

Earth Sciences in the FY 2002 Budget

*David Applegate and Margaret Baker,
American Geological Institute*

HIGHLIGHTS

- **U.S. Geological Survey (USGS):** The USGS is slated for an 8 percent cut, eliminating increases received in FY 2001. The Water Resources Division is hardest hit, facing a 21 percent cut. The Geologic Division would receive a 5 percent decrease. Key program cuts include water-quality assessment, geologic mapping, streamgage networks, and international minerals information.
- **Department of Energy (DOE):** Petroleum and natural gas research accounts would receive cuts of over 50 percent. Geothermal research would be cut by 48 percent. High-level nuclear waste disposal accounts are up 14 percent based on the assumption of presidential approval for the Yucca Mountain repository in Nevada.
- **National Science Foundation (NSF):** Funding for the Geosciences Directorate is essentially flat. Within it, the Earth Sciences Division would receive an increase of under 1 percent. The Polar Research program budget would increase 1.5 percent.
- **National Aeronautics and Space Administration (NASA):** Earth Science Program Science would be up 2 percent in FY 2002, but after adjusting for account restructuring total Earth Science Enterprise funding would fall by nearly 12 percent.

INTRODUCTION

Table 1. Budget request for principal agencies and programs supporting earth-science R&D (budget authority in millions of dollars)

Agency/ Program	FY 2000 enacted	FY 2001 enacted	FY 2002 request	% Chg. FY 01-02
Department of Energy				
Basic Energy Sciences				
Geosciences Research	22	21	21	0%
Fossil Energy R&D				
Natural Gas Research	32	45	21	-53.3%
Petroleum Research	57	67	31	-54.4%
Solar & Renewable Energy				
Geothermal	23	27	14	-48.3%
Yucca Mountain Site Characterization				
Core Science	67	66	76	14.9%
Department of the Interior				
U.S. Geological Survey*	813	883	813	-7.9%
Geologic Division*	211	225	214	-5.1%
Water Resources Div.*	186	204	160	-21.6%
NASA				
Earth Science Enterprise**	1,690	1,716	1,515	-11.7%
Earth Science Program Science	287	351	358	1.9%
EOS Science	55	48	54	12.2%
National Science Foundation				
Geosciences Directorate	488	562	559	-0.6%
Earth Sciences Division	102	116	117	0.8%

Source: Agency budget materials, Office of Management and Budget.

* - Includes non-R&D components.

** - NASA has restructured the Earth Science Enterprise account to include institutional support costs. For ease of comparison, FY 2000 and FY 2001 numbers have been adjusted to reflect this transfer.

In contrast to FY 2001's large increases for earth-science programs at the U.S. Geological Survey (USGS) and the National Science Foundation (NSF), the FY 2002 budget request is marked by cuts or flat funding. Earth-science programs at the Department of Energy (DOE) are a mixed bag with some experiencing large decreases and others moderate increases. Budget restructuring at the National Aeronautics and Space Administration (NASA) appears to provide a slight boost for earth-

EARTH SCIENCES IN THE FY 2002 BUDGET

science research. These four departments and agencies carry out the lion's share of research and development (R&D) in the earth sciences, but a wide variety of federal agencies fund earth scientists to conduct research, carry out assessments, and collect data relevant to environmental, natural resource, natural hazards, and science policy mandates.

Table 1 provides an overview of the President's FY 2002 budget request for earth-science R&D in these four agencies and departments. Readers who seek to view earth-science research in a broader context are encouraged to examine the previous two chapters in this report covering atmospheric and ocean sciences as well as the chapters on agency R&D budgets.

U.S. GEOLOGICAL SURVEY (USGS)

After receiving a record increase in FY 2001, the U.S. Geological Survey (USGS) returns to Earth in the President's request. The USGS is slated for a 7.9 percent decrease to \$813.4 million, taking its budget below FY 2000 levels. According to Interior budget documents, the President's request "proposes to focus resources on high priority programs, including meeting the science needs of the Department and land management programs, and to reduce funding for programs that primarily benefit external customers."

USGS science programs are down nearly 9 percent, forcing all four divisions—Geologic, National Mapping, Biological Resources, and Water Resources—to make cuts. The Geologic Division would receive \$213.8 million, down 5.1 percent from FY 2001. Within that total, the National Cooperative Geologic Mapping Program would receive a \$6 million cut. Other cuts include a \$3 million reduction in global change research and elimination of the international minerals information program (\$2 million). The National Mapping Division would receive \$123.7 million, a 5.2 percent cut from FY 2001, and the Biological Resources Division would receive \$149.3 million, down 7 percent.

The Water Resources Division is by far the hardest hit of the four divisions, taking a 21.6 percent reduction. The bulk of the decrease would be accomplished by eliminating the Toxic Substances Hydrology program

Applegate and Baker

(a \$10 million cut) and reducing the National Water-Quality Assessment (NAWQA) program by \$20 million, halting its next phase. The request also cuts the Water Information Delivery program by \$3 million and the streamgage network by \$5 million. In an annual ritual, the request eliminates support for the Water Resources Research Institutes (\$5.5 million).

Both geologic mapping and the streamgage network benefited in the current fiscal year from funds provided under Title VIII of the FY 2001 Interior appropriations bill (H.R. 4578; Public Law 106-291), which authorized a six-year Land Conservation, Preservation, and Infrastructure program. This program distributes royalties collected from offshore oil and gas activities. Although the Administration has requested full funding of nearly \$1 billion for this fund in FY 2002, it has chosen to shift most of the money toward the National Park Service and direct state grants, dropping USGS spending from \$25 million to zero. (For additional information on USGS, please see Chapters 18 and 19.)

DEPARTMENT OF ENERGY (DOE)

Fossil Energy R&D: DOE's energy supply research accounts fare poorly in the President's request. In the Office of Fossil Energy, a 17.1 percent overall decrease is accompanied by a shift away from geoscience-related natural gas and petroleum exploration research in order to focus on President Bush's Clean Coal Power Initiative. This new initiative, part of a \$2 billion commitment to coal R&D over the next decade, is marked to receive \$150 million or nearly one-third of the entire Fossil Energy budget. The only other increase is for Carbon Sequestration R&D, which would receive a 10.3 percent boost to total \$20.7 million. The Natural Gas R&D program request is \$21 million, a 53.3 percent decrease from last year's allocation. Within that program, Exploration and Production activities are targeted for a 34.5 percent decrease, to total \$9.3 million. Gas Hydrate activities would be funded at \$4.7 million, a 52.5 percent cut. Funding for coal-bed methane research is cut by 97 percent to total \$200,000. The Petroleum R&D program is slated for a 54.4 percent cut to total \$30.5 million. Within this amount, \$20.3 million would go towards petroleum exploration and production, a 29.5 percent decrease from last year's funding.

EARTH SCIENCES IN THE FY 2002 BUDGET

Basic Energy Sciences: Geoscience research within DOE Basic Energy Sciences will remain at the FY 2001 level of \$21.4 million. This program provides peer-reviewed grants to universities and DOE national laboratories for fundamental geoscience research in geochemistry, hydrology, rock mechanics, and geophysical imaging—areas with broad application to multiple DOE mission areas including oil and gas exploration and development, geothermal energy, and environmental remediation. According to DOE budget documents: “The geoscience activity [supported by this office] represents one third of the Nation’s total federal support for investigator-driven basic research in solid earth sciences.”

Geothermal: The geothermal research program within the Solar and Renewable Energy account funds earth-science research in materials, geofluids, geochemistry, geophysics, rock properties, reservoir modeling, and seismic mapping. The program is marked for a 48 percent decrease to \$13.9 million. A majority of the earth science research is supported under the Geoscience and Supporting Technologies account for which the request is \$3.5 million, nearly half the FY 2001 allocation. Funding for university-based research would drop from \$2.6 million in FY 2001 to \$500,000 in FY 2002.

Yucca Mountain Site Characterization: Under the current timetable for opening the Yucca Mountain site in Nevada to accept high-level nuclear waste, the Secretary of Energy is expected to make a recommendation to the President in FY 2002. Based on the assumption that the recommendation will be positive, the president’s budget includes a 14 percent increase for Nuclear Waste Disposal programs to \$445 million. Most of the research occurs in the Core Science account, which supports surface and subsurface field tests and monitoring at Yucca Mountain, which will continue as the repository moves into the licensing process. Earth-science research related to Core Science will increase 14.9 percent to total \$75.6 million. (For more information on the DOE budget, please see Chapter 9.)

NATIONAL SCIENCE FOUNDATION (NSF)

The request for the Geosciences (GEO) Directorate is essentially the same as last year’s allocation. Within that total, the Earth Science

Applegate and Baker

Division would receive \$116.8 million, up slightly under one percent. The funds are divided between project support (\$79.2 million), instrumentation and facilities (\$28.5 million), and continental dynamics (\$9.1 million). The Ocean Science Division would receive \$255.3 million, a 1 percent drop from last year (see Chapter 16). The Atmospheric Science Division would receive \$186.5 million, also a 1 percent drop (see Chapter 15).

Geoscience research is also supported by the Office of Polar Programs, which received a 1.5 percent increase. Last year's NSF request included Major Research Equipment (MRE) funding to begin the Earthscope initiative, a set of four projects designed to expand the observational capabilities of the Earth Sciences, but Congress did not provide funding. This year's MRE request does not include any new starts, pushing Earthscope back at least another year. Agency officials state that they remain committed to the initiative. (For more information on NSF, please see Chapter 7.)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

NASA's Earth Science Enterprise (ESE) works to develop an interdisciplinary research field that looks at the oceans, land surface, atmosphere, and biota as dynamically related components of the Earth system. Many of the ESE programs are interagency research projects primarily related to remote-sensing data interpretation in global change and hazards studies. Funding for the entire ESE would increase by 2 percent over FY 2001 to \$1.5 billion, but a majority of this increase would go toward technology and institutional support that was formerly funded by other accounts. After adjusting for these transfers, ESE funding would decline by 11.7 percent from the comparable funding level in FY 2001. Earth Science Program Science would total \$357.5 million, a 1.9 percent increase. Within this amount, \$54.3 million would go toward science to support the Earth Observing System (EOS). Funding for solid-earth science research is shared between Earth Science Program Science and the Applications program (the natural hazard projects within this program are not considered research because they work to bring scientific knowledge into practical use). A major goal for the upcoming fiscal year is to complete the Southern California Integrated GPS Network (SCIGN) that will provide near-real-time data on ground deformation associated with seismic events.