

Biological and Ecological Sciences in the FY 2005 Budget

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INTRODUCTION

This chapter focuses on those fields of biology pertaining to the natural world, including: botany, zoology, ecology, basic molecular and cellular biology, agricultural sciences, and taxonomy. Funding for human health-related biological research has steadily increased in recent years due to increased funding for the National Institutes of Health. However, funding for non-medical biology has not matched that pace, and, in fact, accounts for only 3 percent of all federally supported life science funding.

Biological and ecological research provides the scientific basis for management of the nation's natural resources. Nearly every federal agency supports biological research, ranging from probing the function of soil microbes to developing atmospheric models. Much of it is conducted in-house by agencies with a regulatory role in environment and natural resources, including the U.S. Geological Survey for the Department of the Interior, the Environmental Protection Agency (EPA), and the National Oceanic and Atmospheric Administration (NOAA).

In addition to in-house federal research, many agencies also have extramural grants programs. Data from the National Science Foundation (NSF) indicate that 65 percent of the extramural funding for this type of research comes from the NSF. The U.S. Department of Agriculture (USDA), the Department of Energy (DOE), EPA, and NOAA also fund competitively awarded extramural biological and ecological research.

HIGHLIGHTS

- **NSF:** The agency proposes three new Long-term Ecological Research sites for FY 2005.

- **EPA:** Funds for the Science to Achieve Results (STAR) graduate fellowship program would fall by 33.5 percent relative to FY 2004 while the larger STAR research grants program would drop by \$36 million.
- **NOAA:** NOAA proposes significant cuts for the National Undersea Research Program, the Coastal Ocean Program, and Ocean Exploration.

NATIONAL SCIENCE FOUNDATION (NSF)

NSF remains the principal federal supporter of the biological and ecological sciences, providing 65 percent of the academic funding for non-medical biology. The NSF proposed budget for FY 2005 includes a 2.2 percent (\$13 million) increase in funding for the Biological Sciences Directorate (BIO) to bring it to a total of \$600 million.

There are six major program areas within BIO. Those programs, along with the requested FY 2005 budget, along with the monetary and percentage change from FY 2004, are: Molecular and Cellular Biosciences \$125 million (\$3.2 million, 2.6 percent increase); Integrative Biology and Neurosciences \$111 million (\$3.2 million, 3.0 percent increase); Environmental Biology \$111 million (\$3.2 million, 3.0 percent increase); Biological Infrastructure \$85 million (\$5.2 million, 6.5 percent); Emerging Frontiers (a cross-discipline, “virtual” directorate) \$78 million (\$1.9 million, 2.3 percent decrease); and Plant Genome Research \$89 million (no change).

The request includes an additional \$2.3 million for the Long Term Ecological Research Network (to \$22.8 million) for the initiation of three new coastal LTER sites. Previous reviews of the LTER program have noted the need to diversify the ecosystems represented in the network.

NSF has selected aquatic research as a new focus for the cross-directorate Biocomplexity in the Environment initiative. Biocomplexity is one of five NSF budget priorities, with a budget request of \$100 million for FY 2005 (no change from FY 2004).

In addition to BIO funding, NSF has again requested \$12 million for the proposed National Ecological Observatory Network (NEON) in Major Research Equipment and Facilities Construction (MREFC). This is the fourth request for NEON through the MREFC account; none of the

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previous requests have been granted. However, language in the FY 2004 appropriations bill directed NSF to spend BIO funds to begin fully developing the NEON plan. While Congress did not specify a dollar amount, NSF set aside \$4 million this year for NEON.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

The Administration is again proposing an increase for the nation's premier competitive research program for fundamental and applied research in agriculture. The National Research Initiative (NRI) would receive \$180 million under the President's proposed budget (up \$16 million). NRI is administered through USDA's Cooperative State Research, Education, and Extension Service, which partners with higher education institutions to foster extramural research, higher education, and extension activities related to agricultural productivity and natural resource management. In addition to fostering peer-reviewed research in the agricultural sciences, NRI also helps develop the next generation of scientists with expertise critical to meeting the nation's challenges in food production. In FY 2005, NRI plans to stress research on emerging diseases and pests, air quality, and biosecurity, among other areas. It also plans to fund functional genomics and databases.

The Administration proposes that the Forest Service's Forest and Rangeland Research budget receive \$280.5 million in FY 2005, an increase of \$14.3 million, including an additional \$3.1 million for research on rapid management responses to invasive species which threaten forest and rangelands and \$6.1 million to boost science and technology applications. The Healthy Forests Initiative, a joint effort of USDA and the Department of Interior meant to reduce hazardous fuels build-up, would continue to be implemented in FY 2005 with a proposed budget of \$266 million. This is far short of the \$760 million proposed in Healthy Forests authorizing legislation. The total request for the National Fire Plan is \$1.7 billion, of which hazardous fuels reduction is a part. For more on USDA, see Chapter 11.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

The President's FY 2005 budget proposes a substantial cut to R&D at the Environmental Protection Agency (EPA). While intramural research is supported throughout the offices of the EPA, the bulk of extramural research funding comes through the agency's Science to Achieve Results

(STAR) program. The STAR program has been part of the President's budget since 1995. Since 2000, the President's budget request for STAR has been about \$100 million per year. However, a substantial cut—to a total of \$65 million—has been proposed for STAR in FY 2005.

The cuts to STAR would eliminate the following ongoing research programs: endocrine disrupting chemicals (EDCs), ecological research, mercury, and pollution prevention (Technology for a Sustainable Environment). In addition, half the funding for the final year of the Hazardous Substance Research Centers, a 5-year program, was not included in the FY 2005 budget. EPA estimates that approximately 90 fewer individual research projects would be awarded from the 2005 President's budget request. (For more on EPA, see Chapter 13.)

The STAR fellowship program is the only federal fellowship program designed exclusively for students pursuing advanced degrees in the environmental sciences and engineering. This year, the administration continues its history of proposing major cuts to the fellowship program. After proposing a 100 percent cut in FY 2003 and a 50 percent cut in FY 2004 (both were restored by Congress), the Administration is proposing a 33 percent cut for FY 2005.

In addition to the cuts to STAR, several other biological and ecological projects at EPA have been proposed for elimination in FY 2005, including: homeland security building decontamination research (\$8.3 million), environmental technology verification (\$1.0 million), and environmental education (\$10 million).

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) supports intramural and extramural research related to its mission to “protect, restore and manage use of coastal and ocean resources through ecosystem management approaches.” Biological and ecological science research is supported in three of NOAA's line offices, the National Ocean Service (NOS), the National Marine Fisheries Service (NMFS) and NOAA Research (OAR). Within the National Ocean Service, three programs fund ecological assessment or research for America's coastlines. The Ocean Assessment Program, which funds monitoring projects such as coastal observing systems, is slated to receive \$72.8 million in FY2005. Ocean and Coastal Research is slated to receive

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\$10.5 million. For the first two programs, the President's FY 2005 request is nearly identical to the FY 2004 request, but lower than the amount appropriated by Congress for FY 2004 (45.5 percent and 47.6 percent cuts, respectively). This trend reflects the removal of earmarked research projects from the President's request and their subsequent reinstatement by congressional appropriators.

The budget requests \$8.7 million for Coastal Ocean Science, which includes the Coastal Ocean Program and supports research on coastal ecosystems (such as harmful algal blooms and eutrophication). This amount represents a 58.5 percent decrease from FY 2004. While much of this decrease reflects removal of congressional earmarks, the administration proposed an additional \$6 million cut from its FY 2004 request. No justification for the decrease was given in the NOAA budget.

Science and Technology programs in NMFS total \$249.9 million in the FY 2005 request, an 11.1 percent decrease from FY 2004. Included in this total are increases in the following categories: expand stock assessments (\$2.8 million), fisheries oceanography (\$1.0 million), climate regimes and ecosystem productivity (\$0.5 million), economics/social sciences (\$1.2 million) and expand/modernize observer data collections (\$9.5 million).

The FY 2004 budget request for ocean, coastal and Great Lakes research in OAR is \$103.5 million, a 33.2 percent decrease from FY 2004 enacted levels. As with other NOAA line offices, this \$51.4 million decrease is largely due to the elimination of several congressionally earmarked projects. The largest program within OAR is the National Sea Grant College Program. NOAA Sea Grant supports research, education and extension projects to help the country better manage its coastal resources. The FY 2005 request is 7.2 percent lower than FY 2004.

Two programs which promote underwater research and exploration would be cut in FY 2005. The National Undersea Research Program (NURP), which places scientists under the sea to conduct research in support of coastal and ocean resource management, would receive \$10.9 million, a decrease of nearly \$1 million. That amount would result in 20 percent fewer underwater ecosystems science projects funded by NURP. The Ocean Exploration program is also slated for a cut of \$1.8 million to \$11.2 million, and will result in a 20 percent reduction in available funding for the academic community and other NOAA partners.

DEPARTMENT OF ENERGY (DOE)

DOE's Biological and Environmental Research (BER) program supports research ranging from climate models to the study of microbes and their role in sequestering carbon. The Administration is again requesting about \$500 million for BER, a decline from FY 2004. BER is divided into four main research areas: life sciences, climate change, environmental remediation, and medical science. One of BER's program goals is to "Harness the Power of Our Living World—Provide the biological and environmental discoveries necessary to clean and protect our environment." Research in fundamental microbiology would continue to explore how microbes can be used to clean up the environment, sequester atmospheric carbon dioxide, and serve as new fuel sources. In fiscal year 2005, DOE would continue support for both terrestrial and ocean carbon sequestration research (\$8.5 million), involving both federal laboratories as well as universities. Also included in the budget is ecological research to better understand the response of ecosystems to environmental changes (\$18.7 million). The agency proposes to shift the Atmospheric Science Program from air quality research on tropospheric ozone and particulates to the effects of aerosols on climate.

U.S. GEOLOGICAL SURVEY (USGS)

USGS is the Department of Interior's sole science agency, providing natural science expertise needed to address challenges that range from freshwater availability to controlling invasive species. The President's budget would cut all USGS divisions (biology, geology and water) with the exception of mapping, where funding would stay flat.

The agency plans to highlight the areas of water availability and invasive species in the coming fiscal year. The Administration requests an increase of \$1 million to expand research and control of the invasive brown tree snake and help implement the interagency National Invasive Species Management Plan. However, for the fourth year in a row, the Administration proposes a significant (14 percent) cut to the Toxic Substances Hydrology Program, part of the agency's Water Resources Division. In previous years, Congress has rejected proposed cuts to the agency's water programs. The National Water Quality Assessment Program, charged with monitoring the nation's water quality, would see a slight increase to \$64 million. The agency's Biological Resources Division is slated for a \$3 million cut to \$172 million in FY 2005.