NOAA
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

FEBRUARY 13, 2012

FY 2013 BUDGET SUMMARY

FRONT COVER: This awe-inspiring image, composited by NASA, was taken by the the VIIRS instrument aboard NPP, the nation's newest polar-orbiting environmental satellite that was launched Oct. 28, 2011. Renamed "Suomi NPP" in honor of the the late Verner E. Suomi of the University of Wisconsin, the satellite will enable NOAA to continue issuing accurate forecasts and provide advanced warnings for severe weather, such as deadly tornado outbreaks, blistering heat waves, floods, snowfall and wildfires. This composite image of the Western Hemisphere uses a number of swaths of Earth's surface taken on January 4, 2012.

Suomi NPP is the result of a partnership between NASA, NOAA and the Department of Defense.

CREDIT **NOAA/NASA**

DEAR FRIENDS OF NOAA

Americans today face challenging economic times. Families are sitting down at their kitchen tables and making tough choices with tighter budgets. Businesses are weighing whether to hire new employees or expand operations. Communities are challenged to determine which essential services to provide to their citizens and businesses. Across the country, we are forced to balance between immediate needs and future investments.

Everyone has to share in the collective effort to reduce the deficit. At NOAA, we too are facing the tough choices of how best to balance the national priorities in science, service and stewardship entrusted to NOAA, while at the same time living within our means. We will still strive to deliver on core missions that Americans have come to depend on each and every day by providing the best information for life and safety, ensuring healthy and productive ecosystems in our oceans and coastal areas, and continuing important research and development. And we will redouble our efforts to make disciplined choices and smart investments, and to seek out new partnerships whenever possible.

This year's budget request of approximately $5.1 billion aims to (1) provide immediate life-saving and job-supporting services needed to prepare and protect American communities and infrastructure and (2) invest in science and research that will enhance America's competitiveness. It reflects a continued commitment to stewardship of coastal and ocean resources, which in turn benefits coastal economies. It includes tough choices and sacrifices made in the face of tightening budgets, with valuable programs reduced or terminated to accommodate critical investments that could not be delayed to ensure we can meet national priorities.

Services that save lives and help businesses succeed

NOAA's services save lives and protect livelihoods. Last year (2011) rewrote the record books on extreme events. From crippling snowstorms to the second deadliest tornado year on record, to epic floods, drought and heat and the third busiest hurricane season on record, we've witnessed the extreme of nearly every weather category. These events provided a sobering reminder about our vulnerability to the impacts of extreme weather and climate. This budget allows NOAA to improve severe weather warnings by producing and delivering forecasts that Americans have come to trust, provide services in a cost-effective manner, and continue to reduce weather-related fatalities. This budget also provides for continued timely advancement of the nation's next-generation weather satellites.

Healthy environment and a healthy economy

NOAA's stewardship responsibilities support coastal economies and provide tourism opportunities, storm protection, safe energy, and recreational and commercial fishing – integral facets of our economy at large. This budget allows us to maintain some of the stewardship programs that our nation's coastal communities have come to rely on, such as sustainable fisheries, marine sanctuaries and coastal manage-

ment. We will work tirelessly to enhance our partnerships and find innovative solutions to conserve and protect our ocean and coastal resources.

Investing in science today for a better tomorrow

Science is at the heart of NOAA's services and stewardship. A more accurate hurricane track forecast today is the result of smart research investments of the past. Putting America's fishing industry on a sustainable and profitable path depends on investments in the best fisheries science. NOAA's science enhances our understanding of and ability to predict changes in the Earth's environment, an increasingly crucial role given the economic and environmental challenges we face. NOAA is making key investments in the next generation of research and informational products to protect our environment, enhance our security, and spur economic recovery. This budget provides necessary investments to improve our understanding of climate processes and support research that will help fuel a clean energy economy.

We must remember the significant contribution NOAA makes to growing a strong economy that is built to last. Just as every citizen depends on NOAA for his or her weather information, from the five-day forecast to life-saving weather alerts, so too do businesses rely on NOAA. Fishermen trust NOAA's nautical charts and check tides and currents information before heading to sea. Farmers depend on our long-range forecasts to determine what crops to plant and when. Using NOAA services, airlines save millions of dollars by keeping planes and personnel from being stranded in bad weather. Marine shipping companies, which transport 90 percent of the goods into and out of the United States, rely on NOAA to keep our ports operating safely. For coastal communities, NOAA's stewardship of our fisheries, coasts and oceans is vital to their prosperity. And the list goes on and on. It is hard to imagine a sector of the economy that does not depend on NOAA in some way or another.

NOAA is in our communities. Our employees are your colleagues, neighbors and friends. As individuals and as an agency, we are partners in the success of families, businesses and communities. This budget keeps our commitment to deliver the services, the stewardship, and the smart investment in the science that America needs.

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TERMINOLOGY

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

FY 2011 Spend Plan

An annualized version of P.L. 111-322, this represents NOAA's estimated funding levels throughout FY 2011.

FY 2012 Estimate

Fiscal Year (FY) 2012 Appropriation, including a congressionally approved spread of undistributed reductions included within the bill (P.L. 112-55) and additional reprogrammings.

Adjustments-to-Base

Includes the estimated FY 2013 federal civilian pay raise of 0.5 percent (and the estimated FY 2013 federal military pay raise of 1.7 percent as appropriate). Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from GSA. In addition, ATBs include unique/technical adjustments to the base program, for example transfers of base resources between budget lines.

FY 2013 Base

FY 2012 Estimate plus Adjustments-To-Base

Program Change

Requested increase or decrease over the FY 2013 base

FY 2013 Request

FY 2013 base plus Program Changes

INTRODUCTION

At Vandenberg Air Force Base's Space Launch Complex-2 in California, a United Launch Alliance Delta II arcs across the sky carrying NASA's National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) spacecraft toward Earth orbit.

CREDIT **NASA/Bill Ingalls**

NOAA: A HEALTHY ENVIRONMENT FOR A HEALTHY ECONOMY

NOAA generates tremendous value for the Nation—and the world—by advancing our ability to understand and anticipate changes in the Earth's environment, improving society's ability to make scientifically informed decisions, delivering services vital to the economy and public safety, and by conserving and managing ocean and coastal ecosystems and resources. NOAA's mission has three core areas, each individually and separately important, but vital and more effective as a cohesive triad, with each providing the foundation for the others. These missions – Science, Stewardship, Service – are integral to the very design of NOAA as an agency.

A Next Generation Weather Radar (NEXRAD). All NEXRAD systems are undergoing an upgrade to Dual Polarization capability to improve measurements, which are vital to increased accuracy and timeliness of warnings that protect life and property.

NOAA provides weather, water, and climate forecasts and warnings for the private and public sectors. Annually, NOAA provides 76 billion environmental observations, 1.5 million forecasts, and 50,000 severe weather warnings. Routine weather events in the United States, such as rain and cooler-than-average days, can add up to an annual economic impact of as much as $485 billon (in 2008 dollars), or about 3.4 percent of the 2008 Gross Domestic Product (GDP).[1] Spring 2011 was one of the deadliest and costliest tornado seasons on record. According to preliminary estimates, from early April through June 1, tornadic storm systems – that also produced dangerous hail, straight-line winds and flooding –led to at least 2 million structure insurance claims, at least $21 billion in economic damages, and at least $15 billion in insured losses.[2] While the tornado resulted in fatalities, injuries, and losses, NOAA's NWS Storm Prediction Center and area Weather Forecast Offices provided early forecasts and warnings saving countless more. NOAA will improve severe weather warnings by fielding new technologies and enhancing public responsiveness to warnings through our Weather-Ready Nation initiative, a joint effort with the private weather industry, emergency managers, and academia.

NOAA protects and preserves the nation's living marine resources through scientific research, fisheries management, enforcement and habitat con-

1 Lazo, J.K., Lawson, M., Larsen, P.H., and D.M. Waldman. (2011, June). U.S. Economic Sensitivity to Weather Variability. Bulletin of the American Meteorological Society, 92(6). http://journals.ametsoc.org/doi/pdf/10.1175/2011BAMS2928.

2 AON Benfield. (2011, June 26). United States April and May 2011 Severe Weather Outbreaks. Chicago, IL. http://www.aon.com/attachments/reinsurance/201106_us_april_may_severe_weather_outbreaks_recap.pdf

servation. In 2009, the U.S. seafood industry supported approximately 1 million full- and part-time jobs and generated $116 billion in sales impacts, $32 billion in income impacts, and $48 billion in value added impacts.[3] NOAA will sustain efforts to rebuild American fisheries and maintain them at sustainable levels to optimize fishing opportunities, jobs and environmental benefits. NOAA will also continue to invest in the future of fisheries management by improving our understanding of the complex ecosystem interactions that impact the resources that are most economically valuable.

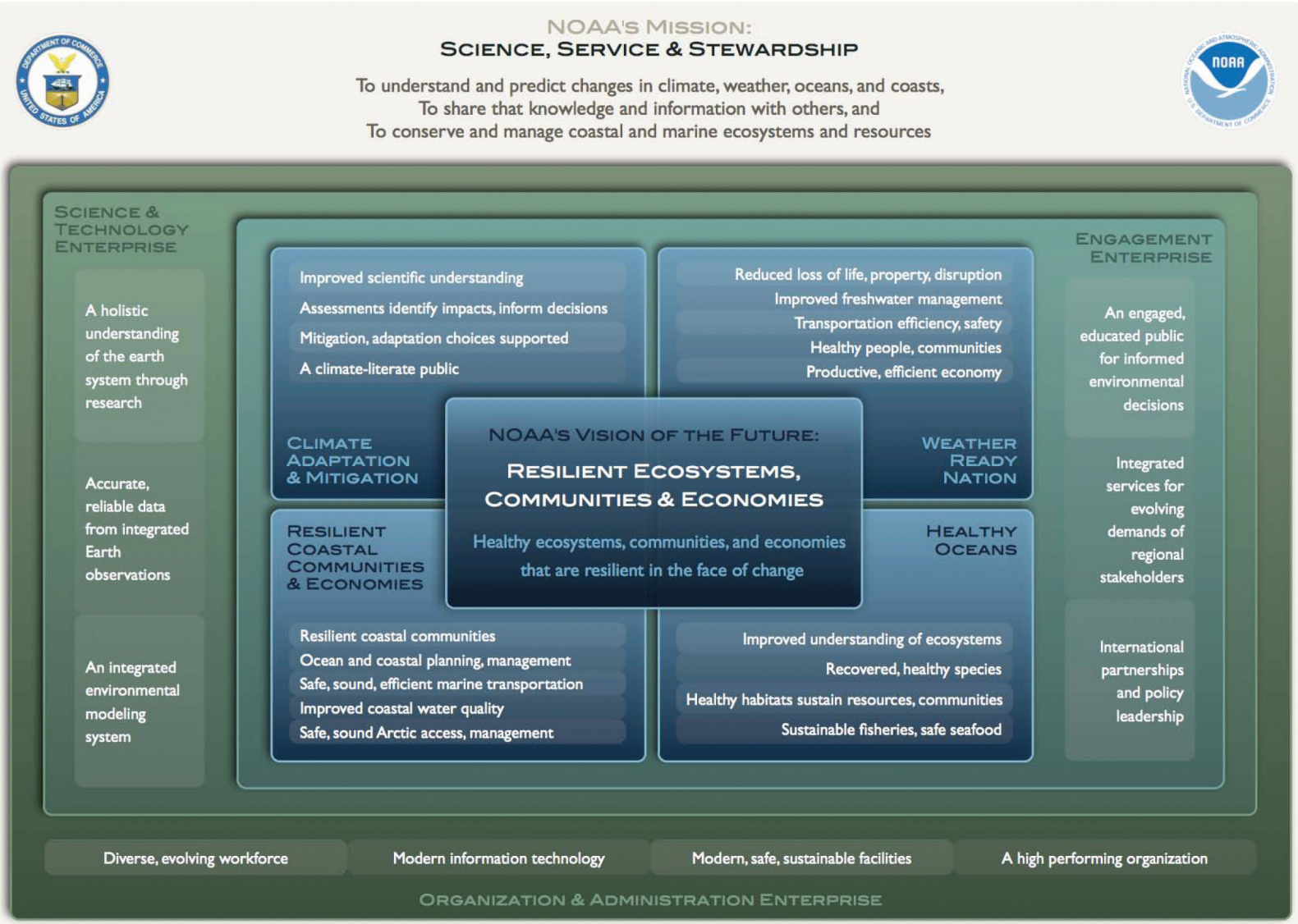
NOAA provides products, services and information that promote safe navigation, support coastal communities, sustain marine ecosystems, and mitigate coastal hazards. NOAA delivers nautical charts, real time tides and currents, accurate positioning infrastructure, and emergency response support to benefit safe, efficient, and secure transportation on U.S. waterways. America's seaports support the employment of 13.3 million U.S. workers.[4] An economic impact analysis conducted in 2007 concluded that U.S. seaport activities generated $3.15 trillion in annual economic output, with $3.8 billion worth of goods moving in and out of seaports every day.[4]

Coastal watershed counties contributed $8.3 trillion to the Gross Domestic Product (GDP) in 2010, over half of the U.S. GDP[5] and a total of 66 million jobs.[6] NOAA partners with states to implement a range of programs that help keep America's coasts healthy and resilient.

NOAA's world-class science underpins NOAA's ability to provide accurate weather forecasts, to protect and manage the nation's coastal and ocean resources, and to enable society to plan and respond to climate change. Research at NOAA is conducted in federal laboratories and through partnerships with universities and science institutes. NOAA's research provides solid science and policy-relevant findings to leaders in government and industry worldwide on topics such as ocean exploration, climate, and ecosystem protection.

An overview of NOAA's Next Generation Strategic Plan is presented on the following page. This plan represents NOAA's assessment of the highest priority opportunities in order to contribute substantially to the advancement of society. Through the concerted efforts of NOAA and many other organizations, we can navigate our way toward a future where people, communities, and ecosystems prosper and are resilient in the face of change.

3 Fisheries Economics of the United States, 2009.
4 John Martin, Ph.D., "The Local and Regional Economic Impacts of the U.S. Deepwater Port System, 2007", prepared for the American Association of Port Authorities, June 2008, p. 5.
5 Bureau of Economic Analysis. 2011. Gross Domestic Product (GDP) for the U.S. Territories. http://www.bea.gov/national/gdp_territory.htm.
6 Bureau of Labor Statistics. 2011. 2010 Census of Employment and Wages. Available from: http://www.bls.gov/cew/



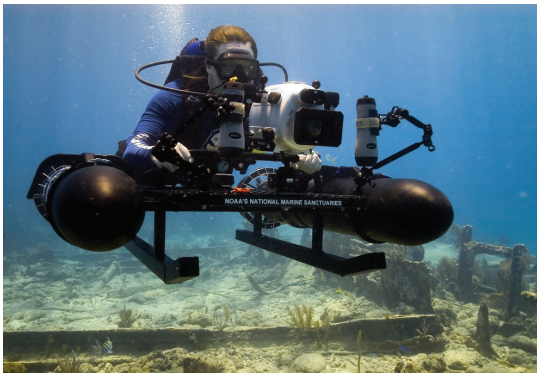
U. S. DEPARTMENT OF COMMERCE • NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

FY 2013 BUDGET HIGHLIGHTS

For Fiscal Year (FY) 2013, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of $5,060.5 million, an increase of $153.9 million, or 3.1 percent above FY 2012. This request reflects NOAA's continuing effort to better serve the American people through advancing critical missions, while also being cognizant of the current fiscal environment. The NOAA staff of dedicated professionals, working with a range of external partners, is expanding meteorological prediction capabilities; maintaining coastal resource management; charting our seas and coasts; continuing environmental stewardship; and extending our knowledge of climate change. It is these NOAA professionals who put NOAA research, programs, and products to work for American people every single day. This year's budget will (1) provide life-saving and job-supporting services needed to prepare and protect American citizens, communities, businesses and infrastructure; (2) support the highest priority stewardship programs, and (3) invest in science and research that will improve our understanding of the Earth and its system which translates into better decision tools for the public.

The Administration is continuing its pursuit of an aggressive government-wide effort to curb non-essential administrative spending. As a result, the Department of Commerce continues to seek ways to improve the efficiency of programs without reducing effectiveness. The Department's total savings target for FY 2013 is $176 million, which includes $142.8 million in savings initiated in FY 2012 and an additional $33.2 million planned for FY 2013. Building on NOAA's administrative savings planned for FY 2012 ($67.8 million), an additional $15.8 million in savings is targeted for FY 2013 for a total savings in FY 2013 of $83.5 million.

Total requested inflationary Adjustments to Base (ATBs) are $39.6 million. These adjustments focus on maintaining and investing in our workforce and supporting NOAA's most important resource – our people. NOAA leverages this most valuable asset by applying our people's knowledge, experience, ingenuity and dedication to the challenges of the 21st century. With this increase, the FY 2013 base level will fund the estimated FY 2013 Federal civilian pay raise of 0.5 percent, and will also provide inflationary increases for non-labor activities, including service contracts, utilities, lease payments, fuel, and rent charges from the General Services Administration.



A NOAA diver conducts shipwreck research at the Florida Keys National Marine Sanctuary. The remains of these ships and their artifacts hold clues to the Keys colorful maritime history, and are protected by NOAA and the State of Florida.

NATIONAL OCEAN SERVICE

One of NOAA's key goals is to organize our resources and capabilities to promote the environmental and economic sustainability of vibrant coastal communities. The emergence of new industries, such as in renewable energy, and vulnerability to environmental hazards and stresses will change these communities in profound ways. In FY 2013, NOAA will continue to support the economic sustainability of coastal communities We have maintained our commitment to Navigation Services and the stewardship role of

Oyster aquaculture in Tomales Bay, CA. On June 9, 2011, the Department of Commerce and NOAA released national sustainable marine aquaculture policies to meet the growing demand for healthy seafood, to create jobs in coastal communities, and restore vital ecosystems.

Daniel Jones preparing to launch the Fetch autonomous underwater vehicle (AUV). He is attaching Fetch's "nose," which contains the side scan sonar, some of the water quality sensors, and the color video camera. Image courtesy of Bonaire 2008: Exploring Coral Reef Sustainability with New Technologies.

the Marine Sanctuary and Coastal Zone Management programs. In addition, NOAA has made a few targeted new investments including: an increase of $6.6 million to begin developing and improving marine sensors that will detect and sample ocean biological and physical parameters at multiple spatial and temporal scales; a $2 million investment to improve NOAA's capacity to conduct natural resource damage assessment (NRDA) activities and expedite the restoration process, and: $1.9 million to strengthen our continued focus on Harmful Algal Bloom (HAB), hypoxia, and ecosystem research.

NATIONAL MARINE FISHERIES SERVICE

By continuing efforts to rebuild American fisheries, NMFS will increase the economic output of our fisheries, improve the economic conditions for our fishermen, and create better, more stable and sustainable jobs and opportunities in our coastal communities. In FY 2013, NMFS will continue the trend of putting America's fishing industry on a sustainable and profitable path through targeted investments in fisheries science, observer, and enforcement programs. A small amount of targeted new funding will improve our focus in the following areas: an additional $4.3 million to improve fisheries stock assessments, $5 million to develop integrated ecosystem assessment, used to better understand and manage the complex web that is ocean ecosystems, and $2.3 million to expand our ability to complete fishery-independent survey and monitoring projects, critical to setting appropriate catch limits in valuable fisheries. Observer programs provide accurate and timely information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries resources. This request includes an increase of $2.9 million for a total of $43.2M for the National Observer Program.

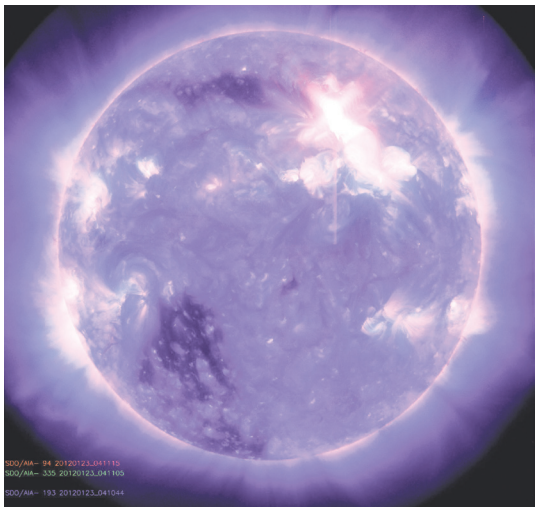
OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH

NOAA's fundamental responsibility is to ensure that complex policy choices are informed by the best available science. As such, data generation and use is the core function of the agency as a whole. Our researchers are examining cutting-edge issues that will guide our approach to resource management for years to come. NOAA's weather data informs millions of people each day, and our resource assessments guide legislative and policy decisions that affect peoples' lives and livelihoods. In addition, NOAA's FY 2013 request continues the necessary investments to improve our climate activities, with a specific focus on the research, which underpins our understanding of climate processes. Continued development and use of state-of-the-art Earth System Models to address urgent climate issues, including sea level rise and Arctic climate change, will be supported by an investment of an additional $8 million, and an investment in Arctic monitoring and full ocean depth profiling floats through the ARGO system ($4.6 million) will continue to improve our ability to chart ocean and sea ice levels. An increase of $2.6 million will support a permanent capability to produce climate assessments at national and regional scales, including support for the Global Change Information System to increase access and usability of the National Climate Assessment, while

an additional $542 thousand will continue development of the NOAA Climate Portal, facilitating public online access to NOAA's climate data, information, and services. Finally, an investment of $855 thousand will support research into wind boundary layers, a fertile area of for clean energy generation.

NATIONAL WEATHER SERVICE

Concern for public safety drives NOAA to continue to improve the timeliness and accuracy of warnings for all weather-related hazards. In addition, more and more sectors of the Nation's economy recognize the impacts of weather and water on their activities, and are becoming more sophisticated at using weather and water information to improve commerce. NOAA is committed to enhancing timely and accurate weather and climate forecasts through better observations, improved data assimilation, and collaboration with the research community. The FY 2013 budget requests an additional $7 million to support the critical upgrading and updating of the NWS Telecom Gateway, the backbone of the Weather Service's information delivery system. The request also includes $12.4 million for ground system readiness, ensuring that the NWS will be prepared to ingest data coming from NOAA's investment in new weather satellites. The request also includes an increase of $2.4 million in resources for fundamental climate observations and data management capabilities to maintain and upgrade the TAO array.



Composite image of a solar flare on January 22, 2012, from the NASA-Solar Dynamics Observatory. NOAA's Space Weather Prediction Center provides real-time monitoring and forecasting of solar and geophysical events which impact satellites, power grids, communications, navigation, and many other technological systems.

NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE

One of the greatest challenges facing NOAA today is ensuring continuity of satellite operations to provide unbroken coverage of weather forecasts and climate measurements into the future. The GOES-R satellite acquisition program has been a successful partnership effort between NOAA and NASA to replace and update the existing GOES series of satellites. The first satellite in this program, GOES-R, is expected to launch in 2015. The new satellites in this series will carry improved environmental instrument suites providing more timely and accurate weather forecasts and improved observation of meteorological events that directly affect public safety, protection of property, and ultimately, economic health and development. Thanks to the support of Congress, NOAA's satellite programs received $1,678 million in FY 2012, a substantial increase over FY 2011, which will allow NOAA to make significant progress in the satellite development program. In order to have new satellites ready when needed, the request includes $802 million for the GOES-R program, as well as an investment ($9.4M) for the processing and distribution of NPP data. $916.4 million is requested for the Joint Polar Satellite System. $30 million is also requested to continue progress on Jason-3.

On October 28, 2011, the successful launch of a new polar-orbiting environmental satellite, NPP, will enable NOAA to continue issuing accurate forecasts and provide advance warning for severe weather .

PROGRAM SUPPORT/OFFICE OF MARINE AND AVIATION OPERATIONS

The FY 2013 budget continues the recapitalization of the NOAA's fleet, data acquisition platforms critical to meeting fisheries management mandates. NOAA's fleets, both air and sea, are crucial to providing the scientific platforms for key observations and maintenance of our observing

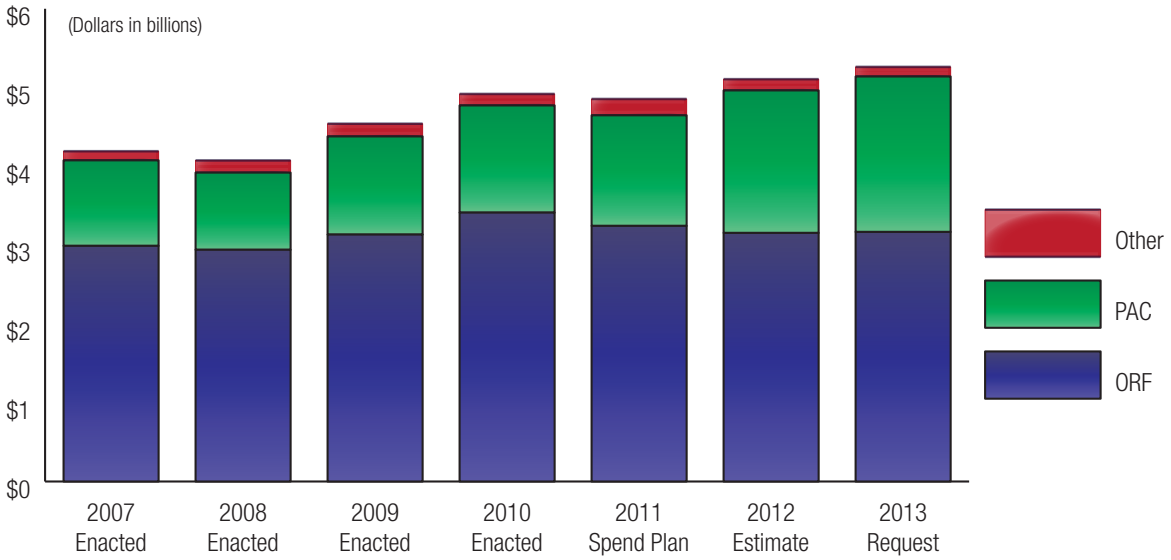
NOAA and the Port of Newport held a ceremony on August 20, 2011 to dedicate the new NOAA Marine Operations Center-Pacific (MOC-P) facility in Newport, Oregon. MOC-P serves as a homeport for four NOAA research and survey ships and provides administrative, engineering, maintenance and logistical support to NOAA's Pacific fleet.

systems. This budget requests a modest increase of $1.9 million to provide an increase in flight hours. An investment of $11.7 million will allow NOAA to perform a Major Repair Period on the Thomas Jefferson, NOAA's primary hydrographic survey vessel. Major Repair Periods are critical to ensuring the ongoing health and well-being of NOAA's fleet; without these periodic refurbishments, ships would be taken out of service. Finally, an additional $1.5 million is requested to complete the construction of FSV 6.

INTRODUCTION

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
ORF	$3,244,294	$3,154,980	$3,167,524	$12,544
PAC	1,403,412	1,808,443	1,972,736	164,293
Other Funds	207,673	143,091	122,283	(20,808)
Financing	(218,766)	(201,253)	(202,061)	(8,765)
Total Discretionary Budget Authority	**$4,636,613**	**$4,905,261**	**$5,060,482**	**$806,105**
FTE	**12,321**	**12,372**	**12,206**	**166**

Budget Trends FY 2007-2013



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: Other Accounts

CREDIT **NOAA National Geodetic Survey**

1

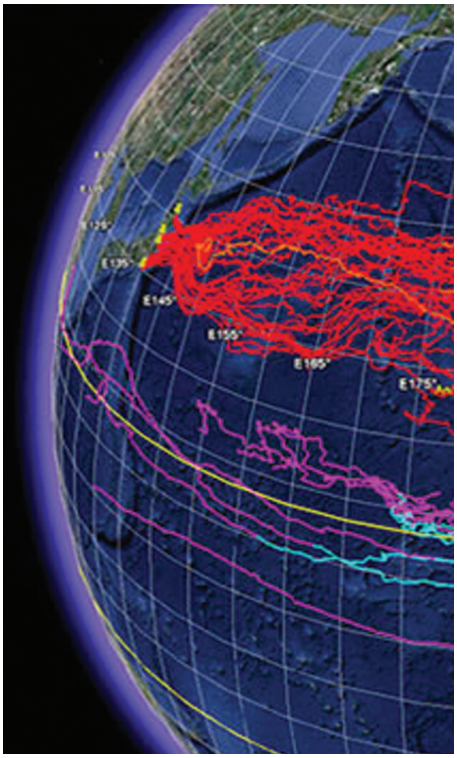
NATIONAL OCEAN SERVICE

NOAA's Continuously Operating Reference Stations (CORS) are a network of over 1,800 permanently installed, survey-grade GPS receivers managed by NOAA's National Geodetic Survey in collaboration with over 200 different government and private organizations.

In fiscal year 2011, NOAA's CORS network provided $1.035 billion in direct economic benefits – a 29% increase over benefits provided in fiscal year 2010.

NATIONAL OCEAN SERVICE

In the U.S., where over half of us live along the coast and more than 78 percent of our overseas trade by volume comes and goes through our seaports, the health of our coasts is intricately connected to the health of our Nation's economy.[8] Through the National Ocean Service (NOS), NOAA is the lead Federal agency providing science-based solutions to address evolving economic, environmental, and social pressures on our oceans and coasts. NOS observes, measures, assesses, and manages the Nation's coastal, ocean and Great Lakes areas, provides critical navigation products and services, and conducts response and restoration activities to protect vital coastal resources. Federal agencies, states, local governments, non-profits, and the private sector utilize NOS products and services to make informed policy, management, and business decisions, which have strong implications for economic activity and the health of ecosystems along the Nation's coasts.



Debris from the tsunami that devastated Japan in March 2011 could reach the United States as early as this winter, according to predictions by NOAA scientists.

NOS also works with other NOAA Line Offices to achieve broader NOAA goals. For example, NOS contributes to the National Weather Service tsunami warning forecasts by providing real-time tidal data from the National Water Level Observation Network. This data is a critical component of the U.S. National Tsunami Warning System and enables accurate warnings, effective models of tsunami arrival times, and timely evacuation orders. In addition, NOS works with the National Marine Fisheries Service and NOAA's General Counsel for Natural Resources to form NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP). DARRP collaborates with other agencies, industry, and citizens to protect coastal and marine resources, respond to pollution incidents, assess risk and injuries, and restore damaged resources.

Healthy and resilient coastal communities are essential to the Nation's economy, providing the Nation with goods through our ports, food to support local communities and industry, and recreational opportunities for Americans and international travelers alike. Yet these communities are vulnerable to sea-level rise, severe storms, habitat loss and frequent disasters. Against these challenges, NOS fosters vibrant coastal economies by enabling safe and efficient marine transportation, restoring coastal habitat, protecting unique marine resources, and delivering data and products from real-time

[8] *2003 Pocket Guide to Transportation Table 5-5, U.S. Department of Transportation*

ocean and coastal observations to meet resource managers' needs. For example, The NOAA Physical Oceanographic Real Time System (PORTS®) is a decision support tool that improves the safety and efficiency of maritime commerce and coastal resource management through the integration of real-time environmental observations, forecasts and other geospatial information. PORTS® provides observations and predictions of water levels, currents, salinity, and meteorological parameters (e.g., winds, atmospheric pressure, air and water temperatures) that mariners need to navigate safely.

NOS also conducts and oversees essential applied research on topics such as harmful algal blooms and hypoxia. This research leads to improved forecasting, helping resource managers ensure the safety of coastal resource users during these types of events. In addition, NOS activities inform science-based ocean and coastal resource management, as well as ecosystem-based management, an approach which NOS has successfully demonstrated through the National Marine Sanctuaries Program.

NOS programs also help NOAA achieve its Next Generation Strategic Plan long-term goal of ensuring resilient coastal communities and economies through comprehensive planning and management to address competing ocean and coastal uses, provision of geospatial services to support coastal communities, and the availability of the best natural and social science for coastal decision makers.

FY 2011 ACCOMPLISHMENTS

NOAA, the Department of Interior, and five states – the members of the Trustee Council- reached an unprecedented agreement with BP in 2011 to provide $1 billion for early restoration projects in the Gulf of Mexico, as down payment on compensation for the 2010 Deepwater Horizon oil spill. This early restoration agreement, the largest of its kind ever reached, represents a first step toward fulfilling BP's obligation to restore injured public resources, including the loss of use of those resources by affected people. The Trustees will use the money to fund projects such as the rebuilding of coastal marshes, replenishment of damaged beaches, conservation of sensitive areas for ocean habitat for injured wildlife, and restoration of barrier islands and wetlands that provide natural protection from storms. This money provides an opportunity to help restoration get started sooner. The selection of early restoration projects includes a public process, and is overseen by the Trustees.

Coastal marshes, like these in Louisiana, will be restored with early restoration funding

In January 2011, Carnival Cruise Lines expressed concerns about reduced clearance on the Dames Point Bridge in Jacksonville, Florida. They were prepared to divert their ships and the $3.4 million in critical tourism revenue they generate for the Jacksonville economy. In response to a request from the Florida Department of Transportation, NOAA installed an air gap measuring system on the Dames Point Bridge. The air gap system is a tool that measures the clearance between the water surface and a bridge, enabling large vessels, such as cruise liners and commercial shipping vessels, to pass safely under the bridge. With the addition of this system, Carnival Cruise Lines kept their vessels on their original routes to Jacksonville. This is an example of how NOS products and services benefit local communities and industries, and help to sustain and grow strong economies.

An employee from the Center for Operational Oceanographic Products and Services installs an air gap sensor which measures bridge clearance on the Verrazano-Narrows Bridge, New York. The sensor is part of the New York/New Jersey Physical Oceanographic Real-Time System. Information from the sensor is critical for under-bridge clearance, as ships continue to maximize channel depths and widths while, at the same time, push the bounds of bridge heights

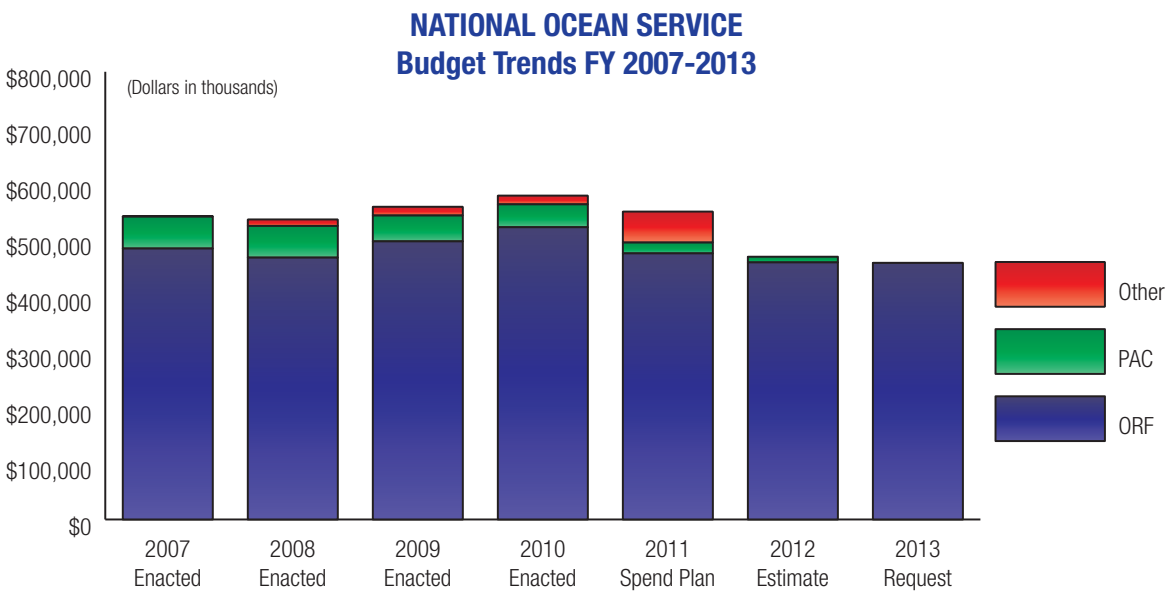
FY 2013 REQUEST **$478,066,000**

NOAA requests a total of $478,066,000 and 1,224 FTEs to support the continued and enhanced operations of the National Ocean Service. This total includes Operations, Research, and Facilities (ORF) and other Mandatory and Discretionary accounts. For the Discretionary accounts this includes a decrease of $8,906,000 and 18 FTEs from the FY 2012 estimate. This reduction is comprised of a net decrease of $7,697,000 and 14 FTEs in program changes plus a decrease of $1,209,000 and 4 FTEs for Adjustments to Base (ATB).

In FY 2013, NOS will support the highest priority and most essential services for coastal communities and the Nation. NOS will continue to create solutions to improve coastal management by providing science-based services and strengthening place-based initiatives to reduce the vulnerability of coastal communities to risks such as storm surge and sea level rise. NOS will continue to improve alignment of coastal habitat-related efforts to achieve long-term habitat protection and coastal resiliency. In addition, NOS will use its social science expertise and partnerships to enhance the effectiveness of NOS products and services.

NATIONAL OCEAN SERVICE

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
NOS — ORF				
Navigation Services	$154,200	$147,958	$149,589	$1,631
Ocean Resources Conservation & Assessment	168,941	163,260	166,077	2,817
Ocean and Coastal Management	152,335	148,154	142,800	(5,354)
Total, NOS - ORF	475,476	459,372	458,466	(906)
Total, NOS - PAC	19,366	8,000	0	(8,000)
Total, NOS - Other	55,326	22,600	19,600	(3,000)
GRAND TOTAL NOS (Direct Obligations)	**$550,168**	**$489,972**	**$478,066**	**($11,906)**
Total FTE	**1,274**	**1,242**	**1,224**	**(18)**



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: Sanctuaries Enforcement Asset Forfeiture Fund; Coastal Impact Assistance Fund; Coastal Zone Management Fund; Damage Assessment and Restoration Revolving Fund

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $458,466,000 and 1,208 FTEs to support the Operations, Facilities, and Research (ORF) of the National Ocean Service. This is a decrease of $906,000 and 17 FTEs from the FY 2012 level. This reduction includes an increase of $303,000 and a decrease of 13 FTEs in program changes plus a decrease of $1,209,000 and 4 FTEs for ATBs. Adjustments include the following transfers:

- NOAA requests a technical adjustment to move $498,000 and 1 FTE from NOS Estuary Restoration Program to NFMS Habitat Management & Restoration. This transfer will shift the responsibilities of the NOAA's Estuary Restoration Program to the Office of Habitat Conservation
- NOAA requests a technical adjustment to move $4,618,000 and 3 FTE from NOS Marine Debris to NMFS Habitat Management & Restoration. This transfer will shift the responsibilities of NOAA's Marine Debris Program to the Office of Habitat Conservation.

NOS — ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, *Appendices*. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

NAVIGATION SERVICES **$149,589,000**

NOAA requests a decrease of $130,000 and 17 FTEs for a total of $149,589,000 and 533 FTEs under the Navigation Services sub-activity.

Mapping and Charting: NOAA requests a decrease of $1,448,000 and 17 FTEs. This is comprised of one increase and two decreases:

A navigation response team deployed to Maine's dangerous Cobscook Bay in 2010. The Eastport fishing community asked for full bottom surveys and updates to nautical charts after several men lost their lives when their boats capsized.

Mapping and Charting Base, Eliminate Navigation Response Teams: NOAA requests a decrease of $2,300,000 and 17 FTEs to terminate the Navigation Response Team (NRT) program in FY 2013. NRTs currently provide 24/7 emergency hydrographic survey support to the U.S. Coast Guard, port officials, and other first responders in the wake of accidents and natural events that create navigation hazards which impede safe and efficient marine transportation and commerce. However, there are more cost-effective ways to support this activity. Beginning in FY 2013, NOAA will pursue an agreement to provide technical assistance to the Federal Emergency Management Agency, which has the authority to fund the assessment of navigational hazards associated with Presidentially-declared disasters.

Mapping and Charting Base, Support Mapping and Charting Activities: NOAA requests an increase of $1,060,000 and 0 FTEs to improve the accuracy of nautical charts for safe navigation. Mapping and charting activities ensure safe navigation, maintain hydrographic expertise, and support coastal management. The information provided through NOAA's nautical charts is an essential contribution to jobs and the economy by supporting a safe, efficient and environmentally sound marine

transportation system. This increase to the Mapping and Charting program provides the expertise needed for verification and validation of survey data. Specifically, survey data collected from NOAA and contractors will be applied to nautical charts and made accessible for non-navigations uses.

Hydrographic Research & Technology Development: NOAA requests a decrease of $318,000 and 0 FTE to reduce grant funding at the Joint Hydrographic Center. NOAA's Joint Hydrographic Center (JHC) evaluates sonar technologies and processes to improve efficiencies in hydrographic data acquisition. At this funding level, NOAA will reduce the amount of grant funding provided to NOAA's Joint Hydrographic Center that supports research personnel. The program will continue to develop improved standards and methods for collecting data and creating Integrated Ocean and Coastal Mapping (IOCM) products such as habitat maps from nautical charting data, or nautical charting data from fish survey assessments on an adjusted timetable. NOAA will procure new technologies for hydrographic testing and development as resources allow.

Tides and Currents: NOAA requests an increase of $1,226,000 and 0 FTEs. This is comprised of one increase:

Tide and Current Data Base, Enhance the Tide and Current Data Program: NOAA requests an increase of $1,226,000 and 0 FTEs to ensure that timely, accurate and reliable oceanographic data and products are available when most needed. Tide and Current data is essential for navigation safety, oil spill response, National Weather Service storm surge and tsunami warnings, and long-term sea level change planning. Ensuring the availability of timely, accurate and reliable data helps ensure that these services are efficient and provide the most value to the American people. This increase will enable NOAA to inspect an additional 60 National Water Level Observation Network (NWLON) stations per year to adequately maintain and operate the full multi-mission functions of the network. NOAA will also collect data on coastal currents at an additional 30 locations per year, for a total of 70, which will help to improve tidal current predictions for mariners and watermen, for search and rescue operations, and enhance the response efforts for oil spills and other hazards.

The Center for Operational Oceanographic Products and Services (COOPS) conducts surveys of tidal currents in response to user requests. Here, scientists deploy current meter buoys and anchors used for the surveys.

OCEAN RESOURCES CONSERVATION AND ASSESSMENT $166,077,000

NOAA requests an increase of $6,543,000 and 4 FTEs for a total of $166,077,000 and 426 FTEs under the Ocean Resources Conservation and Assessment sub-activity.

Ocean Assessment Program: NOAA requests an increase of $2,383,000 and 0 FTEs. This is comprised of three increases, two decreases and two terminations:

IOOS Regional Observations, Develop Improved Marine Sensors: NOS requests an increase of $6,564,000 and 0 FTEs for IOOS Regional Observations to develop and improve marine sensors that will monitor changing conditions in the oceans, coasts, and Great Lakes. With this increase NOAA will establish a $10,000,000 marine sensor program by reallocating $3,436,000 within the funds available to the regional associations and other grant recipientsto participate in this effort. Approximately 100

Scientists from the Office of Coast Survey and the University of New Hampshire lower a sophisticated echo sounder into the water to create a three-dimensional map of the sea floor. The data collected will help scientists better understand the underwater landscape and improve climate and ocean current circulation models.

million Americans use coastal and Great Lakes waters for recreation each year, many of them multiple times, and they are exposed to an increasingly dangerous array of ocean health threats. Through this increase, NOAA will make competitive awards for the development, demonstration, testing, and evaluation of marine sensor technologies that will help to deliver rapid and cost-effective data to inform our understanding of coastal, ocean, and Great Lakes ecosystems, supporting better decision-making to improve public, animal, and ecosystem health and their connections to a strong economy. To ensure the most efficient use of limited resources, demonstrations will focus on topics with potential to result in significant improvements to meet National Ocean Policy priorities related to: 1) informing decisions and improving understanding, 2) water quality, and 3) observations, mapping, and infrastructure.

Coastal Services Center, Reduce Number of New Coastal Services Center Products: NOAA requests a decrease of $1,433,000 and 0 FTEs for the Coastal Services Center (CSC). CSC provides the technology, information, and management strategies used by local, state, and national organizations to address complex coastal issues. This reduction will result in the development of fewer new or enhanced climate products by CSC. However, NOAA will seek to leverage external resources and capabilities through its ongoing partnerships with states and other Federal agencies to ensure that coastal communities continue to be aware of and are able to access the broader range of Federal (and non-Federal) services that CSC helps support. CSC will continue to support its regionally-targeted activities in FY 2013 (i.e., Pacific, Gulf, and West) as well as the Coastal Storms Program.

Coastal Services Center, Eliminate Regional Geospatial Modeling Grants: NOAA requests a decrease of $2,861,000 and 0 FTEs for the Regional Geospatial Modeling grant program. NOAA does not propose to continue this Congressionally-directed program in FY 2013. Base funding from CSC and the National Geodetic Survey already supports a range of geospatial requirements including capacity building and the development of tools and models.

Response and Restoration: NOAA requests an increase of $2,536,000 and 4 FTEs. This is comprised of two increases:

Gulf of Mexico Restoration Effort: Edward Wisner Donation Marsh Restoration.

Response and Restoration Base, Enhance NOAA's Natural Resource Damage Assessment Capacity: NOAA requests an increase of $2,000,000 and 4 FTEs to improve NOAA's capacity to conduct Natural Resource Damage Assessment (NRDA) and to expedite the restoration process. As a natural resource trustee, NOAA is charged with conducting a NRDA in collaboration with affected tribal, state and Federal co-trustees to assess and restore natural resources injured by an oil spill or other hazardous chemical release (as well as ship groundings). NOAA frequently must use base funds to conduct damage assessments following oil and chemical spills, perform legal work toward settlements, and to carry out restoration planning. NOAA will use this increased funding to hire additional staff to advance the more than 200 cases (in addition to Deepwater Horizon) for which

NOAA is currently engaged in as a trustee. Some of these cases represent hundreds of millions of dollars in potential settlements—a substantial investment in habitat restoration across the Nation. Expediting the backlog of NRDA cases will lead to swifter recourse for the public when public trust resources are harmed as a result of pollution events.

Response and Restoration Base, Enhance NOAA's Response and Restoration Capacity: NOAA requests an increase of $536,000 and 0 FTEs to improve NOAA's capacity to prepare for and respond to coastal environmental hazards. NOAA's Office of Response and Restoration (OR&R) protects coastal and marine resources, mitigates threats, reduces harm, and restores ecological function. This increase will provide for: 1) greater NOAA engagement in and support for spill response preparedness in the Arctic, including review of plans and participation in Arctic drills and exercises, 2) the activation of ERMA modules in a robust cloud server environment to ensure reliable access to ERMA services critical to helping decision makers mitigate and remediate the environmental and economic impacts of oil spills, chemical releases and ship groundings, and 3) development of a comprehensive toolkit of response tools and training programs.

National Centers for Coastal Ocean Science (NCCOS): NOAA requests an increase of $1,624,000 and 0 FTEs. This is comprised of one decrease and one increase:

National Centers for Coastal Ocean Science: NOAA requests a decrease of $344,000 and 0 FTEs to reflect savings from a realignment of NCCOS intramural research activities. In FY 2010 and 2011, NCCOS has been engaged in an ongoing evaluation and transformation of its intramural research portfolio. This has resulted in consolidating scientific priorities into four thematic areas consistent with Congressional direction, Administration and Agency priorities, and in line with NCCOS capabilities. In FY 2013, NCCOS will transition out of the laboratories in Oxford, MD and Kasitsna Bay, AK. Additionally, administrative functions have been streamlined and consolidated to increase the efficiency of operations. Achieving administrative efficiencies has resulted in a reduced number of contract positions at the Center for Coastal Ecosystem Health and Biomolecular Research in Charleston, SC and at NCCOS Headquarters in Silver Spring, MD.

Competitive Research, National Centers for Coastal and Ocean Science Competitive Research: NOAA requests an increase of $1,968,000 and 0 FTEs for NCCOS's Competitive Research program. NCCOS's Competitive Research program supports competitive, peer reviewed interdisciplinary research investigations with finite life cycles focused on priority coastal ecosystem issues. Research projects are selected through national competitions to ensure that they are not only of the highest scientific integrity but that they provide actionable information that can be used by coastal managers such as long- and short-term ecological forecasts. With this increase, NOAA will continue to focus on the highest priority research projects including harmful algal blooms, hypoxia, and coastal ecosystem research.

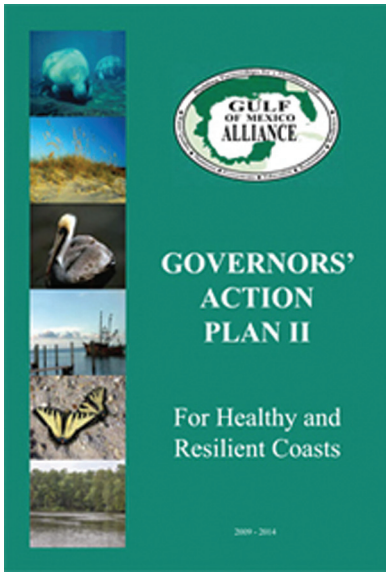
This deep red harmful algae, called Lingulodinium polyedrum, often produces brightly colored water discoloration. It has been associated with fish and shellfish mortality events, but its threat to human health is still being evaluated. (photo credit: Kai Schumann, California Department of Public Health volunteer)

OCEAN AND COASTAL MANAGEMENT $142,800,000

NOAA requests a decrease of $6,110,000 and 0 FTEs for a total of $142,800,000 and 249 FTEs under the Ocean and Coastal Management sub-activity.

Coastal Management: NOAA requests a decrease of $3,067,000 and 0 FTEs. This is comprised of two decreases and two increases:

CZ and Stewardship, Coastal Zone Management Programs and Coastal Services: NOAA requests a decrease of $1,055,000 and 0 FTEs for the consolidation of NOAA's coastal programs. NOAA must ensure that government resources are utilized as efficiently as possible and focused on current and emerging coastal management challenges. An internal review of NOAA's coastal activities is being undertaken to provide a more streamlined and focused coastal program. The proposed savings will be realized by merging the administration of multiple coastal programs.



Cover image of the Governors' Action Plan II Building on successes of the first Action Plan, the Gulf States and their partners developed the Governors' Action Plan II, a farther-reaching, five-year regional plan that looks to expand partnerships. Photo credit: Gulf of Mexico Alliance Governors' Action Plan

Regional Ocean Partnership Grants, Expand Regional Ocean Partnership Grants: NOAA requests an increase of $511,000 and 0 FTEs to expand a targeted competitive grant program to advance regional ocean management through support for regional ocean partnerships (ROPs). ROPs support the effective management of ocean and coastal resources that contribute $230 billion each year to the national economy in market based outputs, in addition to the effective management of ecological systems that increase property values and the quality of life in coastal areas. Working through regional public processes, these governor-led partnerships have identified critical coastal and ocean management issues facing multiple states in a region, such as: coastal water quality, nutrient loading and clean beaches, and habitat restoration, protection and characterization. A comprehensive regional approach to science-based, place-based planning for multiple uses of ocean and coastal resources yields many tangible benefits. This increase will enable the grant program to continue to support key priority actions identified in the plans of existing regional ocean partnerships (Gulf of Mexico Alliance, Northeast Regional Ocean Council, Mid-Atlantic Regional Council on the Ocean, the South Atlantic Alliance, and the West Coast Governors Alliance on Ocean Health), as well as the development and implementation of place-based ocean management plans in other regions (e.g. the Pacific and Caribbean territories, and Alaska).

National Estuarine Research Reserve System (NERRS), NERRS Program: NOAA requests a decrease of $2,733,000 and 0 FTEs for the NERRS program. NERRS is a national network protecting more than 1.3 million coastal and estuarine acres in 28 reserves located in 22 states and Puerto Rico for purposes of long-term research, environmental monitoring, education and stewardship. At this funding level, NOAA will eliminate the NERRS graduate fellowship program and decrease funding to each of the 28 reserves across the U.S. However, NERRS will continue their commitment to their core mission by working with local communities and regional groups to address natural resource management issues, such as non-point source pollution, habitat restoration, and invasive species.

Ocean Management: NOAA requests a decrease of $3,043,000 and 0 FTEs. This is comprised of one decrease and one reduction:

NOAA requests a decrease of $3,043,000 and 0 FTEs within the Marine Sanctuaries Program. The FY 2013 President's Budget proposes to consolidate the National Marine Protected Areas Center with the Office of National Marine Sanctuaries to create a single more efficient and effective program. This request will continue support for the 13 Sanctuaries in the National Marine Sanctuary System, the Papahānaumokuākea Marine National Monument, and National Marine Protected Areas Center as required by Executive Order 13158. The proposed consolidation will allow NOAA to fully leverage ONMS capacities and regional networks for management MPAs and foster more effective information sharing among national and regional ocean management interests. At the requested funding level NOAA will support the highest priorities of all its mandates, maintain its unique capabilities, and continue engaging coastal communities and stakeholders to promote science-based stewardship of designated areas.

FY 2013 PAC BUDGET SUMMARY

NOAA requests a total of $0 and 0 FTEs to support the Procurement, Acquisition and Construction (PAC) of the National Ocean Service. This is a decrease of $8,000,000 and 1 FTE from the FY 2012 level. This reduction includes a decrease of $8,000,000 in program changes and a decrease of 1 FTE plus $0 and 0 FTEs for Adjustments to Base (ATB).

NOS — PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, *Appendices*. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

ACQUISITION **$0**

NOAA requests a decrease of $3,000,000 and 0 FTE for a total of $0 and 0 FTE. This is comprised of one termination:

Terminate new Coastal and Estuarine Land Conservation (CELCP) Program activities: NOAA requests a decrease of $3,000,000 and 1 FTE to terminate CELCP. Existing awards funded in FY 2012 or earlier will be tracked to completion by NOAA staff. NOAA plans to halt new activities given the role and resources of other Federal agencies that can implement this type of land conservation and acquisition program.

CONSTRUCTION $0

NOAA requests a decrease of $5,000,000 and 0 FTEs for a total of $0 and 0 FTEs. This is comprised of two terminations:

Terminate National Estuarine Research Reserve System Acquisition and Construction: NOAA requests a decrease of $1,000,000 and 0 FTEs to terminate funding for National Estuarine Research Reserve System (NERRS) Land Acquisition and Construction. Under the proposed budget, no NERRS acquisition and construction grants will be awarded after FY 2012. Existing awards will be tracked to completion by NOAA staff.

Terminate National Marine Sanctuary Procurement, Acquisition and Construction: NOAA requests a decrease of $4,000,000 and 0 FTEs to terminate funding for a dedicated National Marine Sanctuary System Procurement, Acquisition and Construction program. NOAA will defer the initiation of new, or the completion of ongoing, sanctuary administrative facilities and visitor center projects throughout the National Marine Sanctuary system.

MANDATORY FUNDS

COASTAL ZONE MANAGEMENT FUND

The Coastal Zone Management Fund (CZMF) was established under the Omnibus Budget Reconciliation Act of 1990 (P.L. 101-508). The CZMF receives loan repayments (mandatory) from the Coastal Energy Impact Program. In FY 2012 NOAA proposes to permanently cancel all balances in the CZMF and treat any future receipts in accordance with the Federal Credit Reform Act.

DAMAGE ASSESSMENT & RESTORATION REVOLVING FUND

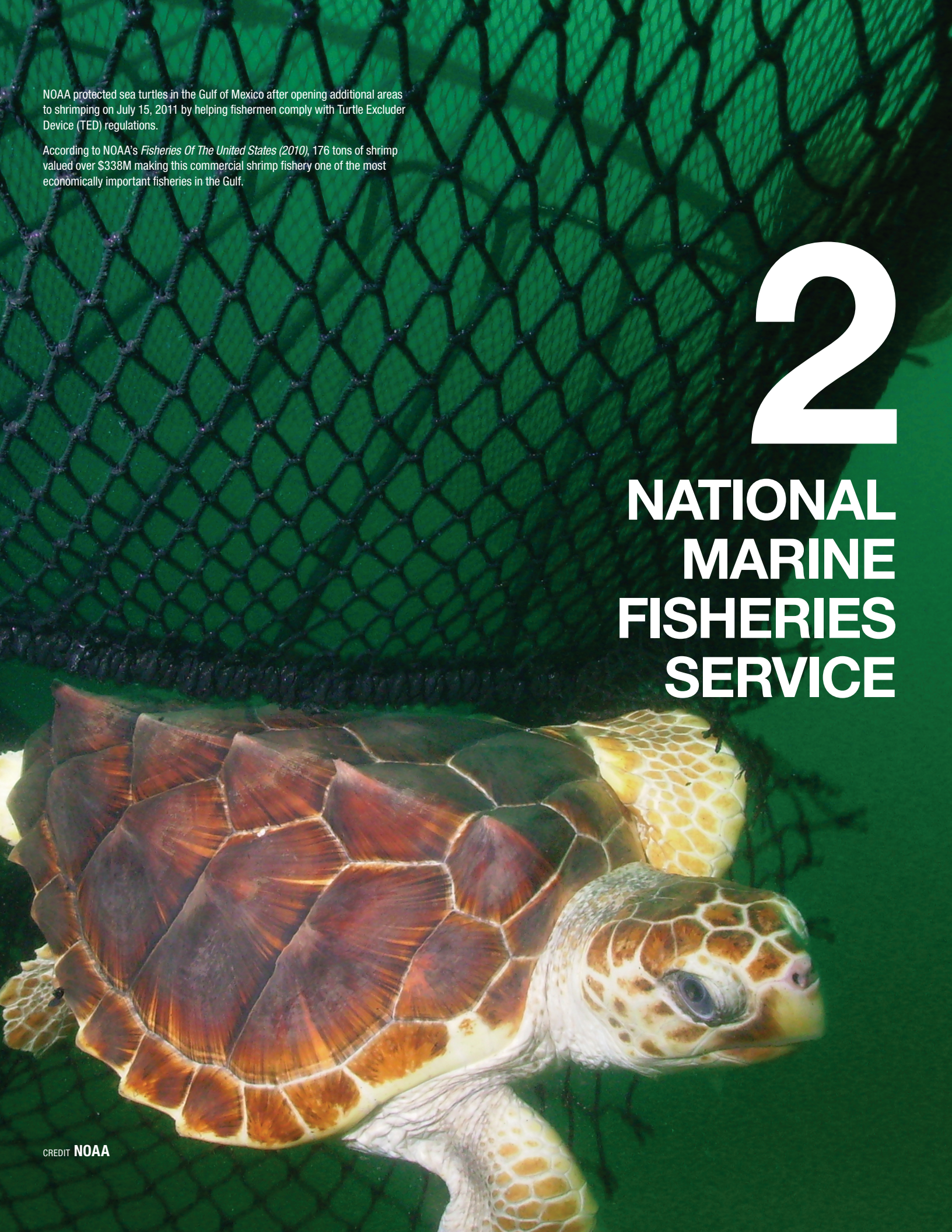
The Damage Assessment and Restoration Revolving Fund (DARRF) was established in 1990 to facilitate oil and hazardous material spill response, damage assessment, and restoration activities for damages to natural resources for which NOAA serves as trustee. The Fund receives proceeds from claims against responsible parties, as determined through court settlements or agreements. In FY 1999 and prior years, funds were transferred to the ORF account for the purposes of damage assessment and restoration. Beginning in FY 2000, funds were expended in DARRF and treated as mandatory budget authority.

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

SANCTUARIES ENFORCEMENT ASSET FORFEITURE FUND

Sanctuaries Enforcement Asset Forfeiture Fund receives proceeds from civil penalties and forfeiture claims against responsible parties, as determined through court settlements or agreements, for viola-

tions of NOAA sanctuary regulations. Penalties received are held in sanctuary site-specific accounts from year to year as the funds are spent on resource protection within the sanctuary site where the penalty or forfeiture occurred. Funds are expended for resource protection purposes which may include all aspects of law enforcement (from equipment to labor), community oriented policing programs, and other resource protection and management measures such as the installation of mooring buoys or restoration of injured resources.



NOAA protected sea turtles in the Gulf of Mexico after opening additional areas to shrimping on July 15, 2011 by helping fishermen comply with Turtle Excluder Device (TED) regulations.

According to NOAA's *Fisheries Of The United States (2010)*, 176 tons of shrimp valued over $338M making this commercial shrimp fishery one of the most economically important fisheries in the Gulf.

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NATIONAL MARINE FISHERIES SERVICE

CREDIT **NOAA**

NATIONAL MARINE FISHERIES SERVICE

The National Marine Fisheries Service (NMFS) serves the Nation through stewardship of living marine resources. This stewardship is accomplished with a science-based approach to conservation and management and the promotion of healthy coastal and marine ecosystems. NMFS is responsible for the management and conservation of fisheries within the U.S. Exclusive Economic Zone (EEZ), and for marine mammals and endangered and threatened species within NMFS' jurisdiction. NOAA's mandate includes the management of 528 federally-managed fish stocks along with invertebrates, sea turtles, marine mammals, and other marine and coastal species and their habitats for commercial, recreational, and subsistence purposes. NMFS also supports international scientific research and policy development.

Oyster Aquaculture in Tomales Bay, CA

Upholding NOAA's mission requires strong coordination and integration across all of the agency's research and stewardship programs, especially with the National Ocean Service (NOS), the Office of Oceanic and Atmospheric Research (OAR) and the Office of Marine and Aviation Operations (OMAO). For example, OMAO vessels are used to collect vital data required by fisheries and marine mammal stock assessments. In addition, NMFS partners and collaborates with Federal, State, and tribal institutions, local stakeholders, academic institutions, and non-governmental organizations. Strong partnerships and enhanced coordination and cooperation among NOAA scientists, policymakers, the Regional Fishery Management Councils, the commercial and recreational fishing industries, coastal stewards, and academic centers ensure a transparent and effective approach to stewardship and management.

NOAA's Next Generation Strategic Plan outlines a framework for ensuring that marine fisheries, habitats, and biodiversity are sustained within healthy and productive ecosystems and that coastal and Great Lakes communities are environmentally and economically sustainable. NMFS supports these goals by balancing protection and conservation mandates with management of the multiple uses and interests in living marine resources. This includes commercial, recreational, and subsistence fishing; marine aquaculture; habitat conservation; protected resources management; and ocean and coastal development. NMFS science supports the Nation's understanding of these systems to inform an ecosystem-based approach to resource management

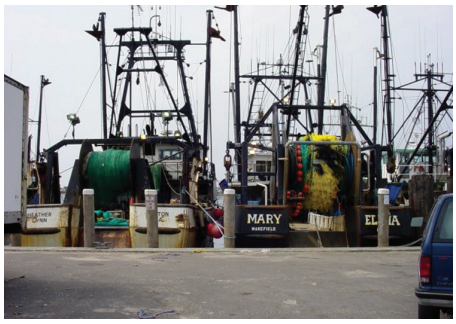
decisions. Long-term sustainability of ecosystems will ensure that seafood harvest and production, recreational fishing opportunities, and non-consumptive uses of living marine resources will continue to support vibrant coastal communities and economies.

FY 2011 ACCOMPLISHMENTS

In this 35th anniversary year of the Magnuson-Stevens Act, significant progress has been made toward ending overfishing and rebuilding overfished stocks. The 14th annual Report to Congress on the Status of the Nation's Fisheries, released in July 2011, showed three additional formerly overfished stocks rebuilt to healthy levels, bringing the total rebuilt since 2000 to 21. As of December 31, 2010, annual catch limits (ACLs) or other management measures were in place for all stocks subject to overfishing as mandated by the Act. During FY 2011, NOAA established required annual catch limits in 20 additional Fishery Management Plans (FMP), including key groundfish fisheries in Alaska, the Mid-Atlantic, and on the Pacific Coast, crab and scallop fisheries in Alaska, and all the FMPs in the Western Pacific. As of December 31, 2011, there were 43 FMPs with required annual catch limits in place. NOAA is on track to have required ACLs in place for all 46 FMPs in time to be effective for their respective 2012 fishing year.

Gulf of Maine Haddock: One of four fish stocks to be removed from the low-population list

In 2011 NMFS saw progress in several catch share programs, which are designed to enhance conservation efforts and provide improved economic viability for fisheries. The Pacific Trawl Rationalization catch share program was launched on January 11, 2011. Preliminary results indicate a strong performance by the fishery this year. After a slow start early in the year, landings have steadily increased to the point that both landings and revenue during June of this year were higher than last year; and even higher than the historical average for June. In addition, revenues per vessel are also up substantially. These positive economic trends for fishermen are even more remarkable because they are accompanied by a vast reduction of discarded catch. On average about 99 percent of what is caught is now being retained, an extremely positive result for fishery management and conservation. Since implementation of the Gulf of Mexico Grouper-Tilefish individual fishing quota (IFQ) program in January 2010, derby fishing and quota closures have been eliminated, safety at sea has improved, and dockside prices have increased. The program was intended to rationalize effort and reduce overcapacity to achieve and maintain optimum yield in this multi-species fishery. Fishermen have stayed within the annual catch limits that have been established, contributing to the rebuilding of the gag stock and improvements in the fishery as a whole.



NOAA-backed catch share programs for the West Coast began January 2011 with the brand-new groundfish rationalization program.

FY 2013 REQUEST **$880,286,000**

NOAA requests a total of $880,286,000 and 2,836 FTEs to support the continued and enhanced operations of the National Marine Fisheries Service. This total includes the Operations, Research, and Facilities (ORF) and other Mandatory and Discretionary accounts. For the Discretionary accounts this is a decrease of $11,910,000 and 29 FTEs from the FY 2012 estimate. This reduction includes a net decrease of $27,704,000 in program changes and 36 FTEs plus an increase of $12,986,000 and 7 FTEs for Adjustments to Base (ATB).

The FY 2013 President's Budget Request supports the highest priority core requirements for the stewardship of living resources. The FY 2013 budget focuses on core program requirements to meet mandates, program integration, and partnerships. NMFS, in partnership with Regional Fisheries Management Councils, will continue efforts to rebuild American fisheries and maintain them at sustainable levels to optimize fishing opportunities, jobs, and environmental benefits. Our Nation's fisheries are very valuable. For example, they supported 1.5 million full and part-time jobs and contributed $79 billion to GDP, $183 billion in sales in 2010. Further, the jobs supported by the commercial fishing industry increased from 2009 to 2010, by 16 percent from 1 million to 1.2 million. Sustaining and improving on these results requires continued assessment of fishing impacts on fish stocks and fishing performance relative to fishery management targets. In FY 2013 NMFS will focus on strengthening current data collection capabilities for fishery stock assessments and surveys, the deployment of advanced fishery sampling technologies such as acoustical and optical remote sensing, and the implementation of critical research to better understand economic impacts. This will allow NMFS to obtain the best available scientific information to implement sound management and conservation actions.

In FY 2013, NMFS' programs will sustain a comprehensive approach to protect and restore healthy ocean ecosystems while supporting economic opportunities. NMFS will continue to conserve, protect, and recover species under the Endangered Species Act, and the Marine Mammal Protection Act (MMPA). NMFS will collaborate with Federal, state, and tribal partners, on ESA activities, such as status reviews to assess threats, development of protective regulations and critical habitat designations for listed species, and conducting research and assessments to achieve species recovery while informing management decisions on proposed actions such as energy development.

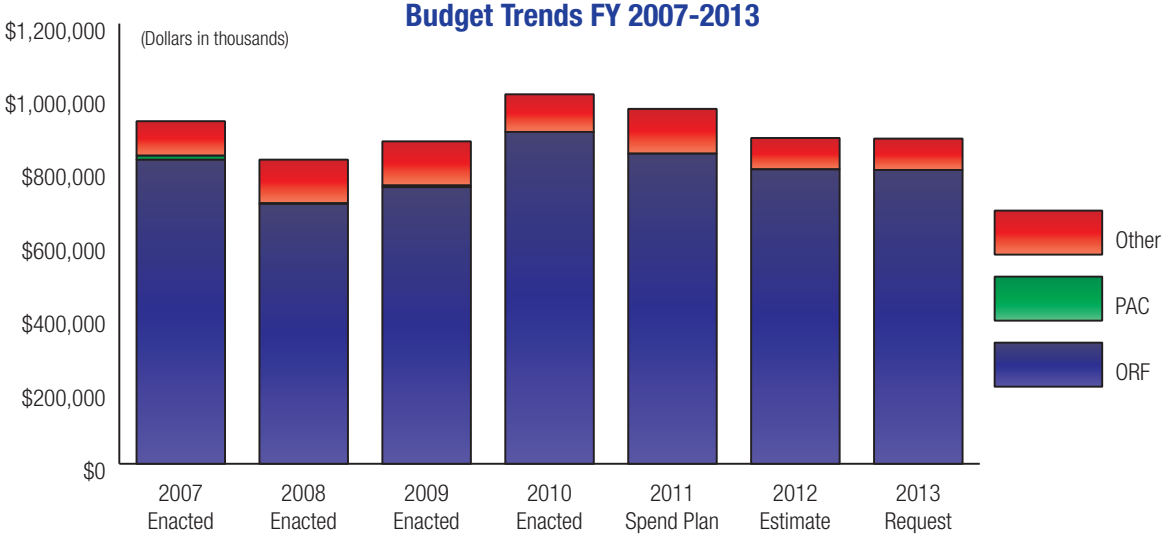
NMFS will also continue to improve the management, protection, and restoration of marine, coastal, and riverine habitats that support sustainable fisheries, protected resources, and coastal communities and economies. Through the Habitat Blueprint, a forward looking action framework, NMFS will leverage strategic partnerships to address the growing challenge of habitat loss and degradation. In 2013, habitat initiatives will be implemented regionally with the establishment of geographic priorities to focus habitat science and conservation. This systematic and strategic approach to habitat science will improve efforts to protect and restore habitat. This approach will be utilized in FY 2013, as NMFS supports recovery of the Gulf of Mexico through planning and implementation of early restoration projects associated with the Deepwater Horizon Oil Spill and implementation of the Executive Order 13508 to protect and restore the Chesapeake Bay.

Overall, NOAA's NMFS, through the efforts of the regional offices, science centers, and with the help of the Regional Fisheries Management Councils and a wide array of other partners, will strive to balance the stewardship of living marine resources with the economic needs of the Nation.

NATIONAL MARINE FISHERIES SERVICE

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
NMFS — ORF				
Protected Species Research and Management	$188,101	$174,159	$170,041	($4,118)
Fisheries Research and Management	438,507	426,075	430,077	4,002
Enforcement and Observers	105,747	105,361	110,289	4,928
Habitat Conservation and Restoration	41,789	41,657	35,987	(5,670)
Other Activities Supporting Fisheries	71,093	57,466	61,414	3,948
Total, NMFS - ORF	845,237	804,718	807,808	3,090
Total, NMFS - PAC	0	0	0	0
Total, NMFS - Other	122,260	90,286	72,478	(17,808)
GRAND TOTAL NMFS (Direct Obligations)	**$967,497**	**$895,004**	**$880,286**	**($14,718)**
Total FTE	**2,930**	**2,865**	**2,836**	**(29)**

NATIONAL MARINE FISHERIES SERVICE
Budget Trends FY 2007-2013



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: Environmental Improvement and Restoration Fund, Federal Ship Financing Fund, Fisheries Finance Program Account, Limited Access System Administration Fund, Promote and Develop American Fishery Products & Research Pertaining to American Fisheries Fund, Western Pacific Sustainable Fisheries Fund

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $807,808,000 and 2,835 FTEs to support the Operations, Facilities, and Research (ORF) of the National Marine Fisheries Service. This is an increase of $3,090,000 and a decrease of 29 FTEs from the FY 2012 estimate. This reduction includes a decrease of $12,704,000 in program changes and a decrease of 36 FTEs plus an increase of $15,794,000 and 7 FTEs for Adjustments to Base (ATB). Adjustments include the following transfers:

- NOAA requests technical adjustment to move $4,618,000 and 3 FTEs from NOS to NMFS for the Marine Debris Program and $498,000 and 1 FTE from NOS to NMFS for the Estuary Restoration Program in order to consolidate restoration programs within NOAA.
- NOAA requests technical adjustments to: 1) change the name of the Sustainable Habitat Management line to Habitat Management and Restoration, and 2) to move $20,765,000 and 54 FTEs from Fisheries Habitat Restoration to the renamed line: Habitat Management and Restoration.

NMFS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, *Appendices*. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

Multiple Sub-Activities: NOAA requests a decrease of $5,000,000 and 27 FTEs as part of NOAA's West Coast proposal. NOAA requests this decrease as part of the President's efforts to find efficiencies and savings. These efficiencies will be achieved by reducing program activities and reconfiguring the NMFS' Southwest and Northwest Regional Offices into a single West Coast Regional Office, closing the Pacific Grove Laboratory in California, eliminating support for the Puget Sound ecosystem surveys, as well as the Newport Seawater Research program at the Newport Laboratory in Oregon. The geographic distribution of the staff will be driven by programmatic needs. These changes reflect NOAA's efforts to focus its resources on its highest priority mission functions and reduce administrative costs to the greatest possible extent. The reconfiguration of the West Coast regional offices will result in a leaner management structure and the elimination of other positions, while the proposed facilities changes will reduce NMFS's physical footprint and associated costs over time. See below for reductions associated with this initiative by budget line.

PROTECTED RESOURCES RESEARCH AND MANAGEMENT ($2,591,000)

Will eliminate duplicative staff functions as part of reconfiguring NMFS' Southwest and Northwest Regional Offices into a single West Coast Regional Office and closure of the Pacific Grove Lab.

MARINE MAMMALS ($7,000)

Terminate small marine mammal research activity located at the Pacific Grove Laboratory which is proposed for closure.

PACIFIC SALMON	**($484,000)**

Eliminates salmon research funding for the Newport Seawater Research program at the Newport Laboratory in Oregon.

FISHERIES RESEARCH AND MANAGEMENT	**($1,460,000)**

Will support the reconfiguring NMFS' Southwest and Northwest Regional Offices into a single West Coast Regional Office, and the closure of the Pacific Grove Laboratory in California, eliminating the Puget Sound ecosystem survey; ending the Northwest Region's support for the Newport Seawater Research program at the Newport Laboratory in Oregon.

EXPAND ANNUAL STOCK ASSESSMENTS	**($8,000)**

Reflects the administrative savings as a result of the closure of the Pacific Grove Laboratory.

INFORMATION, ANALYSIS, AND DISSEMINATION	**($450,000)**

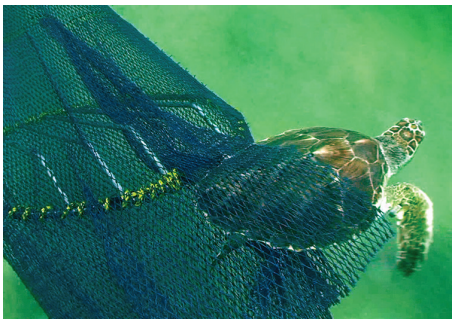
Supports the closure of the Pacific Grove Laboratory.

TOTAL	**($5,000,000)**

PROTECTED SPECIES RESEARCH AND MANAGEMENT	**$170,041,000**

NOAA requests a decrease of $6,607,000 and 21 FTEs for a total of $170,041,000 and 791 FTEs under the Protected Species Research and Management sub-activity. This is comprised of four increases, five decreases, and two terminations:

Protected Resources Research and Management Programs: NOAA requests an increase of $1,603,000 and 0 FTEs for activities that conserve and recover threatened and endangered species. The proposed increase will be distributed among several protected species science and management activities. With these additional resources NOAA will conduct ESA Section 7 consultations and provide authorizations of proposed Federal actions affecting protected species. NOAA will meet emerging requirements for ESA interagency technical assistance and authorizations under the MMPA and ESA for all proposed actions for energy exploration and development, national defense–related activities, and fishery operations. Additionally, NOAA will increase its coordination of stranding network responses to unusual marine mammal mortality events including assessment of causes and risks.



A loggerhead turtle escaping through a turtle excluder device (TED).

Species Recovery Grants: NOAA requests an increase of $1,986,000 and 0 FTEs for the Species Recovery Grants Program. NMFS currently has jurisdiction over 87 threatened and endangered species, 7 species that have been proposed for listing, and 94 candidates for listing under the ESA. Recovery and conservation efforts for ESA-listed species under NMFS's jurisdiction are largely implemented through Spe-

cies Recovery Grants, which are awarded under the authority of section 6 of the ESA. This increase will provide grants to states to conduct priority recovery actions for listed species. Recovery actions can include restoring habitat necessary for the recovery of listed species, reducing or removing significant sources of mortality and injury such as assessing and monitoring species status and trends, partnering with governments and non-governmental organizations to conduct cross-jurisdictional conservation actions, developing conservation plans to mitigate incidental take of listed species, and educating the public about the conservation of ESA-listed species. NMFS will track ongoing and completed recovery actions by incorporating NMFS information into the U.S. Fish and Wildlife Service's "Recovery Online Activity Reporting System" or an equivalent tracking system.

Breaching Humpback whale

Marine Mammals: NOAA requests a decrease of $3,779,000 and 2 FTEs to terminate funding for the John H. Prescott Marine Mammal Rescue Assistance Grant program. The Prescott Grant program provides competitively awarded and emergency response grants to eligible marine mammal stranding network participants nationwide. In FY 2013, NMFS will continue to support the rescue of large whales entangled in fishing gear; coordinate the stranding network; provide limited support for unusual mortality event investigations; and administer the National Marine Mammal Tissue Bank, which maintains samples collected from stranded, by-caught, research, and subsistence animals to help with future disease diagnosis and response.

Other Protected Species: NOAA requests an increase of $500,000 and 0 FTEs for the conservation and recovery of other protected species such as marine fish, plants, and invertebrates. The funds will be used to complete listing determinations for newly petitioned species; conduct post-listing activities (recovery plans, critical habitat designations, 4(d) rules); and monitor ongoing and completed recovery actions to better assess the effectiveness of its recovery program. All these activities will enable the effective conservation and protection of marine fish, plants, and invertebrates by NOAA.

Pacific Salmon: NOAA requests a decrease of $743,000 and 0 FTEs for Pacific Salmon activities. NOAA will continue to meet existing requirements for ESA interagency technical assistance related to Pacific salmon in the Western United States, Including the development of recovery plans and section 7 consultations.

FISHERIES RESEARCH AND MANAGEMENT $430,077,000

NOAA requests a decrease of $1,297,000 and a decrease of 5 FTEs for a total of $430,077,000 and 1,382 FTEs under the Fisheries Research and Management sub-activity. This is comprised of eleven increases and five decreases:

Fisheries Research and Management Programs: NOAA requests a decrease of $2,025,000 and 0 FTEs for Fisheries Management activities. NMFS will continue to work with the eight Regional Fishery Management Councils to manage more than 528 stocks, monitor annual catch limits (ACLs) to identify appropriate harvest levels, administer management programs through which ACLs are implemented, and administer fishery management plans. With this reduction, NMFS will continue to conduct mandated

activities and will endeavor to minimize any delay to the development or implementation of regulations needed to keep fisheries within their annual catch limits. This reduction will be spread across all NMFS Regional Offices and Science Centers. However, NMFS staff and Councils will work closely together to minimize the impact of this reduction on timeliness with which adaptive fishery management actions can be put in place and maintain effectiveness of catch monitoring efforts.

Expand Annual Stock Assessments: NOAA requests an increase of $4,320,000 and 0 FTEs to increase stock assessments. The request will allow for an increase in NMFS's capability to conduct assessments for more stocks. Building on advances in stock assessment prioritization begun in FY 2012, NMFS will conduct improved surveys using advanced technologies to estimate fish abundance in additional habitats. The National Research Council has found that a strong fishery stock assessment report is the foundation of successful management of commercial and recreational fisheries. Incomplete scientific information results in overly conservative Annual Catch Limits, thus limiting fishing opportunity. This increase will support adequate stock assessments to help verify that overfishing is not occurring and safely allow optimum catch levels to support the sustainability and economic viability of the most economically valuable US stocks. Funding will improve fishery-independent surveys using existing advanced technologies and the development and implementation of improved technologies and platforms.

Working with fertilized eggs in a salmon hatchery.

Salmon Management Activities: NOAA requests a decrease of $6,519,000 and 0 FTEs for Salmon Management Activities. These projects fund activities associated with salmon not listed under ESA. At the requested level, NMFS will continue to meet its obligations under the Mitchell Act through continued support for operations and maintenance of Columbia River hatcheries to mitigate the loss of fish production due to hydroelectric dams. NMFS will also conduct a broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers. NOAA will also terminate funding provided in FY 2012 to implement hatchery reforms recommendations by the Hatchery Scientific Review Group. NMFS does not anticipate additional need to continue funding in FY 2013 for these projects.

Regional Councils and Commissions: NOAA requests a decrease of $5,139,000 and 0 FTEs for staff of the Regional Councils and Commissions. NOAA proposes to reduce funding to the Regional Fishery Management Councils (Councils) and Atlantic States Fishery Management Commission by 14 percent. Councils will use remaining funds to prioritize the implementation of adaptive measures that ensure the prevention and end of overfishing, but there should be no impact to the establishment of Annual Catch Limits (ACLs) since all Fishery Management Plans (FMPs) will have them in place to be effective for the 2012 fishing season. This Council reduction will be applied using the formula approved by the Councils to appropriately divide their funding. NMFS will also reduce funding for the Atlantic Cooperative Coastal Act by 14 percent.

Survey and Monitoring Projects: NOAA requests an increase of $2,322,000 and 0 FTEs to support fishery independent surveys. This funding will support fishery independent surveys, which are vital to maintain the scientific integrity of data collections for fishery stock assessments that support management decision making. Funding will be used to support red snapper monitoring, including at sea data collection; Alaska Groundfish monitoring, including snow and tanner crab, rockfish, and walleye Pollock; and at sea data collection for the West Coast Groundfish fishery.

Fisheries Oceanography: NOAA requests an increase of $4,989,000 and 0 FTEs for Integrated Ecosystem Assessments (IEAs). IEAs will provide a more comprehensive science-based decision-making framework for NOAA's management of coastal and marine ecosystem resources. IEAs incorporate diverse sources of data into ecosystem models, including socioeconomic data, that evaluate trade-offs between ecosystem and societal goals. The funds requested in FY 2013 will allow NOAA to make the California Current IEA fully operational and deliver management strategy evaluations, as well as continue to develop and expand the IEA framework in the Gulf of Mexico and Northeast Shelf Regional Ecosystems. The additional funds will also allow NOAA to accelerate the IEA development recently initiated in the Alaska and Pacific Islands Regional Ecosystems, providing the analytical basis for ecosystem-based decision support in all five of these regions.

American Fisheries Act: NOAA requests an increase of $1,662,000 and 0 FTEs for research and management in Alaska Bering Sea and Aleutian Islands (BSAI) groundfish fishery. With this funding NMFS will increase the agency's ability to provide real-time in-season management of the largest volume fishery in US waters. These funds provide core support for research and management in Alaska Bering Sea and Aleutian Islands (BSAI) groundfish fishery. NOAA will also increase its ability to maintain and monitor complex IT systems essential for the management of this fishery, to make modifications to the fishery regime, and to monitor and update necessary recordkeeping which supports backbone monitoring and enforcement.

ENFORCEMENT AND OBSERVERS $110,289,000

NOAA requests an increase of $3,499,000 and 0 FTEs for a total of $110,289,000 and 385 FTEs under the Enforcement and Observers sub-activity. This is comprised of two increases:

NOAA Observer Program in action, collecting data

Observers and Training: NOAA requests an increase of $2,908,000 and 0 FTEs for National Observer Program. This increase includes a reallocation of $1,300,000 from the Hawaii Longline Observer Program to support observing and monitoring for fisheries currently under catch share management. In addition, the increase will also support observing and monitoring costs for programs expected to transition to catch share management in FY 2013. NOAA is reallocating funds provided in FY 2012 that supplemented data collection to achieve statistically valid protected species interactions and bycatch estimates for the American Samoa Long Line fishery. Overall, Observer programs will continue to provide coverage in approximately 47 fisheries nationwide, with a goal of expanding observer coverage in existing fisheries and implementing new observer programs in fisheries with bycatch concerns. Observer programs will maintain the number of fisheries with adequate or near adequate observer coverage at 29 and

the number of sea days observed annually at 72,500. The number of fisheries with adequate or near adequate observer coverage, as well as the target observer coverage may vary depending on fishing effort and program priorities. The National Observer Program will also provide updated bycatch estimates for the National Bycatch Report.

Enforcement: NOAA requests an increase of $591,000 and 0 FTEs for the NMFS Office of Law Enforcement (OLE). The requested increase will provide funding to expand the compliance assistance program. Specialists will work directly with regulated fishermen, businesses, and industry organizations to increase knowledge of and compliance with regulations. Under the compliance assistance program OLE, working though compliance liaisons, will foster better cooperation with the fishing industry.

HABITAT CONSERVATION AND RESTORATION $35,987,000

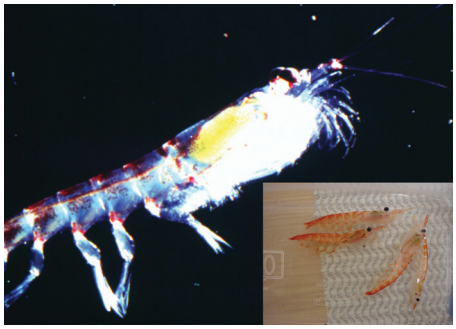
NOAA requests a decrease of $11,274,000 and 0 FTEs for a total of $35,987,000 and 153 FTEs under the Habitat Conservation and Restoration sub-activity. This is comprised of one decrease and one reduction:

Habitat Management and Restoration: NOAA requests a decrease of $10,058,000 and 0 FTEs for community based restoration. NOAA will continue support for mandated restoration activities conducted through the NOAA Restoration Center related to Natural Resource Damage Assessment (NRDA), Oil Pollution Act (OPA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other priority habitat restoration activities. NOAA will focus on projects that enhance stewardship and advance NOAA's priorities for sustainable fisheries, recovering protected resources, and supporting coastal economies. NOAA will continue to provide technical expertise, such as engineering and design, implementation support, and monitoring, and leadership to states, tribes, local communities, and other Federal programs implementing fishery and coastal habitat restoration projects.

Habitat Management and Restoration: NOAA requests a decrease of $1,216,000 and 0 FTEs for Marine Debris and Estuary Restoration Programs. In the FY 2012 appropriation, Congress provided additional funds to track and mitigate the immense debris field generated by the Japanese earthquake and tsunami that struck in March 2011. It is anticipated that the debris will impact the United States in FY 2012. The FY 2013 President's Budget reduces funding for Marine Debris, and does not request these additional funds. Transferring Marine Debris and Estuary Restoration into Habitat Management and Restoration will allow NMFS to find administrative efficiencies while building upon the knowledge gained and continuing to carry out Marine Debris and Estuary Restoration activities.

OTHER ACTIVITIES SUPPORTING FISHERIES $61,414,000

NOAA requests an increase of $2,975,000 and a decrease of 10 FTEs for a total of $61,414,000 and 124 FTEs under the Other Activities Supporting Fisheries sub-activity. This is comprised of nine increases and two decreases:



Krill are a key component in the Antarctic food chain. Photo credit: NOAA/Jessica Lipsky

Antarctic Research: NOAA requests an increase of $1,085,000 and 0 FTEs to support activities to meet mandates established by the U.S. Antarctic Marine Living Resources Conservation Act (AMLR). Under the AMLR Convention Act (Public Law 98-623), NOAA must conduct a program of "directed scientific research" to provide the scientific basis for fisheries management in the Southern Ocean. The requested increase will allow NOAA to collect data needed to meet the mandates of the U.S. AMLR and support ecosystem based management of krill and finfish fisheries in the Southern Ocean. Funds will support research cruises and acoustic surveys of Antarctic krill to estimate the biomass of this critical species. Krill is the largest fishery in Antarctica and the main source of food for most of the Southern Ocean's fishes, birds, and mammals. The increase will also be used to ensure that the research cruises are appropriately staffed to collect data on all aspects of the Antarctic marine ecosystem.

Cooperative Research: NOAA requests an increase of $868,000 and 0 FTEs for Cooperative Research. NOAA recognizes the value of cooperative research in supplementing its existing mandated and core research programs. NOAA will use this increase to provide contract procurements for unique and cost effective cooperative research projects to complement long-term NOAA-NMFS monitoring programs in the Northeast/Mid-Atlantic by partnering and leveraging the capacity of a widely distributed network of commercial fishermen to collect unique biological and physical observations that would be unavailable through NOAA-NMFS resources (i.e., Industry-Based Surveys).

Information Analysis and Dissemination: NOAA requests an increase of $2,801,000 and 0 FTEs to support information management systems and information dissemination. Living marine resource managers require accurate and timely information for decision-making. This increase will accelerate improvements in the quality and timeliness of data delivered, allow NMFS to analyze new and existing data sets, and model fisheries oceanography interactions. This will help to improve, streamline and better integrate previously collected data and information as well as future collections.

NMFS Facilities Maintenance: NOAA requests $0 and 0 FTEs for the closure of the Northeast Fisheries Science Center (NEFSC) James J. Howard Laboratory at Sandy Hook, New Jersey. NOAA proposes to relocate Sandy Hook research programs from the currently leased facility in New Jersey to other facilities in the Northeast Region. This move will be planned to allow as much as possible of the ecosystem-based multidisciplinary research to continue with the least possible disruption. The relocation will take place in the beginning of FY 2014 and the following programs will be impacted: Habitat Program and Ecosystem Research staff will relocate to the Oxford Lab in Oxford, MD; the Ocean Acidification Program will relocate to the NEFSC lab in Milford, CT; a portion of the Library collection will be transferred to the Oxford Lab and the rest will be distributed amongst interested parties; and a 49-foot research vessel, the R/V NAUVOO will also be moved to Oxford, MD.

Regional Studies: NOAA requests a decrease of $1,730,000 and 7 FTEs for Chesapeake Bay Studies and Restoration. The NOAA Chesapeake Bay Office (NCBO) will continue to maintain an active local staff presence in the Chesapeake Bay to engage with the Chesapeake Bay Program and on the ground partners. NCBO will fulfill its statutory mandate through appropriate leadership roles in the Chesapeake Bay Program, particularly through multi-species fisheries research, habitat characterization and assessment, community engagement and outreach, and coordination of NOAA activities under Executive Order 13508. The requested program decrease will be accounted for through reductions in administrative costs such as, consolidation of office space, reducing travel, vehicles, supplies, and equipment. In addition, funding for environmental education will be eliminated and the Chesapeake Bay Interpretive Buoy System (CBIBS) will be removed from the water and stored or otherwise reprogrammed to another agency or organization.

Scientists at the NOAA Chesapeake Bay Office work to characterize habitat so restoration activities can be targeted and effective.

DISCRETIONARY FUNDS

FISHERMEN'S CONTINGENCY FUND

The Fishermen's Contingency Fund (FCF) program minimizes financial losses of the fishing industry caused by competing uses of the Outer Continental Shelf (OCS) and provides for timely resolution of claims by vessel owners. The FCF is authorized under Section 402 of Title IV of the Outer Continental Shelf Lands Act Amendments of 1978. NOAA compensates U.S. commercial fishermen for damage or loss of fishing gear, vessels, and resulting economic loss caused by obstructions related to oil and gas exploration, development, and production in any area of the Outer Continental Shelf. The funds used to provide this compensation are derived from fees collected by the Secretary of the Interior from the holders of leases, exploration permits, easements, or rights-of-way in areas of the Outer Continental Shelf. The FCF account is funded solely through user fees. Disbursements can be made only to the extent authorized in appropriation acts. In FY 2013 NMFS requests budget authority of $350,000 for the payment of claims filed by fisherman. These funds should be sufficient to cover the anticipated amount of claims for FY 2013.

FOREIGN FISHING OBSERVER FUND

The Foreign Fishing Observer Fund (FFOF) is financed through fees collected from owners and operators of foreign fishing vessels fishing within the Exclu¬sive Economic Zone (EEZ) of the United States (such fishing requires a permit issued under the MSA). This includes longline vessels fishing in the Atlantic billfish and shark fishery and other foreign vessels fishing in the EEZ. The fund is used by NOAA to pay salaries, administrative costs, data editing and entry costs, and other costs incurred in placing observers aboard foreign fishing vessels. The observer program is conducted primarily through contracts with the private sector. NOAA/NMFS places these observers aboard foreign fishing vessels to monitor compliance with U.S. fishery laws and to collect fishery man¬agement data. Amounts available in the fund can be disbursed only to the extent and in amounts provided in appropria¬tion acts. In FY 1985, Congress approved the establishment of a supplemental observer program. The program provided that foreign vessels without federally-funded observers are required to obtain the ser¬vices of private contractors certified by the Secretary of Commerce. NOAA does not anticipate foreign fishing in the U.S. EEZ requiring funds from this account.

FISHERIES FINANCE PROGRAM ACCOUNT

The Fisheries Finance Program (FFP) Account is a national loan program that makes long-term fixed-rate financing available to U.S. citizens who otherwise qualify for financing or refinancing of the construction, reconstruction, reconditioning, and, in some cases, the purchasing of fishing vessels, shoreside processing, aquaculture, and mariculture facilities, and the purchase of individual fishing quota (IFQ). The FFP operates under the authority of Title XI of the Merchant Marine Act of 1936, as amended (46 USC 53701); Section 303(a) of the Sustainable Fisheries Act amendments to the MSA; and, from time to time FFP-specific legislation. NMFS requests no increase for the FFP because these loans have a negative subsidy rate and no appropriated funds are required. However, specific loan ceilings for each type of loan authority within the FFP must be included in appropriation language or other bill language regardless of the need for cash appropriations. The FY 2013 budget proposal requests loan authority of $24 million for IFQ loans and $59 million for FFP traditional loans as authorized by the Merchant Marine Act. Three benefits will result from this action. First, the IFQ loan program is part of the Northwest Halibut and Sablefish and the Bering Sea and Aleutian Islands Crab limited entry fisheries management program that continues to stabilize these fisheries. This will also support the crab IFQ loan required by the management plan approved by the North Pacific Fisheries Management Council. Second, FFP traditional lending is harvesting-capacity-neutral and supports qualified established U.S. seafood companies operating in a sustainable fisheries environment. Last, FFP lending to marine aquaculture facilities contributes to the development of a promising avenue of seafood production and greater economic sustainability from U.S. ocean resources.

PACIFIC COASTAL SALMON RECOVERY FUND

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in FY 2000 to address the listings of Pacific salmon and steelhead populations under the ESA and the impacts of the Pacific Salmon Treaty Agreement between the United States and Canada. Under the PCSRF, NMFS manages a program to provide funding to the states (Washington, Oregon, California, Idaho, Nevada, and Alaska) and tribes of the Pacific Coast region (to implement projects that restore and protect salmonid populations and their habitats. Between FY 2000 and FY 2010, over $880 million has been provided to nearly nine thousand projects throughout the region that have made important contributions to improve that status of ESA-listed salmonids, preventing extinctions and helping to protect currently healthy populations, while contributing to local economies. In addition to the PCSRF federal funds, states provide significant matching funds through their grant allocation processes. Furthermore, the federal and state matching funds are supplemented by private and local contributions at the project level, including additional funding, volunteer time, and other in-kind donations. The FY 2013 President's Request includes $50,000,000 for this account.

MARINE MAMMAL UNUSUAL MORTALITY EVENT FUND

An unusual mortality event (UME) is defined under the MMPA as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." In recent years, increased efforts to examine carcasses and live stranded animals have improved the knowledge of mortality rates and causes, allowing a better understanding of population threats and stressors and the ability to determine when a situation is "unusual." Understanding and investigating marine mammal UMEs is important because they can serve as indicators of ocean health, giving insight into larger environmental issues which may also have implications for human health and welfare. MMPA Section 405 (16 USC 1421d) establishes the Marine Mammal Unusual Mortality Event Fund. The fund: "shall be available only for use by the Secretary of Commerce, in con¬sultation with the Secretary of the Interior to compensate

persons for special costs incurred in acting in accordance with the contingency plan issued under section 1421c(b) of this title or under the direction of an onsite coordinator for an unusual mortality event; for reimbursing any stranding network participant for costs incurred in preparing and transporting tissues collected with respect to an unusual mortality event for the Tissue Bank; and for care and maintenance of marine mammal seized under section 1374(c)(2)(D)." According to the MMPA, deposits can be made into the fund by the following: "amounts appropriated to the fund; other amounts appropriated to the Secretary with respect to unusual mortality events; and amounts received by the United States in the form of gifts, devises, and bequests under subsection (d) of this section."

FISHERIES ENFORCEMENT ASSET FORFEITURE FUND

Section 311(e)(1) of the MSA authorizes the Secretary of Commerce (Secretary) to pay certain enforcement-related expenses from fines, penalties and forfeiture proceeds received for violations of the MSA, or of any other marine resource law enforced by the Secretary. Pursuant to this authority, the NOAA has established a Civil Monetary Penalty/Asset Forfeiture Fund (AFF). Certain fines, penalties and forfeiture proceeds received by NOAA are deposited into this fund, and subsequently used to pay for certain enforcement-related expenses. When Congress established the AFF it was deemed appropriate to use these proceeds to offset in part the costs of administering the enforcement program. Expenses such as: costs directly related to the storage, maintenance, and care of seized fish, vessels, or other property during a civil or criminal proceeding; reimbursement to other federal or state agencies for enforcement related services provided pursuant to an agreement entered into with the Secretary; and other limited uses as outlined in NOAA's Asset Forfeiture Fund policy. NMFS Office of Law Enforcement (OLE) manages the AFF, which is used by OLE and NOAA General Counsel Enforcement Section to pay for enforcement activities.

MANDATORY FUNDS

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

The American Fisheries Promotion Act (AFPA) of 1980 amended the Saltonstall-Kennedy (S-K) Act to authorize a grants program for fisheries research and development projects to be carried out with S-K funds. S-K funds are derived from a mandatory transfer from the Department of Agriculture to NOAA from duties on imported fisheries products. An amount equal to 30% of these duties is made available to NOAA and, subject to appropriation, is available to carry out the purposes of the AFPA. Each year a Federal Register notice is published announcing the program. The annual notice outlines priority areas, such as research on reduction/elimination of bycatch and aquaculture. The remainder of the S-K funds, which are transferred as discretionary funds, are used to offset the appropriation requirements of the Operations, Research, and Facilities account.

FISHERIES FINANCE PROGRAM ACCOUNT

The mandatory component of the Fisheries Finance Program Account (FFP) Account authority is subject to the Federal Credit Reform Act of 1990 (FCRA) (2 U.S.C. 661). The FCRA requires estimated loan costs (FCRA cost) be appropriated in cash at the time Congress authorizes annual credit ceilings. FFP Account loan activity demonstrates that the FCRA subsidy is negative. Statutory authority is found in 46 U.S.C. 1274 and 16 U.S.C. 1801 et seq. FFP Account lending guidelines are found at Title 50, Code of Federal Regulations (CFR), Part 253, subpart B; and tempered by NOAA's sustainable fisheries policy and by the practical considerations of a program that has been self-sustaining throughout its credit history.

FEDERAL SHIP FINANCING FUND

This account manages the loan guarantee portfolio that existed prior to the enactment of the Federal Credit Reform Act of 1990.

ENVIRONMENTAL IMPROVEMENT & RESTORATION FUND

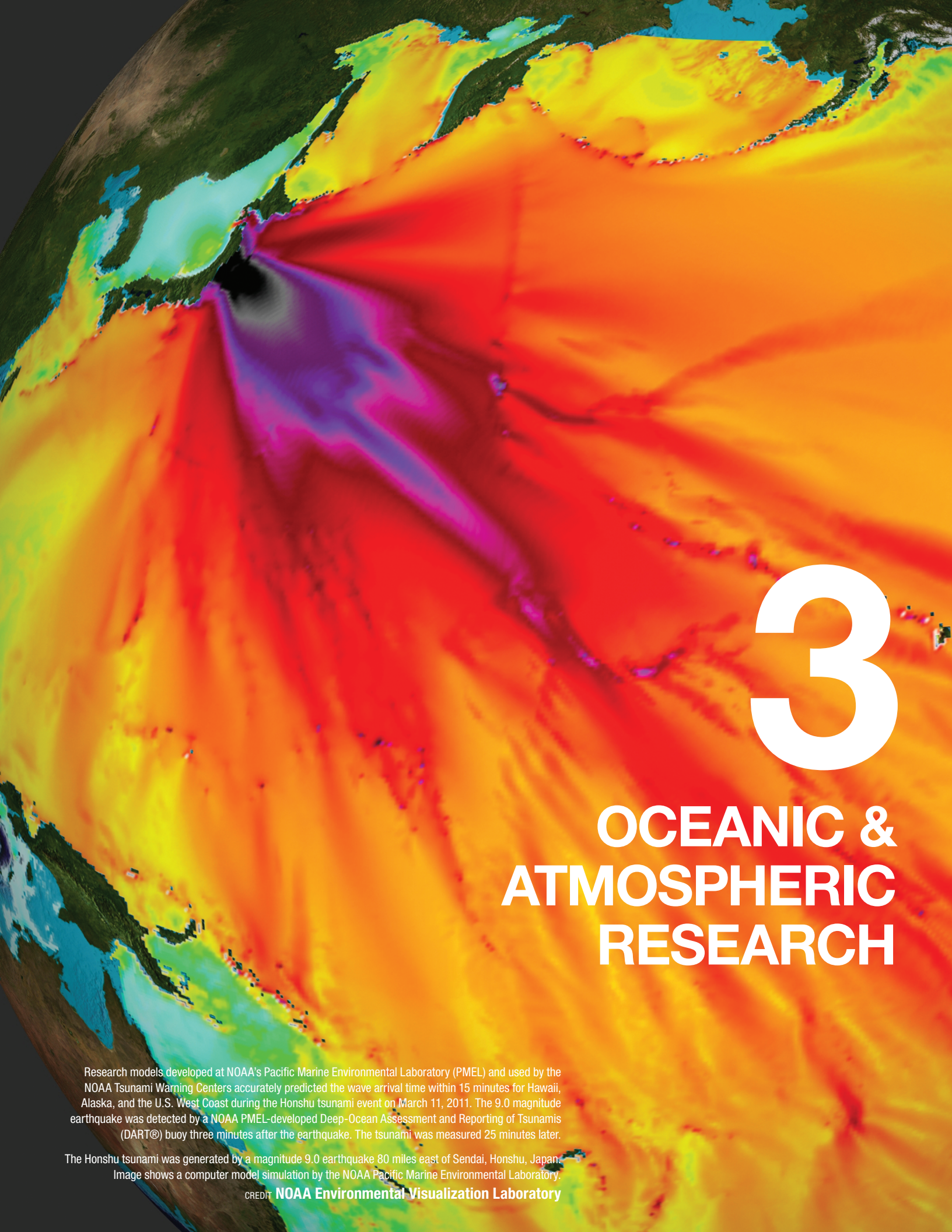
The Environmental Improvement & Restoration Fund (EIRF) was created by the Department of Interior and Related Agencies Appropriations Act of 1998 for the purpose of carrying out marine research activities in the North Pacific. These funds will provide grants to Federal, State, private or foreign organizations or individuals to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean.

LIMITED ACCESS SYSTEM ADMINISTRATION FUND

Under the authority of the MSA Section 304(d)(2)(A), NMFS must collect a fee to recover the incremental costs of management, data collection, and enforcement of Limited Access Privilege (LAP) programs. Funds collected under this authority are deposited into the "Limited Access System Administrative Fund" (LASAF). Fees shall not exceed three percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested. The LASAF shall be available, without appropriation or fiscal year limitation, only for the purposes of administrating the central registry system; and administering and implementing the MSA in the fishery in which the fees were collected. Sums in the fund that are not currently needed for these purposes shall be kept on deposit or invested in obligations of, or guaranteed by the U.S. Also, in establishing a LAP program, a Regional Council can consider, and may provide, if appropriate, an auction system or other program to collect royalties for the initial or any subsequent distribution of allocations. If an auction system is developed, revenues from these royalties are deposited in the LASAF.

WESTERN PACIFIC SUSTAINABLE FISHERIES FUND

Section 204(e) of the 2006 amendments to the MSA authorizes the establishment of the Western Pacific Sustainable Fisheries Fund. This fund serves as a repository for any permit payments received by the Secretary of Commerce for foreign fishing within the U.S. EEZ around Johnston Atoll, Kingman Reef, Palmyra Atoll, and Jarvis, Howland, Baker and Wake Islands, sometimes known as the Pacific Remote Island Areas (PRIA). Also, in the case of violations by foreign vessels occurring in these areas, amounts received by the Secretary attributable to fines and penalties shall be deposited into the fund. Foreign fishing is only allowed though a Pacific Insular Area Fishery agreement. Before entering into such an Agreement, the Western Pacific Fishery Management Council must develop a marine conservation plan that provides details on uses for any funds collected. Marine Conservation Plans must also be developed by the Governors of the Territories of Guam and American Samoa and of the Commonwealth of the Northern Mariana Islands and approved by the Secretary of Commerce or designee. Additionally, any funds or contributions received in support of conservation and management objectives under a marine conservation plan for any Pacific Insular Area other than American Samoa, Guam, or the Northern Mariana Islands shall be deposited in this fund.



3

OCEANIC & ATMOSPHERIC RESEARCH

Research models developed at NOAA's Pacific Marine Environmental Laboratory (PMEL) and used by the NOAA Tsunami Warning Centers accurately predicted the wave arrival time within 15 minutes for Hawaii, Alaska, and the U.S. West Coast during the Honshu tsunami event on March 11, 2011. The 9.0 magnitude earthquake was detected by a NOAA PMEL-developed Deep-Ocean Assessment and Reporting of Tsunamis (DART®) buoy three minutes after the earthquake. The tsunami was measured 25 minutes later.

The Honshu tsunami was generated by a magnitude 9.0 earthquake 80 miles east of Sendai, Honshu, Japan. Image shows a computer model simulation by the NOAA Pacific Marine Environmental Laboratory.

CREDIT **NOAA Environmental Visualization Laboratory**

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

NOAA's Office of Oceanic and Atmospheric Research (OAR) is NOAA's central research line office. OAR supports and produces preeminent long-term and transformational research and technology innovation to advance NOAA's mission of Science, Service and Stewardship. OAR provides the Nation with critical environmental intelligence through atmospheric, oceanic, and Great Lakes research, technology development, and related services that support informed decision-making and promote healthy, productive and resilient ecosystems, communities, and economies.

NOAA scientists Steve Brown (standing) and Nick Wagner (also with the Cooperative Institute for Research in Environmental Sciences) check data from an instrument aboard a research aircraft in California last year. NOAA researchers and collaborators used sophisticated instruments aboard this aircraft and a research ship to study a container ship's emissions in detail. The team found that as the ship shifted to low-sulfur fuels and slowed down near the coast, air pollution emissions plummeted, with some pollutants dropping by as much as 90 percent.

By housing such research in a single line office, NOAA is able to emphasize innovative research and development (R&D) and contribute state of the art products to enhance America's competitiveness. NOAA's FY 2013 budget request recognizes the value of the research enterprise within the Agency and maintains a strong central research function in OAR.

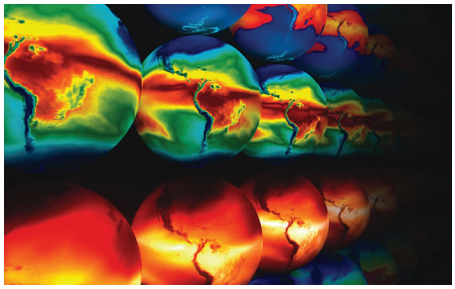
To successfully support NOAA's mission, future operations depend on continued investment in innovative R&D. As such, NOAA's Next Generation Strategic Plan positions OAR to fulfill a NOAA-wide leadership role through responsibilities in three primary areas: holistic understanding of the Earth system through research; integrated environmental modeling; and climate adaptation and mitigation. As part of these three responsibilities, and armed with a mandate from the America COMPETES Act, OAR plays a leading role in identifying the emerging and innovative priorities in transformational research and atmospheric R&D that are consistent with NOAA's mission. OAR provides a comprehensive and integrated office that brings together the agency's existing science and research assets. This unique role of OAR strengthens research activities across the agency enabling NOAA to effectively balance its around-the-clock operational mission while maintaining a cutting edge scientific portfolio that fuels creativity and the next generation of products and services.

OAR consists of seven research laboratories and four programs located across the country as well as an extensive extramural network that includes multiple Cooperative Institutes with academia and thirty-two National Sea Grant institutions. These programs establish and maintain partnerships with

many university and research institutions. In addition, OAR works agency wide through the Research Council and with the other line offices as well as with private industry through the Small Business Innovation Research (SBIR) program. By working closely with its partners, OAR leverages their expertise and capabilities to expand the breadth and depth of our knowledge and skills to more efficiently and effectively serve the Nation, create jobs, maintain our country's competitiveness, and inspire and support America's next generation of scientists.

FY 2011 ACCOMPLISHMENTS

This past year NOAA research upgraded their world class climate and earth system models for use in predicting and projecting climate variability and change. These enhancements will facilitate continuous improvements in NOAA's climate prediction tools on regional scales as well as on seasonal-to-decadal-to-centennial time scales. An additional advancement in climate and weather modeling was achieved with NOAA's partnership with the Department of Energy through an interagency agreement for high performance computing services in climate modeling. This agreement provides NOAA with high performance computing that leverages significant specialized expertise and unique capabilities established at the Oak Ridge National Laboratory (ORNL) in Tennessee.



Climate simulation. Oak Ridge National Laboratory

In June, 2011, the Western Governors' Association (WGA) and NOAA announced a joint agreement for improving the development and delivery of climate science and services to Western states. The Memorandum of Understanding was a timely agreement in the midst of a record-breaking season of extreme drought, flood, wildfire and severe storms. The WGA and NOAA committed to improve the development, coordination and dissemination of climate information to support the important long-range hazard planning priorities and resource management decisions of WGA members. The agreement will assist Western state resource managers, agencies and businesses who manage or are affected by natural disasters and weather variability.

Browned out corn field near Los Fresnos, June 21, 2011, a casualty of drought and lack of irrigation outside of natural rains earlier in the spring

FY 2013 REQUEST **$413,820,000**

NOAA requests a total of $413,820,000 and 758 FTEs to support the continued and enhanced operations of the Office of Oceanic and Atmospheric Research. This includes the Operations, Research, and Facilities (ORF) and the Procurement, Acquisition, and Construction (PAC) accounts. This is an increase of $29,102,000 and 3 FTEs above the FY 2012 estimate. This increase includes $25,926,000 and 3 FTEs in net program changes plus an increase of $3,176,000 and 0 FTEs for Adjustments to Base (ATB).

The FY 2013 President's Budget Request for OAR supports the highest priority and most essential services for building a future Weather-Ready Nation and taking a global lead on improving and providing the scientific understanding of the changing climate system and its impacts, while continuing NOAA's emphasis on initiatives that support holistic ecosystem research.

The OAR budget is organized into four "sub-activities" or themes: (1) Climate Research – the study of complex climate systems to improve predictions and provide a reliable and authoritative source for climate data, information, and decision-support services; (2) Weather and Air Chemistry Research – to understand weather and air-chemistry events to improve forecasts and predictions and assist in saving lives and property; (3) Ocean, Coastal, and Great Lakes Research – to explore, investigate, and understand the complexities of our ocean,

coastal, and Great Lakes ecosystems and resources; and (4) Information Technology R&D - to accelerate adoption of advanced computing, modeling, communications, and information technology throughout NOAA.

Climate Research: The American public is increasingly concerned about the growing frequency and intensity of drought, floods, and other extreme events. OAR continues to take the global lead to improve and provide the scientific understanding of the changing climate system and its impacts, which requires advancing mission-critical climate modeling, national assessments, external and private-sector partnerships, as well as regional climate information and delivery. Easily accessible and relevant information is required to help communities better prepare for these events and make informed decisions. In addition, water resource and emergency managers require improved seasonal and sub-seasonal forecasts for optimum efficiency and preparedness.

NOAA's FY 2013 budget requests an increase of $28.2 million to fund high-priority climate science to advance understanding of Earth's climate system and its atmospheric, oceanic, land, and snow and ice components. This increase will support Regional Integrated Sciences and Assessments (RISA) work and key ocean observations, including Deep Argo, development of an operational NOAA Climate Portal, as well as, funding for Climate Model Data Archives. This increase includes funding for Assessment and Earth System Science activities and will also restore funding for applied climate research and improved climate predictability, which improves NOAA's ability to provide research in support of the nation's decision makers for topics such as El Niño prediction, seasonal temperature/precipitation forecasts, changes in atmospheric composition, and other climate impacts.

Weather and Air Chemistry Research: In strong coordination with both internal and external partners, OAR will help build a future Weather Ready Nation by increasing our ability to anticipate and take appropriate precautions against such oncoming natural disasters as hurricanes, tornadoes, and tsunamis as well as significant heat, snow, and rain events. We can continually improve our warning systems and predictive capacity to minimize the loss of life and property. These improvements advance our predictive capacity so that NOAA can provide enhanced and expanded forecasts to inform emergency managers and other government agencies about high-impact extreme events.

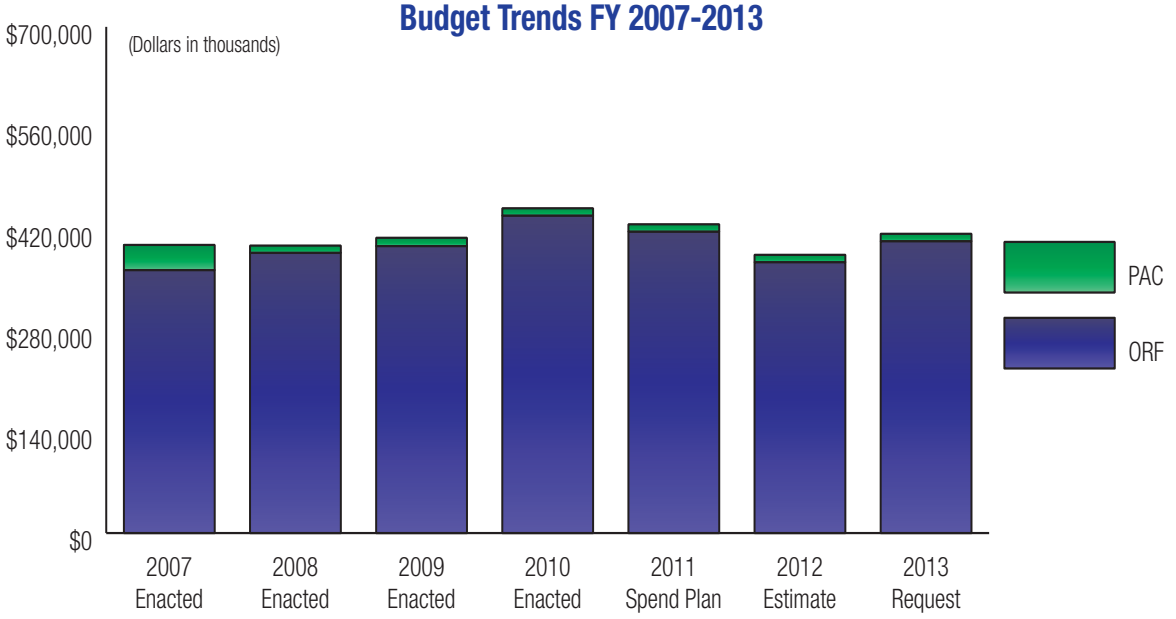
Ocean, Coastal, and Great Lakes Research: NOAA has mandated responsibilities to support the sustainable use, protection, and restoration of coastal, Great Lakes, and marine ecosystems and the ecosystem services they provide to communities. OAR will continue to develop sound scientific information upon which decision makers can develop measured and effective regulations regarding food pathogens, storm mitigation efforts, and harmful atmospheric emissions. In addition, these ecosystems are frequently stressed by human activities, compounding natural variability and undermining their resiliency. OAR's ecosystem research improves our understanding of ecosystem dynamics and environmental stressors, provides innovative solutions to promote ecosystem resilience, and expands NOAA's management capabilities to address new challenges.

Information Technology R&D: OAR will accelerate the adoption of advanced computing, communications, and information technology throughout the agency. This Information Technology R&D supports OAR's High Performance Computing and Communications (HPCC) Initiative with promise for major improvements in weather and climate forecasting, ecosystem and ocean modeling, and environmental information dissemination. These improvements are heavily dependent on major advances in high-end computing power, advanced information technology, and the availability of environmental data and information. As a result, these critical investments will allow NOAA to meet its mission to deliver vital services and science education.

OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
OAR — ORF				
Climate Research	$218,934	$182,978	$212,683	$29,705
Weather and Air Quality Research	69,410	67,779	69,542	1,763
Ocean, Coastal, and Great Lakes Research	115,262	114,719	108,838	(5,881)
Information Technology, R&D & Science Education	13,031	8,946	12,378	3,432
Total, OAR - ORF	416,637	374,422	403,441	29,019
Total, OAR - PAC	10,358	10,296	10,379	83
GRAND TOTAL OAR (Direct Obligations)	**$426,995**	**$384,718**	**$413,820**	**$29,102**
Total FTE	**770**	**755**	**758**	**3**

OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH
Budget Trends FY 2007-2013



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $403,441,000 and 758 FTEs to support the Operations, Facilities, and Research (ORF) of the Office of Oceanic and Atmospheric Research. This is an increase of $29,019,000 and 3 FTEs from the FY 2012 estimate. This includes an increase of $25,843,000 and 3 FTEs in net program changes plus an increase of $3,176,000 and 0 FTEs for Adjustments to Base (ATB).

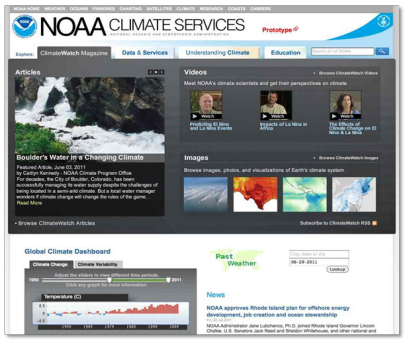
OAR – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

CLIMATE RESEARCH $212,683,000

NOAA requests an increase of $28,166,000 and 14 FTEs in the Climate Research sub-activity for a total of $212,683,000 and 380 FTEs.

Climate Data and Information: NOAA requests an increase of $1,689,000 and 2 FTEs. This is comprised of two increases and one decrease:



NOAA's Climate Portal--www.climate.gov

NOAA Climate Portal: NOAA requests an increase of $542,000 and 2 FTEs to continue supporting development of the NOAA Climate Portal. The Climate Portal will serve as the public's primary online point of entry into NOAA's climate science and services and will be a central component of NOAA's commitment to integration and delivery of climate services enhancing public access to useful climate data and information. The Portal will have unique audience-focused sections designed specifically to serve the needs of climate science decision makers and policy leaders, scientists, educators, and interested members of the public. In FY 2013, NOAA will include improvements to the Portal's interface, deliver a new section, called "Climate Conditions," which presents a data-driven digest of recent and near-future climate trends of interest and relevance to society, and hire full-time administrative personnel to manage the system. Additionally, the agency will create an overarching Portal home page that integrates timely and topical content from each of the Portal's sections. NOAA has robust policies in place to govern information provided on the Climate Portal and is committed to clearly identifying and citing the information published so that users can easily trace the information back to its original scientific sources.

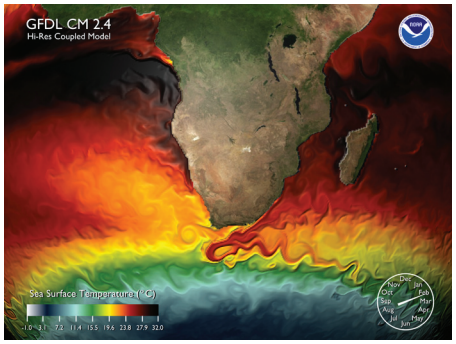
Climate Model Data Archive: NOAA requests an increase of $1,736,000 and 0 FTEs to generate and safely store model-based data records and support an operational archive and access capability for the next generation high-resolution weather and climate reanalysis datasets. This project will further develop and implement a Climate Model Data Archive capability for the next generation climate analyses currently running on supercomputers across NOAA and its collaborators, including the National Science Foundation, the Department of Energy and others. NOAA will provide an operational data stewardship and user access capability for the next generation of climate reanalysis products. These products are derived for the utilization of major advancements in model physics and coupling across the ocean, air and land interfaces. The Climate Model Data

Archive leverages existing supercomputer resources to provide a unified and consistent suite of climate information to users at all levels so that they can make better decisions about their specific management needs. Information will be provided on time scales from days (weather) to months (El Niño) to years and decades (climate variability and change).

Climate Operations: NOAA requests a decrease of $589,000 and 0 FTEs to prioritize activities and maintain support for the transition of regional information applications to operational production and dissemination capabilities. In FY 2013, NOAA requests to maintain core capability support for the production and dissemination of operational forecast products by maintaining model performance, forecast designs, and existing data users. Seasonal and inter-annual climate variability impacts life and property on local, regional, and global scales. Because societal impacts from climate variability and change extend down to sub-seasonal time scales, connections between climate and extreme weather events need to be identified to improve the forecast timing and location of extreme weather events.

Climate Competitive Research Program, Sustained Observations, and Regional Information: NOAA requests an increase of $26,311,000 and 12 FTEs. This is comprised of six increases:

Earth System Modeling for Urgent Climate Issues: NOAA requests an increase of $8,000,000 and 10 FTEs to enable continued development and use of state-of-the-art Earth System Models to address urgent climate issues, including sea level rise and Arctic climate change. One of NOAA's missions is to provide predictive understanding of the climate. A primary tool for this activity is the earth system model (a numerical software coding of the physics and chemistry of the atmosphere, ocean, land, and cryosphere run on high performance computers). The outputs of these models, ranging from seasonal forecasts to century long projections of the future state of the climate, are utilized by the research community, climate assessments (such as the Intergovernmental Panel on Climate Change), and, increasingly, decision making communities. In FY 2013, NOAA will use this funding to continue development of Earth System Models to explore the uncertainties in sea-level rise projections and to examine the terrestrial carbon cycle and future biogeochemical feedbacks on climate; as well as to address gaps in the understanding of the Arctic climate system, including rapid changes. These improved models will also examine the potential for decadal climate predictions and better understanding of abrupt change, such as the sudden onset of extended droughts. Funding will support these developments through a combination of 10 FTE, post-doctoral researchers, and contracts managed primarily by the NOAA Geophysical Fluid Dynamics Laboratory with assistance from the NOAA Earth System Research Laboratory and US academic community. The NOAA Climate Program Office will manage the grants for this request.

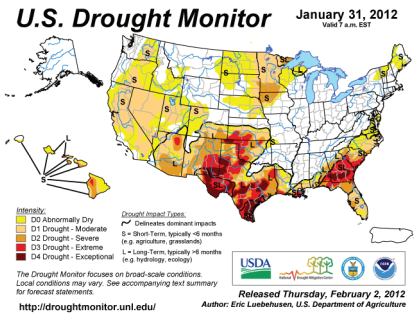


Sea surface temperature (SST) simulation from GFDL's high resolution coupled atmosphere-ocean model. As the animation focuses on various locations of the world ocean we see the major current systems eg. the Agulhas current, Brazil current, Gulf Stream, Pacific Equatorial current, Kuroshio current. The small scale eddy structure is resolved and evident.

Assessment Services: NOAA requests an increase of $2,619,000 and 0 FTEs to support a permanent capability to produce climate assessments at national and regional scales. Periodic climate assessments are essential to ongoing efforts to understand what climate change means for the United States and what services are necessary to allow for informed decision-making. In FY 2013, this increase will help support a permanent capability to produce climate assessments at national and regional scales, leading the

development of relevant and authoritative regional assessments targeted to regional stakeholders. In addition, NOAA plans to create a user-focused interface that links foundational assessment information with other tools and applications across the Government. These assessments will contribute to the legislatively mandated National Climate Assessment and future international climate assessment and will contribute to, the interagency Global Change Information System (GCIS), which is a system that provides public access to datasets and conclusions made through the National Climate Assessment (NCA), furthering the NCA's goal of traceability and transparency. Climate assessments will leverage both operational and research elements of NOAA, and will build upon many existing NOAA resources and functions including research in the physical, biological, and social sciences, observing, data management, modeling and forecasting, education and outreach. NOAA will also enhance its capabilities and tailor its products through partnerships with other Federal agencies, and the academic, public and private sectors.

Global Ocean Observing System (GOOS): NOAA requests an increase of $4,601,000 and 1 FTE to make progress in critical ocean observations and analysis, Arctic monitoring, and more comprehensive deep ocean monitoring. Ocean observations serve as the foundation for understanding and forecasting Earth's climate system, enabling real-time monitoring of ever-changing ocean conditions and seasonal-to-decadal climate forecasts and analyses for a broad spectrum of societal applications. In FY 2013, NOAA requests an increase in support for three components of the Global Ocean Observing System: 1) critical ocean observations and analysis; 2) progress in observational efforts in the rapidly changing Arctic; and 3) technology development to improve our understanding of the deep ocean via deployment of Deep Argo Floats that would provide valuable information on sea level rise and the global energy balance.

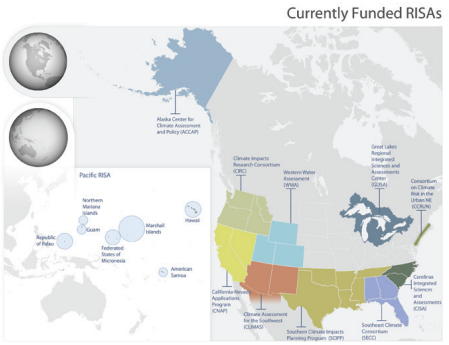


NOAA's U.S. Drought Monitor for January 31, 2012

National Integrated Drought Information System's (NIDIS) Regional Drought Early Warning Information Systems: NOAA requests an increase of $1,500,000 and 0 FTEs to develop Regional Drought Early Warning Information Systems (RDEWS) by providing focused drought impacts research and applications development to underserved regions of the country. Extending products, tools, and knowledge to areas outside of the NIDIS Pilots is the final stage of implementing a national early warning information system for drought. In order to implement the NIDIS Act, NOAA coordinates and integrates drought research, monitoring, forecasting, and early warning information and tools to improve drought risk management across the United States. The funding requested for competitive research grants and contracts will build upon work already in progress to develop the Regional Drought Early Warning Information System (RDEWS) by providing focused drought impacts research and applications development to underserved regions of the country. This funding will also provide research and products relevant to stakeholders and create coordinated and authoritative early warning systems for water resources, agriculture and ecosystem management in key drought sensitive regions. Better and earlier warnings for droughts will provide decision-makers, resource managers and citizens with the information to plan ahead, for example, minimizing water usage and planning for crop production based on drought information.

Climate Science on the Global Carbon Cycle, Aerosols, and Atmospheric Chemistry to Improve Climate Models and Predictions: NOAA requests an increase of $6,491,000 and 0 FTEs to provide a process-level understanding of the climate system through observation, modeling, analysis, and field studies to support the development of improved climate models for use in climate assessments. NOAA, in collaboration with its academic partners including Cooperative Institutes, will advance the understanding of the global carbon cycle and the role of aerosols and chemically active greenhouse gases in the global climate system. This is critical to our understanding of how different components in the atmosphere affect the climate. This knowledge will allow decision-makers to make more informed decisions on adaptation strategies. This research will be done in collaboration with members of the NOAA ESRL Carbon Tracker team and the GFDL Climate and Ecosystems group to incorporate new models into CarbonTracker and to improve the ocean component of Earth System Models.

Regional Integrated Sciences and Assessments (RISA): NOAA requests an increase of $3,100,000 and 1 FTE to expand capability for regional research and information services. In FY 2013, NOAA will increase its support of external research teams who work with resource managers and planners to develop and utilize new information about the impacts of climate on communities, natural and managed resources, infrastructure, transportation, and health. A new region would be funded through a competitive process, and funds will be used to augment and ensure explicit collaborative partnering with NOAA's regional information system components such as NIDIS, NESDIS Regional Climate Service Directors, NOS Coastal Services Centers, NWS Regional offices, NMFS regional offices, as well as other Federal, state, and private providers. RISAs will develop a new suite of applied research products specifically to inform regional networks of information providers, assess the extent to which the regional network is providing "actionable science" able to be taken up into practical decision making, and provide research-based decision support for adaptation such as understanding economic costs benefits. RISA scientists provide information that decision makers can use to cope with drought, understand climatic influences on wildfire, and assess climate impacts on the transportation sector, coastal communities and human health. Stakeholders can use such information to evaluate potential climate change impacts on water supplies and hydroelectric power and support disaster management planning.



Regional Integrated Sciences and Assessments (RISA) supports research teams that conduct innovative, interdisciplinary, use-inspired, and relevant research that informs regional resource planning and management

WEATHER & AIR CHEMISTRY RESEARCH $69,542,000

NOAA requests an increase of $1,071,000 and 0 FTEs in the Weather & Air Quality Research sub-activity for a total of $69,542,000 and 210 FTEs.

Laboratories and Cooperative Institutes: NOAA requests an increase of $1,026,000 and 0 FTEs. This is comprised of one increase and one increase below $500,000:

Wind Boundary Layer Research to Support Improved Forecasts: NOAA requests an increase of $855,000 and 0 FTEs for wind boundary layer research to advance weather forecast quality and accuracy. Much of what we know now about wind is very low to the ground where people live and at altitudes where aircraft fly and storms occur. Very little is known about the wind at mid-altitudes, the height in which we deploy

A collection of wind turbines near farm fields

wind turbines. A better understanding of those mid-level altitudes will allow us to advance weather forecast quality and accuracy and allow for more accurate predictions. In FY13, funding will be used to deploy regional wind test beds designed to determine the optimal mix of instrumentation needed for wind resource characterization and forecast improvement within the region. NOAA will perform scientific analyses and develop Numerical Weather Prediction (NWP) models using the data collected at the test beds. NOAA will also use the funding in FY13 to improve our High Resolution Rapid Refresh weather model. The additional observations collected at the test beds will be used to initialize the HRRR model and equip it with more accurate initial values of weather parameters, so that it can produce a more accurate forecast of wind speeds and direction

OCEAN, COASTAL, & GREAT LAKES RESEARCH $108,838,000

NOAA requests a decrease of $6,826,000 and 11 FTEs in the Ocean, Coastal, & Great Lakes sub-activity for a total of $108,838,000 and 155 FTEs.

Laboratories and Cooperative Institutes: NOAA requests a decrease of $2,365,000 and 2 FTEs. This is comprised of one increase and two decreases:

Ocean Coastal and Great Lakes Research Laboratories and Cooperative Institutes: NOAA requests a decrease of $1,000,000 to reflect a reduced need for Cooperative Institute support for planned research projects in FY 2013. This is a strategic realignment within NOAA's science mission to maintain progress in higher priority areas. In FY 2013, funds will be used to continue improving protection, restoration and management of coastal and ocean resources, monitor ocean, coastal and Great Lakes ecosystems including coral, support ecosystem modeling and forecasting, and encourage technology transfer and efficient resource management. NOAA will continue its traditional relationships with the Cooperative Institutes in accomplishing the above objectives. However, rather than a dedicated pool of funding available for such efforts, the NOAA research labs will continue to involve CI researchers using their base resources and making awards to the CI's in those instances where they can make significant advances through such partnerships.

Ocean Research Advisory Panel: NOAA requests an increase of $300,000 and 0 FTEs to support the Ocean Research Advisory Panel (ORAP). ORAP functions as the science advisory body to the National Ocean Council and includes members from the National Academies, state governments, academia, and ocean industries. The Administration will submit legislation to transfer ORAP responsibly from the Department of Defense to NOAA. NOAA as the nation's premier ocean research agency is the appropriate place to support this organization

Great Lakes Environmental Research Laboratory (GLERL): NOAA requests a decrease of $1,665,000 and 2 FTEs to terminate activities in order to realize efficiencies within the lab. At the reduced level, NOAA will continue to provide research services in the Great Lakes such as forecasts of toxic harmful algal blooms; forecasts of wind, waves, fog, ice, and channel depths, and forecasts of rip currents and pathogen delivery to beaches.

National Sea Grant College Program: NOAA requests a decrease of $571,000 and 3 FTEs. This is comprised of one decrease and two increases, two of which is below $500,000:

Aquatic Invasive Species: NOAA requests a decrease of $999,000 and 3 FTEs to terminate its national competitions for Aquatic Invasive Species (AIS). The Sea Grant AIS Program conducts research, education, and outreach activities to create tools to help states, communities, fishery commissions, industries, and individuals prevent and control invasive species. In FY 2013, NOAA requests the elimination of Sea Grant's national AIS research and outreach competitions. NOAA will continue to support aquatic invasive species activities in other NOAA programs and will continue to provide support to the local, state, and regional invasive species research that are expected to continue.

Marine Aquaculture: NOAA requests an increase of $247,000 and 0 FTE to enhance Sea Grant's support of national grant competitions for marine aquaculture research and technology transfer. Sea Grant facilitates the transfer of aquaculture research and technology into business operations, as well as informs the public and practitioners about key issues and information related to aquaculture. Environmentally and economically sustainable aquaculture helps meet the increasing demand for seafood, creates and sustains jobs, stabilizes economies in coastal working waterfronts, and supports efforts to manage and rebuild wild fish stocks.

Ocean Exploration and Research: NOAA requests a decrease of $3,910,000 and 6 FTEs. This is comprised of one decrease and one increase, which is below $500,000:

National Undersea Research Program (NURP): NOAA requests a decrease of $3,985,000 and 6 FTEs to terminate the National Undersea Research Program (NURP) component of OER. NOAA determined that NURP was a lower-priority function within its portfolio of research activities, particularly given that other avenues of Federal funding for such activities might be pursued. NOAA will continue to support the Ocean Exploration program, which delineates the Extended Continental Shelf and produces significant discoveries in deep sea research. Competitive grants for related activity will continue to be offered through NOAA and other Federal programs.

INFORMATION, TECHNOLOGY, RESEARCH & DEVELOPMENT $12,378,000

NOAA requests an increase of $3,432,000 and 0 FTEs in the Information, Technology, Research and Development sub-activity for a total of $12,378,000 and 13 FTEs.

High Performance Computing: NOAA requests an increase of $3,432,000 and 0 FTEs. This is comprised of one increase:

High-Performance Computing and Communication (HPCC): NOAA requests an increase of $3,432,000 and 0 FTEs to resume and restore applied information technology R&D suspended in FY 2012. Investment in IT R&D is crucial for NOAA to continue to fulfill its mission. NOAA's HPCC program supports IT and computing research to make major improvements in the Nation's ability to forecast the weather and climate and to disseminate environmental information. Past critical investments in IT and HPCC have ensured that NOAA has the best weather forecast and climate models. The Nation is safer

NOAA High Performance Computing Systems at Oak Ridge National Labratory

and our decision-makers have the best data at their fingertips as a result of the Nation's strong history of investing in IT and computing. The funding request will support the IT innovation for approximately 15-20 IT applied R&D innovation projects in environmental modeling and software development.

An outbreak of 343 tornadoes in central and southern states caused 321 deaths. Of those fatalities, 240 occurred in Alabama alone. The deadliest tornado of the outbreak, an EF-5, hit northern Alabama, killing 78 people. Several major metropolitan areas were directly impacted by strong tornadoes including Tuscaloosa, Birmingham, and Huntsville in Alabama and Chattanooga, Tennessee, causing the estimated damage costs to soar. The outbreak caused more than $7.3 billion insured losses and total losses greater than $10.2B.

NOAA tornado damage expert Jim LaDue and Dr. Jane Lubchenco survey tornado damage in Tuscaloosa, Alabama. The trees in the background—while green—are horizontal.

4

NATIONAL WEATHER SERVICE

CREDIT **NOAA**

NATIONAL WEATHER SERVICE

The National Weather Service (NWS) is the Nation's first line of defense against severe weather. The NWS mission is to provide weather, water, and climate data, and issue forecasts and warnings for the protection of life and property and for the enhancement of the national economy.

With approximately 4,600 employees in 122 Weather Forecast Offices, 13 River Forecast Centers, 9 national prediction centers, and other support offices around the country, NWS provides the critical national infrastructure to gather and process data worldwide from the land, sea, and air.

A Rescue Boat searches for stranded people in downtown Kingfisher, OK.
Photo by Marvin Nauman/FEMA

This infrastructure enables data collection using technologies such as radars, satellites, data buoys, and surface observing systems. These data feed sophisticated environmental prediction models running on supercomputers. A highly trained and skilled workforce uses powerful workstations to analyze the information. A communications hub allows for the exchange of data and products between NOAA and its public and private partners and is used to develop forecasts and warnings that are rapidly distributed via a diverse dissemination infrastructure, including NOAA All-Hazards Weather Radio.

NWS has made tremendous strides in forecast and warning services over the past decades due to research advances from other parts of NOAA. For example, the development of hurricane forecast models by the Office of Ocean and Atmospheric Research (OAR) and the tide gauge network operated by the National Ocean Service (NOS) that contributes to the tsunami warning system, are part of a NOAA-wide operational system. Platforms for observations, such as National Environmental Satellite, Data, and Information Service (NESDIS) satellites and Office of Marine and Aviation Operations (OMAO) aircraft, routinely demonstrate how NOAA science and service work together and rely upon each other to save lives and for the stewardship of coastal and marine ecosystems and resources.

According to the American Meteorological Society, weather is directly linked to public safety, and a significant portion of the U.S. economy is weather-sensitive. A nationwide survey indicates that 96 percent of the U.S. public obtains, either actively or passively, 301 billion forecasts each year. Based on an average annual household value of $286 placed on weather information,

the American public collectively receives $31.5 billion in benefits from forecasts each year. In 2011 alone, tornadoes, hurricanes, flooding, and other severe weather caused an estimated $55 billion in economic losses ($25.8 billion in insured losses) in the United States (all values in 2011 dollars).[1] More and more sectors of the U.S. economy are recognizing the impacts of weather, water, and climate on their businesses and are looking for ways to increase their resilience and reduce the potential of severe societal and economic impacts.

To meet these needs, NOAA's Next Generation Strategic Plan envisions a Weather-Ready Nation - a society that is prepared for and responds to weather-related events. Readiness, responsiveness, and resiliency are the foundation for a Weather-Ready Nation. NWS strives to improve decision support services for weather, enhance water and climate services, improve user relevant information, reduce the impact of health and environmental hazards on communities and ecosystems, and sustain a highly-skilled, professional workforce to accomplish the NWS mission. NWS also supports NOAA's strategic goal of climate adaptation and mitigation – an informed society anticipating and responding to climate and its impacts. Research by NWS and OAR into the weather patterns associated with El Niño and La Niña has allowed significant leaps in our capability to forecast on a seasonal basis and associated improvements in numerical models. Advances in understanding these and other larger scale phenomena, and their relationships to high impact weather events, are key to NOAA's ability to give the Nation advance notice and time to prepare.

FY 2011 ACCOMPLISHMENTS

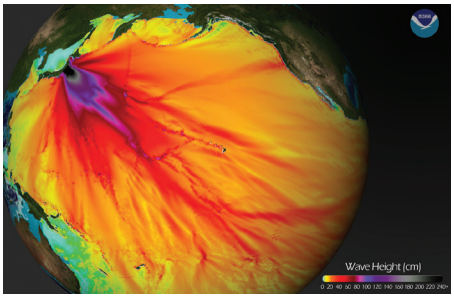
From extreme drought, heat waves, and floods to unprecedented tornado outbreaks, hurricanes, wildfires, tsunami, and winter storms, record weather disasters occurred in 2011.

Aerial views of tornado damage in Alabama, 2011

This year saw the most number of tornados in a single day (200) and the largest outbreak of tornados (343); cutting a swath of destruction across the Midwest and the South, tornados threatened citizens and property. NWS early tornado warnings provided the lead time to prevent widespread loss of life. During a five-day period in late April 2011, the Deep South experienced a historic tornado outbreak. NWS Weather Forecast Offices (WFOs) in the affected areas of Arkansas, Tennessee, Mississippi, Alabama, and Georgia began alerting the public, local emergency managers, and the media to the potential for a large tornado outbreak five days in advance and issued warnings with average lead-time exceeding 20 minutes. Despite advanced notification, there were still 321 fatalities, with April 27, 2011, ranked as the deadliest day for tornadoes since modern record keeping began in 1950. Also, the devastating tornado that struck Joplin, Missouri on May 22 ranks as the seventh deadliest and the most costly single tornado in U.S. history. While the tornado resulted in over 150 fatalities and over 1,000 injuries, NOAA's NWS Storm Prediction Center and area WFOs provided early forecasts and warnings on the order of 24 minutes of lead time for the city of Joplin, saving countless more. Still, improvements in science and technology, as well as outreach and education about preparedness and response, are required in order to see further advances in warning lead times to further reduce such a toll.

NWS provided tsunami warnings and radiological forecast support for the March 2011 undersea earthquake 45 miles east of Japan. Within nine minutes of the earthquake, NOAA's Pacific Tsunami Warning Center, located in Hawaii, issued a tsunami warning for the western Pacific. Within 12 minutes of the earthquake, NOAA's West Coast & Alaska Tsunami Warning Center issued a tsunami warning for the coastal

1 *AON Benfield, United States April and May 2011 Severe Weather Outbreaks. (Chicago, IL, June 22, 2011;* http://www.aon.com/attachments/reinsurance/201106_us_april_may_severe_weather_outbreaks_recap.pdf) and http://www.ncdc.noaa.gov/oa/reports/billionz.html.



Model runs from the Center for Tsunami Research at the NOAA Pacific Marine Environmental Laboratory show the expected wave heights of the tsunami as it traveled across the Pacific basin.

areas of the eastern Pacific. Approximately 25 minutes after the earthquake, the tsunami was recorded by a NOAA Deep Ocean Assessment and Reporting of Tsunamis (DART) buoy off the east coast of Japan. The information from the DART went into NOAA's tsunami models to predict arrival times, wave heights, and inundation areas for specific U.S. locations. As a result of NOAA's tsunami warnings, coastal evacuations in Hawaii and along the U.S. West Coast were ordered. Damage to U.S. interests from the tsunami was isolated, with the most significant damage experienced at the Crescent City and Santa Cruz, California harbors. Local WFOs that serve the U.S coastline issued localized tsunami impact statements. Subsequently, the NWS National Centers for Environmental Prediction (NCEP) provided 24/7 model guidance to track radiation particles on the ocean surface, and estimate dispersion and retention times of radionuclides by ocean currents relating to sustained damage of the Japanese Fukushima Daiichi nuclear power plant.

FY 2013 REQUEST **$972,193,000**

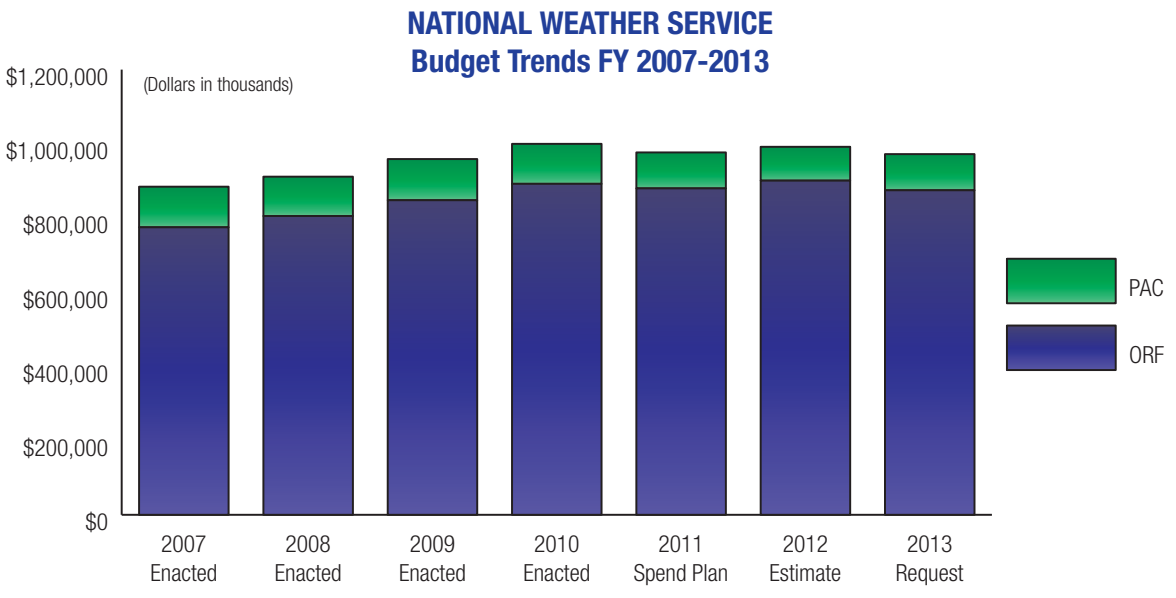
NOAA requests a total of $972,193,000 and 4,548 FTEs to support the continued and enhanced operations of the National Weather Service. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts. This is a decrease of $19,681,000 and 101 FTEs from the FY 2012 estimate. This reduction includes a net decrease of $29,776,000 in program changes and 101 FTEs plus an increase of $10,095,000 and 0 FTEs for Adjustments to Base (ATB).

The FY 2013 President's Budget Request supports the highest priority core requirements necessary to address the NOAA strategic plan goals of a Weather-Ready Nation and a society prepared for Climate Adaption and Mitigation. The request allows the NWS to produce and deliver forecasts that can be trusted, provide services in a cost-effective manner, continue to reduce weather-related fatalities, and improve the economic value of weather, water, and climate information. NWS continues to take steps to evaluate budget priorities, find efficiencies, and leverage NOAA and other agency partnerships.

In FY 2013, NWS base funds will provide up-to-date and accurate weather information and warnings to the Nation through the support of the 122 WFOs. Base funds include the operation and maintenance of systems, such as Next Generation Radar (NEXRAD), the Automated Surface Observing System (ASOS) and others that collect the observations necessary to provide weather forecasts, warnings, and outlooks. In addition, core funding will cover acquisition of systems, including Advanced Weather Interactive Processing System (AWIPS) II, which will offer new and improved ways for forecasters to access and visualize meteorological data; and NWS' operational High Performance Computing (HPC) capability, which is used to run all of NOAA's operational weather models and some experimental hurricane models. Also, funding for construction includes upgrades and improvements to NOAA's Weather Forecast and Weather Service Offices (WSOs).

NATIONAL WEATHER SERVICE

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
NWS — ORF				
Operations and Research	$777,478	$799,260	$772,378	($26,882)
Systems Operation & Maintenance (O&M)	102,104	101,504	102,376	872
Total, NWS - ORF	879,852	900,764	874,754	(26,010)
Total, NWS - PAC	96,899	91,110	97,439	6,329
GRAND TOTAL NWS (Direct Obligations)	**$976,481**	**$991,874**	**$972,193**	**($19,681)**
Total FTE	**4,649**	**4,649**	**4,548**	**(101)**



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $874,754,000 and 4,522 FTEs to support the Operations, Facilities, and Research (ORF) of the National Weather Service. This is a decrease of $26,010,000 and 96 FTEs from the FY 2012 estimate. This reduction includes a decrease of $36,105,000 and 101 FTEs in net program changes plus an increase of $10,095,000 and 5 FTEs for Adjustments to Base (ATB). Adjustments include the following transfers:

- NWS requests a technical adjustment to move 5 FTE from the NEXRAD Product Improvement (PI) program in PAC to the Local Warnings & Forecasts (LWF) program in ORF. This adjustment refocuses the FTE working on the NEXRAD PI program to other LWF activities, following the planned termination of the program.

NWS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

OPERATIONS AND RESEARCH $772,378,000

NOAA requests a decrease of $36,429,000 and 101 FTEs for a total of $772,378,000 and 4,334 FTEs under the Operations and Research sub-activity.

Local Warnings and Forecasts: NOAA requests a decrease of $36,058,000 and 101 FTEs. This is comprised of four increases, three of which are below $500,000, eleven decreases, one of which is below $500,000, and one termination of $10,965,000 for activities not proposed to be continued in FY 2013:

PMEL Scientist Brian Powers monitors the TAO Buoy windbird

Local Warnings & Forecasts Base, Tropical Atmosphere Ocean (TAO) Array: NOAA requests an increase of $2,400,000 and 0 FTEs to support the additional costs associated with the operations and maintenance (O&M), and technology refresh for the TAO Array. TAO network data directly contribute to the prediction of El Niño and La Niña climate events. These disruptions of normal ocean-atmosphere systems lead to extreme shifts in temperature, flooding and drought, etc. that can have devastating impacts on agriculture, fishing, and human health. Accurate prediction of the onset of El Niño and La Niña allows mitigation of impacts. Because of the distance and conditions that the TAO buoys operate in, the costs to operate and maintain the array at an acceptable level have escalated. Projections are that without additional resources, data availability will drop to 50 percent or less annually. Maintenance of the array is necessary to provide accurate observations and with this increase, data availability will increase to an optimal 80 percent annually. Refreshing obsolete technology and components is essential to ensure the continued performance of the TAO array. Technology refresh includes an upgrade to provide near real-time transmission of the entire TAO data set to ensure quality climate data and a more reliable network with improved climate prediction and understanding.

Local Warnings & Forecasts Base, Operational and Organizational Efficiencies in Information Technology (IT): NOAA requests a decrease of $2,000,000 and 0 FTEs to reduce organizational costs through IT consolidations and related efficiencies. NWS will implement various cost savings initiatives through streamlining requirements,

elimination of redundant and duplicative requirements and use of proven, best practices from the IT community. This initiative will be accomplished through ongoing IT efforts including: the re-architecture of its Telecommunications Gateway; ground system preparation for new satellite systems; the Next Generation Air Transportation System (NextGen); the Advanced Weather Interactive Processing System (AWIPS); and the re-compete of the Weather and Climate Operational Supercomputing System (WCOSS) contract. With these major IT efforts, NWS has the unique opportunity to address and implement a more effective and cost conscious, enterprise architecture which will lead to lower IT O&M cost.

Local Warnings & Forecasts Base, National Data Buoy Center (NDBC) Sustainment: NOAA requests a decrease of $2,000,000 and 0 FTEs to reduce operations and maintenance for the Coastal Data Buoy sustainment program within NDBC. NDBC provides critical observations from a network of 101 moored weather observation buoys and 48 Coastal-Marine Automated Network (C-MAN) stations to help meet the needs of forecasters for frequent, high-quality marine observations. NOAA is currently achieving approximately 70 percent availability of marine and coastal buoy generated data for nowcasts and model input. With funding provided in previous years and this decrease, NOAA anticipates a 73 percent availability of data by 2014. Reduced funding will delay routine operations and maintenance and failure response, and slow design and procurement of environmentally-safe moorings.

DART buoys being readied for deployment at the NOAA National Data Buoy Center at the Stennis Space Center, MS.

Local Warnings & Forecasts Base, Establishment of Regional Information Technology (IT) Collaboration Units: NOAA requests a decrease of $9,741,000 and 98 FTEs to reflect the transition to a new IT service delivery model to the NWS Weather Forecast Offices. With technological improvements, such as Advanced Weather Interactive Processing System (AWIPS), NWS has gained the ability to fulfill much of the Information Technology Officer (ITO) responsibilities remotely without impacts to its mission to protect lives and property. NWS will reduce the current 122 ITOs to a total of 24 across all NWS regions to form IT collaboration units. NWS will make every effort to reduce ITO staffing through attrition or work to find other NWS positions for eligible staff. In addition, NWS will explore opportunities for early retirement and voluntary separation incentives for interested individuals.

Air Quality Forecasting: NOAA requests a decrease of $3,122,000 and 0 FTEs to discontinue the National Air Quality Forecasting Capability (NAQFC). The 2013 Budget terminates the NAQFC, which provides air quality forecasts of ozone and particulate matter, and redirects the funding to higher priorities in the National Weather Service. While the NWS is not subject to a legislative mandate to forecast ozone and particulate matter, it has provided air quality predictions in support of state and local air quality forecasting programs since 2004. The Environmental Protection Agency (EPA) and state and local agencies use the NOAA model guidance in conjunction with data and models generated at the local level to provide air quality health alerts to the public. Remaining funding of $865,000 in the program will sustain the on-demand, operational dispersion forecasts of volcanic ash, transport of smoke, and forecast of emergency releases. Funding will also support operational maintenance of models used to generate these forecasts.

Sustain Cooperative Observer Network: NOAA requests a decrease of $867,000 and 0 FTEs to Sustain the Cooperative Observer Network. The Cooperative Observer Network is a program of volunteers across the Nation that collects weather measurements used for supporting weather forecasts and warnings, and used as a record of long-term climate trends. In FY 2002, NWS began refurbishment of the Network with the replacement of rain gauges and temperature sensors to ensure sustainability and accuracy. This request provides required sustainment and modernization activities of instruments used by these volunteers, as recommended by the National Research Council. Rain gauge refurbishment is estimated to be complete by the end of 2013; however, with this reduction, the purchase of wireless thermometer systems, and air and water temperature sensors will be delayed to FY 2014. This funding decrease will also delay the conversion of Network data into a digital format for the National Climatic Data Center's archiving for climate data continuity studies.

Wind profilers are specifically designed to measure vertical profiles of horizontal wind speed and direction. Data from this network are distributed in real-time to government and university atmospheric researchers, private meteorologists, the National Centers for Environmental Prediction, the Storm Prediction Center, all National Weather Service (NWS) Forecast Offices, and foreign agencies responsible for weather prediction.

NOAA Profiler Network: NOAA requests a decrease of $2,417,000 and 3 FTEs in its NOAA Profiler Network (NPN) Program to continue operations and maintenance support of three profilers located in Alaska. Given current plans to turn off wind profilers that will experience operating frequency interruptions once the European Galileo satellites are launched, less funding is needed for NPN O&M. Thus, NOAA proposes to significantly decrease its NPN O&M, using remaining funds to support three critical profilers located in Alaska that have been converted to new frequencies to avoid interference with the Galileo satellites. These profilers will allow NOAA to continue the production of specialized aviation weather warnings and warnings for volcanic ash. Volcanic ash can cause catastrophic engine failure for aircraft in flight. There are 100 volcanoes in Alaska; 40 of which are considered active. The Alaska NPN also provides vertical wind profile data that is utilized as a forecast tool to support public and aviation weather warnings.

A SH-60B helicopter assigned to the Chargers of Helicopter Antisubmarine Squadron (HS) 14 from Naval Air Facility Atsugi flies over the city of Sendai to deliver more than 1,500 pounds of food to survivors of an 8.9 magnitude earthquake and a tsunami. The citizens of Ebina City, Japan, donated the food, and HS-14 is supporting earthquake and tsunami relief operations in Japan as directed. (U.S. Navy photo/Released)

Strengthen U.S. Tsunami Warning Network: NOAA requests a decrease of $4,554,000 and 0 FTEs to terminate partner funding for education and awareness programs to the National Tsunami Hazard Mitigation Program (NTHMP) and to reduce operations and maintenance (O&M) to the Deep-ocean Assessment and Reporting Tsunamis (DART) buoys. NOAA will continue to educate the public about tsunamis through the TsunamiReady program. NOAA proposes to increase the time between scheduled buoy maintenance saving $1.0 million in DART O&M The increase in the interval between scheduled maintenance calls may reduce buoy data availability from a targeted performance from 80 percent to approximately 72 percent. The lower data availability of the DART network will not impact the issue of warnings; however, without these data, warnings may extend to a larger area than necessary and for a longer time. NOAA will continue tsunami work such as developing inundation models; operating the tsunami warning centers; promoting community outreach and education networks to ensure community tsunami readiness; promoting the adoption of tsunami warning and mitigation measures by Federal, State, tribal, and local governments and non-government entities; conducting tsunami research; and operating the U.S. Tsunami Forecasting and Warning Program.

National Mesonet Network: NOAA requests a decrease of $10,965,000 and 0 FTEs for the congressionally directed use of funds for the National Mesonet Network. Data provided by the local mesonets established with this funding provide supplemental model information for local forecasters to consider in issuing forecasts and warnings but is not a primary data for either the weather models or forecast issuance

and warnings. NWS will use FY 2012 appropriated funds to convene a peer-reviewed study to provide recommendations on a national mesonet program plan within NOAA and appropriate implementation. Results of that study may inform future decisions. Currently, the program NWS receives a portion of observations from private sector networks free of charge and incorporates these data into operational weather forecast models. NOAA will collaborate with the private sector to continue such agreements. NOAA will also maintain development of the Meteorological Assimilation Data Ingest System (MADIS) for validation and quality control of mesonet data, and ingestion of data from mobile observational systems.

Advanced Hydrologic Prediction Service: Flood Forecasts: NOAA requests a decrease of $1,964,000 and 0 FTEs for the Advanced Hydrologic Prediction Service (AHPS) program. NWS will use FY 2012 appropriated funds to sustain the current rate of improvements to flood forecast models. The FY 2013 dual polarization advancements to the NEXRAD radar is expected to dramatically improve quantitative precipitation forecasts, which inform flood prediction. NOAA will continue to collaborate with river commissions to ensure that critical data is coordinated and incorporated in accurate and timely flood forecasts.

Weather Forecast Office Maintenance: NOAA requests a decrease of $834,000 and 0 FTEs to the National Weather Service (NWS) Weather Forecast Office (WFO) Maintenance program. The reduction in WFO maintenance redirects funding to higher priorities in the NWS. The WFO Maintenance program allows NWS to protect the capital investment in its previously modernized facilities in accordance with NWS operational standards along with GSA and private industry standards. NWS will continue to prioritize routine maintenance but will extend the time between preventative maintenance actions.

Popo Agie River flooding, WY.
AHPS is a web-based suite of accurate and information-rich hydrologic forecast products. AHPS displays the magnitude and uncertainty of occurrence of floods or droughts, from hours to days and months, in advance. These graphical depictions provide useful information and planning tools for many economic and emergency managers.

FY 2013 PAC BUDGET SUMMARY

NOAA requests a total of $97,439,000 and 26 FTEs to support the Procurement, Acquisition, and Construction of the NWS. This is an increase of $6,329,000 and a decrease of 5 FTEs from the FY 2012 estimate. This increase includes an increase of $6,329,000 in net program changes and 0 FTEs plus a decrease of 5 FTEs for ATBs.

Adjustments include the following transfers:

- NWS requests a technical adjustment to move 5 FTE from the NEXRAD Product Improvement program in PAC to the Local Warnings & Forecasts program in ORF. This adjustment refocuses the FTE working on the NEXRAD Product Improvement (PI) program to other LWF activities, following the planned termination of that program.

NWS — PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

SYSTEMS ACQUISITIONS $94,289,000

NOAA requests an increase of $6,329,000 and 0 FTEs for a total of $94,289,000 and 26 FTEs. This is comprised of two increases and four decreases:

(BUDGET AUTHORITY [BA] IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
AWIPS Tech Infusion	$20,592	$20,592	$20,592	$20,592	$20,592

AWIPS Linus workstation consisting of single-screen text workstation and a triple-screen graphical workstation

Advanced Weather Interactive Processing System (AWIPS) Tech Infusion: NOAA requests a decrease of $3,542,000 and 0 FTEs for AWIPS Tech Infusion. AWIPS is the interactive computer system that integrates all meteorological, hydrological, satellite, and radar data enabling forecasters to prepare and issue more accurate and timely forecasts and warnings. With this reduction, NOAA will slow the implementation of new tools and capabilities aimed at improved decision support services including improved data delivery, collaboration and visualization of meteorological information, and eliminate the Forecast Verification Development work currently being executed by the Office of Oceanic and Atmospheric Research /Global Systems Development (OAR/GSD). The remaining funding will support AWIPS II Extended, a multi-phase program to add new and improved functionalities and capabilities for NWS field forecasters, NOAA partners and the public. These capabilities include better access to data delivery; improved collaboration among NWS operational units and NOAA trusted partners; improved means to generate information supporting decision makers; and improved access and visualization of meteorological information.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
NEXRAD Product Improvement	$0	$0	$0	$0	$0

Next Generation Weather Radar, NEXRAD Product Improvement: NOAA requests a planned decrease of $5,819,000 and 0 FTEs for the planned completion of the NEXRAD Product Improvement Program (NPI). NOAA proposes to close out this program, as all 122 NWS NEXRAD systems have been funded for the upgrade to the Dual Polarization capability, as well as 26 United States Air Force NEXRADs and 12 Federal Aviation Administration (FAA) systems under reimbursable agreements. When all NEXRADs are upgraded, the Dual Polarization modification will improve precipitation estimates and decrease hail false alarm rates. NWS anticipates full deployment of Dual Polarization to the NEXRAD array by the end of 2013.

New NEXRAD Doppler installation in Kirkland, WA

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Telecommunications Gateway Legacy Replacement	$8,185	$16,215	$21,215	$10,245	$3,195

NWS Telecommunications Gateway Legacy Replacement, NWS Telecommunications Gateway (TG) and Backup Telecommunications Gateway (BTG): NOAA requests an increase of $6,990,000 and 0 FTEs to design and implement a re-architected Telecommunications Gateway (NWSTG) and its backup to ensure a modern, scalable, extensible, and reliable system using current best practices. The NWSTG is a hub for collection and transmission of data on millions of hydrometeorological observations and products each day for NOAA's internal use, as well as other user communities, including other Federal Agencies, international organizations, commercial partners, academia, and the public. As the number of satellite, climate, and other observations increases, NWS has been collaborating with National Environmental Satellite Data Information Service (NESDIS) to ensure relevant satellite requirements are incorporated into the functional and technical requirements for the NWSTG Re-Architecture initiative. The projected volumes of observational and weather forecast and warning information cannot be managed with the current system architecture. The aging infrastructure, along with the significant increase in processing requirements, require an upgrade to the infrastructure providing the availability, accuracy, and timeliness of critical products and services that emergency managers and the public rely on during severe weather.

The NWS system called the "Gateway" operates and ensures continuous acquisition and dissemination of NWS and other domestic and foreign hydrometeorological data and products.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Weather & Climate Supercomputing	$38,169	$30,169	$30,169	$30,169	$30,169

Weather and Climate Supercomputing, NOAA High Performance Computing: NOAA requests a decrease of $2,000,000 and 0 FTEs for Weather and Climate Supercomputing to utilize available supercomputing resources for prioritized research efforts. This decrease will reduce resources allocated to running research models of the Hurricane Forecast Improvement Project (HFIP) on the R&D supercomputer in Boulder, CO, and will have no impact on operational weather modeling. NWS will prioritize computing resources to accommodate the most promising HFIP models. The R&D supercomputer run the current development versions of the HFIP models in real-time and the results will be provided to National Hurricane Center (NHC) forecasters for official hurricane forecasts and warnings.

NWS supercomputer

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
NOAA Profiler Conversion	$0	$0	$0	$0	$0

NOAA Profiler Conversion: NOAA requests a decrease of $1,700,000 and 0 FTEs to terminate the NOAA Profiler Conversion Program (NPN). NOAA proposes to terminate the conversion and tech refresh of 32 profiler sites from an operational frequency of 404 to 449 MHz. Thirty-two of the existing 37 wind profilers use a transmitter frequency of 404 MHz issued by the National Telecommunications and Information Administration (NTIA). These 32 profilers will be required to cease transmitting on this frequency to avoid interference with the new European Union's Search and Rescue Satellite Tracking (SARSAT) transponders aboard the Galileo GPS satellite constellation. The three remaining profiler sites, located in Alaska, are already operating on the 449 MHz frequency. These profilers will allow NOAA to continue to provide volcanic forecast products to preserve a safe Alaska airspace.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Ground Readiness Project	$12,400	$15,446	$18,707	$15,399	$15,399

Ground Readiness Project: NOAA requests an increase of $12,400,000 and 0 FTEs to ensure utilization of the substantial increase in environmental satellite observations that will help to improve weather warnings and forecasts. NOAA must update its information technology (IT) infrastructure to ensure adequate processing and use of new environmental satellite data. In order to improve the accuracy of weather warnings and forecasts, NOAA has invested billions of dollars in new satellite sensing systems and data sets within NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) that will come online over the course of FY 2013-2017. This investment will prepare NOAA for the three-fold increase in data volume expected from these new systems, which would far exceed the capacity of NWS's current IT infrastructure to process the data and provide to NWS forecast offices. New satellite data and processing capabilities will improve forecasts from the county/multi-town scale to the neighborhood scale, and in some cases, even street level. Refined forecasts will also assist the critical efforts of local, state, and federal first responders, emergency managers, and decision makers.

Irene first struck the U.S. as a Category 1 hurricane in eastern North Carolina, then moved northward along the Mid-Atlantic Coast. Wind damage in coastal North Carolina, Virginia, and Maryland was moderate, with considerable damage resulting from falling trees and power lines. Irene made its final landfall as a tropical storm in the New York City area and dropped torrential rainfall in the Northeast that caused widespread flooding. More than 7 million homes and businesses lost power during the storm, and Irene caused at least 45 deaths and more than $7.3 billion in damages.

Hurricane Irene is an example of increasing accuracy in forecasting storm track. Its landfall in eastern North Carolina and path northward were accurately predicted more than four days in advance by NOAA's National Hurricane Center, which used information from weather satellites, hurricane models, aircraft observations, and other data.

5

NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE

CREDIT **NOAA**

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE

The National Environmental Satellite, Data, and Information Service's (NESDIS) vision is to be the world's most comprehensive source and recognized authority for satellite products, environmental information, and official assessments of the environment in support of sound decision-making. NESDIS is dedicated to providing timely access to global environmental data to enhance the Nation's economy, security, and quality of life. In collaboration with the National Aeronautics and Space Administration (NASA) and the U.S. Air Force, NESDIS manages and operates weather and environmental monitoring satellites.

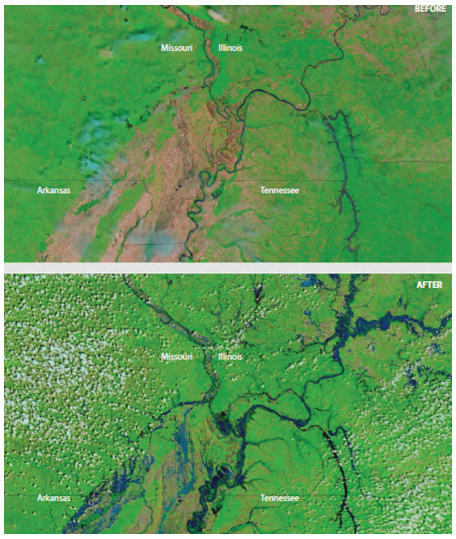
A Delta II rocket launches with the Suomi National Polar-orbiting Partnership (Suomi NPP) spacecraft payload from Space Launch Complex 2 at Vandenberg Air Force Base, CA. on Friday, Oct. 28, 2011. Suomi NPP is the first NASA satellite mission to address the challenge of acquiring a wide range of land, ocean, and atmospheric measurements for Earth system science while simultaneously preparing to address operational requirements for weather forecasting. Photo Credit: (NASA/Bill Ingalls)

To fulfill its responsibilities, NESDIS acquires and operates the Nation's operational environmental satellites, manages the NOAA National Data Centers, provides data and information services, including Earth system monitoring, performs official assessments of the environment, and conducts related research. The NESDIS satellite command and control program acquires data from on-orbit U.S and international satellites 24 hours per day, 365 days per year. This includes monitoring satellite operations, which occur at the NOAA Satellite Operations Facility in Suitland, Maryland; satellite command and data acquisition stations in Wallops, Virginia; and Fairbanks, Alaska. The Fairbanks Satellite Operations Facility (FSOF) opened in FY 2011. This state of the art facility is farther north than any other satellite communications facility in North America and, as a result, it receives more environmental satellite data than any other station and is a vital link to satellites operated by NOAA and other agencies. From these ground stations, NESDIS operates and acquires data from Polar-orbiting Operational Environmental Satellites (POES), Geostationary Operational Environmental Satellites (GOES), the Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP), and Jason-2.

Using environmental satellites to observe the Earth from space is one of the key tools in forecasting weather, analyzing climate, and monitoring hazards worldwide. Such timely and accurate information supports the National Weather Service, Federal and state agencies, and local emergency management agencies, enabling advance warnings of emerging severe weather such as hurricanes, flash floods, winter storms and wild land fires. Along with the skill of NOAA meteorologists, NOAA's satellites are critical to the success of our national forecasts and are the backbone of the global earth observing

system and global weather prediction capability. Satellite observations also assist the National Ocean Service in monitoring coastal ecosystem health, such as coral bleaching, and identifying and monitoring maritime hazards from sea ice.

The products and services NESDIS provides have become more important in decision-making, with increased demand and capacity for satellite derived information. Such information additionally serves as the basis for achieving NOAA's Next Generation Strategic Plan (NGSP) goals and objectives of enhancing climate adaptation and mitigation techniques, developing a weather-ready nation, and ensuring healthy oceans and resilient coastal communities and economies. NESDIS contributes to the effort along with other agencies and countries in establishing a global observing system to meet the world's information needs for weather, climate, oceans, and disasters.

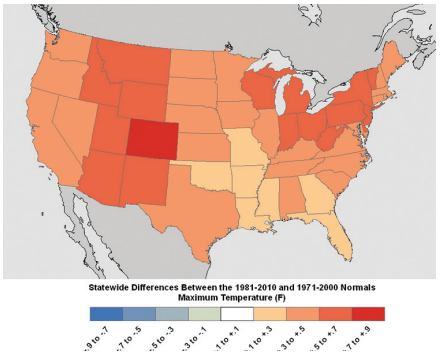


These two false colored images from the NASA Terra satellite show the Cairo, IL region on April 28, 2011 and April 29, 2010. The differences are stark. Blue colors indicate water, while green and brown is dry land. MODIS, the visible and infrared sensor on Terra, is the precursor to the visible and infrared sensors to be flown on NOAA's future geostationary and polar-orbiting satellites, GOES-R and JPSS.

FY 2011 ACCOMPLISHMENTS

As part of the GOES-R program, the Center for Satellite Applications and Research (STAR) team used satellite detections to develop imagery that was successfully applied in monitoring floods after the March 2011 tsunami in Japan and the Mississippi river breach in May 2011. Precise mapping of floods and standing water is crucial for detecting deficiencies in existing flood control and for damage claims. The satellite imagery was used to develop a map of the levee breaches near the confluence of the Ohio and Mississippi rivers and was rapidly disseminated to decision makers and the public to support making informed responses to the disasters.

The National Climatic Data Center (NCDC) released the 1981–2010 Climate Normals in 2011, which serve as a baseline for climate conditions at over 7,500 locations across the United States. Climate Normals are three-decade averages of numerous climatological variables, such as temperature, precipitation, and snowfall that can be produced hourly, daily, monthly, seasonally, and annually. Normals are utilized in countless applications across a variety of sectors such as construction, insurance, and engineering for planning and risk management. Specifically, energy companies use the information to predict fuel demand, and agribusinesses use Normals to monitor departures from normal conditions throughout the growing season and to assess past and current crop yields.



Climate Normals are the latest three-decade averages of climatological variables, including temperature and precipitation. This new product replaces the 1981-2000 Normals product. Additional Normals products; such as frost/freeze dates, growing degree days, population-weighting heating and cooling degree days, and climate division and gridded normals.

FY 2013 REQUEST **$2,041,406,000**

NOAA requests a total of $2,041,406,000 and 818 FTEs to support the continued and enhanced operations of the National Environmental Satellite, Data, and Information Service. This total includes Operations, Research, and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) accounts. This is an increase of $163,561,000 and a decrease of 9 FTEs from the FY 2012 estimate. This includes an increase of $1,518,000 and 0 FTEs in Adjustments to Base (ATB).

The FY 2013 President's Budget supports the highest priority and most essential services for developing, acquiring, and managing satellite and satellite data operations. NOAA recognizes that a significant majority of its missions and programs are supported by satellite data. NESDIS is responsible for ensuring the improved products and services from the next generation of environmental satellites, and has made the Joint Polar Satellite System (JPSS) and the GOES-R programs two of NOAA's highest priorities.

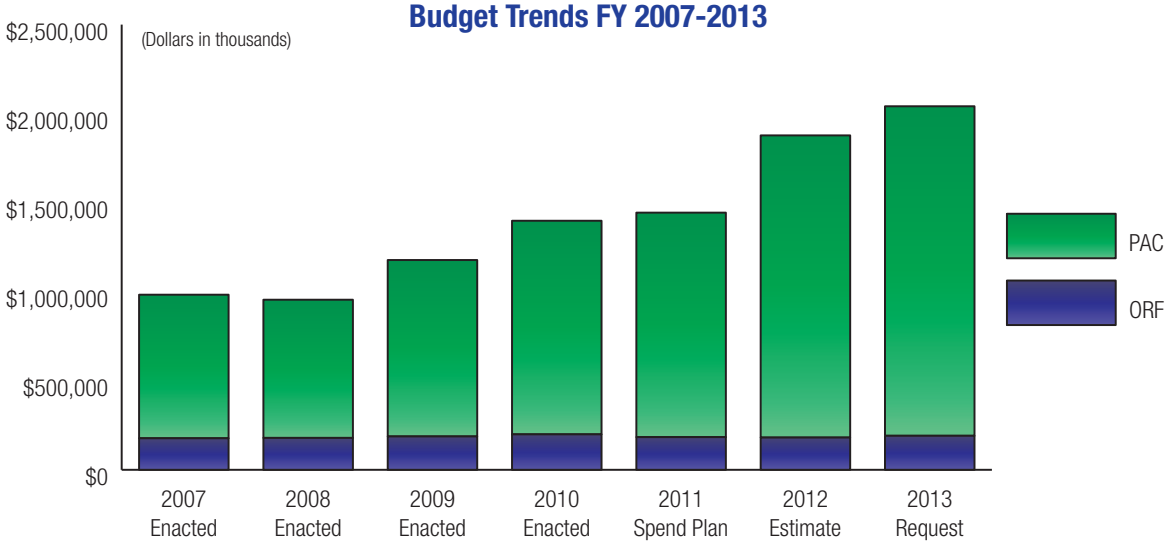
FY 2012 funding support from the Consolidated and Further Continuing Appropriations Act, 2012 (P.L. 112-55) provided a foundation from which NOAA could make significant progress towards developing its next generation polar orbiting satellite system, JPSS. Currently, there is a potential polar observational satellite data gap from the projected end of life of the current polar mission, the Suomi National Polar-orbiting Partnership (Suomi NPP) satellite, to the beginning of the JPSS mission, and NOAA is assessing options to mitigate any gap in weather data.

NOAA is conducting a comprehensive re-evaluation of its space-based observation requirements with a goal to maintain and acquire critical services that meet the Nation's national environmental data needs. NESDIS will continue to pursue collaborative opportunities with other national and international agencies and organizations and partner with industry, academia, and other research and development agencies. These partnerships will bring robust information and service delivery to our customers and invest in effective relationships with stakeholders. In particular, NESDIS will continue participating in global partnerships, such as with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), to help the United States and Europe provide increased capability to monitor global weather and climate.

NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
NESDIS — ORF				
Environmental Satellite Observing Systems	$114,573	$112,478	$123,199	$10,721
NOAA's Data Centers & Information Services	69,083	68,722	67,898	(824)
Total, NESDIS - ORF	183,656	181,200	191,097	9,897
Total, NESDIS - PAC	1,260,422	1,696,645	1,850,309	153,664
GRAND TOTAL NESDIS (Direct Obligations)	**$1,444,078**	**$1,877,845**	**$2,041,406**	**$163,561**
Total FTE	**827**	**827**	**818**	**(9)**

NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE
Budget Trends FY 2007-2013



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $191,097,000 and 669 FTEs to support NESDIS activities funded in the Operations, Research, and Facilities (ORF). This is an increase of $9,897,000 and a decrease of 9 FTEs from the FY 2012 estimate. This includes a net increase of $8,379,000 in program changes and a decrease of 9 FTEs and an increase of $1,518,000 and 0 FTEs for Adjustments to Base (ATB). Adjustments include the following transfers:

- NOAA requests a technical adjustment to transfer the NESDIS Satellite Command and Control Product Processing and Distribution line items to the new NESDIS line item, Office of Satellite and Product Operations (OSPO). No adjustments have been made to the three PPAs, except in the alignment under this new line item.
- NOAA requests a technical adjustment to rename the Regional Climate Centers PPA the Regional Climate Services PPA. No funding or FTE changes are associated with this request.

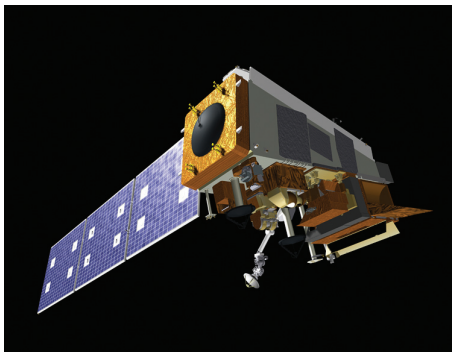
NESDIS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS $123,199,000

NOAA requests an increase of $9,679,000 and 0 FTEs for a total of $123,199,000 and 409 FTEs under the Environmental Satellite Observing Systems sub-activity.

Office of Satellite and Product Operations: NOAA requests an increase of $9,586,000 and 0 FTEs. This is comprised of three increases, two of which are below $500,000:



Suomi-NPP artist rendering

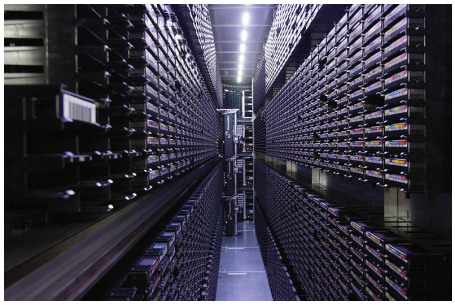
Suomi-NPP and Polar Continuity Data Processing and Distribution: NOAA requests an increase of $9,435,000 and 0 FTEs to process and distribute environmental data from the Suomi NPP mission. The Suomi NPP satellite was successfully launched in October 2011. The checkout period under the National Aeronautics and Space Administration (NASA) will be completed during the seven months following the launch. The Suomi NPP satellite will provide essential continuity of polar environmental observations. The Suomi NPP Production Environment system provides the only national link to get near real-time Suomi NPP data to NOAA operational centers and other NOAA partners in the civilian user community. Funding will be used to procure a robust IT capability needed to generate operational products on a 24 x 7 basis from Suomi-NPP that will lead to improved daily weather forecasts and warnings, hurricane landfall warnings, and harmful algal bloom assessments, which have the potential to mitigate economic losses.

NOAA'S DATA CENTERS & INFORMATION SERVICES $67,898,000

NOAA requests a decrease of $1,300,000 and 9 FTEs and a total of $67,898,000 and 260 FTEs under the Data Centers & Information Services sub-activity.

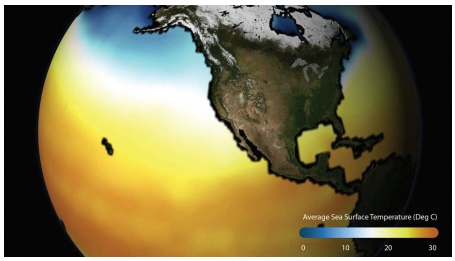
Archive, Access, & Assessment: NOAA requests a decrease of $552,000 and 9 FTEs. This is comprised of one increase and three decreases.

National Climatic Data Center, Data Center Operations: NOAA requests an increase of $5,822,000 and 0 FTEs for Data Center Operations to maintain NOAA's ability to provide long-term preservation (safe storage) and access to the Nation's environmental data and information. NOAA's Data Centers have begun the transition from their legacy archive storage systems to the new Enterprise Archive system. Data Centers are being equipped to handle expanding volumes of data from satellites, weather radars, high resolution weather, ocean, and climate models, and other large volume data sets. Data Center Operations will accommodate the storage and retrieval of these data sets. In FY 2013, funds will be used to provide operations and maintenance of NOAA's new Enterprise Archive and Access system and communications bandwidth to deliver large data volumes. The archive system will accommodate data from new or improved observations planned by NOAA: Suomi-NPP, JPSS, GOES-R, and Dual Polarization-modified weather radar. In addition, funds will support facility infrastructure and Federal IT security requirements including training of systems operators and administrators.



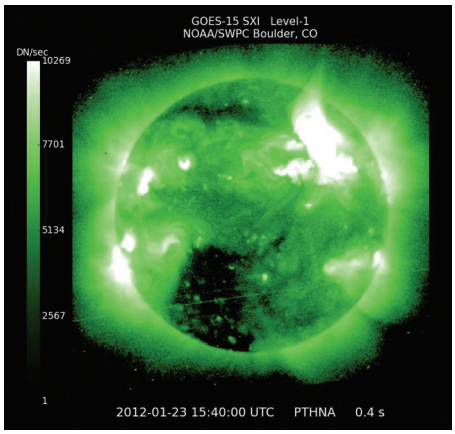
Massive tape library transitioning to new Enterprise Archive System

National Oceanographic Data Center: NOAA requests a decrease of $3,796,000 and 6 FTEs to reduce funding to the National Oceanographic Data Center. The National Oceanographic Data Center (NODC), located in Silver Spring, MD, with offices in Stennis, MS; Honolulu, HI; San Diego, CA; and Charleston, SC, is the Nation's permanent archive for oceanographic data, ensuring public access to and the scientific stewardship (quality control, analysis and management) of long-term observational records of the global ocean, and U.S. coastal waters and their ecosystems. In FY 2013, NODC will begin to consolidate its operations, centralizing Information Technology (IT) functions in Mississippi and administrative functions in Maryland. The consolidation will reduce requirements for contractor support for IT operations. There will be a temporary decrease in the number of data sets going online until the NODC archive is migrated to the Comprehensive Large Array-data Stewardship System. NODC will continue to provide a permanent archive for ocean and coastal data.



This image, developed by NOAA Environmental Visualization Laboratory was generated from NODC's World Ocean Atlas. It shows the long-term average sea surface temperature.

National Geophysical Data Center: NOAA requests a decrease of $578,000 and 3 FTEs to the divisions of the National Geophysical Data Center (NGDC) responsible for space weather and natural hazard data, as well as the National Snow and Ice Data Center. In FY 2013, NOAA proposes to discontinue support for specific sea-ice products that are developed for the NASA funded National Snow and Ice Data Center; some of these products could potentially be funded through other sources outside of NGDC or NOAA. Two FTE will be reduced from the NGDC division responsible for providing scientific data stewardship for the Nation's operational space environmental data and information; even with this reduction NGDC maintains the ability to provide mission critical space weather data sets to support NOAA's forecasting and monitoring abilities. An additional FTE will be reduced from the NGDC division responsible for archiving and assimilating natural hazard information, since funding provided by sources outside of NGDC was already scheduled to decrease.



The GOES-15 spacecraft carries a sophisticated Solar X-ray Imager to monitor the Sun's X-rays for the early detection of solar flares, coronal mass ejections, and other phenomena that impact the geospace environment.

Climate Database Modernization Program: NOAA requests a decrease of $2,000,000 and 0 FTEs to terminate the Climate Database Modernization Program (CDMP). This program scans images and keys data from paper and microfilm of new incoming and historical records and makes the digital data available on the web to businesses and members of the climate and environmental communities. The CDMP program is a partnership with four private sector contractors, currently supporting approximately 35 contractor personnel. CDMP's goal is to preserve and make available climate data going back several hundred years. To date, over 57 million images have been digitized for on-line access. Over 14 terabytes of data have been keyed and converted to digital format, extending the historical climate record back to the early 1800s, and in some cases, the 1700s. Environmental publications and historical documents are now available in electronic form and can be downloaded to a computer. NWS is in the process of digitally converting its remaining stations that still record and report via paper, which will reduce the immediate operational need for CDMP supported service.

Coastal Data Development: NOAA requests a decrease of $500,000 and 0 FTEs to reduce funding to the National Oceanographic Data Center/National Coastal Data Development Center (NODC/NCDDC). NCDDC is located in Stennis, MS. NODC/NCDDC supports marine environmental and ecosystems stewardship by providing access to the nation's coastal data resources. NCDDC uses established and emerging technologies to support end-to-end data management for NOAA and NOAA's partners in Federal, State, local, academic, and other organizations. NCDDC focuses on the development of products and services intended to bring together scientists and coastal managers to act as an important source of coastal ecological and observational data and information for the American public at large. The FY 2013 budget will reduce NODC regional project development and science contractor support at the NCDDC. With increased collaboration with existing partnerships in other agencies, NODC will continue to identify and obtain coastal data sets for ingest into the national ocean and coastal archive.

Devils Lake water level has risen over 25 feet over the last 20 years. Devil's Lake, N.D., July 21, 2011 --A road that had lead to a farm near Devil's Lake is underwater. Devil's Lake has been overtaking the towns surrounding the lake, forcing local and state officials to try and stop the land erosion. Photo by Patsy Lynch/FEMA

Regional Climate Services: NOAA requests a decrease of $1,048,000 and 0 FTEs for Regional Climate Services (RCS), which includes the six Regional Climate Centers (RCCs) and the six Regional Climate Services Directors (RCSDs). Each RCSD is located at an NWS Regional Office. They are charged with coordinating and organizing relationships and projects within their respective region across NOAA business units, their respective regional RCC, and other non-agencies (government, private, academic, research). The RCSDs also provide oversight and direction regarding the tasks included in the individual contracts with each RCC. Through a competitive award process, six new RCC contracts will be awarded for FY 2013. Each RCSD will directly manage the NOAA contract for a specific RCC, thereby reducing the management overhead costs under the contract and providing improved contract oversight regarding deliverables and performance measures. The intent is to better align the geographical regions and area of responsibilities managed by NOAA through the RCSDs and the NWS regions. Together, the RCSDs and RCCs will serve as trans-boundary experts identifying stakeholder needs and matching those needs with the emerging science and observations developed through NOAA's Data Centers, labs and partners.

Environmental Data Systems Modernization: NOAA requests an increase of $800,000 and 0 FTEs for the Satellite Active Archive for web-based digital access to satellite data. The NOAA Satellite Active Archive mission provides robust and safe archive storage and stewardship, and open access to data sets and derived climate model products for present and future generations of users. This next generation archival and access capability enables NOAA and the Nation to maintain and improve its science programs in support of economic growth and improved environmental stewardship. Business, research, and government leaders have critical needs for quality long time-series of historical and recent national and global data to evaluate the current status of the environment, to assess long-term environmental trends, and to assist in predicting future environmental conditions and events. In FY 2013, funds will be used for the communications circuits specific to connecting the CLASS archive system at the National Climatic Data Center, Asheville, NC, and National Geophysical Data Center, Boulder, CO, to the NSOF in Suitland, MD, which is NOAA's state-of-the-art home for 24/7 satellite program operations.

FY 2013 PAC BUDGET SUMMARY

NOAA requests a total of $1,850,309,000 and 149 FTEs to support the Procurement, Acquisition, and Construction (PAC) of the National Environmental Satellite, Data, and Information Service. This is an increase of $153,664,000 and 0 FTEs from the FY 2012 estimate. This includes an increase of $153,664,000 in net program changes and $0 and 0 FTEs in Adjustments to Base (ATB). Adjustments include the following transfers:

- NOAA requests a technical adjustment to move $25,880,000 and 0 FTEs from the Restoration of Climate Sensors PPA to the NESDIS Joint Polar Satellite System PPA, in order to more accurately reflect the actual costs of the JPSS Program and its observation requirements.

NESDIS — PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

ACQUISITION **$1,848,081,000**

NOAA requests an increase of $153,664,000 and 0 FTEs for a total of $1,848,081,000 and 149 FTEs. This is comprised of two increases and three decreases:

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
GOES-N	$29,900	$29,900	$29,900	$29,900	$25,000

GOES-N: NOAA requests a decrease of $2,567,000 and 0 FTEs for the GOES-N program. A planned decrease in funding is proposed to reflect reduced requirements in NASA's system engineering and support of the GOES-N Series based on the launch of the last satellite of the GOES-N series in March 2010. With the successful handover of GOES-15 command and control from NASA to NOAA, funds are still required to support ground

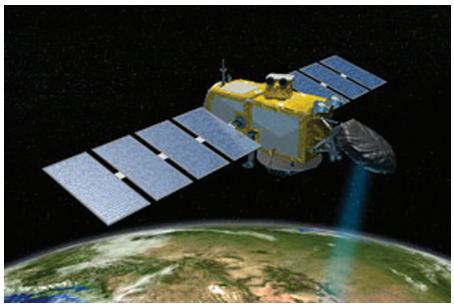
systems, continue product development, and provide technical management, maintenance support and operations of the on-orbit assets. The purpose of the GOES-N Series is to provide environmental satellite continuity of the eastern and western hemispheres until the GOES-R Program launches its first satellite in FY 2016.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
GOES-R	$802,000	$950,761	$844,744	$781,653	$706,251

GOES-R artist rendering

GOES-R: NOAA requests an increase of $186,378,000 and 0 FTEs to provide continued satellite engineering development and production activities for the GOES-R Series (GOES-R, -S, -T, & U) that are necessary to meet a launch readiness date (LRD) of Q1 FY 2016 for the first GOES-R satellite. The GOES-R Series will provide continuity of GOES data coverage after the GOES-N series and will provide critical weather observations for severe weather events such as hurricanes, and also provide key enhancements in observational capabilities for climate, oceans and coasts, and the space environment through 2036. The procurement of GOES-R satellites and ground systems is a cooperative venture between NOAA and NASA. While NOAA defines program requirements, provides funding, and operates the GOES satellites, NASA procures and launches the satellites on NOAA's behalf. In FY 2013, this planned increase will continue spacecraft and ground system development, and support integration, testing, and delivery of initial Flight Units for five instruments. FY 2013 funding will allow a ramp up of ground system integration and test activities, including the new antennas, and launch vehicle acquisition activities. These activities are critical to meeting a first quarter 2016 launch necessary to backup the GOES-west satellite at the end of its expected life in 2017.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Jason-3	$30,000	$40,000	$6,000	$6,000	$6,000

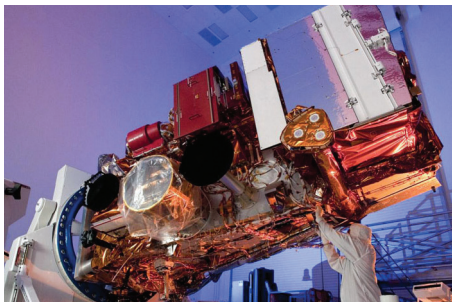


JASON-3 artist rendering

Jason-3: NOAA requests an increase of $10,300,000 and 0 FTEs to continue the development of the Jason-3 satellite in partnership with EUMETSAT and CNES. The most accurate measurements of sea surface heights are made by the Jason series of satellites. It is critical to our understanding of global and regional climate variability that we continue to collect, analyze and maintain a continuous record of sea surface height data. Jason-2 continues the systematic collection of sea level observations initiated by TOPEX/Poseidon in 1992. The Jason-3 satellite will be functionally equivalent to the Jason-2 satellite. The requested funds are necessary to complete development activities on the U.S. instruments, including a microwave radiometer and precision orbit determination components (e.g., GPS). This increase is required to meet a launch date in FY 2015 to ensure the continuity of measuring sea surface height, which is a critical climate data record that has been maintained for over 20 years. Funds will also continue to support launch services and associated engineering services for Jason-3. EUMETSAT and CNES, who have secured their funding contributions, are providing the spacecraft, altimeter, precision orbit components, ground system, and operations. Data from Jason-3 will also be used to assist in forecasting short-term, severe weather events, including tropical cyclones.

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Joint Polar Satellite System (JPSS)	$916,364	$956,000	$958,628	$943,600	$921,100

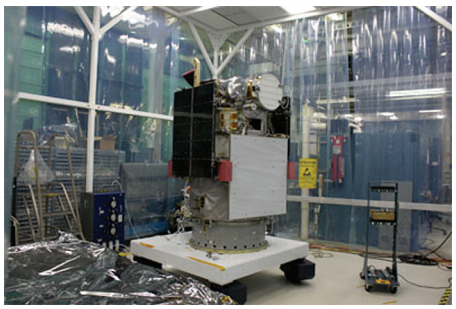
Joint Polar Satellite System (JPSS): NOAA requests a decrease of $33,530,000 and 0 FTEs to continue development of the JPSS instruments, ground system, and spacecraft. The FY 2013 proposed funding profile maintains all planned weather instruments and supports a second quarter FY 2017 Launch Readiness Date for the first JPSS satellite to minimize any gap in weather coverage between the Suomi NPP satellite and the launch of the first JPSS satellite. FY 2013 funding is necessary to continue development of the JPSS ground system, spacecraft and instruments, including sensors for measuring ozone, earth radiation and solar irradiance. FY 2013 funding will complete the development of the Total Solar Irradiance Sensor (TSIS)- 1 and the Clouds and Earth Radiant Energy System instrument (CERES), and continue the development of the Ozone Mapping Profiler Suite-Nadir instrument (OMPS-Nadir). CERES will fly on the JPSS-1 spacecraft sustaining the measurement from the Suomi NPP satellite. TSIS-1 cannot be accommodated on the JPSS-1 spacecraft, and NOAA and NASA are evaluating options for flying the instrument. NOAA and the Administration continue to seek cost-effective ways of implementing satellite missions and are evaluating options to achieve a life-cycle cost of $12.9 billion or less for the JPSS program.



JPSS under construction

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Deep Space Climate Observatory (DSCOVR)	$22,883	$19,275	$3,200	$3,200	$2,400

Deep Space Climate Observatory (DSCOVR): NOAA requests a decrease of $6,917,000 and 0 FTEs to continue the refurbishment of DSCOVR, which will provide solar wind data for geomagnetic storm warnings. Space weather has demonstrated the potential to disrupt significant portions of the U.S. infrastructure, including transportation systems, power grids, telecommunications, and GPS. The NWS Space Weather Prediction Center forecasters use information derived from NASA's Advanced Composition Explorer (ACE) satellite to issue forecasts and warnings for geomagnetic storms. NOAA provides these warnings to allow key industries such as the commercial airline, electric power, and GPS industries to prepare for and avoid the harmful effects of space weather. DSCOVR will provide the same kinds of measurements that ACE currently provides after its launch in FY 2014. FY 2013 funds will continue the refurbishment of the NASA Satellite, DSCOVR, by the NASA/ Goddard Space Flight Center (GSFC). On behalf of NOAA, NASA is conducting this work on a reimbursable basis. The U.S. Air Force (USAF) is a partner and will provide the launch vehicle and services based on funds appropriated for the USAF in the FY 2012 Consolidated Appropriations Act (P.L. 112-74).



DSCOVR

CREDIT **NOAA National Geodetic Survey**

6

PROGRAM SUPPORT

A specially-equipped NOAA aircraft collected aerial images of the damage caused by the EF-5 tornado in Joplin, MO on May 22, 2011. NOAA aviators collected the images while flying the agency's King Air 350 CER aircraft, equipped with specialized remote sensing equipment that captured photographs at a high resolution. The mission was undertaken jointly with FEMA as part of the federal response to the Missouri tornado. The aircraft is operated by NOAA Office of Marine and Aviation Operations.

PROGRAM SUPPORT

NOAA's Program Support provides 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 Support consists of Corporate Services, NOAA's Office of Education, Facilities, and the Office of Marine and Aviation Operations (OMAO).

NOAA's buildings, ships, and aircraft are necessary platforms for NOAA science. All of NOAA's Line Offices utilize these important assets and resources to execute their missions.

Commissioning of Okeanos Explorer

For example, NOAA's Tsunami Warning Centers are state of the art, high-tech facilities designed for a 24-7 mission of saving lives and property, critical monitoring of fisheries stocks, as well as protected marine mammals and sea turtles, are conducted on scientifically specialized ships in NOAA's fleet. NOAA Corp officers and civilians provide a skilled workforce present in all Line Offices.

Program Support provides NOAA with the enterprise-wide capabilities that are required to achieve the environmental, social, and economic outcomes targeted by NOAA's Next Generation Strategic Plan goals. Program Support activities contribute to NOAA's Organization and Administration Enterprise strategic planning objectives of having diverse and constantly evolving capabilities in NOAA's workforce; a modern Information Technology (IT) infrastructure for a scientific enterprise; modern, safe and sustainable facilities, and a high-performing organization with integrated, efficient, and effective business systems and management processes.

FY 2011 ACCOMPLISHMENTS

As part of an aggressive government-wide effort to curb administrative spending, NOAA is committed to controlling administrative costs and performing its mission with the greatest efficiency. In FY 2011, NOAA reduced administrative costs by $3 million through strategic sourcing of IT purchases with NOAAlink. NOAAlink is an innovative IT infrastructure planning and acquisition process, which offers a broad range of cost-effective, enterprise-wide IT solutions and improved service delivery. Through this approach, NOAA succeeded in making the NOAA acquisition process more efficient and cost effective. In FY 2013, NOAA will continue to meet the challenges of managing and contracting for services.

In FY 2011, OMAO responded to Hurricane Irene with three NOAA aircraft—two WP-3D Orions and a Gulfstream IV-SP—providing round-the-clock hurricane research, surveillance and forecast improvement support to the National Hurricane Center. Data collected by the aircraft, along with satellite and other data, helped forecasters predict the intensity and the path of the storm. After the storm made landfall, OMAO and NOAA's National Geodetic Survey dispatched a fourth aircraft,—the NOAA King Air 350 CER turboprop-to conduct aerial surveys of storm-impacted areas in North Carolina and Virginia. NOAA vessels also responded to the storm, surveying shipping channels for storm debris that could pose a hazard to navigation. Hurricane Irene is an example of increasing accuracy in forecasting storm track. Its landfall in eastern North Carolina and path northward were accurately predicted more than four days in advance. NOAA's delivery of critical environmental forecasts provided essential advance information that allowed emergency officials to plan necessary evacuations and sparked individuals to take safety precautions.

Gulfstream IV-SP and WP-3D in flight

CORPORATE SERVICES

NOAA Corporate Services provides centralized executive management, as well as policy formulation and direction, to all of NOAA's Staff and Line Offices. Corporate Services is comprised of various staff offices, such as the Under Secretary and Associate Offices, Acquisitions and Grants Office, Office of the Chief Information Officer, Chief Administrative Officer, Chief Financial Officer, Office of Education, Workforce Management Office, and Policy Planning and Integration. Corporate Services provides activities such as planning, administrative, financial reporting, budgeting, information technology, acquisitions and grants, and human resource services.

In FY 2013, NOAA-wide corporate services will continue to ensure that NOAA has the proper leadership, work environment, and IT support, necessary tools and equipment, and the vital personnel and finance services that will allow the agency to carry out its mission of Science, Service and Stewardship.

OFFICE OF EDUCATION

NOAA's Office of Education (OEd) which is funded in the NOAA Education Program subactivity, provides advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education. The Office, in conjunction with NOAA's Education Council, coordinates educational activities across NOAA and develops NOAA's Education Strategic Plan and policies. These efforts help to ensure that NOAA's education programs and activities are based on NOAA science and are directly tied to the agency's mission. In addition, OEd partners with minority serving institutions to increase the number of

students from underrepresented communities who are trained and graduate with degrees in NOAA mission fields. OEd also directly implements and manages scholarship programs aimed at fostering competitiveness in Science, Technology, Engineering, and Mathematics (STEM) by providing quality educational opportunities for the next generation. For more details on NOAA's education activities, please refer to the Education Chapter.

In FY 2013, OEd will continue to work through the Education Council to coordinate education activities and policy across the agency. The NOAA Education community will continue to work diligently to ensure that programs investing resources in education activities meet top-tier performance measures and evidence standards. NOAA will also implement an agency-wide evaluation and monitoring framework for its education investments. This framework has been reviewed and refined through input provided by an expert panel organized by the National Research Council's Board of Science Education. It was also used by the White House's Office of Science Technology and Policy Committee on STEM Education to inform best practices. In FY 2013 NOAA will also continue to support its scholarship and fellowship programs and train students in STEM fields.

FACILITIES

The NOAA Facility Program is the focal point for facility planning, project planning, formulation and development, and project management oversight to support critical NOAA mission requirements. This program supports an integrated capital investment planning process, integrated facility condition inspection program, systems and technology tools to enable maximum efficiency in project and facility management planning, and investments required to support repair and modernization of NOAA facilities.

NOAA's facility portfolio is diverse and dispersed. NOAA owns more than 400 buildings, in addition to piers and other structures, which are valued at approximately $2.5 billion. These facilities range from state-of-the-art science and research facilities supporting climate, weather, ocean, and fisheries research and services to operational facilities supporting multi-billion dollar satellite programs and NOAA's ship and aircraft operations. In FY 2013, NOAA will continue an integrated facility efficiency planning effort that began in FY 2012. This effort is aimed at creating a more efficient and cost-effective facility portfolio, which includes more aggressive teleworking for NOAA employees, more efficient space utilization in existing facilities, and consolidation opportunities that specifically target the least cost-effective facilities. This planning effort will help NOAA to provide effective space management; improve regional service delivery; balance the portfolio of leased versus owned facilities; promote energy efficiency and sustainable design, and modernize NOAA owned facilities.

OFFICE OF MARINE AND AVIATION OPERATIONS

NOAA's Office of Marine and Aviation Operations (OMAO) operates an array of specialized aircraft and ships throughout the world in support of NOAA's environmental and scientific missions. These include fisheries research, nautical charting, hurricane reconnaissance and research, snow surveys, and specialized atmospheric and ocean research. Ships range from large oceanographic research vessels capable of exploring the world's deepest ocean to smaller ships responsible for charting the shallow bays and inlets of the United States. Aircraft range from the four engine P-3 capable of penetrating a hurricane to the small twin engine Twin Otters suited to marine mammal surveys where slower airspeeds and higher endurance are essential.

In addition, OMAO ships and aircraft provide immediate response capabilities for unpredictable events. Following major natural and environmental disasters, NOAA ships and aircraft can conduct emergency navigation hazard surveys that help ports reopen quickly and obtain aerial images of disaster-torn areas that enable residents and emergency workers to verify the condition of houses, bridges and roads. OMAO also administers the NOAA Diving Program, the NOAA Small Boat Program, and the Teacher at Sea Program. OMAO is home to the NOAA Commissioned Corps (NOAA Corps) officers and civilians who play a critical role in the collection of oceanographic, atmospheric, hydrographic, and fisheries data.

MARINE OPERATIONS AND MAINTENANCE

Marine Operations and Maintenance (MOM) provides centralized management for NOAA's 16 active ships, which range in length from 124 to 274 feet and are capable of conducting operations that support NOAA's programs in nautical charting, bathymetric mapping, fisheries research, ecosystem assessments, marine environmental baseline assessments, coastal-ocean circulation, and oceanographic and atmospheric research. In FY 2013, funding will provide approximately 2,586 Base Funded Days-at-Sea[1] to support NOAA's highest priority programs. This funding also supports OMAO's Marine Operations Center (MOC), the NOAA Commissioned Corps, and OMAO Headquarters which provide regional fleet management, maintenance, stores, supplies, repair facilities, data-processing facilities, operational support, and administrative support for NOAA's vessels. Atlantic and Pacific regional offices are located in Norfolk, Virginia, and the recently dedicated Newport, Oregon facility, respectively. NOAA's Commissioned Corps is the Nation's seventh uniformed service. Three-hundred and twenty-one NOAA Corps officers support the fleet and NOAA Line Offices. The officers of the NOAA Corps command NOAA's research and survey vessels, fly NOAA's hurricane hunters and environmental monitoring aircraft, support field operations and serve in a variety of technical and management positions throughout the agency.

OMAO Headquarters is located in Silver Spring, Maryland and is responsible for OMAO-wide executive direction and oversight of policies and procedures, development of plans and budgets, and management of NOAA Commissioned Personnel. Headquarters also manages the NOAA Dive Program, Small Boat Program, and Teacher at Sea Program. The Dive Program provides diver training, safety standards, certification, technical advice, a standardized equipment program, and publishes the NOAA Diving Manual. NOAA's 400 divers perform approximately over 15,000 dives annually in support of NOAA's programs. The Small Boat Program is designed to reduce risk, promote standardization, and enhance the safety of NOAA's small boats. NOAA maintains over 400 small boats, which are operated and funded within the Line Office programs. The Teacher at Sea Program supports teachers at the kindergarten through college level on NOAA vessels working with NOAA scientists. The teachers provide a valuable connection between NOAA and their students.

AVIATION OPERATIONS

OMAO's Aircraft Operations Center (AOC), located at MacDill Air Force Base in Tampa, Florida, operates NOAA's Aircraft Fleet in support of NOAA's mission of science, service, and stewardship. The aircraft operate throughout the United States and around the world; over open oceans, mountains, coastal wetlands, and the Arctic. AOC provides capable, mission-ready aircraft and professional crews to study global climate change and air quality, assess marine mammal populations, survey coastal erosion, investigate oil spills, conduct coastal mapping, survey snowpack levels for flood prediction, and improve hur-

1 *Additional Days At Sea are funded through individual NOAA programs and occasionally other Federal agencies on a reimbursable basis.*

ricane prediction models. AOC flight crews operate in some of the world's most demanding flight regimes including flying into the eye of a hurricane.

The Fleet is equipped with comprehensive data-collection systems in support of missions related to the Earth's environment, coastal and marine resources, and severe weather. OMAO also ensures that outsourced aviation operations are conducted safely by providing technical support, services and equipment to NOAA programs. In FY 2013, AOC will provide approximately 1,380 Base Funded Flight Hours[2] in support of NOAA's mission.

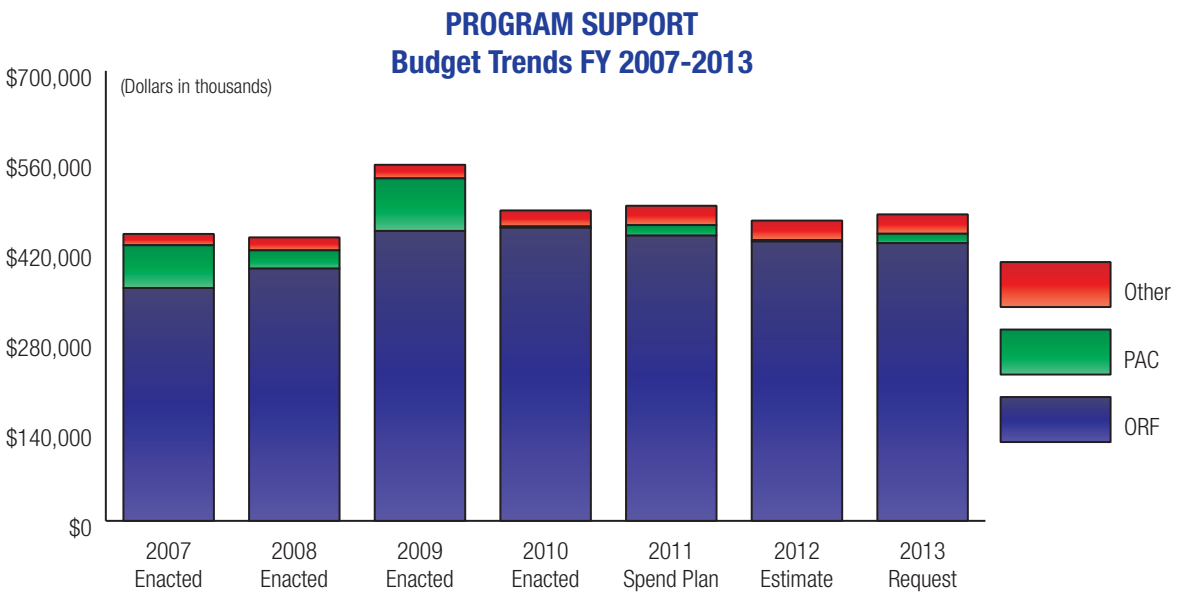
FY 2013 REQUEST	$476,772,000

NOAA requests a total of $476,772,000 and 2,038 FTEs to support the continued and enhanced operations of Program Support. This includes the Operations, Research, and Facilities (ORF) and the Procurement, Acquisition, and Construction (PAC) accounts. This is an increase of $9,671,000 and a decrease of 12 FTEs from the FY 2012 estimate. The total includes a decrease of $560,000 and 12 FTEs in net program changes, as well as an increase of $10,231,000 and 0 FTEs for Adjustments to Base (ATB).

2 *Additional Flight Hours are funded through individual NOAA programs and occasionally other Federal agencies on a reimbursable basis.*

PROGRAM SUPPORT

(DOLLARS IN THOUSANDS)	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	FY 2013 REQUEST	INCREASE (DECREASE)
PS — ORF				
Corporate Services	$206,520	$202,032	$199,901	($2,131)
NOAA Education Program	24,950	$25,090	11,266	(13,824)
Facilities	29,029	24,422	24,535	113
Office of Marine & Aviation Operations	183,207	182,960	192,256	13,296
Total Program Support - ORF	443,706	434,504	431,958	(2,546)
Total, PS - PAC	16,367	2,392	14,609	12, 217
Total, PS - Other	30,087	30,205	30,205	0
GRAND TOTAL PS (Direct Obligations)	**$490,160**	**$467,101**	**$476,772**	**$9,671**
Total FTE	**2,053**	**2,050**	**2,038**	**(12)**



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: NOAA Corps Commissioned Officers Retirement (Mandatory) and Medicare Eligible Retiree Healthcare (Discretionary)

FY 2013 ORF BUDGET SUMMARY

NOAA requests a total of $431,958,000 and 2,033 FTEs to support the continued and enhanced operations of Program Support. This is a decrease of $2,546,000 and a decrease of 12 FTEs from the FY 2012 estimate. This reduction includes a decrease of $12,777,000 in net program changes and a decrease of 12 FTEs, as well as an increase of $10,231,000 and 0 FTEs for Adjustments to Base (ATB).

PS — ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,000) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

CORPORATE SERVICES **$199,901,000**

NOAA requests a decrease of $1,840,000 and 0 FTEs for a total of $199,901,000 and 949 FTEs under the Corporate Services sub-activity.

NOAA Wide Corporate Services & Agency Management Base: NOAA requests a decrease of $479,000 and 0 FTEs. This is comprised of one increase and two decreases:

NOAA Wide Corporate Services & Agency Management Base: Acquisitions and Grants Management: NOAA requests an increase of $740,000 and 0 FTEs to support acquisition and grants services for NOAA. The success of DOC/NOAAs acquisition and grants programs is dependent on the ability of NOAA AGO to successfully obligate funds, and provide oversight and administration of those funds. However, NOAA AGO has been dealing with a declining workforce while their workload and requirements remain unchanged. This increase will be used to augment the acquisition and grants workforce with contractor staff sufficient to ensure successful obligation of the volume of contractual and financial assistance actions. These resources will be used to support the workforce while other DOC and NOAA strategic sourcing initiatives mature, with the ultimate objective to reduce workload and refocus the workforce.

NOAA Wide Corporate Services and Agency Management Base: NOAA requests a decrease of $784,000 and 0 FTEs. The Corporate Services and Agency Management base funds financial reporting, budgeting, information technology, acquisitions and grants, and human resources. NOAA will continue to fund these important services, however in order to continue to provide the level of resources needed to programs, NOAA will achieve savings, through increased labor lapse rates, termination of non-essential contracts, and/or reduced training, travel, supplies and other expenses.

Office of the Chief Information Officer: NOAA requests a decrease of $1,255,000 and 0 FTEs. This is comprised of one decrease:

Office of the Chief Information Officer, Enterprise IT Security: NOAA requests a decrease of $1,255,000 and 0 FTEs reflect reduced requirements in this line as NOAA moves to a new funding model for its enterprise IT security needs. The frequency, sophistication, and maliciousness of cyber attacks in NOAA are rapidly increas-

ing, and NOAA experiences thousands of attacks every month. NOAA is at risk for data integrity losses, network failures, and website compromises that have a significant probability of affecting the collection, processing, and dissemination of forecast and warning information to the public and other government institutions, leading to possible loss of life and property. Through the new model, the OCIO will centrally manage a portion of current Line Office IT investments, ensuring efficient and coordinated oversight of crucial enterprise wide IT security projects that will mitigate risks threatening NOAA's daily operations.

NOAA EDUCATION PROGRAM $11,266,000

NOAA requests a decrease of $13,824,000 and 12 FTEs to fund NOAA's Education Program. This is comprised of two decreases and four terminations:

NOAA Education Program Base: NOAA requests a decrease of $6,324,000 and 12 FTEs to fund NOAA's Office of Education and the Educational Partnership Program for Minority Serving Institutions. NOAA's Office of Education works to educate the public on issues related to NOAA's mission and is strongly committed to supporting the Administration's STEM education priority. Through programs like the Educational Partnership Program (EPP), this office strives to develop a future workforce in disciplines related to NOAA sciences. This decrease includes a reduction of $2,561,000 for a total of $10,000,000 for the Educational Partnership Program; a reduction of $3,107,000 to terminate NOAA's Competitive Education Grant Program and a reduction of $656,000 for a total of $1,266,000 for the Education Program Base, reducing program administration commensurate with these Office of Education program reductions. In FY 2013, The NOAA Office of Education will continue its work in educating the public about ocean, coastal, Great Lakes, atmospheric science and stewardship. Specifically, the NOAA Education Program will award 9 scholarships in the EPP Undergraduate Scholarship Program, fund 4 Graduate Science Awards, award 4 Cooperative Science Centers Cooperative Agreements and over 100 Hollings Scholarships, and continue interagency coordination of STEM activities.

Teachers on the Estuary educators gain hands-on experience in field-based science at the Narragansett Bay NERR, Rhode Island.

NOAA Bay-Watershed Education and Training (B-WET) Regional Program: NOAA requests a decrease of $5,500,000 and 0 FTE for B-WET. With these funds NOAA supported Meaningful Watershed Educational Experiences (MWEE) through competitive funding to local and state education offices and government agencies, academic institutions, and nonprofit organizations. NOAA is not requesting funds for B-WET in the FY 2013 President's Budget. In FY 2013, NOAA will continue to provide watershed educational experiences for students through other programs, including National Marine Sanctuaries and National Estuarine Research Reserves.

Ocean Education Partnerships: NOAA requests a decrease of $1,000,000 and 0 FTEs. With these funds NOAA provided competitive grants to aquariums and their partners to build capacity within that community for effectively communicating ocean literacy and related topics that are relevant to NOAA's mission. NOAA is not requesting funds for Ocean Education Partnerships in the FY 2013 President's Budget.

Geographic Literacy: NOAA requests a decrease of $1,000,000 and 0 FTEs. With these funds NOAA provided competitive grants to support the integration of NOAA assets into geography education. NOAA is not requesting funds for Geographic Literacy in the FY 2013 President's Budget.

MARINE OPERATIONS AND MAINTENANCE $166,015,000

NOAA requests an increase of $817,000 and 0 FTEs for a total of $166,015,000 and 926 FTEs under the Marine Operations and Maintenance sub-activity. This is comprised of one increase and one decrease:

Marine Operations and Maintenance: NOAA requests an increase of $1,017,000 and 0 FTEs for environmental compliance activities. A number of maritime environmental regulations have gone into effect, including stricter emissions requirements from the Environmental Protection Agency (EPA) and stricter discharge requirements from the United States Coast Guard (USCG). These new regulations will require changes to the existing ship fleet to ensure compliance is maintained and monetary fines are avoided. Proactively ensuring compliance with these new environmental regulations will allow NOAA to maintain its position as a leader in environmental stewardship and in executing the Administration's energy priorities.

Marine Operations Center, Atlantic in Norfolk, VA

Marine Operations and Maintenance: NOAA requests a decrease of $200,000 and 0 FTEs for the closure of the Charleston Homeport. NOAA proposes to consolidate the Charleston, South Carolina homeport with the Marine Operations Center and homeport in Norfolk, Virginia. Charleston, SC is currently home to NOAA Ships *Ronald H. Brown* and *Nancy Foster* and their crews, a port captain and a port engineer. The ships and their crews, along with employees of the port office, will be relocated to Norfolk, VA. This relocation will enable NOAA to increase the efficiency of the fleet and NOAA will strive to minimize disruption to staff and missions. The consolidated location will improve training, logistics and fleet maintenance and will eliminate dredging costs of $150,000 required every three years.

AVIATION OPERATIONS $30,241,000

NOAA requests an increase of $1,992,000 and 0 FTEs for a total of $30,241,000 and 104 FTEs under the Aircraft Operations sub-activity. This is comprised of one increase:

NOAA 51RF performing snow survey

Aircraft Operations: NOAA requests an increase of $1,992,000 and 0 FTEs to increase operations supporting hurricane research and reconnaissance, snow survey, ocean winds, and winter storms observations. This funding will provide an additional 595 Flight Hours of critical *in-situ* observations supporting NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment. The flight hours will support hurricane reconnaissance and research missions aimed at improving hurricane intensity forecasts including the only three tail mounted Doppler radars in the world on the WP-3 and G-IV. Additional hours will provide observations necessary for accurate and reliable winter storm warnings and forecasts. It will also support snow pack surveys that allow water managers and forecasters to more accurately

predict spring melts to meet industrial, agricultural, and human needs. International partners rely on the ocean winds observations to conduct satellite ocean wind sensor calibration and validations. In return, our partners provide ocean wind data that is used to improve hurricane

FY 2013 PAC BUDGET SUMMARY

NOAA requests a total of $14,609,000 and 5 FTEs to support the Procurement, Acquisition and Construction (PAC) of Program Support. This is an increase of $12,217,000 and an increase of 0 FTEs from the FY 2012 estimate. This increase includes $12,217,000 in net program changes and $0 and 0 FTEs for Adjustments to Base (ATB).

PS – PAC PROGRAM CHANGE HIGHLIGHTS FOR FY 2013:

Select program changes (generally above $500,00) are highlighted below at the sub-activity level. A summary of funding by Program, Project and Activity (PPA) is located in Chapter 9, Appendices. Detailed descriptions of all program changes by PPA are located in the NOAA FY 2013 Congressional Justification.

OMAO FLEET REPLACEMENT **$14,609,000**

NOAA requests an increase of $12,217,000 and 0 FTEs for a total of $14,609,000. This is comprised of two increases:

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
Major Repair Period for Thomas Jefferson	$11,712	$0	$0	$0	$0

Fleet Capital Improvements and Technology Infusion: NOAA requests an increase of $10,712,000 and 0 FTEs for NOAA Ship *Thomas Jefferson* Major Repair Period (MRP). The *Thomas Jefferson,* a work horse within the NOAA hydrographic survey fleet, is currently the only NOAA ship conducting hydrographic surveys in the Atlantic and Gulf of Mexico. Originally a U.S. Navy anti-submarine warfare platform, the *Thomas Jefferson's* efficiency at slower speed, varied sonar configurations, and Hydrographic Survey Launches capabilities make the ship an excellent multi-platform hydrographic survey vessel. The proposed MRP will provide the necessary capital investments in ship board systems, in-situ observing mission equipment, and crew safety measures to extend the ship's useful life and to allow OMAO to continue to operate the *Thomas Jefferson* in a safe and efficient manner. Lack of regular capital investment may ultimately lead to the premature retirement of the *Thomas Jefferson*.

NOAA Ship *Thomas Jefferson*

(BA IN THOUSANDS)	FY 2013 REQUEST	FY 2014	FY 2015	FY 2016	FY 2017
New Vessel Construction FSV6	$2,897	$0	$0	$0	$0

OMAO Fleet Replacement: NOAA requests an increase of $1,505,000 and 0 FTEs for the Fisheries Survey Vessel 6 Acquisition. The NOAA Ship *Reuben Lasker* (FSV6) will be among the most advanced fisheries survey vessels in the world. The ship will support fishery-independent surveys for NOAA stock assessments and protected species status reviews required by the reauthorized Magnuson-Stevens Act (MSA), Marine Mammal Protection Act (MMPA), and Endangered Species Act (ESA) at NMFS Southwest Fisheries Science Center. NOAA requests funds for activities to complete preliminary ship delivery and final acceptance including post-shipyard testing, performance of initial operations and contract close out. A total of $79,843,000 was provided in the FY 2009 American Recovery and Reinvestment Act for the detailed design and construction. The request is consistent with the acquisition funding profile approved prior to contract award.

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

MEDICARE-ELIGIBLE RETIREE HEALTHCARE FUND CONTRIBUTION

The FY 2003 Department of Defense Authorization Act requires all uniformed services, including NOAA, to participate in an accrual fund for Medicare-eligible retirees. Payments into this accrual fund will cover the future health care benefits of present, active-duty NOAA officers and their dependents and annuitants.

7
EDUCATION

Dry ice, a pH indicator, and water can be used in the classroom to demonstrate the acidifying effects of carbon dioxide in ocean water. This simple, but effective demonstration is one engaging tool that was provided to attendees at the NOAA/NSTA climate change symposium March 2010.

CREDIT **NOAA/CRCP**

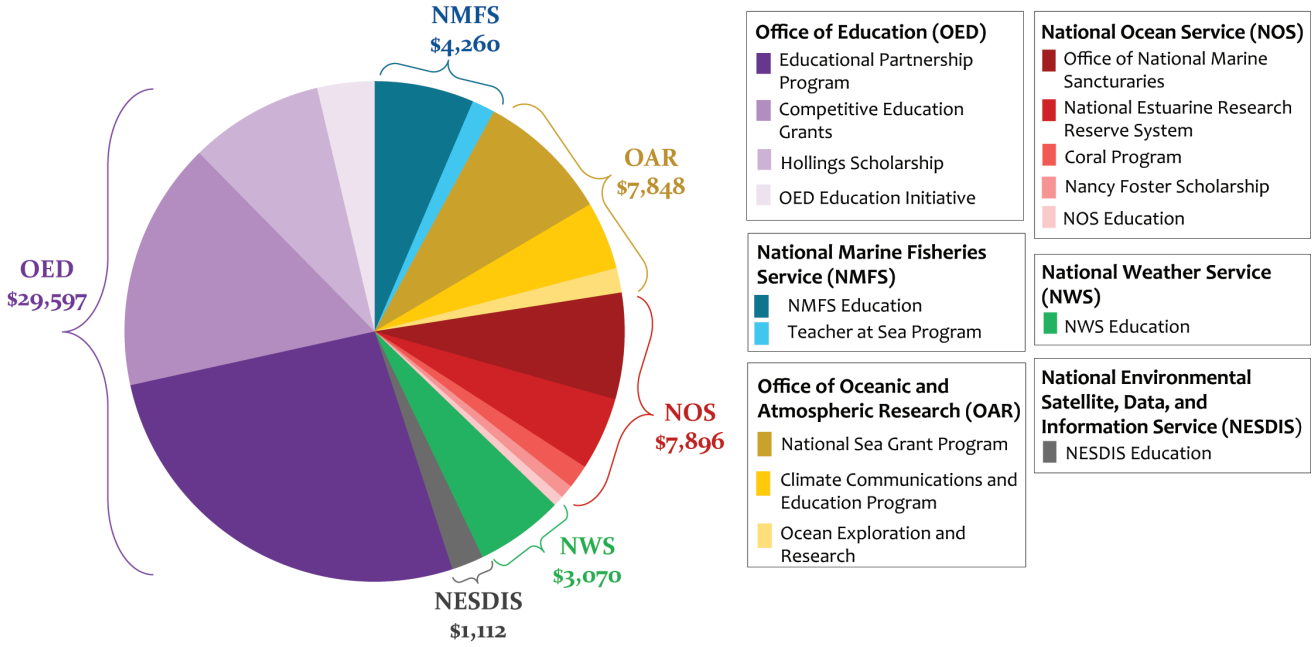
NOAA'S EDUCATION MISSION

NOAA's education mission is "to advance environmental literacy and promote a diverse workforce in ocean, coastal, Great Lakes, weather, and climate sciences, encouraging stewardship and increasing informed decision making for the Nation."[13] In FY 2011, NOAA's investment in education was $53.7 million, 1.2% of the total NOAA enacted FY 2011 budget.

In FY 2013, NOAA estimates an investment of approximately $42.1 million in education funding, of which $11,266 thousand is for the Office of Education through the "Competitive Educational Grants and Programs" budget line.

NOAA Education Investment by Program for FY 2011, in $1,000s

Total Education Investment for FY 2011 = $53.8 Million



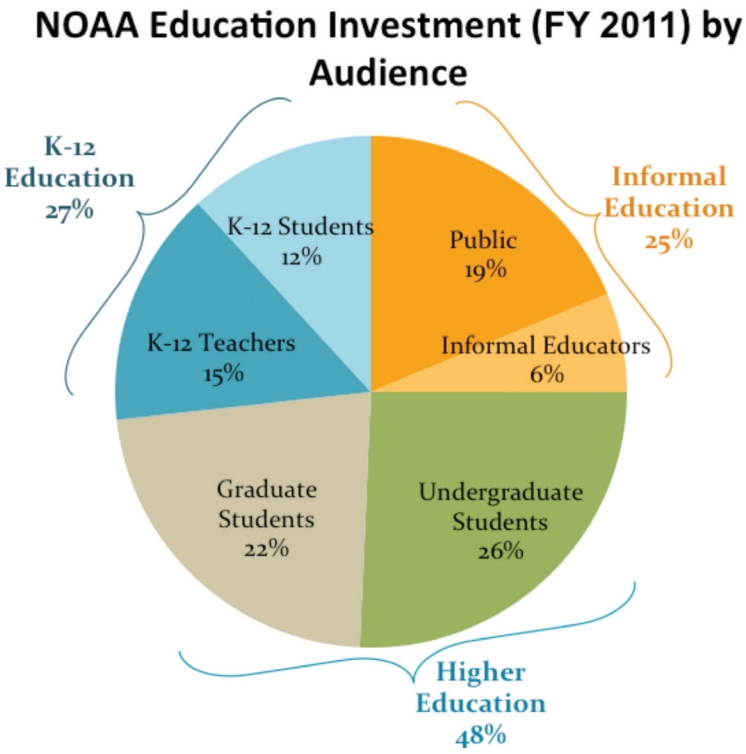
13 *The America COMPETES Reauthorization Act, 2010 (P.L. 111-358) gives NOAA broad authority for educational activities. With this statutory authority and other program-specific education mandates, the NOAA education community works collaboratively to advance the priorities outlined in NOAA's Education Strategic Plan.*

This request includes $10 million for the Educational Partnership Program and $1.3 million to pay for salaries and administrative costs. The balance of the estimated FY 2013 request is within each line office.

WHO WE SERVE

NOAA's education activities connect NOAA-related sciences, places, products, and services with the public, students (K-12 through post-graduate) and educators across the country. NOAA education activities promote environmental literacy and help to create a future workforce that reflects the diversity of the Nation. NOAA's programs support a wide range of Science, Technology, Engineering and Math (STEM) fields, including ocean, atmospheric, climate, and environmental sciences. These programs invest resources in education activities as required by legislation and as a means of meeting their broader program mission. These education investments are a vital component of NOAA's science, service and stewardship functions and combined, they form a robust education portfolio that is unique within the federal government. The agency's education portfolio also leverages external capabilities through a wide array of partnerships with academic and other education institutions, and other federal, state and local agencies, to reach our target audiences across the Nation.

Highlights of NOAA's FY 2011 education accomplishments by program follow.



2011-2013 Undergraduate EPP Scholars

EDUCATIONAL PARTNERSHIP PROGRAM

The Educational Partnership Program (EPP) with Minority Serving Institutions provides financial support to academic institutions through competitive processes. The program's goal is to increase the number of students from underrepresented communities who are trained and graduate with degrees in STEM fields directly related to the NOAA. In FY 2011, 11 undergraduate scholarship students were recruited by EPP; five student trainees became NOAA employees; 366 students were supported by EPP's Cooperative Science Centers (CSCs) and 93 graduated with degrees in STEM fields. Since EPP started in 2001, NOAA has hired 102 CSC students. http://www.epp.noaa.gov

Students explore stream ecology in the Great Smoky Mountains through a grant from NOAA's Office of Education.

COMPETITIVE EDUCATION GRANTS

The Environmental Literacy Grants (ELG) program provides funding for formal and informal education projects implemented on regional to national scales, with the goal of increasing environmental stewardship and informed decision-making among public and K-12 audiences. In FY 2011, ELG awards supported 14 aquariums and museums that reach over 15 million people per year. http://www.oesd.noaa.gov/ELG/. No funds are being requested in the FY 2013 President's Budget for this program.

The Bay Watershed Education and Training (B-WET) Program provides grants to promote locally relevant environmental education for K-12 students and related professional development for educators. B-WET serves California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawaii, New England, and the Pacific Northwest. In FY 2011, B-WET reached over 45,000 students and 1,500 teachers. http://www.oesd.noaa.gov/BWET/. No funds are requested in the FY 2013 President's Budget for this program.

Hollings undergraduates participating in the 2011 NOAA Restoration Day on the Potomac River in Accokeek, Maryland.

ERNEST F. HOLLINGS UNDERGRADUATE SCHOLARSHIP PROGRAM

The Ernest F. Hollings Scholarship provides successful undergraduate applicants with academic assistance, and a 10-week NOAA internship that provides "hands-on" experiences in NOAA-mission science, technology, and educational activities. The Program's goals are: to increase undergraduate training in oceanic and atmospheric science, technology, and education; recruit and prepare students for careers with NOAA and natural resource and science agencies; recruit and prepare students for careers as educators in oceanic and atmospheric sciences; and, improve scientific and environmental education in the U.S. In FY 2011 103 students from 44 states and territories received this scholarship. http://www.oesd.noaa.gov/Hollings_info.html

High school students in the Pribiloff Islands observe and record Northern fur seal behavior.

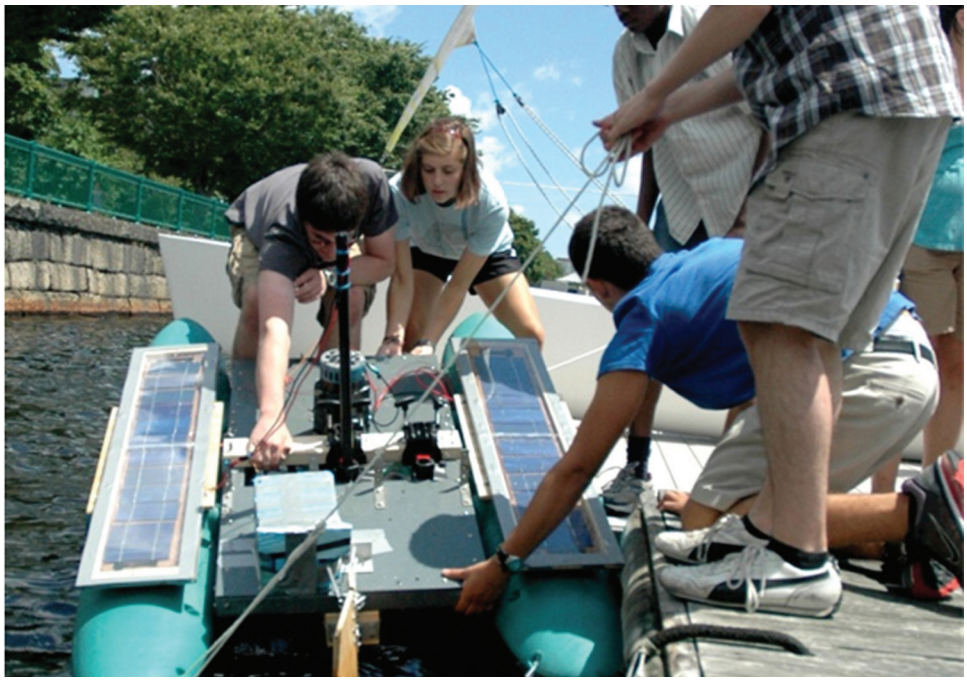
NATIONAL MARINE FISHERIES SERVICE EDUCATION

The National Marine Fisheries Service (NMFS) education program promotes stewardship of living marine resources and environmental literacy. NMFS' staff develops learning tools, provides science experiences for classrooms and families, and professional development opportunities for teachers. In FY 2011, NMFS produced and tested the first Northern Fur Seal Curriculum which integrates NOAA science into the classroom and can be applied to students' curriculum in Alaska and the Pacific Northwest. http://www.nmfs.noaa.gov

NOAA Teacher at Sea, Channa Comer from New York, sailed aboard Research Vessel *Hugh R. Sharp* during a sea scallop survey. Here she displays a section of the iron rings that are used in the construction of the scallop dredge.

TEACHER AT SEA PROGRAM

Since 1990, NOAA's Teacher at Sea Program has provided authentic research experiences to teachers aboard NOAA ships working throughout the Nation's waters. In FY 2011, 34 teachers completed research cruises, 10 conducted research in laboratories and field operations, and over 600 alumni from every state are using NOAA science and data in the classroom, reaching thousands of students each year. One 2011 teacher summed up her participation in the program by saying that "working alongside scientists who are passionate about their impact on the ocean was inspiring," another said her research experience gave her "more confidence to teach science". http://teacheratsea.noaa.gov



MIT Sea Grant's 2011 Ocean Engineering Experience students test their vehicle design off of the MIT Sailing Pavilion.

NATIONAL SEA GRANT COLLEGE PROGRAM

The National Sea Grant College Program's Sea Grant Education Network (SGEN) consists of professional educators working at universities across the Nation to further NOAA's education goals of advancing environmental stewardship and workforce development. SGEN provides multidisciplinary marine and aquatic science education for the formal and informal education sectors through teacher trainings, free-choice learning experiences, student opportunities, and much more. In FY 2011, the SGEN conducted inquiry-based instruction for 19,356 teachers and 7,706 informal educators, and directly and indirectly reached 377,918 in a continuing effort to enhance marine and aquatic literacy.

For more information on the SGEN: http://www.seagranted.net

For Sea Grant-sponsored teacher resources: http://web.vims.edu/bridge/

Teachers learn how to identify forest land cover types as it relates to climate; a project supported by NOAA's Climate Communications and Education Program in partnership with the GLOBE Program.

CLIMATE COMMUNICATIONS AND EDUCATION PROGRAM

The NOAA Climate Communications and Education Program improves public climate science literacy and raises public awareness and understanding of, and engagement with, NOAA's climate science and services programs. In FY 2011, this program expanded the Climate Services Portal prototype (www.climate.gov) and the climate and energy educational collection (http://www.cleanet.org/), and partnered with informal education institutions to reach 13.5 million visitors. http://www.climate.noaa.gov/education/

Students learn how wavelengths of light travel to various depths in the deep ocean using special mask filters in an activity called "Light in the Deep Dark Ocean."

OCEAN EXPLORATION AND RESEARCH PROGRAM

NOAA's Office of Ocean Exploration and Research is committed to engaging educators and students in near-real time ocean exploration to raise America's environmental literacy and interest in ocean sciences and advanced technologies used to explore the ocean. The program offers onsite and online professional development to educators to learn about ocean exploration and how they can use science content associated with exploring the ocean in classrooms. In FY 2011, program offerings focused on the first federally-dedicated ship for ocean exploration, the NOAA Ship Okeanos Explorer, through new inquiry-based teaching materials entitled Why Do We Explore? and How Do We Explore? http://oceanexplorer.noaa.gov/okeanos/edu/welcome.html

Students show their support for the NOAA Ocean Guardian School Program..

OFFICE OF NATIONAL MARINE SANCTUARIES

Since 1972, the NOAA Office of National Marine Sanctuaries (ONMS) has been federally mandated to promote ocean science education through 13 national marine sanctuaries and one marine national monument. A highlight for FY 2011 was the NOAA Ocean Guardian School program, a program that works with schools to implement a stewardship project to protect local watersheds, the world's ocean, and special ocean areas, like national marine sanctuaries. Last year, the program resulted in thousands of pounds of trash removed from local beaches, latex balloons banned at school and community functions, and hundreds of students learning how small, community actions can provide large environmental benefits. http://sanctuaries.noaa.gov/education

Teachers on the Estuary educators 'gain hands-on experience in field-based science at the Narragansett Bay NERR, Rhode Island.

NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

The National Estuarine Research Reserves System (NERRS) provides educational opportunities that advance environmental literacy and engage educators, students and the general public in coastal stewardship. In FY 2011, 83,275 students participated in experiential activities where they learned about estuaries, the scientific method, how to collect and analyze scientific data, and how to restore and protect estuaries. Also in FY 2011, NERRS trained community members who in return contributed over 25,256 hours of volunteer service. in their local estuaries. http://nerrs.noaa.gov/Education.aspx &

Teachers in the ocean acidification workshop learning about a coral nursery at the National Coral Reef Institute in Ft. Lauderdale, Florida

CORAL REEF CONSERVATION PROGRAM

The Coral Reef Conservation Program (CRCP) works closely with states and U.S. territories to address climate change, adverse impacts of fishing, and land-based sources of pollution that damage reef ecosystems. During FY 2011, CRCP completed the development of the Ocean Acidification Data-in-the-Classroom educational module, available nationally, and trained and evaluated over 100 educators in the use of data to teach coral-related science. The CRCP also funded the Coral Reef Management Fellowship, placing recent graduates in Florida, US Virgin Islands, Puerto Rico, Hawaii, CNMI, Guam, and American Samoa. http://coralreef.noaa.gov/education/

Shannon Lyday, a 2011 Nancy Foster scholar, on a research cruise.

DR. NANCY FOSTER SCHOLARSHIP PROGRAM

The Dr. Nancy Foster Scholarship Program makes awards to outstanding scholars in marine biology, oceanography, or maritime archaeology, particularly to women and minorities, and encourages independent graduate-level research by providing financial support, through competitive processes, for graduate studies in those fields. Of the 50 Dr. Nancy Foster Scholarships awarded since the program began in 2000, 45 have been awarded to women. In FY 2011, 3 new scholarships were awarded. This program was authorized by Congress through the National Marine Sanctuaries Amendments Act of 2000 (Pub. L. 106-513)soon after Dr. Foster's death in June 2000, as a means of honoring her life's work and contribution to the nation. http://fosterscholars.noaa.gov/aboutscholarship.html

Elementary school students use math and language skills as they measure plant growth rates and determine reduced carbon footprints in a school vegetable garden, part of the Climate Stewards project.

NATIONAL OCEAN SERVICE EDUCATION

NOAA's National Ocean Service (NOS) education activities serve educators and students through web sites and projects that promote environmental literacy using ocean, coastal, and climate science. Tools and resources are posted at http://oceanservice.noaa.gov/education and http://games.noaa.gov/. In FY 2011, NOS education reached over 28,000 educators through workshops, conference presentations and web based professional development opportunities. In FY 2011 over 1,000,000 unique visitors accessed NOS online educational content. Specifically, The Climate Stewards project provided ongoing professional development and an online collaborative learning community to formal and informal educators to increase their understanding of climate science.

A big part of the NWS education program is teaching the public and K-12 students about emergency preparedness

NATIONAL WEATHER SERVICE EDUCATION

A goal of National Weather Service (NWS) education is to inform students, teachers and the general public about how to minimize fatalities and injuries and protect property from severe weather. A partnership between The American Meteorological Society and NWS has trained over 900 science teachers in weather forecasting, hydrology, and climate, helping them to bring NOAA science to their classrooms. In addition, NWS and emergency managers educate the citizens of local communities through StormReady and TsunamiReady programs. NWS partners with the Plan!T NOW organization to develop innovative, digital severe weather awareness games/activities for all ages. In FY 2011, NWS conducted 2,500 school visits educating students about weather and safety preparedness. http://www.weather.gov/

Nina Jackson of NOAA NESDIS explains the Satellite educational resources and outreach materials available to the public at the American Meteorological Society Weather Fest in Seattle, Washington, January 23, 2011.

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE EDUCATION

NESDIS supports Science, Technology, Engineering and Math (STEM) related educational efforts in three main areas: 1) students and educators of remote sensing and atmospheric sciences through cooperative partnerships such as The Federation of Earth Science Information Partners (ESIP) and Sally Ride Educator Workshops; 2) applied professional development for meteorologists and remote sensing professionals at 14 universities; and 3) applied community and location-specific public education activities.. In FY 2011, NESDIS supported the Sally Ride Science Festival, which introduced remote sensing and space science to almost 200 elementary school students, supported educator workshops in 3 locations serving almost 200 teachers, and provided NOAA-specific educational programming to thousands of elementary-school students through programs at the American Meteorological Society and American Geophysical Union annual conferences.
www.nesdis.noaa.gov

CREDIT **NOAA**

8

RESEARCH & DEVELOPMENT

Ocean explorers on NOAA Ship *Okeanos Explorer* observed two species of marine life scientists believe have never before been seen together at a hydrothermal vent — chemosynthetic shrimp and tubeworms. They also observed the first known live tubeworms ever seen at a hydrothermal vent in Atlantic waters during an expedition to the Mid-Cayman Rise south of Grand Cayman Island in the Caribbean. Most other life on Earth is photosynthetic — relying on energy from the sun. These new hydrothermal vent animals, by contrast, exist on the deep and dark ocean floor where no sunlight penetrates. Instead, they derive energy from chemicals that rise in the hot water of hydrothermal vents making them chemosynthetic.

This photo captures the first live tubeworm seen at a hydrothermal vent site in Atlantic waters.

NOAA RESEARCH & DEVELOPMENT

From the control room on NOAA Ship Okeanos Explorer, technicians send data, including high-definition video from the seafloor to scientists ashore, live via satellite and Internet telepresence pathways. NOAA's Office of Ocean Exploration and Research develops and applies telepresence and other technologies to explore, with the idea that discovery leads to research which in turn leads to products and processes benefiting NOAA and the nation. Image credit: Carl Verplanck/NOAA.

NOAA is the single federal agency with operational responsibility to protect and conserve ocean, coastal, and Great Lakes resources and to provide critical and accurate weather, climate, and ecosystem forecasts that support national safety and commerce. The foundation and forward planning for this mission of science, service, and stewardship is supported by NOAA research and development. NOAA provides research-to-application capabilities that can recognize and apply significant new understanding to questions, develop research products and methods, and apply emerging science and technology to the needs of constituents such as local governments, businesses, and the general public. The agency also has made a firm commitment to protect scientific findings from being suppressed, distorted or altered, to strengthen science, and to encourage a culture of transparency through the recent release of the Scientific Integrity Policy. This policy firmly supports scientists and their scientific activities, as well as instills further public trust in NOAA science.

The NOAA Research Council, an internal body composed of senior scientific personnel from every Line Office in the agency, provides corporate oversight to ensure that NOAA's research activities are of the highest quality, meet long-range societal needs, take advantage of emerging scientific and technological opportunities, and shapes a forward-looking research agenda. The research and development portfolio underlies and supports NOAA's Next Generation Strategic Plan's four long-term goals that are central determinants of resilient ecosystems, communities, and economies. The goals are: **1) Climate Adaptation and Mitigation, 2) Weather-Ready Nation, 3) Healthy Oceans, and 4) Resilient Coastal Communities and Economies.**

Highlighted in this chapter are NOAA's selected research and development accomplishments for FY 2011.

PRIVATE SECTOR TEAMS WITH NOAA ON HAIL AND SEVERE STORMS RISK MANAGEMENT INITIATIVE

The NOAA National Severe Storms Laboratory (NSSL) formed a research collaboration with Atmospheric and Environmental Research (AER). AER is a private company that provides weather risk management solutions for many insurance companies and other industries affected by severe storms, helping the insurance industry anticipate and react to storm damage, saving time and money. The alliance combines NSSL's years of research and development in weather radar technology with AER's expertise in providing data-driven solutions that improve industry practices. Partnerships to share weather information can lead to more productive and efficient industries in those sectors. **(Goal: Weather-Ready Nation)**

THREAT TO COMMON GULF OF MEXICO FISH STIR FEARS OF A DOMINO EFFECT

Atlantic croaker, one of the most abundant fish in the Gulf of Mexico, are starting to exhibit changes that appear to be related to the massive summer "dead zone", a hypoxic or low-oxygen area. A National Centers for Coastal Ocean Science sponsored study found croakers exposed to low oxygen for as few as 10 weeks underwent hormonal alterations that transformed some of their female reproductive tissue into male tissue. Compounding this bad news, the male tissue was incapable of fertilizing eggs, and hatching rates were a tenth of normal. All of these factors are quite capable of causing a population crash in one of the Gulf's top 10 recreational fisheries. Because croaker are closely related to several species of fish in the Gulf, this study indicates there are many fish susceptible to crashing if hypoxic conditions persist.[1] Research results such as these can provide an understanding of the effects of the dead zone on fish populations and recreational fisheries. **(Goal: Resilient Coastal Communities and Economies)**

Atlantic croaker (Micropogonias undulatus) is a coastal marine fish inhabiting the east coast of the United States with an $8 million annual commercial fishery.

CHANGES IN WINTER CLIMATE WILL RESULT IN DRIER SOUTHWESTERN UNITED STATES

Scientists with NOAA's Geophysical Fluid Dynamics Laboratory coauthored a paper[2] theorizing that the projected drying of southwestern North America is driven by a reduction of the winter precipitation, a decline in mountain snow mass due to warming, and an earlier spring snow melt that disrupts natural water storage systems. These results offer improved scientific understanding of the linkages between changing climate systems and the impacts on water, a valuable natural resource. **(Goal: Climate Adaptation and Mitigation)**

ADVANCEMENT IN SENSOR TECHNOLOGY FOR REGIONS WITH EXTREME ARCTIC ENVIRONMENTS

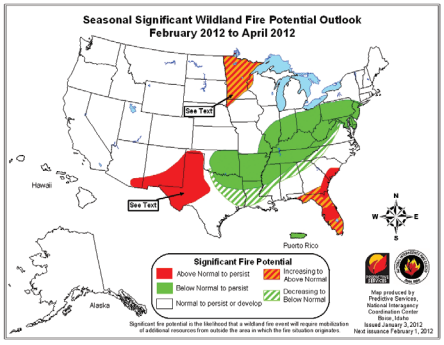
The NOAA National Ocean Service's Center for Operational Oceanographic Products and Services (CO-OPS) has developed an innovative system design to collect water level data in remote, cold climate regions where winter sea ice precludes traditional tide station installations. The systems are equipped with a high-stability pressure sensor, conductivity sensor, an acoustic modem, disposable ballast, and a pop-up buoy for recovery. The data obtained represent one of the most unique and valuable data sets collected by NOAA on the North Slope. The results have already contributed to improved elevation measurements, known as a vertical reference system, for the region that will contribute to future shoreline and bathymetric surveys necessary for

1 *P. Thomas, M. S. Rahman. Extensive reproductive disruption, ovarian masculinization and aromatase suppression in Atlantic croaker in the northern Gulf of Mexico hypoxic zone. Proc. R. Soc. B, 279, 28-38 (January 7, 2012).*

2 *R. Seager, G. A. Vecchi, Greenhouse warming and the 21st century hydroclimate of southwestern N. America, Proceedings of the National Academy of Sciences, 107(50), 21277-21282 (December 14, 2010).*

informing Arctic communities and economies of changing conditions. **(Goal: Resilient Coastal Communities and Economies)**

NATIONAL SEASONAL FIRE OUTLOOKS ALLOW ADVANCED PLANNING



A National Seasonal Fire Outlook map for January-March 2012..

The National Seasonal Assessment Workshops (NSAW) produced annual pre-season fire potential outlooks for the United States. In February 2011, the seasonal fire outlook provided advanced warning of crippling wildfires in Texas. Using the outlook, the National Interagency Fire Center was able to make an informed decision to send interagency assistance to Texas, dispatching firefighters, support staffers, fire engines, dozers, helicopters, fixed wing aircraft and air tankers in order to mitigate the threat of the fires. The NSAW are developed by a partnership among the NOAA Climate Program Office, the NOAA-supported Climate Assessment for the Southwest program, the National Interagency Coordination Center's Predictive Services, and the Program for Climate, Ecosystem and Fire Applications at the Desert Research Institute. **(Goal: Climate Adaptation and Mitigation)**

SIDE SCAN SONAR AUTONOMOUS UNDERWATER VEHICLES (AUVS) RESPOND TO EMERGENCIES

After 3 years of testing, evaluation, and determination of standard operating procedures, AUVs equipped with side scan sonars have been accepted as an operational tool for responding to emergency situations. This highly portable survey system provides autonomous side scan sonar capability to commercial port areas within the United States. The system "sweeps" an area for new obstructions potentially posing hazards to commercial surface navigation. During the evaluation period, the AUV was successfully deployed to gather data to clear ship channels for traffic after tropical storm and hurricane strikes at east coast and Gulf of Mexico ports. **(Goal: Resilient Coastal Communities and Economies)**

CATCH-SHARE STUDIES SHOW GROUNDFISH VESSELS EARN MORE, LAND LESS IN 2010

The Northeast Fisheries Science Center's (NEFSC) Social Sciences Branch examined the social and economic performance of the groundfish fishery in 2010. This is the first year the fishery was managed under a catch-share system—one in which fishermen either joined with others to form a group called a "sector" and fished an allotted share of the total allowed catch, or fished individually with a limit on the number of days spent fishing. Most vessels with a substantial history of landing groundfish fished under the sector option. The studies showed that despite lower catch limits required to end overfishing and rebuild stocks, the groundfish industry obtained higher prices for fish and earned more value from fewer fish landed and less fishing effort expended. These are the first reports generated by the NEFSC, with extensive consultation from stakeholders in the region. Findings were presented to industry and the New England Fishery Management Council and are

being used to formulate actions to help fishermen and fishing communities operate successfully under catch quotas in an effort to end overfishing and rebuild stocks. Results indicated that the fishery's overall economic health improved and suggested that new management processes are beginning to work towards building and sustaining economically robust coastal communities. **(Goal: Healthy Oceans)**

REAL-TIME FLOOD IMAGERY FOR MAJOR DISASTERS

NESDIS provided real-time flood maps to support emergency response to the March 2011 tsunami in Japan and the May 2011 flooding in the U.S. Midwest. The Geostationary Operational Environmental Satellite R Series (GOES-R) land application team used satellite images to create a product to detect flooding and standing water. The imagery was used to rapidly communicate information to decision makers and the public permitting more informed disaster response. **(Goal: Weather-Ready Nation)**

UPGRADE OF NOAA'S CLIMATE FORECAST SYSTEM ENHANCES DECISION MAKING TOOLS

The National Weather Service's National Centers for Environmental Prediction implemented a new operational version of the Climate Forecast System (CFSv2) that combines predictions of atmosphere, ocean, sea ice, and land. The CFSv2 took seven years of development by a team of NOAA scientists and has resulted in improved operational forecasts for sub-seasonal and seasonal timescales. For example, forecasts of heavy rainfall over the U.S. west coast, cold air outbreaks over the eastern United States, and tropical cyclone activity have increased from 6 to 17 days out. The CFSv2 also has improved the skill of other seasonal forecasts. These forecasts can be used by a wide community of users in their decision making processes for areas such as water management for rivers and agriculture, transportation, energy use by utilities, wind and other sustainable energy, and seasonal prediction of the hurricane season. **(Goal: Climate Adaptation and Mitigation)**

NEW DETECTION METHOD FOR VIRULENT-TYPE *VIBRIO VULNIFICUS* MAY LEAD TO SAFER OYSTERS

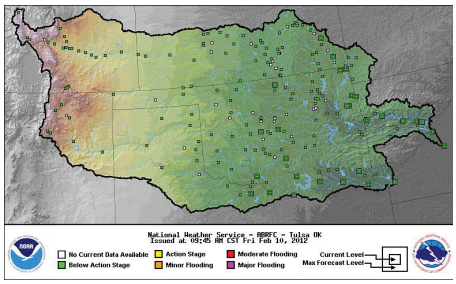
A Louisiana Sea Grant-sponsored project developed an improved rapid and reliable method to detect virulent-type Vibrio pathogen in oysters. Results of the study have been accepted for publication.[3] *Vibrio vulnificus* is a rare but severe cause of oyster-related illnesses in humans, which could be fatal for certain at-risk consumers. Rapid, accurate, and reliable testing methods that can detect *V. vulnificus* strains with potential to cause human illnesses are currently not available. This improved toxin monitoring will be of great value to regulatory agencies to increase resource managers' knowledge of ecological stressors and to inform management decisions. **(Goal: Resilient Coastal Communities and Economies)**

3 *F. Han, F. Wang, B. Ge, Detecting virulent-ypye* Vibrio vulnificus *strains in raw oysters by quantitative loop- mediated isothermal amplification.* Applied Environmental Microbiology. *(2011).*

A 27-YEAR DATA RECORD OF STRATOSPHERIC TEMPERATURE CHANGE

Using observations from seven NOAA satellites, the National Environmental Satellite, Data, and Information Service (NESDIS) Center for Satellite Applications and Research (STAR) developed a 27-year data record of climate change in the stratosphere (the second major layer of Earth's atmosphere). It is the first well-documented data record available to the public that is capable of determining accurate trends of stratospheric temperature change both regionally and globally. Research on decadal timescales is needed to understand feedback between atmospheric temperatures and the rate of global-to-regional climate impacts. **(Goal: Climate Adaptation and Mitigation)**

RELIABLE RIVER FORECASTING FROM HOURS TO SEASONS



Interactive map of up-to-the minute observed/forecast river conditions for the Arkansas-Red Basin River Forecast Center, one of 13 River Forecast Centers in the National Weather Service.

NOAA has developed a reliable method to combine data about precipitation (i.e. rain) and temperature over different time scales ranging from hours to seasons. These groupings or ensembles will drive NWS hydrologic (river) forecast models to produce forecasts, which could predict water levels or flooding conditions. The first user of the upgraded forecast system is the city of New York, which manages a complex system of reservoirs for its water supply. The system in the future will be made available to all River Forecast Centers to serve water resource and environmental managers, city planners, the general public, and private-sector value-added firms. **(Goal: Weather-Ready Nation)**

RESEARCHERS DETERMINE EFFECT OF DEEPWATER HORIZON CONTROLLED BURNS ON AIR QUALITY

Black smoke billows from a controlled burn of surface oil during the 2010 Deepwater Horizon oil spill. A new study by NOAA and the Cooperative Institute for Research in Environmental Sciences (CIRES) investigated the effects of the burn on air quality. Photo Credit: U.S. Coast Guard.

During the 2010 Deepwater Horizon oil spill, an estimated one of every 20 barrels of spilled oil was deliberately burned off to reduce the size of surface oil slicks and minimize impacts of oil on sensitive shoreline ecosystems and marine life. Scientists from NOAA's Earth System Research Laboratory (ESRL) and the Cooperative Institute for Research in Environmental Sciences (CIRES) found the black smoke that rose from the water's surface during the controlled burns pumped more than 1 million pounds of black carbon (soot) pollution into the atmosphere. This is an amount roughly equal to the total black carbon emissions normally released by all ships that travel the Gulf of Mexico during a nine-week period. Publications[4] from these findings will help improve information on the connection between human activities and air quality and the impacts to the Gulf region from this spill. These research activities support the NOAA service of providing forecast guidance for air quality that is based on weather prediction models. **(Goal: Weather-Ready Nation)**

4 *A. E. Perring, J. P. Schwarz, J. R. Spackman, R. Bahreini, J. A. de Gouw, R. S. Gao, J. S. Holloway, D. A. Lack, J. M. Langridge, J. Peischi, A. M. Middlebrook, T. B. Ryerson, C. Warneke, L. A. Watts, D. W. Fahey, Characteristics of black carbon aerosol from a surface oil burn during the Deepwater Horizon oil spill.* Geophysical Research Letters, *38, L17809 (2011;* http://www.agu.org/pubs/crossref/2011/2011GL048356.shtml*).*

BLUEFIN TUNA WEAK HOOK RESEARCH LESSENS BYCATCH MORTALITY

An 82 percent decline in the adult population of Atlantic bluefin tuna (*Thunnus thynnus*) resulted in a prohibition on directed commercial fishing of this species in the Gulf of Mexico (GOM). Concern continues though because of the high levels of spawning bluefin tuna bycatch and mortality by the GOM pelagic longline fleet when pursuing more profitable yellowfin tuna (*Thunnus albacores*). From 2008 to 2011, gear researchers with the Southeast Fisheries Science Center collaborated with industry leaders in the GOM to test the effectiveness of a new "weak hook" designed to reduce bluefin tuna bycatch. Relying upon the difference in overall size, weight and pulling strength between commercially caught bluefin and yellowfin tuna, the weak hook is designed to straighten and safely release a captured adult bluefin tuna. Direct catch comparisons were made between standard hooks and the new weak hooks over three fishing seasons and the results of the research showed that the weak hooks were capable of reducing bluefin tuna bycatch by 56.6 percent, with little difference in the catch of yellowfin tuna. This research demonstrates that progress toward sustainable fishing and recovery of a depleted species can be achieved through sound science and industry partnership. **(Goal: Healthy Oceans)**

An example of the weak hook designed to reduce bluefin tuna bycatch.

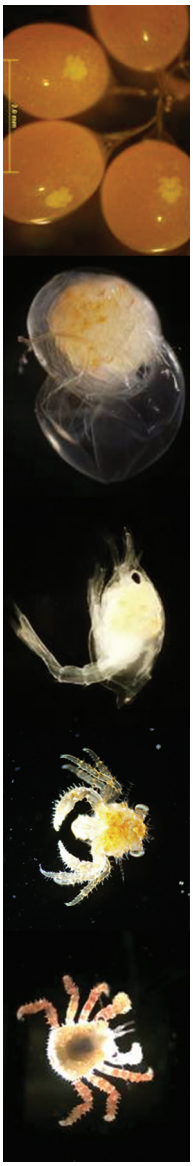
MORTALITY STUDIES PREDICT FUTURE THREATS TO COHO SALMON IN URBANIZING WATERSHEDS

Urban waterways in coastal areas provide spawning habitats for important migratory marine species such as salmon. For over a decade, scientists in the Pacific Northwest have worked to solve the mystery of why adult Coho salmon are dying prematurely in urbanized watersheds when they return from the ocean to spawn. Researchers at the North West Fisheries Science Center and other federal, state, and tribal partners found that the seasonal Coho mortality is linked to toxic urban stormwater runoff. These results indicate a potential for steep salmon declines in response to future changes in land cover. As an important sentinel for ecological resiliency, salmon health and survival can be used to monitor the effectiveness of current land-use strategies, and in turn inform sound coastal planning to ensure healthy habitats for an economically valuable species. **(Goal: Healthy Oceans)**

A typical example of pre-spawn mortality. This female Coho salmon was found dead and unspawned in Longfellow Creek, West Seattle. Photo credit: Northwest Fisheries Science Center.

OCEAN ACIDIFICATION REDUCES SURVIVAL AND GROWTH IN EARLY LIFE HISTORY STAGES OF COMMERCIAL CRAB SPECIES

Crustacean (crab and shrimp) fisheries account for approximately $1.2 billion in domestic U.S. landings, with king crab and Tanner crab accounting for approximately $86 million and $85 million respectively. Recent research conducted at the National Marine Fisheries Service, Alaska Fisheries Science Center, Kodiak Laboratory suggests that predicted increases in oceanic CO_2 levels over the next century may negatively affect the early life history stages of crustaceans. More acidic seawater reduces the availability of calcium based minerals which are used by marine organisms to build shells. The



Red king crab (Paralithodes camtschaticus) early life history stages (top to bottom): embryo, hatching, larvae, glaucothoe, and juvenile. Photo credit: Kodiak Laboratory (Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA).

results of this laboratory research may have important implications for future fisheries and the coastal economies that depend on this source of income. **(Goal: Healthy Oceans)**

SCIENCE TO SUPPORT DAM REMOVAL DECISION IN THE WEST

In March 2012, the Secretary of the Interior, in consultation with the Secretary of Commerce, will decide whether to remove four dams on the Klamath River in the western United States based on two criteria: whether dam removal will advance restoration of salmonid fisheries and whether it is in the public interest. The Southwest Fisheries Science Center (SWFSC) has been heavily involved for almost three years in a major interagency effort to produce research to inform the decision. Based on results of a model developed by the SWFSC[5], dam removal is projected to increase average annual salmon harvest during 2012-2061 by 43 percent for the ocean commercial and recreational fisheries, 8 percent for the in-river recreational fishery, and 50 percent for the tribal fishery. Based on economic models developed by the SWFSC, these harvest increases are expected to yield increases in jobs, labor income, and net economic value to all fisheries. Dam removal would also yield important social and cultural as well as economic benefits to Klamath Basin tribes associated with enhanced subsistence, ceremonial, and commercial use of fish. Measuring the social and economic impacts of habitat restoration efforts will provide policy makers with key information to develop effective management plans. **(Goal: Healthy Oceans)**

DECLINE IN GREAT LAKES PHYTOPLANKTON LINKED TO INVASIVE SPECIES

The unanticipated expansion of invasive zebra and quagga mussels has resulted in an unplanned decrease in phytoplankton, with implications for Great Lakes fisheries. Phytoplankton serves as the base of the food chain in the lakes, which supports a substantial fishery. This study suggests that it may be time to re-examine traditional lake-wide nutrient strategies to recognize the changed nature of habitats and ecological processes in the Great Lakes.[6] NOAA's Great Lakes Environmental Research Laboratory teamed with the University of Michigan to show that from the 1980s-2000s, nutrient management strategies were successful in reducing excessive phytoplankton blooms in Lakes Huron and Michigan. **(Goal: Resilient Coastal Communities and Economies)**

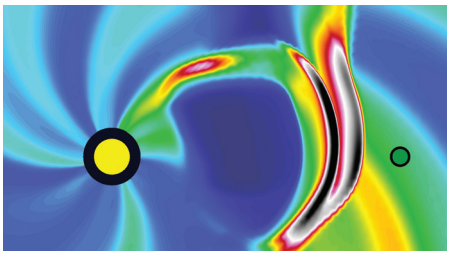
NEW SPACE WEATHER PREDICTION MODEL IMPROVES NOAA'S FORECAST SKILL

NOAA's Space Weather Prediction Center is now using a sophisticated forecast model, WSA-Enlil, which substantially improves predictions of the impacts on Earth from space weather - measurements of the state of the Sun used to forecast changes in the environment between the Sun and

5 *L. Thorsteinson, S. VanderKooi, W. Duffy, Eds., Proceedings of the Klamath Basin Science Conference, Medford, Oregon, February 1–5, 2010* (U.S. Geological Survey Open-File Report 2011).

6 *M. A. Evans, G. Fahnenstiel, D. Scavia, Incidental oligotrophication of North American Great Lakes.* Environ. Sci. Technol., *45(8), 3297–3303 (2012).*

the Earth (e.g., sunspots, solar flares).[7] Variations in space weather have the potential to disrupt virtually every major public infrastructure system, including transportation systems, power grids, telecommunications, and global positioning systems. Before this model was available, forecasters could predict timing of space weather impacts within a 30-hour window, on average. The new model allows forecasters to narrow that window to 12 hours, so that electric power grid and satellite operators and airlines can take better protective measures to limit outages and long-lasting damage. Better space weather forecasts offer additional protection for people and the technology-based infrastructure we use daily in our economy. **(Goal: Weather-Ready Nation)**



A space weather forecast model, which forecast the arrival of three successive coronal mass ejections - big blasts of plasma from the Sun - in early August, 2011.

SEA GRANT INTEGRAL TO DEVELOPMENT OF FIRST FEDERALLY-APPROVED OCEAN SAMP

Rhode Island Sea Grant has worked with the state's Coastal Resources Management Council to develop and implement a coastal and marine spatial planning tool known as Special Area Management Plans (SAMPs). SAMPs are scientific ecosystem-based management plans that comprehensively review ecosystems, regulatory environments and social structures, then propose guidance on regulations to be adopted by the state. Such guidance is closely tailored to the unique ecological and social conditions of each place. The Ocean SAMP also focuses on the state's interest in developing renewable offshore energy from wind. **(Goal: Resilient Coastal Communities and Economies)**

VARIATIONS IN CLIMATE LEAD TO PRECIPITATION EXTREMES OVER THE SOUTHEAST UNITED STATES

Since the early 1980s, an area of high pressure over the North Atlantic has increasingly influenced rainfall patterns over the southeastern United States. The position of this subtropical high plays an important role in whether the southeast receives a drought or deluge. The region experiences more rainfall when the subtropical high dips to the southeast and less precipitation when the high moves to the northwest. Research supported by the NOAA Climate Program Office discovered that the variance of weather extremes has been enhanced in recent decades by a persistent intensification of the high, along with a westward march of its western edge. An understanding of the current state of climate as well as the likely impacts of that climate is important for regional stakeholders in the southeast. **(Goal: Climate Adaptation and Mitigation)**

7 *V. Pizzo, G. Millward, A. Parsons, D. Biesecker, S. Hill, D. Odstrcil, Wang-Sheeley-Arge–Enlil cone model transitions to operations, AGU Space Weather, 9, S03004 (2011).*

MULTI-USE OF AIRBORNE LIDAR DATA FOR SAFE NAVIGATION AND COASTAL SCIENCE

NOAA has recently implemented new production procedures for using light detection and ranging (lidar) data to map the National Shoreline depicted on the Nation's nautical charts. Lidar systems use pulsed lasers in aircraft to measure ranges to the surface below. The range measurements are combined with position and orientation data to obtain accurate, 3D spatial coordinates (e.g., latitudes, longitudes, and heights) of points on the Earth's surface, including below the water surface in the case of bathymetric lidar. The National Shoreline mapped using these procedures supports safe marine navigation, as well as legal boundary determination. Application of lidar data is also useful to ongoing research in a wide range of coastal science and management applications through NOAA's Integrated Ocean and Coastal Mapping (IOCM) initiative – for example, mapping and monitoring of coral reefs, and analyzing shoreline erosion rates and other related effects of climate change. **(Goal: Resilient Coastal Communities and Economies)**

RESEARCH & DEVELOPMENT STATS

The Office of Management and Budget (OMB) defines the conduct of Research and Development (R&D) as "…creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications." NOAA tracks the conduct of R&D as well as assets which support R&D, including equipment and facilities. Those assets include vessels that support research missions and high performance computing infrastructure.

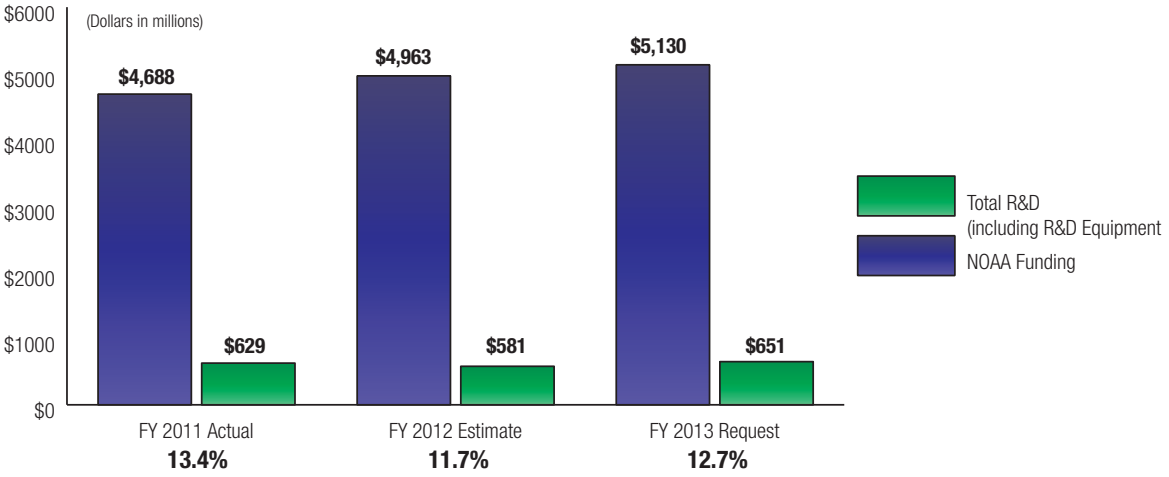
The following charts display the scope and nature of R&D at NOAA:

- NOAA requests a total of $651 million for R&D funding (including R&D Equipment) in FY 2013.
- R&D funding (including R&D Equipment) represents 12.7 percent of total NOAA funding for FY 2013.
- NOAA's R&D budget is comprised of 8.6 percent Development, 69.4 percent Research, and 22.0 percent Equipment.
- 73.0 percent of NOAA's R&D funding, excluding equipment, is intramural and 27.0 percent is extramural.
- NOAA's Office of Oceanic & Atmospheric Research (OAR) manages 62 percent of NOAA's R&D funding, excluding equipment. The remainder of R&D is distributed among the operational Line Offices.

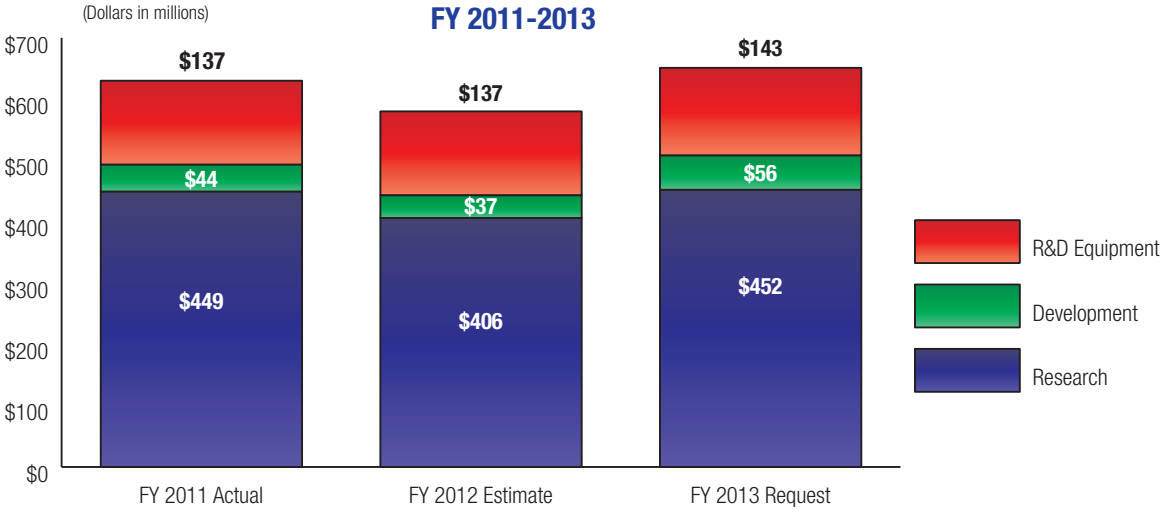
Definitions

- Research and Development includes those activities aimed at broadening general knowledge about scientific topics, applied investigations on specific topics, and development of new technologies.
- Research is defined as systematic study to gain knowledge or understanding about a topic.
- Development is defined as systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.
- Equipment includes infrastructure to support Research & Development such as the Office of Marine and Aviation Operation's (OMAO) research vessels, High Performance Computers, and laboratory equipment.
- Extramural research is that which is ultimately performed by non-Federal entities and may include private companies, academia, non-profits, state and local governments, etc.
- Intramural research is that which is performed by Federal Agencies.

NOAA R&D COMPARED TO TOTAL FUNDING FY 2011-2013

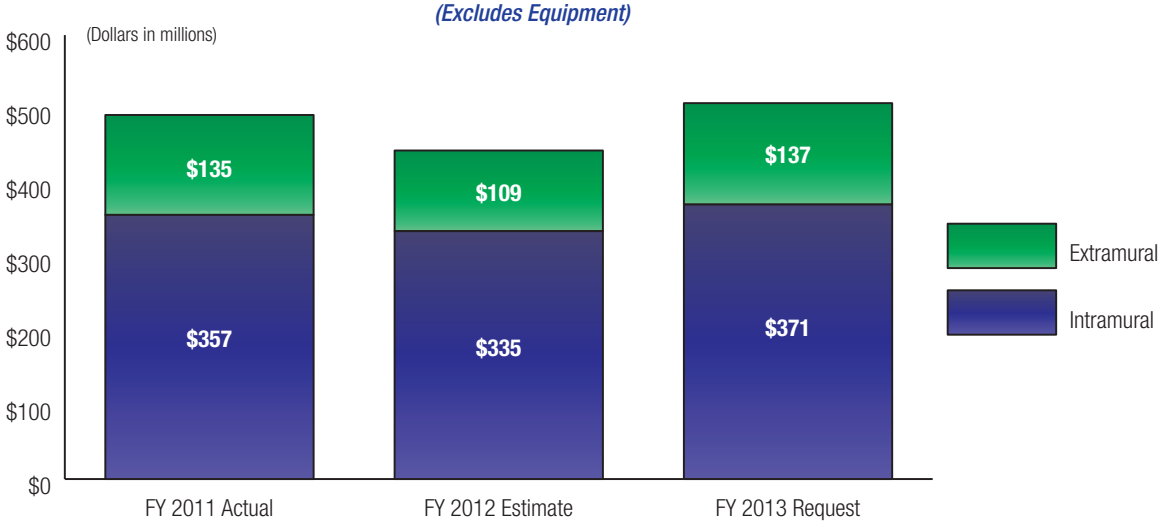


NOAA R & D FUNDING BY TYPE FY 2011-2013

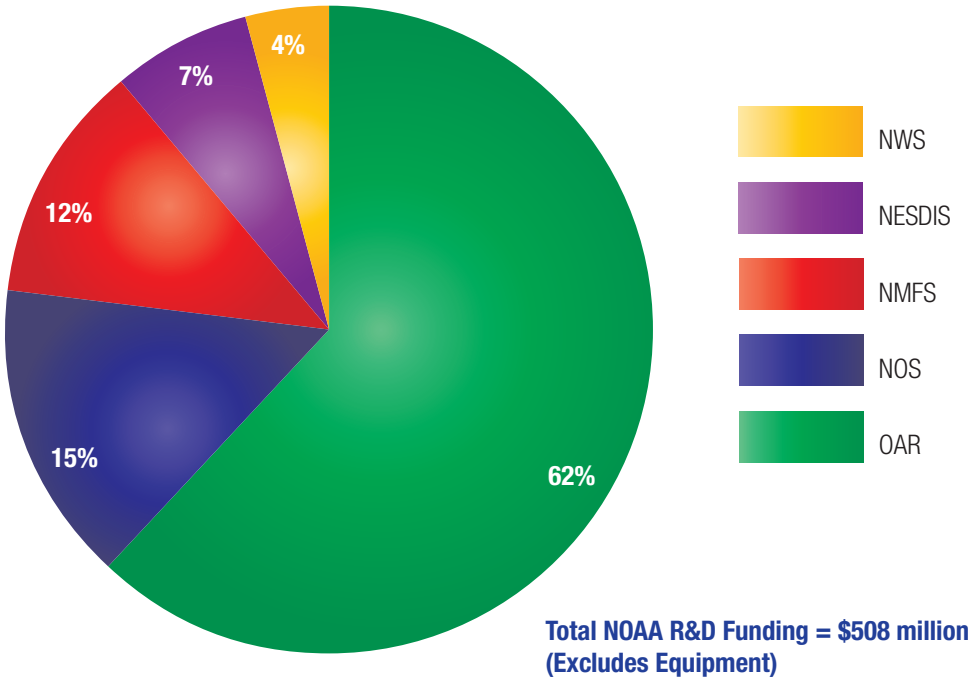


R&D FUNDING BY EXTRAMURAL & INTRAMURAL, FY 2011-2013

(Excludes Equipment)



FY 2013 R&D FUNDING BY LINE OFFICE



Total NOAA R&D Funding = $508 million
(Excludes Equipment)

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APPENDICES

HRD scientist Michael Black and NASA scientist Gerry Heymsfield helped conduct a first ever high-altitude flyover of Tropical Storm Frank with the NASA Global Hawk unmanned aerial system (UAS). The Global Hawk flew a 13-hour mission from Edwards AFB, California to the Eastern Pacific basin to fly the low pressure system that was Hurricane Frank a couple of days before. NOAA and NASA shared the mission scientist's role to coordinate with and advise the Global Hawk pilots (one of whom is a NOAA Corps officer) of real-time aircraft track changes and conditions that could be expected at an altitude of about 60,000 feet. The mission scientists used a combination of NOAA and NASA real-time satellite products, superimposed with current, past, and future positions of the aircraft, to decide where the aircraft should head to obtain the best possible data without placing the plane at risk of turbulence or other adverse conditions. All of the remote sensing instruments performed well on the aircraft, including a high–definition camera that was useful for identifying targets and provides imagery of detailed cloud structures in a wide swath ahead of and beneath the Global Hawk.

CREDIT **NOAA/NASA**

TERMINOLOGY

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

FY 2011 Spend Plan

An annualized version of P.L. 111-322, this represents NOAA's estimated funding levels throughout FY 2011.

FY 2012 Estimate

Fiscal Year (FY) 2012 Appropriation, including a congressionally approved spread of undistributed reductions included within the bill (P.L. 112-55) and additional reprogrammings.

Adjustments-to-Base

Includes the estimated FY 2013 federal civilian pay raise of 0.5 percent (and the estimated FY 2013 federal military pay raise of 1.7 percent as appropriate). Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from GSA. In addition, ATBs include unique/technical adjustments to the base program, for example transfers of base resources between budget lines.

FY 2013 Base

FY 2012 Estimate plus Adjustments-To-Base

Program Change

Requested increase or decrease over the FY 2013 base

FY 2013 Request

FY 2013 base plus Program Changes

APPENDIX A

ADJUSTMENTS TO CURRENT PROGRAMS (ADJUSTMENTS TO BASE) - REQUESTED $39,605,000

Adjustments to Base (ATBs) are defined as increases or decreases to specific objects classes that: represent the same level of effort as the current budget year, are outside of the agency's management's control, are supported by specific documentation, and are a known cost (or fixed cost of doing business).

NOAA has requested the following increases for labor-related and non-labor ATBs* (in thousands):

ORF & PAC	ATB BY LO
National Ocean Service	3,907
National Marine Fisheries Service	10,678
Oceans and Atmospheric Research	3,176
National Weather Service	10,095
National Environment Satellite Service	1,518
Program Support	(256)
Office of Marine and Aviation Operations	10,487
FY 2013 Total Discretionary - ATBs	**39,605**
(Budget Authority)	—
Other Accounts	
(Mandatory Accounts)	
NOAA Corp Retirement	—
Environmental Improvement and Restoration Fund	—
Total Requested FY 2013 ATBs	**39,605**

These increases for ATBs will help fund the agency's overall anticipated adjustments to the current programs. In addition, program totals will also fund inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

* *This total does not include technical ATBs*

APPENDIX B

HEADQUARTERS ADMINISTRATIVE COSTS

IN MILLIONS

In FY2013, NOAA's Line Office Headquarters will use $289.97 million in funds to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, NOAA's Line Office Headquarters will use administrative funds to support the following:

Headquarters Program Support Type	NOS Amount	NOS FTEs	NMFS Amount	NMFS FTEs	OAR Amount	OAR FTEs	NWS Amount	NWS FTEs	NESDIS Amount	NESDIS FTEs	PS Amount	PS FTEs	OMAO Amount	OMAO FTEs	Line Office Total Amount	Line Office Total FTEs
General Management & Direction/ Executive Management	$13.34	51.7	$7.68	36.3	$3.77	23.2	$8.25	37.0	$7.07	34.5	$30.92	149.4	$1.97	8.4	$73.00	340.5
Budget & Finance	$3.18	15.3	$4.74	20.5	$2.46	15.5	$5.17	22.0	$3.73	21.9	$41.05	225.5	$1.87	12.0	$62.20	332.7
Facilities/ Other Administrative (CAO Functions)	$0.43	2.8	$2.56	5.0	$1.33	0	$3.67	6.0	$1.70	0	$48.19	180.7	$0.92	0.0	$57.68	194.5
Human Resources	$0.99	6.8	$2.49	13.8	$1.41	9.5	$1.70	14.0	$2.12	13.2	$16.48	142.2	$0.14	1.0	$27.2	200.5
Aquisitions and Grants	$0.22	1.3	$0.45	2.5	$0.87	7	$0.0	0.0	$0.0	0	$14.82	92.5	$0.0	0.0	$18.6	103.3
Information Tecnhology	$6.85	12.0	$3.45	20.9	$1.01	6.7	$2.87	17.0	$9.25	16.9	$28.87	103.2	$1.98	5.0	$54.28	181.7
Total	**$25.02**	**89.9**	**$21.38**	**99**	**$10.85**	**61.9**	**$21.65**	**96.0**	**$23.87**	**86.5**	**$180.33**	**893.5**	**$6.87**	**26.4**	**$289.97**	**1,353.2**

APPENDIX C

FY 2013 CONTROL TABLE

NATIONAL OCEAN SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Navigation Services					
Mapping and Charting					
Mapping & Charting Base	49,401	49,542	1,042	(1,240)	49,344
Hydrographic Research & Technology Development	7,186	7,282	0	(318)	6,964
Electronic Navigational Charts	5,888	5,762	0	18	5,780
Shoreline Mapping	2,196	2,265	0	7	2,272
Address Survey Backlog/ Contracts	26,946	26,861	0	85	26,946
Subtotal, Mapping and Charting	**91,617**	**91,712**	**1,042**	**(1,448)**	**91,306**
Geodesy					
Geodesy Base	26,647	26,405	333	84	26,822
National Height Modernization	2,495	2,398	0	8	2,406
Regional Geospatial Modeling Grants	4,000	0	0	0	0
Subtotal, Geodesy	**33,142**	**28,803**	**333**	**92**	**29,228**
Tide & Current Data					
Tide & Current Data Base	29,441	27,443	386	1,226	29,055
Subtotal, Tide & Current Data	**29,441**	**27,443**	**386**	**1,226**	**29,055**
Total, Navigation Services	**154,200**	**147,958**	**1,761**	**(130)**	**149,589**
Ocean Resources Conservation and Assessment					
Ocean Assessment Program (OAP)					
Coastal and Marine Spatial Planning	1,493	0	0	0	0
IOOS Regional Observations	21,956	22,956	0	6,564	29,520
NOAA IOOS	6,595	6,432	81	20	6,533

NATIONAL OCEAN SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Coastal Storms	2,794	2,765	0	9	2,774
Coastal Services Center (CSC)	27,622	33,081	365	(4,294)	29,152
Ocean Health Initiative	0	0	0	0	0
Coral Reef Program	26,746	26,529	162	84	26,775
Subtotal, Ocean Assessment Program (OAP)	**89,202**	**91,763**	**608**	**2,383**	**94,754**
Response and Restoration					
Response and Restoration Base	19,343	21,463	289	2,536	24,288
Estuary Restoration Program	1,186	498	(498) [1]	0	0
Damage Assessment Program	0	0	0	0	0
Marine Debris	3,992	4,618	(4,618) [1]	0	0
Subtotal, Response and Restoration	**24,521**	**26,579**	**(4,827)**	**2,536**	**24,288**
National Centers for Coastal Ocean Science (NCCOS)					
National Centers for Coastal Ocean Science (NCCOS)	0	35,886	493	(344)	36,035
Competitive Research	15,968	9,032	0	1,968	11,000
Center for Coastal Environmental Health & Bimolecular Research	11,277	0	0	0	0
Oxford, MD	4,491	0	0	0	0
Center for Coastal Fisheries Habitat Research	4,990	0	0	0	0
Center for Coastal Monitoring & Assessment	7,754	0	0	0	0
Center for Sponsored Coastal Ocean Research	2,754	0	0	0	0
NCCOS Headquarters	3,992	0	0	0	0
Center for Human Health Risk (Marine Env Health Research Lab - MEHRL)	3,992	0	0	0	0
Subtotal, NCCOS	**55,218**	**44,918**	**493**	**1,624**	**47,035**
Total, Ocean Resources Conservation & Assessment	**168,941**	**163,260**	**(3,726)**	**6,543**	**166,077**

[1] *The Estuary Restoration Program and Marine Debris have been transferred to NMFS for consolidation within Habitat Conservation.*

NATIONAL OCEAN SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Ocean and Coastal Management					
Coastal Management					
CZM Grants	66,020	65,936	0	210	66,146
CZM and Stewardship	8,710	7,975	164	(1,055)	7,084
Regional Ocean Partnership Grants	7,027	3,489	0	511	4,000
National Estuarine Research Reserve System - NERRS	22,281	21,712	0	(2,733)	18,979
Marine Protected Areas	2,124	1,982	(1,982) [2]	0	0
Energy Licensing and Appeals	749	0	0	0	0
Subtotal, Coastal Management	**106,911**	**101,094**	**(1,818)**	**(3,067)**	**96,209**
Ocean Management					
Marine Sanctuary Program					
Marine Sanctuary Program Base (Nancy Foster Scholarship 1% of base)	45,424	47,060	2,574	(3,043)	46,591 [2]
Subtotal, Ocean Management	**45,424**	**47,060**	**2,574**	**(3,043)**	**46,591**
Total, Ocean and Coastal Management	**152,335**	**148,154**	**756**	**(6,110)**	**142,800**
Total, National Ocean Service - ORF	**475,476**	**459,372**	**(1,209)**	**303**	**458,466**
Other National Ocean Service Accounts					
Total, National Ocean Service - PAC	19,366	8,000	0	(8,000)	0
Total, National Ocean Service - Other	55,326	22,600	(3,000)	0	19,600
GRAND TOTAL NOS	**550,168**	**489,972**	**(4,209)**	**(7,697)**	**478,066**

[2] *The Marine Protected Areas Program is consolidated with the National Marine Sanctuary Program.*

NATIONAL MARINE FISHERIES SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Protected Species Research and Management					
Protected Species Research and Management Programs Base	40,418	39,350	610	(988)	38,972
Species Recovery Grants	7,990	2,788	23	1,986	4,797
Marine Mammals	47,904	49,153	561	(5,304)	44,410
Marine Turtles	10,452	12,387	166	(1,921)	10,632
Other Protected Species (Marine Fish, Plants, and Invertebrates)	7,984	6,538	110	500	7,148
Atlantic Salmon	7,485	5,563	90	347	6,000
Pacific Salmon (for Salmon Management Activities, see FRM)	65,868	58,380	929	(1,227)	58,082
Total, Protected Species Research and Management	**188,101**	**174,159**	**2,489**	**(6,607)**	**170,041**
Fisheries Research and Management					
Fisheries Research and Management Programs	174,428	178,432	2,613	(3,485)	177,560
National Catch Share Program	41,912	27,911	0	89	28,000
Expand Annual Stock Assessments - Improve Data Collection	53,393	63,562	771	4,312	68,645
Economics & Social Sciences Research	10,939	7,633	116	24	7,773
Salmon Management Activities	34,930	33,341	96	(6,519)	26,918
Regional Councils and Fisheries Commissions	31,855	31,754	734	(5,139)	27,349
Fisheries Statistics	22,243	23,150	307	74	23,531
Fish Information Networks	22,087	21,996	86	70	22,152
Survey and Monitoring Projects	23,970	21,710	304	2,322	24,336
Fisheries Oceanography	3,067	2,140	18	4,989	7,147
American Fisheries Act	5,554	3,876	82	1,662	5,620

NATIONAL MARINE FISHERIES SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Interjurisdictional Fisheries Grants	1,653	0	0	0	0
National Standard 8	1,071	997	17	3	1,017
Reduce Fishing Impacts on Essential Fish Habitat (EFH)	534	0	0	0	0
Reducing Bycatch	3,426	3,381	48	11	3,440
Product Quality and Safety	7,445	6,192	107	290	6,589
Total, Fisheries Research and Management	**438,507**	**426,075**	**5,299**	**(1,297)**	**430,077**
Enforcement & Observers/Training					
Enforcement	66,825	65,617	915	591	67,123
Observers/Training	38,922	39,744	514	2,908	43,166
Total, Enforcement & Observers/Training	**105,747**	**105,361**	**1,429**	**3,499**	**110,289**
Habitat Conservation & Restoration					
Habitat Management & Restoration	20,958	20,892	26,369	(11,274)	35,987 [3,4]
Fisheries Habitat Restoration	20,831	20,765	(20,765) [4]	0	0
Subtotal, Habitat Conservation & Restoration	**41,789**	**41,657**	**5,604**	**(11,274)**	**35,987**
Other Activities Supporting Fisheries					
Antarctic Research	2,741	1,640	40	1,085	2,765
Aquaculture	5,988	5,575	89	18	5,682
Climate Regimes & Ecosystem Productivity	3,383	1,741	60	6	1,807
Computer Hardware and Software - FY 2004 Omnibus Funded in PAC	2,994	1,790	46	6	1,842
Cooperative Research	10,050	10,965	167	868	12,000
Information Analyses & Dissemination	18,962	15,328	280	2,351	17,959

[3] *The NOS Estuary Restoration and Marine Debris Programs are consolidated within the NMFS Habitat Conservation Program.*

[4] *The Fisheries Habitat Restoration and Sustainable Habitat Management PPAs are consolidated into one new Habitat Management & Restoration PPA.*

NATIONAL MARINE FISHERIES SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Marine Resources Monitoring, Assessment & Prediction Program (MarMap)	840	502	0	340	842
National Environmental Policy Act (NEPA)	8,418	6,446	100	21	6,567
NMFS Facilities Maintenance	5,489	3,283	98	10	3,391
Regional Studies	12,228	10,196	93	(1,730)	8,559
Total, Other Activities Supporting Fisheries	**71,093**	**57,466**	**973**	**2,975**	**61,414**
Total, National Marine Fisheries Service - ORF	**845,237**	**804,718**	**15,794**	**(12,704)**	**807,808**
Other National Marine Fisheries Service Accounts					
National Marine Fisheries Service - PAC	0	0	0	0	0
Total, National Marine Fisheries Service - Other	122,260	90,286	(2,808)	(15,000)	72,478
GRAND TOTAL NMFS	**967,497**	**895,004**	**12,986**	**(27,704)**	**880,286**

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Climate Research					
Laboratories & Cooperative Institutes	53,483	52,045	1,139	166	53,350
Subtotal, Laboratories & Cooperative Institutions	**53,483**	**52,045**	**1,139**	**166**	**53,350**
Climate Data & Information					
Climate Data & Information	13,049	10,406	908	1,689	13,003 [5]
Subtotal, Climate Data & Information	**13,049**	**10,406**	**0**	**1,689**	**13,003**
Climate Competitive Research, Sustained Observations and Regional Info					
Climate Competitive Research, Sustained Observations and Regional Information	151,491	119,619	400	26,311	146,330
Subtotal, Competitive Research Program	**151,491**	**119,619**	**400**	**26,311**	**146,330**
Climate Operations					
Climate Operations	911	908	(908)	0	0 [5]
Subtotal, Climate Operations	**911**	**908**	**0**	**0**	**0**
Subtotal, Other Partnership Programs	**0**	**0**	**0**	**0**	**0**
Total, Climate Research	**218,934**	**182,978**	**1,539**	**28,166**	**212,683**
Weather & Air Quality Research					
Laboratories & Cooperative Institutes					
Laboratories & Cooperative Institutes	56,436	53,593	692	1,026	55,311
Subtotal, Laboratories & Cooperative Institutes	**56,436**	**53,593**	**692**	**1,026**	**55,311**

[5] *Climate Operations is consolidated in the Climate Data & Information PPA.*

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Weather & Air Quality Research Programs					
U.S. Weather Research Program (USWRP)	4,990	4,210	0	13	4,223
Tornado Severe Storm Research / Phased Array Radar	7,984	9,976	0	32	10,008
Subtotal, Weather & Air Chemistry Research Programs	**12,974**	**14,186**	**0**	**45**	**14,231**
Subtotal, Other Partnership Programs	**0**	**0**	**0**	**0**	**0**
Total, Weather & Air Chemistry Research	**69,410**	**67,779**	**692**	**1,071**	**69,542**
Ocean, Coastal, and Great Lakes Research					
Laboratories & Cooperative Institutes					
Laboratories & Cooperative Institutes	21,956	22,799	691	(2,365)	21,125
Subtotal, Laboratories & Cooperative Institutes	**21,956**	**22,799**	**691**	**(2,365)**	**21,125**
National Sea Grant College Program					
National Sea Grant College Program Base	56,039	56,861	50	181	57,092
Aquatic Invasive Species Program	1,000	999	0	(999)	0
Marine Aquaculture Program	4,317	4,309	0	247	4,556
Subtotal, National Sea Grant College Program	**61,356**	**62,169**	**50**	**(571)**	**61,648**

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Ocean Exploration and Research					
Ocean Exp & Rsrch (NURP moved in FY08)	25,592	23,545	30	(3,910)	19,665
Subtotal, Ocean Exploration and Research	**25,592**	**23,545**	**30**	**(3,910)**	**19,665**
Other Ecosystems Programs					
Integrated Ocean Acidification	6,358	6,206	174	20	6,400
Subtotal, Other Ecosystems Programs	**6,358**	**6,206**	**174**	**20**	**6,400**
Subtotal, Other Partnership Programs	**0**	**0**	**0**	**0**	**0**
Total, Ocean, Coastal, & Great Lakes Rsrch	**115,262**	**114,719**	**945**	**(6,826)**	**108,838**
Info Tech R&D					
High Performance Computing Initiatives	13,031	8,946	0	3,432	12,378
Total, Info Tech Research & Development	**13,031**	**8,946**	**0**	**3,432**	**12,378**
Total, Office of Oceanic and Atmospheric Research - ORF	**416,637**	**374,422**	**3,176**	**25,843**	**403,441**
Other Office of Oceanic and Atmospheric Research Accounts					
Total, Office of Ocean and Atmospheric Research - PAC	10,358	10,296	0	83	10,379
Total, Office of Oceanic and Atmospheric Research - Other	0	0	0	0	0
GRAND TOTAL OAR	**426,995**	**384,718**	**3,176**	**25,926**	**413,820**

NATIONAL WEATHER SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Operations and Research					
Local Warnings and Forecasts					
Local Warnings and Forecasts Base	628,121	631,168	8,737	(11,341)	628,564
Air Quality Forecasting	2,994	3,987	0	(3,122)	865
Alaska Data Buoys	1,680	1,678	0	5	1,683
Sustain Cooperative Observer Network	998	1,865	0	(867)	998
NOAA Profiler Network	2,768	4,228	0	(2,417)	1,811
Strengthen U.S. Tsunami Warning Network	23,233	23,466	0	(4,554)	18,912
Pacific Island Compact	3,308	3,703	60	12	3,775
National Mesonet Network	8,000	10,965	0	(10,965)	0
Subtotal, Local Warnings and Forecasts	**671,102**	**681,060**	**8,797**	**(33,249)**	**656,608**
Advanced Hydrological Prediction Services	6,037	8,173	0	(1,964)	6,209
Aviation Weather	11,538	21,470	0	(18)	21,452
WFO Maintenance	7,301	7,422	0	(834)	6,588
Weather Radio Transmitters					
Weather Radio Transmitters Base	2,292	2,290	0	7	2,297
Subtotal, Weather Radio Transmitters	**2,292**	**2,290**	**0**	**7**	**2,297**
Subtotal, Local Warnings and Forecasts	**698,270**	**720,415**	**8,797**	**(36,058)**	**693,154**
Central Forecast Guidance					
Central Forecast Guidance	79,208	78,845	750	(371)	79,224
Subtotal, Central Forecast Guidance	**79,208**	**78,845**	**750**	**(371)**	**79,224**
Total, Operations and Research	**777,478**	**799,260**	**9,547**	**(36,429)**	**772,378**

NATIONAL WEATHER SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Systems Operation & Maintenance (O&M)					
NEXRAD	46,145	45,852	249	146	46,247
ASOS	11,186	11,266	50	36	11,352
AWIPS	39,273	39,121	249	125	39,495
NWSTG Backup - CIP	5,500	5,265	0	17	5,282
Total, Systems Operation & Maintenance (O&M)	**102,104**	**101,504**	**548**	**324**	**102,376**
Total, National Weather Service - ORF	**879,582**	**900,764**	**10,095**	**(36,105)**	**874,754**
Other National Weather Service Accounts					
Total, National Weather Service - PAC	96,899	91,110	0	6,329	97,439
Total, National Weather Service - Other	0	0	0	0	0
GRAND TOTAL NWS	**976,481**	**991,874**	**10,095**	**(29,776)**	**972,193**

NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Environmental Satellite Observing Systems					
Office of Satellite and Product Operations (OSPO)					
Satellite Command and Control	39,970	39,707	405	126	40,238
NSOF Operations	7,944	7,919	65	25	8,009
Product, Processing and Distribution	36,041	35,927	320	9,435	45,682
Subtotal, Office of Satellite and Product Operations	**83,955**	**83,553**	**790**	**9,586**	**93,929**
Product Development, Readiness & Application					
Product Development, Readiness & Application	20,771	19,310	174	61	19,545
Prod Devel, Read & App (Ocean Remote Sensing)	4,023	4,010	35	13	4,058
Joint Center for Satellite Data Assimilation	3,358	3,347	26	11	3,384
Subtotal, Product Development, Readiness & Application	**28,152**	**26,667**	**235**	**85**	**26,987**
Commercial Remote Sensing Regulatory Affairs	1,308	1,104	11	4	1,119
Office of Space Commercialization	653	651	6	2	659
Group on Earth Observations (GEO)	505	503	0	2	505
Total, Environmental Satellite Observing Systems	**114,573**	**112,478**	**1,042**	**9,679**	**123,199**

NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Data Centers & Information Services					
Archive, Access & Assessment	47,415	48,510	476	(552)	48,434
KY	1,358	0	0	0	0
MD	991	0	0	0	0
NC - Quality Assurance/ Quality Control	274	0	0	0	0
WV	1,431	0	0	0	0
Subtotal, Archive, Access & Assessment	**51,469**	**48,510**	**476**	**(552)**	**48,434**
Coastal Data Development	4,629	4,500	0	(500)	4,000
Regional Climate Services	3,493	6,800	0	(1,048)	5,752
Environmental Data Systems Modernization	9,492	8,912	0	800	9,712
Total, Data Centers & Information Services	**69,083**	**68,722**	**476**	**(1,300)**	**67,898**
Total, NESDIS - ORF	**183,656**	**181,200**	**1,518**	**8,379**	**191,097**
Other NESDIS Accounts					
Total, NESDIS - PAC	1,260,422	1,696,645	0	153,664	1,850,309
Total, NESDIS - Other	0	0	0	0	0
GRAND TOTAL NESDIS	**1,444,078**	**1,877,845**	**1,518**	**162,043**	**2,041,406**

PROGRAM SUPPORT ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Corporate Services					
Under Secretary and Associate Offices					
Under Secretary and Associate Offices Base	29,707	27,420	115	(106)	27,429
Subtotal, Under Secretary and Associate Offices	**29,707**	**27,420**	**115**	**(106)**	**27,429**
NOAA Wide Corporate Services & Agency Management					
NOAA Wide Corporate Services & Agency Management Base	119,808	114,944	2,334	(44)	117,234
DOC Accounting System	10,298	10,168	0	(435)	9,733
Payment to the DOC Working Capital Fund	39,900	40,245	(3,171)	0	37,074
Subtotal, NOAA Wide Corporate Services & Agency Mgmt	**170,006**	**165,357**	**(837)**	**(479)**	**164,041**
Office of Chief Information Officer					
IT Security	6,807	9,255	431	(1,255)	8,431
Subtotal, Office of Chief Information Officer	**6,807**	**9,255**	**431**	**(1,255)**	**8,431**
Total, Corporate Services	**206,520**	**202,032**	**(291)**	**(1,840)**	**199,901**
NOAA Education Program					
BWET Regional Programs	0	5,500	0	(5,500)	0
Educ Partnership Prog/ Minority Serving Institutions (EPP/MSI)	0	12,561	(12,561) [6]	0	0
NOAA Education Program Base	24,950	5,029	12,561	(6,324)	11,266 [6]
Ocean Education Partnerships	0	1,000	0	(1,000)	0
Geographic Literacy	0	1,000	0	(1,000)	0
Total, NOAA Education Program	**24,950**	**25,090**	**0**	**(13,824)**	**11,266**

[6] *The Educational Partnership Program/Minority Serving Institutions (EPP/MSI) is consolidated with the Competitive Educational Grants and Programs PPA.*

PROGRAM SUPPORT ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
Facilities					
NOAA Facilities Management & Construction and Safety	29,029	24,422	35	78	24,535
Subtotal, NOAA Fac Mgmt, Const & Maint	**29,029**	**24,422**	**35**	**78**	**24,535**
Total, Facilities	**29,029**	**24,422**	**35**	**78**	**24,535**
Total, Program Support - ORF	**260,499**	**251,544**	**(256)**	**(15,586)**	**235,702**
Total, Program Support - PAC	**13,972**	**0**	**0**	**0**	**0**
Total, Program Support - ORF and PAC	**274,471**	**251,544**	**(256)**	**(15,586)**	**235,702**
Marine Operations & Maintenance					
Marine Operations & Maintenance	129,740	128,327	36,871	817	166,015 [7]
Subtotal, Marine Operations & Maintenance	**129,740**	**128,327**	**36,871**	**817**	**166,015**
Fleet Planning and Maintenance					
Fleet Planning and Maintenance	23,352	26,949	(26,949)	0	0 [7]
Subtotal, Fleet Planning and Maintenance	**23,352**	**26,949**	**(26,949)**	**0**	**0**
Total, Marine Operations & Maintenance	**153,092**	**155,276**	**9,922**	**817**	**166,015**
Aviation Operations					
Aircraft Services	30,115	27,684	565	1,992	30,241
Subtotal, Aviation Operations	**30,115**	**27,684**	**565**	**1,992**	**30,241**

[7] *The Fleet Planning and Maintenance PPA is consolidated with the Marine Services PPA to form a new Marine Operations and Maintenance PPA.*

PROGRAM SUPPORT ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Total, OMAO - ORF	**183,207**	**182,960**	**10,487**	**2,809**	**196,256**
Total, OMAO - PAC	**2,395**	**2,392**	**0**	**12,217**	**14,609**
Total, OMAO - Other	**30,087**	**30,205**	**0**	**0**	**30,205**
Total OMAO - ORF, PAC and Other	**215,689**	**215,557**	**10,487**	**15,026**	**241,070**
Total, Program Support and OMAO - ORF	**443,706**	**434,504**	**10,231**	**(12,777)**	**431,958**
Other Program Support and OMAO Accounts					
Total, Program Support - PAC	16,367	2,392	0	12,217	14,609
Total, Program Support - Other	30,087	30,205	0	0	30,205
GRAND TOTAL PS	**490,160**	**467,101**	**10,231**	**(560)**	**476,772**

OPERATIONS, RESEARCH, & FACILITIES SUMMARY LINE OFFICE DIRECT OBLIGATIONS ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
National Ocean Service	475,476	459,372	(1,209)	303	458,466
National Marine Fisheries Service	845,237	804,718	15,794	(12,704)	807,808
Office of Oceanic and Atmospheric Research	416,637	374,422	3,176	25,843	403,441
National Weather Service	879,582	900,764	10,095	(36,105)	874,754
National Environmental Satellite, Data and Information Service	183,656	181,200	1,518	8,379	191,097
Program Support	443,706	434,504	10,231	(12,777)	431,958
SUBTOTAL LO DIRECT OBLIGATIONS	**3,244,294**	**3,154,980**	**39,605**	**(27,061)**	**3,167,524**

OPERATIONS, RESEARCH, & FACILITIES FINANCING ADJUSTMENTS ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
SUBTOTAL LO DIRECT OBLIGATIONS	**3,244,294**	**3,151,980**	**39,605**	**(27,061)**	**3,167,524**
FINANCING					
Cash Refunds/Prior Year Recoveries	(200)	0	0	0	0
De-Obligations	0	(8,000)	2,000	0	(6,000)
Unobligated Balance, EOY	0	0	0	0	0
Unobligated Balance, Expiring	0	0	0	0	0
Unobligated Balance Adj SOY (start of year)	0	0	0	0	0
Transfer of Unobligated P&D Balance	(312)	0	0	0	0
Transfer from USAID/NOAA PAC	0	0	0	0	0

OPERATIONS, RESEARCH, & FACILITIES FINANCING ADJUSTMENTS ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Total ORF Financing	**(512)**	**(8,000)**	**2,000**	**0**	**(6,000)**
SUBTOTAL BUDGET AUTHORITY	**3,243,782**	**3,146,980**	**41,605**	**(27,061)**	**3,161,524**
TRANSFERS					
Transfer from ORF to PAC	28,968	0	0	0	0
Transfer from PAC to ORF	0	(15,651)	15,651	0	0
Transfer from FFPA	0	0	0	0	0
Transfer from P&D to ORF	(90,239)	(109,098)	(9,966)	0	(119,064)
Transfer from CZMF to ORF	(3,000)	0	0	0	0
Transfer from PCSRF to ORF	0	0	0	0	0
Transfer from USAID	0	0	0	0	0
Total ORF Transfers	**(64,271)**	**(124,749)**	**5,685**	**0**	**(119,064)**
SUBTOTAL APPROPRIATION	**3,179,511**	**3,022,231**	**47,290**	**(27,061)**	**3,042,460**

PROCUREMENT, ACQUISITION, & CONSTRUCTION ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
NOS					
CELCP Acquisition					
Coastal and Estuarine Land Conservation Program	10,000	3,000	0	(3,000)	0
Subtotal, NOS Acquisition	**10,000**	**3,000**	**0**	**(3,000)**	**0**
NERRS Construction:					
National Estuarine Rsrch Reserve Construction (NERRS)	3,882	1,000	0	(1,000)	0
Subtotal, NERRS Construction	**3,882**	**1,000**	**0**	**(1,000)**	**0**
Marine Sanctuaries Construction:					
Marine Sanctuaries Base (Nancy Foster Scholarship 1% of base)	5,484	4,000	0	(4,000)	0
Subtotal, Marine Sanctuary Construction	**5,484**	**4,000**	**0**	**(4,000)**	**0**
Subtotal, NOS Construction	**9,366**	**5,000**	**0**	**(5,000)**	**0**
Total NOS - PAC	**19,366**	**8,000**	**0**	**(8,000)**	**0**
Total, NMFS - PAC	**0**	**0**	**0**	**0**	**0**

PROCUREMENT, ACQUISITION, & CONSTRUCTION ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
OAR					
Systems Acquisition					
Research Supercomputing/ CCRI	10,358	10,296	0	83	10,379
Subtotal, OAR Systems Acquisition	**10,358**	**10,296**	**0**	**83**	**10,379**
Total, OAR - PAC	**10,358**	**10,296**	**0**	**83**	**10,379**
NWS					
Systems Acquisition					
ASOS	1,632	1,635	0	0	1,635
AWIPS	23,952	24,134	0	(3,542)	20,592
NEXRAD	11,104	5,819	0	(5,819)	0
NWSTG Legacy Replacement	5,185	1,195	0	6,990	8,185
Radiosonde Network Replacement	4,006	4,014	0	0	4,014
Weather and Climate Supercomputing	29,111	40,169	0	(2,000)	38,169
Weather and Climate Supercomputing Back-up	0	0	0	0	0
Cooperative Observer Network Modernization (NERON)	3,727	3,700	0	0	3,700
Complete and Sustain NOAA Weather Radio	12,589	5,594	0	0	5,594
NOAA Profiler Conversion	0	1,700	0	(1,700)	0
Ground Readiness Project	0	0	0	12,400	12,400
Subtotal, NWS Systems Acquisition	**91,306**	**87,960**	**0**	**6,329**	**94,289**
Construction					
WFO Construction	5,593	3,150	0	0	3,150
Subtotal, NWS Construction	**5,593**	**3,150**	**0**	**0**	**3,150**

PROCUREMENT, ACQUISITION, & CONSTRUCTION ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
Total, NWS - PAC	**96,899**	**91,110**	**0**	**6,329**	**97,439**
NESDIS					
Systems Acquisition					
NOAA Satellite and Climate Sensors					
Geostationary Systems - N	40,520	32,467	0	(2,567)	29,900
Geostationary Systems - R	662,373	615,622	0	186,378	802,000
Polar Orbiting Systems - POES	40,796	32,241	0	0	32,241
Jason-3	19,960	19,700	0	10,300	30,000
Joint Polar Satellite System (JPSS)	471,900	924,014	25,880	(33,530)	916,364 [8]
DSCOVR	2,000	29,800	0	(6,917)	22,883
EOS & Advanced Polar Data Processing, Distribution & Archiving Systems	988	990	0	0	990
CIP - single point of failure	2,766	2,772	0	0	2,772
Comprehensive Large Array Data Stewardship Sys (CLASS)	5,463	6,476	0	0	6,476
NPOESS Preparatory Data Exploitation	4,446	4,455	0	0	4,455
Restoration of Climate Sensors	6,986	25,880	(25,880) [8]	0	0
Subtotal, NESDIS Systems Acquisition	**1,258,198**	**1,694,417**	**0**	**153,664**	**1,848,081**
Construction					
Satellite CDA Facility	2,224	2,228	0	0	2,228
Subtotal, NESDIS Construction	**2,224**	**2,228**	**0**	**0**	**2,228**
Total, NESDIS - PAC	**1,260,422**	**1,696,645**	**0**	**153,664**	**1,850,309**

[8] *The Restoration of Climate Sensors PPA has been consolidated with the Joint Polar Satellite System (JPSS) PPA.*

PROCUREMENT, ACQUISITION, & CONSTRUCTION ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
Program Support					
Construction					
NOAA Construction	13,972	0	0	0	0
Subtotal, Construction	**13,972**	**0**	**0**	**0**	**0**
Total, Program Support - PAC	**13,972**	**0**	**0**	**0**	**0**
OMAO					
OMAO - Fleet Replacement					
Fleet Capital Improvements & Tech Infusion (Vessel Equip & Tech Refresh)	998	1,000	0	10,712	11,712
New Vessel Construction	1,397	1,392	0	1,505	2,897
Subtotal, OMAO Fleet Replacement	**2,395**	**2,392**	**0**	**12,217**	**14,609**
Total, OMAO - PAC	**2,395**	**2,392**	**0**	**12,217**	**14,609**
GRAND TOTAL PAC	**1,403,412**	**1,808,443**	**0**	**164,293**	**1,972,736**

PROCUREMENT, ACQUISTION, & CONSTRUCTION FINANCING ADJUSTMENTS ($ IN THOUSANDS)					
FY 2013 PROPOSE D OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
SUBTOTAL DIRECT OBLIGATIONS	**1,403,412**	**1,808,443**	**0**	**164,293**	**1,972,736**
FINANCING					
Cash Refunds/Recoveries from Prior Year	0	0	0	0	0
De-Obligations	(2,000)	(8,000)	1,000	0	(7,000)
Unobligated balance, Expiring end of year	0	0	0	0	0
Unobligated Balance Adj. SOY (start of year)	0	0	0	0	0
Unobligated Balance End of Year	0	0	0	0	0
Total PAC Financing	**(2,000)**	**(8,000)**	**1,000**	**0**	**(7,000)**
SUBTOTAL BUDGET AUTHORITY	**1,401,412**	**1,800,443**	**1,000**	**164,293**	**1,965,736**
TRANSFERS/RESCISSIONS					
Transfer from ORF to PAC	(28,968)	0	0	0	0
Transfer from PAC to ORF	0	15,651	(15,651)	0	0
Transfer from PCSRF to PAC	0	0	0	0	0
Transfer from Census to PAC	(39,761)	0	0	0	0
Transfer to OIG	0	1,000	(1,000)	0	0
Total PAC Transfers/ Rescissions	**(68,729)**	**16,651**	**(16,651)**	**0**	**0**
SUBTOTAL APPROPRIATION	**1,332,683**	**1,817,094**	**(15,651)**	**164,293**	**1,965,736**

GRAND TOTAL SUMMARY DISCRETIONARY APPROPRIATIONS ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Operations, Research and Facilities	3,179,511	3,022,231	47,290	(27,061)	3,042,460
Procurement, Acquisition and Construction	1,332,683	1,817,094	(15,651)	164,293	1,965,736
Coastal Zone Management Fund	3,000	0	0	0	0
Fisherman's Contingency Fund	0	350	0	0	350
Foreign Fishing Observer Fund	0	0	0	0	0
Fisheries Financing Program	0	0	0	0	0
Pacific Coastal Salmon Fund	79,840	65,000	0	(15,000)	50,000
Marine Mammal Unusual Mortality Event Fund	0	0	0	0	0
Medicare Eligible Retiree Health Care Fund	1,818	1,936	0	0	1,936
GRAND TOTAL DISCRETIONARY APPROPRIATION	**4,596,852**	**4,906,611**	**31,639**	**122,232**	**5,060,482**

OTHER ACCOUNTS (DISCRETIONARY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
NOS					
Coastal Zone Management Fund Obligations	0	0	0	0	0
Coastal Zone Management Fund Budget Authority	0	0	0	0	0
Coastal Zone Management Fund Appropriation	3,000	0	0	0	0
Subtotal, NOS Other Discretionary Direct Obligation	**0**	**0**	**0**	**0**	**0**
Subtotal, NOS Other Discretionary Budget Authority	**0**	**0**	**0**	**0**	**0**
Subtotal, NOS Other Discretionary Appropriation	**3,000**	**0**	**0**	**0**	**0**
NMFS					
Fishermen's Contingency Fund Obligations	10	350	0	0	350
Fishermen's Contingency Fund Budget Authority	0	350	0	0	350
Fishermen's Contingency Fund Appropriations	0	350	0	0	350
Foreign Fishing Observer Fund Obligations	0	0	0	0	0
Foreign Fishing Observer Fund Budget Authority	0	(350)	350	0	0
Foreign Fishing Observer Fund Appropriation	0	0	0	0	0

OTHER ACCOUNTS (DISCRETIONARY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Fisheries Finance Program Account Obligations	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	0	0	0
Promote and Develop Fisheries Obligations	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	(90,239)	(109,098)	(9,966)	0	(119,064)
Promote and Develop Fisheries Appropriation	0	0	0	0	0
Pacific Coastal Salmon Fund Obligations	79,840	65,000	0	(15,000)	50,000
Pacific Coastal Salmon Fund Budget Authority	79,840	65,000	0	(15,000)	50,000
Pacific Coastal Salmon Fund Appropriation	79,840	65,000	0	(15,000)	50,000
Marine Mammal Unusual Mortality Event Fund Obligations	206	200	(200)	0	0
Marine Mammal Unusual Mortality Event Fund Budget Authority	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Appropriations	0	0	0	0	0
Subtotal, NMFS Other Discretionary Direct Obligation	**80,056**	**65,550**	**(200)**	**(15,000)**	**50,350**
Subtotal, NMFS Other Discretionary Budget Authority	**(10,399)**	**(44,098)**	**(9,616)**	**(15,000)**	**(68,714)**
Subtotal, NMFS Other Discretionary Appropriation	**79,840**	**65,350**	**0**	**(15,000)**	**50,350**

OTHER ACCOUNTS (DISCRETIONARY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
OMAO					
Medicare Eligible Retiree Healthcare Fund Acct Obligations	1,818	1,936	0	0	1,936
Medicare Eligible Retiree Healthcare Fund Acct Budget Authority	1,818	1,936	0	0	1,936
Medicare Eligible Retiree Healthcare Fund Acct Appropriations	1,818	1,936	0	0	1,936
Subtotal, OMAO Other Discretionary Direct Obligations	**1,818**	**1,936**	**0**	**0**	**1,936**
Subtotal, OMAO Other Discretionary Budget Authority	**1,818**	**1,936**	**0**	**0**	**1,936**
Subtotal, OMAO Other Discretionary Appropriation	**1,818**	**1,936**	**0**	**0**	**1,936**
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	**81,874**	**67,486**	**(200)**	**(15,000)**	**52,286**
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	**(8,581)**	**(42,162)**	**(9,616)**	**(15,000)**	**(66,778)**
TOTAL, OTHER DISCRETIONARY APPROPRIATION	**84,658**	**67,286**	**0**	**(15,000)**	**52,286**

SUMMARY OF DISCRETIONARY RESOURCES ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Discretionary Direct Obligations					
ORF Direct Obligations	3,244,294	3,154,980	39,605	(27,061)	3,167,524
PAC Direct Obligations	1,403,412	1,808,443	0	164,293	1,972,736
OTHER Direct Obligations	81,874	67,486	(200)	(15,000)	52,286
TOTAL Discretionary Direct Obligations	**4,729,580**	**5,030,909**	**39,405**	**122,232**	**5,192,546**
Discretionary Budget Authority					
ORF Budget Authority	3,243,782	3,146,980	41,605	(27,061)	3,161,524
PAC Budget Authority	1,401,412	1,800,443	1,000	164,293	1,965,736
OTHER Budget Authority	(8,581)	(42,162)	(9,616)	(15,000)	(66,778)
TOTAL Discretionary Budget Authority	**4,636,613**	**4,905,261**	**32,989**	**122,232**	**5,060,482**
Discretionary Appropriations					
ORF Appropriations	3,179,511	3,022,231	47,290	(27,061)	3,042,460
PAC Appropriations	1,332,683	1,817,094	(15,651)	164,293	1,965,736
OTHER Appropriations	84,658	67,286	0	(15,000)	52,286
TOTAL Discretionary Appropriation	**4,596,852**	**4,906,611**	**31,639**	**122,232**	**5,060,482**

OTHER ACCOUNTS (MANDATORY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
NOS					
Coastal Zone Management Fund Obligations	0	0	0	0	0
Coastal Zone Management Fund Budget Authority	(1,500)	0	0	0	0
Coastal Zone Management Fund Appropriation	(3,000)	0	0	0	0
Damage Assessment & Restoration Revolving Fund Obligations	55,326	21,600	(3,000)	0	18,600
Damage Assessment & Restoration Revolving Fund Budget Authority	3,300	6,000	0	0	6,000
Damage Assessment & Restoration Revolving Fund Appropriation	0	0	0	0	0
Sanctuaries Asset Forfeiture Fund Obligations	0	0	1,000	0	1,000
Sanctuaries Asset Forfeiture Fund Budget Authority	0	0	1,000	0	1,000
Sanctuaries Asset Forfeiture Fund Appropriations	0	0	1,000	0	1,000
Subtotal, NOS Other Mandatory Direct Obligations	**55,326**	**21,600**	**(2,000)**	**0**	**19,600**
Subtotal, NOS Other Mandatory Budget Authority	**1,800**	**6,000**	**1,000**	**0**	**7,000**
Subtotal, NOS Other Mandatory Appropriation	**(3,000)**	**0**	**1,000**	**0**	**1,000**

OTHER ACCOUNTS (MANDATORY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
NMFS					
Promote and Develop Fisheries Obligations	0	0	5,000	0	5,000
Promote and Develop Fisheries Budget Authority	90,239	109,098	14,966	0	124,064
Promote and Develop Fisheries Appropriation	0	0		0	0
Fisheries Finance Program Account Obligations	9,910	5,771	(5,771)	0	0
Fisheries Finance Program Account Budget Authority	9,910	5,771	(5,771)	0	0
Fisheries Finance Program Account Appropriation	9,910	5,771	(5,771)	0	0
Federal Ship Financing Obligations	0	0	0	0	0
Federal Ship Financing Budget Authority	0	0	0	0	0
Federal Ship Financing Appropriation	0	0	0	0	0
Environmental Improve & Restoration Fund Obligations	10,248	290	(96)	0	194
Environmental Improve & Restoration Fund Budget Authority	378	290	(96)	0	194
Environmental Improve & Restoration Fund Appropriation	378	290	(96)	0	194

OTHER ACCOUNTS (MANDATORY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Limited Access System Administration Fund Obligations	20,046	9,675	1,259	0	10,934
Limited Access System Administration Fund Budget Authority	8,576	9,675	1,259	0	10,934
Limited Access System Administration Fund Appropriation	8,576	9,675	1,259	0	10,934
Western Pacific Sustainable Fisheries Fund Obligations	2,000	1,000	0	0	1,000
Western Pacific Sustainable Fisheries Fund Budget Authority	1,000	1,000	0	0	1,000
Western Pacific Sustainable Fisheries Fund Appropriation	1,000	1,000	0	0	1,000
Fisheries Asset Forfeiture Fund Obligations	0	0	5,000	0	5,000
Fisheries Asset Forfeiture Fund Budget Authority	0	0	5,000	0	5,000
Fisheries Asset Forfeiture Fund Appropriations	0	0	5,000	0	5,000
Subtotal, NMFS Other Mandatory Direct Obligations	**42,204**	**16,736**	**5,392**	**0**	**22,128**
Subtotal, NMFS Other Mandatory Budget Authority	**110,103**	**125,834**	**15,358**	**0**	**141,192**
Subtotal, NMFS Other Mandatory Appropriation	**19,864**	**16,736**	**392**	**0**	**17,128**

OTHER ACCOUNTS (MANDATORY) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	FY 2011 SPEND PLAN	FY 2012 ESTIMATE	TOTAL ATBS	PROGRAM CHANGES	FY 2013 REQUEST
OMAO					
NOAA Corp Commissioned Officers Retirement Obligations	28,269	28,269	0	0	28,269
NOAA Corp Commissioned Officers Retirement Budget Authority	28,269	28,269	0	0	28,269
NOAA Corp Commissioned Officers Retirement Budget Appropriation	28,269	28,269	0	0	28,269
Subtotal, OMAO Other Mandatory Direct Obligations	**28,269**	**28,269**	**0**	**0**	**28,269**
Subtotal, OMAO Other Mandatory Budget Authority	**28,269**	**28,269**	**0**	**0**	**28,269**
Subtotal, OMAO Other Mandatory Appropriation	**28,269**	**28,269**	**0**	**0**	**28,269**
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	**125,799**	**66,605**	**3,392**	**0**	**69,997**
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	**140,172**	**160,103**	**16,358**	**0**	**176,461**
TOTAL, OTHER MANDATORY APPROPRIATION	**45,133**	**45,005**	**1,392**	**0**	**46,397**

OTHER ACCOUNTS (DISCRETIONARY REIMBURSABLE) ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
NOS					
Sanctuaries Asset Forefeiture Fund Obligations	0	1,000	(1,000)	0	0
Sanctuaries Asset Forefeiture Fund Budget Authority	0	1,000	(1,000)	0	0
Sanctuaries Asset Forefeiture Fund Appropriations	0	1,000	(1,000)	0	0
NMFS					
Fisheries Asset Forfeiture Fund Obligations	0	8,000	(8,000)	0	0
Fisheries Asset Forfeiture Fund Budget Authority	0	8,000	(8,000)	0	0
Fisheries Asset Forfeiture Fund Appropriations	0	5,000	(5,000)	0	0
TOTAL, OTH DISC REIMB DIRECT OBLIGATIONS	**0**	**9,000**	**(9,000)**	**0**	**0**
TOTAL, OTH DISC REIMB BUDGET AUTHORITY	**0**	**9,000**	**(9,000)**	**0**	**0**
TOTAL, OTH DISC REIMB APPROPRIATION	**0**	**6,000**	**(6,000)**	**0**	**0**

**Both Asset Forfeiture Funds transferred to OTHER Mandatory in FY'13*

NOAA SUMMARY ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
TOTAL Direct Obligations (Discretionary & Mandatory)	**4,855,379**	**5,106,514**	**42,797**	**122,232**	**5,262,543**
TOTAL Budget Authority (Discretionary & Mandatory)	**4,776,785**	**5,074,364**	**49,347**	**122,232**	**5,236,943**
TOTAL Appropriation (Discretionary & Mandatory)	**4,641,985**	**4,957,616**	**33,031**	**122,232**	**5,106,879**
Reimbursable Financing	242,000	239,000	3,000	0	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	**5,097,379**	**5,345,514**	**45,797**	**122,232**	**5,504,543**
Offsetting Receipts	(8,000)	(11,000)	1,169	0	(9,831)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	**5,089,379**	**5,334,514**	**49,966**	**122,232**	**5,494,712**

LINE OFFICE SUMMARY ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
National Ocean Service					
ORF	475,476	459,372	(1,209)	303	458,466
PAC	19,366	8,000	0	(8,000)	0
OTHER	55,326	22,600	(3,000)	0	19,600
TOTAL, NOS	**550,168**	**489,972**	**(4,209)**	**(7,697)**	**478,066**
National Marine Fisheries Service					
ORF	845,237	804,718	15,794	(12,704)	807,808
PAC	0	0	0	0	0
OTHER	122,260	90,286	(2,808)	(15,000)	72,478
TOTAL, NMFS	**967,497**	**895,004**	**12,986**	**(27,704)**	**880,286**
Oceanic and Atmospheric Research					
ORF	416,637	374,422	3,176	25,843	403,441
PAC	10,358	10,296	0	83	10,379
OTHER	0	0	0	0	0
TOTAL, OAR	**426,995**	**384,718**	**3,176**	**25,926**	**413,820**
National Weather Service					
ORF	879,582	900,764	10,095	(36,105)	874,754
PAC	96,899	91,110	0	6,329	97,439
OTHER	0	0	0	0	0
TOTAL, NWS	**976,481**	**991,874**	**10,095**	**(29,776)**	**972,193**
National Environmental Satellite, Data and Information Service					
ORF	183,656	181,200	1,518	8,379	191,097
PAC	1,260,422	1,696,645	0	153,664	1,850,309
OTHER	0	0	0	0	0
TOTAL, NESDIS	**1,444,078**	**1,877,845**	**1,518**	**162,043**	**2,041,406**

LINE OFFICE SUMMARY ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Program Support / Corporate Services					
ORF	206,520	202,032	(291)	(1,840)	199,901
PAC	0	0	0	0	0
OTHER	0	0	0	0	0
SUBTOTAL, PS / Corporate Services	**206,520**	**202,032**	**(291)**	**(1,840)**	**199,901**
Program Support / NOAA Education Program					
ORF	24,950	25,090	0	(13,824)	11,266
PAC	0	0	0	0	0
OTHER	0	0	0	0	0
SUBTOTAL, PS / NOAA Education Program	**24,950**	**25,090**	**0**	**(13,824)**	**11,266**
Program Support / Facilities					
ORF	29,029	24,422	35	78	24,535
PAC	13,972	0	0	0	0
OTHER	0	0	0	0	0
SUBTOTAL, PS / Facilities	**43,001**	**24,422**	**35**	**78**	**24,535**
Program Support / Corp Srv, Edu, Fac					
ORF	260,499	251,544	(256)	(15,586)	235,702
PAC	13,972	0	0	0	0
OTHER	0	0	0	0	0
TOTAL, PS / Corp Srv, Edu, Fac	**274,471**	**251,544**	**(256)**	**(15,586)**	**235,702**
Program Support / Office of Marine and Aviation Operations					
ORF	183,207	182,960	10,487	2,809	196,256
PAC	2,395	2,392	0	12,217	14,609
OTHER	30,087	30,205	0	0	30,205
TOTAL, PS / OMAO	**215,689**	**215,557**	**10,487**	**15,026**	**241,070**

LINE OFFICE SUMMARY ($ IN THOUSANDS)					
FY 2013 PROPOSED OPERATING PLAN	**FY 2011 SPEND PLAN**	**FY 2012 ESTIMATE**	**TOTAL ATBS**	**PROGRAM CHANGES**	**FY 2013 REQUEST**
Total PS ORF	**443,706**	**434,504**	**10,231**	**(12,777)**	**431,958**
Total PS PAC	**16,367**	**2,392**	**0**	**12,217**	**14,609**
Total PS Other	**30,087**	**30,205**	**0**	**0**	**30,205**
TOTAL, PS	**490,160**	**467,101**	**10,231**	**(560)**	**476,772**
DIRECT OBLIGATIONS					
ORF	3,244,294	3,154,980	39,605	(27,061)	3,167,524
PAC	1,403,412	1,808,443	0	164,293	1,972,736
OTHER	207,673	143,091	(5,808)	(15,000)	122,283
TOTAL, DIRECT OBLIGATIONS	**4,855,379**	**5,106,514**	**33,797**	**122,232**	**5,262,543**
ORF Adjustments (Deobligations / Rescissions)	(512)	(8,000)	2,000	0	(6,000)
ORF Transfers	(64,271)	(124,749)	5,685	0	(119,064)
PAC Adjustments (Deobligations / Rescissions)	(2,000)	(8,000)	1,000	0	(7,000)
PAC Transfers	(68,729)	16,651	(16,651)	0	0
OTHER Discretionary Adjustments	2,784	(200)	200	0	0
Mandatory Accounts Excluded	(125,799)	(66,605)	(3,392)	0	(69,997)
Discretionary Reimbursable Accounts Excluded	0	(9,000)	9,000	0	0
TOTAL, DISCRETIONARY APPROPRIATIONS	**4,596,852**	**4,906,611**	**31,639**	**122,232**	**5,060,482**

BACK COVER: A companion image to “Blue Marble” (Western Hemisphere) released January 25, is a composite of six separate orbits taken on January 23, 2012. You can find out more about how these composite images were made in this NASA Flickr post: http://j.mp/xvUdea.

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