



Chapter 3

Operations, Research, and Facilities

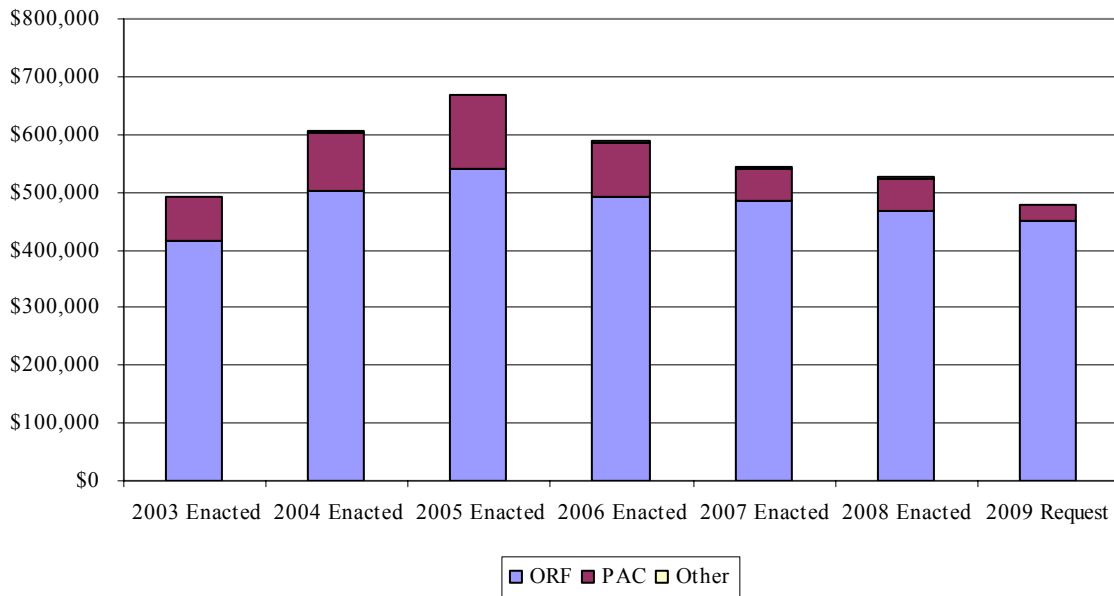


National Ocean Service

(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
National Ocean Service -- Operations, Research and Facilities (ORF)				
Navigation Services	\$165,891	\$141,576	\$149,026	\$7,450
Ocean Resources Conservation and Assessment	175,014	182,752	157,093	(25,659)
Ocean and Coastal Management	143,273	143,602	143,133	(469)
Total, National Ocean Service - ORF	484,178	467,930	449,252	(18,678)
Other National Ocean Service Accounts				
Total, National Ocean Service - PAC	56,945	56,599	27,385	(29,214)
Total, National Ocean Service - Other	1,000	11,600	11,600	0
GRAND TOTAL NATIONAL OCEAN SERVICE (Direct Obligations)	\$542,123	\$536,129	\$488,237	(47,892)
 Total FTE	 1,226	 1,236	 1,240	 4

Budget Trends, FY 2003– 2009

(Dollars in thousands)



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



NOAA's National Ocean Service (NOS) is the primary Federal agency working to preserve America's coastal resources. NOS provides observation, measurement, assessment, and management of the Nation's coastal and ocean areas, delivers critical navigation products and services, and conducts response and restoration activities. NOS balances environmental protection with economic development by providing the scientific, technical, and management expertise necessary to address the complex challenges of our coastal regions, including the Great Lakes.

An estimated 154 million people resided in coastal counties in 2004. The population in these coastal areas is expected to rise to approximately 165 million by the year 2015. This increase in density, coupled with the fast-growing economy of coastal areas, makes the task of managing coastal resources increasingly difficult. Growth in coastal areas creates jobs, generates economic prosperity, adds new industries, enhances educational opportunities, and increases tax revenues. However, it also burdens local environments, threatening the very resources that draw people to the coast.

As a national leader for coastal stewardship, NOS promotes a wide range of research activities aimed at better understanding 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. NOS provides improvements in the quality, quantity, geographic distribution, and timeliness of ocean and coastal observations. Observations by NOS assets and NOS partners are critical components of the Nation's Integrated Ocean Observing System (IOOS) as well as fundamental contributors to the Global Earth Observation System of Systems (GEOSS). NOS mapping, charting, geodetic, and oceanographic activities build on the marine and coastal observations collected to increase the efficiency and safety of marine commerce, and to more effectively manage coastal resources. NOS protects and restores coastal resources damaged by releases of oil and other hazardous materials. NOS also manages the Papahānaumokuākea Marine National Monument, marine



sanctuaries, and through partnerships with coastal states, manages and protects the Nation's valuable coastal zones and nationally significant estuarine reserves. Understanding of the coastal environment is enhanced through coastal ocean activities that support science and resource management programs. NOS helps federal, state, local, and international managers build the suite of skills needed to protect, restore, and use coastal ecosystems by providing technical assistance, process and technical training, and other capacity-building activities.

NOS contributes significantly to achieving two of NOAA's four Strategic Mission Goals: (1) support the Nation's commerce with information for safe, efficient, and environmentally sound transportation, and (2) protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management. While these two goals capture much of the National Ocean Service's activities, NOS also supports and makes important contributions to NOAA's other two mission goals: (1) understand climate variability and change in order to enhance society's ability to plan and respond, and (2) serve society's needs for weather and water information.

FY 2009 Budget Summary

NOAA requests a total of \$488,237,000 and 1,240 FTE to support the continued and enhanced operations of the National Ocean Service. This total includes \$4,613,000 for Adjustments to Base (ATB), and a net program change of \$49,482,000 and 3 FTE.

ADJUSTMENTS TO BASE:

The above ATB request includes a net increase of \$4,632,000 and 10 FTE to fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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 2009:

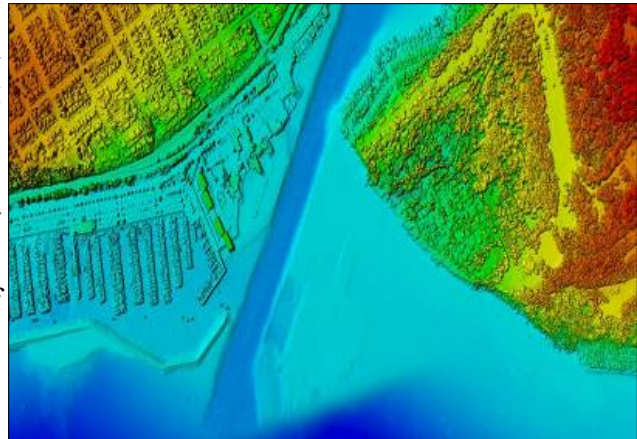
Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2009 Technical Budget.

Navigation Services \$149,026,000

A net increase of \$11,602,000 and 1 FTE above the base is requested in the Navigation Services subactivity, for a total of \$149,026,000 and 603 FTE. The FY 2009 President's Budget requests funding for a suite of navigation products and services which help ensure the safety of marine transportation, while improving the economic efficiency and competitiveness of American commerce. Of this increase, NOAA requests \$7,902,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President's Budget.



- **Mapping and Charting:** A net increase of \$1,700,000 and 0 FTE above the base for a total of \$94,788,000 and 312 FTE under the Mapping and Charting line item of the Navigation Services subactivity. Of this increase, \$7,175,000 will be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President's Budget.
- **NOAA requests an increase of \$1,000,000 and 0 FTE to manage the increasing size and quantity of hydrographic datasets collected by NOAA, contract and third-party data providers.** One of NOAA's primary missions is to deliver accurate nautical charts and related hydrographic information into the hands of mariners navigating on U.S. waters. Currently, however, the time between collection of data and production of nautical charts is too long, compromising navigation safety and limiting the value of survey backlog reduction. The data processing, storage and archiving must be modernized to accommodate increased volumes of data from contractors and new survey technologies. This requested increase upgrades NOAA's Information Technology (IT) capacity to support quick, reliable data transfer and storage of hydrographic survey data, in addition to an updated backup and recovery system that allows NOAA to transition away from tape media. The increase will prevent the loss of critical data from the large investment NOAA makes in hydrographic surveys. It will also enable direct access to all files and improve the flow of survey data from collection to processing, and on to users. The increase helps to bring NOAA's data management and processing capacity more in line with the rate of hydrographic data (the sonar "ping") collection. This data management systems upgrade is a key part of NOAA's goal to reduce "ping to chart" time and improve NOAA's ability to process the data and get it to nautical chart users in a timely fashion.



The requested funds will allow NOAA to begin overhauling the storage and communications capacity of NOAA survey platforms and the processing branches to improve reliability and accommodate the expected increases in data volume in a robust way by:

- Acquiring the necessary communication bandwidth sufficient to mirror collected and processed data for all collection and processing points;
- Establishing and maintaining a central data repository with sufficient space to store, archive and meet Continuity of Operations (COOP) requirements at NOAA's National Geophysical Data Center in Boulder, Colorado;



- Transferring data currently stored on tape that can degrade and corrupt to the new archive system and phasing out long term tape storage; and
- Implementing continual upgrades to data storage, software and maintenance at the processing branches and on NOAA hydrographic platforms.
- **NOAA requests an increase of \$700,000 and 0 FTE to begin incorporating Autonomous Underwater Vehicles (AUV) into hydrographic survey operations.** Incorporating AUVs will maximize existing survey platform capacity, allowing multi-mission operations that collect more data on each survey project in less time.

NOAA's research into hydrographic AUVs has occurred on a small scale in partnership with the Defense Department's Technology Support Working Group to assess the utility of AUVs in underwater object detection for Homeland Security. By FY 2009, Phase 1 AUVs will be ready for deployment. Additional funding is needed for deployment and continued research into a Type 2 AUV that will enhance AUV functionality by carrying multibeam sensors to further satisfy NOAA's survey requirements. The requested funds will improve navigation safety by enabling NOAA to transition from ongoing AUV research to AUV operations in FY 2009. AUVs can gather more survey data faster and can operate in areas where surface vessels cannot, such as rough seas or between sheltered inshore and open water.



The integration of AUVs into NOAA's current hydrographic survey operations has the potential to:

- Increase survey launch performance by 25 percent, and coverage by approximately 50 square nautical miles per year per AUV. AUVs decrease the cost per square nautical mile of surveying;
- Increase efficiency by deploying personnel and fleet resources to survey complicated inshore areas while using AUVs to survey relatively simple regions in open water;
- Increase survey operation hours: since AUVs operate while submerged, they can acquire more high-quality data under a wider range of weather conditions than surface vessels, leading to less surveying downtime; and
- Increase accuracy and efficiency in ship-based multibeam surveys by using AUVs to



automate water column sampling for data validation.

- **Tide and Current Data:** A net increase of \$2,195,000 and 1 FTE above the base for a total of \$28,837,000 and 108 FTE are requested under the Tide and Current Data line item of the Navigation Services subactivity. Of this increase, \$195,000 will be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.
- **NOAA requests an increase of \$2,000,000 and 1 FTE to improve and expand the delivery of real time and forecasted navigation information through the PORTS® and Operational Forecast Model Programs.** Accurate, reliable, and timely information is critical to ensure that marine transportation at U.S. ports is safe and efficient, thus enhancing commerce and economic growth, and protecting the environment from marine accidents that can spill hazardous materials and cause other damage. The Physical Oceanographic Real Time System (PORTS®) Program is a cost shared partnership program that provides US Marine Transportation System (MTS) users with access to quality controlled real time oceanographic and meteorological data critical for safe and efficient navigation. PORTS® is a decision support tool that integrates and disseminates real-time environmental observations, forecasts and other geospatial information. Coupling PORTS® data to a nowcast/forecast model that projects accurate environmental forecasts 24-30 hours into the future significantly expands the window of time a user has accurate information with which to make important safety and efficiency decisions.

To support the further expansion of PORTS®, the requested funds will support NOAA’s ability to work with an expanding circle of partners, to quality control and manage the increasing volume of continuous real time data collected by PORTS® instruments and sensors, to ensure that sensor performance issues are promptly analyzed and corrective actions implemented to minimize sensor down times, to operate additional nowcast/forecast models, and provide adequate customer outreach, onsite management and product feedback.

Tailored to the specific needs of local communities, PORTS® measures, integrates, and disseminates observations of water levels, currents, salinity, wind, and bridge clearance, all of which help mariners successfully guide ships into and out of the nations busiest ports. A recent study indicates that the PORTS® program in Houston-Galveston reduced groundings by over 50% and has economic impacts of \$14-\$18M





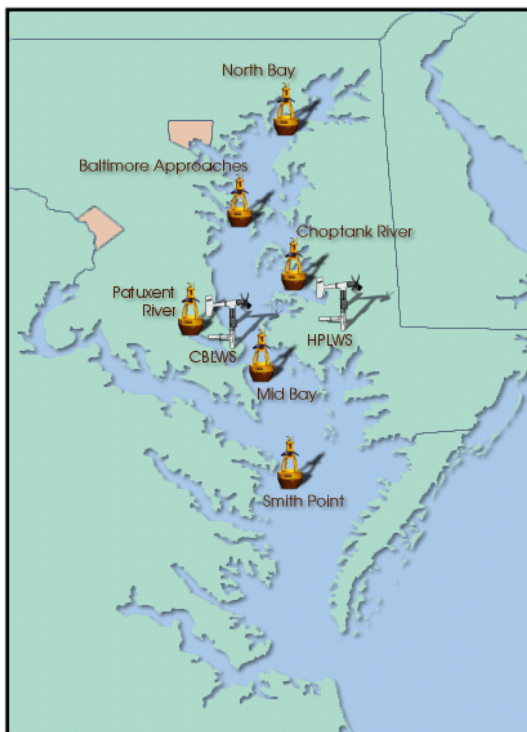
annually. This year, NOAA recently installed the 14th PORTS[®] in Mobile, Alabama. The Port of Mobile is the only deep-water port in the State of Alabama and the 11th largest in the United States.

Ocean Resources Conservation and Assessment

\$157,093,000

A net increase of \$21,605,000 and 2 FTE above the base is requested under the Ocean Resources Conservation and Assessment subactivity for a total of \$157,093,000 and 421 FTE. NOAA requests an increase of \$5,837,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **Ocean Assessment Program:** \$12,034,000 and 1 FTE in net increases above the base, for a total of \$86,080,000 and 69 FTE, are requested under the Ocean Assessment Program line item of the Ocean Resources Conservation and Assessment subactivity. Of this increase, \$34,000 will be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.
- **NOAA requests an increase of \$7,000,000 and 0 FTE for the Integrated Ocean Observing System (IOOS).** This requested increase will: 1) support a national technical capability within NOAA (\$3.0M); 2) improve capacity for the data assembly center at the National Data Buoy Center (\$1.0M) in Stennis, Mississippi; and 3) provide additional support for the regional component of IOOS (\$3.0M).



IOOS implementation requires intensive coordination and cooperation among existing ocean observing activities and capabilities at the federal and regional levels, including the publication and adoption of standards necessary to operate IOOS both within a national and global framework. To this end, NOAA will continue to build a dedicated IOOS Program with technical capabilities to serve as the hub for coordinating and integrating IOOS activities across NOAA and among Federal agencies, regions, and States. The NOAA IOOS Program is working to 1) establish the national structure for the adoption of standards necessary to operate IOOS both within the National and International Framework, 2) bring the capacity of the regional components and the Federal components into an operational status, and 3) assess the



operational gaps and ensure regional IOOS components develop regional system design plans.

Through the National Data Buoy Center, NOAA has pioneered the 24/7 delivery of quality controlled real-time data to create a more highly resolved picture of available in-situ coastal conditions and provide the initial quality control checks of this data before delivering to the Global Telecommunications System (GTS). The pilot effort has demonstrated the ability to deliver 2.5 million quality controlled real-time observations per year from regional IOOS components. With the requested increase, NOAA will transition this capability to operational status and maintain the existing data delivery capability. Specifically, the requested funding will be used to purchase contract support for data processing and QA/QC support.

NOAA is also working to develop the regional component of IOOS, which complements Federal ocean observing assets by providing additional data, models, and information products tailored to the economic and environmental requirements of the community. Integrating Federal and regional observing system assets will improve our understanding, forecasting, stewardship, and use of coastal waters. Ultimately an integrated approach will allow optimization of observing system investments and provide a consistent capability for all users. NOAA will continue to support the regional component of IOOS (both the Regional Associations (RAs) and the Regional Coastal Ocean Observing Systems (RCOOSs)). The requested increase of \$3M will allow NOAA to increase the level of funding available for its competitive selection process of grants and cooperative agreements establishing a regional network of observing systems to serve National and regional needs for ocean observing data and information services.

- **Ocean Research Priorities Plan: NOAA requests an increase of \$5,000,000 and 0 FTE for forecasting the response of coastal ecosystems to persistent forcing and extreme events.** This increase supports one of the near-term priorities identified by the Ocean Research Priorities Plan (ORPP) -- Response of Coastal Ecosystems to Persistent Forcing and Extreme Events. These funds will be used to develop and integrate decision-support tools to help policy makers and managers (coastal, resource, and emergency) anticipate, prepare for and respond to extreme weather events, natural disasters, and changing natural and human influences. Reducing economic, environmental, and social losses requires collaboration at all levels and a coordinated interagency approach. Key federal partners



include the U.S. Geological Survey, the Environmental Protection Agency, the US Army Corps of Engineers, and the National Science Foundation. Activities include community inundation and ecosystem modeling; building a geospatial framework and digital elevation models.

These efforts not only support one of the near-term priorities of the ORPP, but also support efforts outlined in the U.S. Group on Earth Observations and NSTC Subcommittee on Disaster Reduction's Improved Observations for Disaster Reduction: Near-Term Opportunity Plan. Efforts will initially focus on two pilot regions: the northern Gulf of Mexico and the Great Lakes. For the pilot regions, managers and officials will have the tools and resources to ensure that decisions about land and resource use, management practices, and development in the coastal zone and adjacent watersheds can be evaluated with a complete understanding of the probable effects on public health, coastal ecosystems, and community hazard resilience. Within the pilot areas, the leveraging of capabilities across all sectors, the development of regionally relevant decision support tools, and the lessons learned will lead the way for broader national implementation. In addition, NOAA and the USGS will support competitive research proposals to compare various coastal inundation models and develop the observation requirements associated with these models.

- **Ocean Research Priorities Plan: NOAA requests an increase of \$5,000,000 and 1 FTE to develop sensors for rapid detection of pathogens, harmful algae, and their toxins.** This increase supports one of the near-term priorities identified by the ORPP – Sensors for Marine Ecosystems. The ability to rapidly and accurately monitor and assess biodiversity and marine ecosystem health, from the genetic to the ecosystem level, is an essential component of any effort to protect human health and to more effectively implement an ecosystem approach to resource management. Efforts to develop marine genomic tools and technologies and employ them to construct biosensors are just beginning and must be supported in order to garner a more complete understanding of ecosystem health and the effects of environmental stressors on marine organisms and humans.



The \$5.0 million will provide funds for in-situ sensor development. In addition, funds would be used to develop genomic libraries and associated information to support DNA-based identification of a range of marine organisms. Finally, funds would also be used to improve video plankton recorders and related technology. This increase is consistent with the goals and objectives of the Oceans and Human Health Initiative strategic plan.



- **NOAA requests a decrease of \$6,496,000 and 0 FTE for the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET).** This reduction reflects a reassessment of NOAA’s required level of funding. This reduction is taken to reallocate funding to a competitive research grants program that will be administered by the National Estuarine Research Reserves System (NERRS) Program. Funds will be used to conduct research and transform the best available science into practical innovative tools that coastal managers can use to detect, prevent and reverse the impacts of coastal pollution and habitat degradation. Coastal and estuarine managers need to better understand what tools are available, how well they work, and how best to apply them to detect, prevent, and reverse the impacts of coastal pollution and habitat degradation.
- **Response and Restoration:** \$4,708,000 and 1 FTE in net increases above the base, for a total of \$22,454,000 and 111 FTE, are requested under the Response and Restoration line item of the Ocean Resources Conservation and Assessment activity. Of this increase, \$708,000 will be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.
- **NOAA requests a restoration of \$5,245,000 in base funding for a total of \$17,266,000 and 110 FTE for response and restoration activities of the Ocean Resources Conservation and Assessment subactivity.** NOAA’s Office of Response and Restoration (OR&R) responds to approximately 100 significant oil or chemical spills each year as scientific advisors to the U.S. Coast Guard, and provides cleanup solutions to agencies that protect and restore coastal resources at more than 200 hazardous waste sites each year along the Nation’s ocean and Great Lakes coasts. Specifically, OR&R works with the U.S. Coast Guard to forecast the movement and behavior of spilled oil and chemicals, evaluates the risks to resources, and recommends protective and clean up actions. When oil or hazardous substances threaten or injure coastal and marine resources, NOAA and other Federal and state natural resource trustees are responsible for ensuring that cleanup actions protect those resources from further injury; for assessing and recovering natural resource damages to restore the injured resources; and for seeking compensation on behalf of the public for the loss of services that the natural resources provided.
- **NOAA requests an increase of \$4,000,000 and 1 FTE to implement the Marine Debris Research, Prevention, and Reduction Act.** This request supports NOAA’s commitment to implement the Administration’s Ocean Action Plan and the Marine Debris Initiative (announced in November, 2007).





Every year, marine debris injures and kills marine wildlife, harms ocean habitats, interferes with navigation safety, causes economic losses to shipping, fishing, and coastal industries, and poses a threat to human health. The urgent need to address marine debris has been highlighted by a number of recent events. For example, the permanent protection of the Northwestern Hawaiian Islands as a Marine National Monument highlighted their vulnerability to



derelict fishing gear and plastic debris. In the Gulf of Mexico, the tremendous amount of marine debris generated by Hurricane Katrina continues to threaten navigation safety and fishermen’s livelihoods throughout the region. These events and others add to the growing awareness of the extent and impacts of debris on the Nation’s resources.

Human impacts are significant as well. Coastal communities spend millions of dollars cleaning up marine debris on their beaches. U.S. ports and harbors are in a constant battle to keep the nation’s waterways free of hazardous debris and allow maritime commerce to flow efficiently.

To protect NOAA trust resources and fishing livelihoods, it is essential to identify marine debris locations, types, and densities in known hotspots such as the Gulf, the Northwestern Hawaiian Islands, Alaska, Puget Sound, the Chesapeake Bay, and the eastern coast of Florida. With the \$4 million requested, NOAA will provide competitive grants and develop the first Federal information clearinghouse on marine debris. This clearinghouse will track all research, assessments and removal efforts around the U.S. and identify needs to be supported by competitive grants. Targeted prevention and removal activities will protect the nation’s trust resources and navigation safety from the threats of marine debris, with special emphasis on NOAA’s National Marine Sanctuaries and Monument and other areas where habitats and marine species are most threatened by derelict fishing gear, plastics, and other marine debris.

Ocean and Coastal Management

\$143,133,000

A net increase of \$9,140,000 and 0 FTE above the base is requested for a total of \$143,133,000 and 199 FTE for the Ocean and Coastal Management subactivity. The Nation’s ocean and coastal areas represent some of the most ecologically and economically important regions and this request will continue to support and advance NOAA’s important work to sustain these regions. This increase includes \$3,908,000 and 0 FTE to restore funding to complete projects that



were anticipated in the FY 2008 President's Budget but were not able to be completed with the FY 2008 Omnibus Language.

- **Coastal Management:** A net increase of \$9,140,000 and 0 FTE above the base, for a total of \$98,755,000 and 56 FTE under the Coastal Management line item of the Ocean and Coastal Management subactivity.

- **NOAA requests an increase of \$5,232,000 and 0 FTE to establish a competitive national coastal and estuarine research and technology program which operates in partnership with the National Estuarine Research Reserve System (NERRS).** Funds will be used to conduct research and transform the best available science into practical innovative tools that coastal managers can use to detect, prevent and reverse the impacts of coastal pollution and habitat degradation. Coastal and estuarine managers need to better understand what tools are available, how well they work, and how best



to apply them to detect, prevent, and reverse the impacts of coastal pollution and habitat degradation.

Every year, new residents and visitors pour into coastal areas, and with them come development and impacts to coastal and estuarine resources. New homes, roads, parking lots and businesses enrich local economies, but they can also compromise the very qualities that make coastal living so attractive - clean water, thriving ecosystems, and the natural beauty where the land meets the sea. Balancing the use of coastal and

estuarine resources with the need to protect human and environmental health is a national challenge for coastal resource managers. To address it, coastal managers need the right science, tools, and technologies.

Using the system of 27 National Estuarine Research Reserves and state agency and university partners as living laboratories for research and development of science-based solutions to coastal pollution and habitat degradation, the requested increase will foster targeted, competitive research to understand the impacts of human activities on coasts and estuaries through the development of demonstrated and applied tools and technologies to detect, prevent, or reverse impacts. These tools and technologies can then be operationalized through the NERRS sites, National Marine Sanctuaries, and other NOAA programs. This effort will catalyze collaboration across geographic and organizational boundaries, bringing local, State, and Federal government, academia, cooperative insti-



tutes, and the private sector together to work on solutions to coastal and estuarine environmental problems.



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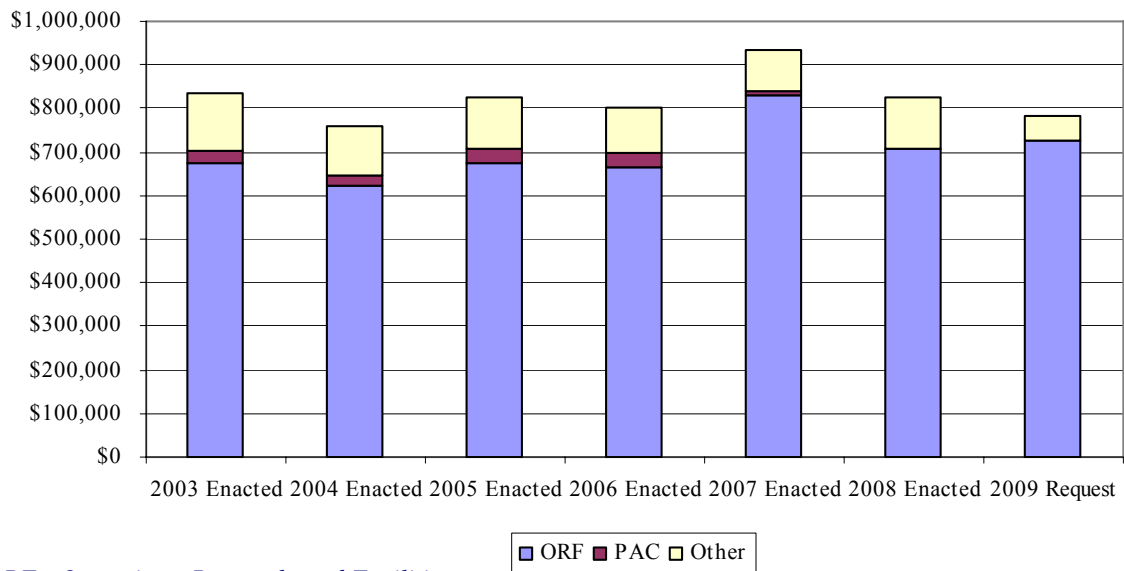


National Marine Fisheries Service

(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
National Marine Fisheries Service -- Operations, Research and Facilities (ORF)				
Protected Species Research and Management	\$141,015	\$163,992	\$167,241	\$3,249
Fisheries Research and Management	301,580	327,260	344,806	17,546
Enforcement and Observers	78,126	84,894	89,085	4,191
Habitat Conservation and Restoration	43,544	50,245	43,405	(6,840)
Other Activities Supporting Fisheries	213,721	81,949	79,674	(2,275)
AK Composite Research & Development Program	50,730	0	0	0
Total, National Marine Fisheries Service - ORF	828,716	708,340	724,211	15,871
Other National Marine Fisheries Service Accounts				
Total, National Marine Fisheries Service - PAC	11,190	2,021	0	(2,021)
Total, National Marine Fisheries Service - Other	94,023	118,722	58,112	(60,610)
GRAND TOTAL NATIONAL MARINE FISHERIES (Direct Obligations)	\$933,929	\$829,083	\$782,323	(\$46,760)
Total FTE	2,586	2,625	2,651	26

Budget Trends, FY 2003– 2009

(Dollars in thousands)



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



NOAA's National Marine Fisheries Service (NMFS) is responsible for the management and conservation of living marine resources within the United States Exclusive Economic Zone (EEZ), the area extending from three to 200 nautical miles from the U.S. coastline. NMFS also 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.

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 ocean and coastal resources including fish, invertebrates, sea turtles, whales, and other marine and coastal species and their habitats. NMFS is charged with balancing these protection mandates with multiple uses and interests in 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 2009, NMFS will continue to focus its resources on building and maintaining fish stocks at productive levels; improving the status of overfished fisheries and 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 2009, NMFS will continue to support new requirements under the reauthorized Magnuson-Stevens Act including an end to overfishing, promote market-based management approaches, improve recreational fisheries data collection, reduce bycatch of protected living marine resources, and address illegal, unregulated, and unreported (IUU) fishing.

In addition, the Administration's U.S. Ocean Action Plan specifies that an effective U.S. ocean policy must be grounded in an understanding and management of ecosystems. This ecosystem approach is the principal management tool that will help NMFS meet its immediate and long-term goals, including:

- Implementing the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (MSRA);
- Doubling the number of Limited Access Privilege Programs (LAPPs) to 16 by 2010;
- Building a strong aquaculture program;
- Ending overfishing;
- Providing adequate consultations under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA);
- Ensuring effective science and management;
- Strengthening environmental compliance for defense and energy-related activities in our oceans and coastal areas;
- Serving as an environmental leader, domestically and internationally.

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 2009 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.

FY 2009 Budget Summary

NOAA requests a total of \$782,323,000 and 2,656 FTE to support the continued and enhanced operations of the National Marine Fisheries Service. This total includes \$10,145,000 for Adjustments to Base (ATB), and a net program change of \$34,318,000 and 45 FTE.



ADJUSTMENTS TO BASE:

The above ATB request of \$9,086,000 and 20 FTE is to fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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.

NMFS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2009:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2009 Technical Budget.

The Reauthorized Magnuson-Stevens Fishery Conservation and Management Act (MSRA)

NOAA requests \$31.8 million for a total of \$45.4 million for activities supporting the mandates of the reauthorized Magnuson-Stevens Act of 2006. The new requirements under MSRA to end overfishing in federal waters include improving fisheries management and data collection procedures, employing market-based approaches to management, addressing issues in management of International fisheries, and expanding the use of ecosystem-based approaches to management. The major components of this initiative are detailed in the sub-activities below.

Protected Species Research and Management \$167,241,000

A net increase of \$10,097,000 and 7 FTE above the base is requested in the Protected Species Research and Management sub-activity, for a total of \$167,241,000 and 670 FTE. Of this increase, NOAA requests \$1,261,000 and 0 FTE to increase the base level of funding for other protected species programs to that recommended in the FY 2008 President’s Budget.

- **Marine Mammals: NOAA requests an increase of \$1,500,000 and 7 FTE for a total of \$41,340,000 to conduct conservation and recovery actions for marine mammals.** This increase will maintain efforts to reduce the bycatch of marine mammals in fisheries, implement non-fishery-related conservation actions, respond to strandings of marine mammals, and improve permit issuance efficiency. Specific activities supported by these funds include stranding and unusual mortality event (UME) response coordination, collection and analysis of samples from strandings/UMEs, protected species stock assessments, Take Reduction Team activities, and permitting. This increase will enhance NMFS capability to





conserve and recover marine mammals, particularly for developing precise estimates of population status and identifying and mitigating human causes of injury and death of marine mammals. These funds will also enable NMFS to sustain the reduction in time required for processing permits that has been achieved since 2005.

- **Pacific Salmon: NOAA requests a net increase of \$3,169,000 for a total of \$62,879,000 for Pacific Salmon.** This net increase includes increases of \$9,224,000 for the Pacific Salmon ESA Recovery and Research line item. The ESA Pacific salmon program conducts ESA listings; develops recovery plans; issues research, enhancement, and incidental take permits; develops habitat conservation plans; completes ESA section 7 consultations; and implements recovery actions for Pacific salmon. The program provides a foundation for Pacific salmon recovery on the West Coast and at the requested level will allow NOAA to meet its basic ESA requirements and maintain the core activities of baseline monitoring. This request also includes a decrease of \$6,055,000 to the Columbia River Biological Opinion to address higher priority needs.
- **Atlantic Salmon: NOAA requests \$4,167,000 for a total of \$9,996,000 to support the recovery of endangered Atlantic salmon and to address habitat needs in key watersheds historically used by Atlantic salmon.** Due to habitat impacts such as dam construction, pollution, and over-harvesting, Atlantic salmon populations have declined precipitously throughout their range. With the requested funds, NOAA will support ecosystem-based habitat restoration efforts to improve habitat for all stages of the salmon life cycle. NOAA will provide technical assistance to projects addressing river barriers and habitat threats that prevent Atlantic salmon from utilizing upstream habitat critical for reproduction and growth. This funding supports the Atlantic Salmon Recovery Plan and will supplement ongoing management and research recovery efforts.

Fisheries Research and Management

\$344,806,000

A net increase of \$48,869,000 and 34 FTE above the base is requested in the Fisheries Research and Management sub-activity, for a total of \$344,806,000 and 1,485 FTE. Of this increase, NOAA requests \$21,927,000 and 12 FTE to increase the base levels of funding for various ongoing programs within this sub-activity to that recommended in the FY2008 President's Budget.

- **Fisheries Research and Management Programs:** \$21,505,000 and 19 FTE in net increases above the base, for a total of \$159,585,000 and 1,386 FTE, are requested under the Fisheries Research and Management line item. Of this increase, \$6,629,000 and 0 FTE to increase the base level of funding for other protected species programs to that recommended in the FY 2008 President's Budget.
- **NOAA requests an increase of \$5,050,000 and 0 FTE for a total of \$6,050,000 for Council Committees, Annual Catch Limits and Stipends to support the new re-**



requirements of the Magnuson Stevens Fishery Conservation and Management Act (MSRA). NMFS requests an increase of \$5,050,000 to enhance the independent peer-review process for scientific data required to appropriately set the annual catch limits for all managed fisheries. To reach the goal of ending overfishing by 2010 required under MSRA, NMFS will support the payments or stipends to the Councils' Scientific and Statistical Committees (SSC) and enhance the interaction with the domestic Councils. This request will support the independent peer review of scientific data (including stock assessments), and will provide recommendations for the sustainable management of marine fisheries resources that are under NMFS purview. The funds will also support stipends for non-government-employee SSC members to cover their participation at meetings so these committees can attract and retain high-quality scientists. In addition, this funding will provide support to NOAA to ensure that annual catch limits are developed and implemented consistently with the administrative procedural requirements of the National Environmental Policy Act, the Magnuson-Stevens Act, the Endangered Species Act, the Marine Mammal Protection Act, and other laws and Executive Orders.



- **NOAA requests an increase of \$250,000 and 1 FTE for a total of \$750,000 for the Pacific Whiting Treaty implementation.** NMFS will use the requested funding to work with its Canadian counterparts to establish an advisory panel, joint management and technical committees, as well as the scientific review group required for implementation of the Pacific Whiting Treaty as required under the reauthorized Magnuson-Stevens Act. This process will lead to a sustainable Pacific Hake/Whiting fishery and sustained economic benefits to the U.S. fleet.
- **NMFS requests an increase of \$1,000,000 and 3 FTE for a total of \$1,000,000 to provide leadership for the U.S. delegation to the Western and Central Pacific Fisheries Commission (WCPFC) as mandated by MSRA.** The WCPFC is a new regional fishery management organization responsible for the conservation and management of highly migratory fish stocks in the Western and Central Pacific Ocean. NMFS will work to ensure the long-term sustainability of highly migratory fish stocks in the Convention area and ensure that measures taken to achieve this objective are based on the best scientific evidence available.
- **NOAA requests an increase of \$4,826,000 and 8 FTEs for a total of \$6,000,000 to**



support the Administration's goal to double the number of Limited Access Privilege Programs (LAPPs). LAPP programs—e.g., individual fishing quota (IFQ), community development, cooperative, and area-based quota programs— can reduce overcapacity and end the “race for fish.” The Administration's *U.S. Ocean Action Plan* committed to the greater use of these market-based systems for fisheries management, and subsequently set a goal to double the eight programs in place in 2006 to 16.

- **NMFS is requesting an increase of \$3,750,000 and 0 FTE for a total of \$5,000,000 to restore funding to improve forecasting of marine ecosystem responses to management strategies through the Comparative Analysis of Marine Ecosystems Organization (CAMEO).** This activity is a near-term priority of the Administration's Ocean Research Priorities Plan. This request will support research focused on developing cutting-edge quantitative models and science-based forecasting tools to assess how marine ecosystems respond to human impacts and environmental variation. NOAA's request for CAMEO will improve the management of the nation's marine ecosystems, as recommended in the Administration's *U.S. Ocean Action Plan*, by advancing our understanding of the underlying dynamics affecting ecosystem processes at various scales. This request will not only provide a greater basic understanding of these processes but will support enhanced coordination between resource management communities and the ocean science community.
- **Expand Stock Assessments: NMFS requests an increase of \$8,484,000 and 10 FTE for a total of \$8,484,000 to initiate new and expand existing sampling programs and management procedures to end overfishing in all fisheries by 2011.** NMFS' stock assessments provide the scientific and technical basis for setting Annual Catch Limits, a requirement of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 and an integral component of the President's U.S. Ocean Action Plan. NMFS will update fish stock assessments from to produce the best technical advice to the Fishery Management Councils and support the implementation of Annual Catch Limits (ACL). This increase will also support fishery independent surveys, expand fishery-dependent biological sampling at sea and in ports, and develop enhanced stock assessment models to improve ACL forecasts. This initiative provides high quality scientific data for NMFS and Regional Fishery Management Councils to promote the use of a market-based system for fisheries management. This investment will help prevent overfishing for additional fish stocks and provide more timely determinations when overfished stocks have been rebuilt. NMFS' enhanced stock assessment research will provide a comprehensive understanding of living marine ecosystems to meet the environmental, economic, and public safety needs of the nation.
- **Fisheries Statistics: NOAA requests an increase of \$3,015,000 and 0 FTE for a total of \$6,515,000 to complete the final implementation phase of a new registry system for recreational fishermen and for-hire fishing vessels by January 1, 2009.** NMFS must meet this congressionally-mandated deadline to execute the new requirements of the



Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 pertaining to improvements in data collection, the redesign of survey and statistical methodologies, and coordination between state and federal programs. This request will enable NMFS to launch a marine recreational information program that provides the most accurate data on recreational catch and fishing effort. High-quality data on recreational fishing trends will lead to confident decision-making about how best to conserve marine ecosystems for present and future generations. NMFS will lead state and federal cooperative efforts to establish regionally-based federal registry programs for anglers and for-hire fishing vessels. NMFS will also implement

appropriate methodological improvements that will utilize the registries and improve the comprehensiveness, accuracy, and timeliness of recreational fisheries statistics needed to support fish stock assessments and fishery management decisions.

- **Bycatch Reduction: \$567,000 and 0 FTE for a total of \$567,000 is requested to implement the MSRA-mandated Bycatch Reduction Engineering Program to reduce mortality of non-target species and keep fisheries open by minimizing impacts to protected species.** Bycatch of non-target species and habitat damage from fishing gear are two of the most serious impacts of fishing activities. These funds will support development of gear technology to reduce bycatch of fish, seabirds, and protected species such as sea turtles and marine mammals. NOAA will provide grants to partner organizations to develop bycatch reduction techniques and encourage adoption of these new gears and fishing techniques to reduce adverse fishing gear effects.

Enforcement and Observers/Training

\$89,085,000

A net increase of \$3,179,000 and 4 FTE above the base is requested in the Enforcement and Observers/Training subactivity, for a total of \$89,085,000 and 255 FTE. Of this increase, NOAA requests \$2,095,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.



- **Enforcement: NMFS requests an increase of \$1,084,000 and 4 FTE for a total of \$2,584,000 for Enforcement and Surveillance. This funding will allow NOAA to address the Illegal, Unregulated and Unreported (IUU) fishing requirements in the Reauthorized Magnuson-Stevens Act.** Specifically, the funding will support NOAA’s efforts to control and reduce IUU fishing on the high seas by reducing the amount of IUU product imported into the United States. The increase will provide for con-



tinued active participation within Regional Fishery Management Organizations; and will expand collaboration with the U.S. Coast Guard, U.S. Customs and Border Protection, the U.S. Fish and Wildlife Service, the U.S. Food and Drug Administration, and the U.S. Department of Agriculture in their efforts to control illegal trade in regulated products from living marine resources.

Habitat Conservation and Restoration

\$43,405,000

A net decrease of \$1,149,000 and 0 FTE from the base is requested in the Habitat Conservation and Restoration sub-activity, for a total of \$43,405,000 and 234 FTE. Of this increase, NOAA requests \$1,496,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **Sustainable Habitat Management:** NMFS requests an increase of \$1,500,000 and 0 FTE for a total of \$1,500,000 to implement the new Deep Coral Research and Technology Program mandated by Congress in the reauthorized Magnuson-Stevens Act. NMFS will use funding to understand and provide information needed to protect deep coral habitats. Deep sea corals serve as habitat for rich and diverse fish and invertebrate communities, including some commercially important fish species, such as grouper, snapper, sea bass, rockfish, and crab. The funds sought will support pilot projects undertaken by NOAA and in coordination with the Fishery Management Councils, other federal agencies and research institutions to understand the ecology of deep sea coral communities, to monitor fishing and other activities in locations where deep-sea corals are known or are likely to occur, to locate and map locations of deep-sea corals, and to report annually on steps taken by NOAA to the public.



- **Fisheries Habitat Restoration:** NOAA requests an increase of \$5,397,000 to the Open Rivers Initiative for a total of \$7,000,000 to restore stream miles of fish habitat through watershed-level projects with multiple fish passage opportunities. The ORI builds on NOAA's existing capabilities in barrier removal projects and employs a cooperative model (i.e., working with state and local agencies, NGOs, and dam owners) to remove dam and river barriers.



ers in coastal states. The \$5,397,000 increase will address on-the-ground river enhancements that restore lost fish habitat. The model catalyzes partnerships at the national and local levels by providing funding, technical assistance, and encouraging volunteer stewardship. Using a community-based model, NOAA has removed more than 80 dams and stream blockages, opening 700 miles of high quality river habitat for migratory fish. These projects enhance river and coastal ecosystems and provide benefits to communities residing near these barriers.

- **Penobscot River Habitat Restoration:** NOAA requests a decrease of \$10,000,000 and 0 FTE from the Fisheries Habitat Restoration line. This requested decrease reflects the completion of the purchase of three dams on the Penobscot river and will allow NOAA to conduct other fisheries habitat restoration activities.

Other Activities Supporting Fisheries \$79,674,000

A net increase of \$5,322,000 and 0 FTE above the base is requested in the Other Activities Supporting Fisheries subactivity, for a total of \$79,674,000 and 7 FTE. Of this increase, NOAA requests \$3,578,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **Cooperative Research:** NMFS requests a net increase of \$1,247,000 and 0 FTE for a total of \$11,455,000 for Cooperative Research to expand and fully implement a nationwide, regionally based cooperative research and management program as directed by the reauthorized Magnuson-Stevens Act. This increase will provide a means for commercial and recreational fishermen to become involved in the collection of fundamental fisheries information to support the development and evaluation of NOAA’s management options for recreational and commercial fisheries. NMFS will support critical needs identified by the Councils with priority to the following focus areas: data collection that will improve, supplement, or enhance stock assessments; estimates of bycatch or post-release mortality occurring in a fishery; and conservation engineering projects designed to reduce bycatch.

- **Antarctic Research:** NOAA requests an increase of \$497,000 and 0 FTE for a total of \$2,639,000 for the Antarctic Research to support NOAA’s goal of managing Southern Ocean resources through an ecosystem approach. The 2009 field season represents the 23rd year of NOAA’s only ecosystem-based Antarctic program collecting biological and oceanographic information as a part of the U.S. commitment to the international treaty to preserve





the Antarctic - the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR). This request will provide funds for increased ship charter days including technical staffing and increased scientific personnel costs enabling the continuation of one of NOAA's longest running data streams on the Antarctic marine ecosystem. The principle mission of this research is to collect the scientific information needed to detect, monitor, and predict the effects of harvesting and changing environmental conditions on targeted species (krill and fishes) and protected species (marine mammals and seabirds). Program scientists operate land-based predator research and ship-based research, conducting oceanographic, trawling, acoustic biomass sensing, and small boat operations to examine the relationship between krill, krill predators, finfish, and key environmental variables under changing sea ice conditions.



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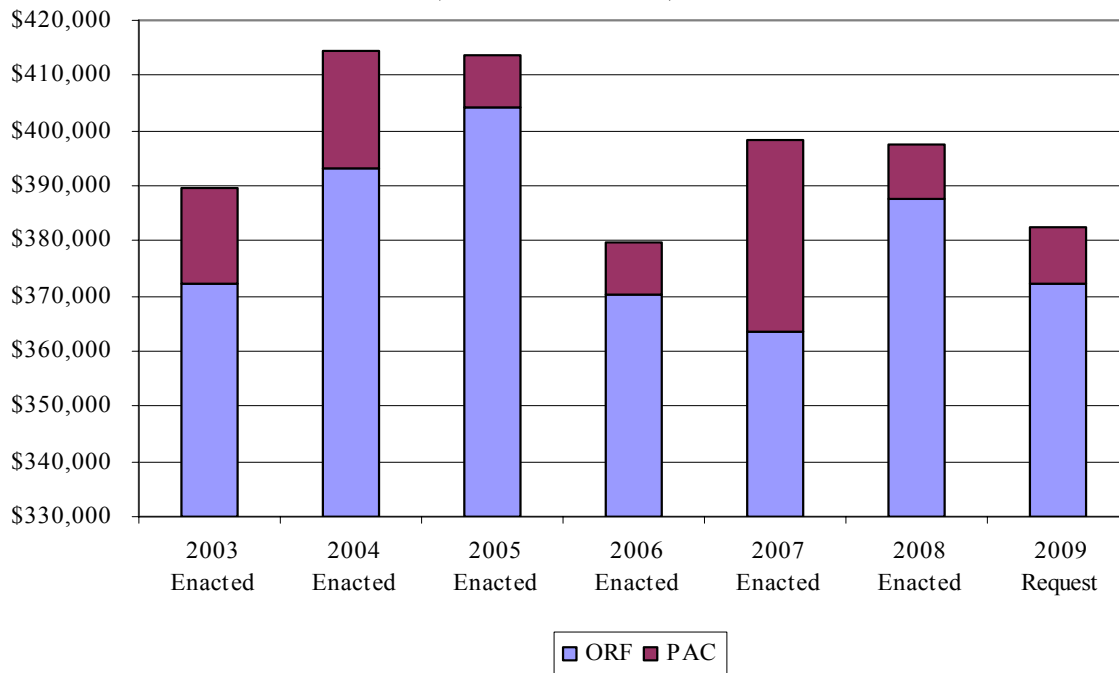


Office of Oceanic & Atmospheric Research

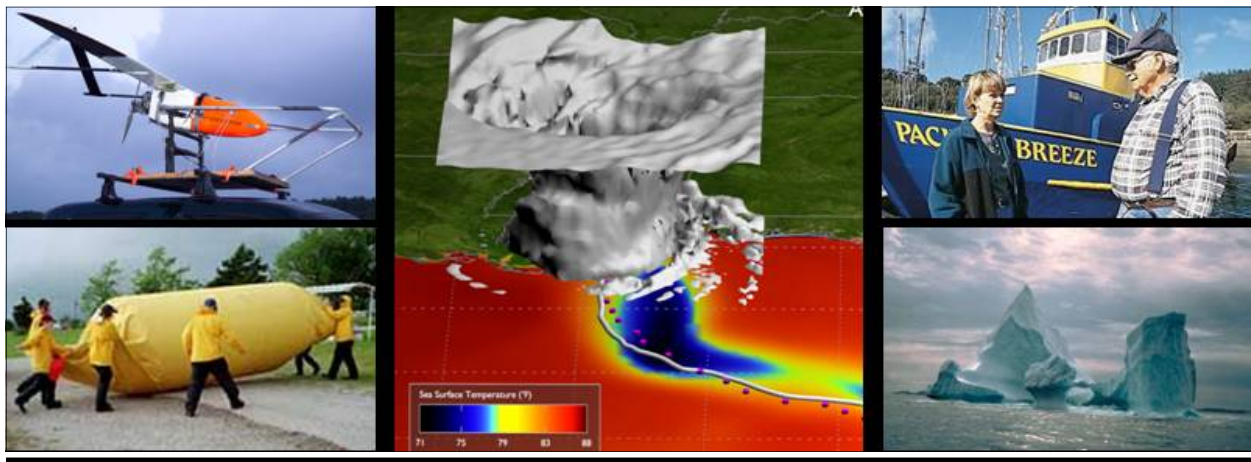
(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
Office of Oceanic & Atmospheric Research -- Operations, Research and Facilities (ORF)				
Climate Research	\$176,296	\$192,812	\$195,477	\$2,665
Weather and Air Quality Research	58,238	52,070	57,561	5,491
Ocean, Coastal, and Great Lakes Research	116,029	130,401	106,204	(24,197)
Information Technology, R&D, and Science Education	12,975	12,659	13,028	369
Total, Office of Oceanic & Atmospheric Research - ORF	363,538	387,942	372,270	(15,672)
Other Office of Oceanic & Atmospheric Research Accounts				
Total, Office of Oceanic & Atmospheric Research - PAC	34,900	10,131	10,379	248
Total, Office of Oceanic & Atmospheric Research - Other	0	0	0	0
GRAND TOTAL OFFICE OF OCEANIC & ATMOSPHERIC (Direct Obligations)	\$398,438	\$398,073	\$382,649	(15,424)
Total FTE	714	717	735	18

Budget Trends, FY 2003– 2009

(Dollars in thousands)



ORF: Operations, Research, and Facilities
PAC: Procurement, Acquisition, & Construction



The primary focus for research and development within NOAA is the Office of Oceanic and Atmospheric Research (OAR), often referred to as NOAA Research. OAR conducts the scientific research, environmental studies, and technology development needed to improve NOAA's operations and broaden our understanding of the Earth's atmospheric and marine environmental systems. OAR currently consists of 7 internal research laboratories and manages or facilitates extramural research at 30 National Sea Grant colleges, universities, and research programs; several undersea research centers; a research grants program through the Climate Program Office; and 13 cooperative institutes with academia.

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 R&D and Science Education. The goals of these four theme areas are to:

- Understand complex climate systems to improve predictions;
- Understand atmospheric events to assist in saving lives and property worldwide;
- Explore, investigate, and understand the complexities of all our coastal, Great Lakes, and ocean habitats and resources;
- Accelerate adoption of advanced computing, communications, and information technology throughout NOAA and support science education, expanding the pipeline of potential future environmental scientists and researchers for industry, academia, and government.

The research is carried out through a national network of more than fifty Federal laboratories and university-based research programs. With this diverse research "tool kit," OAR:

- Provides national and international leadership on critical environmental issues;
- Addresses the environmental R&D needs of internal NOAA customers, 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.

FY 2009 Budget Summary

NOAA requests a total of \$382,649,000 and 735 FTE to support the continued and enhanced operations of OAR. The total includes \$8,914,000 for Adjustments to Base (ATB), and a net program change increase of \$10,042,000 and 0 FTE.

ADJUSTMENTS TO BASE:

NOAA requests a net increase of \$3,071,000 and 21 FTE to fund adjustments to base across all accounts in the OAR activities. This increased program total will fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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 2009:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2009 Technical Budget.

Climate Research \$195,477,000

An increase of \$5,270,000 and 0 FTE above the base is requested in the Climate Research subactivity, for a total of \$195,477,000 and 354 FTE. Of this increase, NOAA requests \$1,084,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

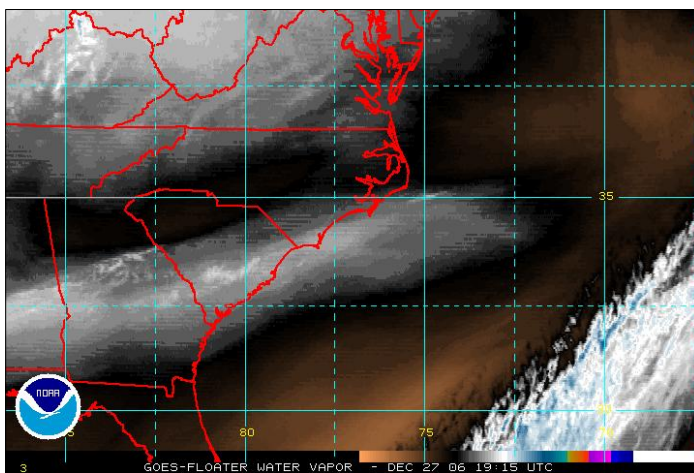
Competitive Research Program: NOAA requests an increase of \$4,186,000 and 0 FTE above the base for a total of \$134,702,000 and 102 FTE under the Competitive Research Program line item of the Climate Research subactivity. This increase is comprised of four parts:

- **National Integrated Drought Information System (NIDIS): Improving NOAA Climate Forecasts.** NOAA requests an increase of \$2,000,000 and 0 FTE for a total of \$10,365,000 to develop and bring into operation by 2010 the next generation Climate Forecast System (CFS), which will lead to improved NOAA climate forecast products. In response to the NIDIS Act of 2006, NOAA has taken the lead on the development and implementation of a National Integrated Drought Information System in partnership with other Federal, regional and state



organizations. Persistent periods of drought have a cumulative effect on humans and society with significant impacts on the economies of the affected regions in the United States. Recent evidence points to the possibility that U.S. droughts may intensify over the next 10 years, and during the next 10-25 years scientists believe the U.S. may experience more frequent and prolonged droughts, which may cover a larger portion of the U.S. This initiative will strengthen cooperative partnerships between NOAA operational centers and the broader research community and allow NOAA to facilitate and enhance the transition of research advances in drought monitoring and prediction to further improve its climate forecasts and increase the scope and applicability of those forecasts for the external user community.

- **Water Vapor Process Research.** NOAA requests an increase of \$880,000 and 0 FTE for a total of \$880,000 to initiate and enhance measurements of water vapor in the lower atmosphere (mid and upper troposphere) to elucidate its role in altering forcing by greenhouse gases, aerosols and clouds. Water vapor has the potential to contribute to global climate change because it: (1) accounts for most of the greenhouse effect, (2) amplifies the greenhouse warming capability ascribed to CO₂ and other greenhouse gases, (3) enhances the ability of aerosols to induce climate change, (4) plays a crucial role in aerosol-cloud interactions, (5) alters the concentrations of other greenhouse gases, and (6) is a key component for calculating climate feedbacks. Furthermore, it is becoming increasingly apparent that water vapor is also an anthropogenic climate-forcing agent. Yet, the distribution of water vapor in the mid-to-upper troposphere and the lower stratosphere is poorly mapped



out for climate purposes and is not well represented in models. The funding requested will be used to develop and deploy instruments to measure water vapor and conduct impact analysis and assessments to develop and improve models. NOAA is uniquely placed to address an important sub-set of the many needed efforts in this area because of its technical expertise in measuring water vapor, its ability to deploy instruments

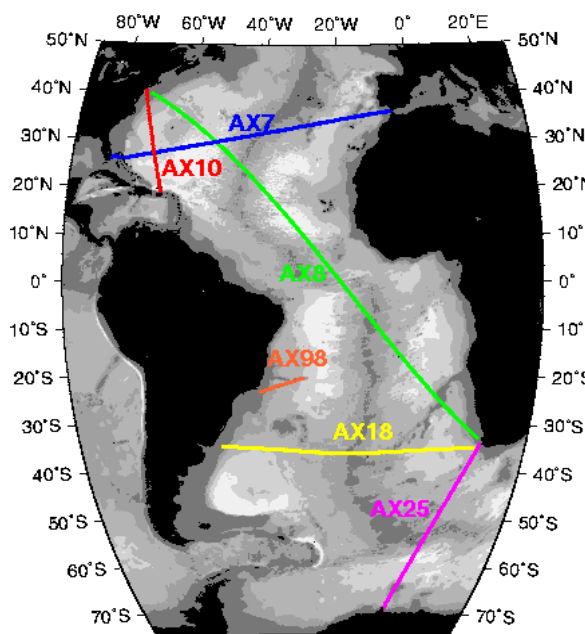
on NOAA aircraft, and its scientific expertise to elucidate the processes involved. Further, NOAA can conduct this work in a highly cost-efficient manner because these measurements can be carried out during existing on-going NOAA missions (e.g., G-IV flights as a part of the Winter Storm Program, the field studies using WP-3 and Twin Otter aircraft).

- **Analysis of Unmanned Aircraft Systems (UAS) Data from the Arctic Test Base.** NOAA requests \$308,000 and 0 FTE for a total of \$308,000 to provide focused applica-

tion of data from Unmanned Aircraft Systems (UAS) to be deployed from the Arctic Test Base. Specifically, NOAA believes deployment of UAS from the Arctic Test Base will provide a significant new type of data to complement that available from satellites and infrequent ship-based observations of the Arctic atmosphere. The analyses to be conducted will also demonstrate the utility of UAS in climate observations in the Arctic and the value of these observations in improving the output from global and regional climate models and forecasts.



- **Assessing Atlantic Meridional Overturning Circulation Variability: Implications for Rapid Climate Change.** NOAA requests an increase of \$998,000 and 0 FTE to improve understanding of the mechanisms behind fluctuations of the Atlantic Meridional Overturning Circulation (A-MOC) and the impact of those fluctuations. This request, added to base and redirected funding, will support a \$5,000,000 effort focused on one of the four key near-term priorities outlined in the draft implementation plan of the Ocean Action Informa-



tion Plan. Decadal variability in the Atlantic Ocean has been linked to the recent upswing in Atlantic hurricane seasons, persistent droughts in surrounding continental areas, and enhanced warming in the Arctic. Although these changes were not anticipated, their persistence would require us to make major adaptations. This decadal variability is partly linked to changes in the A-MOC, an element of the global-scale ocean circulation responsible for long-term climate variations. A-MOC changes are thought to play a key role in the abrupt changes evident in the paleoclimate record. This research activity will lead to new capabilities for monitoring and predicting A-MOC changes, which serve as

an abrupt-change early-warning system. This effort will build upon NOAA's existing research, modeling and forecasting in this region. Specifically, \$2,500,000 of this total program effort will cover research to describe the A-MOC, its variability, and its critical processes. An additional \$1,750,000 will be used to develop now-casting capabilities and experimental products critical to predicting the current A-MOC state as well as changes on a decadal scale and assessing the potential for abrupt changes. Finally, NOAA will use \$750,000 to assess potential decadal impacts of rapid A-MOC changes on ecosystems, car-



bon budgets, regional sea-level changes, and regional climate.

Weather and Air Quality Research

\$57,561,000

NOAA requests an increase of \$4,214,000 and 0 FTE above the base in the Weather and Air Quality Research subactivity for a total of \$57,561,000 and 205 FTE. Of this increase, NOAA requests \$214,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

Weather & Air Quality Research Laboratories and Cooperative Institutes: NOAA requests an increase of \$4,000,000 and 0 FTE above the base for a total of \$49,089,000 and 186 FTE under the Weather & Air Quality Research Laboratories and Cooperative Institutes line item:

- **Unmanned Aircraft Systems (UAS).** NOAA requests an increase of 0 FTE and \$3,000,000 for a total of \$6,000,000 to implement an end-to-end initiative to accelerate research, development, and transition to operations of innovative new observational platforms and forecast tools to advance NOAA’s Earth-system product, service, and information enterprise. Specifically, NOAA will develop, test, and evaluate UAS platforms to determine their role in filling critical observational gaps currently impeding NOAA’s environmental monitoring and prediction capabilities.



long-endurance (HALE) tests will be conducted to explore how best to fill gaps in global observations in some of the most remote areas of the planet, including the Arctic, Pacific and Atlantic Oceans. This UAS initiative advances the development of 21st century observing systems and forecast tools and accelerates their infusion into the operational forecast environment. UAS platforms represent a collaborative effort of several

organizations within NOAA, including NOAA laboratories, National Weather Service, National Ocean Service, Marine and Aircraft Operations, and Cooperative Institutes. This initiative is linked closely to the needs of multiple Federal, state, and local agencies. Specific applications that will be explored through this investment include:

- *Climate:* The proposed UAS project will test two important climate issues: (1) Climate models show that the upper atmosphere over the Arctic Ocean should have warmed by 3° F by late in the current decade. Existing measurements taken at different spatial loca-



tions do not allow comparison of temperatures at the same location over time. By dropping sondes at locations chosen during the International Polar Year, we can address this important question of whether or not the models are right. (An additional \$308,000 is requested under the Climate Competitive Research Program for enhanced analyses of the data resulting from these experiments.) (2) Similarly, the change of water vapor in the upper and lower atmosphere over the tropics is crucial to evaluating climate models. The proposed Pacific test will measure water vapor with higher accuracy and denser spatial specificity than has been possible in the past and will test the ability of UASs to monitor atmospheric rivers, which currently are poorly observed but yet are believed to be crucial to both the global water budget and weather prediction.

- *Weather Research:* The potential for UAS to aid in hurricane reconnaissance and research will be evaluated. The central Pacific UAS project will test the ability of UAS to fill gaps in satellite data that currently limit our ability to monitor water vapor transport over the ocean.
- *Fisheries Enforcement:* Over parts of both Alaska and Hawaii, NOAA will test new concepts of fisheries enforcement using advanced sensors on UAS platforms.
- *Coastal Zone Studies:* NOAA will test and evaluate UAS applications in Marine Sanctuaries for monitoring whale migrations and other phenomena occurring over extensive areas that currently cannot be monitored using manned ships or aircraft.
- **Improvements to Operational Weather Forecasts: NOAA requests an increase of \$1,000,000 and 0 FTE for a total of \$1,000,000 to accelerate the rate at which hurricane forecasts improve through the five-day forecast window.** The primary focus of this increase is to improve the accuracy of the storm track and intensity forecasts. To ensure that innovative research is utilized in an operational setting as quickly as possible, NOAA has developed the Numerical Prediction Developmental Testbed Center (DTC). The DTC is a facility where operational numerical weather prediction codes and the latest research codes are maintained and made available to scientific researchers in academic institutions and non-NOAA operational centers. The DTC will enable the research and operational communities to collaborate in accelerating improvements in operational numerical weather forecasting, first with hurricane prediction and, eventually, with other numerical forecasting problems.

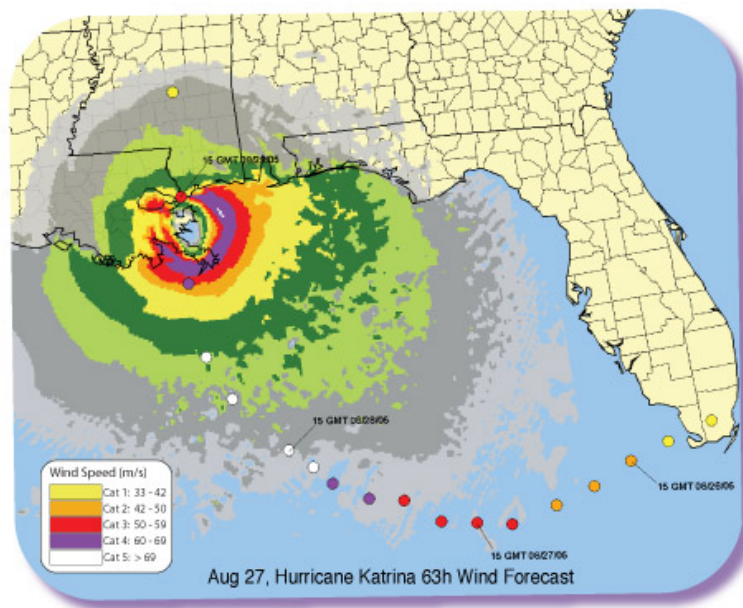
Specifically, the DTC will:

- Serve as a library/support center for the Weather Research Forecast (WRF) operational model computer codes for improved hurricane forecasting and for short-range (24-hour) and medium-range (days 1-5) weather forecasting. The codes will include ocean and wave models that are coupled to the hurricane model. In addition to the codes, the research & operational communities will be able to access tutorials, docu-



mentation, and responses to user questions.

- Acquire model computer code from the research and development communities, test this code, and certify it as Reference code.
- Establish and maintain a test environment complete with test data sets and corresponding model outputs to allow researchers to evaluate and compare their proposed research model improvements.
- Perform formal configuration computer code management to maintain the integrity of the Reference Code library.



Hurricane Katrina was the deadliest hurricane to strike the US since 1928. Approximately 1,300 deaths were documented. Hurricanes Katrina, Rita, and Wilma produced a record 2.773 million insurance claims. Combined insured losses for these three hurricanes are estimated at \$50.8 billion. The DTC is designed to accelerate forecast improvements to mitigate such loss of life and property. Further, DTC is designed to ensure that promising research results are translated quickly into forecast improvements by the operational community. The DTC will take better advantage of NOAA, DOD, and NSF basic, applied, and operational research model investments, helping to ensure projected gains in hurricane forecast improvements (6% improvement per year out to 5 days) and NWS’s overall success in accelerating Hurricane forecast improvements.

Information Technology R&D

\$13,028,000

NOAA requests an increase of \$310,000 and 0 FTE above the base in the Information Technology R&D subactivity for a total of \$13,028,000 and 13 FTE. This increase restores funding to



increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President's Budget.



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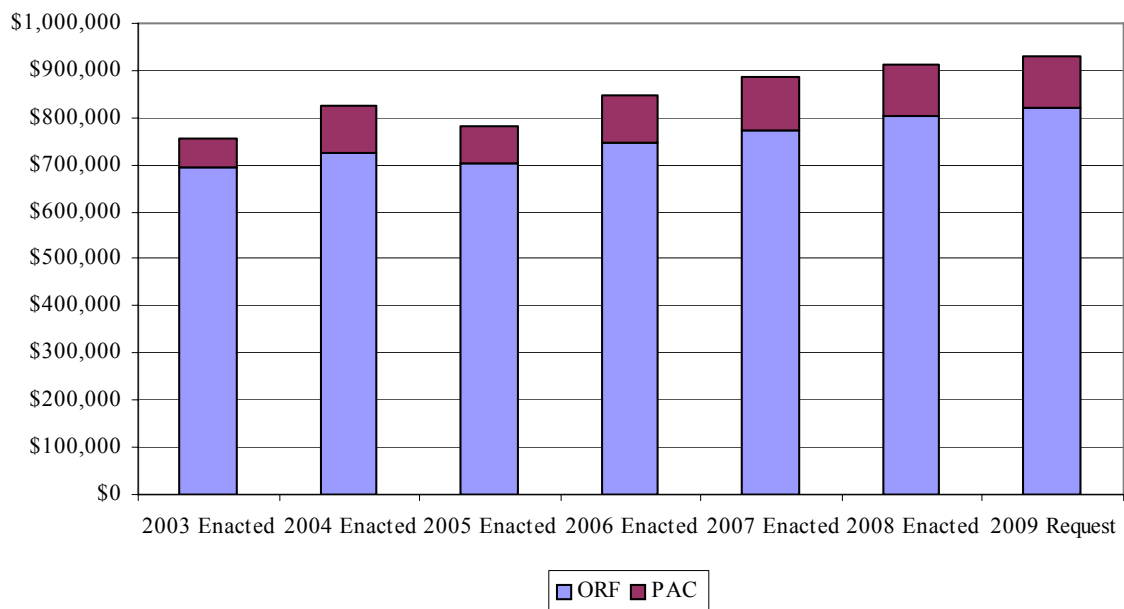


National Weather Service

(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
National Weather Service -- Operations, Research and Facilities (ORF)				
Operations and Research	\$684,342	\$711,252	\$720,478	\$9,226
Systems Operation & Maintenance (O&M)	90,621	94,042	98,355	4,313
Total, National Weather Service - ORF	774,963	805,294	818,833	13,539
Other National Weather Service Accounts				
Total, National Weather Service - PAC	109,429	106,112	111,858	5,746
Total, National Weather Service - Other	0	0	0	0
GRAND TOTAL NATIONAL WEATHER SERVICE (Direct Obligations)	\$884,392	\$911,406	\$930,691	\$19,285
Total FTE	4,656	4,658	4,639	(19)

Budget Trends, FY 2003– 2009

(Dollars in thousands)



ORF: Operations, Research, and Facilities
PAC: Procurement, Acquisition, & Construction



The National Weather Service (NWS) is 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 that can be used by other government agencies, the private sector, the public, and the global community.

The United States is one of the most severe-weather-prone countries on Earth. Each year, Americans cope with an average of 10,000 thunderstorms, 5,000 floods, 1,000 tornadoes, and six deadly hurricanes. Some 90 percent of all Presidentially-declared disasters are weather-related, causing approximately 500 deaths per year and \$14 billion in damage. According to the American Meteorological Society, weather is directly linked to public safety, and about one-third of the U.S. economy (about \$3 trillion) is weather-sensitive.

More and more sectors of the U.S. economy recognize the impacts of weather, water, and climate on their businesses and are becoming more sophisticated at using weather, water, and climate 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 to effectively use all



the relevant data collected; improve collaboration with the research community; make NWS information available quickly, efficiently, and in a useful form (e.g., the National Digital Forecast Database); and include information on forecast uncertainty to help customers make fully informed decisions.

With approximately 4,700 employees throughout 122 weather forecast offices, 13 river forecast centers, nine national centers, and supporting offices around the country, 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 uses powerful workstations to analyze all of these data to issue climate, public, 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 2009 President's Budget Request supports the funding and program requirements necessary to address established NOAA strategic goals and sets NWS on a path to achieve its vision to: produce and deliver forecasts that can be trusted, use cutting-edge technologies, provide services in a cost-effective manner, strive to eliminate weather-related fatalities, and improve the economic value of weather, water, and climate information.

FY 2009 Budget Summary

NOAA requests a total of \$930,691,000 and 4,639 FTE to support the continued and enhanced operations of the National Weather Service. This total includes \$9,840,000 for Adjustments to Base (ATB), and a net program change of \$37,165,000 and 0 FTE.



ADJUSTMENTS TO BASE:

The above ATB request includes a net increase of \$13,379,000 and 1 FTE to fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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.

NWS also requests the following transfers between line offices or appropriations for a net change to NOAA of zero:

- \$5,857,000 and 17 FTE is transferred from the US Weather Research Program (USWRP) within the Local Warnings and Forecasts Base PPA in Operations, Research, and Facilities to the NOAA Line Office of Ocean and Atmospheric Research .
- \$500,000 and 0 FTE is transferred from the Office of Oceanic and Atmospheric Research USWRP to the Local Warnings and Forecast Base PPA in Operations, Research, and Facilities for the Meteorological Assimilation Data Ingest System (MADIS).
- \$210,000 and 2 FTE are transferred from Local Warnings and Forecasts Base PPA in Operations, Research, and Facilities to the NOAA Wide Corporate Services Program Support.
- \$500,000 and 0 FTE is transferred from the Cooperative Observer Network Modernization (NERON) PPA in Procurement, Acquisition, and Construction to Local warnings and Forecast Base PPA in Operations, Research, and Facilities for MADIS.
- \$3,000,000 and 0 FTE is transferred from the Local Warnings and Forecasts Base PPA in Operations, Research, and Facilities to the Complete and Sustain NOAA Weather Radio PPA in Procurement, Acquisition, and Construction.

NWS – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2009:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2009 Technical Budget.

Operations and Research \$720,478,000

A net increase of \$18,780,000 and 0 FTE above the base is requested in the Operations and Research subactivity, for a total of \$720,478,000 and 4,420 FTE. Of this increase, NOAA requests \$6,606,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **Local Warnings and Forecasts:** \$13,477,000 and 0 FTE in net increases above the base, for a total of \$642,322,000 and 4,114 FTE, are requested under the Local Warnings and



Forecasts line item of the Operations and Research subactivity. Of this increase, \$5,486,000 and 0 FTE will be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President's Budget

- **NOAA requests an increase of \$3,000,000 and 0 FTE for a total of \$4,400,000 to operate and maintain 15 weather data buoys (eight buoys funded under the FY 2006 Hurricane Supplemental Appropriation and seven funded in by the FY 2005 Hurricane Supplemental Appropriation) for enhanced real time hurricane data observations and storm monitoring in the Caribbean, Gulf of Mexico, and the Atlantic Ocean to support the NOAA hurricane warning and forecast mission.** The FY 2006 Hurricane Supplemental provided one-time funding to procure and deploy these buoys. This increase will restore funds requested in the FY 2008 Presidents Budget but were not funded in the FY 08 Omnibus Appropriations Bill. This program adjustment requests the funding required for the long-term operation and maintenance of these platforms. This investment is one of the high priority investments required for



NOAA's implementation of the Integrated Ocean Observing System (IOOS) as the coastal and open ocean component of the Global Earth Observing System of Systems (GEOSS). Combined with other like-identified IOOS investments across NOAA, it is part of NOAA's strategy to provide initial benefits of an integrated ocean observing system, focusing on enhancing key observational capabilities throughout NOAA, and our ability to provide customers with enhanced coastal data and information. The eight new Hurricane Supplemental data buoys consist of four 6-meter, and four 12-meter buoys. The seven FY 2005 Hurricane Supplemental data buoys consist of one 3-meter, two 6-meter, two 10-meter, and two 12-meter buoys.

These buoys require increased ship-time for scheduled service due to their large distance from the U.S., are an average of four days of ship time apart, and require a ship with substantial lift capability (especially for the 12-meter buoys). The hired buoy tender vessel will provide scheduled maintenance to all buoys in one continuous trip to minimize ship cost as well as some dedicated service trips to the failed buoys out during hurricane season that must be repaired as soon as possible.

- **NOAA requests \$1,230,000 and 0 FTE for Hurricane Supplemental O&M.** The FY06 Hurricane Supplemental provided \$16.4 million for improved hurricane services and infrastructure support. This increase will restore funds requested in the FY 2008 Presidents Budget but were not funded in the FY 08 Omnibus Appropriations Bill. Full



funding provides ongoing operations and maintenance costs for Incident Meteorologist equipment, software support, and communications, ASOS and NWR backup power units, and backup communications for coastal Weather Forecast Offices and Next Generation Weather Radars. The FY 2006 Hurricane Supplemental provided funding to: (1) equip five coastal Weather Forecast Offices (WFOs) with all-hazards support capability for incident meteorologists deployed to provide on-site tactical forecasting in times of disaster, (2) equip 150 hurricane-prone Automated Surface Observing System (ASOS) sites, and (3) 126 NOAA Weather Radio (NWR) All Hazards transmitters located in hurricane-prone areas with backup power capability so that they can continue to provide critical weather observations and life-saving emergency broadcasts during times of disaster when commercial power is disrupted; and



(4) backup satellite communications at 25 coastal WFOs and 10 NEXRAD sites to provide transmission of forecasts, watches, warnings, and radar products during times of disaster when landline communications have been disrupted. All of these systems and capabilities require ongoing funding to continue to be operated and maintained. Ongoing operations and maintenance funding is necessary to ensure that the capital investments made as a result of the Hurricane Supplemental continue to provide the life-saving services they were intended to support. Equipment for Incident Meteorologists facilitates rapid deployment of tactical meteorology capabilities to sites of hurricanes as well as to other disaster sites. Uninterrupted data from coastal ASOSs will provide forecasters with reliable real-time observations during any type of severe weather event, including hurricanes, and will also maintain the integrity of the climate record, particularly in recording extreme events, and aid research and understanding of tropical cyclone events. Emergency backup power for NWR all hazards will increase reliability of broadcasts of severe weather information, leading to lives and property saved. It will also ensure broadcast of critical information during homeland security events.

- **NOAA requests \$1,100,000 and 0 FTE for Tropical Ocean Atmosphere (TAO) array technological refresh.** Total funding required to replace obsolete components for the 55 buoys in this array is \$6.6 million over a six-year period beginning in FY 2008. Many components of TAO are no longer supported by their manufacturers, and alternate



components must be purchased to continue operation of this array of buoys designed to detect the onset of, and assess the intensity of, El Niño and La Niña. Early detection has substantial positive economic benefits for the global economy because it allows decision makers to more effectively manage agricultural and water resources, fisheries, and grain and fuel reserves. The U.S. Climate Change Science Program also relies on TAO data to further improve climate models for improved understanding and predictions of global climate. Funds are requested to replace obsolete components of the array with new components commercially available and to upgrade communications to provide reporting necessary to calibrate and validate the coupled ocean-atmosphere Climate Forecast



System. Subsurface sensor arrays used to measure temperature and salinity at up to 11 depths, the top-side CPU/data logger and modem, and the compass used to provide earth-referenced coordinates for wind velocity measurements are obsolete and no longer supportable. Continued reliance on these components will result in loss of buoys and data critical to our ability to detect and assess the strength of El

Niño and La Niña and to plan for the impacts they create. The Tropical Moored Buoy network is being extended to all oceans by NOAA's Office of Oceanic and Atmospheric Research in cooperation with international partners. The technology-refreshed TAO buoys will eventually be used for the Atlantic and Indian Oceans as well as the Pacific. Without this investment, sustained operations of the arrays will deteriorate, and atmosphere and ocean models will be unable to adequately initialize to take into account the global components of ocean temperature and density and atmospheric forcing. Without measurements from these arrays, true understanding of the global heat engine, necessary to begin to understand the actual impacts of human activities on climate change, will be impossible. This funding will enable NWS to replace obsolete components of the TAO array for nine buoys and eight spares.

- **NOAA requests \$1,350,000 and 0 FTE for NDBC Ocean Sensor O&M** for ongoing operation and maintenance of the Congressionally mandated ocean instrumentation which was funded and installed by National Ocean Service "Convert Weather Buoys Initiative." These sensors augment fixed and buoy observational sites. In keeping with NOAA's commitment of increased interoperability and cost effective approach to oceanographic observing, the NOS Convert Weather Buoy project augments existing National Weather Service buoys with oceanographic sensors. This national network of weather observing buoys has been augmented with oceans sensors to measure direc-

tional waves and wave heights, and ocean current, temperature, and salinity profiles. Congress has provided NOS over \$12,000,000 to add oceanographic sensors to the existing NWS marine observational backbone. However, ongoing operations and maintenance funding has not been provided for long-term support of the systems. In FY 2008, 98 sites along the U.S. coastline will be outfitted with oceanographic sensors. Without operations and maintenance funding, this equipment will be unsupportable, and the \$12,000,000 investment will become inoperable. Buoys require annual maintenance and shore-side operating/infrastructure support to maintain reliable data output. Buoys outfitted with weather sensors generally only require an at-sea replacement once every three years. However, subsurface oceanographic sensors require an at-sea maintenance visit every nine months. Thus the cost of ship time alone is four times greater. By converting weather buoys to dual-purpose buoys, NOAA obtains oceanographic data in an exceptionally cost-effective manner. These real-time ocean observations are used by weather forecasters in both the government and private sector, coastal managers, recreation and commercial fishing industries, search and rescue, and hazard spill mitigation. These data are also used by Industry to generate value-added products for the private sector. Continued operation of these sensors meets the international priorities of the Integrated Ocean Observing System (IOOS) and the recommendations of the U.S. Commission on Ocean Policy.


- **NOAA requests an increase of \$600,000 for a total of \$600,000 to accelerate improvements to begin development, in concert with NIST, of an advanced fire weather modeling capability.** This enhanced fire weather modeling capability will provide high-resolution, real-time predictions in the field from an atmospheric prediction model coupled with fire spread model. NOAA will work closely with NIST on the wildland-urban interface fire spread problem, as well as with the U.S. Forest Service and others. The nation is facing a crisis with fires increasing in number and intensity in areas with rapid growth in habitation, with the western states being particularly at risk.

During the summer of 2006, there were, at one point, 53 fires burning simultaneously. In 2007, there were 85 large fires (over 100 acres in timber or 300 acres in grass/brush) burning simultaneously. On July 7th of 2007, there were 471 new fire starts (this includes all fires of any size). That day marked the peak number of fire starts for the season. Enhanced weather prediction, fire behavior prediction,





and fire modeling in habitation zones are critical to reducing the danger to life and property. In order to properly support and serve fire fighting, weather prediction needs to be at a very fine scale and allow coupling to fire behavior models. Current national scale models, while covering all areas of the U.S., are not at sufficient resolution to provide the high-resolution winds, temperature, and humidity forecasts needed. This request will begin the development of higher-resolution models.

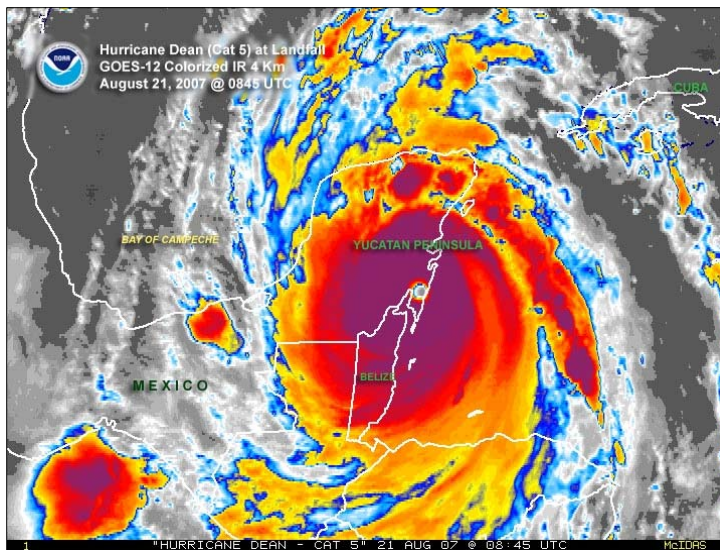
- **NOAA requests an increase of \$711,000 and 0 FTE for a total of \$5,253,000 to expand this multi-year effort to improve aviation weather services. This requested increase supports the procurement and fielding of 30 additional water vapor sensors for a total of 160 as part of an Integrated Upper Air Observing system.** The purchase of water vapor sensors will result in improved forecast accuracy of moisture, convection, icing, and low ceiling and visibility, all of which could show increases of accuracy on the order of 10%. This improvement has wide-reaching impacts on many of NOAA's forecast capabilities inside and outside of aviation. These soundings are 100 times more cost-effective than today's balloon technology. Procuring and installing these 30 sensors will have a cascading impact on the modernization of the nation's Integrated Earth Observing System (IEOS), affecting NOAA's ability to improve hydrologic, climate, and severe weather forecast accuracy.
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- A close-up photograph of a small, cylindrical water vapor sensor with a yellow base and a clear lens. The sensor is resting on a copper coin, likely a penny, which is used for scale. The coin's surface shows the word "CENT" and some embossed patterns.
- **Central Forecast Guidance: \$4,273,000 and 0 FTE** in net increases above the base, for a total of \$57,253,000 and 306 FTE, are requested under the Central Forecast Guidance line item of the Operations and Research subactivity.
 - **NOAA requests an increase of \$4,273,000 and 0 FTE for the operational support and maintenance of the next-generation Hurricane Weather Research and Forecasting (HWRF) model and storm surge prediction system and to accelerate improvements to its Hurricane and Storm Surge Modeling and Forecast systems.** As a result of the active 2005 hurricane season, NOAA was provided hurricane supplemental funding to accelerate the next-generation hurricane and storm surge prediction system. Of this increase, \$946,000 will increase the base levels of funding to that recommended in the FY 2008 President's Budget. Full funding will provide the necessary operations and maintenance funding to support these systems on a daily, routine basis, leading to improved hurricane and storm surge prediction. This environmental modeling investment is necessary to operationally support the next-generation hurricane prediction system and to integrate NOAA's several environmental prediction models into a single environmental modeling prediction system to meet demands for more accurate forecast products in weather, climate, ocean and coastal oceans and ecosystems. Opera-



tional hurricane intensity and storm surge predictions at landfall will be highlighted in this effort, which will capitalize on proven research; lay the groundwork for a national prediction system meeting civil, military, and homeland defense needs; and regain NOAA’s position as a world leader in environmental prediction.

Specifically, this increase will sustain the Administration’s commitment to significantly accelerate the improvement in hurricane track and intensity and storm surge forecasts. Funds are required to increase the research, development, and engineering necessary to accelerate the improvement in the NOAA Hurricane Forecast System (NHFS) and to implement, operate and maintain the expanded NHFS (including coupled global, hurricane, ocean, wave, and storm surge models). The investments in model physics improvements can accelerate the infusion of cutting-edge science into hurricane track and intensity forecasts resulting in critically needed forecasts and warning improvements up to five years earlier than otherwise viable.

With this requested increase, NOAA will make a critical down-payment towards an integrated hurricane forecast improvement plan, which can yield an operational 20% improvement in hurricane intensity and track forecasting accuracy over the next decade. This level of improvement will, for the first time, enable the NWS to pinpoint changes in hurricane intensity (rapid strengthening or weakening), thus greatly reducing the potential for over-warning and associated evacuation costs, and reducing the risk of potentially missing a devastating high category storm warning. To put this in perspective, a 20% improvement would have reduced the number of people evacuated from Houston during Hurricane Rita by 320,000 and would have saved \$140 million. Sustaining and increasing the commitment to improvement in FY 2009 is critical to provide the entire NOAA research and operations community a platform from which to evaluate the efficacy of specific model improvements and to identify where they can best be applied within the NHFS. While improvement efforts are under-



way and continue in FY 2008, NOAA does not today have the ability to rapidly transition hurricane research from NOAA labs and the broader research community into operations. Furthermore, emergency managers, DHS, and industry are demanding better lead time and improved precision on hurricane track and intensity forecasts in order to



improve key decisions on resource planning, evacuation planning, and business operations. This requested increase will allow NOAA to deliver these required improvements.

Systems, Operations & Maintenance (O&M) \$98,355,000

A net increase of \$2,803,000 and 0 FTE above the base is requested in the Systems, Operations & Maintenance subactivity, for a total of \$98,355,000 and 188 FTE. Of this increase, NOAA requests \$2,091,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **NOAA requests an increase of \$712,000 and 0 FTE for a total of \$9,657,000 to begin sustained IT refresh to the nation’s \$200M Automated Surface Observing System (ASOS).** This investment is required to avoid system obsolescence and meet mandated system IT security requirements. With this initial investment the NWS will ensure its ability to maintain critical surface observations used for nation wide aviation operations, local forecasting, and climate monitoring. The present ASOS configuration does not fully comply with NOAA and DOC security safeguards, policies, and procedures. The current operating system has not been supported since 2002, and a new operating system is required to fully meet current security requirements. System events need to be tracked to detect and diagnose intrusion attempts. Users accessing the system need to be fully authenticated. The current residual risk is within acceptable limits due to the limited connectivity of ASOS to other systems (no network connection). However, consumer demand for remote access to data already existing in the system is a driver for network connectivity, further exposing ASOS to security vulnerabilities. Failure to address these system limitations threatens the continued operation of ASOS in supporting its service requirements.



This investment will allow the current ASOS software to be ported to an operating system with ongoing support and security updates. Porting ASOS software to a supportable operating system and replacing Data Collection Package and Acquisition Control Unit hardware will yield the following benefits: (1) achieves full compliance with DOC IT Security policies; (2) replaces the antiquated ASOS Operating System (pSOS which has been un-



ported since 2002; (3) Provides computing capacity for improved sensor data; (4) Provides NOAA customers who are demanding access to high-resolution data the one minute observations recorded by ASOS that now are not available in real-time; (5) Allows remote download of software loads and (6) Provides the computing power necessary to provide Air Traffic Controllers and other users with improved, intuitive, graphic-based display of data.

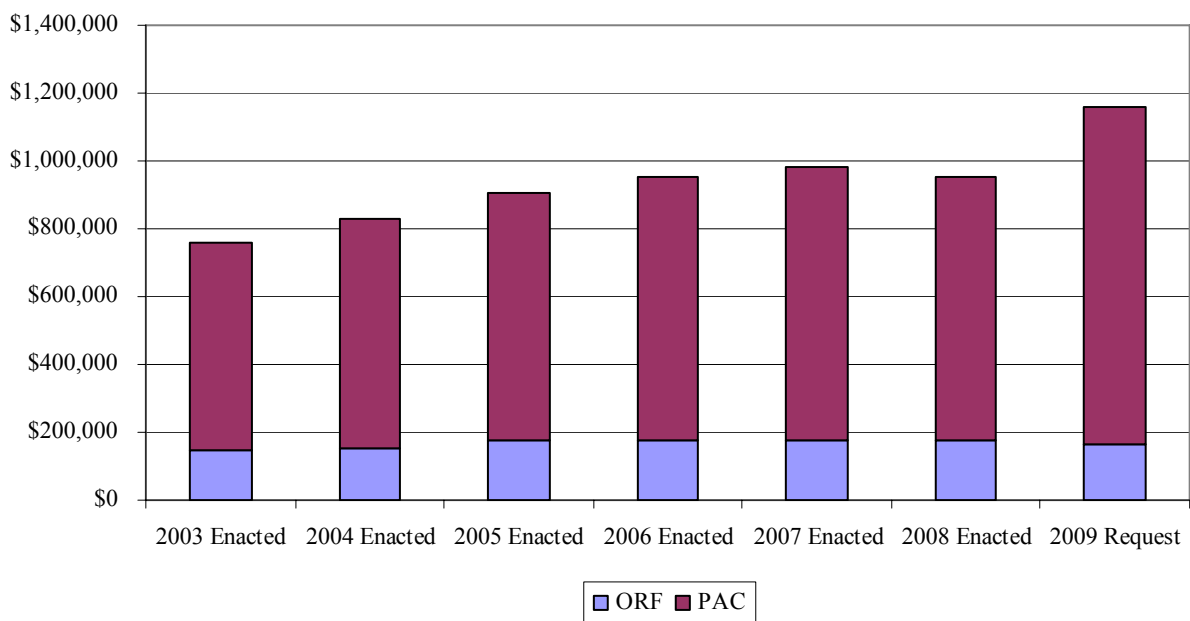


National Environmental Satellite, Data, and Information Service

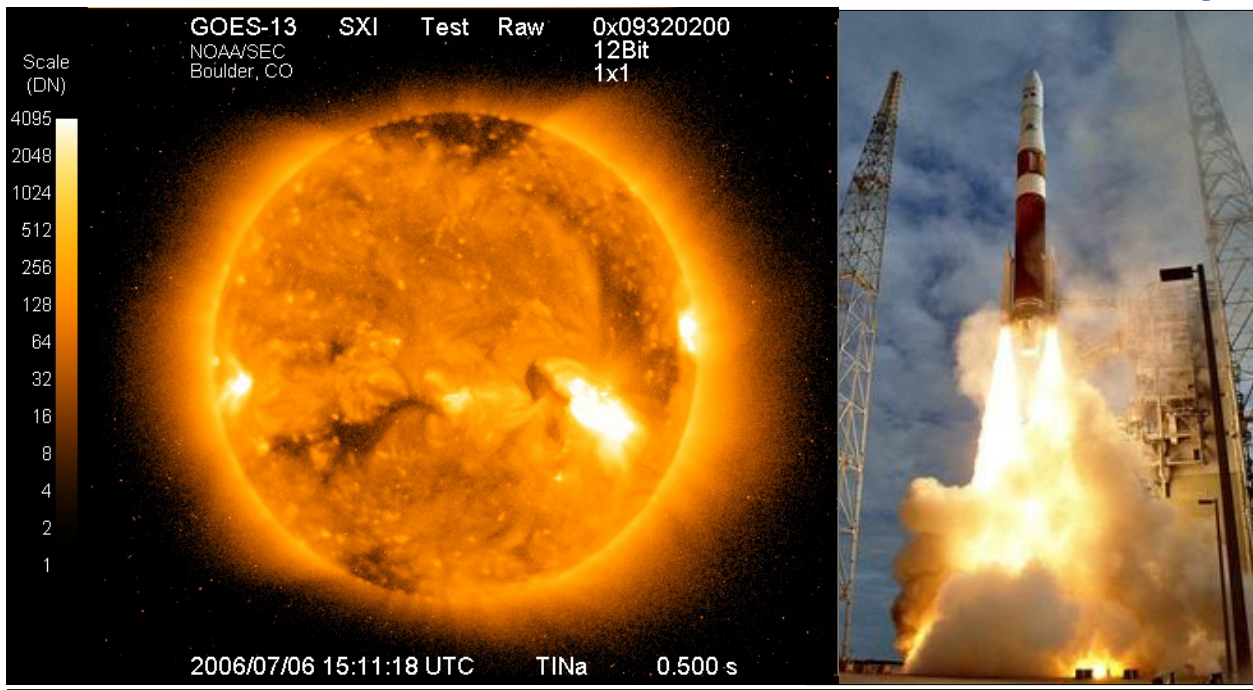
(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
National Environmental Satellite, Data, and Information Service -- Operations, Research and Facilities (ORF)				
Environmental Satellite Observing Systems	\$105,141	\$101,919	\$111,633	\$9,714
NOAA's Data Centers & Information Services	72,050	77,235	53,659	(23,576)
Total, NESDIS - ORF	177,191	179,154	165,292	(13,862)
Other National Environmental Satellite, Data, and Information Service Accounts				
Total, NESDIS - PAC	806,074	775,922	992,588	216,666
Total, NESDIS - Other	0	0	0	0
GRAND TOTAL NATIONAL ENVIRONMENTAL (Direct Obligations)	\$983,265	\$955,076	\$1,157,880	\$202,804
Total FTE	831	831	831	0

Budget Trends, FY 2003– 2009

(Dollars in thousands)



ORF: Operations, Research, and Facilities
PAC: Procurement, Acquisition, & Construction



The NOAA National Environmental Satellite, Data, and Information Service (NESDIS) manages the collection, distribution, and archiving of environmental data. This includes procurement, launch, operation, product development, and product distribution for the Nation’s civil operational environmental satellites. Additionally, NESDIS manages the NOAA environmental data collections and disseminates data and information to meet the user needs in commerce, industry, agriculture, science, and engineering, as well as Federal, state, and local governments.

Through NESDIS, NOAA manages the Nation’s operational environmental satellite systems; acquires environmental data, processes and distributes satellite-derived products and services; and archives and provides global environmental meteorological, oceanographic, solid earth geophysics, and solar-terrestrial data. NOAA’s polar-orbiting satellites work together with geostationary satellites stationed at the equator over the Americas to provide daily global data on weather conditions, atmospheric temperature structure, volcanic activity, sea surface temperature, forest fires, ozone levels, hurricanes, and typhoons. These satellites monitor storms and support NOAA’s National Weather Service and Federal and local emergency management agencies, enabling them to provide advance warnings of emerging severe weather such as hurricanes, tornadoes, flash floods, winter storms, and wildland fires. The satellites and the products and services NESDIS provides are essential to the protection of human life, property, and critical infrastructure. In support of the Nation’s environmental data needs, NESDIS gathers global data regarding the oceans, Earth, air, space, the sun, and their interactions to describe and predict the state of the physical environment. NOAA’s data centers archive the data, which are necessary for scientists, industry, and federal, state, and local governments to fully under-



stand Earth's systems and long-term climatic, oceanographic, and geophysical effects on the environment and the economy. Through the Office of Space Commercialization, NESDIS manages the commercialization of space activities for the Federal government. NESDIS also supports the President's priorities in climate sciences, ocean and coastal management, integrated earth observations, energy, and forest resources protection by developing products from its satellite and data archives. As an important part of this support, NESDIS seeks opportunities to transition research satellite capabilities to operational products and services.

FY 2008 Budget Summary

NOAA requests a total of \$1,157,880,000 and 831 FTE to support the continued and enhanced operations of NESDIS. This total includes \$3,388,000 for Adjustments to Base (ATB), and a net program change of \$226,087,000 and 0 FTE.

ADJUSTMENTS TO BASE:

The above ATB request includes a net increase of \$2,752,000 and 0 FTE to fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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 2008:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2008 Technical Budget.

Environmental Satellite Observing Systems \$111,633,000

An increase of \$7,233,000 and 0 FTE is requested in the Environmental Satellite Observing Systems subactivity, for a total of \$111,633,000 and 409 FTE. Of this increase, NOAA requests \$3,233,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President's Budget.

- **Satellite Command and Control:** An increase of \$500,000 and 0 FTE, for a total of \$38,729,000 and 179 FTE, is requested under the Satellite Command and Control line item to provide contract support for software engineering, as well as technical and network support for the day-to-day operations, maintenance, and modification of the GOES and POES/MetOp spacecraft ground systems. The GOES and POES/MetOp ground systems equipment is routinely replaced and upgraded. As a result, it is essential to upgrade the software and engineering support to maintain and operate the upgraded system. This increase will provide for a dedicated communications link between the NOAA Satellite Operations Facil-



ity and Centre National d'Etudes Spatiales (CNES), the French Space Agency in order to receive data from the MetOp satellite which is the primary mid-morning satellite. NOAA will also utilize this communications link to retrieve POES data from satellites passing over CNES ground stations and to deliver POES primary mission data from NOAA to CNES for their daily use per the agreement between our nations. The cost of the communications link makes up the largest portion of the requested increase. In addition, the increase would enable the Office of Satellite Operations to provide sufficient technical and network support for the day- to-day operations, maintenance, and modification of the GOES and POES/ MetOp spacecraft ground systems necessary to maintain operational capability.

- **Product Processing and Distribution:** An increase of \$500,000 and 0 FTE is requested, for a total of \$31,457,000 and 123 FTE, under the Product Processing and Distribution line item. The increase will provide procurement of a site license and Synthetic Aperture Radar (SAR) imagery scenes from ENVISAT, the European Space Agency's SAR satellite. The procurement of the site license will provide NOAA with the capability to procure roughly 1,200 scenes in FY 2010, which will mitigate the significant impact to the National Ice Center's (NIC) product delivery when its current no-cost data source, Canadian RADARSAT-1, goes offline in Spring 2007. The Ice Center's sea ice nowcasts and forecasts are critical information products used by commercial and government vessels to avoid ice and identify safe routes through ice-covered waters, as well as to plan efficient transits.
- **NOAA requests an increase of \$3,000,000 and 0 FTE for Ocean Surface Vector Wind Studies.** This increase will develop alternatives for collecting ocean surface vector wind observations following NASA's QuikSCAT mission. These observations benefit weather forecasts, including hurricanes and other severe weather events, and climate monitoring. NOAA will complete design trade studies to determine the best alternative to meeting the ocean surface vector winds requirement, including non-space based alternatives.

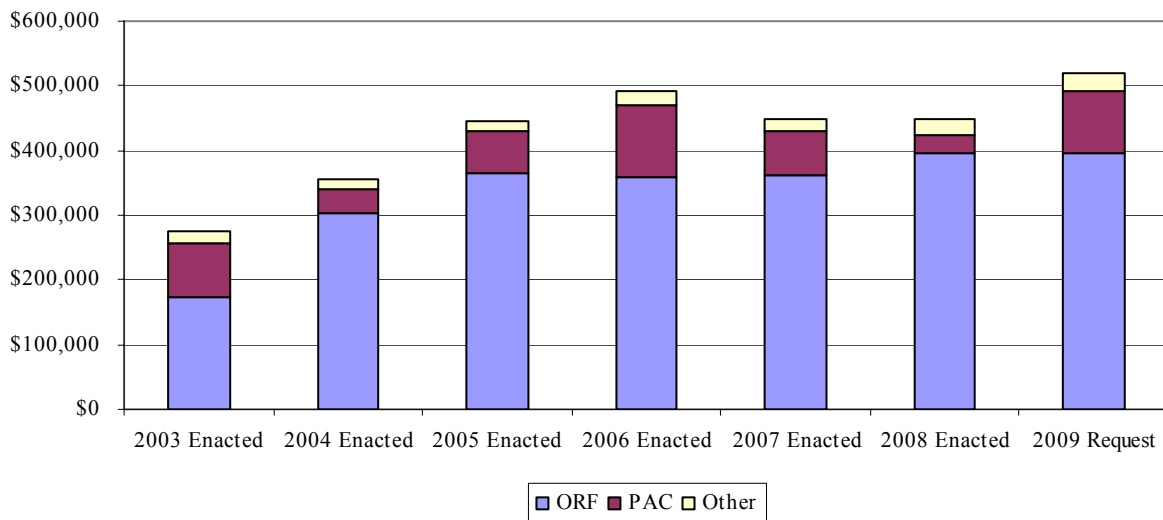


Program Support

(Dollars in Thousands)	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Request	Increase (Decrease)
Program Support -- Operations, Research and Facilities				
Corporate Services	\$180,916	\$187,983	\$193,041	\$5,058
NOAA Education Program	30,446	34,057	16,528	(17,529)
Facilities	21,767	18,501	24,297	5,796
Office of Marine & Aviation Operations	129,113	151,841	160,529	8,688
Total Program Support - ORF	362,242	392,382	394,395	2,013
Other Program Support Accounts				
Total Program Support - PAC	66,494	28,422	98,450	70,028
Total Program Support - Other	21,142	24,921	26,206	1,285
GRAND TOTAL PROGRAM SUPPORT (Direct Obligations)	\$449,878	\$445,725	\$519,051	\$73,326
Total FTE	1,917	1,994	2,019	25

Budget Trends, FY 2003– 2009

(Dollars in thousands)



ORF: Operations, Research, and Facilities

PAC: Procurement, Acquisition, & Construction

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



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

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 over \$2 billion. These facilities are aging, with more than 61 facilities over 50 years old. NOAA's facilities are often subject to 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. OMAO is also responsible for NOAA's fleet safety, diving, and Teacher-at-Sea program. Other mission responsibilities include training and certifying NOAA Corps Officers, crews, and scientists for at-sea duty.

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 20 active ships will perform approximately 3,390 operating days in FY 2009 in support of NOAA programs. The fourth of four newly constructed Fisheries Survey Vessels (FSVs), the BELL M. SHIMADA, will be operational in



FY 2009 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 provides centralized management of 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 2009, Aircraft Services will provide approximately 1,365 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 Citation II, will continue to fly throughout the coastal United States responding and collecting damage assessment imagery, testing new remote sensing technologies, and performing coastal mapping missions.

NOAA Corps Retirement Pay (Mandatory)

The retirement system for the uniformed services provides a measure of financial security after release from active duty for service members and their survivors. It is an important factor in the choice of a career in the uniformed services and is mandated by Federal statutes under Title 10, United States Code. NOAA transfers retirement pay funds to the Coast Guard, which handles the payment function for retirees and annuitants. Health care funds for non-Medicare-eligible retirees, dependents, and annuitants are transferred to the U.S. Public Health Service, which administers the health care program.

FY 2009 Budget Summary

NOAA requests a total of \$519,051,000 and 2,019 FTE for NOAA Program Support. This total includes \$4,079,000 for Adjustments to Base, and a net program change of \$86,522,000 and 38 FTE.

ADJUSTMENTS TO BASE:

The above ATB request includes a net increase of \$3,392,000 and 3 FTE to fund the estimated FY 2009 Federal pay raise of 2.9 percent and annualize the FY 2008 pay raise of 3.5 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.

OMAO

The above ATB request includes a net increase of \$1,695,000 and 66 FTE for ATBs in OMAO, which includes increases for pay raises, expenses, fuel and data acquisition, fleet planning and maintenance, and Aircraft Services.

With these increases, program totals will fund the estimated FY 2009 pay raise of 2.9 percent and annualize the FY 2008 Federal pay raise of 3.5 percent. The FY 2009 base level will provide inflationary increases for non-labor activities, including service contracts, utilities, field



office lease payments, and rent charges from the General Services Administration.

Program Support – ORF PROGRAM CHANGE HIGHLIGHTS FOR FY 2009:

Program changes are summarized at the sub-activity level below. Detailed numeric breakouts are located in Chapter 6, *Special Exhibits*. Descriptions of each request by line item are located in the NOAA FY 2009 Technical Budget.

Corporate Services \$193,041,000

A net increase of \$9,145,000 and 9 FTE above the base is requested in the Corporate Services subactivity, for a total of \$193,041,000 and 1,004 FTE. Of this increase, NOAA requests \$7,945,000 and 0 FTE to maintain current service levels of direct administrative, technical, human resources and financial support to NOAA Staff offices. Funding will also be used to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **NOAA requests an increase of \$1,200,000 and 9 FTE for the NOAA Wide Corporate Services and Agency Management to support the Acquisition and Grants Office (AGO) in providing acquisition and grants support to the Department of Commerce and NOAA.** NOAA’s AGO provides annual acquisition and grants support to DOC and NOAA valued at approximately \$2 billion (\$1 billion in grants awards, \$1 billion in contract awards), representing an increase in workload of approximately 300 percent in just five years. As this workload has increased, the complexity of the acquisitions conducted and the level of contract administration required as have similarly increased. This investment will enhance NOAA’s ability to increase the number of dedicated acquisition and grants personnel to a level 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.

NOAA Education Program \$16,528,000

A net increase of \$336,000 and 0 FTE above the base is requested in the NOAA Education Program subactivity, for a total of \$16,528,000 and 10 FTE. Of this increase, NOAA requests \$341,000 to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **NOAA requests an increase of \$995,000 and 0 FTE** to provide competitive educational grants and continue implementation of the NOAA Educational Plan. This funding will continue to improve coordination of NOAA’s higher education activities directed at strengthening the candidates for a future NOAA workforce. This funding will also enhance NOAA’s higher education activities and promote development of a highly trained, technologically capable workforce.



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\$160,529,000

Marine Operations and Maintenance

A net increase of \$2,378,000 and 29 FTE above the base is requested in the Marine Operations and Maintenance subactivity, for a total of \$130,485,000 and 896 FTE. Of this increase, NOAA requests \$678,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **NOAA requests an increase of \$1,700,000 and 29 FTEs for Marine Crew Safety and Rotation.** The request will improve safety aboard NOAA vessels and improve crew rotation by providing sufficient manpower to reduce the high attrition rate on NOAA ships, safely navigate the NOAA platforms, conduct safe operations, respond to emergencies (fire, accidents, etc.), and provide adequate maintenance services aboard the NOAA vessels.



Aviation Operations

A net increase of \$4,000,000 and 0 FTE above the base is requested in the Aviation Operations subactivity, for a total of \$30,044,000 and 104 FTE. Of this increase, NOAA requests \$616,000 and 0 FTE to increase the base levels of funding for various on-going programs within this subactivity to that recommended in the FY 2008 President’s Budget.

- **NOAA requests \$4,000,000 and 0 FTE for additional operational and maintenance for NOAA aircraft.** This additional funding is needed to maintain NOAA’s current flight hour capacity and also to meet the additional flight requirements emanating from NOAA mission needs, legislative mandates, and Executive Orders. The requested funds will provide an additional 1,295 flight hours for hurricane research, surveillance, and reconnaissance, as well as for winter storms, snow-melt flood forecasting, coastal mapping, and geodic modeling. Additional funding will also enable NOAA to continue to warn the nation about natural environmental forces and to observe, protect, and manage the Earth's resources to promote environmental stewardship.





As aircraft age, routine maintenance costs increase due to the decreasing availability of parts for older aircraft. The breadth of routine inspections increase as more is learned about the aging aircraft, thus increasing costs for inspections and repairs. This request provides additional funds to maintain NOAA's aircraft consistent with the manufacturers' and FAA standards, ensuring that Aircraft Services can sustain a fleet of safe and reliable aircraft. This request also provides additional maintenance funding needed to meet the increased flight hour requirements; as aircraft fly more hours, additional maintenance cycles are required.



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