

Biological and Ecological Sciences in the FY 2004 Budget

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INTRODUCTION

Biological research is supported by nearly every agency of the federal government and performed in habitats ranging from the deep ocean to outer space. For the purposes of this chapter, we focus on those fields of biology pertaining to the natural world, including: botany, zoology, ecology, basic molecular and cellular biology, agricultural sciences, and taxonomy. While funding for biological research related to human health has steadily increased in recent years due to increased funding for the National Institutes of Health (NIH; see Chapter 8), funding for these fields of biology have not matched that pace.

Biological and ecological research provides the scientific basis for management of the nation's natural resources. Much of this type of research is conducted in-house by agencies with a regulatory role in the environment and natural resources. These agencies include the U.S. Geological Survey (USGS) for the Department of Interior, the Environmental Protection Agency (EPA), and the National Oceanic and Atmospheric Administration (NOAA). Annual fish stock assessments conducted by the National Marine Fisheries Service within NOAA and used to determine commercial fish harvests are an example of this type of research.

In addition to research conducted by the federal agencies, many agencies have extramural grant programs. Data from the National Science Foundation (NSF) indicate that 65 percent of the extramural funding for this type of research comes from NSF. The U.S. Department of Agriculture (USDA), the Department of Energy (DOE) and the National

Oceanic and Atmospheric Administration (NOAA) also fund competitively awarded extramural biological and ecological research.

The FY 2004 budget also includes funding for two major infrastructure projects: \$18 million for the National Ecological Observatory Network (NSF) and \$8.3 million for the Habitat Holding Rack for biological research on the International Space Station (NASA).

HIGHLIGHTS

- **Programmatic Transfers:** USGS, NOAA and EPA programs that were slated for transfer to NSF in the President's FY 2003 budget are restored in his FY 2004 budget proposal in the original home agency. Funds for the EPA Science to Achieve Results (STAR) fellowship, proposed for elimination in FY 2003, were also restored.
- **NSF:** Overall research at NSF would only increase by 1.2 percent while the Biological Science Directorate would decline by \$9 million to \$562 million in FY 2004 (see Table II-7).
- **DOE:** In a noticeable trend, funding for the DOE's Biological Environmental Research (BER) division continues to shrink.

NATIONAL SCIENCE FOUNDATION (NSF)

NSF remains the principal federal supporter of academic, non-medical research in biology and ecology. The Administration proposes a modest 3.2 percent increase for this agency. More information on NSF can be found in Chapter 7 of this report and in Table II-7.

NSF's Biological Science Activity (BIO) would decline by 1.6 percent. Because of the unusual delay in passage of the FY 2003 budget, the agency has not yet allocated funds to programs within BIO such as Environmental Biology, the National Center for Ecological Analysis and Synthesis (NCEAS), and the agency's Long Term Ecological Research Program. However, when compared to the agency's FY 2003 request, Environmental Biology is slated to increase by \$4.9 million to \$104.8 million in FY 2004. Both NCEAS and the LTER Program would receive slight increases compared with the President's request last year.

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For the third time, NSF has brought back its request to start up a National Ecological Observatory Network (NEON), a proposal which first appeared in the agency's FY 2001 budget request but has failed to gain congressional approval. Through its Major Research Equipment budget area, NSF is requesting \$12 million to launch two NEON prototype sites and an additional \$6 million through BIO for NEON operations. With NEON, NSF hopes to enhance the ability to predict the effects of changes from such trends as climate change. The agency continues to highlight its interdisciplinary Biocomplexity in the Environment initiative, for which it is requesting a \$4 million increase.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

Included among those areas the agency plans to focus in the coming fiscal year are reduction of wildland fires (as part of President Bush's Healthy Forest Initiative) and continued attention to biosecurity-related issues, such as potential threats to agriculturally important plants and animals. For more information on USDA, see Chapter 11.

The National Research Initiative (NRI), USDA's competitive grants program for investigator-initiated research, received its largest appropriations ever (\$167 million) in FY 2003. Stressing that agricultural research will lead to important understanding of challenges such as emerging diseases and pests, as well as training the next generation of agricultural scientists, the Administration proposes \$200 million in FY 2004. NRI is administered by the 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 FY 2004, the Agricultural Research Service (ARS), USDA's principal in-house research agency, would emphasize animal waste research, pest and disease management strategies, and emerging diseases and biosecurity.

The Administration has requested \$252 million for Forest Service Forest and Rangeland research, a \$3 million increase over FY 2003. The agency proposes increases for specific areas, including Sudden Oak Death (\$2.5 million), invasive species research (\$4.1 million) and both fundamental and applied fire research (\$3 million) as part of the Administration's Healthy Forests Initiative.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

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 \$74.6 million in FY 2004. Oceanic and Coastal Research is slated to receive \$10.4 million. The Coastal Ocean Program, which supports research on coastal ecosystems (such as harmful algal blooms and eutrophication), would receive \$18.7 million. For all three of these programs, the President’s FY 2004 request is nearly identical to the FY 2003 request, but slightly lower than the amount appropriated by Congress. This trend reflects the removal of earmarked research projects from the President’s request and their subsequent reinstatement by congressional appropriators.

Science and Technology programs in NMFS total \$245.0 million in the FY 2004 request, a 3.2 percent increase over FY 2003. Included in this total are fish stock assessments for the nation’s major fisheries (\$188.1 million), cooperative research with the fishing industry (\$9.5 million), Driftnet Act implementation (\$2.4 million), databases of fisheries statistics (\$25.1 million), and funds for fishery observers (\$20 million).

The FY 2004 budget request for ocean, coastal and Great Lakes research in OAR is \$112.2 million. While this is nearly double (\$58.4 million increase) the FY 2003 request, that amount is nearly entirely due to the restoration of funding for the National Sea Grant College Program (\$60.4 million). The Sea Grant program supports research, education and extension projects to help the country better manage its coastal resources. The President had recommended shifting funds for Sea Grant to NSF in the FY 2003 budget, but Congress blocked the move. The FY 2004 request is 18.6 percent lower than the amount appropriated by Congress for FY 2003. As in other NOAA line offices, this \$25.7 million decrease is largely due to the elimination of several congressionally earmarked projects, including \$8 million for an Ocean Health Initiative. The

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National Undersea Research Program, which places scientists under the sea to conduct research in support of coastal and ocean resource management, would receive \$16.0 million under the President's FY 2004 request. (For more on NOAA, please see Chapter 17.)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

NASA supports ground and flight based biological research aimed at understanding how fundamental laws of nature shape the evolution of life. For more information on NASA, see Chapter 10.

Through its Space Science enterprise, NASA funds biological research to understand the building blocks of life, the conditions necessary for life to persist, and the signatures life leaves behind. The majority of funding for biological research comes through its Biological and Physical Research programs, specifically the Fundamental Space Biology program. For FY 2004, the President has requested \$148.8 million for Fundamental Space Biology. This total includes \$81.7 million for International Space Station operations, \$8.3 million for the development of the Habitat Holding Rack, and \$58.8 million for research. The request will focus on research in Cell and Molecular Biology, Developmental Biology and Organismal and Comparative Biology. This total represents a \$20 million increase over the President's request for FY 2003 for the development of the Habitat Holding Rack, cell culture unit, ground based research, and animal and plant habitats for research on the Space Station Centrifuge.

DEPARTMENT OF ENERGY (DOE)

Environmental research is supported through DOE's Biological and Environmental Research (BER) program and conducted at National Laboratories, universities and private institutions. BER is divided into four main research areas: life sciences, climate change, environmental remediation, and medical science. Research areas targeted for emphasis in FY 2004 include fundamental research on carbon cycle research, regional impacts of climate change, and ecosystem responses to changes in the environment. The President's FY 2004 budget proposes to shift some funds out of the U.S. Global Research Program and into the Administration's Climate Change Research Initiative. (For more on these programs, please see Chapter 16.) Compared to FY 2003, BER overall would decline by \$27 million to \$500 million under the Administration's budget. The previous, FY 2003 budget cycle also saw BER's programs

decrease due to a shift of \$20 million to the new Office of Homeland Security and a 5 percent reduction by Congress.

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 combating the problem of invasive species. The agency is highlighting several priority areas for FY 2004 including \$3 million to develop improved methods to detect alien species in their early stages of invasion. In addition, the agency plans to focus on what it is calling "science on the landscape" and will include such focal areas as restoration of degraded habitats and biological issues related to energy development. The agency's Biological Resources Division (BRD) is flat-funded at \$168.8 million in the President's FY 2004 budget (Congress appropriated \$169 million for BRD in FY 2003).

The agency's Water Resources Division, which includes the National Water Quality Assessment Program (NAWQA) and the Toxic Substances Hydrology Program, would decrease by about \$7 million compared to FY 2003 to \$200.1 million. NAWQA, which is charged with monitoring the nation's water quality, would stay flat-funded at \$63.8 million while the Toxic Substances Hydrology Program is slated to decline by \$2.4 million. The agency's National Biological Information Infrastructure (NBII) program would increase dramatically to \$2.3 million in the Administration's proposal. The program was appropriated \$1 million in FY 2003 with Congress noting that while there is support for NBII's mission of improved biological data sharing, it expects better direction and accountability before considering additional funding.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA's science programs would increase by \$15.9 million under the FY 2004 request. The proposal includes a \$3.8 million increase over the FY 2003 budget request for ecosystem assessment and restoration research. A major adjustment in the budget request is the restoration of funding for the Science to Achieve Results (STAR) fellowship program, which was eliminated from the FY 2003 proposed budget. The FY 2004 request includes \$4.9 million for the STAR fellowships, however this total is only approximately half of the \$9.7 million approved by Congress for FY 2003.