

Biological and Ecological Sciences in the FY 2007 Budget

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INTRODUCTION

This chapter focuses on those fields of biology pertaining to the natural world, including: botany, zoology, microbiology, ecology, basic molecular and cellular biology, agricultural sciences, and taxonomy. Biological and ecological research provides the scientific basis for management of the nation's natural resources, development of new agricultural and bio-based products, and improved understanding of how the living world functions.

As National Science Foundation (NSF) director Arden Bement has noted, answering complex questions and addressing society's greatest challenges increasingly requires interdisciplinary research efforts. Thus, biological research is conducted and supported by many federal departments, including largely intramural research at mission-driven agencies such as the Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), and U.S. Geological Survey. In addition to intramural research, fundamental new ideas, research directions, and innovations are spawned from the external research supported by NSF, the primary (65 percent) supporter of biological research, and several competitively awarded research grants funded by the U.S. Department of Agriculture, the Department of Energy (DOE), EPA and NOAA.

HIGHLIGHTS

- **NSF:** \$24 million is proposed for the National Ecological Observatory Network (NEON).
- **DOE:** The Biological and Environmental Research program would receive a \$50 million increase in base funding.

NATIONAL SCIENCE FOUNDATION (NSF)

NSF remains the principal federal supporter of the non-medical biological sciences, providing 66 percent of academic funding in these fields. The NSF proposed budget for FY 2007 includes a 5.4 percent (\$31.1 million) increase in funding for the Biological Sciences Directorate (BIO), which would bump it over \$600 million for the first time, to a total of \$607.8 million (see Table II-7).

Six major program areas make up the core research of biology funded by NSF. Those programs, along with the FY 2007 request and the percentage change from FY 2006, are: Molecular and Cellular Biosciences (\$111 million, up 2.7 percent); Integrative Organismal Biology (\$101 million, up 0.3 percent); Environmental Biology (\$110 million, up 2.7 percent); Biological Infrastructure (\$86 million, up 5 percent); Emerging Frontiers (a cross-discipline, “virtual” directorate, \$99 million, up 23 percent); and Plant Genome Research (\$101 million, up 2.5 percent). In a reorganization move designed to foster cross-fertilization among the NSF Centers, four Centers are now consolidated in the virtual Emerging Frontiers division, accounting for its large increase. One of these is the Center for Ecological Analysis and Synthesis (NCEAS), which used to be housed in Environmental Biology.

A total of \$24 million is proposed for the National Ecological Observatory Network (NEON), \$12 million of it appearing in the agency’s Major Research Equipment account. Within BIO, roughly \$6 million for NEON activities would come from Emerging Frontiers and \$6 million would come from the Biological Infrastructure account. These funds would be used to begin research and development on new sensor technology and to begin securing the discretionary funds needed for the ultimate maintenance and operation expenses for NEON construction.

The Long Term Ecological Research Network program would increase by \$1.1 million to a total of \$19.6 million in FY 2007. The additional monies would be devoted to site-based integrated research, educational activities, and continued boosting of cyber infrastructure abilities. The Center for Ecological Analysis and Synthesis is slated to stay at the current funding level of \$3.46 million, while the National Evolutionary Synthesis Center (NESCent) is proposed to also stay at its current level of \$3 million. (For more on the NSF budget, see Chapter 7.)

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U.S. DEPARTMENT OF AGRICULTURE (USDA)

The Administration is proposing a significant increase of \$66 million to \$248 million for the National Research Initiative (NRI), the nation's premier competitive research program for fundamental and applied research in agriculture. However, because the proposed boost to NRI would once again come largely at the expense of formula funds, which provide infrastructure support to land-grant institutions, it is likely that last year's outcome would be replayed and that NRI will not see much, if any increase. 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. NRI also helps develop the next generation of scientists with expertise critical to meeting the nation's food resources challenges.

Also within USDA, the Forest Service's Forest and Rangeland Research budget is slated to receive \$268 million in FY 2007, a decrease of about \$11 million from 2006. R&D at the FS has been eroding and is now only 6.5 percent of the entire Forest Service budget, down from 11 percent ten years ago. As a result, the agency is losing its internal scientists and is struggling to maintain capabilities at its experimental forest stations.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA's research portfolio would continue to shrink under the Administration's budget proposal for FY 2007, the only exceptions being homeland security and clean air research. The bulk of the cuts are congressional earmark eliminations but some \$10 million would trim agency R&D across the board. While the bottom line for EPA continues to slip, some research programs would see small funding increases in 2007. For instance, within the Office of Research and Development the Administration has identified five priority programs: 1) Clean Air and Global Climate Change; 2) Clean and Safe Water; 3) Land Preservation and Restoration; 4) Healthy Communities and Ecosystems; and 5) Compliance and Environmental Stewardship.

Toward these goals, the budget would provide \$215 million for Clean Air and Global Change, a \$5 million increase over FY 2006. Clean and Safe Water would jump to roughly \$171 million, approximately \$50 million more than the 2006 mark. Although an identified priority area,

Land Preservation and Restoration would fall to \$12 million, down from the current mark of \$15 million and the FY 2005 level of \$48 million. Healthy Communities and Ecosystems would receive a slight boost from \$334 million to \$348 million. The agency's Fellowship programs, which include the Science to Achieve Results (STAR), Greater Research Opportunities (GRO), and Environmental Science and Technology (EST) fellowship programs, are once again targeted for sharp cuts, spelling discontinued support for up to 37 Fellows in environmental research.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

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." Three major mission goals (ecosystems; climate; and weather and water) guide funding in FY 2007. If funded at the requested levels, 13.9 percent of the NOAA budget would be dedicated to R&D in FY 2007. Of this, 69 percent is allocated to intramural and 31 percent to extramural funding, with 87 percent supporting research and 13 percent development. The majority of NOAA research funding, 56 percent, is managed by the Office of Oceanic and Atmospheric Research (OAR). The balance of funding is from NOAA's mission-driven units, such as the National Ocean Service (NOS).

The request for OAR is \$348.7 million, \$30.9 million less than the FY 2006 appropriation. However, a number of biological and ecological research programs would receive increases. To provide scientists with the high-tech tools and expertise to investigate the undersea environment, the budget would add \$5 million to the National Undersea Research Program (NURP). The increase, to \$9.1 million, would be used to restructure the East coast program to better serve the research community. The budget for the Aquatic Invasive Species program would more than double to \$2.5 million. A \$741,000 increase for the National Sea Grant College Program would increase the program's base funding to \$54.8 million. The budget request for ocean, coastal and Great Lakes research is \$102.9 million, \$25 million less than 2006. However, the request is an \$8.6 million increase from the "FY 2007 adjusted base" budget, after program terminations and the removal of earmarks.

For FY 2007, \$413.1 million has been requested for NOS. This is roughly \$177.4 million less than the FY 2006 enacted appropriation.

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Within this request, however, the Response and Restoration, Extramural Research, and National Estuarine Research Reserve System budget functions would receive modest increases. The Ocean Assessment Program, which funds monitoring projects such as coastal observing systems, is slated to receive \$54.7 million in FY 2007, a sharp drop from the \$121.1 million approved by Congress for FY 2006. NOS also requests \$47.0 million for National Centers for Coastal Ocean Science (NCCOS) programs, which includes a proposed \$15.8 million for extramural research, roughly \$6.0 million more than in FY 2006.

DEPARTMENT OF ENERGY (DOE)

The Office of Biological and Environmental Research (BER) supports research falling under one of four categories: life sciences, climate change, environmental remediation, and medical science. The purpose of BER research is to “develop the knowledge base necessary to identify, understand, and anticipate the long-term health and environmental consequences of energy use and development.” Planned areas of focus in the budget include: global climate change; environmental remediation; molecular, cellular, and systemic studies on the biological effects of radiation; structural biology; medical applications of nuclear technology; and the Human Genome Program. Other areas that continue to receive attention include efforts to understand carbon sequestration, sustaining progress toward the development of coupled general circulation models, and sequencing the genomes of microbes that convert carbon dioxide into methane and hydrogen.

For FY 2007, the President has requested \$510 million for BER, an increase of nearly \$50 million over the FY 2006 request. However, the request is nearly \$81 million below the amount appropriated for 2006. In essence, Congress provided and directed how the agency would spend nearly \$129 million in FY 2006. Thus, while the FY 2007 request is a positive sign and a significant increase over the FY 2006 mark, it would potentially represent a cut in the amount available for grant programs if Congress directs expenditures at the same magnitude as FY 2006 without providing an infusion of funds at least equal to the FY 2006 level.

U.S. GEOLOGICAL SURVEY (USGS)

USGS is the Department of the Interior’s sole science agency, providing natural science expertise needed to address challenges that range from

water availability to monitoring migratory bird populations for avian influenza. Through its Cooperative State Research Units, Informatics programs, and Science Centers, the Biological Resources Division supports research and information dissemination efforts that inform public and private sector decision makers from the local to national level.

The President's budget emphasizes "preparing for a new and improved Earth observation system" and a "pilot program to assist communities in developing integrated natural hazards preparedness and mitigation plans." To support these and other initiatives, \$944.7 million has been requested for the USGS, roughly \$30.0 million less than FY 2006. To fund these new initiatives while trimming the bureau's budget, the administration has proposed redirecting a portion of funds currently used for "unrequested earmarks" and \$22.9 million from the Geology division's minerals program.

Within the requested budget, biological research programs would receive \$172.6 million, roughly \$5.9 million less than the current level. Although the request trims the budget by eliminating "lower priority studies" and "unrequested earmarks," some new initiatives would be funded. Included in the budget request is \$1.0 million to support the NatureServe system's efforts to collect information about rare and endangered species and threatened ecosystems. The budget also continues to provide \$3.2 million for avian influenza surveillance. The Cooperative Research Units program would see a \$274,000 increase, bringing the program up to \$14.9 million. The biology division would also receive \$300,000 to support the USGS-wide natural hazards initiative. Sixteen "low priority and unrequested" studies totaling more than \$7.0 million have been cut from the budget. In recent years, these studies have been removed by the Administration, but replaced by Congress.

The budget request does not fully fund "uncontrollable" costs, such as salaries and rent. When these costs are not fully funded, USGS must reprogram money that would otherwise support programmatic activities, such as research, facilities maintenance, or hiring personnel. For FY 2007, the administration estimates that non-discretionary fixed costs across USGS will increase by \$20.7 million, yet the budget requests only \$15.2 million. Thus, if Congress enacts the budget as it is proposed, USGS science programs will likely be forced to find \$5.5 million to pay for these expenses. (For information on other USGS activities, see Chapter 17; for more on Interior R&D, see Chapter 13.)