIS	Product Development, Readiness & Application	Expanding Polar Region Integrated Satellite Marine and Ice Information Capabilities	2,000	62
NESDIS	National Centers for Environmental Information	Improving Local, State, and Regional Climate Services	6,300	62
NESDIS	National Centers for Environmental Information	Climate Data Records	6,000	62
NESDIS	National Centers for Environmental Information	Enhance Enterprise Data Stewardship and Archiving	5,300	63
NESDIS	National Centers for Environmental Information	Sustainment of Cloud Framework for Environmental Data	4,900	63
NESDIS	Common Ground Services (CGS)	Data Access and Distribution	24,000	67
MS	Mission Services and Management	Acquisition and Grants Office	2,530	73
MS	Mission Services and Management	Increase Facility Program Capacity	5,000	73
MS	Mission Services and Management	Implement a Budget Position Management System	1,400	73
MS	Mission Services and Management	NOAA Finance Transaction Processing	800	74
MS	Mission Services and Management	NOAA Open Data Dissemination	3,300	74
MS	Mission Services and Management	NOAA Cloud Program	2,500	74
MS	Mission Services and Management	Enterprise Infrastructure Solutions (EIS)	1,770	75
MS	Mission Services and Management	Spectrum	500	75
OMAO	Marine Operations and Maintenance	Enhanced NOAA Fleet Operations	26,985	82
OMAO	Marine Operations and Maintenance	Enterprise Infrastructure Solutions (EIS)	200	83
OMAO	Aviation Operations and Aircraft Services	Increased Aircraft Operations in Support of Cross-NOAA Climate Objectives	5,000	83
OMAO	NOAA Commissioned Officer Corps	Grow the NOAA Corps	3,136	83
OMAO	Platform Capital Improvements and Tech Infusion	P-3 Service Depot Level Maintenance	5,000	85
Total, Develop and Deliver Climate Products and Services			350,372	

Construction of the Block Island Wind Farm in Rhode Island, the U.S.'s first offshore wind farm, which began commercial operations in December 2016. This is a new use of our marine waters, requiring substantial scientific and regulatory review by NMFS.

Economic Development

NOAA will also continue to foster environmental stewardship and sustainable economic development, with a particular focus on the New Blue Economy, which is new business development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, and recreation. In 2021, the Bureau of Economic Analysis, in partnership with NOAA, released the first official Marine Economy statistics that the U.S. marine economy contributed about $397 million to the Nation's gross domestic products and supported 2.4 million jobs in 2019.[5] In FY 2023, NOAA requests $212.5 million in support of the expansion of offshore wind energy, ocean and coastal mapping and charting, and development of key information systems in our weather and space observations infrastructure. These investments will support the Administration's American Jobs Plan and NOAA's climate ready nation initiative by making our infrastructure more resilient, and advancing U.S. leadership in research and development of critical technologies, climate science, and innovation.

Offshore wind development is rapidly expanding in the U.S., particularly in the Northeast and Mid-Atlantic, and is being considered along the Gulf and West Coasts as well. In support of the Administration's goal to deploy 30 gigawatts of offshore energy by 2030, NOAA will facilitate smart economic and ecological offshore wind development. NOAA will need to work closely with the Bureau of Ocean Energy Management (BOEM) to minimize the effects of offshore energy projects on protected marine resources, fisheries, and important habitats; reduce delays and minimize adverse economic impacts to the fishing industry and related coastal communities; and mitigate impacts to fisheries surveys in the Northeast and Mid-Atlantic. NOAA continues to support the all-of-government effort to deploy offshore wind, while protecting biodiversity and promoting co-use through: 1) offshore energy assessment and scientific advice to support the regulatory process; 2) funding for the regulatory review process associated with offshore energy assessment and protected resources; 3) increased support for environmental assessments and consultations with BOEM; and 4) development of new fisheries survey design and methods to address anticipated changes in habitats around offshore wind developments; and 5) expanded data collection including seafloor mapping and biological assessments; in situ observations; predictive models for marine species distribution; and studies of human perceptions and attitudes towards offshore wind within and near potential wind energy areas.

In FY 2023, NOAA will put people to work surveying and mapping priority coastal areas in Alaska and the U.S. EEZ, and build out the state's foundational geospatial and water level infrastructure, benefiting Tribal populations and other local communities. This will accelerate the joint state/Federal goals of the Alaska Coastal Mapping Strategy (ACMS) and National Ocean Mapping, Exploration and Characterization (NOMEC) goals in Alaska. By providing foundational information, NOAA will support the region's economy and climate resilience now and into the future.

5 Bureau of Economic Analysis and NOAA, Ocean Economy. (2021), https://www.bea.gov/data/special-topics/ocean-economy

NOAA will advance critical research and support industry engagement to prototype a dual polarization Phased Array Radar (PAR) technology. PAR is a promising technology that could advance NOAA's current radars from 1988-based technology to radars that would be viable until the end of the 21st century. This request is part of an integrated effort to prepare for a formal Radar Acquisition Management Program and decision point in 2028, with the objective to evaluate the capabilities of PAR as a replacement for the current NEXRAD radar network by 2040. Once established, PAR will support the national weather enterprise and all economic activities that rely on timely and accurate weather forecasts.

Finally, satellite products, services, and infrastructure are vital for numerous stakeholders nationally and internationally. In FY 2023, NOAA will support development and transition to operations of new and improved satellite products and services for coastal resilience. Funds will expand and enhance observations, mapping, and modeling that predict coastal change and its impacts.

NOAA will develop a space situational awareness capability informed by the objectives of the National Space Policy. This includes supporting partnerships between the Department of Defense, other federal agencies, and commercial industry to share information through an Open Architecture Data Repository (OADR). The OADR will manage a future environment which is expected to comprise 57,000 new satellites in orbit by the year 2030. As of 2022, there are approximately 6,100 satellites in orbit, roughly 1,000 of which launched in 2021.

A container ship enters the shipping channel at Port Miami, where vessel pilots now have access to real-time current information via PORTS® to help mariners navigate safely and efficiently in support of maritime commerce.

Economic Development

Budget Program	PPA	Program Change Title	Program Change	Page Number
NOS	Navigation, Observations and Positioning	Providing Foundational Ocean and Coastal Mapping and Charting to Support Coastal Climate Resilience	14,544	27
NOS	Hydrographic Survey Contracts/ Priorities	Providing Foundational Ocean and Coastal Mapping and Charting to Support Coastal Climate Resilience	12,500	27
NOS	Coastal Science, Assessment, Response and Restoration	Foundational Information for Expansion of Offshore Wind Energy	8,719	28
NMFS	Marine Mammals, Sea Turtles, and Other Species	Endangered Species Act Consultations and Marine Mammal Protection Act Permitting	5,000	35
NMFS	Marine Mammals, Sea Turtles, and Other Species	Wind Energy: Protected Species Environmental Reviews and Science	4,476	35
NMFS	Fisheries and Ecosystem Science Programs and Services	Wind Energy: Fisheries Science & Technical Reviews	8,669	36
NMFS	Fisheries Data Collections, Surveys and Assessments	Wind Energy: Scientific Survey Mitigation	17,380	37
NMFS	Fisheries Management Programs and Services	Seafood Inspection Program	7,500	38
NMFS	Fisheries Management Programs and Services	Wind Energy: Fisheries Management	6,155	38
NMFS	Fisheries Disaster Assistance	Fisheries Disaster Assistance	300	40
OAR	Tornado Severe Storm Research / Phased Array Radar	Phased Array Radar Research and Development Follow-On Plan	6,287	49
OAR	Research Acquisitions and Management	Phased Array Radar Research and Development Follow-On Plan	40,000	50
NESDIS	Product Development, Readiness & Application	Coastal Resilience and Water Quality	3,236	61
MS	Office of Space Commerce	Office of Space Commerce	77,700	76
Total, Economic Development			212,466	

General Vessel Assistant Derrick Mitchell salutes the camera while working on deck aboard NOAA Ship *Ronald H. Brown*. Photo: Grace Owen

Equity and Workforce

Equal opportunity is the fundamental promise of America, but those opportunities have not always been equitable. Our Nation derives strength from the diversity of its population, and the Administration's commitment to equity will help bring that strength to bear. We can overcome our challenges when we draw on the talents and experiences of all parts of our society, and our greatest accomplishments are achieved when diverse perspectives are incorporated. The Administration's policies, including those described in EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, direct agencies to integrate equity into the DNA of their organizations—from management, to policies, to service delivery. In FY 2023, NOAA requests $39.2 million to invest in a framework and lay the foundation for successfully integrating equity across the organization by improving capabilities and knowledge sharing, creating and expanding opportunities, and honing service delivery. This will position us to help vulnerable communities better prepare for, respond to, and build resilience against extreme weather and climate disasters.

In FY 2023, NOAA's goals will respond to EO 13985 by building on service equity assessments (to be completed in FY 2022) of several major NOAA programs to ensure our products and services meet user needs, are delivered equitably, and will improve resilience to and understanding of weather, water, and climate events within historically underserved and vulnerable communities. This includes delivering Spanish-language translation of weather information from NWS offices and broadening Tribal engagement within the U.S. Drought Portal. A Tribal Drought Portal will provide Tribal Nation-specific forecast and outlook data, Tribal drought learning tools, documentation of drought impacts on Tribal lands, and support for peer-to-peer Tribal drought learning networks. At a broader level, NOAA will enhance Tribal consultation on substantive policy matters with at least 30% of federally recognized Tribes in FY 2023.

To support a more robust and diverse domestic seafood sector, NOAA will implement a series of workforce development and training pilot projects and grants, focused on environmental justice and equity through partnerships with entities serving diverse and historically underserved communities, including but not limited to Historically Black Colleges and Universities (HBCUs) and other minority serving institutions (MSIs). Additional training programs will provide fishing and seafood constituents the information and tools needed to confidently and productively engage in fishery (commercial, recreational, aquaculture) management decision processes.

NOAA will expand engagement with new and diverse audiences and invest in the next generation climate workforce. The FY 2023 request will provide dedicated funding for and build on NOAA's most successful public engagement programs, such as, NOAA Heritage initiatives and the Coastal Ecosystem Learning Centers Network. NOAA will increase environmental literacy grants for community resilience education projects. Funded projects will develop and implement innovative approaches to building community resilience through formal and informal education and engage

the most vulnerable children, youth, and adults in learning about and creating resilience for their communities. NOAA will also establish a NOAA Climate Cooperative Science Center as part of the José E. Serrano Educational Partnership Program with Minority Serving Institutions (EPP/MSI) to train post-secondary students in climate science.

NOAA also seeks to strengthen equity efforts internally to accelerate efforts to attract, recruit, retain, and develop talent, including from diverse backgrounds. NOAA will enhance programs and communication tools to support STEM recruitment efforts from HBCUs and other MSIs. NOAA will also leverage these institutions through more tailored recruitment in the NOAA Corps and the IT Fellowship Program. NOAA will accelerate implementation of the Diversity and Inclusion Strategic Plan and training and outreach for staff, supervisors, and leaders. These investments in supporting equity in our current and prospective workforce will allow NOAA to leverage diversity to provide better services to all Americans.

The Diversity and Professional Advancement Working Group received the 2016 Administrator's Award for their contributions to diversity efforts at NOAA.

Equity and Workforce

Budget Program	PPA	Program Change Title	Program Change	Page Number
NMFS	Fisheries and Ecosystem Science Programs and Services	Advancing and Improving Territorial Fisheries Science and Management	3,000	36
NMFS	Fisheries and Ecosystem Science Programs and Services	Community Social Vulnerability Indicators (CSVI) Toolbox	1,000	37
NMFS	Fisheries Management Programs and Services	Education and Outreach for Diverse Participation in Regulatory and Science Processes	2,000	39
NMFS	Fisheries Management Programs and Services	Workforce Training to Support the Seafood Industry	1,000	39
OAR	Regional Climate Data and Information	Tribal Drought Resilience Initiative	3,000	48
NWS	Analyze, Forecast, and Support	Staffing to Enhance Equitable NWS Decision Support Services	8,700	55
MS	Executive Services	NOAA Tribal Liaison	500	73
MS	Executive Services	Strategic Communication and Outreach to Underserved Communities	2,000	73
MS	Mission Services and Management	Equity Assessment and Implementation Support In Compliance with EO 13985	900	74
MS	Mission Services and Management	Strengthen Diversity in NOAA IT	400	75
MS	Mission Services and Management	NOAA Recruiting Program	1,500	75
MS	Mission Services and Management	NOAA Facilitation Network	600	75
MS	Mission Services and Management	Accelerate NOAA's Diversity and Inclusion Plan	2,900	75
MS	Mission Services and Management	Workplace Violence Prevention and Response Program – Racial Equity/Wellness	1,692	75
MS	Office of Education	Educational Partnership Program Climate Cooperative Science Center	3,000	77
MS	Office of Education	Engaging New and Diverse Audiences with NOAA Science	2,900	77
MS	Office of Education	Environmental Literacy Grants for Community Resilience Education	2,000	77
OMAO	Marine Operations and Maintenance	Office of Health Services Increase	1,200	82
OMAO	NOAA Commissioned Officer Corps	NOAA Corps Recruitment	900	84
Total, Equity and Workforce			39,192	

GOES-T, the third in NOAA's GOES-R series of advanced geostationary weather satellites, completed rigorous testing to ensure it can withstand the harsh conditions of launch and space. GOES-T was successfully launched on March 1, 2022.
Credit: Lockheed Martin

Satellites

NOAA satellites are a critical component of NOAA's mission, as well as the security, safety, and prosperity of the Nation. Data from these satellites provide essential support to all segments of the U.S. economy. The FY 2023 request includes significant investments in NOAA's observational infrastructure. The FY 2023 budget request underscores NOAA's commitment to making crucial, time-sensitive, and cost-effective investments to ensure that the Nation's next-generation satellite systems expand service delivery of essential earth system to meet the evolving needs of the American public. The FY 2023 budget will help NOAA better observe environmental phenomena connected to climate change-related impacts and patterns, and deliver products, information, and climate services to inform decision makers.

The value of NOAA's world-class data is enhanced by NOAA applications and access by users. The FY 2023 budget supports much-needed improvements to NOAA's data infrastructure that will ensure that the data collected are preserved for the future and can be easily accessed in a cloud-based environment. This includes funding to transition NOAA to cloud computing for data ingest, processing, dissemination, and archiving, which will expand the size and diversity of NOAA user communities and data applications.

For decades, the U.S. government was alone in developing Earth-observing satellites on behalf of the Nation. Now, the government is joined by domestic companies racing to deploy constellations of satellites for communications and connectivity. The growth of the U.S. space industry has created new opportunities for Federal agencies like NOAA to leverage new technologies, foster partnerships, and diversify key data applications. There are more sophisticated commercial technologies and capabilities available than ever before to advance NOAA's mission. NOAA will continue leading the world in cutting-edge Earth-observing instruments, setting the global standards for such technology and observations.

NOAA's current constellation has proven its worth and will continue to do so for another decade. However, NOAA must concurrently invest in the next generation of environmental satellites with the needs of all of our communities in mind. FY 2023 funding for future geostationary, low earth orbit, and space weather observations will ensure critical data continuity from legacy systems, while providing significant improvements in data and products to meet the complex societal and environmental needs of the Nation. Our program investments also allow us to immediately exploit the National Aeronautics and Space Administration's (NASA) research satellite observations for NOAA requirements and for integration into NOAA's operational mission.

With advances in technology, NOAA can build a more holistic and efficient observing system—one that supports our vision to create an integrated, digital understanding of our Earth environment, evolves quickly to help our communities adapt and thrive, and maintains a stable and predictable budget path that avoids outyear cost growth (which creates risk to both NESDIS and other NOAA priorities). This observing system, a

composite of satellites deployed by NOAA and our partners in Earth observations—including NASA, the Department of Defense (DOD), Japanese Meteorological Agency, European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), and others—will provide advanced, real-time data critical to saving lives and protecting property. This joint observing system will improve Earth and space weather forecasting and expand capabilities for extreme weather, ocean, air quality, and climate observations. It will also enable NOAA to continue long-term monitoring and continuous services with no gaps in coverage of key climate parameters essential to understanding our changing environment.

As our weather and climate become increasingly complex, NOAA's satellite observations, data, and scientific experts are needed now more than ever. NOAA must invest in the next generation of satellites, products, and services to meet the demands for more accurate and expanded environmental information and services for the American public. Continuity of NOAA's current satellites and information services, exploitation of partner research observations, support for cutting-edge products and services, and implementation of NOAA's plans for enhanced observing capabilities and vital partnerships, will directly enhance the entire weather and climate enterprise.

Satellites

Budget Program	PPA	Program Change Title	Program Change	Page Number
NESDIS	U.S. Group on Earth Observations (USGEO)	U.S. Group on Earth Observations (USGEO)	500	62
NESDIS	Geostationary Earth Orbit (GEO)	Geostationary Extended Observations (GeoXO)	653,829	63
NESDIS	Low Earth Orbit (LEO)	LEO Weather Satellites	78,330	64
NESDIS	Low Earth Orbit (LEO)	Polar Operational Environmental Satellites (POES) Extension	10,000	65
NESDIS	Low Earth Orbit (LEO)	COSMIC-2/GNSS RO	2,208	65
NESDIS	Space Weather Observations	Space Weather Next	145,000	66
NESDIS	Space Weather Observations	Space Weather Follow On	28,085	66
NESDIS	Common Ground Services (CGS)	Data-Source Agnostic Common Services (DACS)	25,007	67
NESDIS	Systems/Services Architecture & Engineering (SAE)	Commercial Data Purchase (CDP)	16,000	67
NESDIS	Systems/Services Architecture & Engineering (SAE)	Joint Venture Partnerships	15,000	68
NESDIS	Systems/Services Architecture & Engineering (SAE)	Commercial Weather Data Pilot (CWDP)	5,000	68
Total, Satellites			978,959	

A beautiful day outside the Twin Cities, Minnesota Weather Forecast Office.

Facilities

Safe and modern facilities are vital to support NOAA's mission of science, service, and stewardship. NOAA's facilities and infrastructure are vulnerable to the full range of weather and climate impacts. In FY 2023, NOAA is requesting $102.7 million to ensure the long-term viability of these vital assets to NOAA's mission. Our overall owned real property portfolio condition is "poor" and current repair needs exceed $700M based on FY 2022 data. NOAA requests sustained funding for major and minor capital improvement projects at facilities supporting marine operations and scientific research, as part of NOAA's long-term strategy for funding the most mission-critical priorities.

In addition, improvements are necessary at the Northwest Fisheries Science Center (NWFSC) facilities near Seattle, Washington. The research and innovation conducted at the NWFSC helps build sustainable fisheries, restore threatened and endangered species, safeguard healthy ecosystems, and reduce risks to human health. This investment will prevent large-scale mission failure by enabling necessary improvements at a new Montlake facility, as well as at the Manchester and Western Regional Center sites, to ensure long-term continuation of the National Marine Fisheries Service's science mission at NWFSC.

Summary

The next decade is a critical time to address the climate crisis. We have a small window to shift to a carbon neutral economy and hold climate impacts in check. With increased funding to develop and deliver climate products and services, foster environmental stewardship and sustainable economic development, and advance diversity, equity, and inclusion within our workforce, partnerships, and communities we serve, we have a once in a generation opportunity. In FY2023, NOAA will support the whole-of-government effort to address the climate crisis, boost resilience, and promote economic growth by building a climate ready nation.

Facilities

Budget Program	PPA	Program Change Title	Program Change	Page Number
MS	NOAA Construction	Northwest Fisheries Science Center Facilities Consolidation	83,200	78
MS	NOAA Construction	NOAA Construction	19,500	78
Total, Facilities			102,700	

A Hawaiian monk seal and green sea turtle nap together in Papahānaumokuākea Marine National Monument.

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, improve effective protection and use of coastal resources, and facilitate adaptation to change.

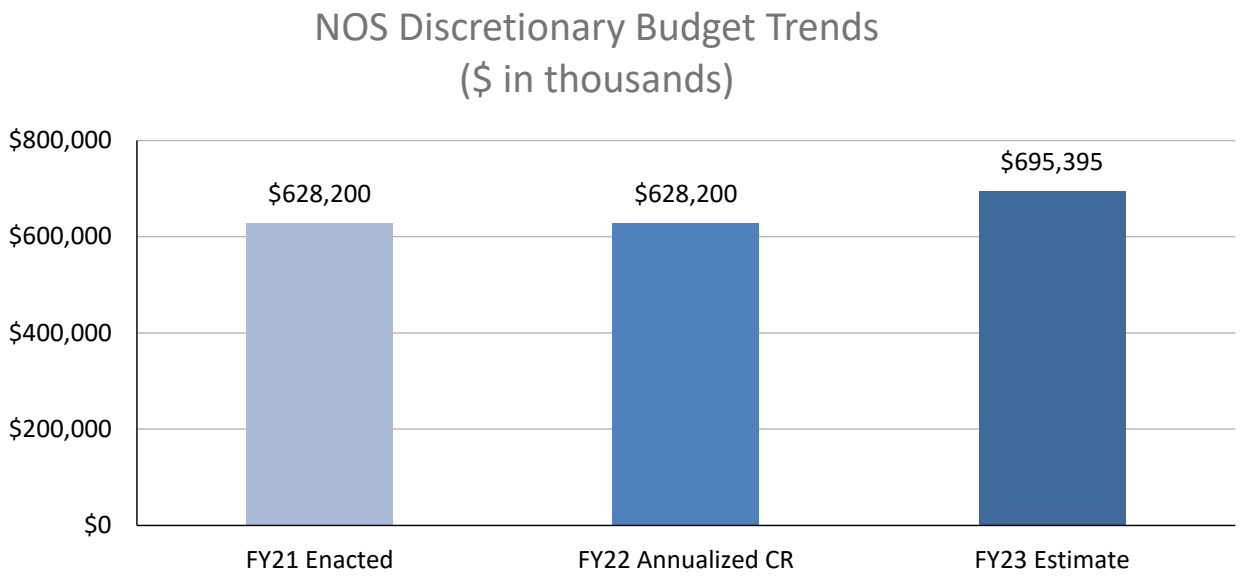
FY 2021 Accomplishments

In FY 2021, NOS completed over half of the shoreline mapping needed in Alaska. NOS flew 14 missions over the remote Aleutian Islands for the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project, resulting in collection of approximately 78,000 mi2, an area the size of Nebraska. The GRAV-D project overall is now nearly 90% complete. The resulting data will ultimately provide a vertical reference framework emphasizing how sea level changes at the local level, improving coastal resilience efforts. It is estimated that GRAV-D will provide $4.8 billion in socioeconomic benefits to the U.S. through improved floodplain mapping, coastal resource management, construction, agriculture, and emergency evacuation planning.

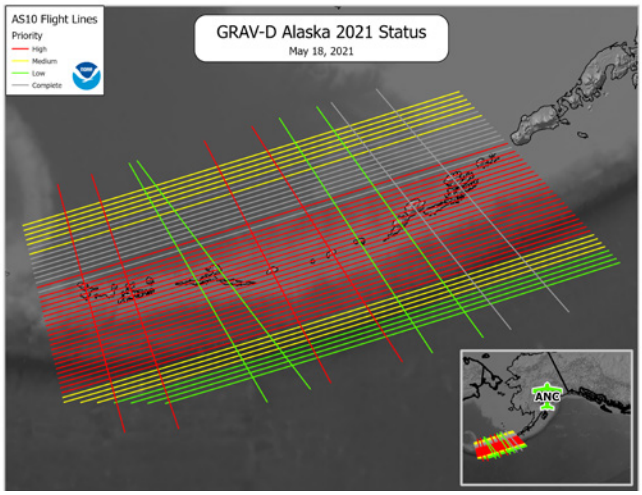
The Physical Oceanographic Real Time System program (PORTS®) commemorated its 30th anniversary in July 2021, with the launch of an updated PORTS landing page featuring the customizable MyPORTS application, a new system map, and an outreach video. Throughout FY 2021, NOS expanded several of its 36 existing PORTS®, providing vessel operators with quality controlled real-time status of environmental parameters to inform their key navigation, safety of life and property decisions. NOS also announced the establishment of three future PORTS in Freeport, Texas; Kitsap Peninsula, Washington; and Pearl Harbor-Honolulu, Hawaii.

In August 2021, NOAA designated its 15th national marine sanctuary—a 962-square mile area of Lake Michigan named Wisconsin Shipwreck Coast National Marine Sanctuary - with strong support from a diverse coalition of local, state, regional, and national stakeholders. The Wisconsin sanctuary protects and celebrates the region's maritime cultural heritage while creating unique research, educational, recreational, and tourism opportunities. There are currently 36 known shipwreck sites, but an additional 60 ships may exist within the boundaries of this national treasure.

NOS also enhanced the Nation's capacity to monitor and detect harmful algal blooms (HAB), awarding $2.5 million in FY 2021 for seven HAB pilot technology testbeds across eight of the eleven NOS Regional Associations. Building on existing HAB initiatives, these projects focus on data integration and information services, informing decision makers across coastal management, seafood, aquaculture, drinking water utilities, and tourism organizations about the extent, toxicity, and length of blooms.



In FY 2021, the Coral Reef Conservation Program released a framework to slow the spread of Stony Coral Tissue Loss Disease, which is spreading throughout the Atlantic and Caribbean regions, and threatens the Indo-Pacific region. NOAA is co-leading the Coral Rescue Team, which places healthy corals in land-based aquaria to prevent disease, preserve genetic diversity, and propagate source stock for future restoration. This is the first-ever rescue effort of this magnitude, necessitated by the urgency and devastating impact of the disease. NOAA is working with state and federal partners in Florida, the U.S. Virgin Islands, and Puerto Rico to lead disease response and wider restoration efforts in these coral reef jurisdictions, and is specifically supporting coordination with the wider Caribbean region.



Map depicting the lines flown, grey, during the NGS GRAV-D (Gravity for the Redefinition of the Vertical Datum) Alaska 2021 campaign over the Aleutian Islands. Remaining lines have been prioritized for maximum impact to NGS's geoid models with red being top priority, yellow medium priority, and green low priority.

FY 2023 Request $719,823,000

NOAA requests a total of $719,823,000 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 is a net increase of $45,326,000 in FY 2023 program changes.

In FY 2023, NOAA will scale up efforts to develop and equitably deliver climate products and services building on our research, observations and forecasting, and restoration and resilience efforts. NOS will focus on the use of place-based and nature-based solutions to provide

communities with critical climate information and predictive capabilities, and strengthen place-based conservation efforts to promote ecological and community resilience. Through increases in extramural research and community engagement, NOS will help communities mitigate, plan, and adapt to sea level rise, flooding, and inundation threats; evaluate and assess the effectiveness of mitigation solutions to enhance community resilience; and inform infrastructure adaptation in underserved communities. NOS will also engage partners, underrepresented communities, Tribes, and other indigenous and native communities to assess place-based climate vulnerability and strengthen conservation in existing national marine sanctuaries and marine national monuments, while also assessing new sites for potential sanctuary designation.

These initiatives will increase NOAA's understanding of the effects of climate change and the associated rate of change on special places, including the species and habitats within them, to inform management strategies that promote resilience. Through research, monitoring, restoration, permitting, and interagency partnerships, NOS will increase its engagement with communities of color, underrepresented groups, and indigenous and native peoples, on conservation and planning for informing locally driven management decisions. As outlined in Executive Order 14008 on *Tackling the Climate Crisis at Home and Abroad*, these ecological restoration and community resilience efforts are integral to NOAA and the Administration's climate strategy.

NOAA will continue to foster environmental stewardship and sustainable economic development, with a particular focus on the New Blue Economy: new business development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses.

NOS will invest in the activities to develop the social and ecological science to plan and site offshore wind energy development in support of the Administration's goal to deploy 30 gigawatts of offshore wind energy by 2030. This effort will facilitate smart ecological offshore wind development, by enhancing observations, research, modeling, and analyses to understand and mitigate impacts of offshore wind energy development on stakeholders and critical ecosystems. Additionally, NOS will survey and map priority coastal areas in Alaska and the U.S. EEZ to build out the state's foundational geospatial and water level infrastructure. This will accelerate national goals of the Alaska Coastal Mapping Strategy (ACSM); National Ocean Mapping, Exploration and Characterization (NOMEC) goals in Alaska; and Administration priorities to rebuild infrastructure, respond to the climate crisis, and create a sustainable economy.

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $686,895,000 to support the ORF activities of the NOS, reflecting a net increase of $45,326,000 in FY 2023 program changes.

Navigation, Observations and Positioning $273,129,000

NOAA requests a net increase of $28,044,000 in program changes for a total of $273,129,000 in the Navigation, Observations, and Positioning activity. Funds in this activity will support physical oceanographic observations and applications for the safe and efficient use of coastal waterways. Program changes include:

Navigation, Observation, and Positioning: Providing Foundational Ocean and Coastal Mapping and Charting to Support Coastal Climate Resilience: NOAA requests an increase of $14,544,000 to survey and map priority coastal areas in Alaska and the U.S. EEZ, and build out the state's foundational geospatial and water level infrastructure, benefiting local communities and Tribal populations. This is one of two complementary requests, which together will accelerate the joint state-Federal ACMS goals; NOMEC goals in Alaska; and Administration priorities to rebuild infrastructure, respond to the climate crisis, and create a sustainable economy.

Navigation, Observation, and Positioning: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $1,000,000 to enable NOAA to conduct technology modernization and support an accelerated transition of telecommunications services to the General Services Administration's (GSA) EIS contract vehicle.

Hydrographic Survey Priorities/Contracts: Providing Foundational Ocean and Coastal Mapping and Charting to Support Coastal Climate Resilience: NOAA requests an increase of $12,500,000 to survey and map priority coastal areas in Alaska and the U.S. EEZ, and build out the state's foundational geospatial and water level infrastructure, benefiting local communities and Tribal populations. This is one of two complementary requests, which together will accelerate the joint state-Federal ACMS goals; NOMEC goals in Alaska; and Administration priorities to rebuild infrastructure, respond to the climate crisis, and create a sustainable economy.

Coastal Science and Assessment $137,074,000

NOAA requests an increase of $24,119,000 in program changes for a total of $137,074,000 in the Coastal Science and Assessment activity. Funds in this activity will support applied research and scientific information for disaster response and management,

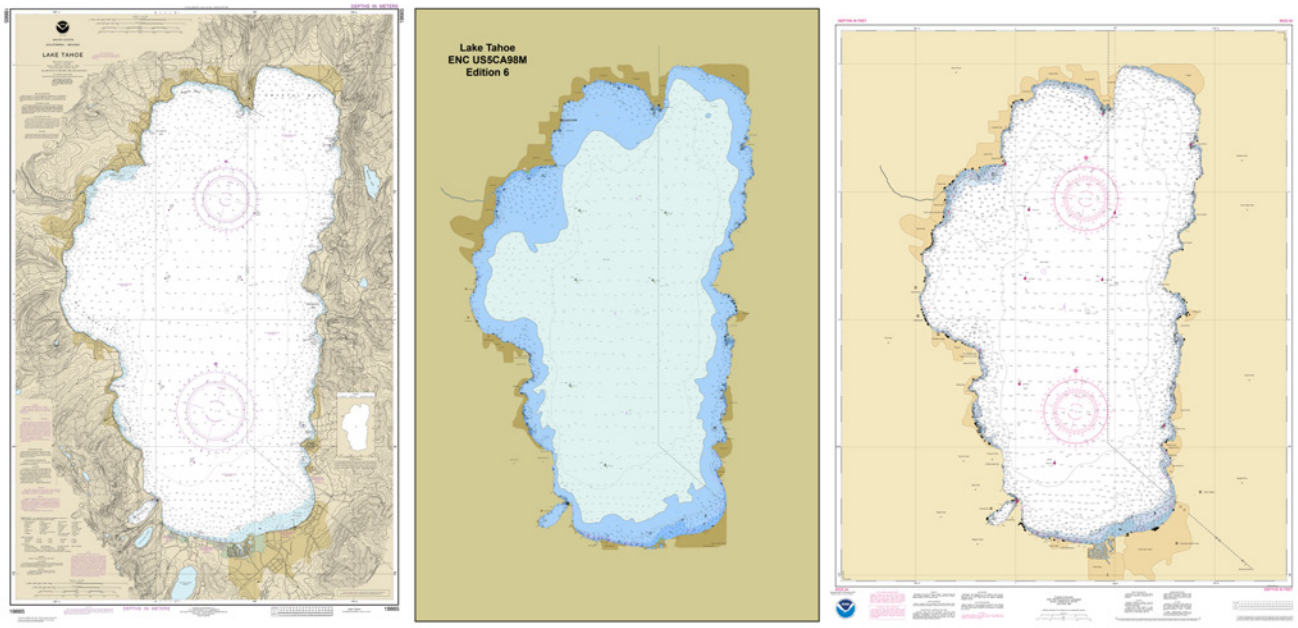
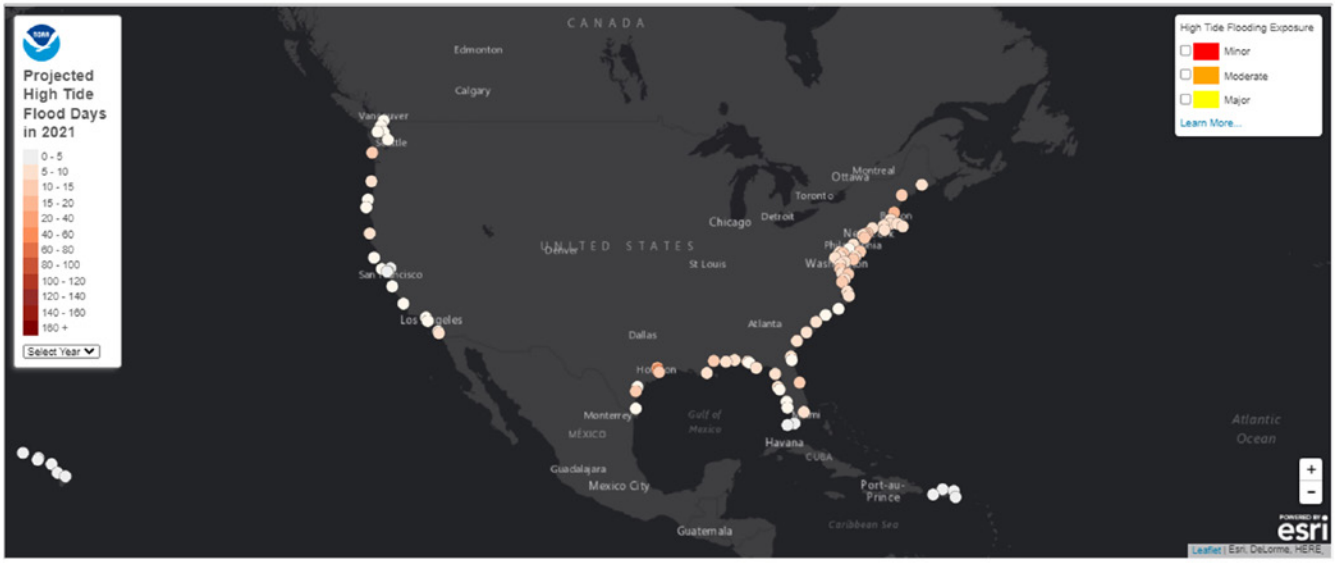


Chart 18665, Lake Tahoe, is the first traditional paper chart to be fully supplanted by an electronic navigational chart (ENC) as part of NOAA's Office of Coast Survey chart transition plan. On the left is the original, center is the NOAA ENC® with the same coverage, and the right is a NOAA Custom Chart derived from the ENC data.



Updated High Tide Flooding Map, which now includes exposure parameters for minor, moderate and major flooding.

protection, and restoration of ocean and coastal resources. Program change increases include:

Coastal Science, Assessment, Response and Restoration: Foundational Information for the Expansion of Offshore Wind Energy: NOAA requests an increase of $8,719,000 to develop the social and ecological science to plan and site offshore wind energy development in support of the Administration's goal to deploy 30 gigawatts of offshore wind energy by 2030. This investment will facilitate smart economic and ecological offshore wind development through expanded data collection for NOAA trust resources, including seafloor mapping and biological assessments; in situ observations; predictive models for marine species distribution; and studies of human perceptions and attitudes towards offshore wind within and near potential wind energy areas. NOAA is requesting a total of $45,399,000, including $36,880,000 in NMFS, to support wind energy development and mitigate potential impacts of offshore energy projects.

Coastal Science, Assessment, Response and Restoration: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $900,000 to enable NOAA to conduct technology modernization and support an accelerated transition of telecommunications services to the GSA EIS contract vehicle.

Competitive Research: Nature-based Solutions to Enhance the Resilience of Coastal Communities and Ecosystems: NOAA requests an increase of $14,500,000 to provide critical information and predictive capabilities to inform community adaptation planning to coastal inundation under sea level rise. Efforts will also enable the expanded use of nature-based solutions through a stressor-based approach.

Ocean and Coastal Management and Services $276,692,000

NOAA requests a net decrease of $6,837,000 in program changes for a total of $276,692,000 in the Ocean and Coastal Management and Services activity. Funds in this activity will support place-based, community, and regional approaches to achieve sound management and sustainable use of coastal and marine resources. This total includes an investment to accelerate the economic benefits of new national marine sanctuaries. Program change increases include:

Funded in part through a National Coastal Resilience Fund grant, the recently completed Crab Bank Seabird Sanctuary project restored over 30 acres of nesting habitat for seabird and shorebird species. The island also protects the nearby shoreline from waves and erosion, protecting wildlife and coastal communities alike. Photo Credit: South Carolina Department of Natural Resources.

Coastal Zone Management and Services: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $300,000 to conduct technology modernization and support an accelerated transition of telecommunications services to the GSA EIS contract vehicle.

National Oceans and Coastal Security Fund: Terminate Base Funding for the National Coastal Resilience Fund: NOAA requests a decrease of $34,000,000 for the National Coastal Resilience Fund (NCRF), a partnership with the National Fish and Wildlife Foundation (NFWF), which will allow NOAA to sustain other key priorities across the agency. NOAA will continue to maintain its NCRF partnership with NFWF using the significant funding received under the FY 2022 Infrastructure Investments and Jobs Act (IIJA) through FY 2026.

Sanctuaries and Marine Protected Areas: Assessing Place-based Climate Vulnerability for Conservation Action: NOAA requests an increase of $24,063,000 to engage partners, underrepresented communities, Tribes, indigenous, and native communities to invest in priorities within current and potential national marine sanctuaries. NOAA will also strengthen conservation in U.S. waters by increasing capacity for protection, conservation, and stewardship in existing and potential new sanctuaries.

Sanctuaries and Marine Protected Areas: Fostering Ecological Resilience through Conservation Action: NOAA requests an increase of $2,000,000 to increase observations within Sanctuaries and to incorporate more observations—including on climate change, biological resources, living resources and other environmental and human drivers—into sanctuary management plans and condition reports.

Sanctuaries and Marine Protected Areas: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $800,000 to conduct technology modernization and support an accelerated transition of telecommunications services to the GSA EIS contract vehicle.

FY 2023 PAC Budget Summary

NOAA requests a total of $8,500,000 to support the PAC activities of the NOS, which is equal to FY 2022 Annualized CR funding levels.

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 Science Program. 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.

Aerial view of an algal bloom in Lake Okeechobee, Florida. A third of all lakes studied by the United States Geological Survey (USGS) contained toxins produced by similar blooms. Photo credit: Nicholas Aumen, USGS.

The green sea turtle is the largest hard-shelled sea turtle. NOAA is dedicated to protecting and recovering green sea turtle populations worldwide.

Chapter 3

National Marine Fisheries Service

NOAA's National Marine Fisheries Service (NMFS) is responsible for the stewardship of the Nation's marine fisheries, protected resources, and their habitats. NMFS provides vital services for the Nation, which ensure: productive and sustainable fisheries, safe sources of seafood, the recovery and conservation of protected resources, and healthy coastal habitats—all backed by sound science and an ecosystem-based approach to management. NMFS manages 460 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. The work of NMFS and our partners promotes trade, jobs, and industry growth in commercial and recreational fisheries, aquaculture, tourism, and resource use, while protecting various marine species from extinction. U.S. commercial and recreational saltwater fishing provides significant contributions to our economy, which include 1.7 million jobs, $238 billion in sales impacts, $67 billion in income impacts, and almost $108 billion in value-added impacts to the U.S. economy.[1] The U.S. aquaculture industry produced $1.5 billion worth of seafood in 2018, which equals about 21 percent of total U.S. seafood production by value.[2]

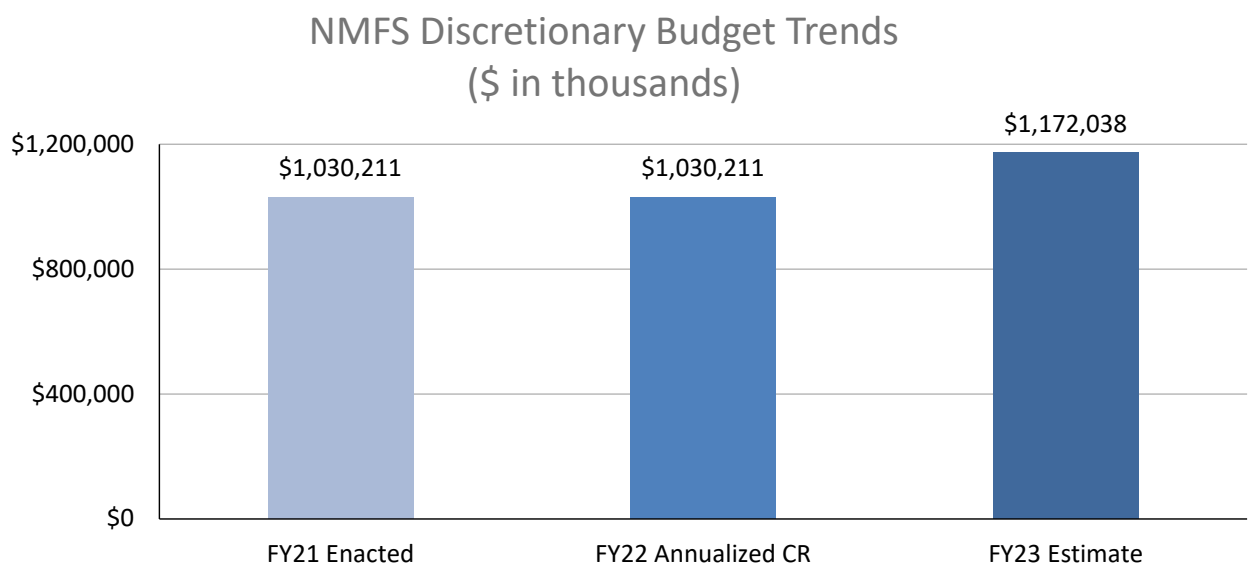
FY 2021 Accomplishments

In FY 2021, in support of the Administration's goal of deploying offshore wind while protecting biodiversity and promoting ocean co-use, NMFS completed the permitting review process for Vineyard Wind, the first major offshore wind energy facility in the U.S. and completed the Biological Opinion for a second project, South Fork Wind Farm. NMFS established new approaches to understand, communicate, and manage related issues and impacts to fishing communities and living marine resources from these projects. NMFS also developed benthic habitat monitoring guidance and other tools to assist wind project developers in the appropriate monitoring and sampling techniques to improve the quality of impact assessments and facilitate essential fish habitat consultations, and the issuance of research permits to conduct wind energy monitoring surveys.

NMFS continues to take a proactive approach to increasing the resilience and adaptation of living marine resources and the people who depend on them in the face of a changing climate. For example, in Alaska, NMFS engaged in multi-organizational, interdisciplinary collaborations with partners to describe and forecast responses of the Gulf of Alaska and Bering Sea ecosystems—both the physical environment and human communities—to varying climate conditions. These efforts use sophisticated regional climate-ecosystem models and dynamically link biological and socioeconomic models to help inform managers of climate change

1 National Marine Fisheries Service, Fisheries Economics of the United States, 2018. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-225, (2021), https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-economics-united-states.

2 National Marine Fisheries Service, Fisheries of the United States, 2019. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2019 (2021), https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states.



risks for fish and fisheries and enable the evaluation of a range of adaptation strategies. The results will help Alaska Native and coastal communities in the Gulf of Alaska better plan for environmental and ecological changes due to climate change.

In support of its mission to manage, protect, and promote sustainable fisheries in the U.S.—and provide a safe, sustainable supply of seafood to the Nation—NMFS conducted an economic analysis to identify impacts of the COVID-19 pandemic on U.S. commercial seafood and recreational for-hire/charter industries in 2020. The analysis shows that the COVID-19 public health crisis created a turning point for the U.S. and the global seafood industry and created new long-term challenges to expanding our sustainable domestic seafood sector. It also created significant challenges for the U.S. recreational for-hire industry. While losses vary by sector, by region, and by industry, data and information from the associated report may help businesses and communities assess losses and inform long-term recovery and resilience strategies.

NMFS also played a key role in efforts to offset pandemic impacts to the U.S. fishing community through the distribution of $300 million in emergency federal relief funding provided by the Consolidated Appropriations Act of 2021. This was in addition to $300 million provided in the previous year's Coronavirus Aid, Relief, and Economic Security (CARES) Act. NMFS has allocated this fisheries assistance funding to marine and Great Lakes states, U.S. territories, and federally recognized tribes. These entities, with the help of interstate fisheries commissions, are then distributing these much-needed funds to eligible fishery participants. NMFS also executed a unique interagency agreement with the Bureau of Indian Affairs to expedite execution of $30 million of the 2021 funds designated for the Tribes.

FY 2023 Request $1,204,079,000

NOAA requests a total of $1,204,079,000 in discretionary and mandatory funds to continue and enhance the operation of NMFS. This total includes Operations, Research, and Facilities (ORF) and other accounts, and is a net increase of $85,910,000 in FY 2023 program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and restoration and resilience efforts. In FY 2023, NMFS will increase surveys, sampling, and analysis capabilities to better track species that are shifting their distributions due to the changing climate. NMFS will also expand production, delivery, and use of climate science in fisheries assessments and management to address the impacts of climate change on marine resources, fisheries, and the many businesses and communities that depend on them. Climate change is also anticipated to negatively impact the status of a number of species requiring the protections of the Endangered Species Act (ESA). NMFS proposes to enhance conservation and recovery of marine and anadromous species by increasing Tribal and state capacity for species recovery.

NOAA will continue to foster environmental stewardship and sustainable economic development, with a particular focus on the New Blue Economy: new business development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses. NMFS will expand the capacity for assessing and minimizing the impacts of offshore wind activities on marine species and habitats, reduce delays and minimize adverse economic impacts to the fishing industry and coastal communities, and mitigate impacts to fisheries surveys. These activities support the Administration's goal to deploy 30 gigawatts of offshore energy by 2030. NMFS will facilitate smart economic and ecological offshore wind development through expanded data collection for NOAA trust resources, while protecting communities, setting quotas for commercial and recreational fishermen, and monitoring and assessing the recovery and conservation programs for protected species and essential fish habitat.

To keep pace with increasing infrastructure development across the country, NMFS will increase its capacity and efficiency for completing ESA consultations and Marine Mammal Protection Act (MMPA) permitting requests. NMFS also proposes additional support for NOAA's seafood inspection services to help the industry improve the quality, safety, and marketability of seafood and fishery products for the benefit of consumers. Finally, NMFS will improve responsiveness to administering requests for fishery disaster determinations and assistance by more quickly processing fisheries disaster determination requests, allocating available appropriations, and awarding grants.

NOAA will advance diversity, equity, and inclusion within our workforce, partnerships, and communities we serve, as well as in the development and delivery of NOAA's products and services. To support a more robust and diverse domestic seafood sector, NMFS will support science and management efforts in underserved communities, especially in the Pacific and Caribbean territories, and expand decision-support tools to address environmental justice, climate vulnerability, and racial equity in underserved coastal communities. NMFS will also implement a series of workforce development and training pilot projects and grants, focused on environmental justice and equity through partnerships with entities serving diverse and historically underserved communities. Additional training programs will provide fishing and seafood constituents the information and tools needed to confidently and productively engage in fishery (commercial, recreational, aquaculture) management decision processes.

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $1,106,389,000 to support the ORF activities of NMFS, reflecting a net increase of $85,610,000 in FY 2023 program changes.

Protected Resources Science and Management $239,965,000

NOAA requests an increase of $19,476,000 in program changes for a total of $239,965,000 in the Protected Resources Science and Management activity. These funds will support activities to assess, understand, and protect the health of protected species, the ecosystems that sustain them, and the communities that value and depend on them. Program change increases include:

Marine Mammals, Sea Turtles, and Other Species: Endangered Species Act Consultations and Marine Mammal Protection Act Permitting: NOAA requests an increase of $5,000,000 to support increased staff capacity for ESA consultations and MMPA authorizations to improve NMFS consultation timelines and to keep up with incoming consultation and authorization requests.

Marine Mammals, Sea Turtles, and Other Species: Wind Energy: Protected Species Environmental Reviews and Science: NOAA requests an increase of $4,476,000 to assess the effects of planned offshore wind energy activities on ESA listed species and critical habitat, coordinate MMPA incidental take authorizations, and conduct review of environmental impact statements analyzing the impacts to living marine resources and affected communities under the National Environmental Policy Act (NEPA). Offshore wind development is rapidly expanding and represents a new use of our marine waters requiring substantial scientific and regulatory review. NOAA is requesting a total of $36,680,000 in four complementary areas within NMFS and $8,719,000 within NOS for a total of $45,399,000 to support offshore wind energy development and mitigate potential impacts of offshore wind energy projects.

Kate Sampson, NMFS Sea Turtle Stranding and Disentanglement Coordinator, Greater Atlantic Region, coordinating the flight of an endangered sea turtle to a medical facility. Credit: Lauren Owens Lambert

Species Recovery Grants: Species Recovery Grants Program: NOAA requests an increase of $10,000,000 to increase Tribal and state capacity for species recovery. States and Tribes have management authorities and responsibilities for protected species within their jurisdictions and, as such, they are uniquely qualified to partner with NMFS in the implementation of recovery actions for listed species.

Fisheries Science and Management $725,172,000

NOAA requests an increase of $66,134,000 in program changes for a total of $725,172,000 in the Fisheries Science and Management activity. These funds will support scientific and management activities to ensure the sustainability of the Nation's marine fishery resources. Program changes include:

Fisheries and Ecosystem Science Programs and Services: Climate-Ready Fisheries: Climate-Informed Fisheries Assessments and Management Strategies for Changing Oceans: NOAA requests an increase of $10,000,000 as part of the NOAA cross line office Climate Ecosystem

A fisherman unloads his catch in Galilee, Rhode Island.

Fisheries Initiative (CEFI) to support the expanded production, delivery, and use of climate science in fisheries assessments and management to address the impacts of climate change on marine resources, fisheries, and the many businesses and communities that depend on them. With these funds, NOAA will establish a nationwide ocean modeling and decision support system that provides decision-makers with climate-informed advice on changing ocean conditions, impacts on marine resources, and best management strategies to reduce impacts and increase economic resilience. These funds ensure that increased understanding of changing ecosystems is incorporated in management decisions.

Fisheries and Ecosystem Science Programs and Services: Wind Energy: Fisheries Science & Technical Reviews: NOAA requests an increase of $8,669,000 to assess the effects of planned offshore wind energy activities on fish, fisheries, and ecosystems. Funds will support the regulatory review process for offshore energy assessment and advance scientific understanding of the interaction of offshore wind on NOAA trust resources to help inform the regulatory review process. Offshore wind development is rapidly expanding and represents a new use of our marine waters requiring substantial scientific and regulatory review. NOAA is requesting a total of $36,680,000 in four complementary areas within NMFS and $8,719,000 within NOS for a total of $45,399,000 to support offshore wind energy development and mitigate potential impacts of offshore wind energy projects.

Fisheries and Ecosystem Science Programs and Services: Advancing and Improving Territorial Fisheries Science and Management: NOAA requests an increase of $3,000,000 to increase science and management efforts for economically and culturally significant fisheries located within U.S. Pacific and Caribbean territories. Several fisheries are at risk of overfishing and immediately require bolstering of current science and management efforts. Local territorial fisheries agencies will benefit greatly from additional

A fisherman throws a cast net in Guam.

resources and support to address gaps in effective reporting, data collection, and complementary management measures.

Fisheries and Ecosystem Science Programs and Services: Community Social Vulnerability Indicators (CSVI) Toolbox: NOAA requests an increase of $1,000,000 to expand the CSVI Toolbox—an interactive, online GIS-based decision-making tool—to include new metrics that consider environmental justice, climate change concerns, and racial equity in underserved coastal communities. The toolbox will provide robust social, economic, and climate change indicators that uniquely characterize and evaluate a community's vulnerability and resilience to disturbances (e.g., extreme weather, oil spills, sea level rise), and additional funding will enhance understanding of community-level physical threats from climate change and its impacts.

Fisheries and Ecosystem Science Programs and Services: Enterprise Infrastructure Solutions: NOAA requests an increase of $200,000 to conduct technology modernization and support an accelerated transition of telecommunications services to the General Services Administration's (GSA) Enterprise Infrastructure Solutions (EIS) contract vehicle.

Fisheries Data Collections, Surveys and Assessments: Wind Energy: Scientific Survey Mitigation: NOAA requests an increase of $17,380,000 to establish a national program to mitigate the adverse effects of planned offshore wind energy activities on NMFS scientific surveys. This investment will enable NMFS to identify and develop new survey approaches and data streams for scientific surveys that will be disrupted by offshore wind energy development. Offshore wind development is rapidly expanding and represents a

new use of our marine waters requiring substantial scientific and regulatory review. NOAA is requesting a total of $36,680,000 in four complementary areas within NMFS and $8,719,000 within NOS for a total of $45,399,000 to support wind energy development and mitigate potential impacts of offshore wind energy projects.

Fisheries Data Collections, Surveys and Assessments: Climate-Ready Fisheries: Advancing Fisheries Survey Capacity for Commercially and Recreationally Valuable Species: NOAA requests an increase of $11,562,000 for surveys, sampling, and analysis capabilities to better track species that are shifting their distributions due to climate change, while working to restore survey days at sea (DAS) for fish and protected species to levels that were performed in the recent past. Surveys are core to our fisheries and protected species management mission. The data gathered through surveys informs stock assessments, management actions, and predictions of future trends. Funds will primarily be used to acquire survey capacity to increase the geographic extent of surveys and collect more climate and environmental data by purchasing supplemental DAS on NOAA ships and chartered vessels, and by investing in advanced sampling technologies (e.g., Saildrone, DriX) to augment survey capacity using innovative approaches.

A fish market display of whole fish for sale.

Observers and Training: Northeast Multispecies Fishery: NOAA requests a decrease of $2,332,000 for the Northeast At-Sea Monitoring Program (ASM). Using prior year appropriations, NOAA will cover all industry costs for at-sea monitoring in fishing year 2022 (May 1, 2022, through April 30, 2023). NOAA will fully fund ASM costs for fishing year 2023, consistent with recent Congressional direction.

Fisheries Management Programs and Services: Seafood Inspection Program: NOAA requests an increase of $7,500,000 to support the sustained operation of the NOAA Seafood Inspection Program (SIP) for when unanticipated events impact the demand for services, and provides funding at the start of each fiscal year while collections accumulate and become available for obligation. These funds are requested in coordination with program measures implemented in FY 2022 to achieve the goal of full cost recovery. The Agricultural Marketing Act authorizes NOAA to assess and collect a reasonable amount of fees to as nearly as possible cover the total cost of the program (7 U.S.C. § 1622(h)), which allows NOAA to use appropriated funds to cover any shortfall in fee collections.

Fisheries Management Programs and Services: Wind Energy: Fisheries Management: NOAA requests an increase of $6,155,000 to conduct the environmental reviews necessary to assess the effects of planned offshore wind energy activities on fisheries, living marine resources, and affected communities. Funds will allow NMFS to efficiently and effectively carry out increased fisheries environmental reviews, including Essential Fish Habitat (EFH) consultations and review of environmental impact statements, associated with new offshore wind energy activities. Offshore wind development is rapidly expanding and represents a new use of our marine waters requiring substantial scientific and regulatory review. NOAA is requesting a total of $36,680,000 in four complementary areas within NMFS and $8,719,000 within NOS for a total

of $45,399,000 to support offshore wind energy development and mitigate potential impacts of offshore wind energy projects.

Fisheries Management Programs and Services: Education and Outreach for Diverse Participation in Regulatory and Science Process: NOAA requests an increase of $2,000,000 to implement training programs that would provide fishing and seafood constituents the information and tools needed to confidently and productively engage in fishery (commercial, recreational, aquaculture) management decision processes. Very few new constituents participate in the fishery management process, and among those who do participate there is a lack of understanding of the scientific underpinnings and the public processes for regulatory actions. By targeting outreach to underserved and underrepresented communities, NMFS will provide these training opportunities to a more diverse group of new participants. This initiative will benefit both the agency and stakeholders by improving cooperation and trust among industry, the public, scientists, and regulators.

Fisheries Management Programs and Services: Workforce Training to Support the Seafood Industry: NOAA requests an increase of $1,000,000 to implement a series of workforce development and training pilot projects and grants, focused on environmental justice and equity, to support a more robust and diverse domestic seafood sector. The requested funds will support workforce development and training efforts through partnerships with entities serving diverse and historically underserved communities, including but not limited to Historically Black Colleges and Universities and other minority serving institutions.

Enforcement $79,899,000

NOAA requests a total of $79,899,000 in the Enforcement activity. These funds support the work

Two technicians tend the nets during a groundfish survey.

of NOAA's Office of Law Enforcement in enforcing NOAA's natural resource protection laws and promoting compliance with federal regulations to conserve and protect our Nation's living marine resources and their natural habitat and to combat illegal, unreported and unregulated fishing. There are no program changes requested for this activity.

Habitat Conservation and Restoration $61,353,000

NOAA requests a total of $61,353,000 in the Habitat Conservation and Restoration activity. These funds will support NOAA's programs that protect and restore habitat to sustain fisheries, recover protected species, and maintain resilient coastal ecosystems and communities. There are no program changes requested for this activity.

Discretionary Funds

Pacific Coastal Salmon Recovery Fund

The Pacific Coastal Salmon Recovery Fund 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 $65,000,000 for this program in FY 2023.

Fisheries Disaster Assistance

Fisheries Disaster Assistance provides support for addressing the economic and social effects of a commercial fishery failure, for activities to restore the fishery or prevent a similar failure in the future, and for assisting fishing communities. If the Secretary of Commerce determines that a fishery disaster has occurred, Congress may appropriate funds for disaster assistance, which are administered by the Secretary. The FY 2023 Budget includes an investment of $300,000 to bolster NOAA staffing necessary to execute the Fisheries Disaster Assistance Program. NOAA will use these funds to more quickly process fisheries disaster determination requests, allocate available appropriations, and award grants. This request will improve responsiveness to administering requests for fishery disaster determinations and assistance.

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. 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 reconstruction, reconditioning, or the purchasing of fishing vessels, shoreside processing, aquaculture or mariculture facilities, or individual fishing quota.

Marine Mammal Unusual Mortality Event Fund

An unusual mortality event is defined under the Marine Mammal Protection Act 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."

Fishing boat in Chatham Strait, Alaska.

Mandatory Funds

Promote and Develop American Fishery Products & Research Pertaining To American Fisheries Fund

NOAA will transfer $348,871,000 from the Promote and Develop account to offset the appropriation requirements of NMFS's 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, the Fisheries Management Programs and Services PPA, and the Interjurisdictional Fisheries Grants PPA. With this transfer, $7,530,000 will be available for the Saltonstall-Kennedy program in FY 2023. 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 (USDA).

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 Fishery Conservation and Management 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

MSA Section 204(e) 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

MSA Section 311(e)(1) authorizes the Secretary of Commerce to pay certain enforcement-related expenses from fines, penalties, and forfeiture proceeds received for violations of the MSA, Marine Mammal Protection Act, 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, or (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.

A new study linking climate change and the northern sardine stock fishery shows they may shift north along the West Coast as the ocean warms. Understanding the effects of climate change on fish populations is an emerging area of study and a priority for NMFS. Credit: y-studio

Sea Grant staff and University of New Hampshire Coastal Habitat Restoration Team members prepare beachgrass to be planted in dunes near Hampton Beach State Park. Credit: Becky Zeiber

Chapter 4

Office of Oceanic and Atmospheric Research

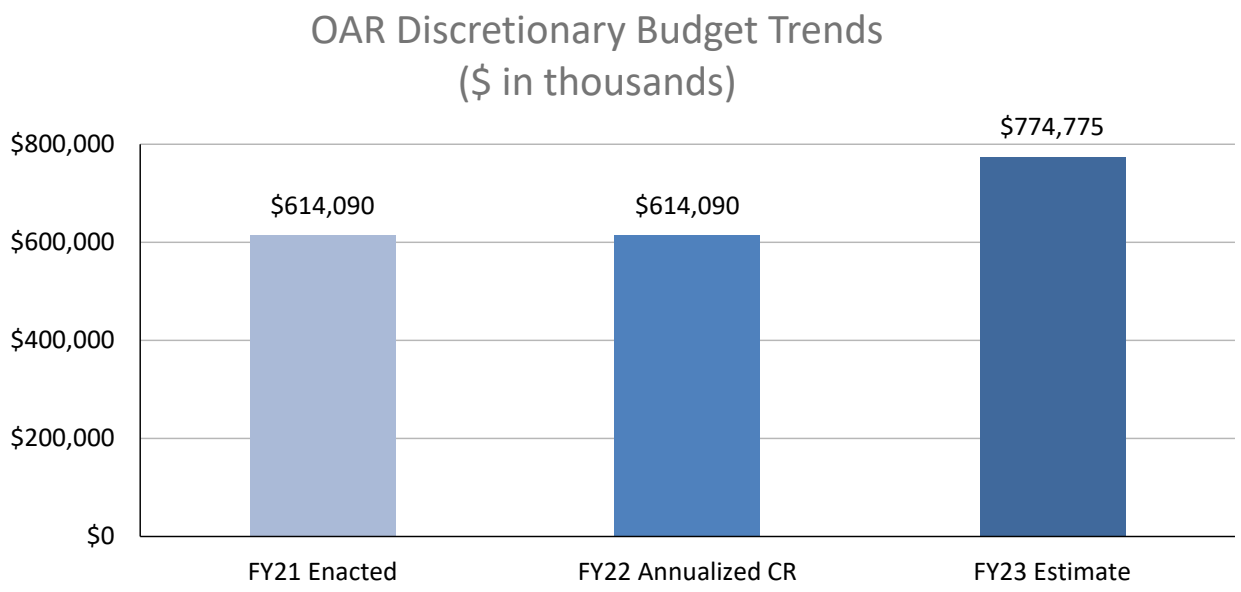
NOAA's Office of Oceanic and Atmospheric Research (OAR) conducts and integrates research across NOAA. OAR's interdisciplinary research promotes better understanding of the Earth, and its scientific results improve NOAA science and services and strengthen decision-making across the country. OAR research 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.

FY 2021 Accomplishments

Climate change is impacting every geographic region and economic sector of the U.S. There is an urgent need for coordinated action to mitigate and adapt, and NOAA is actively working to deliver resources and tools to foster community resilience and preparedness throughout the United States. For example, in July 2021 the NOAA Climate Program Office (CPO) in OAR and the Chicago Metropolitan Mayors Caucus co-authored the "2021 Climate Action Plan for the Chicago Region." It is one of the first regional climate plans in the U.S. and serves a region with approximately nine million people. CPO used the U.S. Climate Resilience Toolkit's 'Steps to Resilience' framework as a guide, which is built through extensive stakeholder engagement to ensure an equitable and comprehensive product.

NOAA is at the forefront of extreme weather prediction to provide accurate and timely warnings and forecasts of high-impact weather events. NOAA's research and development of the next generation of weather radars in the U.S. reached a new milestone in 2021. Installed at NOAA's National Severe Storms Laboratory in Norman, Oklahoma in 2018, the Advanced Technology Demonstrator (ATD) Phased Array Radar (PAR) combines the benefits of two critical technologies for the first time: PAR provides faster updates than current dish radars, while dual-polarization can more accurately identify and characterize types of precipitation and objects in the air, such as raindrops, hail, snow, and even tornado debris. The unique capabilities of this new radar could ultimately improve the accuracy and timeliness of severe weather forecasts and warnings. After six years of design, development, engineering, and testing, the radar data quality was demonstrated for weather research in April 2021. NOAA now has a robust dual-polarized PAR onsite and is stepping up research and development efforts to demonstrate the value of this new technology for weather observation and forecasting.

NOAA is using a wide range of uncrewed tools to improve weather forecasting and disaster response, for extreme events such as hurricanes. These uncrewed systems can take large amounts of high-quality, high-resolution images, reach areas that are dangerous or difficult for scientists to reach, and do so efficiently and cost-effectively. In September 2021, a world first, the Saildrone Explorer SD 1045, one of a fleet of five hurricane Saildrones deployed in the Atlantic Ocean during hurricane season, was directed into the eyewall of Category 4 Hurricane



Sam. The Saildrone navigated 50 foot waves and winds over 120 mph to collect critical scientific data that is unobtainable by other means. New data from Saildrones and other uncrewed systems will help NOAA better predict the forces that drive hurricanes and allow NOAA to provide communities with earlier warnings of impending threats.

NOAA Sea Grant's network is working with coastal communities across the U.S. to respond to climate-related challenges by bringing together experts and leaders to collaborate, conduct research, and engage in education and outreach with affected communities in an equitable way. In FY 2021, NOAA Sea Grant funded a number of resilience initiatives, focusing on topics such as sea level rise, to sustain diverse and vibrant coastal economies. One interdisciplinary collaboration between academics, marine resource managers, and the Tolowa Dee-ni' Nation is assessing sea level rise along the Southern California coast. The collaboration will enable a detailed analysis of sea-level rise impacts on important biological and cultural resources in the face of climate change, producing robust sea-level rise vulnerability data, while empowering historically marginalized Indigenous Nations with the utilization of cutting edge technology.

FY 2023 Request $774,775,000

NOAA requests a total of $774,775,000 to support OAR's continued and sustained operations. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts, and is a net increase of $144,548,000 in FY 2023 program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and restoration and resilience efforts. In FY 2023 NOAA will continue to serve as the global leader in monitoring long-term atmospheric and climate change trends. OAR will maintain and enhance its long-term atmospheric observations, which serve as a baseline and record of trends for important greenhouse gases, and support research on future climate scenarios. NOAA will also invest additional resources to improve predictions and projections in a research environment. In particular, OAR will improve precipitation predictions across weather and climate timescales through the Precipitation Prediction Grand Challenge, a cross-NOAA effort to advance subseasonal-to-seasonal and

seasonal-to-decadal forecasts and will include more skillful precipitation forecasts using NOAA's Unified Forecast System. In addition, NOAA will develop a global high-resolution model to improve the understanding and prediction of extreme events. Developing and delivering the next generation modeling systems for weather and climate prediction will be supported by crucial investments to maintain and expand high performance computing for research and development.

NOAA's weather and climate predictions and information must be reliably delivered to users to impact decision-making. To assist climate risk decision-making across a wide range of stakeholders and economic sectors, OAR will develop accessible and actionable climate projections with society-relevant data delivery services. Contributing to the NOAA Climate and Fisheries Initiative, OAR will build a national prediction system spanning U.S. coastal waters, the Arctic, and the Great Lakes to develop tools for decision-makers to prepare for changing conditions. Investments in OAR's Regional Integrated Sciences and Assessments (RISA) program and Climate-Smart Communities Initiative will allow OAR to work with more communities across the Nation to co-produce and operationalize lasting and equitable climate resilience plans, prioritizing underserved communities that are particularly vulnerable to a changing climate and its impacts.

NOAA and Saildrone launched the uncrewed surface vehicles from Jacksonville, Florida at the beginning of the 2021 Hurricane Season to track storms and collect data to improve forecast models. Credit Saildrone

NOAA will continue to foster environmental stewardship and sustainable economic development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses.

With key investments in weather observation technology and infrastructure, OAR will advance critical research and support industry engagement to prototype a dual polarization Phased Array Radar (PAR) technology. PAR is a promising technology that could advance NOAA's current radars from 1988-based technology to radars that would be viable until the end of the 21st century. This request is part of an integrated effort to prepare for a formal Radar Acquisition Management Program and decision point in 2028 with the objective to evaluate the capabilities of PAR as a replacement for the current NEXRAD radar network by 2040.

NOAA will advance diversity, equity, and inclusion within our workforce, partnerships, and the communities we serve, as well in the development and delivery of NOAA's products and services. Investments in the Tribal Drought Resilience Initiative will expand engagement with Tribal Nations related to drought forecasting, documentation, and mitigation strategies through the development of a Tribal Drought Portal and Tribal Drought Monitoring Program. This request will position us to help vulnerable communities better prepare for and respond to extreme weather and climate disasters, in support of the Administration environmental justice and equity priorities described in EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.*

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $666,275,000 to support the ORF activities of OAR, reflecting an increase of $79,548,000 in FY 2023 program changes.

Climate Research $256,639,000

NOAA requests an increase of $69,261,000 in program changes for a total of $256,639,000 in the Climate Research activity. This total advances the long-term observing, monitoring, research, and modeling capabilities performed in OAR's Climate Research. It provides the science that Americans need to understand how, where, and when Earth's conditions are changing. Program changes include:

Climate Laboratories and Cooperative Institutes: Sustained Atmospheric Observations Increase: NOAA requests an increase of $20,261,000 to support and enhance its atmospheric observing systems, which will allow NOAA to support a Global Stocktake, a requirement of the Paris Agreement. This requested increase would create an independent, transparent evaluation of greenhouse gas (GHG) emissions and changes in emissions at various scales; provide a robust understanding of the allowable cumulative GHG emissions to limit global warming at different future levels by taking into account likely changes in natural GHG sinks and sources in the ocean, land, and atmosphere; and examine the biogeochemical-climate feedbacks and the resulting climate sensitivity.

Over the past 8 years samples of methane and carbon dioxide captured at this urban observatory on the roof of a Boston University building have helped scientists show that natural gas leaks from the city are much larger than previously thought. Credit: L.R. Hutyra, Boston University

Climate Laboratories and Cooperative Institutes: Global-Nested High-Resolution Model Increase: NOAA requests an increase of $10,000,000 to develop a global high-resolution atmospheric model with a 3km or below resolution to improve NOAA's understanding and prediction of extreme events on all timescales beginning at two weeks. The inclusion of an observational program for the boundary layer and clouds will further improve forecasting skill for extreme weather events with earlier warnings and more accurate spatial patterns.

Regional Climate Data and Information: Enhancing Regional and Community Resilience by Scaling Up RISA Program and "Climate-Smart" Communities Initiative: NOAA requests an increase of $10,000,000 to extend the proven capabilities of the RISA program and the U.S. Climate Resilience Toolkit (USCRT) to advance adaptation measures and resilience planning at regional and local scales, while prioritizing environmental justice. NOAA proposes a new public-private partnership, the Climate-Smart Communities Initiative, to scale up and accelerate training and the pace of resilience-building in communities across the Nation utilizing the USCRT. This initiative will train communities in 20 cities around the Nation, and address environmental justice issues within these communities when determining how communities are selected.

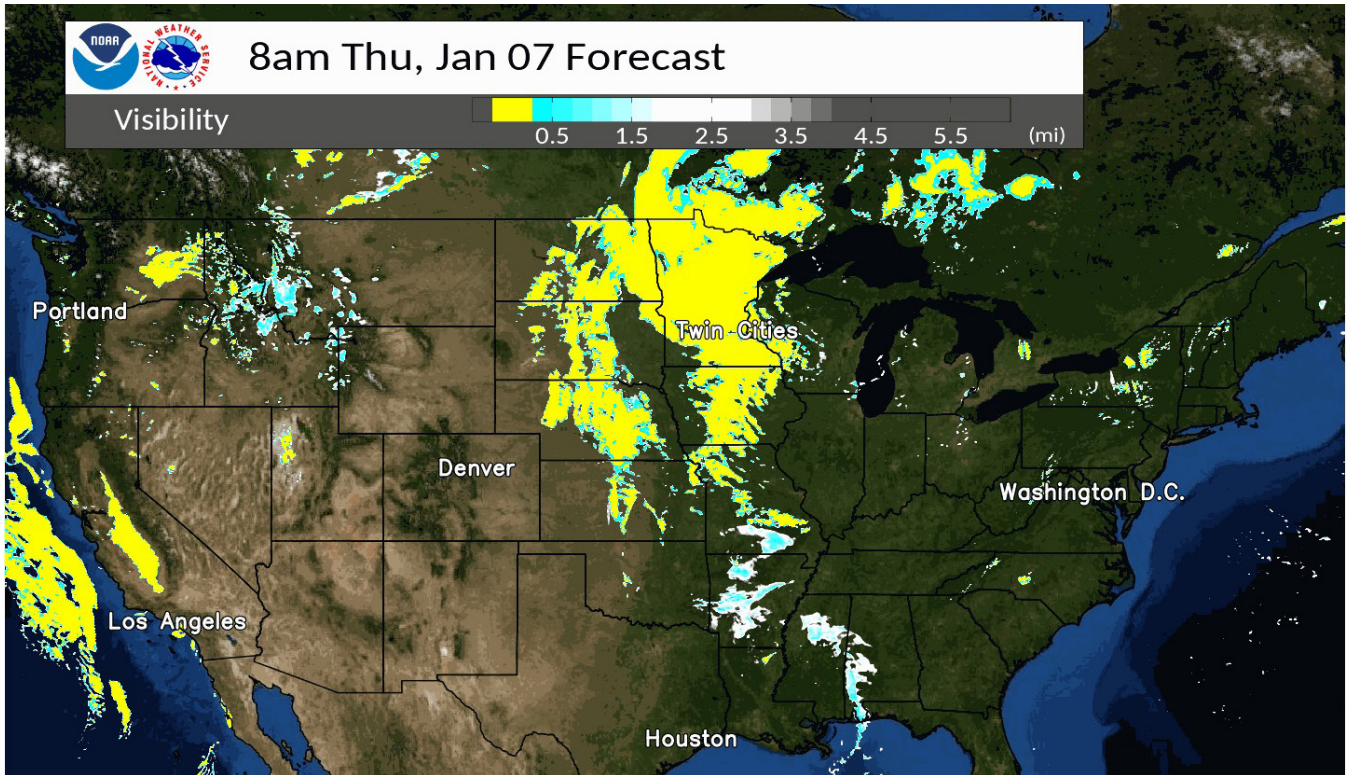
As Arctic tundra warms and thaws, incursions of shrubs and small trees have created new habitat for beaver, which create ponds and wetlands that further transform the once-frozen landscape. Credit: Kenneth Tape/University of Alaska Fairbanks Geophysical Institute

Regional Climate Data and Information: Tribal Drought Resilience Initiative Increase: NOAA requests an increase of $3,000,000 to broaden Tribal engagement through the National Integrated Drought Information System (NIDIS). To effectively address this, NIDIS, along with Tribal, Federal, and other partners, jointly developed the NIDIS Tribal Drought Engagement Strategy: 2021-2025. Tribal Nations will benefit from increased support to implement the strategy, which articulates specific activities and outcomes to improve drought observations and monitoring; prediction and forecasting; communication and outreach; planning and preparedness; and interdisciplinary research.

Climate Competitive Research: Marine Ecosystem Responses to Climate Change Increase: NOAA requests an increase of $10,000,000 to provide decision-makers with the information and tools they need to prepare for changing conditions in the ocean and Great Lakes, reduce climate impacts, and increase the resilience of living marine resources and the communities that depend on them.

Climate Competitive Research: Providing Climate Change Projections out to 2050 to Inform Risk Management Increase: NOAA requests an increase of $9,000,000 to develop standardized and accessible climate projections with society-relevant data delivery services to improve the equity of climate risk information and assist decision making across a wide range of stakeholders and economic sectors.

Climate Competitive Research: Precipitation Prediction Grand Challenge Increase: NOAA requests an increase of $7,000,000 to enhance the skill of precipitation predictions across weather and climate timescales in a research environment and for potential transition to operations. NOAA will improve understanding of key physical processes operating in the atmosphere and the ocean, identify ways to improve model representations of these processes, and reduce the systematic biases in NOAA models, which will lead to the demonstration of improved precipitation forecast skill. This initiative will focus on key research areas,



Forecast from the operational High-Resolution Rapid Refresh (HRRR) model displays areas in yellow where visibility is predicted to be less than a 1/2 mile, which slows down air traffic significantly at airports. It's one of several new types of forecasts that are generated hourly by the pioneering weather model.

including conducting process studies, ocean and atmospheric field campaigns, and global modeling experiments targeting key model deficiencies that limit precipitation prediction skill.

Weather & Air Chemistry Research $150,766,000

NOAA requests an increase of $6,287,000 in program changes for a total of $150,766,000 in the Weather and Air Chemistry Research activity. This total supports NOAA's efforts to advance community-developed enhancements to weather models and to provide the resources needed to advance and accelerate transition of the most promising research activities into operations in the National Weather Service. Program changes include:

Tornado Severe Storm Research / Phased Array Radar: Phased Array Radar Research and Development Follow-On Plan: NOAA requests an increase of $6,287,000 to advance critical research on Phased Array Radar (PAR) technology including the engineering, digital architecture, operational studies, and scientific studies that quantify the benefits of various PAR technologies for weather radar. In parallel with the PAC request, this request is part of an integrated effort to evaluate the capabilities of PAR as a replacement for the current NEXRAD radar network.

Ocean, Coastal & Great Lakes Research $236,639,000

NOAA requests a total of $236,639,000 in the Ocean, Coastal, and Great Lakes Research activity. This total includes research activities to better understand the ocean and Great Lakes, their natural resources, and the influence they have on the Earth's weather and climate through technological advancements in modeling, computing, observing, and information dissemination. There are no program changes in this activity.

Innovative Research & Technology $22,231,000

NOAA requests an increase of $4,000,000 in program changes for a total of $22,231,000 in the Innovative Research & Technology activity. This total advances continued support to accelerate the adoption and transition of advanced cloud and traditional high performance computing and technology throughout NOAA. Program changes include:

Uncrewed Systems: Uncrewed Systems Increase: NOAA proposes an increase of $4,000,000 to advance research and evaluation for operational readiness of a full spectrum of NOAA's aircraft and maritime Uncrewed Systems (UxS) mission concepts. These funds will move notional ideas to testable technologies and finalize mature, transition-ready projects into operational use within NOAA. NOAA will use these resources for directed research and proposal solicitations for Research and Development (R&D) related to UxS concepts and technologies to support missions across NOAA's Line Offices.

Installed at the National Weather Radar Testbed facility, the Advanced Technology Demonstrator is the first full-scale, S-band, dual-polarization Phased Array Radar built from the ground up and designed specifically for use as a weather radar.

FY 2023 PAC Budget Summary

NOAA requests a total of $108,500,000 to support the PAC activities for OAR, reflecting an increase of $65,000,000 in FY 2023 program changes.

Systems Acquisition $108,500,000

NOAA requests an increase of $65,000,000 in program changes for a total of $108,500,000 in the Systems Acquisition activity. Program changes include:

Research Supercomputing/CCRI: Research and Development (R&D) High Performance Computing (HPC): NOAA proposes an increase of $25,000,000 for recapitalization and sustaining infrastructure to address major R&D HPC capacity challenges. Developing and delivering the next generation modeling systems for weather and climate prediction depends on expanding essential compute elements of NOAA's HPC enterprise. This request will decrease the gap between operational and R&D HPC capacity by providing funding for recapitalization of NOAA's R&D HPC resources.

Research Acquisitions and Management: Phased Array Radar Research and Development Follow-On Plan: NOAA proposes an increase of $40,000,000 for industry engagement to prototype a dual polarization Phased Array Radar (PAR) for a weather surveillance PAR testbed. This critical step would allow NOAA to evaluate industry's potential to deliver dual polarization PAR technology to meet NOAA's weather radar requirements. In parallel with the ORF request, this request is part of an integrated effort to evaluate the capabilities of PAR as a replacement for the current NEXRAD radar network.

Snow falls outside of the NWS Weather Forecast Office in Las Vegas, Nevada.

Chapter 5

National Weather Service

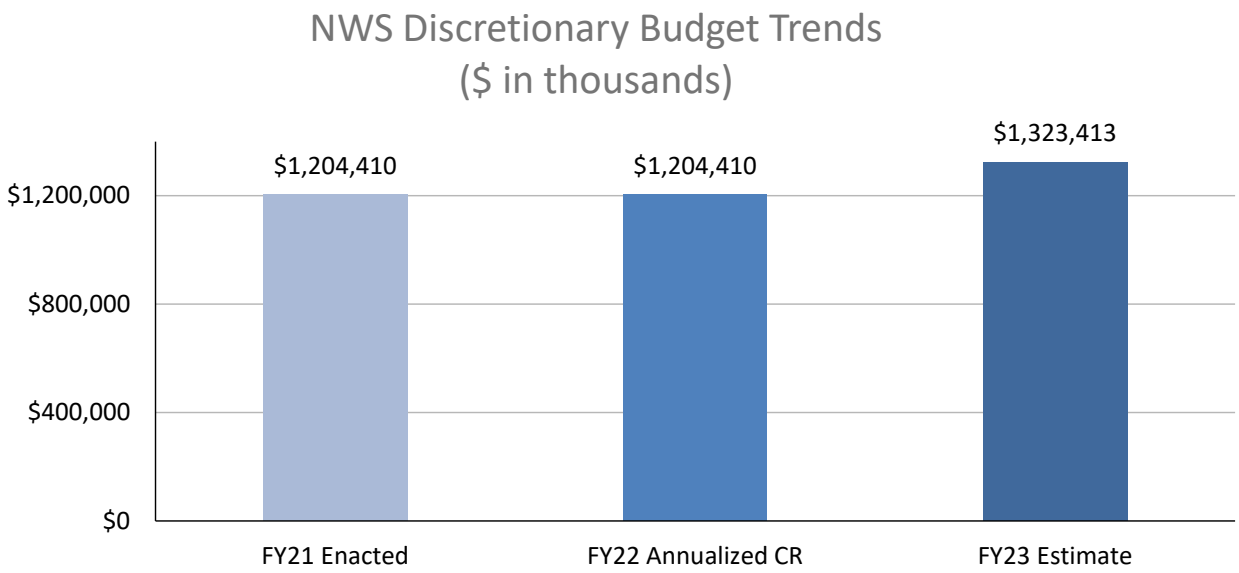
NOAA's National Weather Service (NWS) is the official government authority for issuing warnings during life-threatening weather events. Every day, NWS forecasters issue public, aviation, marine, fire weather, climate, space weather, river, and flood forecasts and warnings for the protection of life, property, and the enhancement of the national economy. NWS forecasters work with local partners and communities by providing impact-based decision support services (IDSS) to understand and manage risk, formulate emergency response plans, and promote community preparedness and public safety. With 122 Weather Forecast Offices, 13 River Forecast Centers, nine National Centers, and other support offices, the NWS collects and analyzes more than 6.3 billion observations per day and releases about 1.5 million forecasts and 50,000 warnings each year. 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 2021 Accomplishments

During the record-setting tropical storm and wildfire seasons of 2021, the coordination across Weather Forecast Offices (WFO), Regional Operations Centers/NWS Operations Center, and National Centers was exemplary. NWS employees provided consistent and accurate forecasts, warnings, and pre-event messaging about public sheltering informed by CDC guidelines. NWS deployed Incident Meteorologists on 216 missions for on-site and virtual support at wildfires and other hazards, working in coordination with numerous federal, state, and local emergency management COVID protocols. This number exceeded the previous record of 208 missions from 2006. The fire season saw over 26,000 spot forecasts issued by September 30th. This demonstrates NWS' ability to adapt operational capabilities while providing customer service to decision-makers during extreme events.

NWS strengthened the ability to provide robust, secure, flexible and high-capacity services to the Nation by continuing to implement the Integrated Dissemination Program (IDP). In FY 2021, the NWS addressed challenges and concerns about data accessibility by quickly implementing new technology to ensure timely dissemination of NWS products, watches and warnings. For example, NWS moved critical applications to a 24x7 cloud environment including the Geographical Information (GIS) National Viewer which supports better IDSS. NWS also utilized the RIDGE II web-based display, which provides more radar products and radar images are updated more frequently and at four times higher resolution than before. This GIS-based application allows users to integrate our radar data into their own platforms.

In an effort to improve our public safety partners dissemination of timely emergency information, an upgrade to the NWS Common Access Protocol Handler software was deployed that allows NWS to receive and process Non-Weather Emergency Messages (NWEMs) from the Federal Emergency Management Administration's Integrated Public Alert and Warning System and broadcast them



over NOAA Weather Radio (NWR) and other NWS dissemination systems.

In FY 2021, the Global Forecast System (GFS) weather model was upgraded to boost weather forecasting capabilities across the United States and the world. These advancements will improve forecasting for hurricane development and heavy rainfall, modeling for snowfall location, and overall model performance. NWS also deployed an upgraded National Water Model (NWM) Version 2.1 into operations. This release expands the domain to include the Great Lakes drainage basin and produces an operational NWM forecast for Puerto Rico and the U.S. Virgin Islands for the first time. NOAA continues to increase the accuracy and availability of mission critical hydrologic services to the Nation.

Observations are vital to NOAA products and services and in FY 2021, NWS completed a $26M capital improvement of remote upper air stations by replacing 21 of 91 sites in the national radiosonde network with fully automated weather balloon launchers. Weather balloons carrying radiosonde instruments provide important observations of temperature, wind, relative humidity, and pressure above the ground. Automated stations are remotely operated and require visits by technicians every 2 weeks, whereas the manually operated stations require staffing to conduct daily maintenance and at least 2 manual launches per day.

FY 2023 Request $1,323,413,000

NOAA requests a total of $1,323,413,000 to focus on NWS' core mission, which is to provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts and includes a net increase of $41,320,000 in program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and restoration and resilience efforts. NWS will continue to optimize and upgrade the Integrated Dissemination Program (IDP) in accordance with the

plan provided to Congress. The investment in IDP will allow NWS to reliably and quickly deliver critical observations, model guidance, forecasts, and watch and warning information to NWS meteorologists, emergency management partners, the Weather Enterprise, and the public.

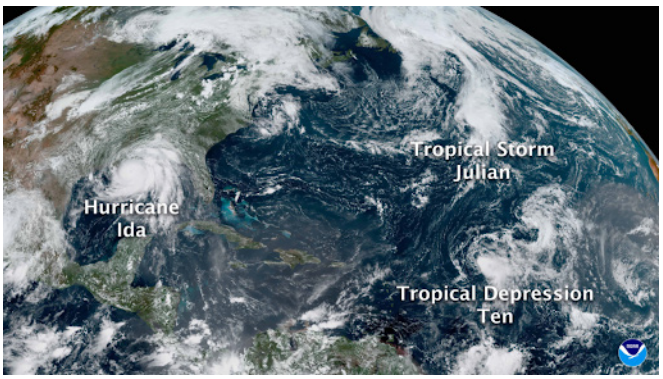
NOAA will advance diversity, equity, and inclusion within our workforce, partnerships, and communities we serve, as well as in the development and delivery of NOAA's products and services. NWS will continue to work towards making the United States a Weather Ready Nation (WRN) in which NWS operations provide IDSS to decision-makers at every government level and life-saving products and services to the public as they prepare for and respond to oncoming extreme weather and water events. As the Nation continues to experience a growing number of record-breaking snowfall, cold temperatures, extended drought, high heat, severe flooding, unprecedented wildfires, violent tornadoes, and massive hurricanes, NWS must also ensure that its products and services, including IDSS, reach everyone in the country, regardless of socio-economic status, race, language, or other factors that might lead to inequitable access.

Going forward in FY 2023 with an emphasis on IDSS, NWS will continue to work to enhance relationships with communities and organizations to ensure that NWS products and services reach everyone in the country, especially historically underserved and socially vulnerable communities. In order to do so, this request will increase the NWS' dedicated workforce that provides services 24/7/365 in support of the mission.

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $1,219,309,000 to support the ORF activities of the NWS, reflecting a net increase of $40,850,000 in program changes.



GeoColor image of Hurricane Ida, Tropical Storm Julian, and Tropical Depression Ten (which intensified into Tropical Storm Kate on August 30) from NOAA's GOES-16 satellite on August 29, 2021.

Observations $247,843,000

NOAA requests a net increase of $750,000 in program changes for a total of $247,843,000 in the Observations activity. Program change increases include:

Observations: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $750,000 as part of the NOAA-wide EIS modernization effort that will support a five year transition of its current infrastructure to the new General Services Administration (GSA) EIS contract.

Central Processing $108,353,000

NOAA requests a total of $108,353,000 in the Central Processing activity. This total supports the Weather and Climate Operational Supercomputing System (WCOSS), the Advanced Weather Interactive Processing System (AWIPS), hydrology information technology initiatives, and the information technology (IT) infrastructure that supports national centers and field operations. There are no program changes requested for this activity.

Analyze, Forecast, and Support $584,176,000

NOAA requests a net increase of $8,700,000 in program changes for a total of $584,176,000 in the Analyze, Forecast, and Support activity. Program changes include:

Analyze, Forecast, and Support: Staffing to Enhance Equitable NWS Decision Support Services: NOAA requests an increase of $8,700,000 to address critical staffing within NWS field offices and national centers to meet increasing demand for impact-based decision support services (IDSS) from communities faced with an increasing pace of extreme weather water and climate events.

Dissemination $119,658,000

NOAA requests a net increase of $36,400,000 in program changes for a total of $119,658,000 in the Dissemination activity. Program changes include:

Dissemination: Optimize and Upgrade the Integrated Dissemination Program: NOAA requests an increase of $25,000,000 to optimize and upgrade both the National Dissemination on-premise IT infrastructure and applications, and to build the public cloud framework, by focusing on activities within Phases 3 and 4 of the Integrated Dissemination Program (IDP) plan. These activities will provide the public and core partners with timely critical warnings, watches, and forecasts that protect lives and property.

Dissemination: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $11,400,000 as part of the NOAA-wide EIS modernization effort that will support a five year transition of its current infrastructure to the new GSA EIS contract.

Science and Technology Integration $159,279,000

NOAA requests a net decrease of $5,000,000 in program changes for a total of $159,279,000 in the Science and Technology Integration activity. Program changes include:

Science and Technology Integration: Suspend COASTAL Act Implementation: NOAA requests a decrease for $5,000,000 which will suspend implementation of the NOAA Consumer Option for an Alternative System To Allocate Losses (COASTAL) Act of 2012 in order to better align NOAA's timeline with FEMA's.

FY 2023 PAC Budget Summary

NOAA requests a total of $104,104,000 to support the PAC activities of the NWS, reflecting a net increase of $470,000 in program changes.

Systems Acquisition $94,104,000

NOAA requests a net increase of $470,000 in program changes for a total of $94,104,000 in the Systems Acquisition activity. This total provides continued support for the Nation's weather radar and surface weather observing network, ensures the uninterrupted flow of information from the collection of observations, to central guidance production, to local applications of all essential weather and climate data products, and continuity of public watches and warnings, and development of a reliable and scalable NWS dissemination infrastructure to sustain 24x7 mission operations.

Observations: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $470,000 as part of the NOAA-wide EIS modernization effort that will support a five year transition of its current infrastructure to the new GSA EIS contract.

Observations: Automated Surface Observing System Service Life Extension Program: NOAA requests an increase of $8,040,000 to modernize

Forecasters assess a new tool which uses rapidly-updating, high-resolution Probabilistic Hazard Information as the basis for next-generation severe weather warnings during a Hazardous Weather Testbed Experiment at NOAA's National Severe Storm Laboratory in Norman, OK.

and sustain the ongoing Automated Surface Observing System (ASOS) Service Life Extension Program (SLEP) which is facilitating the weather sensor improvements necessary for more robust products and services to include better fire weather and climate services as well as to support impact-based decision support services.

Observations: Reduce Service Life Extension Program for Next Generation Weather Radar (NEXRAD): NOAA requests a planned decrease of $8,040,000 to sustain aging Next Generation Weather Radar (NEXRAD) infrastructure. This reflects the award of major contracts on the pedestal and shelter refurbishments, and generator replacement projects, now in deployment.

Construction

Facilities Construction and Major Repairs $10,000,000

NOAA requests a total of $10,000,000 in the Construction Activity. This total supports repairs and renewal of forecast offices and other government owned weather facilities that contain critical infrastructure; maintain structural integrity through capital improvements. There are no program changes requested for this activity.

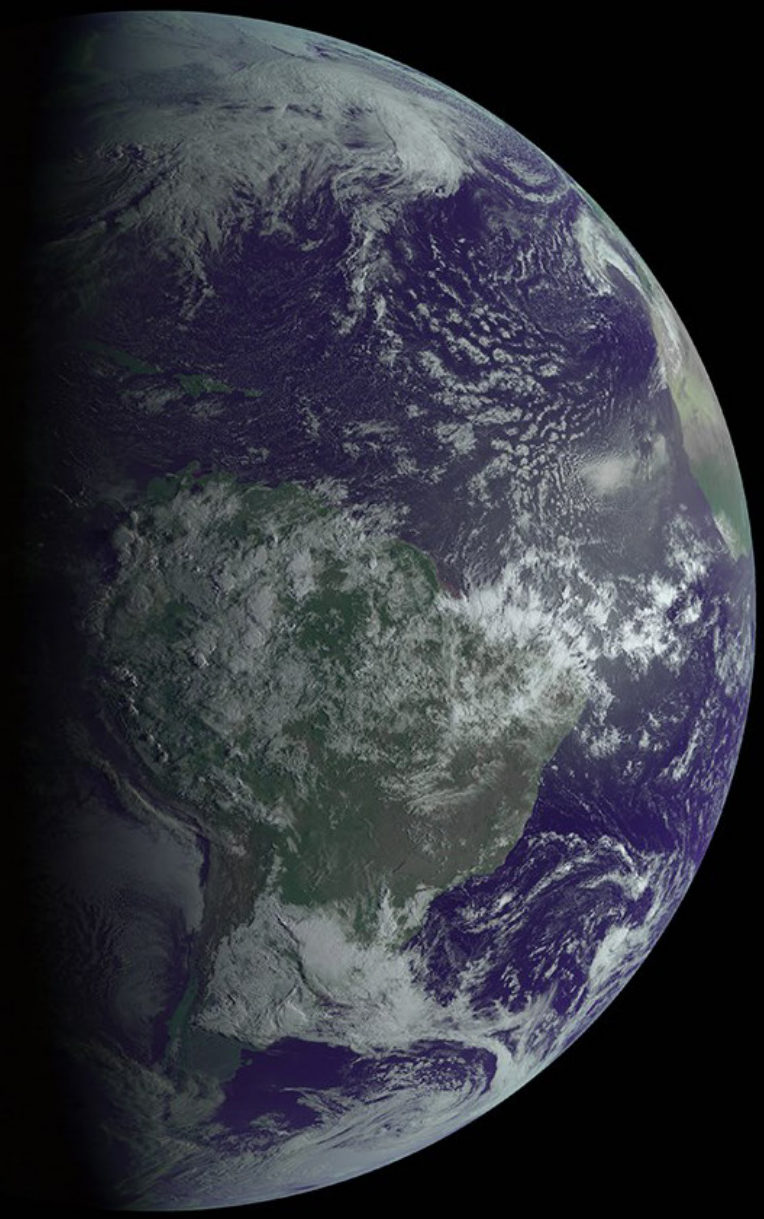


Image from GOES East on March 26, 2021.

Chapter 6

National Environmental Satellite, Data, and Information Service

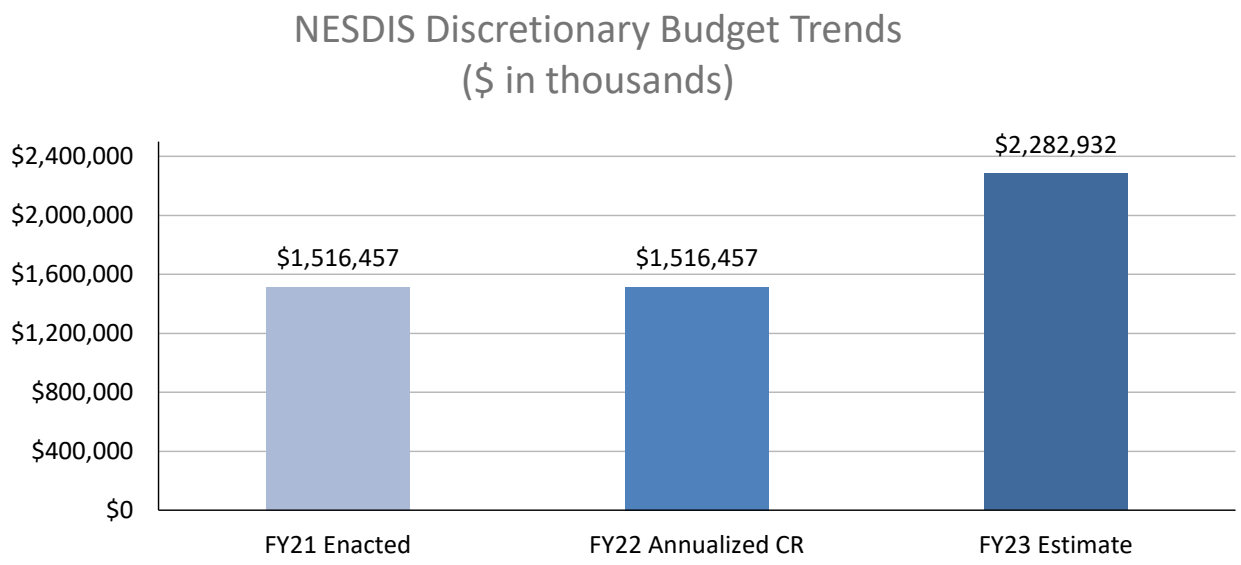
The National Environmental Satellite, Data, and Information Service (NESDIS) has the unique role of providing timely access to global environmental space-based and ground-based data, products, and services, 24/7. These data and end user products promote, protect, and enhance the Nation's economy, security, environment, and quality of life. Along with launching and operating NOAA's satellites, NESDIS manages the product development and distribution of NOAA and partner satellite data, archives this and other environmental data, and provides numerous environmental and resource reports for commercial, state, regional, national, and global users. NOAA satellites support the national weather and space weather forecasting enterprise by providing timely, high quality data for model outputs and publicly disseminated weather forecasts and warnings. NESDIS also develops the next generation of satellites to avoid gaps in satellite coverage that could affect NOAA's primary mission essential functions. These next-generation satellite systems will launch in the next decade to further protect people and property in an increasingly complex weather- and climate-sensitive environment.

FY 2021 Accomplishments

In order to address major environmental challenges of the future, NOAA's Geostationary Extended Observations (GeoXO) satellite system was formally approved in FY 2021 as the next-generation mission to advance Earth observations from geostationary orbit and succeed the GOES-R Series. NOAA is working to ensure these critical observations are in place by the early 2030s, when NOAA predicts the loss of the on-orbit geostationary backup capability. The mission will supply vital information to support weather and climate related products and services in the United States, and address emerging environmental issues and challenges that threaten the security and well-being of every American.

A prime example of NOAA partnerships both domestically and internationally, the Constellation Observing System for Meteorology, Ionosphere, and Climate–2 (COSMIC-2) achieved full operational capability, with all spacecraft in their final orbits and producing data with sufficient quality, quantity, and latency to meet mission requirements by September 16, 2021. Building upon the success of the COSMIC-1 program, the COSMIC-2 smallsats are constantly orbiting Earth, collecting atmospheric data used for weather forecasting, space weather monitoring, and climate research. The data, along with commercially procured data, are being ingested into NWS numerical weather prediction models.

On May 18, 2021, NOAA began incorporating its first commercially purchased space-based radio occultation (RO) data into operational numerical weather prediction models, all within the Cloud Framework, a consolidated dissemination portal that NOAA plans to use to increase public



accessibility of our data. This is a major milestone in NOAA's efforts to meet the Nation's weather and environmental monitoring needs in a flexible and cost effective manner, and builds on the inclusion of COSMIC-2 and international partner RO data that were incorporated into the models over the past few years. NOAA awarded its first RO contracts in November 2020 to purchase these data. The two-year contracts went to U.S. commercial space firms GeoOptics and Spire Global.

NOAA's National Centers for Environmental Information (NCEI) revitalized its regional outreach in a number of areas in FY 2021. NOAA hired three Regional Climate Service Directors (RCSDs), resulting in a full complement for the Regional Climate Services (RCS) program. RCSDs work directly with public and private sector partners and constituent groups in their respective regions by leveraging data and information from national and global sources to meet local needs. Partners at the six RCS programs include the Regional Climate Centers, the NWS, Regional Integrated Sciences and Assessments program, state climatologists, the National Integrated Drought Information System, Indigenous people and tribes, and other agencies, institutions, and organizations. By building and strengthening these partnerships, RCSDs provide more cost-effective and regionally tailored products and services. NCEI also released an innovative online mapping tool that provides hazard risk information at the county-level for natural disaster hazards across the United States. This online resource provides detailed information on a location's risk and social vulnerability to weather and climate hazards that can lead to billion-dollar disasters. The tool covers every county and county-equivalent in the 50 U.S. states plus the District of Columbia.

FY 2023 Request $2,282,932,000

NOAA requests a total of $2,282,932,000 to support NESDIS continued and enhanced operations. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts, and is a net increase of $758,765,000 in FY 2023 program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and

restoration and resilience. In FY 2023, NESDIS will support more efficient, cost-effective delivery of regionally specific weather and climate products and services to support economic activity and mitigation of weather and climate hazards and vulnerability. Specifically, in FY 2023, NESDIS will enhance enterprise data stewardship and archiving, sustain multi-decadal climate data records, and advance operations in the cloud to expand public access. NESDIS will also expand the scope and operationally transition numerous ocean, arctic-, and fire-related products to address critical information gaps for decision makers.

NOAA will continue to foster environmental stewardship and sustainable economic development, new business development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses. In FY 2023, NESDIS will improve satellite-derived coastal resilience and water quality products that support monitoring, forecasting, and prediction of events such as coastal storms, nutrient and sediment loadings, hypoxia, eutrophication, oil spills, coastal habitat changes, fisheries, and aquaculture.

Crucial, time-sensitive investments in satellites reinforce NOAA's commitment to ensure that the Nation's next-generation satellite systems expand service delivery of essential earth system information to meet the needs of the American public. The FY 2023 request includes increased and continued support for development of NOAA's polar-orbiting, geostationary, and Space Weather Follow On satellite programs, and increased support for commercial data purchase of Global Navigation Satellite System RO data.

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2022 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $409,074,000 to support the ORF activities of NESDIS, reflecting an increase of $55,741,000 in FY 2023 program changes.

Environmental Satellite Observing Systems $318,242,000

NOAA requests a net increase of $33,241,000 for a total of $318,242,000 in the Environmental Satellite Observing Systems activity. This total provides continued support for satellite operations and the development of new products to leverage global observing system capabilities. Program changes include:

Office of Satellite and Product Operations: Satellite and Product Operations Deferred and Extended Maintenance: NOAA requests an increase of $7,500,000 to support critical satellite operations and maintenance requirements. These funds will ensure NOAA does not redirect mission resources to address repairs, maintenance, and major upgrades.

Office of Satellite and Product Operations: Enterprise Infrastructure Solutions (EIS): NOAA requests $1,500,000 for NOAA to conduct a technology modernization and support an accelerated transition of telecommunications services to the General Services Administration (GSA) EIS contract vehicle.

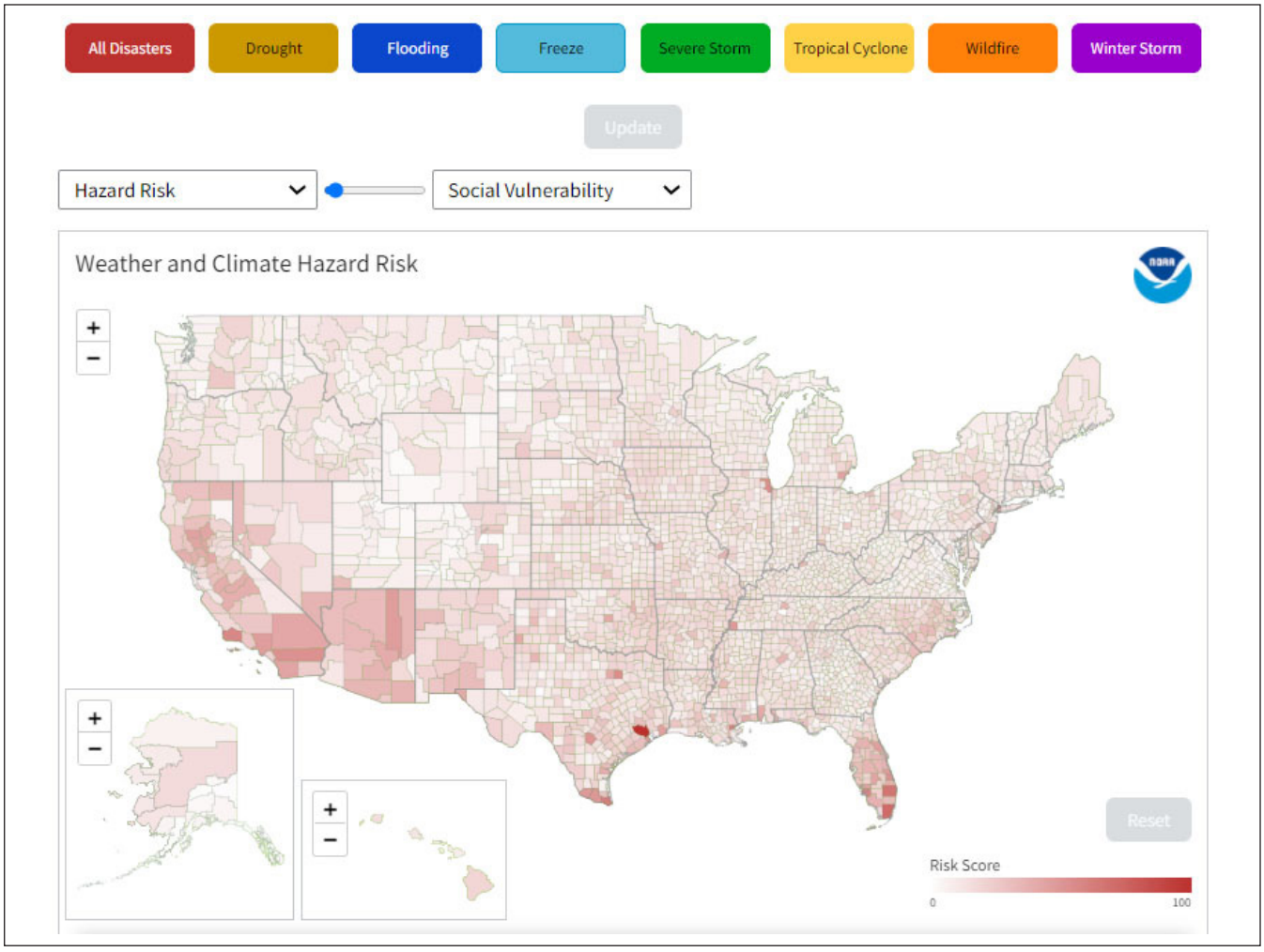
Product Development, Readiness & Application: Advance Core Activities: NOAA requests $8,000,000 to improve the development rate of data products, applications, techniques, and systems to better meet NOAA mission requirements, defining an appropriate baseline performance, as well as

to support the full requirement for the legacy geostationary and polar satellite systems calibration and validation of instruments.

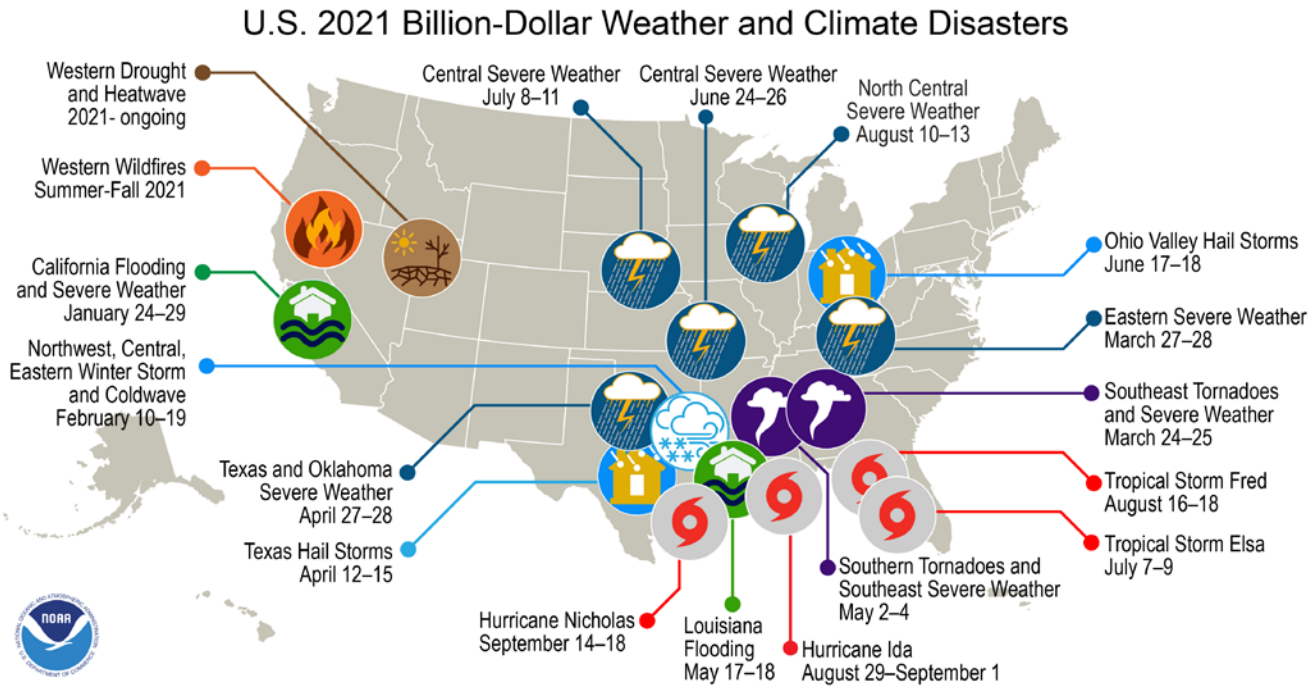
Product Development, Readiness & Application: Ocean Remote Sensing: NOAA requests $6,505,000 to support sustainment and development of ocean-related products and their transition to operations, including products utilized by the global and coastal ocean user community, climate-related products, and products and services that support improved understanding of ocean dynamics and marine ecosystems.

Product Development, Readiness & Application: Advancing Fire Weather Priorities: NOAA requests $4,000,000 for fire product research, development, transition, and sustainment. NESDIS is pursuing a series of short-term and long-term fire product development activities, including demonstrating fire detection and characterization products and alerting systems in the NOAA Fire Weather Testbed, that address critical gaps in the fire product lifecycle.

Product Development, Readiness & Application: Coastal Resilience and Water Quality: NOAA requests $3,236,000 to support development, transition to operations, and maintenance of new and improved satellite products, applications, and services for coastal resilience, including physical and ecological states across the land-sea interface.



The National Centers for Environmental Information's recently released disaster mapping tool is a new way to visualize hazard risk information on a county level, supporting informed decision-making, hazard mitigation, community planning, and climate resilience.



From January through the end of September 2021, the U.S. experienced 18 weather and climate disasters with losses exceeding $1 billion each. This year surpassed all of 2011 and 2017 for the largest number of disasters in a calendar year, and ranks second behind 2020, which had 22 events.

Product Development, Readiness & Application: Expanding Polar Region Integrated Satellite Marine and Ice Information Capabilities: NOAA requests $2,000,000 to expand the scope of the current satellite work and its application for the polar regions (Arctic and Antarctic). Changes in polar climate and sea ice cover have societal impacts on national security, polar maritime transportation, fisheries, stability of Arctic communities, and severe weather throughout the U.S.

U.S. Group on Earth Observations (USGEO): NOAA requests $500,000 to the GEO Trust Fund for the operations of the GEO Secretariat and to support the AmeriGEO efforts in the Americas.

National Centers for Environmental Information $90,832,000

NOAA requests a net increase of $22,500,000 for a total of $90,832,000 in the NCEI activity. This total provides continued support for aligning science and stewardship requirements and resources to ensure return on investments in NOAA observation systems. Program changes include:

National Centers for Environmental Information: Improving Local, State, and Regional Climate Services: NOAA requests $6,300,000 to increase support for local, state, and regional climate services and fund climate change attribution services. NCEI's Regional Climate Services, including the Regional Climate Centers, support the development and delivery of a wide range of place-based climate science and information products and services to help people make informed decisions.

National Centers for Environmental Information: Climate Data Records: NOAA requests $6,000,000 to revitalize NOAA's ability to develop and operationally sustain seamless and consistent multi-decadal climate data records (CDRs) derived from NOAA and NOAA partner satellite observations. Government, industry, and academia use CDRs to detect, monitor, and assess climate change-related trends and patterns in the Earth system.

National Centers for Environmental Information: Enhance Enterprise Data Stewardship and Archiving: NOAA requests $5,300,000 for data stewardship and archiving to further the value of NOAA's investment in Earth observations. It will allow NCEI to address the current underfunded demand for data management, archive, and access capabilities and be able to better meet future demand.

National Centers for Environmental Information: Sustainment of Cloud Framework for Environmental Data: NOAA requests $4,900,000 for additional funding to provide sustained science and data stewardship operations in the cloud. To enable accelerated public access, increased data innovation, and economic exploitation of NCEI products and services, NESDIS proposes to move all of its product areas and supporting applications to the cloud.

FY 2023 PAC Budget Summary

NOAA requests a total of $1,873,858,000 to support the PAC activities for NESDIS, reflecting an increase of $703,024,000 in FY 2023 program changes.

Systems Acquisition $1,871,408,000

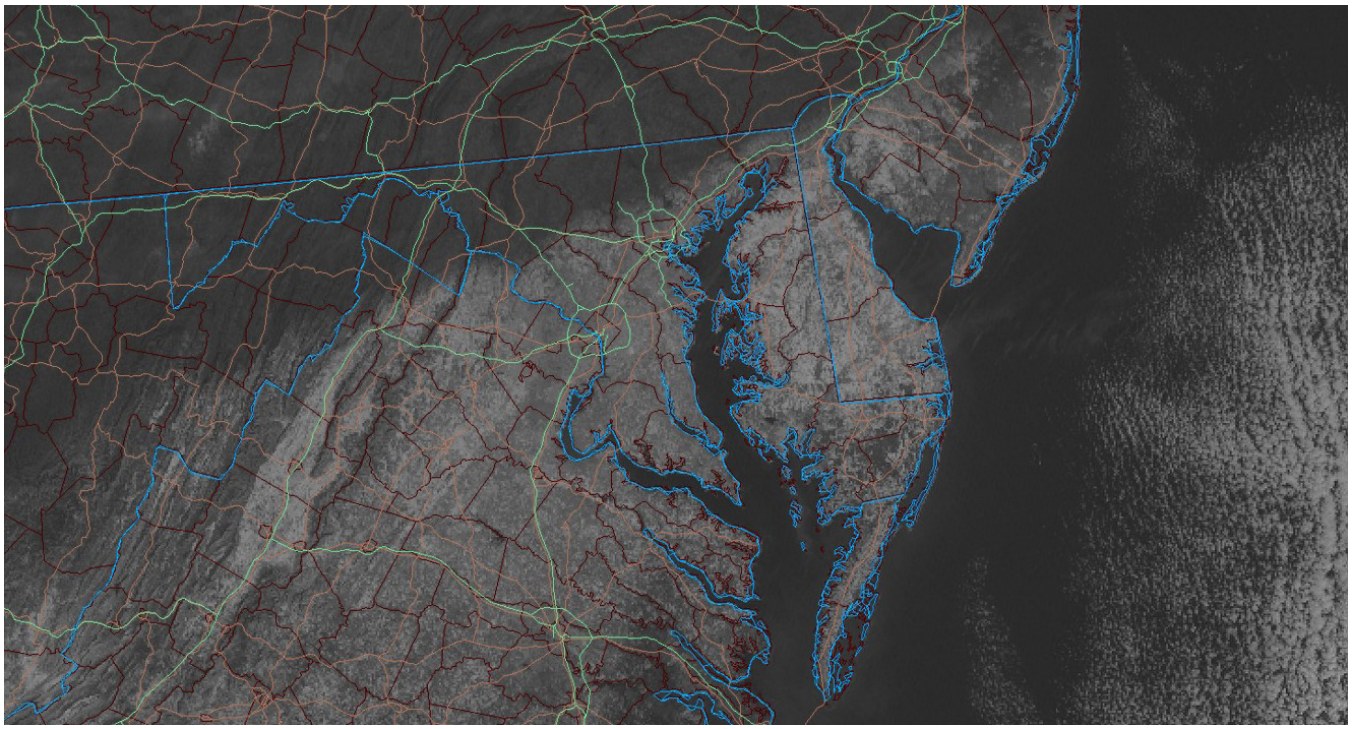
NOAA requests a net increase of $703,024,000 for a total of $1,871,408,000 in the Systems Acquisition activity. This total provides continued support for the development, deployment, and sustainment of flight and ground assets that meet the Nation's needs for observations and measurements, and to lead and manage the NESDIS system architecture, enterprise engineering, and advanced planning efforts to deliver sustainable, robust, and adaptive systems and services that meet NESDIS customer needs.

NESDIS began evolving its budget structure in FY 2020 and 2021 to lay the groundwork for the architecture recommendations in accordance with the NOAA Satellites Observing System Architecture (NSOSA) study. Budget structure changes proposed in FY 2022 align with the investments requested for all our observing systems. In FY 2020, NESDIS created two Subactivities: Polar Weather Satellites and Systems/Services Architecture and Engineering (SAE).

NOAA requests a net increase of $620,329,000 for a total of $964,829,000 in the GEO Subactivity. This total provides continued support for current and future geostationary satellites. Program changes include:

Geostationary Earth Orbit (GEO): Geostationary Extended Observations (GeoXO): NOAA requests an increase of $653,829,000 to complete the Imager and Sounder Phase A formulation studies. NOAA will also initiate Phase A formulation studies for the remaining proposed GeoXO instruments and the spacecraft. GeoXO will continue observations provided by the GOES-R Series, bringing capabilities to address emerging environmental issues and challenges that threaten the security and well-being of every American.

The GOES-T satellite is unloaded from the C-5 Super Galaxy cargo aircraft that flew it to the Kennedy Space Center in Florida on Nov. 10, 2021.



GOES-16 visible satellite image showing the snow cover over the mid-Atlantic from the January 4, 2022 snow storm.

Total GeoXO Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	663,829
FY 2024	395,000
FY 2025	642,500
FY 2026	689,000
FY 2027	735,000
CTC	TBD
Total	TBD

Total GOES-R Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	301,000
FY 2024	301,000
FY 2025	124,500
FY 2026	98,500
FY 2027	96,800
CTC	524,411
Total	11,022,087

Geostationary Earth Orbit (GEO): GOES-R Series: NOAA requests a decrease of $33,500,000 for planned decreases to GOES-R Series. The remaining funds will continue integration and testing for the GOES-U satellite, the final satellite in the GOES-R Series program, as well as to complete the recapitalization of the GOES-R Series ground system.

In FY 2023, NOAA proposes to establish the Low Earth Orbit (LEO) Subactivity, which will set the stage for managing future polar and other low earth and medium earth orbit satellite observations as loosely coupled programs. Program changes include:

Low Earth Orbit (LEO): LEO Weather Satellites: NOAA requests an increase of $78,330,000 to initiate a LEO Weather Satellites program that will ultimately serve as the follow-on to the PWS program.

Total LEO Weather Satellites Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	78,330
FY 2024	123,590
FY 2025	134,590
FY 2026	163,500
FY 2027	154,000
CTC	TBD
Total	TBD

Low Earth Orbit (LEO): Polar Operational Environmental Satellites (POES) Extension: NOAA requests $10,000,000 to extend operations of the Polar Operational Environmental Satellites (POES) system and its associated ground system, which provide critical early morning orbit observations.

Total POES Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	10,000
FY 2024	0
FY 2025	0
FY 2026	0
FY 2027	0
CTC	0
Total	10,000

JPSS-2 completes satellite alignment in preparation for its planned launch in September 2022, where it will join JPSS-1, also known as NOAA-20, in polar orbit. Credit: Northrop Grumman

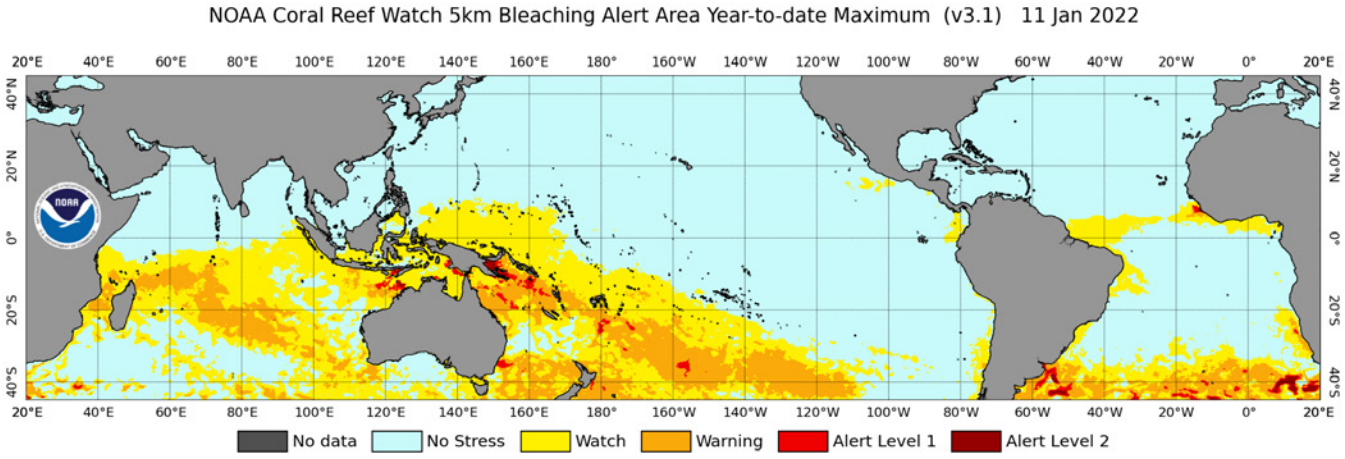
Low Earth Orbit (LEO): COSMIC-2/Global Navigation Satellite System (GNSS) Radio Occultation (RO): NOAA requests an increase of $2,208,000 to maintain the current operational capability of the ground system for the COSMIC-2 program. This increase supports quality assurance of the data and maintains ground reception stations used to acquire data.

Total COSMIC-2/GNSS RO Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	8,100
FY 2024	8,100
FY 2025	8,100
FY 2026	8,100
FY 2027	8,100
CTC	TBD
Total	TBD

Low Earth Orbit (LEO): Cooperative Data and Rescue Services (CDARS): NOAA requests a decrease of $13,100,000 due to completion of the integration and launch phases of the program. The remaining funding and personnel will continue post launch as support for the U.S. Air Force Hosted Payload Solutions of the Argos-4 Advanced Data Collection System instrument provided by the French space agency Centre National d'Etudes Spatiales.

Total CDARS Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	0
FY 2024	0
FY 2025	0
FY 2026	0
FY 2027	0
CTC	N/A
Total	N/A

Low Earth Orbit (LEO): Polar Weather Satellites: NOAA requests a decrease of $252,835,000 for planned decreases to Polar Weather Satellite (PWS) due to the rescheduled launch commitment dates applying to a five-year cadence. The launch vehicles will be purchased in future years reducing the current need.



Natural Resource Managers use the NOAA Coral Reef Watch (CRW) daily global 5km Bleaching Alert Area product to strategically manage coral reef ecosystems, marine parks, and marine sanctuaries.

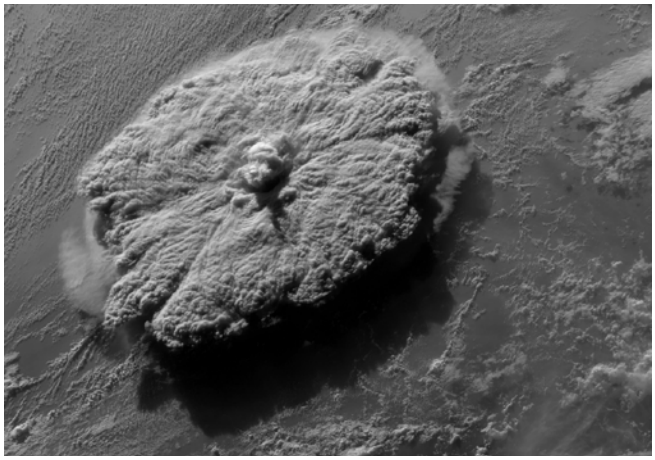
Total PWS Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	350,210
FY 2024	350,210
FY 2025	350,210
FY 2026	350,210
FY 2027	350,210
CTC	1,922,576
Total	16,903,385

Total SW NEXT Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	145,000
FY 2024	225,000
FY 2025	228,000
FY 2026	231,200
FY 2027	231,200
CTC	TBD
Total	TBD

In FY 2023, NOAA also proposes to establish the Space Weather Observations (SWO) Subactivity, which will manage the future space weather observations as loosely coupled programs. Program changes include:

Space Weather Observations: Space Weather Next (SW NEXT): NOAA requests $145,000,000 to initiate the Space Weather Next program that will sustain, improve, extend and mitigate potential gaps in observations to support NOAA space weather forecast operations as authorized by the "Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow (PROSWIFT) Act" and driven by the National Space Weather Strategy and Action Plan.

Space Weather Observations: Space Weather Follow On (SWFO): NOAA requests an increase of $28,085,000 for the SWFO program. Funding will support a SWFO-L1 mission with a Space Weather Instrument Suite for solar wind observations and a compact coronagraph for coronal mass ejection imagery at Lagrange point 1 (L1). The NOAA SWFO-L1 mission will ensure continuity of space weather data beyond NOAA's Deep Space Climate Observatory and NASA European Space Agency research Solar and Heliospheric Observatory, which are well past their design life.



NOAA's GOES-17 satellite showed the rapid expansion of a volcanic cloud and abrupt shock wave following an eruption of Hunga Tonga-Hunga Ha'apai, located in the South Pacific Kingdom of Tonga, on January 15, 2022.

Total SWFO Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	136,200
FY 2024	97,200
FY 2025	41,200
FY 2026	22,300
FY 2027	21,800
CTC	13,385
Total	692,800

NESDIS will utilize a Common Ground Services approach to operate the evolving observing system, and integrated cloud, artificial intelligence, and machine-learning capabilities to verify, calibrate, and fuse data into better products and services. This includes a flexible, scalable platform that enables secure ingest of partner data in different formats. Program changes include:

Common Ground Services (CGS): Data-source Agnostic Common Services (DACS): NOAA requests an increase of $25,007,000 to further leverage non-NOAA and commercial data sources and to provide the IT infrastructure to securely ingest, generate science products, distribute, and archive data. NOAA will complete an end-to-end infrastructure that will allow us to leverage partner and commercial observations to meet NOAA's and NESDIS' mission requirements in a cost-effective manner, and to begin delivering enhanced products and services to meet NOAA's environmental and climate mission.

Total DACS Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	30,022
FY 2024	45,500
FY 2025	45,500
FY 2026	45,500
FY 2027	45,500
CTC	N/A
Total	N/A

Common Ground Services (CGS): Data Access and Distribution: NOAA requests $24,000,000 to expand and accelerate the development of and migration to the NOAA cloud infrastructure. This effort builds upon current NESDIS cloud initiatives such as DACS, and enables NOAA to provide increased data volumes from a diverse suite of sources in concert with tools, platforms, information, products and services, as well as skilled personnel to enhance discoverability, access, and usability of NOAA data for climate and other emerging applications.

Total Data Access and Distribution Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	24,000
FY 2024	24,000
FY 2025	24,000
FY 2026	24,000
FY 2027	24,000
CTC	N/A
Total	N/A

Through Systems/Services Architecture and Engineering (SAE), NESDIS initiated studies to define next-generation polar and geostationary satellite capabilities. Program changes include:

Systems/Services Architecture & Engineering (SAE): Commercial Data Purchase: NOAA requests an increase of $16,000,000 to purchase commercial GNSS-RO data for operational use. It will also support continued development and sustainment

of the infrastructure and capability to securely import, transfer, process, and store external data from commercial providers for operational use.

Total CDP Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	25,000
FY 2024	28,000
FY 2025	31,000
FY 2026	31,000
FY 2027	31,000
CTC	N/A
Total	N/A

Systems/Services Architecture & Engineering (SAE): Joint Venture Partnerships: NOAA requests $15,000,000 to expand activities with other agencies and the commercial sector that investigate, mature, and demonstrate new technologies and capabilities that could potentially be incorporated into NOAA satellite architectures and associated enterprise products and services portfolios.

Total Joint Venture Partnerships Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	20,000
FY 2024	20,000
FY 2025	20,000
FY 2026	20,000
FY 2027	20,000
CTC	N/A
Total	N/A

Systems/Services Architecture & Engineering (SAE): Commercial Weather Data Pilot (CWDP): NOAA requests $5,000,000 to continue executing pilots on emerging commercial data capabilities. These pilots assess operational viability of possible future commercial capabilities, which is critical to planning for NOAA's future satellite architecture needs.

Total CWDP Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	8,000
FY 2024	8,000
FY 2025	8,000
FY 2026	8,000
FY 2027	8,000
CTC	N/A
Total	N/A

Construction $2,450,000

NOAA requests a total of $2,450,000 in the Construction activity. This total supports repairs and renews facilities that contain critical infrastructure; maintains structural integrity through capital improvements; and ensures availability of power and cooling necessary for NOAA's satellite ground system. There are no program changes requested for this activity.

Total Satellite CDA Facility Request (BUDGET AUTHORITY IN $K)	
FY 2023 Request	2,450
FY 2024	2,450
FY 2025	2,450
FY 2026	2,450
FY 2027	2,450

On an educational outing about marine debris, a student at College of William and Mary, shows off a particularly large haul of trash collected from Deer Park Lake in Newport News, VA.

Chapter 7

Mission Support

NOAA's Mission Support services are the backbone of NOAA's programs and mission. These activities ensure that NOAA staff have the proper work environment, the necessary tools and equipment, and vital personnel and finance services which, in turn, allow them to provide the finest possible service to the American people, the economy, and the environment.

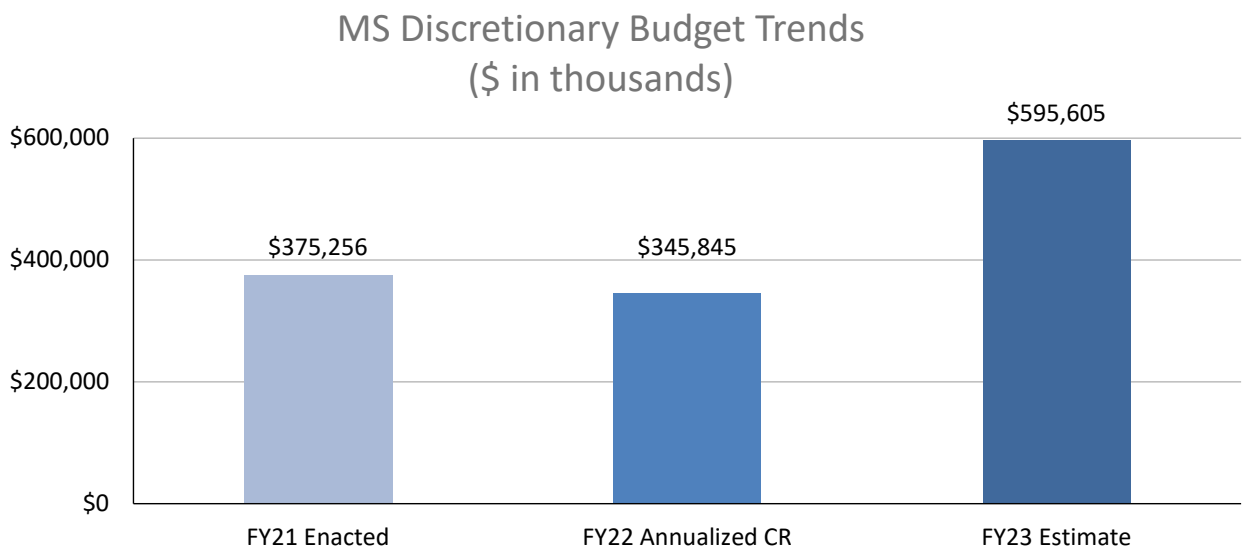
FY 2021 Accomplishments

In FY 2021, the Staff Offices of Mission Support provided numerous services in support of the NOAA mission including the following highlights. The Acquisition and Grants Office (AGO) obligated $1.81 billion and managed over 4,900 active contracts valued at over $12 billion. AGO executed over 2,300 financial assistance transactions to award $1.4 billion. NOAA also successfully executed over 8,000 acquisition and nearly 700 financial assistance closeout actions in FY 2021. NOAA continued its strong support of small businesses in FY 2021, obligating $834 million to small businesses equating to a 47.6 percent overall small business achievement for the year.

High speed network access is required to ensure scientists and engineers have access to the resources needed to propel the New Blue Economy, advance research on climate change, and achieve NOAA's vital mission. The Alaska region is among the most difficult to reach, sheer size and limited infrastructure combine to make stable, high-speed, cost-efficient connectivity a significant challenge. To improve this network landscape, the Office of Chief Information Officer (OCIO) N-Wave and partners initiated the Alaska Shared Network Infrastructure project. With new network points of presence in Anchorage and Fairbanks, new fiber in Utqiaġvik, and new circuits extending south to Juneau and west to Kodiak, the project directly benefits science and operations across all NOAA Line Offices. In addition, NOAA established an N-Wave point-of-presence at the Department of Commerce (DOC) that provides connectivity to NOAA's high-speed nation-wide network and Trusted Internet Connection Access Provider (TICAP) services, providing increased resilience and capacity, enhanced cybersecurity, and significant cost avoidance.

The Workplace Violence Prevention and Response Program (WVPRP) has been highlighted as having best practices by the National Academies of Science (NAS) and the "We Are NOAA" survey has been identified as a best practice benchmark in the development and implementation of workplace culture surveys. The WVPRP Director co-leads the NAS Preventing Sexual Misconduct in Academia evaluation group and is a contributing editor to NAS guidance to optimize prevention, response and evaluation efforts, which highlights NOAA's key efforts in SASH prevention and response. NAS are key stakeholders in sexual assault and sexual harassment prevention and response efforts within the science, technology, engineering, and mathematics (STEM) fields, leading the Action Collaborative on Preventing Sexual Harassment in Higher Education.

NOAA's Office of Education supports citizen scientists who provide NOAA projects over 1.1 million volunteer hours per year. People have spent



more time at home in the past two years, but that has not stopped volunteers from counting fish on underwater cameras, recording precipitation data, or reporting severe weather events. Thanks to citizen scientists working from home, projects such as FISHstory in Daytona Beach, Florida, OceanEYEs in Hawaii, and the Old Weather WW2 project have either been completed or made significant progress in the past year. Citizen Scientists working with FISHstory used historic dock photos to document species and length composition data in the charter and headboat fisheries in the South Atlantic prior to when dedicated catch monitoring began in the 1970s. These photos are an untapped source of biological data to understand changes in overall catches or seasonality of catches, as well as investigate if there were changes in the size of fish caught over time. Information gathered builds a more complete picture in this historic time period which assists in understanding the health of fish stocks today.

FY 2023 Request $595,605,000

NOAA requests a total of $595,605,000 to position NOAA's Mission Support programs 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 increase of $216,952,000 in FY 2023 program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on our research, observations and forecasting, and restoration and resilience efforts. In FY 2023, Mission Support will support NOAA Open Data Dissemination to provide worldwide cloud access to NOAA's climate and earth systems dynamics data. This will allow for enhanced collaboration to improve climate modeling in conjunction with the NOAA Cloud Program to streamline and accelerate the transition of increased data to the cloud. NOAA also seeks to increase capacity to manage facilities repair and construction needs to ensure NOAA facilities can support climate, weather, ocean, and fisheries research and services, multi-billion-dollar satellite programs and NOAA's ship and aircraft operations. This will help NOAA meet the Administration's climate science goals, including Executive Order (EO) 14008 on *Tackling the Climate*

Crisis at Home and Abroad, through improved observations and forecasting for the American public. In addition, an investment in AGO and NOAA Finance will support increased management responsibilities through expanded programs that allow NOAA to provide inherently governmental management and oversight functions.

NOAA will continue to foster environmental stewardship and sustainable economic development framed around an information and knowledge-based approach to support fisheries, transportation, shipping, renewable energy, recreation, and other ocean-based uses. NOAA will develop a space situational awareness capability informed by the objectives of the National Space Policy. This includes supporting partnerships between the Department of Defense and other federal agencies, and commercial industry to share information through an Open Architecture Data Repository (OADR). The OADR will manage a future environment that is expected to comprise 57,000 new satellites in orbit by the year 2030. As of 2022, there are approximately 6,100 satellites on orbit, roughly 1,000 of which launched in 2021.

Nikki Vanelli, a 2020 Hollings scholar, spent her 2021 summer internship at Great Bay National Estuarine Research Reserve researching nitrogen in eelgrass beds versus mudflats and participating in a wide range of lab and fieldwork.

NOAA will advance diversity, equity, and inclusion within our workforce, partnerships, and the communities we serve, as well in the development and delivery of NOAA's products and services. In FY 2023, investments in recruitment, the implementation of the Diversity and Inclusion Plan, strategic communications, and our premiere education programs position the agency as a critical leader to make tangible improvements to vulnerable communities. NOAA is aligned with the Administration priority of environmental justice and equity and will further support EO 13985 on *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* by developing a framework and laying the foundation for successfully integrating equity across the organization to reach a broader range of Americans in underserved communities.

Safe and modern facilities are vital to support NOAA's mission of science, service, and stewardship. NOAA's facilities and infrastructure are vulnerable to the full range of weather and climate impacts. In FY 2023, NOAA will ensure the long-term viability of these vital assets to NOAA's mission. Our overall owned real property portfolio condition is "poor" and current repair needs exceed $700 million based on FY 2022 data. NOAA requests sustained funding for major and minor capital improvement projects at facilities supporting marine operations and scientific research, as part of NOAA's long-term strategy for funding the most mission-critical priorities. In addition, improvements are necessary at the Northwest Fisheries Science Center (NWFSC) facilities near Seattle, Washington. The research and innovation conducted at the NWFSC helps build sustainable fisheries, restore threatened and endangered species, safeguard healthy ecosystems, and reduce risks to human health. This investment will prevent large-scale mission failure to ensure long-term continuation of the National Marine Fisheries Service's science mission at NWFSC.

Program changes are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $449,905,000 to support the ORF activities of Mission Support, reflecting a net increase of $113,892,000 in FY 2023 program changes.

Executive Leadership $31,743,000

NOAA requests an increase of $2,500,000 in program changes for a total of $31,743,000 in the Executive Leadership activity. These funds will support NOAA's centralized executive management as well as policy formulation and direction. Program changes include:

Executive Leadership: NOAA Tribal Liaisons: NOAA requests an increase of $500,000 to create two full-time NOAA Tribal Liaison positions to strengthen NOAA communications and outreach to Tribal governments, Native Alaska Corporations, and Native Hawaiians; one in Juneau, Alaska and one located in the Washington DC metro area. The Tribal Liaisons will support meaningful consultations and coordination with Tribal officials in the development and implementation of Federal policies that have tribal implications.

Executive Leadership: Strategic Communication and Outreach to Underserved Communities: NOAA requests an increase of $2,000,000 to put the NOAA Communications capacity on par with that of other Federal science agencies. This directly supports NOAA's mission of sharing scientific knowledge, data and services with the public, including underserved communities. This request enables the Office of Communications to implement a strategy, using traditional and new media platforms, to educate and build awareness among diverse and multi-sector decision-makers, community members, and stakeholders.

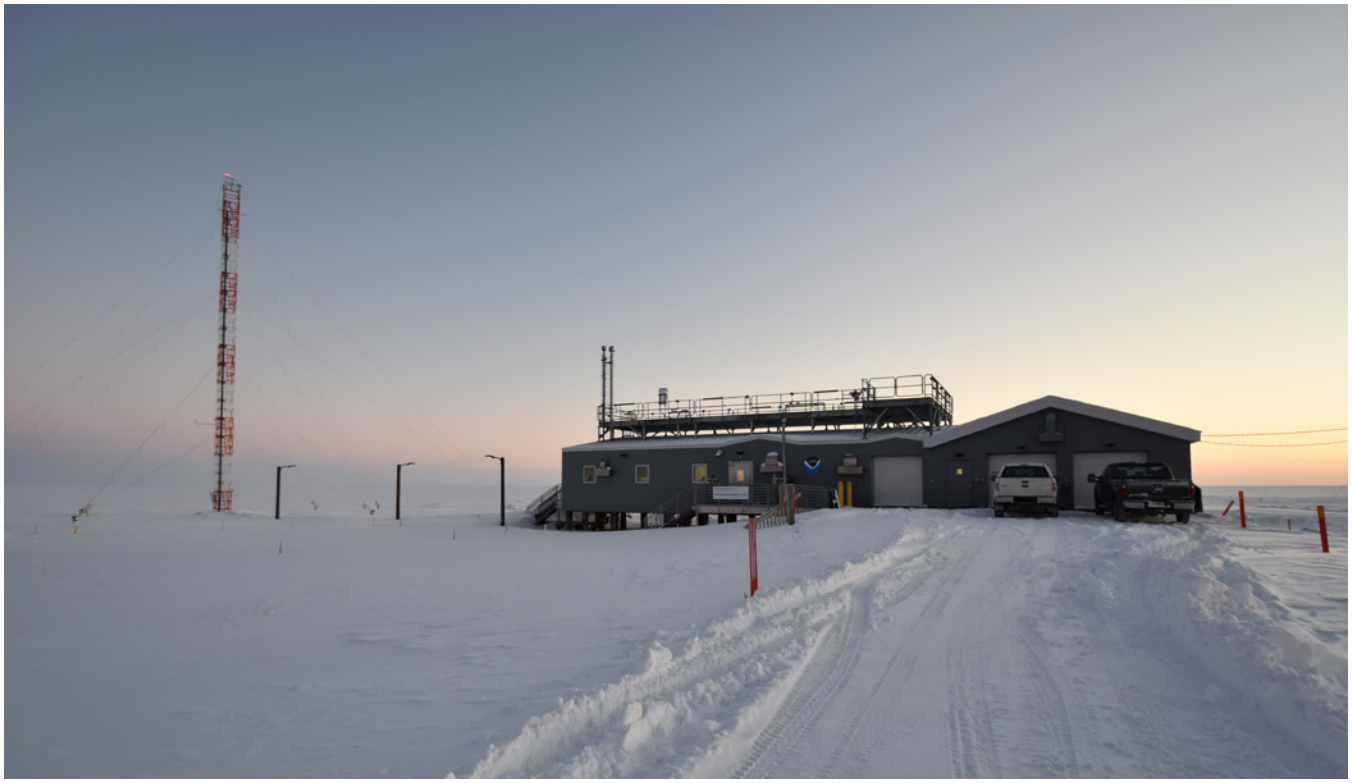
Mission Services and Management $196,419,000

NOAA requests an increase of $25,792,000 in program changes for a total of $196,419,000 for the Mission Services and Management activity. These funds will support the planning, administrative, financial, procurement, information technology, human resources, and infrastructure services that are essential to the safe and successful performance of NOAA's mission. Program changes include:

Mission Services and Management: Acquisition and Grants Office: NOAA requests an increase of $2,530,000 for personnel to process and manage new grants, and diligently monitor those grants to ensure good performance and proper financial stewardship.

Mission Services and Management: Increase Facility Program Capacity: NOAA requests an increase of $5,000,000 to build capacity within the Office of Chief Administrative Officer to coordinate capital investment, sustainment, and deferred maintenance and repair activities supported by NOAA's Facilities Maintenance (ORF) and Construction (PAC) accounts.

Mission Services and Management: Implement a Budget Position Management System: NOAA requests an increase of $1,400,000 to implement a budget position management system to improve NOAA's ability to report required position data and be directly responsive to Congressional directives in recent years. The establishment of a transparent linkage between positions and budget is a necessary component for oversight and interoperability to continuously improve the provision of human capital services, most importantly the hiring process, across NOAA.



In November 2021, construction of the Utqiaġvik Atmospheric Baseline Observatory was completed. Throughout the project, measures were taken to use sustainable materials and incorporate energy conserving technologies and best practices. The result was a LEED Silver qualification from the U.S. Green Building Council, making it the northernmost remote LEED certified facility at NOAA.

Mission Services and Management: Equity Assessment and Implementation Support In Compliance with EO 13985: NOAA requests an increase of $900,000 to expand the number of Service Equity Assessments of NOAA's programs and services per Section 5 of EO 13895 and learn, through the statistical collection of evidence, which plans are effective in addressing barriers. In this way, it will be possible to quickly incorporate lessons learned and institutionalize an efficient strategy for equitable service delivery at NOAA.

Mission Services and Management: NOAA Finance Transaction Processing: NOAA requests an increase of $800,000 for additional support staff to ensure successful processing and appropriate oversight of financial transactions associated with the appropriated resources requested in the FY 2023 President's Budget. Additional staff will review internal controls, support external audit requests and analysis, and provide financial policy guidance and reporting.

Mission Services and Management: NOAA Open Data Dissemination: NOAA requests an increase of $3,300,000 to evolve NOAA's proven, cost-effective Big Data Program into an Enterprise-wide Service, NOAA Open Data Dissemination (NODD). NODD will provide worldwide cloud access to all of NOAA's rapidly increasing open data, including climate data and other Earth System dynamics crucial to improve climate modeling.

Mission Services and Management: NOAA Cloud Program: NOAA requests an increase of $2,500,000 to establish a NOAA Enterprise Cloud Program Office to streamline and accelerate the transition of NOAA mission areas to the cloud and access to innovative cloud inherent technologies. The program will deliver comprehensive multi-cloud

services, avoiding the need for duplication of effort across NOAA in the following areas: acquisition support, networking, cybersecurity, authentication services, cloud subject matter expertise, and customer advocacy.

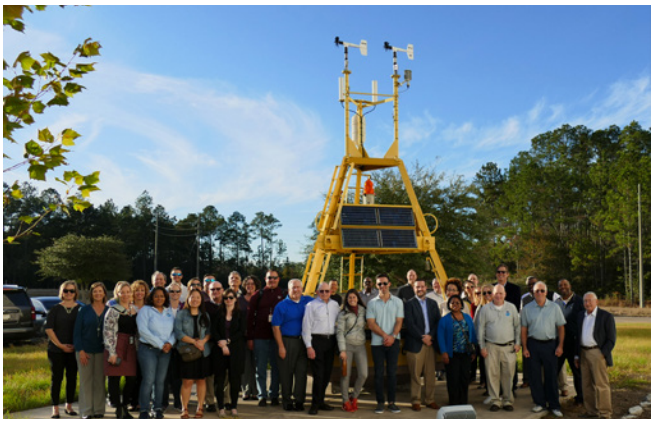
Mission Services and Management: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $1,770,000 to conduct a technology modernization and support an accelerated transition of telecommunications services to the General Services Administration (GSA) EIS contract vehicle.

Mission Services and Management: Spectrum: NOAA requests an increase of $500,000 to more effectively manage its access to spectrum and support wireless broadband.

Mission Services and Management: Strengthen Diversity in NOAA IT: NOAA requests an increase of $400,000 to expand an IT Fellowship Program to diversify its high-quality, entry-level Information Technology (IT) workforce. Demand for IT professionals is high nationwide. In order to compete with the private sector and other government agencies, NOAA must expand the opportunities it provides to promising candidates, including IT professionals of color.

Mission Services and Management: NOAA Recruiting Program: NOAA requests an increase of $1,500,000 to develop and execute a NOAA-wide recruiting program. This program will improve entry level hiring outreach and create a student-in-residence program to engage and employ students on a part-time basis year round to assist with recruiting efforts on the campuses of targeted minority serving institutions.

Mission Services and Management: Facilitation Network: NOAA requests an increase of $600,000 to formalize and manage a NOAA Facilitation Network, an internal, cross-line office effort to develop organizational excellence by promoting more inclusive, productive and efficient meetings, planning sessions and training workshops.



NOAA staff gain in-depth knowledge of operations and contractual requirements at the National Data Buoy Center.

Mission Services and Management: Accelerate NOAA's Diversity and Inclusion Plan: NOAA requests an increase of $2,900,000 to fully implement its Diversity and Inclusion (D&I) Plan. This will enable NOAA to comply with the provisions of EO 13985 to assess current programs and policies which perpetuate systemic barriers to opportunities and benefits for people of color and other underserved populations. Training and outreach resources are required for staff, supervisors and leaders. Tools will be developed to track progress and measure D&I outcomes.

Mission Services and Management: Workplace Violence Prevention and Response Program—Racial Equity and Wellness: NOAA requests an increase of $1,692,000 to establish three full-time positions to support program evaluations such as needs assessments, and gap analyses to ensure culturally competent victim services, social justice, and racial equity. The WVPRP will also co-lead the implementation of EO 13985, Section 8 goals of strengthening engagement of underserved communities, by embedding community liaisons strategically in selected NOAA programs to build more meaningful coordination.

IT Security $16,393,000

NOAA requests a total of $16,393,000 in the IT Security activity. These funds defend NOAA's data, networks, equipment, intellectual property and personnel against a wide variety of adversaries ranging from nation states to lone-wolf attackers. There are no program changes requested for this activity.

Payment to DOC Working Capital Fund $71,299,000

NOAA requests a total of $71,299,000 for the payment to the DOC Working Capital Fund activity. There are no program changes requested for this activity.

Facilities Maintenance $5,000,000

NOAA requests a total of $5,000,000 in the Facilities Maintenance activity. There are no program changes requested for this activity. In FY 2023, NOAA will continue to reduce the backlog of deferred maintenance and repair across the NOAA facilities portfolio, provide project and program management, and begin pre-planning for Silver Spring Metro Center lease requirements. There are no program changes requested for this activity.

Office of Space Commerce $87,700,000

NOAA requests an increase of $77,700,000 in program changes for a total of $87,700,000 in the Office of Space Commerce activity. These funds will foster the conditions for the economic growth and technological advancement of the U.S. commercial space industry. Program changes include:

Office of Space Commerce: Office of Space Commerce: NOAA requests an increase of $77,700,000 to support the development of a space situational awareness (SSA) capability informed by Space Policy Directive-3. This includes supporting partnerships between the Department of Defense and other Federal agencies, and commercial industry to share SSA information through an OADR. The OADR will manage a future environment which is expected to comprise 57,000 new satellites in orbit by the year 2030. As of 2022, there are approximately 6,100 satellites on orbit, roughly 1,000 of which launched in 2021.

Virtual reality, like Sanctuaries 360°, a collection of immersive underwater experiences can bring these exceptional places to viewers all over the world. This student explores these underwater parks from his home in California as part of Get into Your Sanctuary celebrations.

Office of Education $41,351,000

NOAA requests an increase of $7,900,000 in program changes for a total of $41,351,000 in the Office of Education activity. These funds will support a centralized Office of Education focused on coordinating and improving the performance of NOAA's numerous activities in STEM education. This request recognizes this office's critical role as the primary point of contact for the National Science and Technology Council's Committee on STEM for NOAA and DOC. Program changes include:

Teacher at Sea Alum Marsha Skoczek holds a sea star in her classroom's touch tank. Credit: Marsha Skoczek/Teacher at Sea

Office of Education: Educational Partnership Program Climate Cooperative Science Center: NOAA requests an increase of $3,000,000 to establish a NOAA Climate Cooperative Science Center as part of the José E. Serrano Educational Partnership Program with Minority Serving Institutions. Through a national competition, the Center will be established to train post-secondary students in climate science and related multi-disciplinary fields including, atmospheric sciences, oceanography, Earth science, meteorology, hydrology, geography, physics, chemistry and computer sciences.

Office of Education: Engaging New and Diverse Audiences with NOAA Science: NOAA requests an increase of $2,900,000 to provide dedicated funding to build on its most successful public engagement programs, such as NOAA Heritage initiatives and the Coastal Ecosystem Learning Centers Network. This initiative will increase NOAA's capacity to bring NOAA's cutting-edge science and compelling history to new audiences, with a focus on enhancing equity by engaging cultural and racial minorities.

Office of Education: Environmental Literacy Grants for Community Resilience Education: NOAA requests an increase of $2,000,000 for environmental literacy grants to develop and implement innovative approaches to building community resilience through formal and informal education and engage the most vulnerable children, youth, and adults in learning about and creating resilience for their communities. This increase will enable the Office of Education to fund more projects that involve the communities that bear a disproportionate share of the burden of climate change, including communities of color, low income communities, and Tribal and indigenous communities.

FY 2023 PAC Budget Summary

NOAA requests a total of $145,700,000 to support the PAC activities of Mission Support, reflecting a net increase of $102,700,000 in FY 2023 program changes.

NOAA Construction $145,700,000

NOAA requests a net increase of $102,700,000 in program changes for a total of $145,700,000 in the NOAA Construction activity. NOAA's facilities constitute a significant capital investment with over 690 different facilities across 160 markets and 6,965,592 total Usable Square Feet, including 401 NOAA-owned facilities with an estimated replacement value of $3 billion. Program changes include:

Bay Watershed Education and Training (B-WET) supported Environmental Science Center naturalists as they walked students through water quality testing. These naturalists worked virtually with students on the Duwamish River in Seattle, Washington. Students used Zoom to share their analyses of the water quality tests.

NOAA Construction: Northwest Fisheries Science Center Facilities Consolidation: NOAA requests an increase of $83,200,000 for the consolidation and realignment of Northwest Fisheries Science Center (NWFSC) facilities in the vicinity of Seattle, Washington. Necessary improvements will be made to ensure continuation of the research and innovation to build sustainable fisheries, restore threatened and endangered species, safeguard healthy ecosystems, and reduce risks to human health.

NOAA Construction: NOAA Construction: NOAA requests an increase of $19,500,000 for facilities construction to ensure safe and modern facilities to support NOAA's critical science, service, and stewardship missions and in support of EO 14057 on *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*. NOAA's facilities and infrastructure are vulnerable to the full range of weather and climate extremes. This request sustains funding for major and minor capital improvement projects at facilities supporting marine operations and scientific research in accordance with NOAA's current facilities investment and strategic plans, studies, and business case analyses that inform NOAA and DOC on how to prioritize and fund competing objectives from a portfolio perspective.

NOAA Corps officer Lieutenant Junior Grade Linda Junge operates sensors aboard a NOAA Beechcraft King Air during a storm damage assessment flight after Hurricane Ida.

Chapter 8

Office of Marine and Aviation Operations

NOAA's Office of Marine and Aviation Operations (OMAO) manages 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. OMAO also provides centralized coordination, support and guidance for unmanned systems across NOAA. OMAO includes civilians, mariners, and officers of the NOAA Commissioned Officer Corps (NOAA Corps), one of the eight uniformed services of the United States. NOAA is currently authorized for up to 500 NOAA Corps officers, excluding flag officers.

FY 2021 Accomplishments

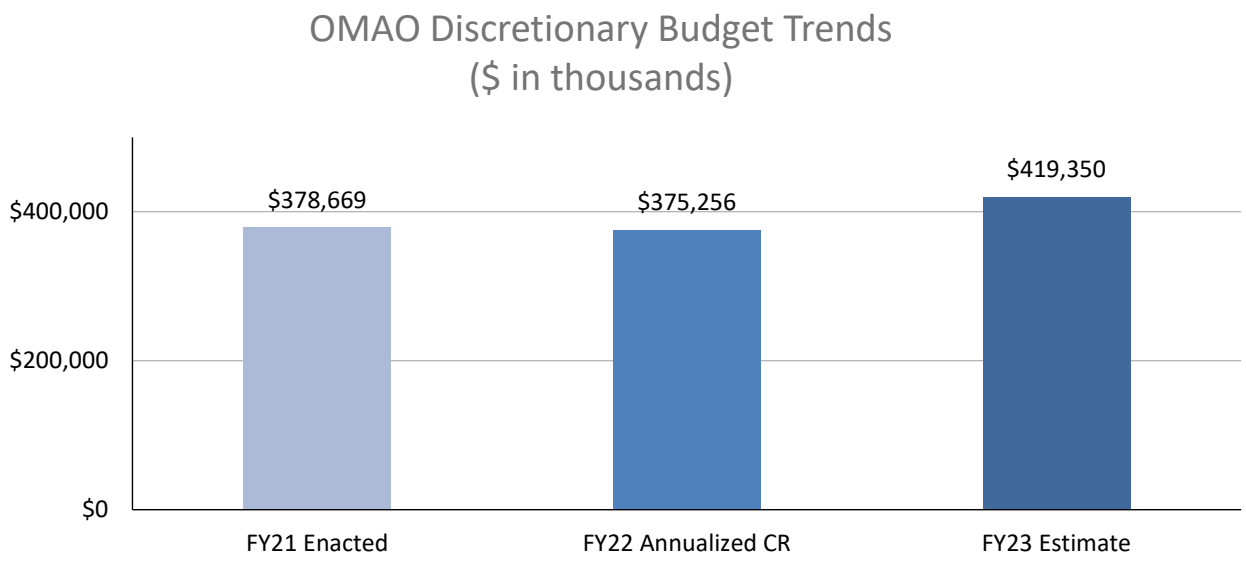
Despite the continuing challenges created by the Coronavirus Pandemic, all fifteen NOAA Ships and nine NOAA Aircraft operated in support of NOAA prioritized requirements in FY 2021.

On August 31, 2021, NOAA held a groundbreaking ceremony to revitalize NOAA's port facility in Ketchikan, Alaska. Upon completion of the project, NOAA will have a fully functioning homeport in Alaska capable of supporting Ketchikan-based NOAA Ship *Fairweather* and other visiting NOAA and government vessels. NOAA expects the project to be completed by December 2022.

NOAA's effort to recapitalize its aging fleet of research ships took a major step forward on December 31, 2020, with the award of a contract to Thoma-Sea Marine Constructors LLC in Houma, Louisiana, for the detailed design and construction of two new oceanographic ships. The first ship, the *Oceanographer*, will be homeported in Honolulu, Hawaii. The second ship, the *Discoverer*, will be homeported in Newport, Rhode Island. Both ships will be among the world's most advanced research vessels, operating around the world to study and explore the ocean.

In response to Hurricane Delta in FY 2021, the NOAA Ship *Thomas Jefferson (TJ)* cleared the approaches to Calcasieu Channel, Lake Charles, LA, the eleventh largest port in the country. Without the *TJ's* efforts, the port would have remained closed for several weeks to months, critically impacting maritime commerce and safety. The *TJ* surveyed 30 nautical miles of offshore shipping channels, discovered 42 offshore aids-to-navigation that were off-station (buoys, etc), and located a sunken barge that was a hazard to navigation in a major shipping channel.

OMAO enhanced the ability to collect data vital to forecasters, researchers and emergency managers with NOAA's first new aircraft in over 10 years. The Beechcraft King Air 350 CER turboprop replaced the aged and less capable Gulfstream Turbo Commander. The new aircraft is outfitted with remote sensing equipment that measures the water content of snow and soil—data that is used for flood, river level and water supply forecasts. The King Air can also be configured to support other NOAA missions. Since receiving the aircraft in December 2020, NOAA Corps officers and civilians have performed nearly 1,000 flight hours



providing information fundamental for flood forecasts and water resource management.

NOAA and the University of Southern Mississippi (USM) signed a 10-year agreement in February 2021, to partner on development and applications for uncrewed systems (UxS) and future workforce development. Supported by funding for NOAA's Uncrewed Systems Operations Center (UxSOC), the agreement provides a framework for USM collaborating with NOAA scientists and UxS operators on projects to further UxS platforms, payloads, and applications. The recent increase in the availability of highly capable UxS has resulted in a corresponding increase in their innovative use as a force multiplier for many NOAA programs.

FY 2023 Request $450,354,000

NOAA requests a total of $450,354,000 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 includes a net increase of $22,421,000 in FY 2023 program changes.

NOAA will scale up efforts to develop and deliver climate products and services building on research, observations and forecasting, and restoration and resilience efforts. The FY 2023 request continues NOAA's data collection capabilities at sea and air, improving the ability of the NOAA fleet to inform climate science while investing in NOAA's workforce. With these funds, NOAA will provide capable, mission-ready aircraft and professional crews to better meet demand for data during increasingly active hurricane seasons, maximizing the critical data sets that only NOAA aircraft can collect. NOAA will continue the adoption of new technologies through uncrewed systems to better understand and mitigate the impacts of climate change.

NOAA continues investments to sustain its current Hurricane Hunters. Resources are requested to support the Service Depot Level Maintenance of NOAA's two P-3 Hurricane Hunter aircraft. The ability to issue accurate forecasts and warnings that inform decision makers and the public about the impact of storm surge, heavy rain, wind and

tornadoes depends on these aircraft.

OMAO's activities are directly aligned with Administration priorities, including EO 14008, through support for a science-based climate response and Made in America initiatives to benefit the American economy.

NOAA will advance diversity, equity, and inclusion within our workforce partnerships, and communities we serve, as well as in the development and delivery of NOAA's products and services. Additional resources are included for increases in ship personnel and training, expanding NOAA's ability to address behavior and mental health within the workforce, and for a robust approach to diversity, equity, and inclusion.

Furthermore, NOAA seeks to further increase clarity and programmatic transparency in FY 2022 by consolidating funds from other Line Offices supporting the NOAA Corps within OMAO in the NOAA Commissioned Officer Corps activity. This transfer will allow for better alignment of funding and greater transparency over the full cost of the NOAA Corps. This transfer also increases efficiency within the program by reducing administrative burdens, and allows NOAA to better manage personnel requirements consistent with the NOAA Corps Amendments Act of 2020.

Program change increases are highlighted below. A summary of funding by Program, Project, and Activity is located in Appendix 2. Detailed descriptions of the program changes below are located in the NOAA FY 2023 Congressional Justification.

FY 2023 ORF Budget Summary

NOAA requests a total of $312,733,000 to support the ORF activities of the OMAO, reflecting an increase of $37,421,000 in FY 2023 program changes.

Marine Operations and Maintenance $203,646,000

NOAA requests an increase of $28,385,000 in program changes for a total of $203,646,000 in the Marine Operations and Maintenance activity. These funds allow NOAA to provide ships capable of meeting prioritized, geographical and temporal, at-sea NOAA requirements and will advance maintenance and operations for NOAA's diverse fleet of vessels. NOAA ships range from large oceanographic research vessels capable of exploring the world's deepest oceans to smaller ships responsible for charting the shallow bays and inlets of the United States. Program changes include:

Marine Operations and Maintenance: Enhanced NOAA Fleet Operations: NOAA requests an increase of $26,985,000 to support NOAA missions. Staffing, ship operations and maintenance, including mission systems, habitable space, and advancements in safety systems, increased Very Small Aperture Terminal (VSAT) bandwidth, and preparation for NOAA's new ships are critical for enhanced operations. Investments in personnel and training will support growth in NOAA's at-sea data collection requirements, improve diversity, crew readiness, and the quality of life aboard its vessels. As ships operate at a higher tempo, enhancing investments in mission systems will be critical to sustaining Fleet readiness, expanding ship capabilities, and executing the Fleet Allocation Plan in support of NOAA's rigorous scientific and regulatory missions. NOAA will also continue preparations to bring its first two new vessels, the *Oceanographer* and the *Discoverer*, on-line.

Marine Operations and Maintenance: Office of Health Services Increase: NOAA requests an increase of $1,200,000 for the Office of Health Services (OHS) to expand NOAA's ability to address

NOAA Ship *Fairweather* in Alaska's College Fjord.

behavioral and mental health within the workforce. These additional resources will help build and shape a total worker wellness program for the workforce and agency.

Marine Operations and Maintenance: Enterprise Infrastructure Solutions (EIS): NOAA requests an increase of $200,000 to conduct technology modernization and support an accelerated transition of telecommunications services to the General Services Administration (GSA) EIS contract vehicle.

Aviation Operations and Aircraft Services $39,292,000

NOAA requests an increase of $5,000,000 in program changes for a total of $39,292,000 in the Aviation Operations and Aircraft Services activity. These resources will help provide capable, mission-ready aircraft and professional crews to safely meet NOAA's scientific mission by assisting with coastal mapping, flood prediction, hurricane prediction modeling, marine mammal population assessments, coastal erosion surveys, oil spill investigations and air quality studies. Program changes include:

Aviation Operations and Aircraft Services: Increased Aircraft Operations in Support of Cross-NOAA Climate Objectives: NOAA requests an increase of $5,000,000 in support of NOAA's climate objective with staffing for 24-hour hurricane operations and additional flight hours. The request will sustain flight hours while renting engines required to continue operating NOAA's high altitude jet Hurricane Hunter. This request will strengthen NOAA's ability to meet current and growing demands for airborne data requirements resulting from more frequent and intense storms, rapidly intensifying storms, and the reliability and significant impact of NOAA aircraft data to hurricane forecasts. For example, demand for hurricane hours on NOAA's P-3s has more than doubled since 2015.

Autonomous Uncrewed Technology Operations $14,358,000

NOAA requests a total of $14,358,000 for the Autonomous Uncrewed Technology Operations activity. This total allows OMAO to continue providing centralized coordination, support, and guidance for unmanned marine and aircraft systems across NOAA, evaluate emerging technologies, manage unmanned systems acquisitions, and determine cost-effective opportunities to carry out NOAA mission-critical activities. There are no program changes requested for this activity.

NOAA Commissioned Officer Corps $55,437,000

NOAA requests an increase of $4,036,000 in program changes for a total of $55,437,000 in the NOAA Commissioned Officer Corps activity. This newly established budget line supports NOAA Corps Officers that operate NOAA ships, fly aircraft, operate uncrewed systems, conduct diving operations, and serve in NOAA staff positions to fulfill NOAA's mission requirements. Program changes include:

NOAA Commissioned Officer Corps: Grow the NOAA Corps: NOAA requests an increase of $3,136,000 to strengthen NOAA's ability to meet current and growing demands for airborne and marine data requirements resulting from climate-induced changes by hiring ten additional NOAA

Corps Officers, consisting of eight aviators and two marine officers. These officers will staff NOAA's 3rd P-3 crew and an initial transition team for the Oceanographer and Discoverer. As climate change results in floods and droughts, spurs more frequent and intense hurricanes, alters the distribution of fisheries, and threatens coastal resources, scientists and decision-makers increasingly require data from NOAA aircraft and ships—operated by NOAA Corps officers—to inform products and services for the Nation.

NOAA Commissioned Officer Corps: NOAA Corps Recruitment: NOAA requests an increase of $900,000 for NOAA to accelerate and improve NOAA Corps recruitment levels, with a focus on leveraging programs to underserved communities and building partnerships with Minority Serving Institutions (MSIs) and Historically Black Colleges and Universities (HBCUs) to improve diversity. An inclusive environment will improve individual and organizational performance and result in better value to customers and other stakeholders.

FY 2023 PAC Budget Summary

NOAA requests a total of $105,000,000 to support the PAC activities of the OMAO, reflecting a net decrease of $15,000,000 in FY 2023 program changes.

Marine and Aviation Capital Investments $105,000,000

NOAA requests a net decrease of $15,000,000 in program changes for a total of $105,000,000 in the Marine and Aviation Capital Investments activity. These resources will enable OMAO to continue to

Sunrise seen from the flight station of NOAA WP-3D Orion "Kermit" as it heads to Tropical Storm Elsa on July 4, 2021.

NOAA WP-3D Orion "Kermit" before takeoff to Tropical Storm Elsa on July 4, 2021.

maintain its vessels and aircraft, and provide the sustained technology refresh that plays a critical role in the in-situ collection of oceanographic, atmospheric, hydrographic, and fisheries data in support of NOAA's missions. Program change increases include:

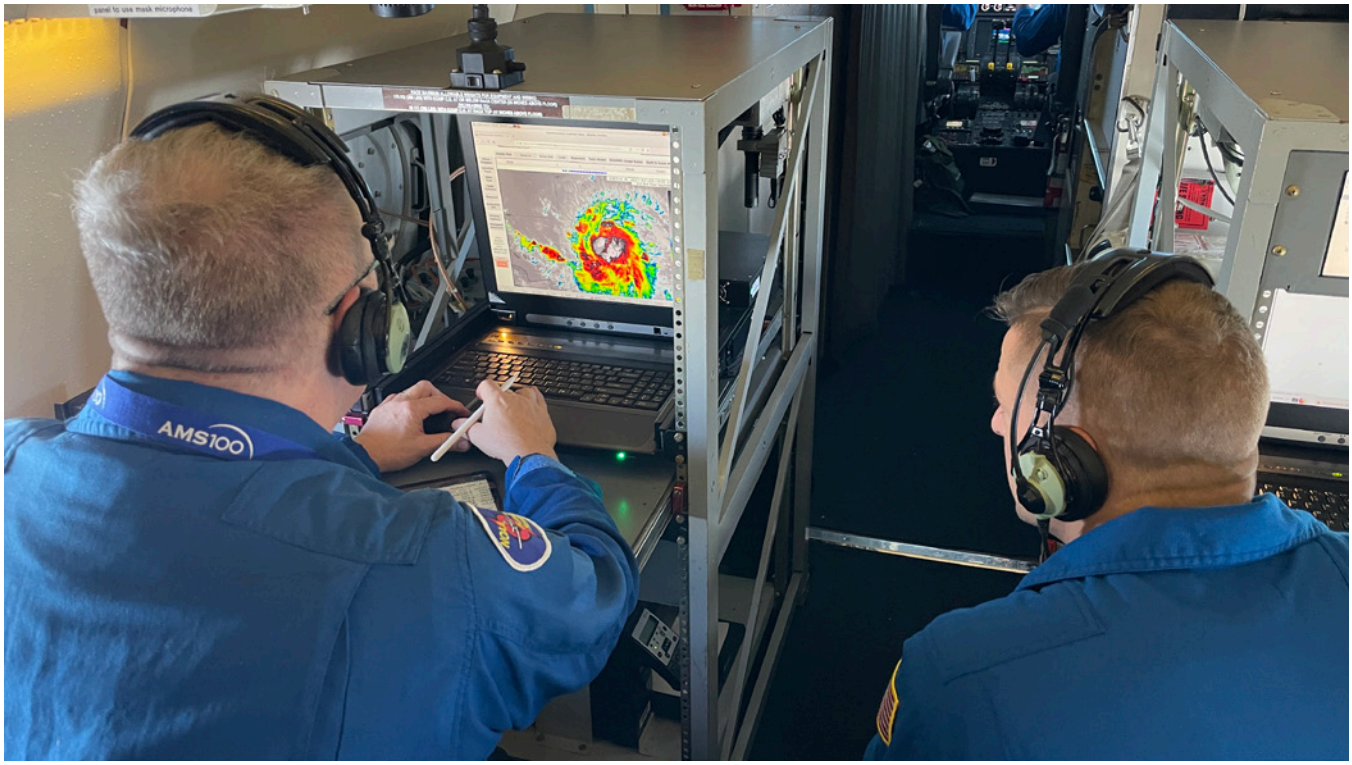
Platform Capital Improvements & Tech Infusion: P-3 Service Depot Level Maintenance: NOAA requests an increase of $5,000,000 for Service Depot Level Maintenance for NOAA's two P-3 Hurricane Hunter aircraft. This maintenance is required to maintain the aircraft's airworthiness until the end of their service life in 2030 and will provide the necessary certification, a legal requirement to fly. The P-3s are extremely important airborne tools for NOAA's climate products and services. They collect data that informs hurricane forecasts, fire predictions, tornado warnings and much more.

Aircraft Recapitalization and Construction: Suspend Aircraft Recapitalization: NOAA requests a decrease of $20,000,000 to suspend its aircraft recapitalization program and will not acquire any additional aircraft at this funding level. Acquisition of a G-550 is underway to replace the G-IV. When the G-IV is out of service, NOAA will use NASA's G-V high altitude jet in a back-up capacity, when available, to meet tasking during the hurricane season until its G-550 is complete. NOAA is currently updating its Aircraft Recapitalization Plan, which will inform future budget requests and further identify plans for the critical replacement of the P-3 Hurricane Hunters.

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



NOAA flight directors Rich Henning and Quinn Kalen monitor Hurricane Elsa during a July 2, 2021 mission on board NOAA's Gulfstream IV-SP.

will cover the future healthcare benefits of present, active-duty NOAA officers and their dependents and annuitants. FY 2023 payments to the accrual fund are estimated to be $1,617,000. This is a slight increase over the FY 2022 Annualized CR amount ($1,591,000).

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. Healthcare funds for non-Medicare eligible retirees, dependents, and annuitants are transferred to the U.S. Public Health Service, which administers the health care program.

Appendix 1

Technical Transfers

ORF Account

Line Office	PPA	OMAO NOAA Corps	NESDIS Restructure	NESDIS Operational Phase Transfers	Office of Space Commerce	DOC Working Capital Fund	Total PPA Technical ATB
NOS	Navigation, Observations and Positioning	(2,044)					(2,044)
NOS	Coastal Science, Assessment, Response & Restoration	(319)					(319)
NOS	Sanctuaries and Marine Protected Areas	(563)					(563)
NMFS	Fisheries Data Collections, Surveys, and Assessments	(1,562)					(1,562)
OAR	Climate Laboratories & Cooperative Institutes	(261)					(261)
OAR	Ocean Laboratories and Cooperative Institutes	(390)					(390)
OAR	Ocean Exploration and Research	(130)					(130)
OAR	Sustained Ocean Observations and Monitoring	(130)					(130)
NWS	Observations	(324)					(324)
NWS	Central Processing	(346)					(346)
NWS	Analyze, Forecast and Support	(54)					(54)
NESDIS	Office of Satellite and Product Operations	(277)		40,490			40,213
NESDIS	Product Development, Readiness & Application	(276)		14,600			14,324
NESDIS	Office of Space Commerce				(10,000)		(10,000)
NESDIS	National Centers for Environmental Information			1,000			
MS	Mission Services and Management	(661)				3,071	2,410
MS	Payment to the DOC Working Capital Fund					(3,071)	(3,071)
MS	Office of Space Commerce				10,000		10,000
OMAO	NOAA Commissioned Officer Corps	7,337					7,337

PAC Account

Line Office	PPA	OMAO NOAA Corps	NESDIS Restructure	NESDIS Operational Phase Transfers	Office of Space Commerce	DOC Working Capital Fund	Total PPA Technical ATB
NESDIS	Geostationary Systems–R		(334,500)				(334,500)
NESDIS	Polar Weather Satellites		(657,835)				(657,835)
NESDIS	Cooperative Data and Rescue Services (CDARS)		(14,400)				(14,400)
NESDIS	Space Weather Follow On		(108,115)				(108,115)
NESDIS	COSMIC-2 / GNSSRO		(5,892)				(5,892)
NESDIS	Common Ground Services (CGS)		9,339	7,800			17,139
NESDIS	Projects, Planning, and Analysis		(15,945)				(15,945)
NESDIS	Geostationary Earth Orbit (GEO)		334,500				334,500
NESDIS	Low Earth Orbit (LEO)		678,127	(63,890)			614,237
NESDIS	Space Weather Observations		114,721				114,721
Total		0	0	0	0	0	(1,000)

* The total PPA Technical ATB column aligns with the amounts for each PPA in the Technical ATBs column of the FY 2023 President's Budget Control Table as reflected in the CJ.

**Note that the FY 2023 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.

Appendix 2

Control Table

National Ocean Service ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Navigation, Observations and Positioning					
Navigation, Observations and Positioning	162,500	10,058	172,558	15,544	188,102
Hydrographic Survey Priorities/Contracts	32,000	27	32,027	12,500	44,527
IOOS Regional Observations	40,500	0	40,500	0	40,500
Total, Navigation, Observations and Positioning	235,000	10,085	245,085	28,044	273,129
Coastal Science and Assessment					
Coastal Science, Assessment, Response and Restoration	86,500	5,438	91,938	9,619	101,557
Competitive Research	21,000	17	21,017	14,500	35,517
Total, Coastal Science and Assessment	107,500	5,455	112,955	24,119	137,074
Ocean and Coastal Management and Services					
Coastal Zone Management and Services	46,700	2,480	49,180	300	49,480
Coastal Zone Management Grants	78,500	0	78,500	0	78,500
National Oceans and Coastal Security Fund	34,000	0	34,000	(34,000)	0
Coral Reef Program	33,000	441	33,441	0	33,441
National Estuarine Research Reserve System	28,500	0	28,500	0	28,500
Sanctuaries and Marine Protected Areas	56,500	3,408	59,908	26,863	86,771
Total, Ocean and Coastal Management and Services	277,200	6,329	283,529	(6,837)	276,692
Total, NOS - Discretionary ORF	619,700	21,869	641,569	45,326	686,895
Total, NOS - Discretionary PAC	8,500	0	8,500	0	8,500
Total, NOS - Other Discretionary Accounts	0	0	0	0	0
Discretionary Total - NOS	628,200	21,869	650,069	45,326	695,395
Total, NOS - Mandatory Accounts	52,449	(28,021)	24,428	0	24,428
GRAND TOTAL NOS	680,649	(6,152)	674,497	45,326	719,823

National Marine Fisheries Service ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Protected Resources Science and Management					
Marine Mammals, Sea Turtles, and Other Species	125,164	8,244	133,408	9,476	142,884
Species Recovery Grants	7,000	21	7,021	10,000	17,021
Atlantic Salmon	6,500	418	6,918	0	6,918
Pacific Salmon	67,000	6,142	73,142	0	73,142
Total, Protected Resources Science and Management	205,664	14,825	220,489	19,476	239,965
Fisheries Science and Management					
Fisheries and Ecosystem Science Programs and Services	146,927	10,450	157,377	22,869	180,246
Fisheries Data Collections, Surveys, and Assessments	175,927	7,226	183,153	28,942	212,095
Observers and Training	55,468	1,999	57,467	(2,332)	55,135
Fisheries Management Programs and Services	123,836	8,590	132,426	16,655	149,081
Aquaculture	17,500	679	18,179	0	18,179
Salmon Management Activities	62,050	712	62,762	0	62,762
Regional Councils and Fisheries Commissions	41,500	2,797	44,297	0	44,297
Interjurisdictional Fisheries Grants	3,365	12	3,377	0	3,377
Total, Fisheries Science and Management	626,573	32,465	659,038	66,134	725,172
Enforcement					
Enforcement	75,000	4,899	79,899	0	79,899
Total, Enforcement	75,000	4,899	79,899	0	79,899
Habitat Conservation and Restoration					
Habitat Conservation and Restoration	57,625	3,728	61,353	0	61,353
Subtotal, Habitat Conservation & Restoration	57,625	3,728	61,353	0	61,353
Total, NMFS - Discretionary ORF	964,862	55,917	1,020,779	85,610	1,106,389
Total, NMFS - Discretionary PAC	0	0	0	0	0
Total, NMFS - Other Discretionary Accounts	65,349	0	65,349	300	65,649
Discretionary Total - NMFS	1,030,211	55,917	1,086,128	85,910	1,172,038
Total, NMFS - Mandatory Accounts	51,164	(18,205)	32,041	0	32,041
GRAND TOTAL NMFS	1,081,375	37,712	1,118,169	85,910	1,204,079

Office of Oceanic and Atmospheric Research ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Climate Research					
Climate Laboratories & Cooperative Institutes	75,500	2,972	78,472	30,261	108,733
Regional Climate Data & Information	42,500	903	43,403	13,000	56,403
Climate Competitive Research	64,000	1,503	65,503	26,000	91,503
Total, Climate Research	182,000	5,378	187,378	69,261	256,639
Weather & Air Chemistry Research					
Weather Laboratories & Cooperative Institutes					
Weather Laboratories & Cooperative Institutes	85,500	4,105	89,605	0	89,605
Subtotal, Weather Laboratories and Cooperative Institutes	85,500	4,105	89,605	0	89,605
Weather and Air Chemistry Research Programs					
U.S. Weather Research Program (USWRP)	26,500	499	26,999	0	26,999
Tornado Severe Storm Research / Phased Array Radar	14,382	247	14,629	6,287	20,916
Joint Technology Transfer Initiative	13,000	246	13,246	0	13,246
Subtotal, Weather and Air Chemistry Research Programs	53,882	992	54,874	6,287	61,161
Total, Weather and Air Chemistry Research	139,382	5,097	144,479	6,287	150,766
Ocean, Coastal, and Great Lakes Research					
Ocean Laboratories and Cooperative Institutes					
Ocean Laboratories and Cooperative Institutes	36,500	1,507	38,007	0	38,007
Subtotal, Ocean Laboratories and Cooperative Institutes	36,500	1,507	38,007	0	38,007
National Sea Grant College Program					
National Sea Grant College Program	75,000	1,316	76,316	0	76,316
Sea Grant Aquaculture Research	13,000	235	13,235	0	13,235
Subtotal, National Sea Grant College Program	88,000	1,551	89,551	0	89,551
Ocean Exploration and Research	43,000	894	43,894	0	43,894
Integrated Ocean Acidification	15,500	376	15,876	0	15,876
Sustained Ocean Observations and Monitoring	45,408	848	46,256	0	46,256
National Oceanographic Partnership Program	3,000	55	3,055	0	3,055
Total, Ocean, Coastal, and Great Lakes Research	231,408	5,231	236,639	0	236,639
Innovative Research & Technology					
High Performance Computing Initiatives	17,800	431	18,231	0	18,231
Uncrewed Systems	0	0	0	4,000	4,000
Total, Innovative Research & Technology	17,800	431	18,231	4,000	22,231
Total, OAR - Discretionary ORF	570,590	16,137	586,727	79,548	666,275

Office of Oceanic and Atmospheric Research Cont'd ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Total, OAR - Discretionary PAC	43,500	0	43,500	65,000	108,500
Discretionary Total - OAR	614,090	16,137	630,227	144,548	774,775

National Weather Service ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Observations	231,910	15,183	247,093	750	247,843
Central Processing	97,980	10,373	108,353	0	108,353
Analyze, Forecast and Support	537,000	38,476	575,476	8,700	584,176
Dissemination	78,362	4,896	83,258	36,400	119,658
Science and Technology Integration	155,524	8,755	164,279	(5,000)	159,279
Total, NWS - Discretionary ORF	1,100,776	77,683	1,178,459	40,850	1,219,309
Total, NWS - Discretionary PAC	103,634	0	103,634	470	104,104
Discretionary Total - NWS	1,204,410	77,683	1,282,093	41,320	1,323,413

National Environmental Satellite, Data, and Information Service

($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Environmental Satellite Observing Systems					
Office of Satellite and Product Operations	189,099	50,803	239,902	9,000	248,902
Product Development, Readiness & Application	28,434	16,165	44,599	23,741	68,340
Office of Space Commerce	10,000	(10,000)	0	0	0
U.S. Group on Earth Observations (USGEO)	500	0	500	500	1,000
Total, Environmental Satellite Observing Systems	228,033	56,968	285,001	33,241	318,242
National Centers for Environmental Information					
National Centers for Environmental Information	63,500	4,832	68,332	22,500	90,832
Total, National Centers for Environmental Information	63,500	4,832	68,332	22,500	90,832
Total, NESDIS - Discretionary ORF	291,533	61,800	353,333	55,741	409,074
Total, NESDIS - Discretionary PAC	1,224,924	(54,090)	1,170,834	703,024	1,873,858
Discretionary Total - NESDIS	1,516,457	7,710	1,524,167	758,765	2,282,932

Mission Support ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Mission Support Services					
Executive Leadership	27,078	2,165	29,243	2,500	31,743
Mission Services and Management	156,000	14,627	170,627	25,792	196,419
IT Security	15,378	1,015	16,393	0	16,393
Payment to the DOC Working Capital Fund	66,389	4,910	71,299	0	71,299
Facilities Maintenance	5,000	0	5,000	0	5,000
Office of Space Commerce	0	10,000	10,000	77,700	87,700
Total, Mission Support Services	269,845	32,717	302,562	105,992	408,554
Office of Education					
Office of Education	33,000	451	33,451	7,900	41,351
Total, Office of Education	33,000	451	33,451	7,900	41,351
Total, MS - Discretionary ORF	302,845	33,168	336,013	113,892	449,905
Total, MS - Discretionary PAC	43,000	0	43,000	102,700	145,700
Discretionary Total - MS	345,845	33,168	379,013	216,592	595,605

Office of Marine and Aviation Operations ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Marine Operations and Maintenance	166,000	9,261	175,261	28,385	203,646
Aviation Operations and Aircraft Services	32,000	2,292	34,292	5,000	39,292
Autonomous Uncrewed Technology Operations	13,665	693	14,358	0	14,358
NOAA Commissioned Officer Corps	42,000	9,401	51,401	4,036	55,437
Total, OMAO - Discretionary ORF	253,665	21,647	275,312	37,421	312,733
Total, OMAO - Discretionary PAC	120,000	0	120,000	(15,000)	105,000
Total, OMAO - Other Discretionary Accounts	1,591	26	1,617	0	1,617
Discretionary Total - OMAO	375,256	21,673	396,929	22,421	419,350
Total, OMAO - Mandatory Accounts	30,861	143	31,004	0	31,004
GRAND TOTAL OMAO	406,117	21,816	427,933	22,421	450,354

ORF Summary ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
National Ocean Service	619,700	21,869	641,569	45,326	686,895
National Marine Fisheries Service	964,862	55,917	1,020,779	85,610	1,106,389
Office of Oceanic and Atmospheric Research	570,590	16,137	586,727	79,548	666,275
National Weather Service	1,100,776	77,683	1,178,459	40,850	1,219,309
National Environmental Satellite, Data and Information Service	291,533	61,800	353,333	55,741	409,074
Mission Support	302,845	33,168	336,013	113,892	449,905
Office of Marine and Aviation Operations	253,665	21,647	275,312	37,421	312,733
SUBTOTAL LO DIRECT DISCRETIONARY ORF OBLIGATIONS	4,103,971	288,221	4,392,192	458,388	4,850,580

ORF Adjustments ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
SUBTOTAL ORF DIRECT OBLIGATIONS	4,103,971	288,221	4,392,192	458,388	4,850,580
FINANCING					
Deobligations	(17,500)	0	(17,500)	0	(17,500)
Total ORF Financing	(17,500)	0	(17,500)	0	(17,500)
SUBTOTAL ORF BUDGET AUTHORITY	4,086,471	288,221	4,374,692	458,388	4,833,080
TRANSFERS					
Transfer from P&D to ORF	(246,171)	(102,700)	(348,871)	0	(348,871)
Total ORF Transfers	(246,171)	(102,700)	(348,871)	0	(348,871)
SUBTOTAL ORF APPROPRIATION	3,840,300	185,521	4,025,821	458,388	4,484,209

Procurement, Acquisition, and Construction ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
NOS					
Construction					
National Estuarine Research Reserve Construction	4,500	0	4,500	0	4,500
Marine Sanctuaries Construction	4,000	0	4,000	0	4,000
Subtotal, NOS Construction	8,500	0	8,500	0	8,500
Total, NOS - PAC	8,500	0	8,500	0	8,500
Total, NMFS - PAC	0	0	0	0	0
OAR					
Systems Acquisition					
Research Supercomputing/ CCRI	43,500	0	43,500	25,000	68,500
Research Acquisitions and Management	0	0	0	40,000	40,000
Subtotal, OAR Systems Acquisition	43,500	0	43,500	65,000	108,500
Total, OAR - PAC	43,500	0	43,500	65,000	108,500
NWS					
Systems Acquisition					
Observations	15,700	0	15,700	470	16,170
Central Processing	68,000	0	68,000	0	68,000
Dissemination	9,934	0	9,934	0	9,934
Subtotal, NWS Systems Acquisition	93,634	0	93,634	470	94,104
Construction					
Facilities Construction and Major Repairs	10,000	0	10,000	0	10,000
Subtotal, NWS Construction	10,000	0	10,000	0	10,000
Total, NWS - PAC	103,634	0	103,634	470	104,104
NESDIS					
Systems Acquisition					
Geostationary Systems - R	334,500	(334,500)	0	0	0
Polar Weather Satellites	657,835	(657,835)	0	0	0
Cooperative Data and Rescue Services (CDARS)	14,400	(14,400)	0	0	0
Space Weather Follow On	108,115	(108,115)	0	0	0
COSMIC 2/GNSS RO	5,892	(5,892)	0	0	0
Common Ground Services (CGS)	39,287	17,139	56,426	49,007	105,433
Projects, Planning and Analysis	15,945	(15,945)	0	0	0
Geostationary Earth Orbit (GEO)	10,000	334,500	344,500	620,329	964,829

Procurement, Acquisition, and Construction Cont'd ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Low Earth Orbit (LEO)	0	614,237	614,237	(175,397)	438,840
Space Weather Observations	0	114,721	114,721	173,085	287,806
Systems/Services Architecture and Engineering (SAE)	38,500	0	38,500	36,000	74,500
Subtotal, NESDIS Systems Acquisition	1,224,474	(56,090)	1,168,384	703,024	1,871,408
Construction					
Satellite CDA Facility	2,450	0	2,450	0	2,450
Subtotal, NESDIS Construction	2,450	0	2,450	0	2,450
Transfer to OIG	(2,000)	2,000	0	0	0
Total, NESDIS - PAC	1,224,924	(54,090)	1,170,834	703,024	1,873,858
Mission Support					
Construction					
NOAA Construction	43,000	0	43,000	102,700	145,700
Subtotal, Mission Support Construction	43,000	0	43,000	102,700	145,700
Total, Mission Support - PAC	43,000	0	43,000	102,700	145,700
OMAO					
Marine and Aviation Capital Investments					
Platform Capital Improvements & Tech Infusion	25,000	0	25,000	5,000	30,000
Vessel Recapitalization and Construction	75,000	0	75,000	0	75,000
Aircraft Recapitalization and Construction	20,000	0	20,000	(20,000)	0
Subtotal, Marine and Aviation Capital Investments	120,000	0	120,000	(15,000)	105,000
Total, OMAO - PAC	120,000	0	120,000	(15,000)	105,000
GRAND TOTAL PAC DISCRETIONARY OBLIGATIONS	1,543,558	(54,090)	1,489,468	856,194	2,345,662

PAC Adjustments ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
SUBTOTAL PAC DIRECT OBLIGATIONS	1,543,558	(54,090)	1,489,468	856,194	2,345,662
FINANCING					
Deobligations	(13,000)	0	(13,000)	0	(13,000)
Total PAC Financing	(13,000)	0	(13,000)	0	(13,000)
SUBTOTAL PAC BUDGET AUTHORITY	1,530,558	(54,090)	1,476,468	856,194	2,332,662
TRANSFERS					
Transfer to OIG	2,000	(2,000)	0	0	0
Total PAC Transfers	2,000	(2,000)	0	0	0
SUBTOTAL PAC APPROPRIATION	1,532,558	(56,090)	1,476,468	856,194	2,332,662

Other Accounts Discretionary ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
NMFS					
Fishermen's Contingency Fund Obligations	349	0	349	0	349
Fishermen's Contingency Fund Budget Authority	349	0	349	0	349
Fishermen's Contingency Fund Appropriations	349	0	349	0	349
Promote and Develop Fisheries Obligations	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	(246,171)	(102,700)	(348,871)	0	(348,871)
Promote and Develop Fisheries Appropriation	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund Obligations	65,000	0	65,000	0	65,000
Pacific Coastal Salmon Recovery Fund Budget Authority	65,000	0	65,000	0	65,000
Pacific Coastal Salmon Recovery Fund Appropriation	65,000	0	65,000	0	65,000
Marine Mammal Unusual Mortality Event Fund Obligations	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Budget Authority	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Appropriation	0	0	0	0	0
Fisheries Disaster Assistance Fund Obligations	0	0	0	300	300
Fisheries Disaster Assistance Fund Budget Authority	0	0	0	300	300
Fisheries Disaster Assistance Fund Appropriation	0	0	0	300	300
Subtotal, NMFS Other Discretionary Direct Obligations	65,349	0	65,349	300	65,649
Subtotal, NMFS Other Discretionary Budget Authority	(180,822)	(102,700)	(283,522)	300	(283,222)
Subtotal, NMFS Other Discretionary Appropriation	65,349	0	65,349	300	65,649
OMAO					
Medicare Eligible Retiree Healthcare Fund Obligations	1,591	26	1,617	0	1,617
Medicare Eligible Retiree Healthcare Fund Budget Authority	1,591	26	1,617	0	1,617
Medicare Eligible Retiree Healthcare Fund Appropriation	1,591	26	1,617	0	1,617
Subtotal, OMAO Other Discretionary Direct Obligations	1,591	26	1,617	0	1,617
Subtotal, OMAO Other Discretionary Budget Authority	1,591	26	1,617	0	1,617
Subtotal, OMAO Other Discretionary Appropriation	1,591	26	1,617	0	1,617
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	66,940	26	66,966	300	67,266
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	(179,231)	(102,674)	(281,905)	300	(281,605)
TOTAL, OTHER DISCRETIONARY APPROPRIATION	66,940	26	66,966	300	67,266

Grand Total Summary Discretionary Appropriations ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Operations, Research, and Facilities	3,840,300	185,521	4,025,821	458,388	4,484,209
Procurement, Acquisition, and Construction	1,532,558	(56,090)	1,476,468	856,194	2,332,662
Fisherman's Contingency Fund	349	0	349	0	349
Pacific Coastal Salmon Recovery Fund	65,000	0	65,000	0	65,000
Fisheries Disaster Assistance Fund	0	0	0	300	300
Marine Mammal Unusual Mortality Event Fund	0	0	0	0	0
Medicare Eligible Retiree Health Care Fund	1,591	26	1,617	0	1,617
GRAND TOTAL DISCRETIONARY APPROPRIATION	5,439,798	129,457	5,569,255	1,314,882	6,884,137

Summary of Discretionary Resources ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Direct Discretionary Obligations					
ORF Direct Obligations	4,103,971	288,221	4,392,192	458,388	4,850,580
PAC Direct Obligations	1,543,558	(54,090)	1,489,468	856,194	2,345,662
OTHER Direct Obligations	66,940	26	66,966	300	67,266
TOTAL Direct Discretionary Obligations	5,714,469	234,157	5,948,626	1,314,882	7,263,508
Discretionary Budget Authority					
ORF Budget Authority	4,086,471	288,221	4,374,692	458,388	4,833,080
PAC Budget Authority	1,530,558	(54,090)	1,476,468	856,194	2,332,662
OTHER Budget Authority	(179,231)	(102,674)	(281,905)	300	(281,605)
TOTAL Discretionary Budget Authority	5,437,798	131,457	5,569,255	1,314,882	6,884,137
Discretionary Appropriations					
ORF Appropriation	3,840,300	185,521	4,025,821	458,388	4,484,209
PAC Appropriation	1,532,558	(56,090)	1,476,468	856,194	2,332,662
OTHER Appropriation	66,940	26	66,966	300	67,266
TOTAL Discretionary Appropriation	5,439,798	129,457	5,569,255	1,314,882	6,884,137

Other Accounts Mandatory ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
NOS					
Damage Assessment and Restoration Revolving Fund Obligations	45,900	(29,900)	16,000	0	16,000
Damage Assessment and Restoration Revolving Fund Budget Authority	5,900	100	6,000	0	6,000
Damage Assessment and Restoration Revolving Fund Appropriation	0	0	0	0	0
Sanctuaries Enforcement Asset Forfeiture Fund Obligations	120	0	120	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Budget Authority	120	0	120	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Appropriation	120	0	120	0	120
Gulf Coast Ecosystem Restoration Fund Obligations	6,429	1,879	8,308	0	8,308
Gulf Coast Ecosystem Restoration Fund Budget Authority	0	0	0	0	0
Gulf Coast Ecosystem Restoration Fund Appropriation	0	0	0	0	0
Subtotal, NOS Other Mandatory Direct Obligations	52,449	(28,021)	24,428	0	24,428
Subtotal, NOS Other Mandatory Budget Authority	6,020	100	6,120	0	6,120
Subtotal, NOS Other Mandatory Appropriation	120	0	120	0	120
NMFS					
Promote and Develop Fisheries Obligations	7,989	459	7,530	0	7,530
Promote and Develop Fisheries Budget Authority	254,160	102,241	356,401	0	356,401
Promote and Develop Fisheries Appropriation	0	0	0	0	0
Fisheries Finance Program Account Obligations	17,293	(17,293)	0	0	0
Fisheries Finance Program Account Budget Authority	17,293	(17,293)	0	0	0
Fisheries Finance Program Account Appropriation	17,293	(17,293)	0	0	0
Environmental Improvement & Restoration Fund Obligations	4,652	(2,877)	1,775	0	1,775
Environmental Improvement & Restoration Fund Budget Authority	4,652	(2,877)	1,775	0	1,775
Environmental Improvement & Restoration Fund Appropriation	4,933	(3,051)	1,882	0	1,882
Limited Access System Administration Fund Obligations	14,325	532	14,857	0	14,857
Limited Access System Administration Fund Budget Authority	14,325	532	14,857	0	14,857
Limited Access System Administration Fund Appropriation	14,468	412	14,880	0	14,880

Other Accounts Mandatory Cont'd ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
Western Pacific Sustainable Fisheries Fund Obligations	766	127	893	0	893
Western Pacific Sustainable Fisheries Fund Budget Authority	766	127	893	0	893
Western Pacific Sustainable Fisheries Fund Appropriation	776	124	900	0	900
Fisheries Enforcement Asset Forfeiture Fund Obligations	2,981	51	3,032	0	3,032
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	(2,019)	5,051	3,032	0	3,032
Fisheries Enforcement Asset Forfeiture Fund Appropriation	3,032	0	3,032	0	3,032
North Pacific Observer Fund Obligations	3,158	796	3,954	0	3,954
North Pacific Observer Fund Budget Authority	3,158	796	3,954	0	3,954
North Pacific Observer Fund Appropriation	3,200	800	4,000	0	4,000
Subtotal, NMFS Other Mandatory Direct Obligations	51,164	(18,205)	32,041	0	32,041
Subtotal, NMFS Other Mandatory Budget Authority	292,335	88,577	380,912	0	380,912
Subtotal, NMFS Other Mandatory Appropriation	43,702	(19,008)	24,694	0	24,694
OMAO					
NOAA Corps Commissioned Officers Retirement Obligations	30,861	143	31,004	0	31,004
NOAA Corps Commissioned Officers Retirement Budget Authority	30,861	143	31,004	0	31,004
NOAA Corps Commissioned Officers Retirement Appropriation	30,861	143	31,004	0	31,004
Subtotal, OMAO Other Mandatory Direct Obligations	30,861	143	31,004	0	31,004
Subtotal, OMAO Other Mandatory Budget Authority	30,861	143	31,004	0	31,004
Subtotal, OMAO Other Mandatory Appropriation	30,861	143	31,004	0	31,004
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	134,474	(46,083)	87,473	0	87,473
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	329,216	88,820	418,036	0	418,036
TOTAL, OTHER MANDATORY APPROPRIATION	74,683	(18,865)	55,818	0	55,818

NOAA Summary ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
TOTAL Direct Obligations (Discretionary & Mandatory)	5,848,943	188,074	6,036,099	1,314,882	7,350,981
TOTAL Budget Authority (Discretionary & Mandatory)	5,767,014	220,277	5,987,291	1,314,882	7,302,173
TOTAL Appropriation (Discretionary & Mandatory)	5,514,481	110,592	5,625,073	1,314,882	6,939,955
Reimbursable Financing	387,658	(145,658)	242,000	0	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	6,236,601	42,416	6,278,099	1,314,882	7,592,981
Offsetting Receipts	(12,396)	(5,853)	(18,249)	0	(18,249)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	6,224,205	36,563	6,259,850	1,314,882	7,574,732

Line Office Summary ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
National Ocean Service					
ORF	619,700	21,869	641,569	45,326	686,895
PAC	8,500	0	8,500	0	8,500
OTHER	52,449	(28,021)	24,428	0	24,428
TOTAL, NOS	680,649	(6,152)	674,497	45,326	719,823
National Marine Fisheries Service					
ORF	964,862	55,917	1,020,779	85,610	1,106,389
PAC	0	0	0	0	0
OTHER	116,513	(18,205)	97,390	300	97,690
TOTAL, NMFS	1,081,375	37,712	1,118,169	85,910	1,204,079
Oceanic and Atmospheric Research					
ORF	570,590	16,137	586,727	79,548	666,275
PAC	43,500	0	43,500	65,000	108,500
TOTAL, OAR	614,090	16,137	630,227	144,548	774,775
National Weather Service					
ORF	1,100,776	77,683	1,178,459	40,850	1,219,309
PAC	103,634	0	103,634	470	104,104
TOTAL, NWS	1,204,410	77,683	1,282,093	41,320	1,323,413
National Environmental Satellite, Data and Information Service					
ORF	291,533	61,800	353,333	55,741	409,074
PAC	1,224,924	(54,090)	1,170,834	703,024	1,873,858
TOTAL, NESDIS	1,516,457	7,710	1,524,167	758,765	2,282,932
Mission Support					
ORF	302,845	33,168	336,013	113,892	449,905
PAC	43,000	0	43,000	102,700	145,700
TOTAL, Mission Support	345,845	33,168	379,013	216,592	595,605
Office of Marine and Aviation Operations					
ORF	253,665	21,647	275,312	37,421	312,733
PAC	120,000	0	120,000	(15,000)	105,000
OTHER	32,452	169	32,621	0	32,621
TOTAL, OMAO	406,117	21,816	427,933	22,421	450,354
DIRECT DISCRETIONARY OBLIGATIONS					
ORF	4,103,971	288,221	4,392,192	458,388	4,850,580
PAC	1,543,558	(54,090)	1,489,468	856,194	2,345,662

Line Office Summary Cont'd ($ in Thousands)

FY 2023 Proposed Operating Plan	FY 2022 Annualized CR	Total FY 2023 ATBs	FY 2023 Base	FY 2023 Program Changes	FY 2023 Estimate
OTHER	201,414	(46,057)	154,439	300	154,739
TOTAL, DIRECT DISCRETIONARY OBLIGATIONS	5,848,943	188,074	6,036,099	1,314,882	7,350,981
ORF Adjustments (Deobligations/Rescissions)	(17,500)	0	(17,500)	0	(17,500)
ORF Transfers	(246,171)	(102,700)	(348,871)	0	(348,871)
PAC Adjustments (Deobligations/Rescissions)	(13,000)	0	(13,000)	0	(13,000)
PAC Transfers	2,000	(2,000)	0	0	0
Mandatory Accounts Excluded	(134,474)	46,083	(87,473)	0	(87,473)
TOTAL, DISCRETIONARY APPROPRIATIONS	5,439,798	129,457	5,569,255	1,314,882	6,884,137

Cover Caption: NOAA is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep the public informed of the changing environment around them.

Layout Design: Tiffany Small

National Ocean Service
www.oceanservice.noaa.gov

National Marine Fisheries Service
www.fisheries.noaa.gov

Office of Oceanic and Atmospheric Research
www.research.noaa.gov

National Weather Service
www.weather.gov

National Environmental Satellite, Data, and Information Service
www.nesdis.noaa.gov

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

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