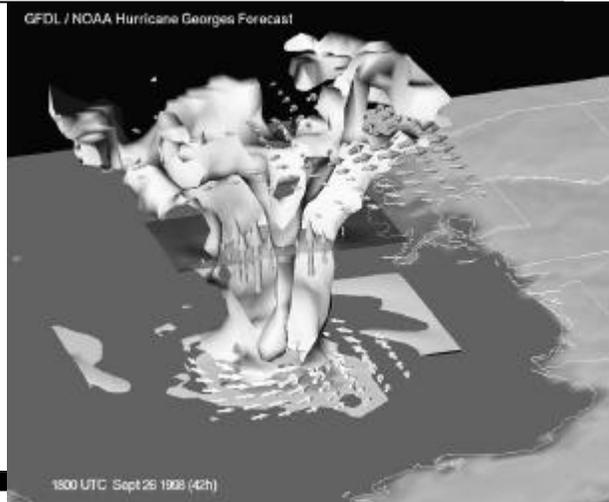


Oceanic and Atmospheric Research

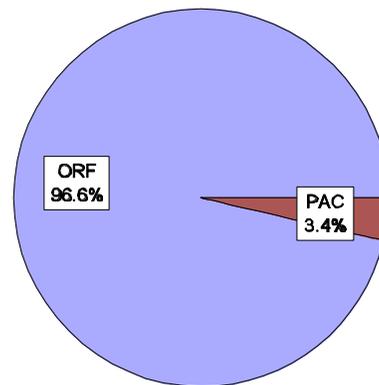
Total Request: \$292,610,000
 ORF: \$282,570,000
 PAC: \$10,040,000



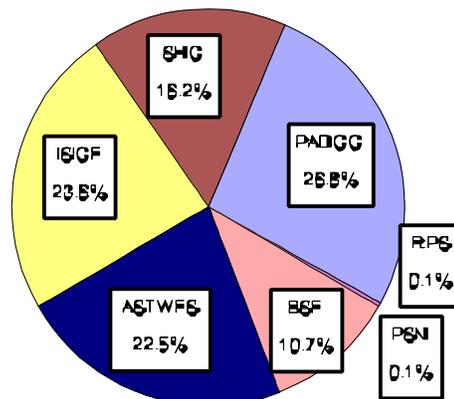
The Office of Oceanic and Atmospheric Research (OAR) conducts the scientific research, environmental studies, and technology development critical to improve NOAA services. These activities directly contribute to the achievement of all of NOAA's seven Strategic Plan goals: Advance Short-Term Warning and Forecast Services, Implement Seasonal to Interannual Climate Forecasts, Predict and Assess Decadal to Centennial Change, Promote Safe Navigation, Build Sustainable Fisheries, Sustain Healthy Coasts and Recover Protected Species. These goals constitute NOAA's contribution to the Nation's on-going effort to maintain economic growth in an environmentally sound manner.

OAR budget activity supports a number of NOAA and government-wide initiatives, including the U.S. Weather Research Program (USWRP), NOAA's components of the U.S. Global Change Research Program (USGCRP) and Natural Disaster Reduction Initiative (NDRI), the Health of

Activity Based (Appropriations Structure)



Goal Based (Strategic Plan Structure)



OAR

the Atmosphere program, the Climate and Global Change program, High Performance Computing and Communications (HPCC), and Global Learning and Observations to Benefit the Environment (GLOBE).

To advance its mission, OAR supports a network of internationally recognized federal scientists, laboratories, university partnerships, and private-sector researchers through the Environmental Research Laboratories, Office of Global Programs, National Sea Grant College Program, National Undersea Research Program, and Joint and Cooperative Institutes. Through these scientific entities, OAR continually improves NOAA's ability to make weather and climate predictions, solar-terrestrial forecasts, manage fisheries and conserve coastal resources. OAR scientists compile the scientific evidence upon which sound regulations in key environmental areas are based. OAR promotes economic growth through the development of marine-derived biotechnology, sustainable aquaculture, and environmental prediction technologies. OAR contributes to the next generation of scientists through outreach and education programs from K-12 to university and beyond. In conjunction with NOAA operations and other federal agencies, OAR is dedicated to promoting the quality of life and economic competitiveness of the Nation.

For FY 2000, NOAA requests \$292.6 million for OAR. This is a net increase of \$0.7 million above the FY 2000 base funding and consists of program increases of \$28.1 million and program decreases of \$27.4 million.

Detailed Program Increases

Climate and Air-Quality Research - NOAA requests \$139.7 million for this subactivity, an increase of \$16.9 million over the FY 2000 base. OAR's climate and air-quality research focuses on the physical process of the ocean and atmosphere, to develop NOAA's predictive capabilities through increased knowledge and modeling accuracy.

Ocean Climate Variability - NOAA requests a \$4.0 million increase to construct, deploy and operate an array of 1000 profiling autonomous floats in the Pacific and Atlantic Oceans. These floats will make real-time, basin-wide measurements of temperature and salinity profiles, as well as estimates of current velocities at depth. These data will be used with existing satellite and in situ ocean observations, along with weather analyses, to produce, for the first time, "weather maps" of the upper ocean and associated seasonal cycles. The seasonal patterns of ocean anomalies in these maps are key to understanding and predicting the climate phenomena that affect U.S. interests both home and abroad. This program will be carried out through the National Oceanographic Partnership Program.

The Role of Oceanic Processes in Climate - NOAA requests an increase of \$1.6 million within its Long-Term Climate and Air Quality Research line item to implement a systemic long-term ocean carbon observing program, and upgrade existing Voluntary Observing

Ship (VOS) programs to include new sensors for carbon dioxide and other climate variables. The resulting data streams will be used with the data from the ocean climate variability to improve existing climate models, develop new data assimilation methods and ocean models, and develop a record of the evolution of the carbon dioxide signal into the world's oceans.

Ozone and Particulate Matter - Health of the Atmosphere (HOA) - NOAA requests an increase of \$0.4 million to improve the understanding of the atmospheric processes controlling the formation and distribution of ground-level ozone and fine particles (aerosols). Research efforts will focus on: (1) studying the chemistry forming these pollutants to identify how changes in emission reductions associated with one could positively or negatively influence the other; and (2) determining the chemical composition of aerosols, their sources, and the aerosol-forming atmospheric processes, to provide a better predictive understanding.

Atmospheric Deposition in Coastal Waters - NOAA requests an increase of \$1.0 million within the long-term climate and air quality line item to improve coastal monitoring and assessment capabilities. The purpose of this work is to quantify the influence of atmospherically-derived anthropogenic nitrogen and other hazardous pollutants on U.S. coastal waters. These have been shown to seriously degrade water quality and damage ecosystems.

Baseline Observational Continuity - NOAA requests an increase of \$1.2 million within the Long-Term Climate and Air Quality Research line item to restore and maintain operations at its base-line observatories in Alaska, Hawaii, Samoa, and Antarctica. These observations are critical to the collection and continuity of the world's longest atmospheric time series, supplying the scientific community with invaluable information on the state and recovery of the ozone layer, global carbon dioxide, and other trace gases impacting the global climate.

High Performance Computing and Communication (HPCC) - Forecast Systems Laboratory (FSL) - NOAA is requesting an increase of \$1.5 million for the FSL massively parallel computer to build and evaluate mesoscale weather prediction models and to improve the national weather observing system. Procurement of this computer was initiated in FY 1999.

Global Learning and Observations to Benefit the Environment (GLOBE) - NOAA proposes a \$2.5 million increase for the GLOBE Program to increase the existing number of participating U.S. schools, teachers, and students, and expand the breadth of science data being collected for the science community. GLOBE is an increasingly valuable aspect of science education for many K-12 students in the U.S., improving the quality of science education for the next generation of American scientists.

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Climate and Global Change - NOAA requests a \$6.7 million increase for the Climate and Global Change Program to improve NOAA's prediction and assessment capabilities through a competitive grants program. The improvements will result from a better understanding of the recurrent patterns of variability of the climate system and its forcings across all time scales. Specific goals will include: (1) improved determination of the influence of the North American Monsoon, North Atlantic Oscillation, and Pacific Decadal Oscillation on climate variability; (2) improved information on the trends and probabilities of occurrence of extreme events such as floods, storms, hurricanes, and tornadoes; (3) improved quantification of the oceanic and terrestrial sources and sinks of carbon dioxide with an emphasis on North America; and, (4) improved estimation of the spatial distribution of atmospheric carbon dioxide and tropospheric ozone and its role in the patterns of climate variability.

Atmospheric Programs - NOAA requests \$47.1 million for this subactivity which promotes NOAA's progress in making advanced warnings of geomagnetic storms and severe weather. Geomagnetic storms and severe weather cause hundreds of deaths and billions of dollars worth of damage annually. The critical research in this subactivity provides increased lead times and improved forecast accuracy. It is focused on developing better observing tools, understanding the processes that cause violent weather and solar-terrestrial phenomenon, and applying that information to improve warnings and forecasts. Through this research, OAR builds the knowledge base that enables vulnerable geographic areas and economic sectors to prepare for and respond to natural disasters and disruptive weather.

U.S. Weather Research Program (USWRP) - NOAA requests an increase of \$1.5 million for the USWRP to improve the forecast accuracy and lead-time for hurricane landfall location using state-of-the-art instruments deployed from NOAA aircraft during coordinated hurricane surveillance missions. This will improve the accuracy of predictions for emergency preparedness, ultimately saving lives and property. Enhancing the economic and social benefits of improved hurricane tracking and landfall predictions fulfills an important part of NOAA's mission goal to Advance Short-Term Warning and Forecast Services.

Oceans and Great Lakes Programs - These programs constitute OAR's efforts to enhance our predictive ability and knowledge of ocean and Great Lakes environments, ensure their sustainable management, and promote economic growth in marine industries. A total of \$82.8 million is requested for this subactivity in FY 2000.

Marine Aquaculture - NOAA requests an increase of \$3.6 million to launch new projects to begin the sustainable production of native commercial ocean species. It will also support research on the impacts of aquaculture on the marine environment to ensure continued responsible development. This effort promises to strengthen the U.S. fisheries industries by increasing domestic fish production, reducing the fisheries trade deficit, and

building a sophisticated, profitable, environmentally-friendly industry. This technology will also be useful for enhancing stocks of over-exploited wild fishes, and will relieve pressures on wild stocks.

Hypoxia - NOAA requests an increase of \$0.4 million to research and model the hypoxic (low oxygen content) conditions that have developed in the northern Gulf of Mexico. Hypoxia seriously threatens the region's marine ecosystems and dependent economies. The assessments would help Mississippi basin managers choose cost-effective means to reduce the nutrient loading in waters flowing into the Gulf and the resulting hypoxic conditions.

Fisheries Oceanography - NOAA requests an increase of \$0.4 million to develop, deploy and maintain a network of bio-physical moorings in the Pacific Ocean. This system will provide data on key oceanographic indicators and give NOAA managers greater insight on environmentally-induced decadal-scale shifts in the productivity of commercially important fish stocks. This cooperative efforts, between OAR and NMFS is part of the Fisheries and the Environment (FATE 2000) Initiative, and is critical to mission-related NMFS and OAR goals of Building Sustainable Fisheries.

Aquatic Nuisance Species/Non-Indigenous Species Act - Non-indigenous species pose significant threats to local economies by disrupting natural ecosystems and displacing indigenous commercial species. NOAA requests an increase of \$0.2 million to support efforts in new technology, research, outreach, and the development of control programs by the Aquatic Nuisance Species Task Force to curb the spread of invasive species in U.S. waters.

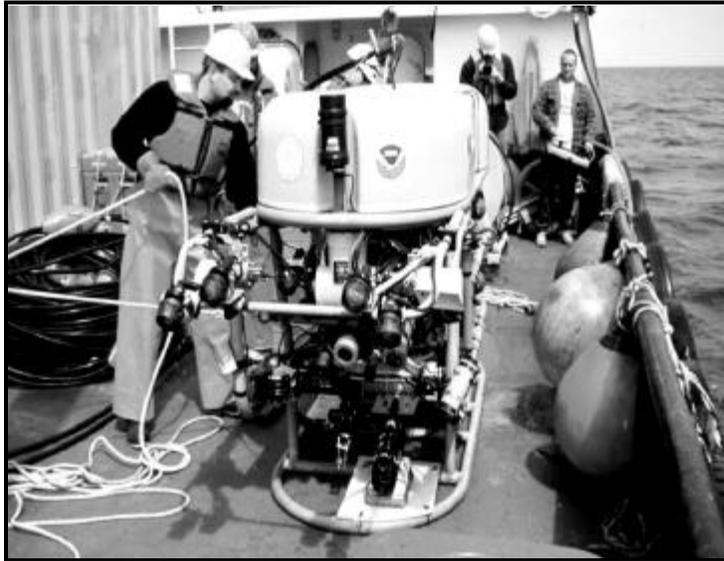
Ocean Floor Observatories - As announced at the National Oceans Conference, OAR is requesting an increase of \$3.1 million to expand shallow water observatories, develop new deep-sea observatories, and enhance vehicles through the use of advanced technologies to explore and understand the undersea environment. The vast unknown resources of the undersea environment, earth's last frontier, await our exploration.

Sea Grant College Program - NOAA supports the operation of the Sea Grant College program at the \$51.5 million level.

National Undersea Research Program - The administration supports the NURP program at the \$9.0 million level. This request will continue important undersea research in fisheries habitats, coral reef ecosystems, and fisheries management issues. The program expects to encourage new research related to understanding deep ocean environments and obtaining new products from the sea. This new direction, "bio-prospecting," will catalyze new partnerships to pursue aggressively an integrated program of basic and applied research into the biotechnological benefits that lurk beneath the ocean's surface.

OAR

Acquisition of Data - NOAA is requesting \$13.0 million for ship operations in support of oceanographic data collections. This maintains funding at the FY 1999 level.



A NURP Remotely Operated Vehicle (ROV)

HPCC - Geophysical Fluid Dynamics Lab (GFDL) - NOAA requests an increase of \$5.7 million to acquire a very large, scalable computer to be located at OAR's Geophysical Fluid Dynamics Lab (GFDL), in Princeton New Jersey. This computer will be used to improve forecasts of El Nino events, model climate variability, and make better hurricane tracking and intensity predictions. This item is listed in the Procurement and Acquisition and Construction (PAC) Account of the budget request.

GEOSTORMS (ACE follow-on) - In the Procurement, Acquisition, and Construction Account, NOAA requests an increase of \$4.3 million to fund the GEOSTORMS program. GEOSTORMS is the follow-on to the Advanced Composition Explorer satellite (ACE) and maintains operational satellite continuity for our Real-Time Solar Wind (RTSW) data requirement. These observations are the only way to tell whether a solar storm will hit Earth and if so, its intensity. Power companies and other vulnerable industries now count on solar wind warning products to trigger preventive measures that help avert massive utility blackouts and satellite failures. Without GEOSTORMS, the lead time for solar storm warnings drops from 60 minutes to 0, and the accuracy drops from nearly 100% to less than 30%. With GEOSTORMS we will use solar sail propulsion to move twice as far from the Earth and improve the lead-time to 120 minutes while maintaining almost the same accuracy. Furthermore, GEOSTORMS will allow us to keep running, improving, and developing forecast models that predict storm dynamics. Industry has told NOAA to

make this our number one priority. The program is so integral to USAF and NASA requirements and plans that they are contributing 25% and 50% of the costs, respectively.

Boulder Building Facilities Operations - NOAA is requesting \$3.8 million in FY 2000 to fund recurring Boulder facilities operations, including the higher lease, utility, custodial, and security costs association with the 24-hour operations at the new Boulder Laboratory. Negotiations on the final costs are still continuing with GSA.

Adjustments-to-base, program reductions and terminations are shown in Section 4: Supplementary Information.

DOC: The Digital Department
<http://www.oar.noaa.gov/>

OCEANIC AND ATMOSPHERIC RESEARCH
(\$ IN THOUSANDS)

GOAL BASED - All Accounts	FY 1999 ENACTED		FY 2000 BASE		FY 2000 PRES. REQUEST		INC./DEC. (REQUEST - BASE)	
	FTE	AMT.	FTE	AMT.	FTE	AMT.	FTE	AMT.
Advance Short-Term Warning and Forecast Services	296	56,813	296	56,613	296	65,853		9,240
Implement Seasonal to Interannual Climate Forecast	174	63,599	187	63,317	187	68,917		5,600
Predict and Assess Decadal-to-Centennial Change	374	67,936	374	69,553	374	78,440		8,887
Promote Safe Navigation		389		389		389		
Build Sustainable Fisheries	24	35,145	24	32,095	24	31,386		(709)
Recover Protected Species		340		340		340		
Sustain Healthy Coasts	115	63,188	42	59,576	42	47,285		(12,291)
TOTAL OAR	983	287,410	923	281,883	923	292,610		10,727