

## Life Sciences in the FY 2001 Budget

*Nadine Lymn and Alison Gillespie, ESA*

### INTRODUCTION

Major life science programs are found within several agencies, including the National Science Foundation (NSF), the Departments of the Interior (DOI) and Agriculture (USDA), and the Environmental Protection Agency (EPA), among others. The FY 2001 budget includes several significant programmatic and research areas addressing current and future environmental challenges. Two cross-agency initiatives serve to highlight this trend. Integrated Science for Ecosystem Challenges (ISEC) is aimed at improving science's ability to address pressing challenges facing U.S. natural resources. Within a total of \$747 million, USDA's budget would contain the bulk of ISEC (\$452 million). The U.S. Global Change Research Program (USGCRP), with a proposed scientific research budget of \$843 million, is aimed at research and monitoring of climate, ecosystem science, and the global water cycle.

### HIGHLIGHTS

- **NSF:** The budget request for Environmental Biology includes a substantial increase of 32.7 percent to \$119 million.
- **USDA:** \$1.5 million is slated to address research regarding invasive species under USDA's competitive grants program.
- **U.S. Geological Survey (USGS):** The request for the Biological Research Activity is \$158.8 million, a \$21.9 million increase.

### NATIONAL SCIENCE FOUNDATION (NSF)

The President's budget request for this agency reflects strong interest in gaining improved understanding about how natural systems function and

are likely to respond to future stressors. NSF remains the principal source of federal support of academic, non-medical research in biology-related disciplines. Under the President's request, the NSF budget as a whole would increase substantially, by 17.3 percent to a total of \$4.6 billion. Of that, Research and Related Activities (R&RA) would receive a 19.7 percent increase to \$3.5 billion (see Table II-7). One of the key priorities within R&RA are investigations associated with the areas of Biocomplexity in the Environment (BE), for which the FY 2001 request is \$136 million. BE research activities, which operate at the interface between multiple disciplines, emphasize systems ranging from the microscale to the planetary scale. Included in the FY 2001 initiative are plans to launch the National Ecological Observatory Network (NEON). NEON aims to improve the ability to share data by connecting research sites through improved technical infrastructure such as computational and communications facilities. (Please see Chapter 9 for more on NSF.)

Life sciences research is funded primarily through the agency's Biological Sciences Activity, which ranges from the study of molecules to ecosystem research. Out of the various activities within the agency, the Biological Science Activity (BIO) would receive the second largest increase of 23.3 percent. This would bring BIO's total to \$511 million in FY 2001, an increase of \$97 million. Within Biology, Environmental Biology is slated to receive the largest (32.7 percent) increase, to \$119 million. The National Center for Ecological Analysis and Synthesis would remain funded at \$2 million and the 21 Long-Term Ecological Research Sites would stay funded at \$17 million in FY 2001.

Within the USGCRP framework of \$187 million, NSF plans to emphasize carbon cycle research and influences of global climate change at local and regional levels. NSF's portion of ISEC is \$125 million, including \$16 million for BE and new research platforms such as NEON.

#### **DEPARTMENT OF THE INTERIOR (DOI)**

The DOI proposed budget totals \$9.2 billion. This includes a sizable 100 percent increase to \$54 million in the amount of funding for the department as part of ISEC. Within DOI, the U.S. Geological Survey (USGS) serves as the nation's primary provider of earth and life science information related to natural hazards, the environment and energy,

#### LIFE SCIENCES IN THE FY 2001 BUDGET

minerals, and water and biological research. The USGS request totals \$895.4 million, an increase of \$82 million over FY 2000. The request for Biological Research is \$158.8 million, an increase of \$21.9 million.

The USGS request includes \$16.7 million for research generally related to America's natural heritage, representing a 19 percent increase over last year. The largest part of this request, \$15 million, is covered under the general heading of DOI science priorities. Under the specific priority of declining species at risk, the bureau is asking for \$4 million for research on resources within the Columbia River Basin, including declining salmon populations. Addressing one of the past year's hottest topics, invasive species control, the bureau is asking for \$2 million for research on this topic. Another \$2 million would go to expand USGS research on coral reefs in Hawaii and the Caribbean. In response to science needs identified last year by DOI's Bureau of Land Management, USGS will also focus on research on management of rangelands in the Great Basin, restoration research in the Monongahela River Basin, and water rights issues in the Desert Southwest.

In addition, USGS requests an increase of \$2 million to support implementation of the interagency plan to identify the cause of amphibian declines nationwide. Also included is a \$1 million increase to investigate fish and wildlife diseases. The proposal also includes an increase of \$1.3 million to expand research in three areas (the Great Lakes, Greater Yellowstone, and the Mojave Desert), focusing on integrated studies of these ecosystems as a component of USGS' ecosystem and watershed-wide approach to natural resource management.

#### **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)**

The NOAA budget request for FY 2001 totals \$2.9 billion, representing an increase of \$4.9 million from FY 2000. The agency is slated to receive \$28 million under the Administration's Climate Observation and Services Initiative. NOAA says it will focus its efforts within this initiative to address key deficiencies in its observation and data management systems related to climate change. Specifically, the agency is proposing the formation of a new Climate Reference Network, to be funded at a level of \$6 million. The network will consist of cooperative observation sites, and will collect data on temperature, precipitation, and soil moisture to

develop a source of long-term data. An additional \$3 million would go towards upgrading and expanding operations at NOAA's observatories, which measure up to 250 different atmospheric parameters relevant to the study of climate change.

Within NOAA, the Office of Oceanic and Atmospheric Research (OAR) conducts the scientific research and environmental studies which foster NOAA's operations. A significant increase in climate research is requested this year through OAR. The Climate and Air Quality Research request is \$154.4 million and would represent an increase of \$25.4 million over last year's budget. In addition, OAR is asking for \$3 million to expand the Global Atmospheric Baseline Observatories, which measure different atmospheric parameters relevant to the study of climate change. \$9 million would go to establish and maintain global observation and data stewardship systems for climate research and long-term forecasting. Within the Oceans and Great Lakes Programs, the National Sea Grant College Program is set to receive \$59.2 million. The agency is also asking to transfer \$6.7 million from the Great Lakes Environmental Research Laboratory to OAR to fund research in: aquatic nuisance species (\$0.2 million), marine aquaculture (\$1.6 million), fisheries oceanography (\$0.5 million), and seafloor observatories (\$3.1 million).

NOAA requests \$656 million for the National Marine Fisheries Service (NMFS). NMFS would use \$1 million of this money for research on West Coast groundfish and \$2.5 million for the Fisheries Oceanography program. In addition, \$1.5 million would be used to study the impacts of fishing activity on coral reefs. The National Ocean Service (NOS), the primary federal agency charged with the observation, measurement, assessment and management of US coastal and ocean areas, requests \$516 million in FY 2001. Of that, the Coastal Ocean Program is to receive \$1.1 million. Also, \$0.4 million is slated for research on hypoxia in the northern Gulf of Mexico. Another \$0.6 million is scheduled to go to the interagency ECOHAB program for research on the ecology and oceanography of harmful algal blooms along the U.S. coast.

#### **ENVIRONMENTAL PROTECTION AGENCY (EPA)**

The EPA FY 2001 budget request totals \$7.3 billion (see Table II-17), with an additional \$2.2 billion slated for the Better America Bonds

#### LIFE SCIENCES IN THE FY 2001 BUDGET

program. If granted, this total proposal would represent the largest increase in the history of the Administration in overall spending for the EPA, although a few areas of research are scheduled for a decrease in the coming year. EPA is to receive a 5 percent increase in funding for ISEC for a total of \$59 million. EPA also requests \$23 million during FY 2001 for USGCRP, a 10 percent increase over last year.

One of EPA's stated goals is the reduction of global and cross-border environmental risks. Within that goal, climate change research is designated to receive \$257.9 million. The agency's climate change research is focused upon assessing the vulnerability of human health and ecosystems to climate-induced stressors at the regional scale, and to assess possible mitigation and adaptation strategies. Assessment includes changes in climate variability, land use, UV radiation, air quality, and water quality. The budget also includes a request of \$674 million for sound science as expressed by the EPA's outlined goals. Within this amount, the designated spending for research on ecosystem assessment and restoration would represent a 4 percent decrease from FY 2000. As is the case with many of the agencies this year, the EPA is emphasizing the importance of establishing baseline conditions from which changes and trends in ecological conditions of the environment can be judged. The agency's ecosystem research is especially focused upon the nation's estuaries, with a special emphasis on monitoring the nation's watersheds.

#### **U.S. DEPARTMENT OF AGRICULTURE (USDA)**

The overall research account for USDA would increase by 3.5 percent to \$1.8 billion. An emphasis on generating scientific baseline information emerges throughout the USDA budget, focusing on the topic areas of the nation's forests, water quality, and global change. The overall Forest Service budget requests an additional increase of \$83 million for inventory and monitoring of activities conducted on the nation's forests. The budget request for watershed health and restoration is \$42 million more than last year and would include a new \$5 million pilot project aimed at restoration on a watershed scale. Forest and Rangeland Research would receive \$231 million in FY 2001 (up \$13 million).

Activities within USDA related to combating invasive species are proposed to increase by 32 percent to a total of \$561 million. USDA's

competitive grants program, the National Research Initiative (NRI), includes \$1.5 million for research addressing invasive plants, animals, and diseases. Overall, the NRI would receive \$31 million more in FY 2001.

USDA's share of the USGCRP would go up by \$32 million to a total of \$85 million. This includes an increase of \$8 million to examine the role of agriculture and forests in the global carbon cycle, and exploration of methods to increase carbon storage in both soils and forests. An additional \$12.3 million would go towards the development of inventories and a database on carbon in the soil.

#### **DEPARTMENT OF ENERGY (DOE)**

Within this year's proposed budget for the DOE's Office of Science (\$3.2 billion), a total of \$445 million is requested for Biological and Environmental Research (BER), an increase of \$11.2 million over last year. BER's activities focus on risk assessment, environmental restoration, and consequences of energy production. This would include \$16.3 million for the cross-agency Climate Change Technology Initiative (CCTI). Improved understanding of natural carbon sequestration processes in terrestrial and ocean systems would be addressed under this initiative. DOE's proposed overall contribution to the CCTI would be \$1.1 billion and the agency proposes to devote \$42.6 million to learn more about carbon sequestration, including the environmental consequences of large-scale CO<sub>2</sub> storage and integrating sequestration technologies with natural sinks (see Chapter 17 for more on CCTI). DOE also supports USGCRP through its Environmental Processes subprogram. The agency's research in this arena would go toward measuring carbon exchanges and climate modeling and simulation.

#### **NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)**

NASA's Earth Science Enterprise, which aims to improve understanding of both Earth and the consequences of human and other changes on the global environment is slated to receive \$1.4 billion under the President's proposal. Of this amount, \$353 million would go to the Research and Technology Program which targets understanding of the global environment, including climate change, atmospheric ozone, environmental hazards, and assessment of the globe's forest and agricultural resources.