

General Statement

Science for a Changing World

The United States government has many critical funding needs: paying for the health, safety, and well being of its citizens; ensuring safe and abundant housing; offering education; maintaining public lands; and furnishing dependable travel venues to move commerce. Balancing all of these pressing needs requires increases for scientific research.

Science and scientific research enables the Federal government to meet its obligations in all of the areas mentioned above. Because our world is changing at a faster pace than ever before, we need to understand the impacts of these changes and learn how to best manage them. Without science, leaders and decision makers at all levels of the public trust find themselves trying to lead the country down a road without a road map. Science provides the key to not only finding out how to get somewhere, but also to arriving safely. The fiscal year 2001 budget request for the U.S. Geological Survey (USGS) is \$895.4 million – a net increase of \$82 million over its FY 2000 enacted level. The requested increase for USGS will address many issues of critical importance to our society and its welfare, including natural hazards, the competing demands for natural resources, and preservation of America’s natural resources legacy. The increased funding will help USGS to respond to some of the myriad requests for its scientific research, analysis, monitoring programs and for accessible information so highly valued by its many customers. The USGS must be able to grow in order to keep up with the demand for its work and data. Most of its work has been completed on a modest scale; “pilot” levels. Because of the success of its work, USGS always receives requests to do more.

The Nation needs a balanced portfolio of research about conditions of our planet. There must be a balance among land, oceans, and atmosphere, and there must be a balance between research done from space and that which is conducted from or strongly linked to the Earth’s surface. USGS focuses on the land and the life forms of the land. NOAA focuses on the atmosphere and the oceans. NASA, as well as NOAA and USGS, applies space technology to study all of these systems. The USGS budget proposed for FY 2001 is a step toward regaining the right balance – putting increased emphasis on the land, water, and biological resources.

The USGS is the Nation’s largest water, earth, and biological science and civilian mapping agency. We work in close cooperation with more than 2,000 organizations across the country (and the world, as well) to provide reliable, impartial scientific information to resource managers, planners, and other customers. **USGS information, gathered in every State, is critical to the Nation’s well being** and to future ability to minimize the loss of life and property from natural disasters. Our science programs help avert the human and economic consequences of natural disasters that take the lives of citizens and cost billions annually in the United States. The USGS biological, geological, hydrological, and mapping programs are essential to the effective stewardship of the Nation’s cultural and natural resources, including the Department of the Interior’s management of more than 450 million acres of Federal land. USGS data collection and analytic capabilities contribute to the conservation and sustainable development of the Nation’s natural resources. Other Federal agencies and State and local governments use USGS water, biological, energy and mineral resources, and mapping information and capabilities to guide planning, management, and regulatory programs.

“Progress is meaningless if we don't know where we're going. Unless we try to visualize what is beyond the horizon, we will always occupy the same shore.”

Representative George Brown (1993)

Even given the fiscal constraints facing the Nation's purse and the accountability to the taxpayers who fill it, **justifying science programs is not difficult** when one applies a "relevancy" filter and asks of science programs and scientists: What do you want to accomplish? Why do you want to do it? and What will be the result of doing it? Science programs that pass this relevancy test generate benefits to society that far outweigh their economic costs.

USGS is poised to do a great deal of work in FY 2001 to enhance the health, safety, and protection of the Earth and the species that inhabit it. In many cases the health of the natural system is failing; the safety of our citizens is at risk. USGS research is needed to ensure the vitality and production of the land and its resources. With the requested increases, USGS will be able to produce the objective, credible data and information that will assist decision makers in arriving at answers to solve or manage these challenges.

With an increase in FY 2001, USGS will complete some programs, expand some current programs, and begin new ones as well. Both new starts and expansions advance the USGS mission and its core programs in the earth and life sciences and do so in a manner that supports Secretary Babbitt's goal of delivering USGS scientific information and tools to the decision makers and managers who need it. In addition to the Administration's Lands Legacy Initiative, USGS has developed four overarching themes within which program components address natural resources management challenges related to people, wildlife, and the land and resources that support them. The themes are safety, communities, lands and resources, and natural heritage. They propose questions, describe the impetus behind the questions, and offer tools to answer the questions. The answers are obtainable, but not without significant additional funding in FY 2001.

Safer Communities +\$7.1 million – The cost of natural disasters – earthquakes, floods, volcanoes, coastal storms – has skyrocketed to more than \$50.0 billion per year. The USGS helps communities become more resilient to natural disasters by providing fundamental understanding of and information on them in real-time. The USGS proposes to enhance its ability to provide advance warning of impending natural disasters, enabling communities to save lives and property. From the study of earthquakes in Alaska and the Pacific West, to floods in high-risk areas around the Nation, USGS efforts will help create stronger and safer communities.

Livable Communities (+\$47.0 million) – Americans want communities where they can enjoy a healthy environment and earn a decent living. To balance competing demands for natural resources, recreational opportunities, wildlife habitat, and economic growth, planners need reliable tools and an immense amount of information. The USGS delivers these products to the doorsteps of communities, helping them to plan for intelligent resource use and growth. With the funding proposed for FY 2001, USGS will work with local communities to solve natural resource problems by providing easy access to understandable, usable information on the natural resources vital to community health.

Sustainable Resources for the Future (+\$15.3 million) – Understanding how the land responds to change is essential for our continued enjoyment of the natural landscape in the future. With additional funding in FY 2001, USGS will develop tools to predict how the land interacts with the oceans and air and how it reacts to the many uses humans make of it. Focused research on river, coastal, and wetland habitats and other critical landscapes will increase our understanding of how these major systems respond to change and enable us to develop restoration tools for areas that have been altered. With a solid understanding of how the Earth works, we can help to ensure thriving landscapes for people and wildlife.

America's Natural Heritage (+\$16.7 million) – A vital part of America's natural legacy is its parks, refuges and other public lands, many of which are entrusted to the Department of the Interior. These landscapes and the fish and wildlife they support are key to our core national identity. USGS, in partnership with stakeholders throughout the Nation, is helping land and resource managers preserve our natural heritage by monitoring, assessment, and research that address issues of critical importance. With the funds requested in FY 2001, USGS will focus on developing tools to understand and control invasive species, develop habitat conservation plans, protect and restore habitat for migratory birds, and evaluate the health and stability of coral reefs. This work will provide the scientific foundation for preserving the places America cares about.

Lands Legacy in 2001

Fiscal year 2001 is the second year of the Administration's "Lands Legacy" Initiative. It builds on America's commitment to its natural environment through the preservation of public lands and national treasures and through partnerships with local communities and States to protect open spaces and natural resources. The Department of the Interior FY 2001 budget includes \$735.0 million in support of the Lands Legacy Initiative. USGS will contribute to this initiative, requesting \$50.0 million in new funding for State Planning Partnerships. These partnerships will provide community, local, and State decision makers and Federal resource managers with geospatial data, earth science information, and information technology tools they need to more fully achieve the goals of the Lands Legacy initiative, including more effectively protected open space, sustainable development, and improved quality of life. Access to these tools will strengthen partners ability to preserve natural resources, identify optimal lands for acquisition, design effective land-use and development strategies, and mitigate natural hazards. Three program components make up the USGS Lands Legacy Request: Community/Federal Information Partnership, Urban Dynamics - Decision Support, and Decision Support for Resource Management, The program components are discussed below.

The science programs conducted by the USGS are developed according to science plans based on sound management. **Goals related to USGS science are contained in the USGS Strategic Plan** and are **customer driven**. Our commitment to our customers follows through in our budget and accompanying annual plan with their increased emphasis on providing natural science data and research that meet the highest priority needs of our customers. This focus strengthens our contribution to the resolution of complex issues and our tie to the outcomes achieved by our customers through science-based decision-making.

Integration of USGS' scientific disciplines enables land and resource managers to more clearly understand and preserve the habitats that support healthy fish and wildlife populations, provide recreation and family fun, and nourish the national spirit. Reliable and objective information about our natural heritage leads to responsible decision making for healthy, thriving parks, refuges and other public lands for our children and grandchildren. The FY 2001 budget request is presented in the following summary tables, text, graphics, and supporting justifications.

Summary of FY 2001 Program Changes

The **USGS budget request for FY 2001 is \$895 million, a net increase of \$82 million over the FY 2000 enacted budget.** Included in this amount is an increase of \$18 million to cover uncontrollable costs (e.g., salary increases). Additionally, the budget contains decreases of \$22.2 million representing projects that are nearing completion in 2000 or lower priority projects being ended in FY 2001.

This year the **Lands Legacy** (+\$50 million) initiative includes State Planning Partnership and consists of Community/Federal Information Partnership, Urban Dynamics – Decision Support, and Decision Support for Resource Management. These programs are described individually as they fit under the theme categories below.

Safer Communities +\$7.1 million

Earthquakes +\$2.6 million – Building on the success of FY 2000 pilot projects, USGS will use the proposed increase to expand and modernize its earthquake monitoring in urban areas in the United States, reflecting the plans developed for the USGS Real Time Hazards Initiative and for the Advanced National Seismic System. A total of 150 regional/urban seismic stations will be installed or upgraded.

Volcanoes +\$0.5 million – From FY 1996 to 2000, USGS has installed, operated, and maintained seismic monitors at 20 active volcanoes in Alaska's Aleutian Islands. These monitors provide rapid information about volcanic activity to the aviation community so that airplane encounters with ash clouds can be averted. The proposed increase will enable USGS to expand this real-time volcano monitoring seismic monitors installed at one additional high-risk Alaskan volcano.

Floods +\$4.0 million – The proposed increase will improve the existing USGS streamgaging network in two ways. First, it will add stations to address the current shortfall of 800 National Weather Service (NWS) flood forecast points that do not have a nearby streamgage. Second, it will upgrade existing gages to provide the real-time information that is critically important to local emergency managers and the public during floods. The USGS is working with the NWS and other partners to determine the best location for these improvements. A list of gages to be added or reactivated is available from USGS in March 2000.

Livable Communities +\$47.0 million

Urban Dynamics - Decision Support +\$10.0 million – The increase, part of the Administration's Lands Legacy program, will expand efforts to understand landscape change in large metropolitan regions and assess the impacts of such changes on a regional scale. USGS will also improve and apply technology for monitoring, analyzing, and predicting landscape changes. Investigations of urban growth will draw on historical trends to compare the effects of physical, social, and economic factors on land use changes. USGS will transfer historical data and tools to organizations around the country to plan for sound urban growth.

Community/Federal Information Partnership (C/FIP) +\$30.0 million – The proposed increase, part of the Administration’s Lands Legacy program, will fund partnership projects across the country to increase creation and use of geospatial information for informed decision-making. These C/FIP partnerships are aimed at developing local solutions to local problems by integrating base map data with geologic, biologic, hydrologic, soils, and land cover information. Of this amount, \$25 million will be allocated to competitively awarded matching grants and cooperative agreements to provide communities access to geospatial data and geographic information system technology.

Accessible Data Transfer +\$2.0 million – The USGS has been successful in marketing its natural science products and services on the Internet to a point in which its networks are becoming saturated. Customers are routinely routed over the internal network to meet their needs, making USGS data and computer systems vulnerable to security breaches and retarding internal processing due to increased traffic. Unless we invest in systems technology, the USGS network will become inundated with more requests, as more customers request USGS data. The increase will enable USGS to expand, improve reliability and speed for data delivery, and provide real-time data to customers by upgrading data transmission lines connecting major USGS centers (Reston, VA; Denver, CO; Menlo Park, CA; EROS Data Center in Sioux Falls, SD). This investment in information management and transmission infrastructure will enable USGS to expand on the Ohio Pilot and other partnership models. In so doing, USGS will make the information available to other regions of the country in order to enhance the ability of communities and local, regional, and State decision makers to address their unique natural resource and related issues.

Landsat 7 Program Operations +\$5.0 million – Landsat 7 data need to be collected, transmitted, received, processed, stored, and made available for distribution. The proposed increase will meet the need to ensure stability of Landsat 7 system operations over the long term. Data from Landsat satellites have provided the United States and other users with a continuous stream of land-image data since 1972. The wealth of data now available provides an unprecedented ability to look at changes on the Earth over nearly three decades. These data sets are of great value to the scientific community. USGS has partnered in various ways with the Landsat programs over the years and responsibility for operation of Landsat 7 is a logical fit with the core mission of USGS.

**Sustainable Resources for the Future
+\$15.3 million**

Aquatic Resources - Columbia River +\$4.0 million – Over the past 50 years, the Columbia River landscape has changed. Urbanization, heavy logging, and agricultural development have affected its natural resources, including Pacific salmon. With this increase, USGS will provide integrated science to managers charged with recovery of Pacific salmon, trout, and sturgeon in four areas (habitat characterization, restoration of habitat altered by humans, biological and geophysical factors limiting fish populations, and the socio-economic factors of restoration). With the proposed funding, USGS will provide an understanding of the relationship between the behavior of downstream migrating salmon and the hydraulic dynamics of river flow. It will establish a foundation for restoring natural processes within the river and for monitoring system health. Regional-scale maps that help define the riverine ecosystem needed to improve survival of critical species and serve human needs will also be developed.

Great Lakes +\$0.5 million – Many government agencies and other organizations have conducted natural-science studies related to change in the lakes or on the land. But there has been no regional approach linking science in the lakes to science in the watershed and the surrounding region. The USGS will begin to make that linkage with a study of Lake Michigan’s watershed and lake processes and how they affect fish. Integrated activities will include water sampling, geologic studies, habitat data inventory, shoreline mapping, and analysis of land-use change. Inclusion of this kind of information into a Great Lakes data base will give managers the information they need to make better decisions affecting the future of the lakes.

Yellowstone +\$0.4 million – The USGS will develop models of habitat use for threatened species. Part of the decline of the grizzly can be traced to human activities such as development and the degradation, fragmentation, and loss of habitat – effects also felt by other species, such as mule deer and wolves. Other work in FY 2001 will focus on historical inventories of land use and land change to document changes over time, climate data bases to show temperature and precipitation, and the development of software for display and analysis of climate data. This proposed work continues collaborative efforts of the Greater Yellowstone Area Initiative, developed in partnership with U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, and U.S. Forest Service.

Mojave Desert +\$0.4 million – In 2001, USGS, in partnership with the California Desert Managers Group (DMG), will focus new efforts on water and ecological resources in the Mojave Desert. Existing water data (ground-water levels, spring sources, water chemistry, and surface water) will be compiled into a spatial data base for analysis by DMG partners and other stakeholders. The USGS will complete a draft protocol for desert-wide use to monitor water chemistry and quality, water levels, discharge, and water use.

Decision Support for Resource Management +\$10.0 million – This increase is part of the Administration’s Lands Legacy Initiative, State Planning Partnerships program. The funding will support Lands Legacy objectives and help States and communities preserve local lands and habitat. The increase will develop decision support tools for managers at local, State, and Federal levels who address high-priority resource issues.

**America's Natural Heritage
+\$16.7 million**

DOI Science +\$15.0 million

- **DOI Science Priorities +\$13.0 million** – Managing America’s public lands requires an integrated scientific approach to ensure that decisions are based on sound understanding of ecosystems and the processes that occur within them. In FY 2001 a new Department of the Interior Agreement, signed by all DOI bureau directors, will be implemented to provide integrated scientific research and information necessary for DOI land and resource decisions. The increase will be used to develop projects to meet the high-priority management requests from each bureau at the following funding levels: \$3 million each for Bureau of Land Management, U.S. Fish and Wildlife Service, and National Park Service, and \$1 million each for Bureau of Indian Affairs, Bureau of Reclamation, Minerals Management Service, and Office of Surface Mining.
- **Amphibian Research and Monitoring +\$2.0 million** – Part of DOI Science, the proposed increase will fund monitoring surveys in the Upper and Lower Mississippi River Basins. Many

species make up the amphibian fauna of the United States. Research in local areas over the past 10 years indicates a dramatic decline in some amphibian populations, although the exact extent and cause of losses remain unknown. USGS leads a national program to determine the status of amphibians and to investigate potential factors causing their declines and malformations. The proposed increase will support the compilation and analysis of geospatial data to characterize habitat in areas of demonstrated amphibian loss and to develop methods to use spatial analysis techniques to predict potential loss.

Fish and Wildlife Disease +\$1.0 million – The increase will provide detailed information about the distribution of the West Nile virus in birds of the East and Gulf Coast States. This information will enable public health agencies to anticipate where the disease is likely to occur or spread, quickly test diseased birds, and mitigate the impacts of this deadly encephalitis disease on humans. Brain lesions in birds have been a growing concern since they were first diagnosed in 1994. With funding for new research, USGS will better understand such wildlife diseases. USGS will increase its grant to the Southeastern Cooperative Wildlife Disease Study to assist with both projects.

Coop Units +\$0.7 million – The Cooperative Research Units program consists of 39 Cooperative Fish and Wildlife Research Units located on university campuses in 37 States. The cooperative program allows government and non-government entities with common interests and responsibilities for natural resource management to work together to address biological resources issues. The increase will complete a multi-year effort to fill and support all science vacancies in the Cooperative Fish and Wildlife Research Units program.

A New Look

This year's budget justifications (or "Greenbook") have a slightly different look. Full descriptions of program changes follow in the "Program Change" section. This new section is designed to focus the reader's attention on what is changing in current programs and to provide a strong justification for the requested change. Within this section, each program increase is discussed in terms of what the issue is that prompts the request for an increase; why USGS is uniquely qualified to address the issue; what USGS may be doing in its current program related to the issue; the 2001 change described in budget program element detail; partners and customers associated with the issue; and expected products from the increased effort. Government Performance and Results Act (GPRA) data for the increases are summarized at the end of the Program Change section. Following the program change section is the base narrative of current USGS programs. The program change and the base sections are will be cross referenced to one another to aid navigation through the Greenbook.

