

Ocean Sciences in the FY 2003 Budget

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HIGHLIGHTS

- National Oceanic and Atmospheric Administration (NOAA): Overall NOAA funding would decrease by \$45.4 million (down 1.4 percent) in FY 2003. A significant portion of that decrease comes from NOAA's ocean research programs, which would lose the Sea Grant program (\$57 million) to NSF, and see major cuts in Oceans, Coastal and Great Lakes Research Partnership Programs (down \$21.0 million).
- National Science Foundation (NSF): Funding for the Geosciences Directorate (GEO) would increase 13.4 percent to \$691.1 million, and the Ocean Sciences Division would see an increase of 13.5 percent for a total of \$319.0 million in FY 2003. However, this increase is directly attributable to the transfer of programs to NSF from other agencies.
- Department of the Navy: Navy basic research ("6.1") would see an increase of \$5.4 million, 1.3 percent over FY 2002, while Navy applied research ("6.2") would take a 25.3 percent cut.
- National Aeronautics and Space Administration (NASA): Earth Science at NASA would increase slightly to \$1.6 billion. Funding for the Earth Observing System would increase \$25.5 million to \$410.9 million, while Earth Science Program Science would decrease by \$30.8 million to \$506.3 million in FY 2003.
- U.S. Geological Survey (USGS): Geologic Hazards, Resources, and Processes, which funds coastal and resource studies, would decrease by \$8.1 million to \$224.6 million.

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INTRODUCTION AND POLITICAL ENVIRONMENT

Oceans cover nearly three-quarters of our Earth's surface, and are the primary driver of weather and climate on Earth. The oceans also are a vital part of U.S. national security and a critical element in international trade and economic development. In addition, more than half of the world's population currently live where the ocean meets the land, an area that comprises less than two percent of the Earth's surface. These fertile coastal zones provide food, recreation, and natural resources.

Today, a host of new questions are facing the ocean community as our country reevaluates our national priorities and attempts to address pressing concerns in the international arena. How do we protect our shores and coastal communities from the threat of terrorism? How can we implement management regimes that conserve marine resources and ensure adequate food supplies around the world? How do we maintain the health and well-being of the American public and minimize coastal hazards? In order to address these emerging issues, protect our ocean resources, and better understand important climate phenomena such as El Niño, more information is needed about the oceans and its processes.

U.S. research programs at more than a dozen federal agencies contribute to our understanding of marine environmental systems along the coasts and in the deep ocean. One new approach to coordinating efforts among all the agencies involved in ocean research is the National Oceanographic Partnership Program (NOPP). Recently, NOPP has been involved in the development of implementation plans for an integrated ocean and coastal observing system, and the establishment of an interagency office, OCEAN.US, to develop a national plan for integrating and sustaining ocean observations and predictions. This observation system will be used to collect the biological, chemical, physical, and geological oceanographic data necessary to ensure national security, facilitate safe and efficient marine operations, manage living resources, detect and predict climate variability, preserve and restore marine ecosystems, mitigate natural hazards, and ensure public health.

NATIONAL SCIENCE FOUNDATION (NSF)

At the start of the new millennium, NSF seemed on track to double its budget over five years. However, growth in the NSF budget slowed last year and in FY 2003 the NSF budget is slated to increase only 5.0

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percent to a total of \$5.0 billion (see Table II-7). Funding for Research and Related Activities would increase 5.1 percent to \$3.8 billion.

Geosciences (GEO) funding in FY 2003 would total \$691.1 million, an increase of \$81.6 million (13.4 percent), but the bulk of this increase is attributable to program transfers from other agencies. Without transfers of \$57.0 million from NOAA, \$9.0 million from the Environmental Protection Agency (EPA), and \$10 million from the U.S. Geological Survey, Geosciences would see only a 1.3 percent increase. The impact of these program transfers on the Geosciences budget is felt particularly in the ocean science community. NSF is the largest supporter of basic ocean science in the United States, funding major programs as well as individual investigator-initiated projects. The FY 2003 budget request for the Ocean Sciences Division (OCE) totals \$319.0 million (up \$38.0 million) of which \$43.3 million is a result of the transfer of the National Sea Grant College program from NOAA to NSF. Without the Sea Grant transfer, OCE would actually see a decrease of \$5.3 million. Under NSF management, the Sea Grant program would focus on the development of marine resources, marine commerce and engineering, and marine social science issues. Sea Grant education and extension programs as well as the Sea Grant-sponsored research on zebra mussels and oyster disease would be eliminated.

Within the OCE division, the budget requests \$120.0 million for Ocean Section research support (up 15.4 percent). This funding would support individual investigator research in areas such as marine biocomplexity, the linkages between oceans and human health, data assimilation and modeling for ocean circulation, carbon cycling, and sustained observations of deep ocean and coastal systems.

The Integrative Programs Section would receive \$104.0 million (up 11.1 percent). Of this amount, \$62.0 million is slated to support ship operations and the academic research fleet (up 3.5 percent). This section also includes \$750,000 in funds for the Ocean Observatories Initiative, a basic infrastructure and placement project that has been approved by the National Science Board for inclusion in a future NSF budget. The funds included in FY 2003 are to be used for related projects and planning efforts. Also included in Integrative Programs is \$1.5 million for the Centers for Ocean Science Education Excellence (COSEE). This funding will be used to support a network of coordinated centers to facilitate collaborations and communications between ocean science

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researchers and educators. Funds will also be used to support NOPP, including (NSF Director) Dr. Rita Colwell's role as chair of the National Ocean Research Leadership Council, which will oversee planning for the renewal of the academic fleet.

The Marine Geosciences Section would receive \$95.0 million of the OCE funding request, including \$30.0 million for Ocean Drilling Program operations. (For additional information on GEO programs, see also Chapter 15.)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOAA's FY 2003 budget request totals \$3.3 billion, a decrease of \$45.4 million (down 1.4 percent) from FY 2002 funding levels. This request includes \$18.0 million in funding for the Administration's new U.S. Climate Change Research Initiative (CCRI) including: \$5 million to establish a climate modeling center; \$4 million to extend the U.S. portion of ARGO floats; \$4 million for an international Global Climate Atmospheric Observing System; \$2 million for participation in the multi-agency National Aerosol-Climate Interactions Program; \$2 million for carbon monitoring; and \$1 million for the Regional Science Integrated Assessments Program. (For more on CCRI, see Chapter 15.)

Oceanic and Atmospheric Research (OAR): The budget request for OAR, which funds the bulk of NOAA research, would decrease by \$76.2 million (20.0 percent) to total \$307.5 million in FY 2003.

Decreases to the OAR budget request include the transfer of the National Tsunami Hazard Mitigation Program (down \$2.3 million) to the National Weather Service; a decrease to the National Undersea Research Program (down \$2.4 million); and a decrease to the Ocean, Coastal, and Great Lakes Research Partnership Programs (down \$20.6 million). In addition, \$62.4 million of the reduction reflects the transfer of \$57 million (in FY 2003) for the Sea Grant College Program to NSF and the termination of national research programs on zebra mussels and oyster disease.

Increases are included for the NOAA Climate Research account, which would receive \$171.0 million, an increase of \$20.8 million over FY 2002. Increases are included for Laboratories and Joint Institutes (up \$5.4 million) which fund the TAO/Triton buoy array, a critical component of the ENSO Observing System, and the Global Ocean

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Observing System (GOOS). In addition, \$2.0 million is requested to study Environmental Arctic Change and improve detection of change at the Arctic air/ice/ocean interface.

Also included in the OAR budget is funding for a third year of ocean exploration activities. Last year NOAA received \$14 million to fund partnerships with public and private institutions to promote ocean exploration and research. This year's request is for \$14.2 million which will be used to focus on mapping the oceans, exploring ocean dynamics and interactions, developing new sensors and systems for ocean exploration, and ocean education and outreach.

National Ocean Service (NOS): The funding request for NOS totals \$385.3 million for FY 2003, a decrease of \$28.6 million from FY 2002 funded levels. While the primary mission of NOS is coastal stewardship, NOS' budget would support approximately \$55 million of R&D activities in FY 2003.

The request includes \$18.8 million (down \$2.8 million) for the Coastal Ocean Program, which supports peer-reviewed, multi-disciplinary research to assess three national issues: coastal ecosystem oceanography, cumulative coastal impacts, and harmful algal blooms/eutrophication. The request includes funding for the ECOHAB program (\$4.2 million), Hypoxia (\$1.1 million), and South Florida Ecosystems (\$1.2 million). Funding for the Long-term Estuary Assessment Consortium and the Mississippi River/Gulf of Mexico Nutrient Watershed would be eliminated.

The NOS budget request also provides funding for the Ocean Resources Conservation and Assessment program, which directs research programs to provide scientific information to policymakers on the protection and sustainable use of ocean and coastal areas. Included in this program is \$75.0 million for the Ocean Assessment Program, down \$19.8 million from the FY 2002 level. This reduction in funding is due primarily to the proposed termination of congressionally requested and one-time-only projects including such programs as the coastal observation technology system (down \$0.5 million); Center for Integrated Marine Technologies (down \$2.0 million); Coastal Change Analysis (down \$2.0 million); and wave Current Information System (down \$1.0 million).

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In addition, the NOS budget requests \$16.4 million for Estuarine Research Reserves, equal to the FY 2002 level, and \$35.6 million for the Marine Sanctuary Program, an increase of \$1.3 million over last year's level. An additional \$3 million has been requested to inventory and assess existing marine protected areas.

National Marine Fisheries Service (NMFS): The total budget request for NMFS for FY 2003 is \$741.2 million, an increase of \$34.0 million above the FY 2002 funded level. Research funding within NMFS would increase 2.3 percent (\$8.7 million). Within this amount \$237.7 million is provided for science and technology within the Fisheries Research and Management Services account (up 3.0 percent) and \$103.9 million is included for science and technology under the Protected Resources Research and Management Services account (down 4.8 percent). This funding would support research on specific fishery issues, including Atlantic salmon, Pacific salmon, sea turtles, Steller sea lions, red snapper and west coast groundfish. Funds totaling \$1.0 million (down 33 percent from FY 2002) are also provided for fisheries oceanography studies on the impact of long-term environmental factors on fish stocks.

National Environmental Satellite, Data, and Information Service (NESDIS): In FY 2003 NESDIS would receive a total of \$764.7 million, an increase of \$60.4 million over the FY 2002 funded level. Funding of \$237.3 million is included in the budget request for continuation of the National Polar Orbiting Environmental Satellite System (NPOESS), an increase of \$79.9 million over the FY 2002 enacted level. Enhancements to this system, which is jointly funded with the Department of Defense and NASA, will continue the development of instrumentation for the system and fund the first full year of the spacecraft engineering and development phase of NPOESS. The request also includes \$6.0 million for Coastal Remote Sensing to develop and deploy a high-resolution imaging sensor to monitor coastal ocean areas for harmful algae blooms, coral reef habitats, pollution changes, and fisheries management.

Office of Marine and Aviation Operations: A total of \$86.0 million has been requested for the Marine Operations account in FY 2003, an increase of \$11.0 million over the FY 2002 funding level. This account supports the data acquisition needs of NOAA line offices, including days-at-sea for the research programs. The request includes an increase of \$2.5 million to outsource with the UNOLS for ships in the Pacific to support Fisheries-Oceanographic Coordination Investigations, VENTS,

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and Oregon/Washington groundfish habitat, and maintenance of the tsunami moorings in the Gulf of Alaska and Pacific Ocean.

DEPARTMENT OF THE NAVY

The Office of Naval Research is one of the largest supporters of oceanographic research in the Federal government, with the bulk of that support coming from the “6.1” basic research account. In FY 2003, the budget request is \$409.9 million for “6.1” basic research, an increase of \$5.4 million (1.3 percent) over the FY 2002 funding level. The Navy’s request for “6.2” applied research is \$580.3 million in FY 2003, a decrease of \$196.4 million or 25.3 percent. Navy applied research is funded by program element that includes requests of \$55.2 million for Ocean Warfighting Environment Applied Research, \$71.3 million for Undersea Warfare Applied Research, and \$56.8 million for Mine and Expeditionary Warfare Applied Research.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

For the third year in a row, the budget request has included an increase for NASA. In FY 2003, the request totals \$15.1 billion, an increase of \$104.3 million over the FY 2002 level. In contrast to previous years in which the Earth Science budget request declined, the FY 2003 Earth Science request increases \$2.7 million to total \$1.63 billion. Requested funding for the Earth Observing System (EOS) is \$410.9 million in FY 2003 (up \$25.5 million). EOS is a program of multiple spacecraft, which observe the major interactions of the land, oceans, atmosphere, ice, and life, and interdisciplinary science investigations that together provide data needed to understand global climate change. Among EOS missions under development are Jason, to study ocean topography; Aqua, to examine atmospheric temperature and humidity, clouds, and sea surface temperature; and SeaWinds, the ocean winds successor to QuikSCAT.

The Earth Explorers funding request is \$71.2 million (down \$3.0 million). This program uses data collected by the Shuttle Radar Topography Mission (SRTM) to create a high-resolution digital topographic map of the world.

The request for Earth Science Program Science is \$506.3 million, a cut of \$30.8 million from FY 2002. Research conducted through this program is designed to answer basic questions about how the global

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Earth system is changing through a variety of disciplines including oceanography, atmospheric chemistry and physics, and ecology.

The request for the EOS Data Information System (EOSDIS), which operates the EOS satellites now in orbit, and retrieves and converts flight data to useful scientific information, is \$74.3 million in FY 2003, a decrease of \$218.7 million. This decrease is a result of the near-completion of EOSDIS and the transfer of operations requirements to the Mission Operations account, whose FY 2003 request is \$247.8 million.

U.S. GEOLOGICAL SURVEY (USGS)

The budget request for the Interior Department's USGS in FY 2003 is \$905.0 million, a \$45.8 million decrease from FY 2002 enacted funding. Reductions include one-time and congressionally requested projects, as well as the transfer of the Toxic Substances Hydrology Program to the NSF. (For more on USGS, see Chapters 17 and 18.) The Geologic Hazards, Resources, and Processes account, which funds coastal and resource studies, would decrease by \$8.1 million (down 3.5 percent) for a total of \$224.6 million. Budget cuts include a \$0.5 million reduction for coastal erosion studies in North Carolina; a \$0.5 million decrease for a land subsidence, sea-level rise, and hurricane risks assessment in southeast Louisiana; and the elimination of \$0.5 million in pass-through funding for to the Puget Sound LIDAR consortium.

OTHER AGENCIES

Department of Energy (DOE): The DOE Office of Science request for FY 2003 includes a total of \$504.2 million for Biological and Environmental Research, a decrease of \$66.1 million from the FY 2002 funding level. Included in the total request is \$138.0 million for DOE support for the U.S. Global Change Research Program (USGCRP).

Environmental Protection Agency (EPA): The budget request for the EPA totals \$7.7 billion, a decrease of \$283.2 million. EPA's Strategic Goal entitled Sound Science, Improved Understanding of Environmental Risk, and Greater Innovation to Address Environmental Problems would receive \$327.8 million, \$8.2 million less than FY 2002. Within this goal, funding of \$119.1 million (down \$1.5 million) is provided for Research for Ecosystem Assessment and Restoration, which funds the national coastal monitoring program and a report on the nation's estuaries.