

Biological and Ecological Sciences in the FY 2006 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. While life sciences as a broad category have the biggest share of non-defense R&D funding (55 percent), the bulk of that funding is for human health-related research sponsored by the National Institutes of Health (NIH; see Chapter 8). By contrast, funding for non-medical biology amounts to approximately \$5.1 billion—less than 20 percent of all federally supported life sciences 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 this type of research is conducted in-house by agencies with a regulatory role in environment and natural resources. These agencies include the U.S. Geological Survey (USGS) for the Department of the Interior, the Environmental Protection Agency (EPA), and the National Oceanic and Atmospheric Administration (NOAA).

In addition to research conducted by federal agencies themselves, many 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 proposed budget includes a 0.9 percent (\$5.1 million) increase in funding for the Biological Sciences Directorate (BIO).
- **NOAA:** The National Undersea Research Program would decrease nearly 40 percent.
- **USDA:** The National Research Initiative would receive \$250 million, a 39 percent boost.

NATIONAL SCIENCE FOUNDATION (NSF)

NSF remains the principal federal supporter of the biological and ecological sciences, providing 63 percent of the academic funding for non-medical biology. The NSF proposed budget for FY 2006 includes a 0.9 percent (\$5.1 million) increase in funding for the Biological Sciences Directorate (BIO), which would bring it to a total of \$581.7 million (see Table II-7).

Six major program areas make up the core research of biology funded by NSF. Those programs, along with the requested FY 2006 budget, and the percentage change from FY 2005, are: Molecular and Cellular Biosciences, \$109.7 million (a 7.1 percent decrease); Integrative Biology and Neurosciences, \$101.7 million (a 1.7 percent decrease); Environmental Biology, \$107.1 million (a 1.1 percent increase); Biological Infrastructure, \$82.9 million (a 2.9 percent increase); Emerging Frontiers (a cross-discipline, “virtual” directorate), \$85.9 million (a 16.0 percent increase with a focus on microbial biology); and Plant Genome Research, \$94.2 million (no change from the enacted amount).

Within these program areas, the Long Term Ecological Research Network program would stay at last year’s enacted level of \$17.5 million. The Center for Ecological Analysis and Synthesis is slated to be funded at \$3.8 million, a 10 percent increase, while the Center for Synthesis in Biological Evolution is proposed at \$3 million (a \$0.6 million decrease), shifting from start up costs to day-to-day research and educational activities.

BIO’s portion of the cross-directorate Biocomplexity in the Environment

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Initiative would decrease by 23.7 percent to \$30.4 million. This is a reflection of the planned absorption of this initiative into core activities across the BIO Directorate. The focus will continue on the ecology of infectious disease and microbial genome sequencing.

NSF has requested \$6 million for the National Ecological Observatory Network (NEON) in BIO. Last year's enacted amount of nearly \$6 million (after a \$50,000 rescission and also through the BIO account) has been funding the development of the NEON plan. The FY 2006 request would continue development of this execution plan and of "necessary tools and infrastructure" that are to be key components in preparation for the actual construction of a NEON platform.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

The Administration is again proposing a significant increase for the nation's premier competitive research program for fundamental and applied research in agriculture. The National Research Initiative (NRI) would receive \$250 million under the President's proposed budget, a 39 percent boost over FY 2005 (see Table II-13). NRI is administered through USDA's Cooperative State Research, Education, and Extension Service (CSREES), 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 bolstering 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 resources. However, because the proposed boost to NRI would come at the expense of formula funds, which provide infrastructure support to Land Grant Colleges, NRI's proposed budget windfall is far from certain.

Also within USDA, the Forest Service's Forest and Rangeland Research budget is slated to receive \$285 million in FY 2006, an increase of \$9 million over fiscal year 2005. The proposed increase is to ensure the full implementation of the Forest Inventory and Analysis program.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

The President's FY 2006 budget proposes a slight cut to research and development at the Environmental Protection Agency (EPA). EPA's R&D budget is slated for a \$4 million (0.7 percent) cut to a total of \$568

million (see Table II-17). A significant amount of EPA's research budget is for biological and ecological research. Of particular interest to biologists is EPA's Human Health and Ecosystems program. EPA is requesting \$169.6 million for the program this year, a 4 percent decline from last year's request.

Several biological and ecological science programs would be cut as a result of the budget request. The ecosystem protection research program would be reduced by \$5.8 million to \$88 million. The Western Environmental Monitoring and Assessment Program (EMAP), the National Coastal Assessment, the Regional Vulnerability Assessment tools and watershed modeling research would all be affected by the cuts. The EPA budget also includes a \$5.0 million (50 percent) cut to its exploratory grants program, which supports investigator-initiated research projects that address future or emerging environmental issues.

EPA is requesting \$8.3 million (no increase) for its fellowships programs, which includes the Science to Achieve Results (STAR), Greater Research Opportunities (GRO), Environmental Science and Technology (EST) and Environmental Public Health (EPH) fellowship programs.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) supports intramural and extramural research related to its mission to "understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs." NOAA is requesting a total of \$565 million for research and development in FY 2006. The National Ocean Service (NOS) and NOAA Research (OAR) support the bulk of biological and ecological science research at NOAA.

Within the National Ocean Service, two 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 \$55.2 million in FY 2006, a sharp drop from the \$146.9 million approved by Congress for FY 2005. A large amount (\$80.5 million) of the drop is due to the elimination of congressional earmarks; however the request is still 24 percent below what the Administration requested last year.

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The National Ocean Service also requests \$48.0 million, including \$16.6 million for extramural research, for the National Centers for Coastal Ocean Science (NCCOS). NCCOS joins NOAA's coastal research centers: the Center for Sponsored Coastal Ocean Research, the Center for Coastal Monitoring and Assessment, the Center for Coastal Fisheries and Habitat Research, the Center for Coastal Environmental Health and Biomolecular Research and the Hollings Marine Laboratory. NCCOS activities focus on five areas of ecosystem research: climate change, extreme natural events, pollution, invasive species and land and resource use. The request is \$11.6 million below the amount appropriated for FY 2005.

The FY 2006 budget request for ocean, coastal and Great Lakes research in OAR is \$118.6 million, a 19.2 percent decrease from FY 2005 enacted levels. As with other NOAA line offices, this large cut is largely due to the elimination of several congressionally earmarked projects. The largest program within OAR is the National Sea Grant College Program, which is flat-funded at \$61.2 million. NOAA Sea Grant supports research, education and extension projects to help the country better manage its coastal resources.

The National Undersea Research Program (NURP), which places scientists under the sea to conduct research in support of coastal and ocean resource management, would decrease nearly 40 percent to \$10.4 million under the President's FY 2006 request. The Ocean Exploration program is flat-funded at \$22.7 million. NOAA is also requesting \$4.1 million in other ecosystem programs: \$2.5 million for its share of a multi-agency aquatic invasive species program and \$1.6 million for a marine aquaculture research, education and technology transfer program.

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. FY 2006 would see a \$126.2 million decline in the overall BER program, most coming from reductions in medical and environmental remediation research, as well as elimination of some \$80 million worth of earmarked programs. BER is divided into four main research areas: life sciences, climate change, environmental remediation, and medical science. Funding for climate change research within BER

would increase slightly (\$141 million to \$143 million). (See Table II-11 and Chapter 9 for more information on DOE.)

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 provide basically flat funding to USGS' biology division, a funding increase to the mapping program, and cuts to geology and water. Overall funding for the science agency would fall by 0.2 percent to \$933.5 million. The agency's Water Resources Research Institutes, currently funded at \$6.4 million, would once again be eliminated by the Administration's budget blueprint.

Research areas the agency plans to highlight in the coming year include invasive species research initiatives addressing Tamarisk in the Rio Grande Basin, the Brazilian pepper tree in South Florida, and leafy spurge and yellow star thistle in the Northern Great Plains. In addition, the budget would provide small increases to assess ground-water depletion in the western United States and conduct research activities in the Grand Canyon. (For information on other USGS activities, see Chapter 17; for more on Interior R&D, see Chapter 13.)