



# CHAPTER 2

NOAA Operations, Research, & Facilities By Line Office

Incident Meteorologist Joel Curtis (second from left) monitors a forest fire with local firefighters in Derby, Montana





## NATIONAL OCEAN SERVICE

The National Ocean Service (NOS) is responsible for the preservation of coastal resources by providing science-based solutions through collaborative partnerships to address evolving economic, environmental, and social pressures on our oceans and coasts. All NOS activities serve to support sound decision making for human, ecological, and economic health. An estimated 154 million people, over 50 percent of the Nation's population, lived in coastal counties in 2004. These coastal counties make up only 17 percent of the Nation's land area.



*GPS observations are collected at Elkhorn Slough National Estuarine Research Reserve*

Although coastal population growth has generally reflected the same rate of growth as the entire Nation, the limited land area of coastal counties is increasingly strained by the increased density of people. This increasing density, coupled with the important economies of coastal areas, makes the task of managing coastal resources increasingly difficult. It is expected that the Nation's coastal population will grow to more than 11 million by 2015. In addition, over half of the U.S. Gross Domestic Product is generated in coastal counties, highlighting their critical importance to the nation's economy and further emphasizing the need for access to data and sound science to inform decision making.

As a national leader for coastal and ocean stewardship, NOS promotes a wide range of research and operational activities aimed at developing a better understanding of ocean, coastal and Great Lakes ecosystems. This research provides the strong science foundation required to effectively manage and advance the sustainable use of our coastal and ocean systems, improve ecosystem and human health, and support economic vitality. NOS provides improvements in the quality, quantity, geographic distribution, and timeliness of ocean and coastal observations. Observations by NOS assets and partners are critical components of the Nation's Integrated Ocean Observing System (IOOS<sup>®</sup>) as well as fundamental contributors to the Global Earth Observation System of Systems (GEOSS). NOS mapping, charting, geodetic, and oceanographic activities build on marine and coastal observations collected to increase the efficiency and safety of maritime commerce, support coastal resource management and marine spatial planning, and address coastal flooding and water quality concerns. NOS protects and



restores coastal resources damaged by releases of oil and other hazardous materials. NOS also protects and manages the special marine areas of the Nation's marine sanctuaries and the Papahānaumokuākea Marine National Monument. Through partnerships with coastal states, NOS manages and protects the Nation's valuable coastal zones and nationally significant estuarine reserves. NOS helps federal, state, local, and international managers build the suite of skills and capacity needed to protect, restore, and use coastal ecosystems by providing financial and technical assistance, process and technical skill training, and other applied research and capacity-building resources.

NOS delivers a range of nationwide coastal and Great Lakes scientific, technical, and resource management services in support of safe, healthy, and productive oceans and coasts. In carrying out its diverse programs and services, NOS forges partnerships to integrate expertise and efforts across all levels of government and with other nongovernmental organizations. This coordinated approach is an essential component of NOS' national effort to protect, maintain, and sustain the viability of coastal communities, economies, and ecosystems.

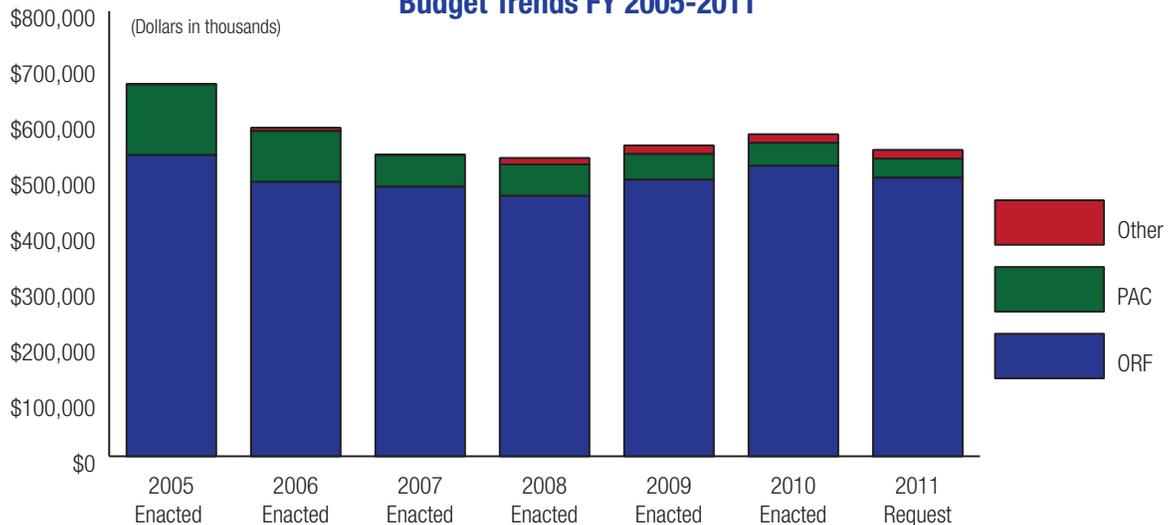
The FY 2011 President's Budget supports funding and program requirements that enable NOS to deliver a dynamic range of nationwide coastal and Great Lakes scientific, technical and resource management services. This funding enables NOS to address established NOAA strategic goals and to continue along the path to meet the NOS vision: A nation with safe, healthy, and productive oceans and coasts.



## NATIONAL OCEAN SERVICE

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
<b>NOS — ORF</b>				
Navigation Services	\$166,373	\$168,172	\$156,150	(\$12,022)
Ocean Resources Conservation & Assessment	175,494	195,932	178,670	(17,262)
Ocean and Coastal Management	155,100	158,116	165,788	7,672
<b>Total, NOS - ORF</b>	<b>496,967</b>	<b>522,220</b>	<b>500,608</b>	<b>(21,612)</b>
Total, NOS - PAC	46,188	40,890	34,385	(6,505)
Total, NOS - Other	16,875	15,600	15,600	0
<b>GRAND TOTAL NOS (Direct Obligations)</b>	<b>\$560,030</b>	<b>\$578,710</b>	<b>\$550,593</b>	<b>(\$28,117)</b>
<b>Total FTE</b>	<b>1,240</b>	<b>1,246</b>	<b>1,259</b>	<b>13</b>

### NATIONAL OCEAN SERVICE Budget Trends FY 2005-2011



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: Environmental Improvement and Restoration Fund; Coastal Impact Assistance Fund; Coastal Zone Management Fund; Damage Assessment and Restoration Revolving Fund



## FY 2011 ORF BUDGET SUMMARY

NOAA requests a total of \$500,608,000 and 1,242 FTEs to support the continued and enhanced operations of the National Ocean Service. This total includes \$4,752,000 and 1 FTE for Adjustments to Base (ATB) and a net program change of \$36,444,000 and 12 FTEs over the FY 2011 Base.

### ADJUSTMENTS TO BASE:

The above ATB request includes an increase of \$4,752,000 and 1 FTE to fund the estimated FY 2011 federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

### NOS — ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2011 Technical Budget.

#### OCEAN RESOURCES CONSERVATION AND ASSESSMENT

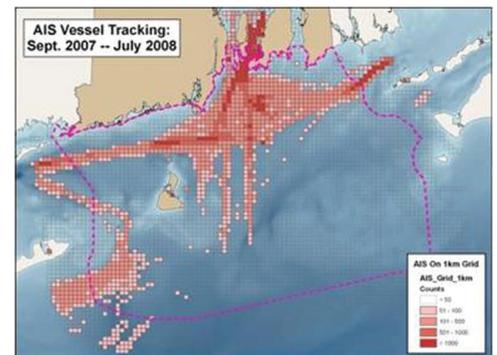
**\$178,670,000**

NOAA requests an increase of \$17,594,000 and 11 FTEs under the Ocean Resources Conservation and Assessment sub-activity for a total of \$178,670,000 and 439 FTEs.

**Ocean Assessment Program:** NOAA requests an increase of \$8,094,000 and 11 FTEs. This increase is comprised of three new initiatives and one decrease:

**Coastal and Marine Spatial Planning: NOAA requests an increase of \$6,770,000 and 9 FTEs to develop an agency-wide capability to conduct and support comprehensive Coastal and Marine Spatial Planning (CMSP) in U.S. waters.**

Human uses of ocean resources are accelerating faster than our ability to manage them. Increasing conflicts are unavoidable as demands increase for ocean-based energy (oil and gas, wind, wave), marine aquaculture, commercial and recreational fishery products, shipping and navigation services, and other activities. The health of ocean ecosystems are at risk as well as the benefits they provide to coastal communities and the national economy. The Nation's current approach to managing the use of ocean resources is ad hoc and fragmented, with no systematic way of evaluating competing ocean uses as well as informing and navigating the often difficult trade-offs they require. President Obama recently released a policy directive calling on federal departments and agencies to develop an integrated and comprehensive CMSP framework by December 2009. To support CMSP, this increase will allow NOAA to provide decision support tools that enable ocean managers and stakeholders to enhance and improve the siting of ocean and coastal uses, provide support to other federal and state agencies to facilitate the integration of existing data and information into NOAA-developed decision support tools, convene regular interagency coordination discussions on integrated approaches to CMSP, create regional maps (three regions per year) of important and vulnerable areas to inform ecosystem-based



Coastal and Marine Spatial Planning's (CMSP) Automated Identification System (AIS)



CMSP and identify and map prevailing area-based management authorities and their potential impacts on the allocation of uses in U.S. waters. These activities will enable NOAA to support integrated and comprehensive coastal and marine spatial plans, which will enhance existing efforts for sustainable fisheries, safe navigation, improved water quality, living marine resources and critical habitat protection. Societal benefits include reduced impacts of ocean uses on marine ecosystems, reduced user conflicts over ocean areas, increased economic certainty and stability for ocean-dependent industries, accelerated siting for offshore renewable energy, enhanced security, and enhanced support for marine protected areas.

**Coastal Services Center – Climate Hazards: NOAA requests an increase of \$4,000,000 and 2 FTEs to prepare coastal communities for climate hazards.** As

coastal populations continue to grow, coastal habitats are becoming increasingly vulnerable to climate hazards (from winds, waves, and flooding generated by hurricanes and other major storms, as well as physical impacts caused by sea-level rise, coastal erosion, and long-term shoreline changes). To reduce the vulnerability of coastal communities to the hardship and costs associated with climate-related natural hazards, NOAA will apply its scientific and technical expertise towards the development of improved environmental tools. NOAA will work with communities on applying these tools in an effort to mitigate or effectively manage the devastating human, economic and environmental impacts of events such as sea level change and other forms of coastal inundation. With an initial focus on the Gulf of Mexico and Pacific Islands, this request will allow NOAA to develop planning guidelines, provide training and information on understanding coastal risk and vulnerability assessments, and develop decision support resources that integrate social, economic, and climate data. NOAA will also provide accurate and timely prediction of changing sea level at global, regional, and local scales to improve resiliency and response to climate hazards. This funding increase represents a joint effort across NOAA to address climate hazards by leveraging strengths and collaboratively addressing needs identified via regional and national coastal management assessments.



*Surveying damage caused by storm surge from Hurricane Katrina*

**Coastal Services Center – Gulf of Mexico Coastal and Marine Elevation Pilot: NOAA requests an increase of \$2,000,000 and 0 FTEs to develop a Gulf of Mexico Coastal and Marine Elevation Pilot.** Coastal wetland loss and rapid erosion in the Gulf

of Mexico has led to the loss of key ecosystem services (such as critical storm protection), causing economic and environmental consequences for both the region and the Nation. To address these issues, NOAA will develop a national integrated high-resolution topographic and bathymetric dataset that will improve the accuracy of storm surge, models, optimize ecosystem restoration, inform coastal and marine spatial planning (CMSP) and enhance ecosystem assessments. This effort will be pursued jointly with the Department of Interior (USGS and MMS). Initial pilot efforts will focus on Mississippi and Louisiana, in support of the Gulf Coast Ecosystem Restoration Working Group and the Interagency Working Group on Long Term Disaster Recovery; however, the intent is to develop a robust framework that can be extended to other regions and applications over time. Ultimately, this increase will provide the foundational data and geospatial framework needed to measure changes in coastal elevation and nearshore bathymetry, delivering critical data to monitor and mitigate for the impacts of coastal erosion, habitat loss, and coastal inundation (including sea level



rise). This effort will allow for more effective science based decisions at state and local levels regarding habitat restoration and will enable more comprehensive coastal and marine spatial planning to analyze current and anticipated ocean uses related to energy, fisheries, and navigation.

**Gulf of Mexico Regional Collaboration: NOAA requests a decrease of \$4,750,000 and 0 FTEs.** Regional Ocean Partnerships, a new \$20 million dollar competitive grant program, will provide funding to implement activities in the action plans of all regional ocean partnerships. As such, entities that had competed for funds under the Gulf of Mexico grant program in the past will be eligible to compete for funds under Regional Ocean Partnerships.

**National Centers for Coastal Ocean Science (NCCOS):** NOAA requests an increase of \$9,500,000 and 0 FTEs. This increase is comprised of one new initiative:

**Competitive Research: NOAA requests an increase of \$9,500,000 and 0 FTEs to develop and improve sensors for ocean chemical, biological, and physical parameters at multiple spatial and temporal scales.** Continued coastal development, changes in land use, a varying climate, and altered ecosystem diversity add a complexity of environmental and human stresses; the consequences of which we do not yet fully understand and are ill prepared to manage. With this increase, NOAA will develop and apply a variety of biological sensing technologies, genomic tools and other technologies that will allow rapid, accurate, and cost effective detection, identification, characterization, and quantification of disease-causing microbes, toxins, and contaminants in marine waters, seafood, and sentinel marine organisms which may indicate health risks to humans. The goal will be to incorporate the successful technologies into monitoring and prediction programs. Funds will be used to target sensor development, which will support ocean and coastal related Health Early Warning Systems, identify risks and promote public health. Bio-sensing capability coupled to traditional oceanographic data will enhance efforts in research, modeling, and forecasting. Priority consideration will be given to efforts that have applicability to ocean acidification, harmful algal blooms (HABs) and their contributing factors, and issues pertaining to oceans and human health. This effort will allow NOAA and its external partners to significantly improve the Nation's ability to support ecosystem-based management of critical marine and coastal systems and protected species, and provide crucial information to safeguard public health.

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**OCEAN AND COASTAL MANAGEMENT**

**\$165,788,000**

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NOAA requests an increase of \$18,850,000 and 1 FTE under the Ocean and Coastal Management sub-activity for a total of \$165,788,000 and 253 FTEs.



**Coastal Management:** NOAA requests an increase of \$18,850,000 and 1 FTEs. This increase is comprised of one new initiative and one decrease:

**Regional Ocean Partnership Grants: NOAA requests an increase of \$20,000,000 and 1 FTE to establish a competitive grants program to support regional ocean partnerships.**

The interim report of the Ocean Policy Task Force, the Pew Oceans Commission, the U.S. Commission on Ocean Policy and the Joint Ocean Commission Initiative all call for regional ocean governance mechanisms to address fragmented planning and management of societal use of coastal lands and waters. The value of regional approaches in this regard is reflected in the rapid engagement by most coastal states in new regional ocean governance partnerships. Regional ocean governance mechanisms facilitate the effective management of ocean and coastal resources across jurisdictional boundaries by improving communications, aligning priorities, and enhancing resource sharing between local, state, and federal agencies. With this increase, NOAA will establish a competitive grants program to advance effective ocean management through regional ocean governance. To this end, the program will help support priority actions identified in plans of the existing regional ocean partnerships (e.g., Gulf of Mexico Alliance, Northeast Regional Ocean Council, Great Lakes Regional Collaboration, and the West Coast Governors' Agreement on Ocean Health), as well as support the development and implementation of ocean management plans in other regions (e.g. the Mid-Atlantic Regional Council on the Ocean, the South Atlantic Alliance, Hawaii, and other regions) and address regional activities in other parts of the country (e.g. the Pacific and Caribbean territories, and Alaska). Support for these partnerships will also include the development of comprehensive coastal and marine spatial plans (CMSP) consistent with the U.S. National Framework for CMSP. Eligible grant recipients will include state, local and tribal governments, institutions of higher learning and non-profit organizations working with these regional ocean partnerships or member states. Each year, NOAA will work with the regional ocean partnerships to identify priority areas to focus the funding opportunity. This grant program will be closely coordinated with other NOAA programs and the activities supported through the coastal and marine spatial planning increase also requested in FY 2011.



*Coastal areas are important to a variety of users*

**Energy Licensing and Appeals: NOAA requests a decrease of \$1,150,000 and 0 FTEs for Energy Licensing and Appeals.**

NOAA will work to meet its statutory responsibilities related to energy under the Coastal Zone Management Act (CZMA) and the Ocean Thermal Energy Conversion Act (OTECA) with the remaining \$750,000 and by utilizing current agency resources.





# NATIONAL MARINE FISHERIES SERVICE

The National Marine Fisheries Service (NMFS) is responsible for the management and conservation of living marine resources within the U.S. Exclusive Economic Zone (EEZ), the area extending from 3 to 200 nautical miles offshore. NMFS provides critical scientific and policy leadership in the international arena and plays a key role in the management of living marine resources in coastal areas under state jurisdiction. NMFS implements science-based conservation and management measures and actions aimed at sustaining long-term use and promoting the health of coastal and marine ecosystems.



*NWFS scientists Dave Misitano and John Ferguson are beach seining for juvenile salmon in a reference area for a study examining contaminant exposure and health of juvenile salmon in Puget Sound*

NMFS' mission is to maximize benefits to the Nation from the protection and use (commercial, recreational, and aesthetic) of living marine resources. To achieve its mandates, NMFS works to ensure the long-term health, productivity, and diversity of our Nation's oceans and coastal living marine resources—including fish, invertebrates, sea turtles, marine mammals, and other marine and coastal species—and their habitats. NMFS is charged with balancing these protection mandates with multiple uses and interests in living marine resources, including commercial, recreational, and subsistence fishing; aquaculture; and marine and coastal observation and research. Successful management relies upon NMFS' strong scientific and research competency to support the challenging public decision-making processes associated with NMFS' stewardship responsibilities.

NMFS continues to develop and track key performance measures that demonstrate meaningful results to the American public. In FY 2011, NMFS will continue to focus its resources on building and maintaining fish stocks at productive levels; improving the status of overfished fisheries and of endangered and threatened species and ensuring those species have adequate population assessments and forecasts; implementing plans to rebuild, recover, and conserve major fish stocks and protected species; and restoring habitat for NOAA trust resources.

In FY 2011, NMFS will continue its efforts to end overfishing, promote market-based management approaches, improve recreational fisheries data collection, reduce bycatch of living marine resources, and address illegal, unregulated, and unreported (IUU) fishing. NMFS will also conduct Endangered



Species Act (ESA) section 7 consultations with a wide range of federal land, mineral, and natural resource management and national defense agencies to assess and minimize effects of their proposed actions on listed species and critical habitat. NMFS will also collaborate with other agencies and organizations on an ecosystem-based approach to develop indicators of ecosystem status and trends, and on joint strategies to address priority regional ecosystem issues.

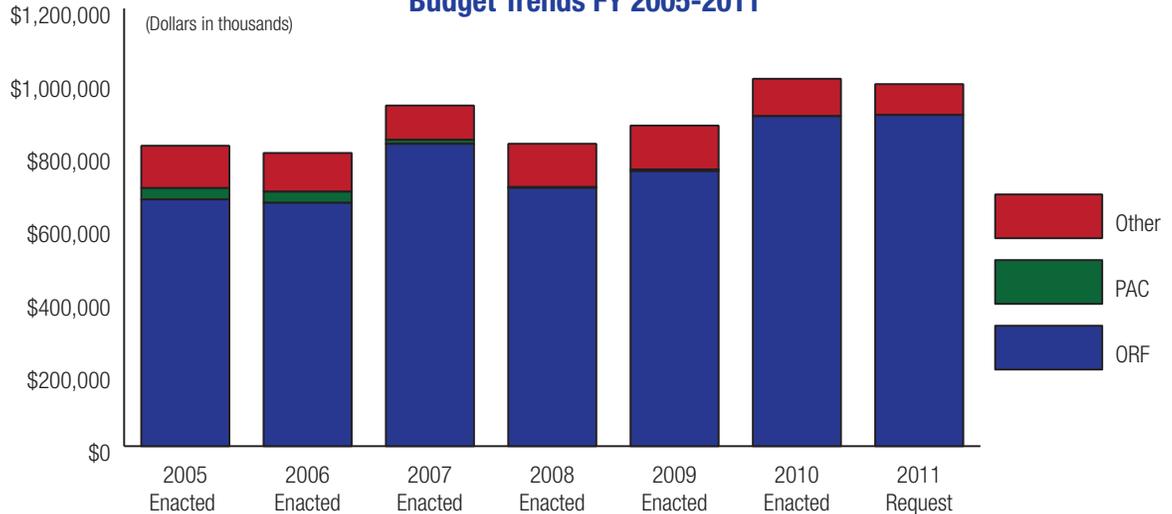
The FY 2011 President's Budget Request supports funding and program requirements to enable NMFS to be effective stewards of living marine resources for the benefit of the Nation through science-based conservation and management and the promotion of ecosystem health.



## NATIONAL MARINE FISHERIES SERVICE

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
<b>NMFS — ORF</b>				
Protected Species Research and Management	\$173,945	\$203,952	\$210,251	\$6,299
Fisheries Research and Management	360,826	432,917	463,576	30,659
Enforcement and Observers	90,085	106,747	105,345	(1,402)
Habitat Conservation and Restoration	53,655	58,193	54,918	(3,275)
Other Activities Supporting Fisheries	75,494	102,730	73,687	(29,043)
<b>Total, NMFS - ORF</b>	<b>754,005</b>	<b>904,539</b>	<b>907,777</b>	<b>3,238</b>
Total, NMFS - PAC	4,600	0	0	0
Total, NMFS - Other	120,841	103,642	84,604	(19,038)
<b>GRAND TOTAL NMFS (Direct Obligations)</b>	<b>\$879,446</b>	<b>\$1,008,181</b>	<b>\$992,381</b>	<b>(\$15,800)</b>
<b>Total FTE</b>	<b>2,656</b>	<b>2,823</b>	<b>2,882</b>	<b>64</b>

**NATIONAL MARINE FISHERIES SERVICE  
Budget Trends FY 2005-2011**



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

Other: Fishermen's Contingency Fund; Foreign Fishing Observer Fund; Fisheries Finance Program Account; Promote and Develop; Pacific Coastal Salmon Recovery Fund; Marine Mammal Unusual Mortality Event Fund; Federal Ship Financing Fund; Environmental Improvement and Restoration Fund; Limited Access System Administration Fund



## FY 2011 ORF BUDGET SUMMARY

NOAA requests a total of \$907,777,000 and 2,877 FTEs to support the continued and enhanced operations of the National Marine Fisheries Service. This total includes an increase of \$13,429,000 and 42 FTEs for Adjustments to Base (ATB) and a net program change of \$64,555,000 and 17 FTEs over the FY 2011 Base.

### ADJUSTMENTS TO BASE:

The above ATB request includes an increase of \$13,429,000 and 42 FTEs to fund the estimated FY 2011 federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

### NMFS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are provided in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are provided in the NOAA FY 2011 Technical Budget.

### PROTECTED SPECIES RESEARCH AND MANAGEMENT

**\$210,251,000**

NOAA requests an increase of \$15,804,000 and 10 FTEs in the Protected Species Research and Management sub-activity for a total of \$210,251,000 and 827 FTEs. This increase is comprised of four new initiatives, and one decrease:

**Protected Species Research and Management Programs Base: NOAA requests an increase of \$3,000,000 and 7 FTEs to increase its capacity to meet interagency consultations and authorizations under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA).** Consultations are necessary in order to authorize lawful activities potentially affecting protected species and to ensure that economic development and national defense actions are compatible with species conservation and recovery. Through the consultation process, NMFS helps agencies tailor their actions, so as to avoid additional peril to the impacted species and assist in conservation efforts. The number of these consultations is expected to increase in FY 2011 and beyond because of new species listings, (currently averaging two per year), the new Pacific Marine National Monuments, increased vessel traffic in the Arctic environment, development of conventional and alternative energy projects, and national security. This increase will support consultations and authorizations for regional energy development, national defense related activities, pelagic longline fishery operations, and operations of the Pacific Marine National Monuments. Funding will also support NMFS' efforts to improve its FY 2009 on-time completion rate of approximately 30 percent and reduce the backlog of consultation that have received no action.



*Ribbon seal pup with a satellite tracking tag with the NOAA Ship Oscar Dyson in the background. The tracking tag provides information on the behavior of ribbon seals during the pupping, breeding, and molting season when they are often found within the marginal sea-ice zone*



**Species Recovery Grants: NOAA requests an increase of \$9,636,000 and 0 FTEs for the conservation and recovery of marine and anadromous species under NMFS jurisdiction and listed under the Endangered Species Act (ESA) through the Species Recovery Grants Program.**

NMFS currently has jurisdiction over 68 threatened or endangered species, five of which have been proposed for listing, and six candidates for listing under the ESA. Although highly variable, species continue to be added to these lists at a rate of about two per year. Addition of species to these lists without corresponding investments in, and implementation of recovery and conservation actions result in increasing pressure on all ESA programs within NMFS and an increasing regulatory burden on the public. With increased funding for the Species Recovery Grants Program, NMFS will conduct cooperative conservation and recovery implementation with states and tribes assisting protected species recovery. Recovery of listed species is dependent on collaboration and cooperation with partners, states and tribes; however, most partners do not have adequate resources to address necessary recovery actions and Federal assistance is necessary to ensure their ability to engage in effective partnership. By leveraging the financial, technical, and educational resources from states and tribes, NMFS can achieve a greater level of conservation of listed species. Specifically, matching funds offer additional financial resources that NMFS would not need to spend on recovery, thus allowing for larger or more complex conservation and habitat restoration projects. Fostering relationships with other states and tribes through cooperative conservation effectively incorporates local expertise and is therefore, a more effective approach to protect and recover listed species. The requested funds will be used by NMFS' partners to implement priority recovery actions for listed species including restoring habitat necessary to recover listed species; monitoring population trends of listed species; partnering with other states and tribes to conduct cross-jurisdictional conservation actions; developing conservation plans to address incidental take of listed species; and educating the public about conservation of ESA listed species. This investment will provide for implementation of recovery and conservation actions, ultimately leading to decreasing the regulatory burden on the public.



*North Atlantic right whales*

**Pacific Salmon: NOAA requests an increase of \$2,668,000 and 0 FTEs to monitor Pacific salmon reintroductions, evaluate the effectiveness of restoration efforts, and expand NMFS genetic stock identification capability.**

This increase will improve the scientific information for Pacific salmon recovery, allowing managers to effectively focus efforts on the most critical actions threatening salmon. Managers will be better able to predict ocean abundance and develop improved conservation strategies, improve success of restoration projects, and understand the risks of hatchery supplementation. In turn, better management of the salmon fishery should provide greater fishing opportunities. Funding of \$668,000 will support fish tagging and tracking technology to monitor and evaluate watershed level salmon reintroduction and habitat restoration actions. This effort will focus restoration efforts to those habitat elements that can best increase survival. Genetic tools and stock indicators will be funded at \$2,000,000 to provide stock specific ocean distribution and catch information providing new opportunities to manage fisheries and target strong stocks while limiting the impact on ESA-listed salmon populations.



*Seining for juvenile Chinook salmon for mark-recapture study at Russian Island*



**Pacific Salmon - CALFED Bay-Delta Program: NOAA requests an increase of \$1,000,000 and 3 FTEs to support the Water Operations Oversight and Coordination activities under CALFED Bay- Delta Program.** The CALFED Bay-Delta Program is a cooperative effort of 18 State and Federal agencies with regulatory and management responsibilities in the San Francisco Bay/Sacramento/San Joaquin River Bay-Delta to develop a long-term plan to restore ecosystem health and improve water management for beneficial uses of the Bay-Delta system. Funding will support NOAA's actions required under the new Operations Criteria and Plan (OCAP) Biological Opinion (issued June 4, 2009) on Endangered Species Act (ESA) listed Chinook salmon, steelhead and green sturgeon. Specifically, funding will support coordination of permitting with the Bureau of Reclamation and the California Department of Water Resources. These funds will also enable NMFS to participate in reviewing water operations forecasts, participate on technical teams, and assist in adaptive management decisions regarding operations of the state and Federal Central Valley water projects.

**Atlantic Salmon: NOAA requests a decrease of \$500,000 and 0 FTEs for Atlantic Salmon.** Remaining funds will be used to continue implementing projects to address fish passage barriers, restore habitat, study the major threats to Atlantic Salmon, and conduct ESA consultations on Federal projects that might impact Atlantic Salmon survival.

**FISHERIES RESEARCH AND MANAGEMENT**

**\$463,576,000**

NOAA requests an increase of \$36,600,000 and 15 FTEs in the Fisheries Research and Management sub-activity for a total of \$463,576,000 and 1,381 FTEs. This increase is comprised of two new initiatives and one decrease:

**National Catch Share Program: NOAA requests an increase of \$36,600,000 and 10 FTEs to accelerate and enhance the implementation of a National Catch Share Program.** Rebuilding our Nation's fisheries is essential to preserving the livelihood of fishermen, the vibrancy of our coastal communities, the sustainability of a healthy seafood supply, and restoring ocean ecosystems to a healthy state. Catch share programs give fishermen a stake in the benefits of a well-managed fishery, and therefore, greater incentive to ensure effective management. This funding will support the development, implementation, and operation of catch share programs in fisheries across the nation. Fourteen catch share programs are currently in place, with a total of 16 scheduled to be operational by 2010. This increase continues the transition of the Northeast groundfish fishery to sector management and provides for implementation of catch share programs in fisheries in the Mid-Atlantic, Gulf of Mexico, and Pacific Coast regions. It supports analysis and evaluation of new programs, the development of fishery management plans and regulations to support catch shares, observing and monitoring at sea and on shore for specific fisheries, and enforcement activities. It also provides for the continued implementation of electronic log books as well as dockside data collection and management, including quota accounting and lien registry. The funding also increases NMFS' analytical capacity to evaluate and report performance of catch share monitoring programs with respect to economic performance, fleet behavior, annual catch limits, and bycatch reduction.



*Removing halibut in Sitka, Alaska. The halibut catch share program has been in place more than a decade*



**Fisheries Oceanography: NOAA requests an increase of \$5,400,000 and 5 FTEs to support the expedited creation of Integrated Ecosystem Assessments (IEAs) for three of NOAA's eight Regional Ecosystems.** To better manage the Nation's highly complex and evolving marine ecosystem resources and services, IEAs provide a comprehensive, science-based decision-making framework and holistic approach to ecosystem-based management (EBM). IEAs bring scientific and technological rigor to resource management decisions by incorporating diverse sources of data into ecosystem models, including socio-economic data, that evaluate trade-offs between ecosystem and societal goals. In 2011, this effort will focus primarily on the California Current Ecosystem and will include work on the Gulf of Mexico and Northeast Shelf IEAs. IEAs will allow managers to make informed management decisions through the management strategy evaluation tools. Such tools will provide managers with sectoral uses (e.g., fishing, aquaculture, offshore alternative energy development, recreation, and other ecosystem goods and services sectors) as well as socioeconomic implications of management actions. In turn, this will promote job retention and economic growth by supporting sustainable resource use within various sectors.

**Salmon Management Activities: NOAA requests a decrease of \$5,400,000 and 0 FTEs for Salmon Management Activities.** This reduction is a planned component of the renegotiated Pacific Salmon Treaty from \$16,500,000 to \$11,100,000. The remaining funds will support the following activities: Coded Wire tag (CWT) Program Improvements-\$1.5 million, Puget Sound Critical Stocks Augmentation-\$2.1 million, and Alaska Fishery Adjustment Mitigation-\$7.5 million.

## HABITAT CONSERVATION AND RESTORATION

**\$54,918,000**

NOAA requests an increase of \$10,364,000 and 0 FTEs in the Habitat Conservation and Restoration sub-activity for a total of \$54,918,000 and 149 FTEs. This increase is comprised of one new initiative:

**Fisheries Habitat Restoration: NOAA requests an increase of \$10,364,000 and 0 FTEs for the Community-based Restoration Program to implement larger-scale ecological restoration.** Habitat destruction, degradation, and modification are a threat to endangered and threatened species populations and serve as major limiting factors in the recovery of such populations. In order to effectively implement recovery efforts for listed species, improving habitat condition and ecosystem function through larger-scale habitat restoration in targeted areas, are required. With this increase NOAA will implement larger-scale ecological restoration to increase habitat to support such recovery of threatened and endangered species. Specific activities include restoring wetlands and fish passage to provide spawning and rearing habitat for fish. Other benefits include the provision of storm protection from flooding and storm surge in the most vulnerable coastal communities. Activities would also address habitat degradation which is caused by human impacts and has been further exacerbated by climate change. The requested funding will advance national priorities for larger-scale habitat restoration and strengthen NOAA's leadership role in science-based conservation. With this increase NOAA can capitalize on previous experience gained from implementing larger-scale habitat restoration projects through the American Recovery and Reinvestment Act (ARRA), and further strengthens its leadership role in science-based habitat conservation.



*Recovery Act funds are being used to re-flood and restore salt marshes. The Magnolia Marsh component, Huntington Beach, CA, is the final phase of this restoration project which restores significant habitat for birds, shellfish and coastal marine fish, such as anchovy, mullet, corvina, and halibut*



**OTHER ACTIVITIES SUPPORTING FISHERIES**

**\$73,687,000**

NOAA requests an increase of \$1,787,000 and a decrease of 13 FTEs in the Other Activities Supporting Fisheries sub-activity for a total of \$73,687,000 and 135 FTEs. This increase is comprised of two new initiatives and two decreases:

**Aquaculture: NOAA requests an increase of \$2,352,000 and 1 FTE to support the NOAA/USDA Alternative Feeds initiative.** As U.S. citizens continue to eat more aquaculture seafood, complementary studies are also needed to understand the human health benefits of eating such seafood. Additionally, many forage fish stocks are at risk of overexploitation from the growing demand for finfish aquaculture feeds. In these aquaculture operations, feed is the highest single cost and fish meal and fish oil prices have doubled in the past 15 years. Reducing the amount required in fish feeds will therefore, have dramatic economic benefits to the aquaculture industry. Current research has made progress in reducing the amount of fish meal and fish oil required in commercial aquaculture feed diets. NOAA and other federal agencies play a vital role in that research and the transfer of such technology to industry. To that effect, these funds will support NOAA's partnership with USDA in the Alternative Feeds Initiative. Staff will lead NOAA's internal and external research on alternative feeds and expand research at the NOAA Fisheries Science Centers, support a competitive grants initiative on priority alternative feed research topics, and work with NOAA Fisheries' Fishery Finance Program and other DOC and Federal agencies to transfer technology and enable expanded alternative aquaculture feeds production in the United States.



*Aquaculture Program — Open fish farming in Hawaii*

**Regional Studies: NOAA requests an increase of \$5,000,000 and 4 FTEs to improve the quality of NOAA's research in the Chesapeake Bay through the acquisition of new technology and infrastructure improvement projects, which support the Chesapeake Bay Executive Order (EO).** The population of the 64,000 square-mile Chesapeake Bay watershed has increased by about 8 percent in the past decade and the amount of impervious surface has increased by over 40 percent. These trends have drastically altered the hydrology and natural filtering systems of the Bay, overtaking restoration and protection efforts to date with large infusions of sediment and nutrients. As a result, many of the Bay's living resources and key habitats; such as, wetlands, submerged grasses, oysters, crabs, and finfish have suffered. The Bay has tremendous cultural significance and economic potential for the region. To improve the Bay, this increase will provide enhanced understanding of the relationships between the Chesapeake Bay's living resources and habitat, coordinate protection and restoration of key species and habitats across jurisdictional lines, and support a coordinated system of monitoring platforms distributed across the Bay. FY 2011 funds will be targeted to improve the quality of NOAA's research through the acquisition of new technology and infrastructure. The funding will ensure NOAA has state of the art field and laboratory equipment in place in FY 2011, and the base funding required for addressing the mandates of the EO in FY 2012 and beyond. NOAA proposes to obtain field equipment to enhance field restoration efforts, support enforcement for oyster sanctuaries, and for staff support to



*Jesse Mechling, NOAA Seagrant Fellow, carries a tray of native Chesapeake Bay marsh grasses for shoreline planting*



plan and implement habitat assessments and characterizations. NOAA will also enhance scientific and laboratory applications as well as geospatial modeling capacity to support the proposed restoration of native oysters in 20 tributaries by 2020. Funds will be used to enhance operations and maintain the Chesapeake Bay Interpretive Buoy System (CBIBS) and incorporate data into the Integrated Ocean Observing System.

**Cooperative Research: NOAA requests a decrease of \$4,565,000 and 13 FTEs for Cooperative Research.** This decrease is offset by increases in other fisheries research. At this level of funding, NOAA's cooperative research program will continue to support high-level projects nationwide through competitive grant and contract procurements, as well as cooperative agreements.

**Southwest Fisheries Science Center: NOAA requests a decrease of \$1,000,000 and 0 FTEs for the Southwest Fisheries Science Center.** This is a planned decrease for the leasing of temporary office and laboratory space in La Jolla, California.





## OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH

The Office of Oceanic & Atmospheric Research (OAR) serves as NOAA's source for research and development (R&D), often referred to as NOAA Research. OAR conducts the scientific research, environmental studies, and technology development needed to improve NOAA's operations and to broaden our understanding of the Earth's atmospheric and marine environmental systems. OAR currently consists of 7 intramural research laboratories and manages or facilitates extramural research at 32 National Sea Grant colleges, universities, and research programs; several undersea research centers; a research grants program through the Climate Program Office; and many cooperative institutes with academia.



*DART II Tsunami Buoy*

OAR's activities are organized along four themes: (1) Climate Research; (2) Weather and Air Quality Research; (3) Ocean, Coastal, and Great Lakes Research; and (4) Information Technology (IT) R&D. The goals of these four theme areas are to: (1) understand complex climate systems to improve predictions; (2) understand atmospheric events to assist in saving lives and property worldwide; (3) explore, investigate, and understand the complexities of our ocean, coastal, and Great Lakes habitats and resources; and (4) accelerate adoption of advanced computing, communications, and IT throughout NOAA. The research is carried out through a national network of more than fifty Federal and university-based laboratories and research programs. With this diverse research "tool kit," OAR: (1) provides national and international leadership on critical environmental issues and (2) addresses the environmental R&D needs of internal NOAA customers as well as of states, industry, the Department of Commerce, and other Federal agencies. OAR researchers represent the cutting edge in sustained, long-term environmental observations and modeling. Their contributions enhance the health and economic well-being of society.

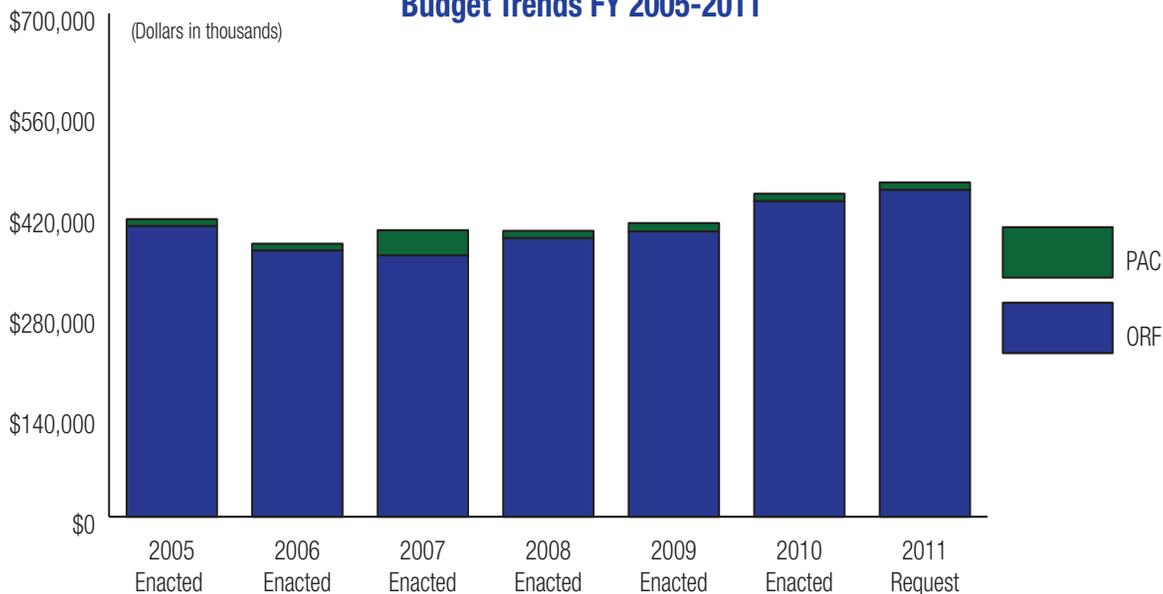
OAR's FY 2011 request seeks funding to: (1) sustain critical research activities in support of NOAA climate, weather, and ocean missions; (2) initiate new activities that address currently unmet gaps in the NOAA service missions; and (3) meet the information needs of our Nation's environmental decision-makers. The request also responds to recent considerations regarding: (1) strengthening collaboration between OAR & NWS; (3) supporting a "warn-on-forecast" capability, improved lead time for forecasts, and new observational tools, e.g., MPAR (Multi-Function Phased-Array Radar) and (3) preparing for the establishment of a climate service.



## OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
<b>OAR — ORF</b>				
Climate Research	\$196,536	\$225,135	\$241,509	\$16,374
Weather and Air Quality Research	63,411	69,997	75,552	5,555
Ocean, Coastal, and Great Lakes Research	122,759	130,606	124,290	(6,136)
Information Technology, R&D & Science Education	14,028	13,028	13,130	102
<b>Total, OAR - ORF</b>	<b>396,734</b>	<b>438,766</b>	<b>454,481</b>	<b>15,715</b>
Total, OAR - PAC	11,579	10,379	10,379	0
<b>GRAND TOTAL OAR (Direct Obligations)</b>	<b>\$408,313</b>	<b>449,145</b>	<b>\$464,860</b>	<b>15,715</b>
<b>Total FTE</b>	<b>735</b>	<b>744</b>	<b>773</b>	<b>29</b>

### OFFICE OF OCEANIC & ATMOSPHERIC RESEARCH Budget Trends FY 2005-2011



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction



## FY 2011 ORF BUDGET SUMMARY:

NOAA requests a total of \$454,481,000 and 773 FTEs to support the continued and enhanced operations for the Office of Oceanic & Atmospheric Research. This total includes \$4,504,000 and 3 FTEs for Adjustments to Base (ATB) and a net program change increase of \$55,850,000 and 26 FTEs over the FY 2011 Base.

### ADJUSTMENTS TO BASE:

The above ATB request includes an increase of \$4,504,000 and 3 FTEs to fund the estimated FY 2011 Federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

### OAR – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2011 Technical Budget.

### CLIMATE RESEARCH

**\$241,509,000**

NOAA requests an increase of \$34,300,000 and 23 FTEs in the Climate Research sub-activity for a total of \$241,509,000 and 384 FTEs.

**Climate Data & Information:** NOAA requests an increase of \$1,500,000 and 2 FTEs. This increase is comprised of one new initiative:

**NOAA Climate Services Portal: NOAA requests an increase of \$1,500,000 and 2 FTEs to support the development of a new NOAA Climate Services Portal Program, which will provide the public with readily accessible climate data, information, and services.**

Societal concern about the impacts of climate change is continuing to grow. Citizens in public and private sectors are requiring, more than ever, access to credible climate science information in order to help them make informed decisions affecting their businesses and their livelihoods. Climate influences almost every sector of society and affects nearly 40 percent of the United States' \$10 trillion annual economy. As the leading provider of climate, weather, and water information to the Nation and the world, NOAA serves as the public's logical source for easily available climate information. NOAA must expand and improve the way it communicates, educates, reaches out to, and engages with public stakeholders to better meet the Nation's needs for timely, authoritative climate information. The requested funding will be used to build a comprehensive new NOAA Climate Services Portal (NCS Portal). The NCS Portal will be a central component of NOAA's commitment to the integration and delivery of climate services by providing readily accessible climate data and information to the public. The NCS Portal will have audience-focused sections designed to serve four key segments of society: (1) climate science decision makers and policy leaders; (2) scientists and applications-oriented data users (e.g., resource managers and business leaders); (3)



*Climate Services Portal (in development)*

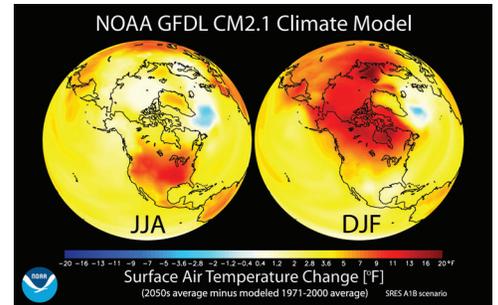


educators; and (4) climate interested members of the public. In addition to data and products, the NCS Portal will offer a broad array of climate communications, outreach, and educational materials that demonstrate NOAA's leadership in climate science research, observations, modeling, and service to society.

**Competitive Research Program:** NOAA requests an increase of \$32,800,000 and 21 FTEs. This increase is comprised of five new initiatives:

**Earth System Modeling - Urgent Climate Issues: NOAA requests an increase of \$6,980,000 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, feedbacks in the global carbon cycle, Arctic climate change and decadal predictability of extreme events.**

The increased demand for projections of climate change at regional scales and understanding of potential climate impacts requires increased modeling resolution and realism, as well as improved scientific understanding on the reliability of models and downscaling techniques for various regional climate applications. The requested increase will specifically focus on (1) reducing uncertainties in sea level rise projections, (2) reducing uncertainties in the terrestrial carbon cycle and future biogeochemical feedbacks on climate through more realistic model treatment of the terrestrial biosphere, (3) addressing gaps in the understanding of the Arctic climate system including rapid changes and future projections, and (4) augmenting decadal climate predictions and abrupt changes in order to complete decadal prediction model evaluations and assess the predictability of high impact climate extremes. Developing decadal climate predictions of sea surface temperature will lead to skillful decadal predictions of several phenomena of great economic importance, including hurricanes, drought, heat waves, and ecosystems.



*Climate Services Portal (in development)*

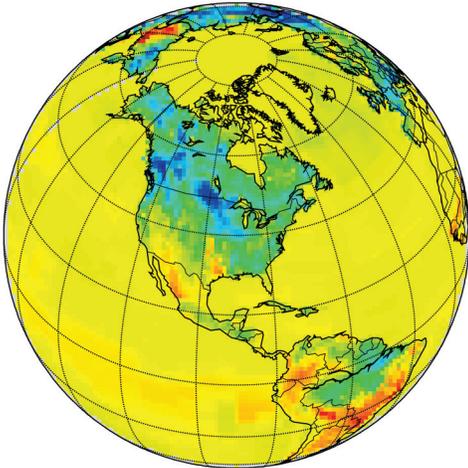
**Assessment Services: NOAA requests an increase of \$10,000,000 and 3 FTEs to provide a permanent capability to produce climate assessments and support the National Climate Assessment.** The National Climate Assessment is mandated by the Global Change Research Act of 1990 and due in 2013. The National Climate Assessment, led by the U.S. Global Change Research Program, will synthesize, evaluate and report on climate change research findings, evaluate the effects of climate variability and change for different regions, and identify climate vulnerabilities and uncertainties as part of an ongoing effort to understand what climate change means for the United States. Understanding and characterizing the nation's vulnerability to climate change and its adaptive capacity to reduce that vulnerability is not only essential for informed, near-term decisions regarding government actions to promote adaptation to committed warming (i.e., unavoidable warming that will occur due to historic emissions of greenhouse gases), but it is also essential for making decisions on how to reduce greenhouse emissions. The increase will provide technical support for the National Climate Assessment and augment existing regional and sectoral focal points across the agency and with our federal and non-federal partners (states academia, user communities, etc). In addition, NOAA will develop a framework for consistent approaches and application of downscaling efforts to support regional decision making, including facilitating better connectivity of high resolution data with decision processes and models. Climate assessment services will involve 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. This assessment services capability will serve as a cornerstone of NOAA's climate services.

**Carbon Observing and Analysis System: NOAA requests an increase of \$8,000,000 and 7 FTEs to complete and sustain an observation and analysis system to determine uptake and emissions of carbon dioxide and greenhouse gases across North America.**

Addressing climate change and its impacts have become both a national and an international priority. Climate change is driven by Green House Gases (GHGs), mainly anthropogenic release of CO<sub>2</sub>, and is posing a major threat to agriculture, human health, the economy, and national security. The rapid increase of CO<sub>2</sub> is essentially the sole cause of global ocean acidification, which is threatening our marine ecosystem and fisheries. Regulating CO<sub>2</sub>, evaluating mitigation strategies and understanding and predicting future climate change and ocean acidification will require an accurate, reliable and independent system for tracking sources and sinks of CO<sub>2</sub> and other GHGs.



*CarbonTracker — A system to keep track of carbon dioxide uptake and release at the Earth's surface over time. Warm colors show high atmospheric CO<sub>2</sub> concentrations, and cool colors show low concentrations.*

With this increase, NOAA will continue to implement the Carbon Tracker Observing and Analysis System, completing NOAA's obligation under the United States Global Change Research Program (USGCRP). The Carbon Tracker Observing and Analysis System will serve as the backbone for verifying GHG emission reduction and mitigation efforts in North America. The network collects continuous measurements from tall towers, air sampled in flasks, aircraft profiling, and satellite remote sensing to provide the accuracy and precision to quantify the exchange of GHGs between the atmosphere and terrestrial ecosystem and to characterize the regional distribution of GHG emissions and uptake. The funding will increase the sampling capacity and finalize the greenhouse gas monitoring network, with a total of 14 tall towers and 24 aircraft sites. This effort builds on NOAA's strong observation, modeling, and analysis capabilities; involves coordination with national and international partners; and serves as a structural, operational, and research backbone in a global effort to understand the carbon cycle and verify reduction and offsets of CO<sub>2</sub> and other GHG emissions.

**Arctic Watch: NOAA requests an increase of \$3,000,000 and 1 FTE to continue and sustain Arctic observations as part of the U.S. contribution to the International Arctic Observing Network.**

The Arctic region is currently undergoing profound atmospheric, terrestrial and oceanic changes related to climate variation and change. In many cases, observed changes far exceed the current model projections. These changes impact human health, infrastructure, fisheries, ecosystems, coastal communities, international maritime activity, and regional to mid-latitude climate shifts. Diminishing sea ice cover contributes to significant changes in weather patterns both within and surrounding the Arctic, modifies ecosystems, opens new shipping channels, and provides access to previously unobtainable natural resources. An expanded, more robust, integrated and coordinated NOAA Arctic program is necessary for addressing immediate and near-term impacts of climate change and supporting NOAA's response capabilities to stakeholders, particularly those in Alaska and the Pan-Arctic region, but also throughout the Nation. This increase will (1) improve and amplify representation of Arctic climate processes in global climate models, (2) strengthen a network that integrates observations from atmospheric, coastal, and oceanographic



observatories; ocean moorings; ice buoys and stations; and ship transects, (3) and provide user-focused research assessments and projection tools for the Arctic and Alaska region. The NOAA Climate Program Office will lead this effort and will utilize the capabilities of the NOAA Joint and Cooperative Institutes, such as The Cooperative Institute for Research in Environmental Sciences (CIRES) and the Cooperative Institute for Alaska Research (CIFAR). This increase will expand NOAA's Arctic observing capacity and produce data that will allow existing NOAA programs to improve modeling, analysis, and assessment products.

**Global Ocean Observing System: NOAA requests an increase of \$4,820,000 and 0 FTEs to continue implementation of the Global Ocean Observing System (GOOS) with an emphasis on improving sea level rise monitoring and understanding.**

Episodes of devastating coastal inundation over the last decade have emphasized the critical importance of fielding an ocean observing system that can continuously monitor approaching marine hazards and provide early warnings to the coasts for hazard mitigation. Storm surge, El Niño, tsunamis, as well as gradual sea level rise, all originate in the deep ocean well beyond the coastal zone, where much of the observing capacity currently exists. A sustained global observing system is the foundation of all climate research and services. With this requested increase, NOAA will invest in emerging technologies across ocean networks; such as, GPS receivers for tide gage stations to measure sea level rise and monitor storm surge events, tsunamis, etc., real-time deep ocean monitoring systems, and deep argo profilers for measuring changes in ocean heat. These investments will contribute to national preparedness, resilience, and early warning for coastal inundation due to sea level rise coupled with extreme events. This initiative also addresses opportunities identified in NOAA's report to the House of Representatives in 2009, *Implementing the Sustained Global Ocean Observing System for Climate*.

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**WEATHER & AIR QUALITY RESEARCH**

**\$75,552,000**

NOAA requests an increase of \$10,697,000 and 0 FTEs in the Weather & Air Quality Research sub-activity for a total of \$75,552,000 and 210 FTEs.

**Laboratories & Cooperative Institutes:** NOAA requests an increase of \$4,697,000 and 0 FTEs. This increase is comprised of one new initiative and one decrease:

**Water Resources Research to Operations: NOAA requests an increase of \$7,672,000 and 0 FTEs to perform research, development and implementation for Integrated Water Resource Services, a NOAA Regional Collaboration Priority.**

Water resource and precipitation monitoring and forecasting have become a particular challenge with increases in population, drought, and frequent changes in commercial shipping needs. The majority of federally declared disasters on an annual basis are due in large part to flooding. Additionally, quantitative precipitation forecasts, particularly for significant rain events (>1 inch of rain) on a national average can have an error of 0.5 inch or more. Such errors can severely compromise the accuracy of river forecasts and degree of flooding. With such a demand and need for improved accuracy, NOAA must enhance its ability to quantitatively monitor and predict extreme precipitation events, river and stream flow, flooding and flash flooding, and storm-driven storm surges. With this request, NOAA will research, develop and deliver water forecasting services for new river, estuary and coastal flood-forecast capabilities areas not receiving such information. The goal will be



to develop a forecasting infrastructure to demonstrate the risks and benefits associated with regional (coordination) implementation and integration. This research to operations activity is organized around three programs: 1) Hydrometeorology Testbed, which focuses on research and on accelerating the infusion of new observing technologies and strategies, precipitation forecast model improvements, and new science of precipitation from the research community into forecasting operations of the National Weather Service (NWS) 2) THORPEX, which is an international program, under the World Meteorological Organization, designed to improve global forecasts of high impact weather out to fourteen days with improved precipitation forecast being the key objective, and 3) CERIS (Coast, Estuary, River Information Services), which will develop and transition to operations: new river, estuary and coastal forecasting capabilities and ecosystem management services by using the Tar River Basin and Pamlico Sound in North Carolina for operational prototyping.

**Unmanned Aircraft Systems (UAS): NOAA requests a decrease of \$3,000,000 and 0 FTEs to reflect the planned completion of the High Altitude Long Endurance**

**(HALE) UAS testing and demonstration program.** The results of the test observing missions over the Atlantic Ocean, Central Pacific, and the Arctic will be evaluated over the next year with respect to a possible future expansion of NOAA's suite of observing capabilities to include this new technology, which may be capable of expanding NOAA's observational reach with greater efficiency and less risk to human life than current methods.



NOAA/NASA research UAS, Altair

**Weather & Air Quality Research Programs:** NOAA requests an increase of \$6,000,000 and 0 FTEs. This increase is comprised of one new initiative:

**Multi-Function Phased Array Radar (MPAR): NOAA requests an increase of \$6,000,000 and 0 FTEs to further demonstrate through scientific research that MPAR technology can cost effectively replace aging operational weather and aircraft tracking radars.** MPAR has the potential to measure phenomena such as tornadoes on the time scale that they occur (minutes) and to initialize high resolution cloud models with high resolution radar data to move current operational warnings from “warn on detection” to “warn on forecast”. By 2020-2025 more than 350 FAA radars and nearly 150 weather radars will need to be replaced or have their service life extended. The MPAR program is currently jointly funded by NOAA and the FAA (50-50 match), with both agencies coordinating their budget requests. This investment in MPAR provides the resources needed for the next step of the project, which will engage industry to add polarization to the radar by FY 2013. Polarization is not currently available on phased array radars, but is a requirement for the National Weather Service (NWS). Matching funding will be provided by the FAA to fulfill its requirement for airport terminal weather and aircraft tracking. In FY 2010, a contract vehicle will be put in place to acquire a dual-polarized MPAR antenna. With this increase, NOAA will continue research to demonstrate that MPAR technology can be a cost-effective replacement for aging weather and aircraft tracking radars, while also offering significant service improvements such as longer tornado warning lead times. Funding will provide for six separate design studies that will focus on risk reduction for determining whether dual polarization is feasible and affordable.

**OCEAN, COASTAL, & GREAT LAKES RESEARCH****\$124,290,000**

NOAA requests an increase of \$10,800,000 and 3 FTEs in the Ocean, Coastal, & Great Lakes sub-activity for a total of \$124,290,000 and 166 FTEs over the FY 2011 Base.

**National Sea Grant College Program:** NOAA requests an increase of \$4,700,000 and 0 FTEs. This increase is comprised of two new initiatives:

**Sea Grant National Marine Aquaculture Initiative: NOAA requests an increase of \$2,700,000 and 0 FTEs to implement a two-pronged approach to address marine aquaculture via extramural research and transfer of research by Sea Grant Extension and other outreach activities.** Many fishing communities are facing severe economic hardships as declining fish stocks and the need to end overfishing have necessitated reduced fish harvests levels. New approaches are therefore, required to end overfishing and supply safe and sustainable seafood, while maintaining economically vibrant coastal communities. The increase will specifically support (1) aquaculture extension enhancement, emphasizing regional outreach (2) a competitive research initiative which will include smart design approaches to sustainable aquaculture, development of planning tools to aid in the selection of aquaculture facilities, and research on the social and economic issues associated with current and new marine aquaculture. With such efforts, NOAA will be able to provide working waterfront alternatives for fishing communities, increase and stabilize flow of seafood products to markets and promote locally grown and sustainable seafood. The requested increase will complement, accelerate, and enhance current aquaculture activities in NOAA Fisheries and address a variety of research gaps with adaptive management strategies to improve NOAA's ability to manage fisheries, end overfishing, and ensure the viability of the multibillion-dollar U.S. seafood industry. NOAA will increase capacity to address issues identified by the GAO's report on "Offshore Marine Aquaculture: Multiple Administrative and Environmental Issues Need to be Addressed in Establishing a U.S. Regulatory Framework (GAO-08-594, May 9, 2008)". This FY 2011 coordinated effort will enable the NOAA Aquaculture Program, a matrix program containing offices in OAR, NMFS, NOS, and NESDIS, to advance sustainable, domestic aquaculture.

**NOAA Sea Grant-Helping Coastal Communities Prepare for and Respond to Natural Hazards and Extreme Events: NOAA requests an increase of \$2,000,000 and 0 FTEs to support regional research, training, and technology transfer to enhance the resiliency of coastal communities to ongoing natural hazards such as, sea-level rise and coastal storms.** The increasing number and intensity of coastal storms, the ongoing threat of oil spills, and other natural and human hazards are putting more people and property at risk along the nation's coasts, with major implications for human safety and the economic and environmental health of coastal areas. It is essential that residents of coastal communities understand these risks, so they might reduce their vulnerability to certain events, and respond quickly and effectively when events do occur. With this increase, NOAA Sea Grant will conduct the research needed to assess hazard-related risks and increase the availability and usefulness of hazard-related information and forecasting for citizens, industries, and decision-makers in coastal communities. Funding will specifically be directed to (1) conduct risk assessment research in the context of hurricanes, other coastal storms, and climate-related changes, (2) assist public and private decision-makers in creating and adopting policies, plans, and ordinances to reduce risks, manage cata-



strophic events, and speed recovery, (3) conduct research and communicate information on how the use of natural features and new technologies can help communities prepare for and mitigate the impacts of hazardous events and climate change, (4) make Sea Grant's local knowledge and contacts available to work with federal, state, regional, and local agencies, non-governmental organizations, and international partners that have hazardous event responsibilities to facilitate the speed and quality of response to these crises, (5) identify viable strategies and formulate plans to prepare for, mitigate and adapt to climate expected impacts and, (6) consolidate best research-based practices in risk analysis, assessment, mitigation, adaptation and communications, and disseminate risk information to citizens, industries and decision makers in coastal communities. NOAA Sea Grant will bring together the regional institutional infrastructure represented by the network of state Sea Grant programs, NOAA's Coastal Services Center, and other coastal programs to create a powerful regional science and outreach capability.

**Ecosystem Programs:** NOAA requests an increase of \$6,100,000 and 3 FTEs. This increase is comprised of one new initiative:

**Integrated Ocean Acidification: NOAA requests an increase of \$6,100,000 and 3 FTEs to implement a NOAA Integrated Ocean Acidification (OA) initiative.** Increased atmospheric carbon dioxide concentrations result in increased carbon levels in our oceans, causing changes in seawater chemistry, otherwise known as ocean acidification. OA generates a unique suite of environmental changes that increasingly affect ocean ecosystems, fisheries, and other marine resources in such profound ways as reducing the ability of many organisms to build their shells and impacting both the carbon and nitrogen cycles that help sustain life on Earth. This increase will support new technologies and ecosystem monitoring systems, better models, and dedicated research programs, as outlined in the NOAA Ocean Acidification Implementation Plan. Efforts in FY 2011 will be directed to (1) assess physiological and ecosystem-level effects of OA on commercial and recreational marine fish stocks and key species critical to NOAA-managed resources, (2) develop advanced OA technologies and sensors, (3) create an ecosystem OA monitoring Network, and (4) build carbonate analytical capabilities. The increase will complement, accelerate, and enhance current NOAA OA activities within OAR, NMFS, and NOS.



*Limacina helicina*, a swimming pteropod and an important food source to many fish, has a calcium carbonate shell that is highly susceptible to oceanic pH changes and as dissolved  $\text{CO}_2$  in sea water rises, the skeletal growth rate of calcium-secreting organisms are reduced  
Photo by Russ Hopcroft, UAF/NOAA





# NATIONAL WEATHER SERVICE

The National Weather Service (NWS) serves as the Nation's first line of defense against severe weather. The NWS provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure used by government agencies, the private sector, the public, and the global community.



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

The United States is one of the most severe weather prone countries in the world. Each year, Americans cope with, on average, 10,000 thunderstorms, 5,000 floods, 1,000 tornadoes, and 6 hurricanes. Some ninety percent of all Presidentially-declared disasters are weather-related. There are approximately 7,900 weather-related deaths per year and \$14 billion in damage due to weather incidents. According to the American Meteorological Society, weather is directly linked to public safety, and about one-third of the U.S. economy (about \$4 trillion) is weather-sensitive. Vulnerability from severe weather is increasing as the Nation's population continues to grow and shift to coastal areas.

More and more sectors of the U.S. economy are recognizing the impacts of weather, water, and climate on their businesses and are becoming more sophisticated at using weather-related information to make better decisions. To meet this growing demand for information and to improve the timeliness and accuracy of warnings for all weather-related hazards, the NWS will continue to enhance observing capabilities; improve data assimilation from both the NWS and external partners; improve collaboration with the research community; provide the NWS information in a quick, efficient, and useful form (e.g., the National Digital Forecast Database); and include information on forecast uncertainty to help customers make fully informed decisions. A key focus for the NWS is to improve decision support for high impact weather events.

With approximately 4,800 employees spread throughout 122 weather forecast offices, 13 river forecast centers, 9 national centers, and other support offices around the country, the NWS provides a national infrastructure to



gather and process data worldwide from the land, sea, and air. This infrastructure enables data collection using technologies such as Doppler weather radars; satellites operated by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS); data buoys for marine observations; surface observing systems; and instruments for monitoring space weather and air quality. These data feed sophisticated environmental prediction models running on high-speed supercomputers. Our highly trained and skilled workforce use powerful workstations to analyze all of these data to issue climate, aviation, marine, fire weather, air quality, space weather, river and flood forecasts and warnings around-the-clock. A high-speed communications hub allows for the efficient exchange of these data and products between NWS components, partners and customers. NWS forecasts and warnings are rapidly distributed via a diverse dissemination infrastructure including NOAA Weather Radio. Finally, customer outreach, education, and feedback are critical elements to effective public response and improvements to NWS services.

The FY 2011 President's Budget request supports the funding and program requirements necessary to address NOAA's strategic goals and allows the NWS to achieve its mission of: using cutting-edge technologies to produce and deliver trusted forecasts, providing services in a cost-effective manner, striving to reduce weather-related fatalities, and improving the economic value of weather, water, and climate information.

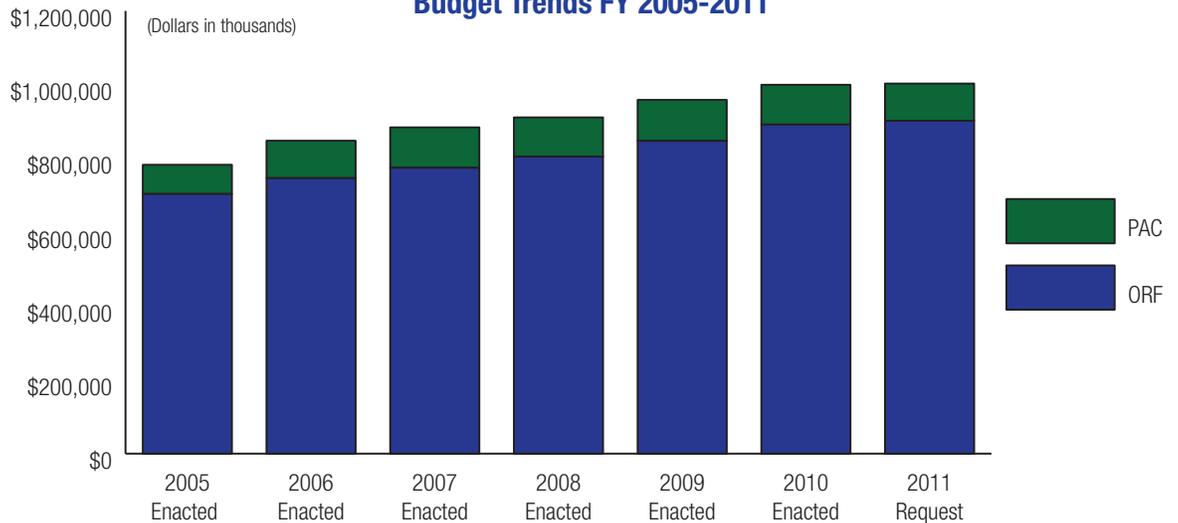


## NATIONAL WEATHER SERVICE

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
<b>NWS — ORF</b>				
Operations and Research	\$749,583	\$790,139	\$799,907	\$9,768
Systems Operation & Maintenance (O&M)	98,355	101,979	102,555	576
<b>Total, NWS - ORF</b>	<b>847,938</b>	<b>892,118</b>	<b>902,462</b>	<b>10,344</b>
Total, NWS - PAC	110,951	107,727	100,731	(6,996)
<b>GRAND TOTAL NWS (Direct Obligations)</b>	<b>\$958,889</b>	<b>\$999,845</b>	<b>\$1,003,193</b>	<b>\$3,348</b>
<b>Total FTE</b>	<b>4,640</b>	<b>4,644</b>	<b>4,649</b>	<b>5</b>



### NATIONAL WEATHER SERVICE Budget Trends FY 2005-2011





## FY 2011 ORF BUDGET SUMMARY

NOAA requests a total of \$902,462,000 and 4,618 FTEs to support the continued and enhanced operations of the National Weather Service. This total includes \$18,104,000 and 1 FTEs for Adjustments to Base (ATB) and a net program change of \$17,465,000, and 4 FTEs over the FY 2011 Base.

### ADJUSTMENTS TO BASE:

The above ATB request includes an increase of \$18,104,000 and 1 FTEs to fund the requested FY 2011 Federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent. The increase will also provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

### NWS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2011 Technical Budget.

### OPERATIONS AND RESEARCH

**\$799,907,000**

NOAA requests an increase of \$17,136,000 and 4 FTEs in the Operations and Research sub-activity for a total of \$799,907,000 and 4,430 FTEs.

**Local Warnings and Forecasts:** NOAA requests an increase of \$17,136,000 and 4 FTEs for local warnings and forecasts. This increase is comprised of two new initiatives:

**Local Warnings and Forecasts Base: NOAA requests an increase of \$2,000,000 and 0 FTEs to complete required IT security improvements to the National Critical Space Weather System in order to prevent the loss of authority to operate, which would result in the shutdown of NOAA's space weather predictions and forecast program.**

Space weather has the potential to disrupt virtually every major public infrastructure system, including transportation systems, power grids, telecommunications, and global positioning systems (GPS). Aircraft flying through polar routes now rely on space weather information to provide a necessary view of the flight environment, which includes potential impacts to critical communication and navigation systems, and the potential for hazardous solar radiation exposure. Strong storms with the potential to impact critical elements of our Nation's infrastructure can occur over 100 times during a solar cycle. NOAA's Space Weather Program depends on the National Critical Space Weather System to: monitor the space environment and provide timely and accurate operational space weather forecasts, warnings, and alerts. The Program is the sole civilian entity that (1) operates and maintains the US National Critical Space Weather System, (2) ingests and processes data from NOAA, NASA and other sources, (3) supports research to understand the processes that cause severe space weather, (4) transitions research into operations to



NOAA's Space Weather Prediction Center



improve services, and (4) archives data from NOAA and the Department of Defense (DoD) and makes it accessible to customers. Without the Authorization to Operate, all of the above activities will cease and the space weather products and services critical to our Nation's infrastructure and defense will be lost.

**Aviation Weather: NOAA requests an increase of \$15,136,000 and 4 FTEs to fund the Next Generation Air Transportation System (NextGen) development activities as a multi-year effort to improve aviation weather services and meet the aviation weather requirements of the multi-agency NextGen initiative.**

The demand for air transportation is expected to more than double by 2025. The current National Airspace System (NAS) cannot accommodate the increased demand and will be saturated by 2015. In May 2008, the Congressional Joint Economic Committee quantified the cost of flight delays at \$41 billion in 2007 to passengers, the airline industry and the economy. Federal Aviation Administration (FAA) records indicate that on average, weather is a factor in 70% of these delays, costing roughly \$29 billion. The FAA estimates that two-thirds of these delays can be avoided with enhanced weather information fully integrated into the operational decision making process, which could save approximately \$19 billion annually.



*Significant weather events attribute to 70% of air traffic delays*

The Joint Planning and Development Office (JPDO) have developed a plan for accommodating this expected growth in demand. A critical component of the NextGen plan is a weather forecast process, with meteorologist intervention, that generates rapidly-updated, high-resolution probabilistic weather information, consistent across space and time. This 4-Dimensional Weather Single Authoritative Source (4-D Weather SAS) will be stored in a Weather Information Database (WIDB) where it can be accessed by all National Airspace System (NAS) users. This funding increase supports the NOAA-led effort to develop a WIDB, which will provide the aviation community with an authoritative and timely source of weather information for decision support. The WIDB will integrate observed and forecast weather information and enable its use within an automated, multi-agency coordinated, air traffic management system. This capability does not presently exist within the federal government, and the JPDO partner agencies are depending on NOAA, as the federal weather information experts, to deliver it. Specific actions are 1) Improve aviation weather observations, analyses and forecasts (\$9,670,000). NextGen requires high resolution digital observational, analysis and forecast (temporal and spatial) information that is rapidly updated and consistent; 2) Improve access to information (\$3,386,000). NOAA is working closely with FAA to develop interagency data standards and an architecture enabling the rapid transfer of weather information between users; 3) Assist in the integration of weather information into FAA and user decision support systems (\$780,000). NOAA will play a key role in ensuring weather information is appropriately integrated into NAS decisions by providing expert advice to FAA in the translation of weather information and its impact on air traffic management decisions; and 4) Develop and field advanced operationally relevant verification capabilities (\$1,300,000). Enhanced verification techniques and concepts must be developed and deployed so that assessments of forecast quality and accuracy reflect the impact to the operational decisions of air traffic managers and airspace users.





# NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

The National Environmental Satellite, Data, and Information Service (NESDIS) manages the Nation's operational environmental satellite systems by acquiring global environmental data as well as processing and distributing satellite-derived products and services; and archiving and providing global environmental meteorological, oceanographic, solid earth geophysics and solar-terrestrial data. These environmental satellites not only monitor storms, but also support NOAA's National Weather Service, Federal and state agencies, and local emergency management agencies, enabling them to provide advance warnings of emerging severe weather such as hurricanes, tornadoes, flash floods, winter storms and wild land fires.



*Loading GOES-0 into the rocket's nose cone.  
Photo by Dimitri Gerondidakis/NASA*

The satellites and the products and services NESDIS provides are essential to the protection of human life, property, critical infrastructure, and the Nation's economy.

NESDIS' satellite command and control program acquires data from on-orbit satellites 24 hours per day, 365 days per year. This includes monitoring satellite operations, which occur at the NOAA Satellite Operations Control Center in Suitland, Maryland; Wallops, Virginia; and Fairbanks, Alaska. From these ground stations, NESDIS operates and acquires data from Polar-orbiting Operational Environmental Satellites (POES), Geostationary Operational Environmental Satellites (GOES), Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP), and Jason-2.

NESDIS provides the Nation with specialized expertise and computing systems that process, analyze, and distribute satellite-derived products and services using data from NOAA, DoD, and NASA environmental satellites, as well as foreign and commercial spacecraft. These products and services are provided to national and international users 24 hours per day, 7 days per week. This enables NOAA's Programs and Line Offices and international users to accurately track the location, extent, and duration of severe weather, such as hurricanes, tornadoes, and winter storms; support development of flash flood warnings; track volcanic ash clouds and severe winds that threaten aviation safety; detect remote wild land fires; monitor coastal ecosystem health such as coral bleaching; identify and monitor maritime hazards from sea ice; and assist the U.S. Coast Guard in satellite-assisted search and rescue activities.



As an important part of this support, NESDIS works to transition research satellite capabilities to operational products and services. NESDIS also provides the Nation with a long-term archive of past, present, and future environmental observations and associated data recorded across the United States and globally. NOAA's three National Data Centers, environmental data, information, products, and services provide support to climate, atmospheric, oceanographic, and the solid earth and solar-terrestrial geophysical sciences and promote sustained economic growth, scientifically sound environmental management, and public safety.

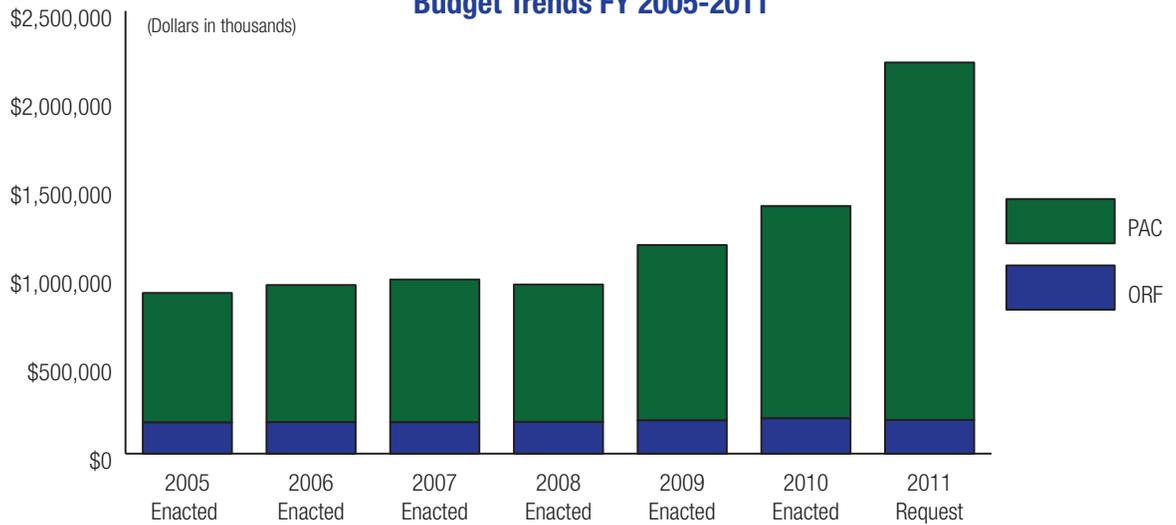
NESDIS also supports the President's priorities in space, climate sciences, ocean and coastal management, integrated earth observations, energy, and forest resources protection through the development of various products.



## NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
NESDIS — ORF				
Environmental Satellite Observing Systems	\$107,896	\$110,490	\$115,274	\$4,784
NOAA's Data Centers & Information Services	79,526	88,675	74,949	(13,726)
<b>Total, NESDIS - ORF</b>	<b>187,422</b>	<b>199,165</b>	<b>190,223</b>	<b>(8,942)</b>
Total, NESDIS - PAC	990,579	1,199,357	2,018,796	819,439
<b>GRAND TOTAL NESDIS (Direct Obligations)</b>	<b>\$1,178,001</b>	<b>\$1,398,522</b>	<b>\$2,209,019</b>	<b>\$810,497</b>
<b>Total FTE</b>	<b>831</b>	<b>831</b>	<b>835</b>	<b>4</b>

### NATIONAL ENVIRONMENTAL SATELLITE, DATA, & INFORMATION SERVICE Budget Trends FY 2005-2011



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction



**FY 2011 ORF BUDGET SUMMARY**

NOAA requests a total of \$190,223,000 and 682 FTEs to support the continued and enhanced operations of the National Environmental Satellite, Data, and Information Service. This total includes \$2,378,000 and 0 FTEs for Adjustments to Base (ATB) and a net program change of \$16,146,000 and 4 FTEs over the FY 2011 Base.

**ADJUSTMENTS TO BASE:**

The above ATB request includes an increase of \$2,378,000 and 0 FTEs to fund the estimated FY 2011 Federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration.

**NESDIS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:**

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2011 Technical Budget.

**ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS**

**\$115,274,000**

NOAA requests an increase of \$3,108,000 and 0 FTEs under the Environmental Satellite Observing Systems sub-activity for a total of \$115,274,000 and 409 FTEs.

**Product Processing and Distribution:** NOAA requests an increase of \$3,108,000 and 0 FTEs. This increase is comprised of one new initiative:

**Information Technology (IT) Satellite Security:** NOAA requests an increase of \$3,108,000 and 0 FTEs to provide critical IT security to compute satellite data products and services for daily weather forecasts, hurricane tracking, and the Nation’s public weather warnings. NOAA must protect its computing systems from unauthorized access since these environmental data are critical to mitigating loss of life, injury, and damage to the Nation’s economy. The requested funds are for the implementation of the National Institute of Standards and Technology (NIST) and Federal Information Processing Standard (FIPS) 200 minimum required security controls. These security controls are mandated and cannot be waived, making the implementation a required action. NESDIS has worked hard to improve its IT security program, and this request ensures that NOAA can meet its core mission with adequate security of NESDIS information, assets and services.

**DATA CENTERS AND INFORMATION SERVICES**

**\$74,949,000**

NOAA requests an increase of \$13,038,000 and 4 FTEs under the Data Center and Information Services sub-activity for a total of \$74,949,000 and 273 FTEs.



**Archive, Access, & Assessment:** NOAA requests an increase of \$13,000,000 and 4 FTEs. This increase is comprised of two new initiatives:

**Data Center Operations: NOAA requests an increase of \$2,000,000 and 2 FTEs to close the gap in long-term safe storage of and access to the Nation's environmental data and information.** This operational component will address the anticipated increase in data volume of greater than 3,000% over the next several years and ensure environmental observations remain useful and accessible to the widest range of current and future users. This request will provide NOAA the operational capability to allow users to search for and acquire the increased amount of archived data. It will ensure that environmental observations collected at great expense remain useful and understandable to the widest range of current and future generations. Users will be able to search for and acquire archived data by seamlessly connecting NOAA's Comprehensive Large Array Stewardship System (CLASS) ingest, storage, and access capabilities with the NOAA Data Center archive management system. This increase also meets emerging requirements associated with implementing NOAA's Climate Services that include the long-term preservation of the Nation's climate record.

**Climate Data Records (CDRs): NOAA requests an increase of \$11,000,000 and 2 FTEs to transform raw satellite data into unified and coherent long-term environmental observations and products which are critical to advancing climate change understanding, prediction, mitigation and adaptation.** NOAA's CDR efforts are initially focused on critical CDRs that address key societal issues including: water, drought, and floods; energy and renewable energy; and hurricanes and coastal hazards. Improved knowledge in these areas translates into lives and property protected or saved, as well as economic resiliency and national security. CDRs are distinct from operational weather/hazard satellite products since they remove or minimize time dependent biases in satellite data and provide long term "seamless" records characterizing climate change and variation (50+ years). The Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report (2007) underscores the urgent need for CDRs. Key NOAA constituents, including major private sector industries, such as insurance, energy, and transportation, have increasingly called for authoritative climate reference data upon which to base investments and strategic plans. In FY 11, NOAA will transition 10 CDRs to operations and continue the development of 6 additional CDRs.



*NOAA's National Climatic Data Center, Asheville, NC*





# PROGRAM SUPPORT

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



*Commissioning of Okeanos Explorer*

## CORPORATE SERVICES

NOAA Program Support provides the planning, administrative, financial, and infrastructure services that are essential to the successful performance of NOAA's mission. In addition to NOAA-wide corporate services and agency management, Program Support activities specifically support the people and programs of NOAA, ensuring that they have the proper work environment, the necessary tools and equipment, and the vital personnel and finance services which, in turn, allow them to provide the finest possible service to the American people, our economy and our environment. Through OMAO, Program Support provides data collection at sea and in the air to support NOAA program requirements.

## EDUCATION

NOAA's Office of Education provides advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education. The Office, in conjunction with the Education Council, coordinates educational activities across NOAA and develops NOAA's Education Strategic Plan and policy. These efforts help to ensure that NOAA's education programs and activities are based on NOAA science and support the agency's cross-cutting priority of promoting environmental literacy. The Office of Education directly implements and manages scholarship programs aimed at fostering competitiveness in science, technology, engineering and math by providing quality educational opportunities for the next generation. The Office of Education also offers competitive grant programs at the national and regional level to promote environmental literacy efforts through collaboration with external partners.

In FY 2011 the Office of Education will continue to work with the NOAA education community to advance the priorities outlined in NOAA's 2009-2029 Education Strategic plan (<http://www.education.noaa.gov/plan/>), and will continue its scholarship, fellowship and education grants programs. NOAA will work with OSTP, NASA and NSF to implement the recommendations from the 2010 OSTP review of the GLOBE Program.



## FACILITIES

The NOAA Chief Administrative Officer (CAO), through the Facilities Management and Modernization Program, provides program direction and oversight to NOAA's major construction program and has been the focal point for facility master 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 owns more than 400 buildings, in addition to piers and other structures, which are valued at approximately over \$2.5 billion. These facilities are aging, with more than 30 facilities over 60 years old. NOAA's facilities are often subject to the extremes of weather and climate conditions, and are, therefore, more prone to unplanned repairs. This program provides funding to conduct facility condition inspections and supports investments in necessary facility repairs and modernization needed to ensure that the facilities remain safe, effective, and efficient in support of NOAA's programs. It also supports operations at NOAA's state-of-the-art laboratory building in Boulder, Colorado. This facility houses staff and programs from three NOAA line organizations (OAR, NESDIS, and NWS) as well as NOAA's program support units for the region, and supports NOAA's climate and weather research. The CAO organization is responsible for managing the total project life cycle for facility construction and modernization projects, including environmental and safety projects.

## OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)

### MARINE OPERATIONS

OMAO operates NOAA's fleet of vessels and provides ship support to NOAA programs through outsourcing, operational readiness, and maximum platform utilization in support of NOAA's at-sea data collection requirements. OMAO provides centralized management for operations, fleet planning, and maintenance support and is responsible for NOAA's fleet safety and diving programs. Other mission responsibilities include training and certifying NOAA Corps Officers, crews, and scientists for at-sea duty. OMAO also contributes funding and platform operation support to NOAA's Teacher-at-Sea program.

NOAA's vessels support nautical charting, fisheries research, marine environmental assessments, coastal-ocean circulation studies, and oceanographic and atmospheric research, and operate on both the East and West Coasts. The 19 active ships will perform approximately 3,390 operating days in FY 2011 in support of NOAA programs. The fourth of four newly constructed Fisheries Survey Vessels (FSVs), the Bell M. Shimada, will be operational in FY 2010 and will be homeported on the West Coast.

OMAO's Marine Operations Center (MOC) has Atlantic and Pacific regional offices located in Norfolk, Virginia, and Seattle, Washington, respectively, and the vessels are assisted by a small support staff at the home port of most ships. The centers provide maintenance, stores, supplies, and repair facilities for the vessels.

The NOAA Commissioned Corps is the nation's seventh and smallest uniformed service. NOAA Corps officers support the fleet and NOAA Line Offices. The majority of the NOAA Corps payroll is funded through the Marine Services line. The officers of the NOAA Corps command NOAA's research and survey vessels,



fly NOAA's "hurricane hunter" and environmental monitoring aircraft, support field operations, and serve in a variety of technical and management positions throughout the agency.

### **AVIATION OPERATIONS**

OMAO's Aircraft Operations Center (AOC), located at MacDill Air Force Base in Tampa, Florida, ensures the availability and readiness of NOAA's uniquely configured aircraft. AOC operates a fleet of 12 aircraft used as observation platforms equipped with comprehensive data-collection systems in support of missions related to the Earth's environment, coastal and marine resources, and severe weather.

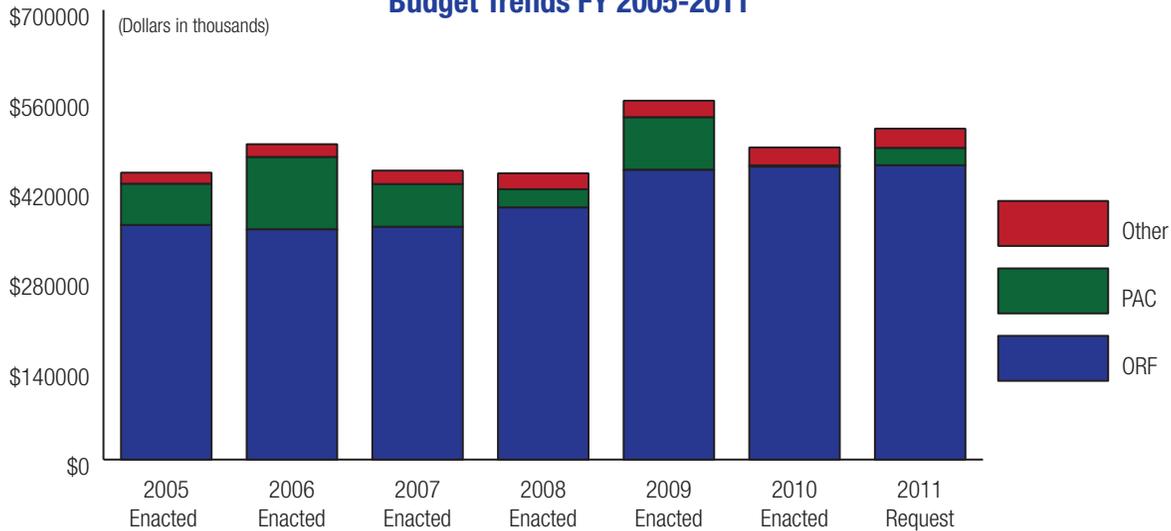
In FY 2011, Aircraft Services will provide approximately 2,845 flight hours in support of NOAA missions. NOAA aircraft are fitted with specialized instrumentation for airborne research, airborne data collection, and observation. Two of NOAA's three WP-3D aircraft (the "Hurricane Hunters") and the G-IV high-altitude jet will be mission-ready with instruments and personnel for hurricane surveillance, reconnaissance, and research during the hurricane season from June 1 to December 1. NOAA's third P-3 has a mission that includes air chemistry and air quality research, remote sensing, oceanographic research, and other missions not involving flights in severe weather. The G-IV will also be mission-ready with instruments and personnel to collect data for West Coast winter storm predictions from January 15 to April 1. NOAA's Jet Prop Commander and Shrikes will be mission-ready with equipment and personnel for snow radiation surveys, flood forecasts, water management, and other background surveys throughout the year in Alaska and Northern United States. The Twin Otters will continue to operate throughout the coastal Atlantic, Pacific, and Gulf of Mexico, surveying living marine resources and conducting remote sensing missions. NOAA's premier remote sensing aircraft, the King Air, will fly throughout the coastal United States responding and collecting damage assessment imagery, testing new remote sensing technologies, and performing coastal mapping missions.



## PROGRAM SUPPORT

(DOLLARS IN THOUSANDS)	FY 2009 ENACTED	FY 2010 ENACTED	FY 2011 REQUEST	INCREASE (DECREASE)
PS — ORF				
Corporate Services	\$205,809	\$205,203	\$223,024	\$17,821
NOAA Education Program	46,114	53,753	20,758	(32,995)
Facilities	21,000	30,346	36,406	6,060
Office of Marine & Aviation Operations	178,055	166,668	177,942	11,274
<b>Total Program Support - ORF</b>	<b>450,978</b>	<b>455,970</b>	<b>458,130</b>	<b>2,160</b>
Total, PS - PAC	81,750	2,000	26,800	24,800
Total, PS - Other	25,946	27,938	30,205	2,267
<b>GRAND TOTAL PS (Direct Obligations)</b>	<b>\$558,674</b>	<b>\$485,908</b>	<b>\$515,135</b>	<b>\$29,227</b>
<b>Total FTE</b>	<b>2,019</b>	<b>2,053</b>	<b>2,077</b>	<b>24</b>

**PROGRAM SUPPORT**  
Budget Trends FY 2005-2011



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

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



## FY 2011 ORF BUDGET SUMMARY:

NOAA requests a total of \$458,130,000 and 2,072 FTEs to support the continued and enhanced operations of Program Support. This total includes \$15,114,000 and 7 FTEs for Adjustments to Base, and a net program change of \$29,646,000 and 17 FTEs over the FY 2011 Base.

### **ADJUSTMENTS TO BASE:**

The above ATB request includes an increase of \$15,114,000 and 7 FTEs to fund the estimated FY 2011 Federal pay raise of 1.4 percent and annualize the FY 2010 pay raise of 2.4 percent. Program totals will provide inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, fuel, and rent charges from the General Services Administration.

### **PS - ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2011:**

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 7, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2011 Technical Budget.

### **PROGRAM SUPPORT**

#### **CORPORATE SERVICES**

**\$223,024,000**

NOAA requests an increase of \$16,898,000 and 11 FTEs in the Corporate Services sub-activity for a total of \$223,024,000 and 1,021 FTEs.

**Under Secretary and Associate Offices:** NOAA requests an increase of \$1,000,000 and 0 FTEs. This increase is comprised of one new initiative:

**Under Secretary and Associate Offices Base - NOAA General Counsel (GC): NOAA requests an increase of \$1,000,000 and 0 FTEs to enable NOAA GC to provide necessary legal support to NOAA programs.** Recent legislation and ongoing emergent issues have created additional requirements for legal support. One of the administration's priorities is the establishment of catch share programs in U.S. fisheries. Establishment and implementation of such a program will require intensive legal support in structuring the program. Without additional legal support, efforts to meet these new requirements will be delayed and vulnerable to legal challenge. With this requested increase, NOAA's Office of General Counsel will support the following NOAA activities: (1) limited access permit programs/catch shares under the Magnuson Stevens Fishery Conservation and Management Act, (2) Increased responsibilities to reduce illegal, unreported and unregulated fishing by foreign vessels on the high seas, including implementation and enforcement of the recently concluded FAO Port State Measures Agreement to Combat Illegal, (3) Unreported and Unregulated Fishing, Implementation of Western and Central Pacific Fishery Commission and Western Pacific Marine National Monuments, (4) Increased international responsibilities resulting from U.S. accession to the Law of the Sea Convention, which the U.S. is expected to join in 2010, (5) including delimitation of the outer boundary of the U.S. extended continental shelf, and (6) Consultations under the Endangered Species Act on alternative energy and other high priority projects.



**NOAA Wide Corporate Services & Agency Management:** NOAA requests an increase of \$11,198,414 and 7 FTEs. This increase is comprised of three new initiatives:

**Information Technology Infrastructure: NOAA requests an increase of \$4,000,000 and 2 FTEs to acquire, install, operate, and maintain the NOAA Single Enterprise Wide Area Network (WAN).** NOAA's current operating network is inefficient, with each Line Office (LO) and sub-LO operating under its own independent WAN. This creates numerous points of failure and duplicative efforts across LO's. Network management is uncoordinated with duplicate network operations staff and duplicative circuits, with multiple separate acquisitions. With this request, NOAA will implement a single, transitional backbone wide area network that will enable secure communications among NOAA locations, while providing economies of scale and more complete network management. NOAA will ensure timely delivery of NOAA data and information products (e.g., tornado warnings, hurricane forecasts, climate models, tide data) and allow secure, efficient, and highly-reliable transport of NOAA's exponentially-growing environmental data, while providing the foundation for the Department to implement its plan to meet the Office of Management and Budget (OMB) Trusted Internet Connections Initiative. NOAA's environmental information products and resource management services are essential public goods used in households across the nation. NOAA will continue to ensure that NOAA's observing and modeling systems provide high-quality information and data products for public use 24 hours a day, 7 days a week. NOAA strives to meet the needs of its constituents and partners by providing a suite of products and services that continues to improve in scientific and technical quality, economic value, and social relevance. This investment in IT infrastructure is essential for moving NOAA forward in achieving mission goals and serving society in the best way possible.

**Acquisitions and Grants Management: NOAA requests an increase of \$4,345,000 and 0 FTEs to support acquisition and grant services for NOAA.** The number of acquisitions awarded by the NOAA Acquisition workforce has increased by almost 300% in just 5 years. The Acquisition and Grants Office (AGO) currently performs approximately 16,000 acquisition actions and nearly 2,000 grants annually. As the NOAA acquisition workload has increased, the complexity of the acquisitions conducted and the level of contract administration oversight required have similarly increased. NOAA's AGO provides annual acquisition and grants support to DOC and NOAA valued at approximately \$2 billion (\$1 billion in grants awards, and \$1 billion in contract awards). These services equate to roughly a third of DOC's annual appropriation. The success of DOC and NOAA in accomplishment of missions and goals is largely dependent on the ability of the NOAA AGO to successfully obligate these funds in accordance with statutory and regulatory requirements. This requested increase will enhance NOAA's ability to provide dedicated personnel assets to increase the capacity of the acquisition and grants workforce sufficient to ensure successful obligation of the increasing volume of contractual and financial assistance actions. Additionally, requested funding will provide dedicated personnel and funding sufficient to implement an effective procurement oversight program. These resources will afford NOAA an opportunity to establish a Policy and Oversight Division (POD). The POD will implement recommendations made by the Government Accountability Office (GAO) in their June 2006 report to Congress (GAO-06-594, NOAA Acquisition Function).



**Department of Commerce Acquisitions Initiative: NOAA requests an increase of \$1,112,951 and 1 FTE to support implementation of a DOC wide acquisition intern program.** DOC's Acquisition workforce supports a diverse portfolio of acquisition instruments from construction of buildings, ships, plans, and satellites. To support the diversity of acquisition needs, the workforce must be agile, flexible and highly trained in the planning, solicitation, award, administration and close-out of acquisitions and financial assistance funding mechanisms. With this requested funding, DOC would establish a DOC Acquisition Intern (which is a three year, career ladder developmental program). As DOC's largest acquisition office, NOAA's robust acquisition community and expertise will serve the entire Department. All DOC Acquisition Interns would receive training and developmental assignments in multiple bureaus. This model would promote interoperability between bureaus, provide increased opportunities for employee growth and development, and foster a sense of organizational unity. The intern program will be tailored to the agency's needs and development and oversees the quality of the intern's training and development activities thereby producing greater results and effectiveness for agency specific acquisition mission needs.

**Acquisitions Staffing: NOAA requests an increase of \$795,463 and 4 FTEs to support an acquisition and grants services initiative to build acquisition capacity within the Department to handle the increasing workload of grants and contracts.** NOAA Acquisition and Grants Office provides support to lines of business and staff offices, and a number of other DOC bureaus, with the planning, solicitation, award, administration and close-out of acquisitions and financial assistance funding mechanisms. Through its services, DOC Acquisition and Grants helps execute its day-to-day responsibilities and assists the agency in providing critical services to the Nation. With this increase, each of the acquisition offices will fill critical vacancies to address the following: increased focus on strategic acquisition planning, increased focus on proactive contract administration, and increased focus on closing-out completed contracts. The additional capacity also would allow for more one-on-one time to develop junior-level acquisition personnel and to focus on strategic sourcing initiatives across the Department to leverage the buying power of the Department both across DOC and in partnership with other Federal agencies.

**NOAA Wide Corporate Services and Agency Management-HPSD-12: NOAA requests an increase of \$945,000 and 0 FTEs to support compliance with Homeland Security Presidential Directive-12 (HSPD-12), Personal Identity Verification-II (PIV-II) access requirements.** HSPD-12, PIV-II requires Agencies to comply with Federal Information Processing Standards (FIPS) 201 standards for secure and reliable identity credentials supporting both physical and logical (systems) access. NOAA has chosen to use the DoD CAC as NOAA's HSPD-12 solution. NOAA must ensure re-badging of over 16,400 employees and contractors and aims to complete 100% of that task in FY 2010. In FY 2011, NOAA will continue to badge new employees and replace expired PIV-II cards for existing employees. Funding from this requested increase will support: (1) Annual DoD infrastructure, technical, and database support for issuance of Common Access Cards (CAC) to NOAA employees/contractors--including database and systems maintenance, and help desk support, (2) Public Key Infrastructure PKI certificate licenses and DoD PKI support, (3) Planning and development of physical access control systems integration with CAC, (4) NOAA administrative costs for contractor support for NOAA-operated badging stations and (5) Replacing physical access control systems at the Silver Spring Metro Campus and Western Regional Center.



**Office of the Chief Information Officer:** NOAA requests an increase of \$4,700,000 and 4 FTEs. This increase is comprised of one new initiative:

**Enterprise IT Security: NOAA requests an increase of \$4,700,000 and 4 FTEs to improve Enterprise Information Technology (IT) Security by enhancing nationwide security monitoring and incident response and providing an incremental implementation of the NOAA Cyber Security Center (NCSC).** The frequency, sophistication, and maliciousness of cyber attacks in NOAA are rapidly increasing. Intrusion detection alerts are doubling every year. NOAA is at risk to data integrity losses, network failures, and website compromises that have a significant probability of compromising the collection, processing, and dissemination of forecast and warning information to the public and other government institutions, leading to the possible loss of life and property. With this requested increase, NOAA will reduce high vulnerability to cyber threats by: (1) providing needed cutting edge IT security technologies to support NOAA's infrastructure (maintaining state of the art monitoring equipment and near real-time IT security event correlation), (2) continuing reduction in the backlog and duration of incident investigations, (3) providing highly skilled IT security engineers, (4) improving Federal Information Security Management Act of 2002 (FISMA) mandated incident reporting capabilities, (5) improving research and development for testing and evaluation of applications and technologies prior to procurement and deployment, and (6) improving the identification and remediation of security weaknesses. Funding will also enable a new 5 x 12 security monitoring capability for the NCSC and enhance the existing 5 x12 incident response capability to cover moderate and high priority incidents. This increase will fortify critical IT support for accomplishing NOAA's mission, enable enterprise IT resource management, and ensure the confidentiality, integrity, and availability of NOAA environmental data collection, processing, and distribution systems.

**FACILITIES**

**\$36,406,000**

NOAA requests an increase of \$5,758,000 and 1 FTE in the Facilities sub-activity for a total of \$36,406,000 and 6 FTEs.

**NOAA Facilities Management, Construction, & Safety:** NOAA requests an increase of \$5,758,000 and 1 FTE. This increase is comprised of two new initiatives:

**NOAA Facilities Construction: NOAA requests an increase of \$5,000,000 and 0 FTEs to support major restoration and modernization projects to address critical facility condition deficiencies, and improve safety and operating conditions in support of NOAA's mission.** NOAA owns over 400 buildings valued at over \$2.5 billion. These buildings support NOAA's scientific and operational mission and programs, and are designed to provide a safe working environment for NOAA's employees and contractors—in laboratory and research space, offices, and operational buildings. NOAA's facilities are geographically dispersed and aging. As facilities age, repair and restoration of deteriorated or damaged building conditions or systems, replacement of building systems (roofs, HVAC, etc.), abatement of asbestos and other safety/environmental conditions, and installation of new systems to meet current fire safety code requirements is necessary to sustain operational capabilities and provide a safe working environment. With this re-



*The Marine Operations Center, Atlantic, is the National Oceanic and Atmospheric Administration's Atlantic Fleet Vessel Operations and Support facility located in Norfolk, VA*



requested increase, NOAA will support the completion of major restoration projects at NOAA's facilities, in order to address deteriorated building systems, and safety/environmental conditions. This funding will support the most critical major restoration and modernization projects (i.e., projects with estimated costs greater than \$2 million, but less than \$10 million), such as the replacement of the deteriorated bulkhead at the OMAO Marine Operations Center – Atlantic (MOC-A) facility in Norfolk, Virginia. The MOC-A facility is a federally-owned waterfront facility and is an important asset that serves as a centralized operations and administration center providing administration, engineering, logistics, operational support and maintenance for NOAA ships in the Atlantic and Gulf. The condition of the MOC-A bulkhead, which is forty-eight years old, has deteriorated severely increasing the safety risks at the Center and restricting and disrupting operations.

**Pribilof Islands Environmental Monitoring: NOAA requests an increase of \$758,000 and 1 FTE to restore funding for the long-term property transfer and environmental monitoring activities on Pribilof Islands.** The funding requested will provide the Office of the Chief Administrative Officer (OCAO) with the resources to manage the long-term responsibility for performance of property transfer activities, post environmental remediation monitoring and supporting well and landfill cap maintenance on the Pribilof Islands (St. Paul and St. George). Pribilof Islands remediation and long-term monitoring are mandated by a 1996 Two Party Agreement (TPA) between NOAA and the State of Alaska. Property transfers from DOC/NOAA to local island entities are mandated by a 1984 Transfer of Property Agreement (TOPA).

## OMAO

### MARINE OPERATIONS & MAINTENANCE

**\$147,655,000**

NOAA requests an increase of \$6,990,000 and 5 FTEs in the Marine Operations and Maintenance sub-activity for a total of \$147,655,000 and 931 FTEs. This increase is comprised of two new initiatives:

**Marine Services: NOAA requests an increase of \$790,000 and 5 FTEs for the Dive Center Improvement Plan.**

This request will address the findings released in the NOAA Florida Keys National Marine Sanctuary Dive Fatality Incident Report. To date, 21 of 33 recommendations have been completed and additional funding is required to address five of the remaining 12 recommendations to increase safety & reduce the number of dive-related incidents. With the additional funding NOAA will implement an on-site inspection program for all NOAA diving units, develop a diving standards and safety manual in conjunction with the Occupational Safety and Health Administration (OSHA), develop a web-based refresher training module in Oxygen Administration and Dive Procedures and Regulations, issue additional safety equipment, and develop a formalized science diver training and certification program specifically geared toward NOAA divers.



NOAA diver examining sea grass

**Fleet Planning and Maintenance: NOAA requests \$6,200,000 and 0 FTEs for Preventive, Corrective, and Deferred Ship Maintenance.** There has been an 89% increase in the number of significant mechanical/electronic failures as indicated in NOAA Ship Casualty Reports (CASREPS) – from 95 in FY 2005 to 180 in FY 2008 – and a 62% increase in Lost Days at Sea (DAS) for NOAA programs – from 184 DAS in FY 2005 to



299 DAS in FY 2008. With this request, NOAA will address deferred maintenance items and decrease the number of CASREPS that impact accomplished days at sea and scientific data collection for NOAA programs. Specifically this increase will eliminate the deferred maintenance backlog for electronics and marine engineering within five years and increase the preventative maintenance accomplishment rate. This increase supports NOAA's Ship Recapitalization Plan to ensure its oldest ships can operate until replacements are delivered and to bridge the operational period until a Major Repair Period can be funded. It also builds on major vessel maintenance and repair investments that were made during FY 2010 using American Recovery and Reinvestment Act of 2009 (ARRA) funding. The proposed increase also accelerates the accomplishment rate of OMAO's shipboard maintenance management program to enhance at-sea safety and ship productivity and to meet emerging regulatory requirements.