USGS
science for a changing world

Performance and Accountability Report
Fiscal Year 2004

125 years of science for America

1879–2004

U.S. Department of the Interior
U.S. Geological Survey

The Bureau at a Glance

History and Enabling Legislation

The USGS, created by an act in the final session of the 45th Congress in 1879, celebrated its 125th anniversary this year. The USGS was established for the "classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain."

Mission

The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

Strategic Goals

Resource Protection:	Protect the Nation's natural, cultural, and heritage resources
Resource Use:	Manage resources to promote responsible use and sustain a dynamic economy
Serving Communitites:	Safeguard lives, property and assets, advance scientific knowledge, and improve the quality of life for communities we serve

Organization

Regions:	Eastern, Central, and Western
Scientific Disciplines:	Biology, Geology, Geography, and Water
Programs:	Biological Informatics, Coastal and Marine Geology, Contaminant Biology, Cooperative Research Units - Biology, Cooperative Topographic Mapping, Cooperative Water, Earth Surface Dynamics, Earthquake Hazards, Energy Resources, Enterprise Information, Facilities, Fisheries: Aquatic and Endangered Resources, Geographic Analysis and Monitoring, Geomagnetism, Global Seismic Network, Ground Water Resources, Hydrologic Networks and Analysis, Hydrologic Research and Development, Invasive Species, Land Remote Sensing, Landslide Hazards, Mineral Resources, National Cooperative Geologic Mapping, National Streamflow Information, National Water-Quality Assessment, Science Support, Status and Trends of Biological Resources, Terrestrial, Freshwater, and Marine Ecosystems, Toxic Substances Hydrology, Volcano Hazards, Water Resources Research Act, and Wildlife: Terrestrial and Endangered Resources

Employees

USGS has scientists, technicians, and support staff in every State with a total of approximately 9,500 employees.

Financial Resources

The Bureau's FY2004 budget was approximately $1 billion.

Internet

The Bureau's internet address is http://www.usgs.gov.

Performance and Accountability Report

Limited copies of the FY2004 Performance and Accountability Report were printed in black and white.

The FY2004 Performance and Accountability Report is available at: http://www.doi.gov/pfm/burrept.html.

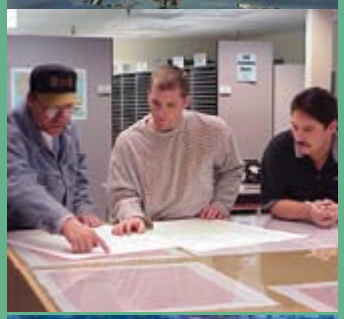


Table of Contents

Introduction
Message from the Director.... ii
Message from the Chief Financial Officer.... iii
Message from the Chief, Office of Budget and Performance.... iv

SECTION I - Management Discussion and Analysis
Overview of the Organization.... 2
Strategic Goals.... 5
Performance Reporting.... 8
Looking Forward.... 39
Compliance with Legal and Regulatory Requirements.... 43
Analysis of Our Financial Statements.... 53
Limitations to Our Financial Statements.... 55

SECTION II - Basic Financial Statements
Consolidated Balance Sheet.... 57
Consolidated Statement of Net Cost.... 58
Consolidated Statement of Changes in Net Position.... 59
Combined Statement of Budgetary Resources.... 60
Consolidated Statement of Financing.... 61
Notes to the Financial Statements.... 62

SECTION III - Required Supplemental Information
Combining Statements of Budgetary Resources by Major Budget Accounts.. 82
Working Capital Fund.... 86
Deferred Maintenance.... 89

SECTION IV - Required Supplemental Stewardship Information
General Stewardship Information.... 93
Heritage Assets – Museum Collections.... 95
Heritage Assets – Library Collections.... 96
Research and Development Investments.... 98

SECTION V - Independent Auditors' Report
Inspector General Transmittal Letter.... 112
Independent Auditors' Report.... 114

SECTION VI - Appendices
A. Glossary of Acronyms.... 127
B. Validation and Verification of Performance Measures.... 130
C. Program Evaluation Data.... 132
D. Significant FY2004 Accomplishments by USGS Employees.... 134

Message from the Director

In FY2004, the USGS celebrated its 125th anniversary, marking a long and distinguished history of providing science information to the Nation. This Performance and Accountability Report (PAR) highlights examples of USGS science that inform decisions on earth processes and resources.

We are proud of the many contributions that USGS has made to the knowledge needed to manage public lands, protect human health, guide community decisions, and many other purposes. For example, USGS has provided essential information to:

- *Protect lives, resources, and property.* In the Fall of 2004, USGS scientists monitored the eruption of Mount St. Helens in Washington State. Seismic unrest at the volcano began on September 23rd. USGS scientists quickly expanded monitoring networks and issued appropriate warnings of the potential dangers of the eruption. They have provided continuous updates and information needed to protect people and aircraft from hazardous situations, as the volcano produced periodic steam and ash explosions that sent ash as high as 10,000 feet, accompanied by persistent seismic unrest.
- *Improve the health of watersheds, landscapes, and marine resources.* The USGS conducted fire ecology research to assist the National Park Service, the Bureau of Land Management, the U.S. Fish and Wildlife Service, and other partners to determine in advance if habitats are naturally vulnerable to or resistant to invasions of non-native species, enabling limited resources to be more effectively deployed both during and after fires.
- *Sustain biological communities.* The USGS developed statistical models to predict the distribution of mussels and fishes in large rivers using biological, physical, landscape, and hydraulic variables. A decision support system with spatial information on fish community distributions at large spatial scales for the Middle Mississippi River will enable the FWS to manage endangered, threatened, or at-risk species of native mussel and fish populations in large, managed rivers of the United States.
- *Manage or influence resource use (energy).* Systematic energy-resource analyses of the San Joaquin Basin, Barnett Shale, Raton Basin, Wyoming Thrust Belt, and Burgos Basin are the foundation of a multi-agency effort in which USGS provides the technically recoverable, undiscovered oil and gas resource assessments for land managing agencies.
- *Manage or influence resource use (non-energy minerals).* A web-based geochemical database (http://pubs.usgs.gov/of/2004/1001/), released in January of this year, includes data for approximately 71 percent of the land area of the United States, including sites in all 50 States. The web site provides complete access to the geochemical data, much of it collected in partnership with States; describes analytical methods used; and presents geochemical maps of the United States for all analyzed elements.
- *Advance knowledge.* Geospatial information now supports an ever-expanding range of management and decisionmaking activities by providing credible, accurate, and timely geographic information to policy makers and the public. The National Map provides a consistent framework for geographic knowledge and is based on partnerships. An example of these efforts is the innovative partnerships being used to develop the National Hydrography Dataset, which contains streams, lakes, and other bodies of water. The data are being developed by a consortium of the USGS, other Federal agencies and groups, States, regional organizations, and universities. The program saves money by sharing in the creation of the data and by using it multiple times to meet specific but diverse mission needs.

The accomplishments described in this PAR attest to the diversity of USGS science conducted on behalf of the Nation and the importance of collaboration with partners in planning and implementing projects.

For 125 years USGS has employed its talented work force and resources to support public health, public safety, and public prosperity. We look forward to the next 125 years of scientific advancement and dissemination of knowledge to inform the best decisions for the Nation's resources.

Charles G. Groat
Director
October 2004

Message from the Chief Financial Officer

The USGS continues on the path towards excellence in its business and financial practices which we believe supports our commitment to excellence in science. After several years of effort, we received an unqualified opinion on our Consolidated Balance Sheet as of September 30, 2003. The Independent Auditor's Report identified four reportable conditions, one of which was a material weakness related to deficiencies in the USGS' policies, procedures and controls over accounting for reimbursable agreements. In FY2004, corrective action plans were developed and implemented, and the Bureau has made substantial improvements in all areas of financial management.

During FY2004, the USGS made measurable improvement to Information Technology. We developed and implemented an action plan to achieve compliance with the Federal Information Security Management Act. The resulting improvements to the USGS security infrastructure include: improved information technology security plans, enhanced computer incident response capabilities including reporting of security incidents to the Federal Computer Incident Response Center, annual incident response training of all personnel, and standard procedures for system configuration and patch management. The USGS also completed security certification and accreditation of all IT systems as of July 31, 2004. Additionally, we completed bureau-wide implementation of the new Federal Personnel Payroll System web-based Time and Attendance system, Quicktime, effectively eliminating stand-alone systems and providing the Bureau a single time and attendance system.

We continued our investment in training for the Bureau's financial and administrative staff, conducting three regional workshops that addressed the annual financial operating schedule, Working Capital Fund policies and procedures, and reimbursable accounting. We recently hired two new senior staff, filling the vacant Chief of the Office of Accounting and Financial Management position and replacing the retired Chief of the Office of Fiscal Services. The Business Leaders Team and the Field Managers Team continued to play an important role by providing advice and insight on business practices to ensure that we effectively meet our challenges and goals.

We established a Configuration Management Committee (CMC) and Technical Review Board (TRB) to provide oversight and guidance for enhancements and changes to the "Budget and Science Information System" (BASIS+), the system that provides to our scientists and managers an automated tool for planning and tracking their work. The CMC in conjunction with the TRB will ensure that BASIS+ is responsive to our program manager's needs and provides information necessary to make financial decisions.

The result of these efforts is an unqualified opinion on all of the basic financial statements as of and for the year ended September 30, 2004. The opinion also identified two reportable conditions, neither of which was a material weakness. The USGS is proud of the extraordinary efforts given by all our employees and most especially our program managers who have over the last year worked to ensure that internal control procedures were implemented effectively. The successful outcome of our FY2004 audit is attributable to this level of commitment and diligence.

We will continue our endeavors to maintain and improve upon the successes we have achieved over the last two years. To that end, I am committed to supporting integrated science with modern systems and processes in an environment of competent and accountable financial management.

Carol F. Aten
Chief Financial Officer and
Chief, Administrative Policy and Services
October 2004

Message from the Chief, Office of Budget and Performance

Integrating planned performance with budget requests and actual accomplishments with financial and performance reports is fundamental to understanding what is being achieved in relation to what is being spent. Since FY2002, USGS has worked with the Department of the Interior and the Administration to establish accurate and meaningful performance measures for its programs in accordance with the President's Management Agenda. The USGS has been particularly successful in this endeavor, owing to the physical integration of its budget, regional, and planning and performance teams in its Office of Budget. Working in constant contact, these teams jointly develop and produce budget and performance documents that are fully integrated with respect to description of base programs and analyses, their funding and FTE implications, and what the standards of their performance will be and how they will be evaluated. The three teams work closely with Bureau program staff to understand and evaluate the science programs' budget and performance levels, ensuring delivery of mission and responsiveness to USGS executive management decisions, Departmental concerns, and Administration policies. The result of this close coordination has been a commendation by the Assistant Secretary for Policy, Management and Budget on the functional organization and coordination of budget and performance planning for USGS within the Office of Budget.

USGS employs a robust, cyclic requirement for science planning, program reviews, cost center reviews, management control reviews, and peer reviews and continues to refine these processes. Program evaluations are the foundation on which USGS gauges performance relative to the DOI End Outcome measure for soundness of methodology, accuracy, and reliability of science. External reviews from the GAO, OMB, Office of the Inspector General, and other organizations, such as the National Academy of Public Administration and the National Research Council are critical to maintaining the USGS' reputation for scientific excellence and credibility as well as providing guidance for future research needs. The evaluations not only improve the accountability and quality of programs, but also identify and address gaps in programs; redirect or reaffirm program directions; identify and provide guidance for development of new programs; and review and/or motivate managers and scientists. Another means of ensuring product quality and relevance is Standard Customer Satisfaction/ Outcome Surveys which we began in FY2001. Since then, more than 1,500 customers, mostly scientists and resource managers, have described their satisfaction with various aspects of more than 30 different USGS science products. Many enhancements have been made to these products in response to the expressed needs of our customers. While the surveys all follow the same format, each one is modified to meet a specific program's customer information needs, and the final result of each survey is immediately useful to the program manager. The results meet the goals of the Department's Unified Strategic Plan.

This array of tools is now supplemented further and coordinated with OMB Program Assessment Rating Tool evaluations, and is also beginning to include the results of Activity Based Cost/Management (ABC/M) to further instruct our planning processes. Cost management information will help our employees and the public that we serve better understand what it costs to deliver quality products and services, such as the cost of producing geospatial data or monitoring for volcano and earthquake hazards. Capturing the cost of work will also help the USGS better document our basis for cost-share projects, and cost recovery. In FY2004 USGS actively participated in the Department's ABC/M oversight efforts to "get the work activities right," by reviewing 326 DOI work activities for commonality and distinctions, challenging models and assumptions to define common ground, improving activity definitions, and realigning bureau work activities with a revised set of DOI activities for implementation in FY2005 to ensure continuous improvement in accuracy and usefulness of the information. Several years of implementation will be needed to standardize processes, to ensure consistency of interpretation and application of work activity definitions across the organization and across the scientific disciplines, and to identify trends in the data that can lead to programmatic decisions.

USGS is committed to science and management excellence.

Carla Burzyk
Chief, Office of Budget and Performance
October 2004

Section I

Management Discussion and Analysis

A USGS scientist conducts a mussel survey in Big Bend National Park in Southwest Texas as part of the Rio Grande Bioassessment being conducted with the National Park Service.

Contents

Overview of the Organization 2
Strategic Goals 5
Performance Reporting..... 8
Looking Forward..... 39
Compliance with Legal and Regulatory Requirements..... 43
Analysis of Our Financial Statements 53
Limitations to Our Financial Statements 55

The USGS serves the Nation as an independent fact-finding agency that collects and analyzes natural resource data and provides scientific understanding about conditions, issues, and problems. The USGS is the science provider of choice for accessing information and understanding to help resolve complex natural resource problems across the Nation and around the world.

Vision

The USGS is a world leader in the natural sciences through our scientific excellence and responsiveness to society's needs.

Created by an act of Congress in 1879, the USGS celebrated its 125th anniversary this year. When the USGS was established, the Federal government held title to more than 1.2 billion acres of land, nearly all of it west of the Mississippi River, and only 200 million acres of this land had been surveyed. John Wesley Powell, who led one of the great western surveys that preceded the creation of the USGS and who later served as the second USGS Director, suggested that very little of the remaining public land was suitable for conventional farming and that only a small fraction of the arid land was irrigable using known resources. Powell proposed radical changes in the land system, including organization of irrigation and pasturage districts, to improve management of water and natural resources by sociopolitical institutions, based on natural science. One hundred twenty five years later, the USGS continues to provide the scientific foundation to ensure the best planning and the best decision-making.

"For 125 years, the USGS has provided the DOI, the Nation, and the world with the science needed to make important decisions and safeguard society. I am delighted to have the opportunity to mark this significant anniversary and invite you to join us as we celebrate 125 years of science for America--the mission that has guided us, the people and traditions that have shaped us, the science that has made us great, and the partnerships that will continue to help us achieve our goals for the next 125 years."
Dr. Chip Groat at the 125th anniversary celebration

Today, the USGS is sought out by thousands of partners and customers for its natural science expertise and its vast earth and biological data holdings. The value of USGS to the Nation rests on its ability to carry out studies on a national scale and to sustain long-term monitoring and assessment of natural resources. Because it has no regulatory or management mandate, the USGS provides impartial science that serves the needs of our changing world. Its diversity of scientific expertise enables the USGS to carry out large-scale, multi-disciplinary investigations that build the base of knowledge about the Earth. In turn, decision makers at all levels of government and citizens in all walks of life have the information they need to address pressing societal issues.

The thousands of scientists, technicians, and support staff of the USGS are located in nearly 400 offices in every State and in several foreign countries. With an annual budget exceeding $1 billion, the USGS leverages its resources and expertise in partnership with more than 2,000 agencies of State, local and Tribal governments, the academic community, other Federal agencies, non-governmental organizations, and the private sector. Field investigations, direct observations of natural science processes and phenomena, and monitoring and data collection are the scientific hallmarks of the USGS.

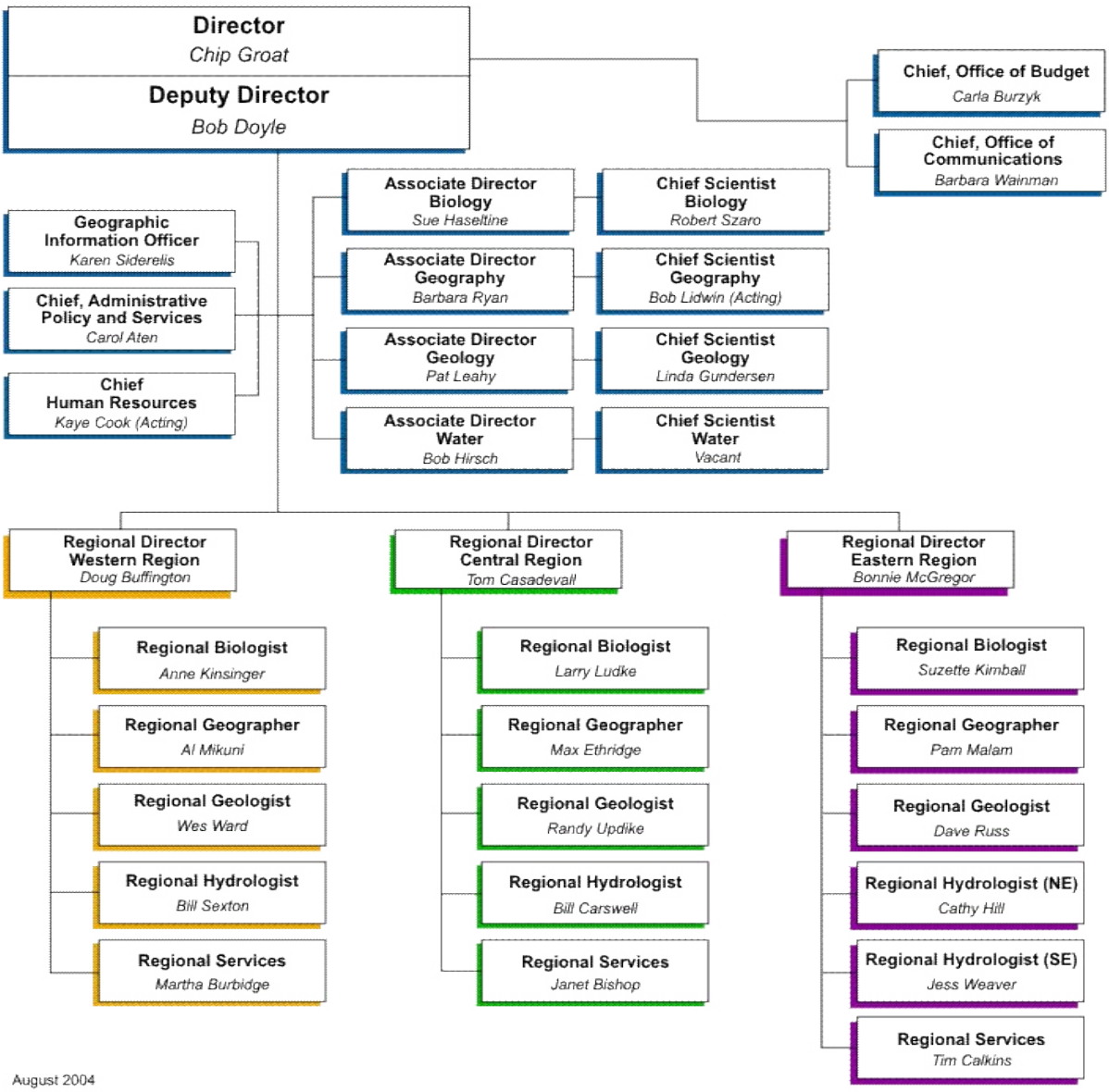
The USGS is proud of its outstanding history of public service and staying at the forefront of advances in understanding the Earth, its processes, and its resources. USGS scientists pioneered hydrologic techniques for gaging the discharge in rivers and streams and modeling the flow of complex ground-water systems. Innovative ventures with the private sector have given the world access to digital images of neighborhoods and communities in one of the largest data sets ever made available online. Modern-day understanding of the formation and location of energy and mineral resource deposits is rooted in fundamental scientific breakthroughs by USGS scientists. USGS biologists revolutionized thinking about managing wildlife resources, providing a sound scientific basis for waterfowl conservation and recreational hunting to work in tandem as adaptive management, not as conflicting interests. Advances in seismology are making early warnings of earthquakes a reality that will give the needed alert time to save lives. The future of the global community presents unprecedented opportunities for the science of the USGS

to continue to make substantive and life-enhancing contributions to the betterment of the Nation and the world.

The USGS addresses both national program priorities and local science needs on the landscape through a matrix management approach. National programs are overseen by Associate Directors for each discipline and administered by Program Coordinators at Headquarters in Reston, Virginia. Regional Directors, Regional Executives for each discipline, and Science Coordinators are deployed across the Nation, bringing Bureau leadership and programs closer to customers and their issues. Together, they ensure the quality of our science and its relevance to the needs of land and resource management decisionmakers. Together, they offer holistic science solutions by bringing to bear the expertise of scientists from multiple disciplines, integrating science to confront the complexity of a continually changing world. Together, USGS resources and science benefit not only the immediate needs of partners and customers but also the Nation as a whole through application of the results to similar issues across the country and into the future.

Strategic Direction

The USGS will combine and enhance our diverse programs, capabilities, and talents and increase customer involvement to strengthen our science leadership and contribution to the resolution of complex issues.



The USGS has major field centers for the three regions in Reston, Virginia (Eastern), Denver, Colorado (Central), and Menlo Park, California (Western). The USGS rents 4.5 million square feet of space in about 220 GSA buildings nationwide and owns 35 installations with 1.2 million square feet of space in 280 owned buildings. The USGS operations include:

- an earthquake monitoring network comprising a global seismographic network of 130 stations located worldwide with national and regional networks located throughout 35 states and territories and the National Earthquake Information Center in Golden, Colorado;
- 14 geomagnetic observatories;
- a landslide network and the National Landslide Information Center;
- a volcano hazards network and volcano observatories in five states to monitor 49 U.S. volcanoes;
- 17 biological science centers and associated field stations and a center for biological informatics;
- approximately 7,000 streamgages and water quality monitors, the National Water Quality Laboratory, and the Hydrologic Instrumentation Facility;
- production and distribution facilities that manage more than 55,000 topographic maps, 2.6 petabytes of cartographic and digital data stored at EROS Data Center, and archive aerial photographs, and 32 years of global satellite data;
- an average of 10,800,000 successful requests made to the USGS home page every month, an average of 400,000 customer inquiries made to USGS libraries and Earth Science Information Centers annually, more than 25,000 scientific and technical publications previously available only in paper made electronically accessible, and an average of 19,000 SPAM and virus messages blocked daily by IT security operation; and
- affiliation with 40 Cooperative Research Units and 54 State Water Resources Research Institutes.

The Eastern region is composed of 26 States, the District of Columbia, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands and has approximately 3,300 employees distributed across duty stations throughout the region. USGS Eastern region offices are located at 175 sites in the 26 States east of the Mississippi River, plus Puerto Rico and the Virgin Islands. The Central region is composed of 15 States between the Mississippi River and the western slope of the Rocky Mountains. Approximately 2,700 employees and 900 onsite contractors are distributed in 76 cities and 21 field offices across the Central region. The Western region is composed of nine western States, Guam, American Samoa and the Commonwealth of the Mariana Islands. Approximately 2,500 employees are distributed in 33 cities and 64 field offices across the Western region. The Headquarters location in Reston, Virginia, is within the District of Columbia metropolitan area and has approximately 1,000 employees stationed in Reston and in several foreign countries.

The USGS vision, mission, and strategic direction focus on responsiveness and customer service, underscoring the application of science to customer, partner, and other stakeholder needs; directing the combined expertise of the Bureau's scientific disciplines; and defining its commitment to pursuing an integrated approach to providing science for a changing world. All support the DOI's unified Strategic Plan implemented in FY2004.

Strategic Goal **Resource Protection: Protect the Nation's Natural, Cultural, and Heritage Resources**

End Outcome Goal: Improve the health of watersheds, landscapes, and marine resources that are DOI managed or influenced in a manner consistent with obligations regarding the allocation and use of water

End Outcome Goal: Sustain biological communities on DOI managed and influenced lands and waters in a manner consistent with obligations regarding the allocation and use of water

Strategic Goal **Resource Use: Manage Resources to Promote Responsible Use and Sustain a Dynamic Economy**

End Outcome Goal: Energy – Manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal value

End Outcome Goal: Non-Energy minerals – Manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal value

Strategic Goal **Serving Communities: Safeguard Lives, Property, and Assets; Advance Scientific Knowledge; and Improve the Quality of Life for the Communities We Serve**

End Outcome Goal: Protect lives, resources, and property

End Outcome Goal: Advance knowledge through scientific leadership and inform decisions through the applications of science

Strategic Goals

In the past, each DOI Bureau prepared an individual strategic plan outlining missions, responsibilities, organizations, programs, and measureable performance goals linked to five Government Performance Results Act (GPRA) goals. *Providing Science for a Changing World* was the goal that was the focus of USGS financial and performance results. As the DOI planned for the future, Secretary Gale Norton endorsed a dramatic change in the fundamental structure of performance planning and execution: a logic model (see performance model on next page) was used to revise GPRA goals across the organization and create one Department-wide strategic plan implementated in FY2004. It provides the Department a set of consistent goals with a common agenda and the means to increase focus on performance results; helps to make managers more accountable; and creates a springboard for communication, collaboration, and coordination in the interest of conservation with interested citizens, organizations, and constituents on a shared future direction.

DOI CHANGED ITS STRATEGIC PLAN	
FY2003 GPRA GOALS	*FY2004 GPRA GOALS*
Protect the environment and preserve our Nation's natural and cultural resources	Resource Protection: Protect the Nation's natural, cultural, and heritage resources
Provide recreation for America	Recreation: Provide recreation opportunities for America
Manage natural resources for a healthy environment and a strong economy	Resource Use: Manage natural resources to promote responsible use and sustain a dynamic economy
Provide science for a changing world	
Meet our trust responsibilities to Indian tribes and our commitments to island communities	Serving Communities: Safeguard lives, property, and assets; advance scientific knowledge; and improve the quality of life for the communities we serve

The previous five DOI GPRA goals were replaced with four GPRA mission goals, supported by seventeen Department-level end outcome goals. USGS activities in FY2004 focus on three of the new DOI GPRA goals and six of the DOI's seventeen end outcome goals. USGS activities in relation to the GPRA goals are described below.

Serving communities strategic goal: Safeguard lives, property, and assets; advance scientific knowledge; and improve the quality of life for the communities we serve. The USGS geologic hazards programs produce information and understanding that reduce the impact of natural hazards and disasters on human life and the economy. USGS analyses of the availability and quality of water resources help to develop, regulate, and monitor management practices to ensure the continued availability of water resources for human consumption, agriculture, business, recreation, and environmental stability. The USGS geography program is expanding its partnerships with Federal agencies and State and local governments to develop and promote the use of geographic data and mapping products that are essential for economic and community development, land and natural resource management, and health and safety services.

Resource use strategic goal: Manage natural resources to promote responsible use and sustain a dynamic economy. USGS information on the availability and extraction of mineral, oil, gas, and alternative energy resources is a primary Federal source of objective resource assessments and unbiased research on mineral, oil, gas, and alternative energy potential, production, consumption, and environmental effects. The USGS will continue to conduct national and global energy resource assessments of oil, natural gas, coalbed natural gas, gas hydrates, and coal resources, as well as evaluate their risks for environmental and ecological degradation associated with the production and use of energy resources. These investigations enable the Nation to make sound decisions regarding domestic energy production with an understanding of potential impacts on the environment.

Resource protection strategic goal: Protect the Nation's natural, cultural, and heritage resources. USGS biological studies assist in maintaining healthy ecosystems and natural resources so that these habitats can continue to provide food, energy, medicine, transportation, and recreation. The USGS will continue to serve the biological research needs of DOI Bureaus and others by providing scientific information through research, inventory, and monitoring investigations. Information

generated by the biological research program contributes to achieving DOI Bureau goals for improved management of the Nation's land and water resources and improved decision-making regarding land and resources use.

Last year, USGS reported all activities under two end outcome goals: environment and natural resources and hazards, which rolled into the DOI strategic goal of providing science for a changing word. In FY2004, the USGS is reporting all activities under six end outcome goals listed in the charts on the previous page, which roll into the three DOI strategic goals also listed in the charts on the previous page.

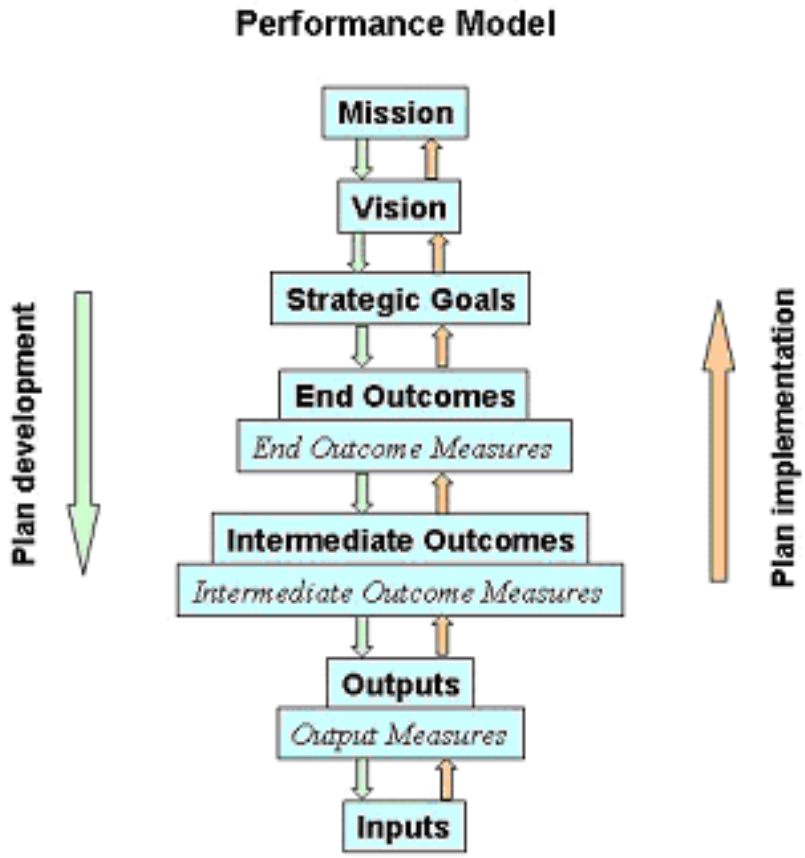
Performance Plan Development and Implementation

The DOI Strategic Plan provides a high-level overview of performance, setting large mission goals and broad program objectives. Its greatest value, day-by-day, comes from connecting that larger view with each day's ground-level work.

Because the plan sets up a clear hierarchy of objectives, organized from mission to strategic goal to program, it demonstrates how each Bureau's work contributes to DOI's end results. Targets are set at every level, providing numerical measures of USGS accomplishment.

The plan structure is focused on end outcomes, selected high-priority intermediate outcomes, and on performance measures, indicators, and output that verify progress toward outcome achievement. Just as each mission area has its own strategic goals, each strategic goal has its own end outcome goals and measures. Supporting those, in turn, are intermediate outcome goals and measures, with outputs and inputs below that.

Outputs are typically quantifiable products of work processes or activities. Activity-based costing, in its first year of implementation at USGS, holds the potential to connect outputs to costs and create a powerful management tool for identifying superior efficiencies, focus attention on achievement and innovation, and move more quickly to spread best practices throughout the organization.



Performance measures are also generated through application of OMB's Program Assessment Rating Tool (PART).

Those measures and their performance results are included with the strategic plan measures within the tables to follow. The following legend applies:

Ω Target Not Met

Δ Target Exceeded

√ Target Met

<u>Summary Performance Result</u> Each analysis of results begins with Target Met; Target Not Met; or Target Exceeded. USGS is applying the Department's 5% threshold application in determining the result, which dictates that if the result is within 5% of the target performance, this generates a "goal met" rating. The summary result for actual or estimated values that are less than 95% or more than 105% of the target must be either Target Not Met or Target Exceeded, respectively.

Resource Protection: Protect the Nation's Natural, Cultural and Heritage Resources

End Outcome Goal:

Improve the health of watersheds, landscapes, and marine resources that are DOI managed or influenced in a manner consistent with obligations regarding the allocation and use of water

FY2004 Performance	Results			
Intermediate Outcome: Restore and maintain proper functions to watersheds and landscape				
√ *Restore Fire Adapted Ecosystems:* Percent satisfaction with scientific and technical products (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	97%	≥ 80%	100%
FY2004 Performance Outputs:				
Ω Number of systematic analyses and investigations delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	11	11	11	4[1]
√ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1	1	1	1

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Forge Effective Partnerships:* Satisfaction score (number score) on resource protection partnerships (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	97%	≥ 80%	97%
√ *Customer Satisfaction:* Percent satisfaction with scientific and technical products and assistance	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	97%	≥ 80%	97%
√ *Customer Satisfaction:* Timeliness of scientific and technical products	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	95%	93%	≥ 80%	93%
√ *Customer Satisfaction:* Usefulness of scientific and technical products	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	98%	97%	≥ 80%	97%
√ *Quality:* Percentage of watershed and landscape-related research studies validated through appropriate peer review or independent review (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%

FY2004 Performance	Results			
√ *Facilities Condition:* Conservation and biological research facilities are in fair to good condition as measured by the Facilities Condition Index (lower FCI is good)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	n/a	.24	.24
FY2004 Performance Outputs:				
Ω Number of systematic analyses and investigations delivered to customers	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	143	151	148	107[1]
√ Number of new or improved decision support tools	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	0	1	1	1
Ω Number of formal workshops or training provided to customers	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	63	63	63	[1]

Targets Met = 9	Targets Not Met = 3	Targets Exceeded = 0
Summary Performance Result		
[1]Systematic analyses and workshops/training are funded by multiple sources for multiple purposes resulting in difficulty ensuring that a product is counted only once and deciding which goal it supports. This is further complicated by the actual products being customer driven, which also influences the goal to which they are associated, compared against a target set well before requirements and customers are identified. There is no effect on overall program or activity performance.		

Biology Accomplishments

Fire Science Research: Terrestrial, Freshwater, and Marine Ecosystems

This project supports fire ecology research to determine the role of fire in the restoration of non-forested ecosystems, the role of fire in the control and spread of invasive plants, and the effectiveness of fire/fuel treatments to reduce fire hazard.

Annual grasses have invaded scrubland and forest ecosystems in Western North America and are linked to changes in plant communities and altered fire regimes. This has occurred over vast expanses of public lands in the Great Basin and the Mojave Desert, and is a threat to lower elevation yellow pine forests. Fire has the potential for contributing the most to annual grass invasion in low nutrient soils. Soil nutrient changes can vary widely depending on soil properties and the amount and duration of soil heating.

Results of the study were conveyed to the NPS, BLM, FWS, and other client agencies in progress and annual reports, peer-reviewed journal articles, oral presentations, databases, Geographic Information System (GIS) products, publication briefs, Web sites, and other forms of outreach.

With this information, managers can determine in advance if habitats are naturally vulnerable or resistant to invasions, enabling limited resources to be more effectively deployed both during and after fires.

Resource Protection: Protect the Nation's Natural, Cultural, and Heritage Resources

End Outcome Goal:
Sustain biological communities on DOI-managed and -influenced lands and waters in a manner consistent with obligations regarding the allocation and use of water

FY2004 Performance	Results			
Intermediate Outcome: Create habitat conditions for desired biological communities to flourish				
√ *Invasive Species - Prevention:* Percentage of invasive species research focused on pathways and prevention methods	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	2%	8%	7%	7%
Δ *Invasive Species - Early Detection:* Percentage of invasive species research focused on detection and assessments of new invasions	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	2%	3%	5%	8%
√ *Invasive Species - Rapid Response:* Percentage of invasive species research focused on rapid management response to new invaders	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	<1%	<1%	2%	1%
√ *Invasive Species - Control & Management:* Percentage of invasive species research focused on providing information and methods for control and management of established invasive species	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	95%	89%	86%	84%
√ *Invasive Species - Forge Effective Partnerships:* Satisfaction score (number score) on biological research partnerships	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	97%	≥ 80%	99%
FY2004 Performance Outputs:				
Δ Number of systematic analyses and investigations delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	16	20	24	51
√ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1	1	1	1

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Forge Effective Partnerships:* Satisfaction score (number score) on biological research partnerships (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	97%	≥ 80%	98%

FY2004 Performance	Results			
√ *Shared Data:* Percentage of DOI databases with species information that is available throughout DOI and other partners	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	100%	100%	100%	100%
√ *Customer Satisfaction:* Percent satisfaction with DOI scientific and technical information	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	100%	99%	≥ 80%	98%
√ *Customer Satisfaction:* Timeliness of scientific and technical information	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	97%	97%	≥ 80%	97%
√ *Customer Satisfaction:* Usefulness of scientific and technical information	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	99%	98%	≥ 80%	98%
√ *Quality:* Percentage of biological research studies validated through appropriate peer review or independent review (DOI strategic plan key measure)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	100%	100%	100%	100%
√ *Facilities Condition:* Conservation and biological research facilities are in fair to good condition as measured by the Facilities Condition Index (lower FCI is good) (DOI strategic plan key measure)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	n/a	.19	.19
FY2004 Performance Outputs:				
√ Number of systematic analyses and investigations delivered to customers	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	816	796	813	797
√ Number of long-term data collections maintained	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	8	9	10	10
√ Number of new or improved decision support tools	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	2	1	1	1
Ω Number of formal workshops or training provided to customers	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	125	97	126	70[2]

Targets Met = 15	Targets Not Met = 1	Targets Exceeded = 2

Summary Performance Result

[2]Workshops/training are funded by multiple sources for multiple purposes resulting in difficulty ensuring that a product is counted only once and deciding which goal it supports. This is further complicated by the actual products being customer driven, which also influences the goal to which they are associated, compared against a target set well before requirements and customers are identified. There is no effect on overall program or activity performance.

Biology Accomplishments

River and Stream Ecosystems, Living Resources, Human Uses, and Impact Mitigation in the Upper and Middle Mississippi River Basins: Fisheries: Aquatic and Endangered Resources

The USGS developed aquatic systems models from assessments of the biological and physical health of river biota and habitats to provide resource managers with appropriate data and analytical tools to develop scientifically sound adaptive management plans for multiple uses of river resources, including aquatic species and habitat management and restoration, water and human health protection, and river management.

This multi-disciplinary project investigated nutrient cycling and aquatic species and habitats in the largest river system in the United States. The fisheries-related tasks focus on the effects of river and watershed management on at-risk species (native mussels) and important fish populations. These tasks help determine if the physical-chemical condition of the Upper Mississippi River can be used to estimate and predict the productivity and available habitat for aquatic organisms, including fish and plants, and determine if the habitat is limiting. Determining the effects of waterborne pharmaceuticals from feedlots, aquaculture facilities, and personal care products on fish, aquatic organisms, and potentially human health in the Mississippi Basin are an associated task with a focus on areas in the national refuge and national park systems.

Upper Mississippi River near Genoa, WI. The island picture is a constructed island designed to replace those lost to erosion from lock and dam operations.

The USGS developed statistical models to predict the distribution of mussels and fishes in large rivers using biological, physical, landscape, and hydraulic variables. A decision support system with spatial information on fish community distributions at large spatial scales will be developed for the Middle Mississippi River. The FWS will use the information, models, and tools to manage endangered, threatened, or at-risk species of native mussel and fish populations in large, managed rivers of the U.S. models of areas of concern where aquatic populations and habitats may be at risk from affected waters. Some of the products will be completed in FY2005.

The FWS and the EPA provide financial support for these tasks. The FWS applies the information to the management and restoration of aquatic species and habitats in the Mississippi River. The EPA funds the tasks that evaluate the effects of different spill and river management actions on aquatic populations and habitats, including potentially contaminated water supplies. The U.S. Army Corp of Engineers (USCOE) may apply information to spill management and to management backwaters for aquatic populations. The FWS and the NPS use the information to manage aquatic species and habitats under their responsibility in the Mississippi Basin.

Population and Habitat Ecology of Virginia's Hunted Black Bear Population

The USGS conducted research on Virginia's hunted black bear population to estimate important demographic variables, determine effects of hunting, describe essential habitats, and provide the basis for developing a bear management plan for Virginia.

Prior to the initiation of this 10-year bear study, Virginia's annual bear harvest was steadily increasing, but there was no data on the number of bears in Virginia, the number of bear hunters, or the harvest rate. In addition, animal rights groups had successfully stopped bear hunting in several States, arguing that the States lacked sufficient data on their bear populations to permit hunting. Virginia was vulnerable to the same argument. Thus, the Virginia Department of Game and Inland Fisheries,

along with the U.S. Forest Service (USFS), commissioned this study to provide them with the kinds of data they could use to manage bears in a more informed way and to develop a Statewide bear management plan.

The Virginia Department of Game and Inland Fisheries used the information from this study to develop a bear management plan for Virginia and to alter the harvest strategy. In addition, they used data from this research to successfully argue for restrictions on bear chase and for the banning of feeding bears on both private and public lands in Virginia. As a final product of this research, the USGS will prepare a document designed for day-to-day use by wildlife managers in Virginia and elsewhere in dealing with bear-related issues. It will contain the most in-depth and up-to-date information on black bear ecology in the Appalachian Mountains.

Virginia Black Bears in their Native Habitat

Barrens Topminnow

USGS scientists and cooperators are monitoring the stocking program of a multi-agency task force trying to establish new populations of an imperiled fish species, the Barrens Topminnow (*Fundulus julisia*), and are identifying factors that influence the fate and persistence of stocked fish. The task force is comprised of representatives from the FWS, the Nature Conservancy of Tennessee, the Tennessee Wildlife Resources Agency, Tennessee Technological University, the Tennessee Aquarium, and Conservation Fisheries, Inc.

The Barrens Topminnow is endemic to the Barrens Plateau Region of middle Tennessee, but its continued survival is uncertain. This species inhabits small spring pools at the headwaters of first-order streams. Land-use practices have altered many of these spring habitats, and an exotic competitor and potential predator, the Western Mosquitofish (*Gambusia affinis*), has invaded most of these habitats throughout the topminnows' former and current range. Currently, only four wild populations are known, and each consists of several hundreds, not thousands, of individuals. The State of Tennessee lists the Barrens Topminnow as threatened, and some authorities consider it one of the most imperiled fish species in Eastern North America. The Barrens Topminnow is not yet listed under the Endangered Species Act because of ongoing efforts to establish new populations. Recovery of the species will not occur without identifying the factors that influence the population dynamics of stocked and wild Barrens Topminnows.

Field and laboratory investigations have produced similar findings: mosquitofish suppress Barrens Topminnow populations. Reproduction and recruitment by stocked topminnows is essentially nil in the presence of mosquitofish. USGS scientists documented long-term persistence of topminnows stocked as adults, even in habitats supporting dense populations of mosquitofish, but no recruitment by topminnows was observed. Laboratory studies demonstrated that larval and juvenile topminnows were preyed upon or injured by mosquitofish. One report summarizing the field component of this study was presented to the task force in March 2004, and one report summarizing the laboratory study was distributed in August 2004. Additional field studies are also underway to monitor the fate and persistence of topminnows scheduled to be stocked by the task force later in 2004 and 2005.

The FWS is now partnering with the U.S. Air Force (Arnold Engineering Development Center, Tullahoma, TN) to support new research on creating topminnow habitats with fish barriers to prevent invasion by mosquitofish. Proposals to collect information on negative interactions between mosquitofish and topminnows are also being solicited. Finally, the task force is placing less emphasis on stocking hatchery-reared Barrens Topminnows into as many habitats as possible and more emphasis on stocking topminnows into habitats with few mosquitofish.

Resource Use: Manage Resources to Promote Responsible Use and Sustain a Dynamic Economy

End Outcome Goal:
Energy – Manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal value

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Baseline Information:* Number of targeted basins with oil and gas resource assessments available to support management decisions (DOI strategic plan key measure and PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	7	5	5
√ *Quality & Utility of Information:* Percentage of customers satisfied with timeliness of data	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%
√ *Quality & Utility of Information:* Percentage of accessible data	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	95%	95%	≥ 80%	95%
√ *Quality & Utility of Information:* Percentage of customers for which energy data meets their needs	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	93%	93%	≥ 80%	93%
√ *Quality and Utility of Information:* Percentage of studies validated through appropriate peer review or independent review (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%
FY2004 Performance Outputs:				
√ Number of systematic analyses and investigations delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	4	7	5	5
√ Number of long-term data collections maintained	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	5	5	3	3
√ Number of new or improved decision support tools	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1	1	1	1
√ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	10	9	8	8
√ Percentage of targeted analyses/investigations delivered which are cited by identified partners within 3 years of delivery (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	80%	80%

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
Ω Average cost of a systematic analysis or investigation (PART measure)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	$2.75M	$2.75M	$2.2M[3]

Targets Met = 10	Targets Not Met = 1	Targets Exceeded = 0
Summary Performance Result		
[3]Target is an estimate. Our current ABC capability is not able to do this level of analysis automatically. Manual calculations are needed and will also instruct the definition of processes to mature ABC system design.		

Geology Accomplishments

Systematic Analyses Delivered on San Joaquin Basin, Barnett Shale, Raton Basin, Wyoming Thrust Belt, and Burgos Basin

These are thorough, geologically-based assessments of the undiscovered, technically recoverable oil and gas resources in these Basins. These assessments are important because the USGS is the only group to do such assessments and is the only source of geologically-based information concerning the as yet undiscovered oil and gas resources of the Nation and the world. These domestic assessments are the basis and foundation of the Energy Policy and Conservation Act Amendments of 2000 (EPCA) work. The EPCA work is a multi-agency effort conducted by USGS, which provides the technically recoverable, undiscovered oil and gas resource assessments; BLM, which provides the restrictions and impediments to development on BLM-managed lands; USFS, which provides the restrictions and impediments to development on Forest Service-managed lands; and the Department of Energy and Energy Information Administration, which provides current production and reserves of the oil and gas on these lands. The international assessments are also part of Energy Resources Program (ERP) World Petroleum assessment project, cited and used by international organizations all over the world. USGS is the only organization to provide such data. It provides an invaluable source of oil and gas resource assessments to U.S. law makers, policy makers, resources managers, foreign governments, industry consortia, and other nongovernmental groups.

Manuscript on Oil and Gas Resources and Reserves of Iraq

The ERP has published a manuscript on the oil and gas resources and reserves of Iraq, entitled "Petroleum Reserves and Undiscovered Resources in the Total Petroleum Systems of Iraq: Reserve Growth and Production Implications." This manuscript was published in GeoArabia, Volume 9, Number 3, 2004. GeoArabia is the major journal for geosciences in the Middle East, thus an appropriate medium for the publication of Iraq's petroleum resources. A petroleum migration modeling paper on Iraq, also by ERP scientists, will follow in the next issue as a companion paper, further supporting the analysis in Iraq. This companion paper will reaffirm the claim of the large hydrocarbon potential of Iraq.

The ERP paper on Iraq not only complements the undiscovered resources given in the USGS World Petroleum Assessment 2000 (WPA 2000), but also provides significant additional information such as reserve volumes and important reservoir parameters of individual fields, reserve growth, hydrocarbon potential of individual producing and non-producing fields, status of crude-oil handling facilities, upstream infrastructure, and the outlook for Iraq's oil. WPA 2000 described the geology from a regional standpoint and reported Iraq's known reserve (sum of cumulative oil production and remaining reserves). In 1996, Iraq's known oil reserves were estimated to be about 100 billion barrels compared to the current reserves of about 136 billion barrels. These types of analyses are integral to ERP's base mission to understand the energy needs and distribution, directly linked to our national energy needs, because of our dependence on this fossil energy resource, which is expected to dominate the world for at least the next several decades.

Release Of Production Data Test From Gas Hydrate Well

The ERP participated in the release of the first production test data from a gas hydrate well in Makuhari, Japan. The ERP was part of an international research

consortium that drilled a hydrate test well in 2002 and produced natural gas from a hydrate accumulation for the first time. Gas hydrates are a naturally occurring "ice-like" combination of natural gas and water that have the potential to be a significant new source of energy from the world's oceans and polar regions. The first public results were released in December 2003 showing for the first time that gas hydrates are producible. These results are important because gas hydrates represent a potentially huge new energy resource and those interested in energy resources. (For example, Congress, policy makers, other research organizations, foreign governments, etc., are interested in these concrete test results.) For the first time, it has been proven that it is technically feasible to produce gas from gas hydrates. At the symposium in Japan, the successful results of the first modern, fully integrated production testing of gas hydrates were released. The test drilling took place in the MacKenzie Delta of the Canadian Arctic because of its very high concentrations of known hydrates. Depressurization and thermal heating experiments at the Mallik site were extremely successful. The results demonstrated that gas can be produced from gas hydrates with different concentrations and characteristics, by both temperature and pressure changes, and also exclusively through pressure stimulation. The data supports the interpretation that the gas hydrates are much more permeable and conducive to flow from pressure stimulation than previously thought. In one test, the gas production rates were substantially enhanced by artificially fracturing the reservoir. These tests are extremely valuable as hydrates represent a potentially vast new source of clean-burning natural gas.

Release of Organic Geochemistry Database (OGDB)

The ERP released an organic geochemistry database containing over 65,000 records from over 18,000 worldwide locations. The OGDB contains chemical analysis data for crude oil, natural gas, and rock samples analyzed by the USGS Central Energy Resources Team's Organic Geochemistry Laboratory or by contracted-service laboratories. Data were also obtained from the literature and unpublished public domain sources including a substantial amount of natural gas data from the U.S. Bureau of Mines. The sample types included are primarily rock, oil, and gas samples collected from outcrops or from exploratory or production wells. This information is used by the USGS for domestic and worldwide energy resource assessments based on the petroleum systems model (source rock - reservoir rock relation), and is periodically released to the public. Analytical data within the OGDB includes Rock-Eval pyrolysis, organic mass spectrometry, vitrinite reflectance, gas chromatography, column chromatography, stable carbon isotopes, and a number of other related petroleum geochemical analyses that, in some instances, predate the OGDB. Throughout the years, ERP scientists have utilized these data to not only develop an understanding of the physical and geochemical processes responsible for hydrocarbon formation, maturation, generation, migration, and accumulation, but also as a tool to assess the oil and gas potential for petroleum systems in both national and international settings. The general public will find the information suitable in aiding their understanding of the geochemistry of many of the world's major oil and gas producing regions. The OGDB will be a useful reference for Federal, State, and local agencies involved in planning, oil and gas production, oil and gas assessments, public safety, and environmental concerns. Additionally, it is a useful reference for basic academic research into the processes responsible for the formation and accumulation of petroleum.

Revision of Coal Assessment Methodology

The ERP is revising its coal assessment methodology, in anticipation of conducting assessments to estimate the amount of remaining technically recoverable coal in the U.S. The National Coal Resource Assessment (NCRA), nearing its completion phase, will result in a digital assessment of the United State's coal resources on a regional basis. The next phase of the NCRA, already initiated, is the development of a standardized approach for the assessment of economic coal resources. The USGS's evaluation of the Nation's economic coal resources grew from concerns regarding the reliability of current estimates of the remaining coal resources necessary to meet the future fuel supply needs of the United Sates. Thus, the economic coal resource assessment methodology is being developed and incorporates the use of mine modeling and mining economic analysis software developed by the USGS. A revised methodology has been drafted which received an external peer review of the methodology. The peer review panel was comprised of experts with an extensive background in coal geology, mining, management, economics, and resource evaluation from academia, State and Federal agencies, and industry. The purpose of the team has been to provide an independent review and constructive review of the ERP's coal resource assessment methodology, associated support programs, and results. Suggestions for improvement will be incorporated into the new methodology.

Resource Use: Manage Resources to Promote Responsible Use and Sustain a Dynamic Economy

End Outcome Goal:
Non-energy minerals – Manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal value

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Baseline Information:* Average square miles of the United States with non-energy mineral information available to support management decisions (DOI strategic plan key measure and PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	2,368,794	2,535,644	2,401,329
√ *Quality & Utility of Information:* Percentage of U. S. with geologic, geochemical, geophysical, and mineral locality data (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	67%	71%	68%
√ *Quality & Utility of Information:* Percentage of customers satisfied with timeliness of data	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	78%	78%	≥ 80%	78%
√ *Quality & Utility of Information:* Percentage of customers for which minerals data meets their needs	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	84%	84%	≥ 80%	84%
√ *Quality & Utility of Information:* Percentage of studies validated through appropriate peer review or independent review (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%
FY2004 Performance Outputs:				
√ Number of systematic analyses and investigations delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	5	4	5	5
√ Number of long-term data collections maintained	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	5	5	5	5
√ Number of new or improved decision support tools	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	1	1	1
√ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	8	9	8	8
√ Number of mineral commodity reports available for decisions (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	725	733

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ Percentage of targeted analyses/investigations delivered which are cited by identified partners within 3 years of delivery (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	80%	80%	80%
Ω Percentage of expected responses for which canvas forms have been converted to electronic format (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	70%	58%[4]
√ Average cost of a systematic analysis or investigation (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	$4.125M	$4.125M	$4.306M

Targets Met = 12	Targets Not Met = 1	Targets Exceeded = 0
Summary Performance Result		
[4]Progress in conversion of forms to electronic format was delayed by about 9 months due to difficulties in diagnosing software problems.		

Geology Accomplishments

Mineral Resources External Research Program

The National Academy of Sciences, in recent reviews of the Mineral Resources Program (MRP), recommended developing an external grants program to assist MRP's basic research function. In March 2004, the Mineral Resources External Research Program (MRERP) was introduced and research-based proposals that supported the goals of MRP were solicited. The new MRERP was announced and managed using the Grants.gov system, as mandated by the President's Management Agenda (http://www.grants.gov).

In June 2004, the MRP announced that 6 of the 34 proposals received would be funded for mineral-resources research; total funding awarded was $200,000. Among the grant recipients who received funding were researchers at Oregon State University, University of Florida, Colorado School of Mines, University of Alaska at Fairbanks, Southern Illinois University, Washington State University, and the Idaho Geological Survey. One of the proposals had two researchers with three affiliations, one was from Washington State University, and the other was affiliated with both the University of Idaho and the Idaho Geological Survey. The overall quality of the proposals that were reviewed by a panel of six research scientists (five from USGS and one external to the USGS) was high; and USGS has high expectations that the grants program will offer opportunities for collaborative research and synergy.

Department of Commerce Trade Ruling Relies Upon USGS Data

The Department of Commerce's Bureau of Industry and Security (BIS) used USGS data and analyses to make a decision concerning export controls for copper-base scrap. The decision, published on July 22, 2004, rejected a petition by the copper- and brass-producing industry for export controls and export monitoring of copper-base scrap. Based on USGS minerals information, the BIS rejected the industry claims that rising exports of scrap to China had the effect of causing scrap price increases, shortages of domestic materials, and severe economic harm to the brass industry. The USGS continues to advise the BIS as it works with the Bureau of the Census to refine export classification for copper-base scrap.

New Geologic and Geochemical Data Available for Land Managers

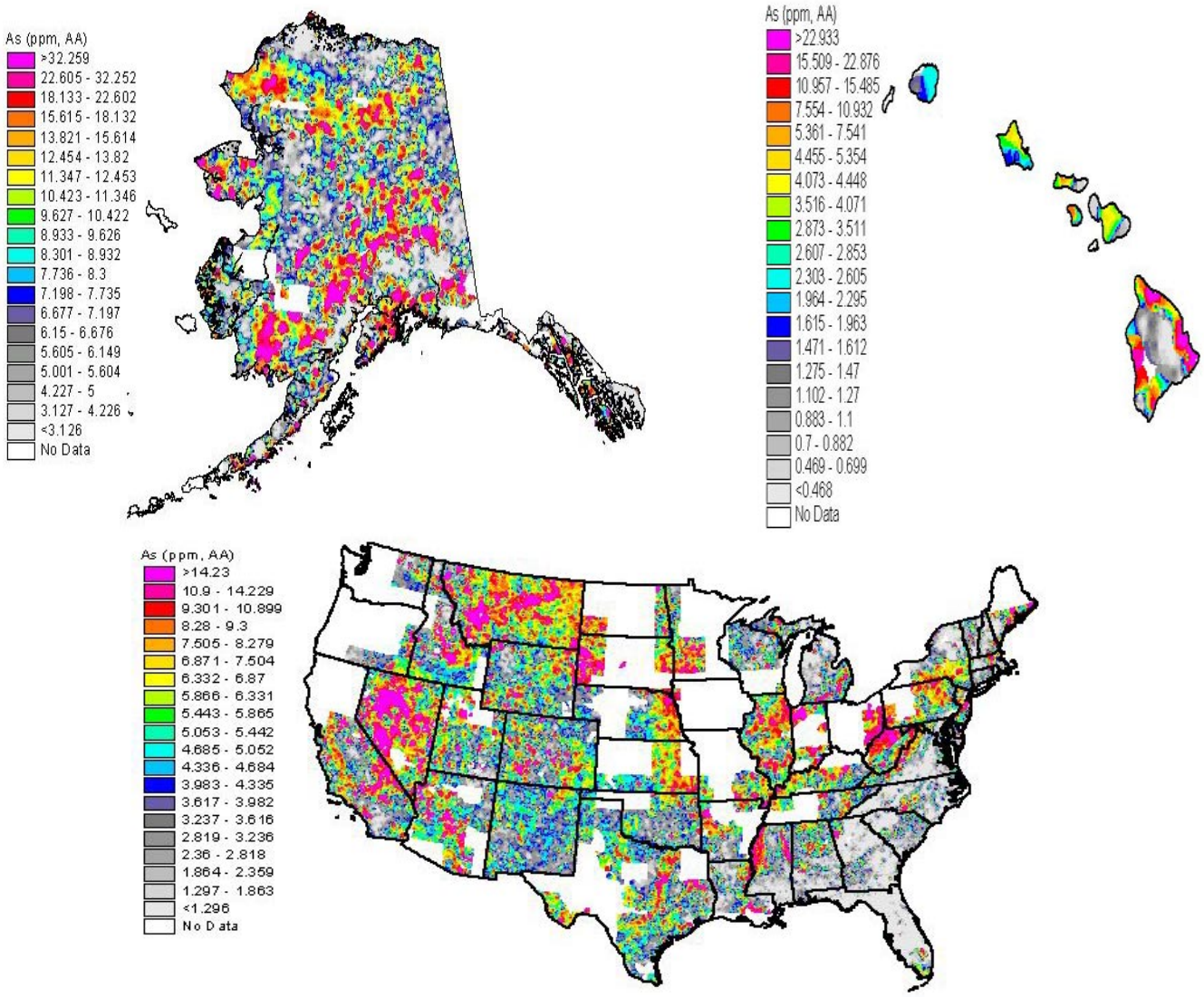
A long-term goal of the MRP is to provide consistent, accurate geologic, geochemical, geophysical, and mineral locality information in readily-available digital formats. This information will be available to assist managers from Federal and State agencies, industry, and Congress to make informed land-planning decisions. Among other accomplishments in FY2004, new geologic and

geochemical data have been made available to land managers.

In a cooperative effort with State Geological Surveys, digital data sets consisting of geologic information for the States of Colorado, Illinois, Indiana, Michigan, Minnesota, Montana, New Mexico, Wisconsin, and Wyoming, as well as two large blocks of land in Alaska (14 1:250,000-scale quadrangles) have been prepared for release as USGS publications. For the first time, data for each of these States, organized in a consistent format and reviewed for quality, are readily available to land-planners. These data are critical for regional mineral-resource and environmental assessments.

A Web-based geochemical database (http://pubs.usgs.gov/of/2004/1001/), released in January of this year, includes data for approximately 71 percent of the land area of the United States, including sites in all 50 states. The Web site provides complete access to the geochemical data, describes the history of the project, describes analytical methods used, and presents geochemical maps of the United States for all analyzed elements. This national data set provides regional background values for chemical elements having potential environmental impact, characterizes regional mineral districts, and provides studies on the relationship between toxic commodities, mining practices, and human health. Future work includes collaborative efforts with State and private partners to collect and analyze samples from areas where none are currently available.

Mineral resources online spatial data can be accessed at (http://mrdata.usgs.gov/).



Maps of the United States showing the distribution of arsenic from data in the National Geochemical Survey database. Data for stream sediments, soils, and other media were combined to generate the images.

Serving Communities: Safeguard Lives, Property, and Assets; Advance Scientific Knowledge; and Improve the Quality of Life for the Communities We Serve

End Outcome Goal:
Protect lives, resources, and property

FY2004 Performance	Results			
End Outcome Measure: Protect lives, resources, and property				
Δ *Hazards:* Percentage of communities using DOI science on hazard mitigation, preparedness, and avoidance for each hazard-management activity (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	34.9%	36.7%	43.2%[5]
√ *Decision Maker Satisfaction:* Met need for information to help achieve goal of reduced risk (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	97%	98%	≥ 80%	98%

FY2004 Performance	Results			
Intermediate Outcome: Improve public safety and security and protect public resources from damage				
√ *Facilities Condition:* Buildings (administrative, employee housing) are in fair-to-good condition as measured by the Facilities Condition Index (FCI) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	.20	.20

FY2004 Performance	Results			
Intermediate Outcome: Provide information to assist communities in managing risks from natural hazards				
Δ *Use Rate - Earthquakes:* Percentage of communities using DOI science on hazard mitigation, preparedness, and avoidance for each hazard management activity	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	42.7%	43.2%	62.7%[5]
√ *Use Rate - Landslides:* Percentage of communities using DOI science on hazard mitigation, preparedness, and avoidance for each hazard management activity	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	3.3%	3.7%	3.7%
√ *Use Rate - Volcanoes:* Percentage of communities using DOI science on hazard mitigation, preparedness, and avoidance for each hazard management activity	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	58.6%	63.3%	63.3%
√ *Use Rate - Landslide Hazards:* Number of responses to inquiries from the public, educators, and public officials to the National Landslide Information Center on hazard mitigation, preparedness, and avoidance strategies for landslide hazards	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1,600	1,600	1,600	1,600
√ *Adequacy:* Percentage of sampled stakeholders reporting adequacy of science base to inform decision-making for each hazard-management activity (volcanoes, earthquakes, etc.) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	97%	≥ 80%	98%

FY2004 Performance	Results			
Intermediate Outcome: Provide information to assist communities in managing risks from natural hazards				
√ *Adequacy - Earthquake Hazards:* Percentage of customers for which earthquake hazards data meets their needs	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	97%	≥ 80%	97%
FY2004 Performance Outputs:				
√ Number of hazards monitoring networks maintained	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	4	4	4	4
√ Number of risk/hazard assessments delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	5	4	3	3
Δ Number of real-time earthquake sensors (reported yearly and cumulative at the end of the year) (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	96 (cum 425)	51 (cum 476)	64 (cum 540)	75 (cum 551)[6]
√ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	6	13	14	14
√ Number of sites (mobile or fixed) monitored for ground deformation to identify volcanic activity	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	75	85	85
√ Adoption of National Seismic Hazard Maps by NEHRP provisions and International Building Codes (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	0	1	0	0
√ Number of urban areas for which detailed seismic hazard maps are completed (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	0	1	2	2
Δ Number of areas or locations for which geophysical models exist that are used to interpret monitoring data (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	3	3 ⅓	4[7]
√ Number of metropolitan regions where Shakemap is incorporated into emergency procedures (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	3	4	5	5
√ Number of volcanoes for which information supports public safety decisions (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	45	48	49	49

FY2004 Performance	Results			
Intermediate Outcome: Provide information to assist communities in managing risks from natural hazards				
√ Percentage of potentially hazardous volcanoes with published hazard assessments (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	58.6%	61.4%	61.4%	61.4%
√ Number of counties, or comparable jurisdictions, that have adopted improved building codes, land-use plans, emergency response plans, or other hazard mitigation measures based on USGS earthquake hazards information (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	503	559	559
√ Number of counties, or comparable jurisdictions, that have adopted improved building codes, land-use plans, emergency response plans, or other hazard mitigation measures based on USGS landslide hazards information (Baseline is 1,800 counties and parks with moderate to high landslide susceptibility in the U.S. (FY1999-FY2003, 60 adopted measure) (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	60	68	68
√ Percentage data availability for real-time data from the GSN (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	89%	90%	90%	90.5%
Δ Data processing and notification costs per unit volume of input data from earthquake sensors in monitoring networks (in cost per gigabyte) (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	1.007 $k/Gb	0.997 $k/Gb	.90[8] $k/Gb

Targets Met = 19	Targets Not Met = 0	Targets Exceeded = 5
Summary Performance Result		

[5]The FY2003 baselines were recalculated to reflect more accurate assessment of number of communities at risk for Earthquakes. The FY2005 targets will be increased.

[6]More real-time sensors were installed than planned due mainly to leveraging of outside funds from the National Science Foundation's EarthScope Initiative, and State and University partners.

[7]The modeling of debris flow following the fire in California was accelerated.

[8]The 2004 final plan for data processing and notification costs per unit volume of input data from earthquake sensors in monitoring anticipated increased costs from the moving of staff from lower to higher cost areas to areas collocated with other program staff. Those increased costs, however, were offset by other efficiencies.

Geology Accomplishments

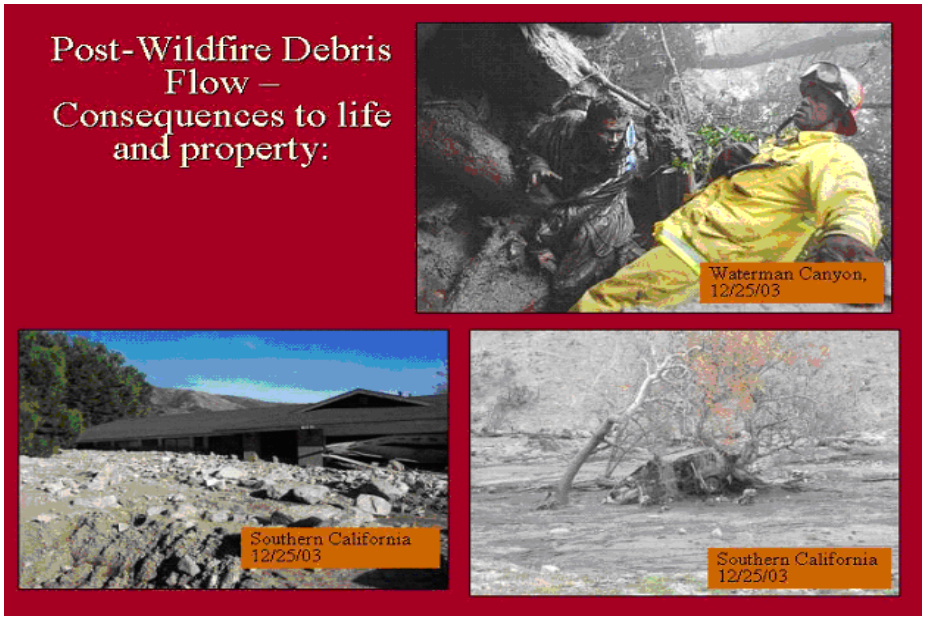
Development of Method for Forecasting Rainfall-Induced Landslides

To help mitigate landslide hazards in Seattle, Washington, USGS scientists developed a Web-based, prototype system for forecasting precipitation-induced landslides. Presently, the system provides hourly updates on current conditions relative to a recently developed precipitation threshold for anticipating the occurrence of landslides. Several departments in the City of Seattle use the Web-based information for preparedness and emergency-response planning. The information is also available to residents of the Seattle area as an indicator of general conditions that commonly produce landslides. Continuous monitoring of precipitation and soil-moisture conditions at sites of recent landslides near Seattle, in concert with laboratory studies of soil properties and theoretical studies of rainfall infiltration and landslide initiation, are providing a basis for understanding how winter storms cause landslides in the Seattle area and are clarifying the conditions under

which the empirical rainfall thresholds can be relied upon for anticipating landslide activity. A preliminary test to integrate a numerical weather forecast by the University of Washington Department of Atmospheric Sciences with precipitation measurements to forecast conditions relative to the precipitation threshold demonstrated the potential of the method for forecasting precipitation-induced landslides in the Seattle area. Representatives from the city of Seattle have recently expressed a strong interest in further development of the landslide forecasting system and deploying soil moisture monitoring stations on city hillsides.

Post-Fire Debris Flow Hazard Maps

Landslide Hazard Program (LHP) scientists produced maps of basins in Southern California with the greatest potential for producing debris flows as a result of the devastating October 2003 fires. The new maps show the probability for debris-flow (mudslide) activity and estimates of the peak discharge from drainage basins burned by the Old and Grand Prix Fires near San Bernardino and the Piru, Simi, Verdale Fires near Simi Valley and Fillmore, and the Cedar and Paradise Fires. The devastating Christmas Day mudslides, located in the Waterman Canyon burned by the Old Fire, resulted in the deaths of 14 people.



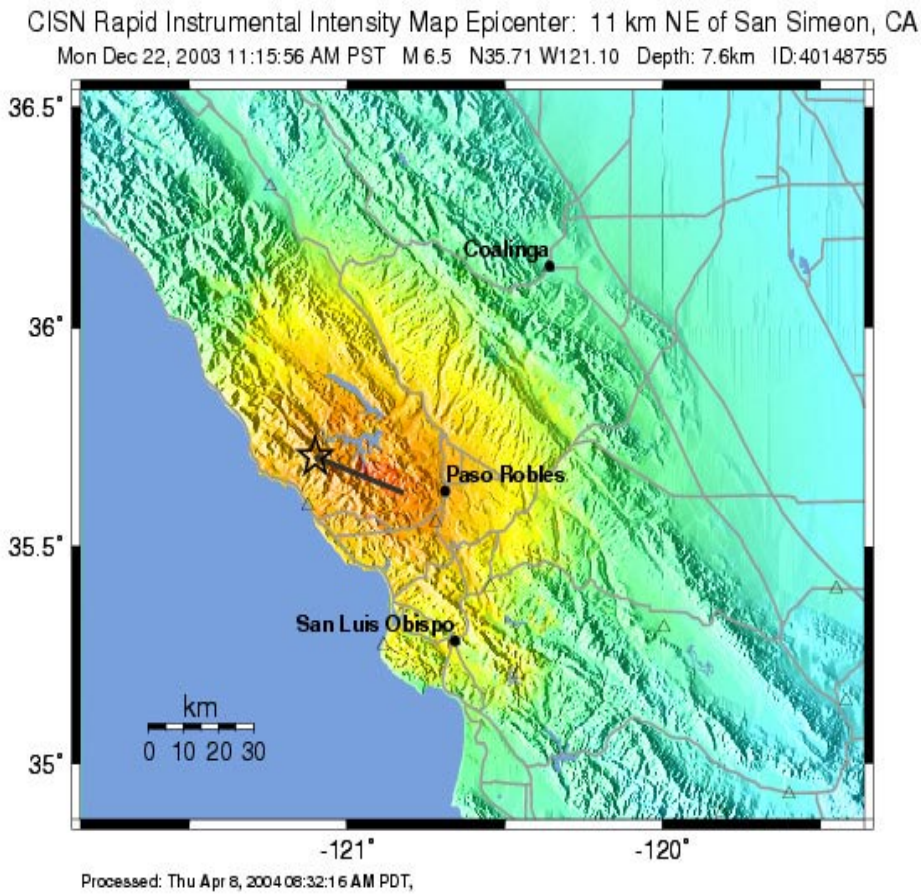
The new maps, produced in cooperation with the Federal Emergency Management Agency (FEMA), are available on the Internet, and paper copies were provided to each County Flood Control District impacted by the fires in California. The maps provided decision makers; emergency responders; and Federal, State, and county agencies the tools to help identify risk potential and develop mitigation strategies. The maps were also used to identify potential hazards and aid in decisions about evacuation timing and routes.

The USGS continues to provide support by producing new maps, installing rain gages, disseminating information on stream flow and sediment transports, conducting field surveys and reconnaissance, and documenting hazards created by the changes in the carrying capacity of streams and the steepness of slopes.

Earthquake Partners Deliver Real-Time Data for Effective Response

A magnitude 6.5 earthquake struck California's central coast three days before Christmas 2003 killing two people in the town of Paso Robles and causing an estimated $300 million worth of damage in the region. In the minutes following the event, emergency managers needed to know where the greatest damage had occurred so they could deploy their teams to the most affected areas. Fortunately, data on shaking intensity was available in real-time from the California Integrated Seismic Network (CISN), a partnership of USGS, UC Berkeley, Caltech, and the California Geological Survey. A preliminary ShakeMap portraying the extent of potentially-damaging ground shaking was available in minutes, allowing the FEMA and California Office of Emergency Services, also a CISN partner, to quickly generate loss estimates by plugging the shaking intensity information into FEMA's HAZUS software. The California Department of Transportation used the ShakeMap to prioritize their bridge inspections. USGS also provided real-time information and analysis on aftershock location and probability of occurrence. Pacific Gas & Electric made the decision to proceed with critical maintenance on the Diablo Canyon Nuclear Power Plant based on the USGS aftershock analysis, as well as USGS data suggesting that the San Simeon earthquake had reduced stress on faults near the facility. The Survey's ability to produce timely ShakeMaps depends on the proximity of seismic stations providing strong-motion data in real

time. And that is why the Advanced National Seismic System (ANSS) is so important. ANSS, of which CISN is a regional component, will deliver 1,000 regional broad-band stations across the country and 6,000 ground-based and structural strong-motion sensors in 26 seismically active urban areas. Deploying ANSS means a great deal more than simply installing new sensors. It means building a system that seamlessly integrates the new sensors with existing networks. It also means developing tools like ShakeMap and delivery mechanisms to provide this information to the people who need it.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

As part of the expansion and modernization of earthquake monitoring in the U.S. that is being carried out through the development of ANSS, USGS installed 75 seismic stations in FY2004, significantly expanding the ANSS and meeting its PART and GPRA targets. A major accomplishment was the expansion of the ANSS national seismic "backbone" network from 53 to 63 stations. This will provide a nationwide earthquake detection capability of magnitude 3.5 or better –essentially allowing the rapid technical characterization of all felt earthquakes. This has been a major program goal for many years, and its achievement means that a key performance target of the program's Five-Year Plan has been met nearly four years ahead of schedule. ANSS is also working with the National Science Foundation (NSF) to expand the backbone network to 80 stations. NSF will provide funding in FY2005-FY2006 for 17 new ANSS backbone stations and 8 station upgrades as part of their Earthscope research initiative. USGS will install, operate, and maintain the stations as part of ANSS. The design goal for the ANSS backbone network is 100 stations with a national earthquake detection capability of magnitude 3.0.

Oregon's Mount Hood

USGS scientists with the Volcano Hazard Program (VHP) are working with Federal, State, Tribal, and local officials to develop plans that explain how governmental agencies will coordinate their activities in the event of volcanic unrest or eruption at Oregon's Mount Hood. The plan has been completed and awaits the last few signatures by county officials before it is released.

Serving Communities: Safeguard Lives, Property, and Assets; Advance Scientific Knowledge; and Improve the Quality of Life for the Communities We Serve

End Outcome Goal:
Advance knowledge through scientific leadership and inform decisions through the applications of science

FY2004 Performance	Results			
End Outcome Measure: Advance knowledge through scientific leadership and inform decisions through the applications of science				
Ω *Research:* Soundness of methodology, accuracy, and reliability of science (program evaluation) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	80%[9]
√ *Inform decisions through the application of science:* Improved access to needed science information (number score) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	80%	92%	90%	90%
√ *Inform decisions through the application of science:* Stakeholders reporting that information helped achieve goal (number score) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	80%	94%	90%	93%
Δ *Inform decisions through the application of science:* Improved access to needed science information, number of USGS science publications cataloged in master USGS publications database	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	38,000	56,086	63,000	66,626[10]
Δ *Inform decisions through the application of science:* Improved access to needed science information, number of associated USGS science publications accessible online	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1,000	3,533	15,000	25,909[11]
√ *Inform decisions through the application of science:* Improved access to needed science information (number of biological partnership links)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	27,000	32,500	34,300	36,000
√ *Inform decisions through the application of science:* Percentage of IT customers reporting that information helped achieve goal	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	91%	91%	≥ 70%	86%

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land use planning and monitoring requirements (Roll-up of all components below)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	54.59%	54.66%
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land use planning and monitoring requirements (number of square miles assessed by GAP analysis) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	82%	82%

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land-use planning and monitoring requirements (NCGMP) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	2.2%	5.5%	7.7%	7.3%
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land-use planning and monitoring requirements (percentage of proposed NSIP sites currently in operation) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	64%	65%	64%	64%
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land-use planning and monitoring requirements (satellite data collected over global land surface) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	100%	100%
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land-use planning and monitoring requirements (GAM) National Land Cover dataset - 66 mapping units across country (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	.05%	17%	45%	45%
√ *Content and expanse of knowledge base:* Percentage of land with temporal and spatial monitoring, research, and assessment/data coverage to meet land use planning and monitoring requirements (number of completed eco-region assessments out of 84 eco-regions) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	18%	29%	31%
√ *Content and expanse of knowledge base:* Average percentage of coverage for 6 data themes in The National Map in national databases at medium resolution; does not measure currentness (TNM) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	67%	67%	67%	67%
√ *Content and expanse of knowledge base:* Average percentage of coverage for 7 data themes in The National Map in national databases at high resolution; does not measure currentness (TNM) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	18%	33%	42%	41%
√ *Content and expanse of knowledge base:* Percentage of data accessible: Percentage of satellite data available from archive within 24 hours of capture	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	99%	95%	90%	90%
√ *Quality:* Percentage of studies validated through appropriate peer review or independent review (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%
√ *Access:* For information products surveyed, percentage of mapping, water, and biology customers that are satisfied with ease and timeliness of access	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	91%	92%	≥ 80%	90%

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ *Access:* Customer satisfaction (number score) with ease and timeliness of delivery of science support services	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	81%	81%	≥ 70%	82%
√ *Ease of use:* Customer satisfaction (number score) with documentation and ease of usability of science support services	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	81%	81%	≥ 70%	74%
√ *Facilities Condition:* Facilities are in fair-to-good condition as measured by the Facilities Condition Index (FCI) (DOI strategic plan key measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	.17	.17
√ *Learning Approach:* Percentage of instructor proficiencies in select subject areas, GIS and Earth Science	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	20%	30%	30%
√ Percentage of time that all WAN and Internet access locations are up and running and accessible	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	95%	99.8%	98.5%	99.7%
Ω *Online transactions:* Increase online transactions to a percentage relative to baseline inventory of all USGS transactional services	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	51%	70%	58%[12]
√ *IT Investment:* Percentage of major IT investment projects for which cost estimates, established in project or contract agreement, meet actual costs with a variance of a certain percentage	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	100%	100%	100%	100%
FY2004 Performance Outputs:				
√ Number of long-term data collections maintained	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	26	26	27	27
√ Number of systematic analyses and investigations delivered to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	588	573	556	571
√ Number of new or improved decision support tools	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	2	4	4	4
Δ Number of formal workshops or training provided to customers	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	22	61	101	107

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
Δ Number of real-time streamgages reporting in NWIS Web	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	5,626	5,621	5,320	5,978[13]
Δ Number of real-time ground-water sites reporting in NWIS Web	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	697	700	779[13]
Δ Number of real-time water-quality sites reporting in NWIS Web	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	891	900	1,062[13]
√ Number of mapping nodes (publicly available Web mapping services available through The National Map)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	25	50	90	90
Δ Improve the value of the geospatial data available to the natural resource decision makers and the public by building *The National Map* distributed databases through partnerships with State and local governments that collect and maintain higher resolution and more current data (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	10	13	30[14]
√ Ensure availability of nationally consistent and integrated geospatial data by leading development and promoting the use of international, national, and FGDC NSDI standards among *The National Map* partners (number of standards used or in work) (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	12	17	17	17
Ω Percent of the Nation's surface for which hydrography, elevation, and orthoimagery data are available through the National Spatial Data Infrastructure Clearinghouse and supported through partnerships (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	.8%	41%	68%	62%[15]
Δ Cost avoided by making data available through The National Map partnerships. USGS is in the process of determining the baseline (the value of data and access to the data) (PART measure)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	n/a	n/a	40%	71%[16]
Δ Number of summer workshop provided to instructors of Tribal Colleges & Universities (TCUs)	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1	2	2	4
√ Number of academic year short courses and mini-workshops provided to TCUs	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	7	9	8	8
√ Number of summer internships	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	1	4	5	5

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
Ω Number of academic year internships	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	2	3	4	3[17]
√ Number of bureau conditional assessments in progress or completed (within a 5-year cycle)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	25	39	39	41
Ω Number of deferred maintenance and capital improvements completed (cumulative)	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	14	24	40	36[18]
√ Number of bureauwide data integration practices and/or policies adopted	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	n/a	1	1
Δ Number of new NSDI Clearinghouse nodes established for serving data	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	41	41	50	82[19]
Δ Number of informal NSDI conference outreach exhibits	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	58	52	43	52[20]
Ω Number of new NSDI standards developed	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	2	2	2	0[21]
Ω Number of new NSDI partnership agreements	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	29	51	60	52[22]
Δ Number of significant Webvsites co-located on consolidated hardened, secure, and redundant Internet servers	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	17	61	80	167[23]
√ Percentage of total legislatively-mandated narrowband radio transition achieved	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	9%	34%	98%	100%
√ Number of IT help desks operational in major USGS offices	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	8	4	5[24]
√ Percentage of Internet hosts potentially vulnerable to unauthorized access	2002 Actual	2003 Actual	2004 Planned	2004 Actual
	n/a	n/a	5%	5%

FY2004 Performance	Results			
Intermediate Outcome: Improve information base, information management, and technical assistance				
√ Number of NBII nodes	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	10	10	14	14
Δ Number of NBII Clearinghouse metadata records	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	4,000	6,600	6,900	7,500[25]
Ω Number of gigabytes of data in servers under biology management	**2002 Actual**	**2003 Actual**	**2004 Planned**	**2004 Actual**
	389	400	420	360

Targets Met = 35	Targets Not Met = 8	Targets Exceeded = 13
Summary Performance Result		
[9]External reviews were delayed from the original schedule. There is no effect on overall program or activity performance.		
[10]Additional focus was placed on adding citations for historical and previously retired scientific publication report series. Adding these older references enables the USGS to be more comprehensive in completing its citation lists.		
[11]USGS has installed new, faster scanners and implemented efficiencies for the conversion and quality control of paper reports and publications to digital form.		
[12]Results were lower than planned due to technical problems and subsequent delays relating to database software.		
[13]The vast majority of funding for USGS water data collection programs is provided by State, local, Tribal, and Federal partners, and precise funding levels for these activities often are not known until well into the year. Additional reimbursable funds were received, allowing USGS to exceed targets by installing additional real-time sensors that were not originally planned.		
[14]Changed emphasis to create more but smaller projects to encourage broader participation in *The National Map*		
[15]Production efforts declined as a result of staff taking the buyout.		
[16]USGS was more successful than anticipated in partnering with local governments·		
[17]The performance goal was set at an approximate target level, and the deviation from the level is slight. There is no effect on overall program or activity performance.		
[18]The FY2004 target was erroneously set as the entire backlog, when annualized and prioritized results in a true target of 14 completions for FY2004. However, 25% of the deferred maintenance funding was reprogrammed to address the Landsat 7 malfunction. The loss of funds coupled with the normal variability of project cost resulted in two projects being completed. There is no effect on overall program or activity performance.		
[19]The number of additional NSDI Clearinghouse Nodes registered by October 2004 exceeded the projected target by 40% due in large part to the collaboration between the FGDC and the Canada GeoConnections program that yielded additional metadata collections.		
[20]Additional conference opportunities were available as a result of NSDI collaboration with Geospatial One-Stop E-Government initiative.		

[21]The FGDC has assumed leadership for continued standards activities for the Framework data standards initially developed through the Geospatial One-Stop E-Government project. As a result, several new NSDI standards are undergoing public review through the formal American National Standards Institute (ANSI) standards approval process. USGS anticipates that these new standards will be endorsed as NSDI standards in FY2005.
[22]Results were lower than planned due to natural variation from year-to-year in the number of projects awarded funding through the NSDI Cooperative Agreements Program (CAP). Number of project awards made each year varies due to quality of project proposals and size of proposed project budgets, category of awards, and total amount of funding available.
[23]As part of the effort to achieve security Certification and Accreditation of the Enterprise Web system, the USGS reprioritized existing resources (staff time and funding) to accelerate the consolidation of public Web sites into the NatWeb infrastructure.
[24]FY2004 actual number is more than the planned target (i.e., fewer help desks have been consolidated) as a result of unanticipated delays in the acquisition of a new Bureau-wide help desk tracking software suite.
[25]NBII successfully expanded partnership contributions to the knowledge base beyond original expectations for FY2004. Because metadata records are created for each dataset or information product registered by an NBII partner, this expansion resulted in a greater-than-target increase in the number of metadata records in the NBII Clearinghouse.

Biology Accomplishments

Southern Appalachian Information Node (SAIN) Hemlock Woolly Adelgid Project

The Southern Appalachian Information Node (SAIN) staff of the National Biological Information Infrastructure (NBII) work with scientists who are seeking ways to combat the infestation of hemlock woolly adelgid by building 3-D models that track the damage inflicted by the woolly adelgids and by providing Web support to the Hemlock Woolly Adelgid Action Team.

Hemlock forests throughout Appalachia are being devastated by the hemlock woolly adelgid. The USDA says the woolly adelgid threatens to infest the entire hemlock range in the eastern U.S. The models and Web sites provide assistance by informing people and helping them understand and combat the spread of this destructive invader.

SAIN has joined forces with the Hemlock Woolly Adelgid Action Team (HWAAT) to spread awareness and communicate the importance of combating this species by establishing and hosting the HWAAT public Web site (www.saveourhemlocks.org). It includes important facts about "How to Help Save Our Hemlocks on Our Pubic Lands and Private Property," maps, and photos. It is an interactive web site, allowing visitors to submit questions that are directed to an action team specialist. An HWAAT community on the (My.NBII.Gov) portal has been established this year. Work will continue into FY2005 on development of 3-D models and associated data sets to support the models.

Federal, State, and local resource agencies use this information in their management plans and in specific efforts to combat the invader. The Web site also provides information about beetles as biocontrol agents. For example, using information from this project, a Girl Scout troop in Michigan raised over $1,000 to develop a new rearing facility for predator beetles, which is now two years ahead of schedule.

Great Basin Information Project

The goal of the Great Basin Information Project (GBIP) is to provide consolidated and efficient access to information about the Great Basin and Columbia Plateau regions of the Intermountain West. Effective decision-making and management of the natural resources of an area as complex as the Great Basin requires ready access to scientific and educational information so that stakeholders can explore the biological diversity in this region and work together in an informed manner.

The unique biodiversity of the Great Basin and Columbia Plateau Regions faces potentially devastating and irreversible changes as a result of varying land uses and human population growth, invasive species, altered

fire regimes, mineral and energy development, and competition for scarce water resources.

Our first-year products are the GBIP Web site, a metadata server and bibliography for the region, and an Internet mapping application. The Web site has been on-line since January 2004, with the Internet mapping application debuting in June 2004. The bibliography now has approximately 1200 articles, while the metadata server had approximately 100 records at the end of Summer 2004.

The wide variety of stakeholders involved in managing these regions can use information gathered here to guide decisionmaking on a more regional basis and in a collaborative manner. By using GBIP as a clearinghouse of information in the Great Basin and Columbia Plateau regions, decisions can be made with a regional or cumulative understanding of the consequences.

Water Accomplishments

National Water-Quality Assessment Program

America's rivers and streams are generally suitable for irrigation, drinking water, and home and recreational uses. However, in areas with significant agricultural and urban development, the quality of our Nation's water resources has been degraded by contaminants such as pesticides, nutrients, and gasoline-related compounds. In May 2004, the USGS National Water-Quality Assessment (NAWQA) Program released the last 15 of 51 reports on water quality in major river basins and aquifers across the Nation. The river basins are in Hawaii, Alaska, California, Washington, Wyoming, Montana, Utah, Idaho, North Dakota, Ohio, Indiana, Kentucky, Illinois, Wisconsin, Louisiana, Mississippi, Alabama, Georgia, Tennessee, Maine, New Hampshire, Massachusetts, Rhode Island, Pennsylvania, New Jersey, New York, Delaware, Maryland, and Virginia. Findings of regional and national interest are highlighted in a separate report entitled, "Water Quality in the Nation's Streams and Aquifers—Overview of Selected Findings, 1991-2001." Collectively, the new reports characterize the general health of ground-water and surface-water resources, address current and emerging water issues and priorities, and describe trends in water quality. These assessments use a nationally consistent design and methodology so that water-resource managers can compare water quality in their basins to other areas in the Nation. Using this information, decisionmakers can implement cost-effective water-management strategies in specific geographic areas.

Hydrologic Networks and Analysis – National Water Information System

In FY2003, the USGS developed a new tool to detect probable erroneous real-time water-level data that is publicly available on the Internet through the National Water Information System Web interface (NWISWeb). The use of this program, combined with increased vigilance by data maintainers, has dramatically reduced the number of real-time water-level gages with large data spikes on NWISWeb. Because of this success, a new real-time data quality assurance tool was developed during FY2004 to check for possible erroneous data in other types of real-time data, including selected water-quality parameters. Results of the modified tool are sent daily by electronic mail to the District Offices whenever a publicly available spike is detected for that District. This tool allows staff to focus their attention on identified problem areas, thereby reducing the time needed to quality assure the vast amounts of water data that the USGS collects daily.

Water Resources Research Act Program

The USGS completed evaluations of each of the 54 State Water Resources Research Institutes in 2004 to determine their eligibility to continue receiving grants, in accordance with the provisions of the Water Resources Research Act and the Code of Federal Regulations (30 CFR Part 401.26). The Institutes will be notified of the results of the evaluation. Institutes failing the evaluation will not be eligible for future grants until they have developed and implemented a plan to overcome identified deficiencies.

Toxic Substances Hydrology: Emerging Water Quality Issues

Toxic Substances Hydrology Program scientists have published new methods developed during the past year that provide improved measurement capability for many tens of contaminants, including those for sediment-associated contaminants and for improved measurement of antibiotics. These new methods provide crucial tools that are enabling scientists to determine:

- the levels and mixtures of compounds that occur in the environment,
- the mechanisms by which these compounds enter the environment, and
- the processes that affect the transport, persistence, and fate of the compounds in the environment.

Geography Accomplishments

Fire Fuel Mapping

In FY2004, the USGS Geography Discipline applied land cover mapping techniques to assist DOI bureaus and the USFS in their efforts to manage wildfires. Over ninety years of fire exclusion, domestic livestock grazing, logging, and widespread exotic species invasions have altered fire regimes, fuel loadings, and vegetation composition and structure. As a result, the number, size, and intensity of wildfires have significantly changed from the historic conditions, sometimes with catastrophic consequences. In response to these severe conditions, the Federal government has developed a National Fire Plan that is being implemented jointly by the USFS and the DOI. The LANDFIRE project involves the USFS and Bureaus of DOI and is critical to the National Fire Plan, the Healthy Forests Initiative, and implementation of the Healthy Forests Restoration Act. This project will help land managers identify priority areas for reduction of wildfire risks and to identify and facilitate restoration of forest, shrub, and grass ecosystems.

At the heart of LANDFIRE lies a reference database containing geo-referenced field data describing vegetation, fire, and fuels. The LANDFIRE project integrates referenced data, satellite imagery, and models of fire and vegetation dynamics. The project will generate nationally consistent, mid-scale maps and digital geospatial data of vegetation characteristics and condition, fire behavior and effects, fuels models, historical fire regimes, and fire regime condition class at the landscape level.

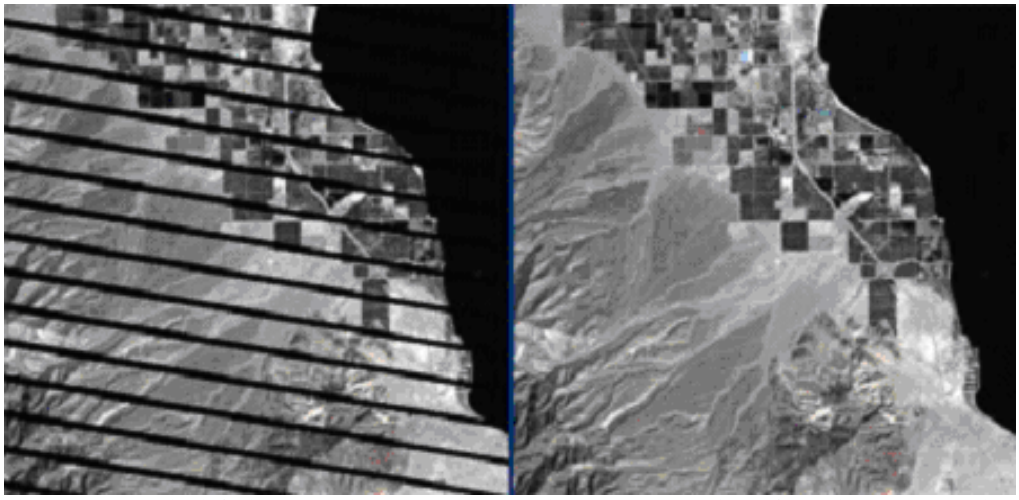
Models and methods are currently being developed and refined in two prototype areas in the western U.S.: central Utah and the northern Rocky Mountains (shown on the map). The land cover data developed for *The National Map* are used as the base vegetation layer to map tree species and forest structure for these areas. Fire fuel maps have proved valuable for emergency wildland fire management planning.

Landsat 7 Price Reduction

The Landsat Project is the longest-running enterprise for acquisition of moderate resolution imagery of the Earth from space. The first Landsat 1 satellite was launched in 1972; the most recent, Landsat 7, was launched in 1999. Since 1972, the instruments aboard have acquired millions of images. These images provide a unique resource for applications in agriculture, geology, forestry, regional planning, education, mapping, and global change research.

An instrument malfunction occurred onboard Landsat 7 in May 2003, caused by failure of the scan line corrector (SLC), which compensates for the forward motion of the satellite. The failed component has been turned off, leaving "gaps" in the data received from the satellite. About 75 percent of the picture elements, or pixels, in each new Landsat 7 scene are intact with the SLC remaining off. In October 2003, the USGS began producing Landsat 7 products from post-anomaly data, i.e., from scenes containing the gaps. By April 2004, the USGS had developed a new Landsat 7 product that filled the data gaps with information derived from a Landsat image acquired prior to the equipment malfunction.

This new product meets the requirements of many users. The USGS continues to research methods for improving data products. In an effort to expand the use of post-anomaly data, the USGS announced in May 2004 a price reduction for some Landsat products. This lowered the price from $600 a scene to $250 for scenes containing data gaps and to $275 for scenes with the gaps filled using the data from a previously acquired scene.



The picture on the left shows pixels missing in a Landsat 7 image resulting from the SLC turned off. The picture on the right is the image after the data gaps have been filled using data from a previously acquired scene.

The National Map: Collect Data Once, Use Them Many Times

Geospatial information now supports an ever-expanding range of management and decisionmaking activities by providing credible, accurate, and timely geographic information to policy makers and the public. The USGS's efforts on *The National Map*, which provides a consistent framework for geographic knowledge based on partnerships, is finally realizing the management goal of the last four Administrations to manage geospatial data properly by acquiring them once and using them many times.

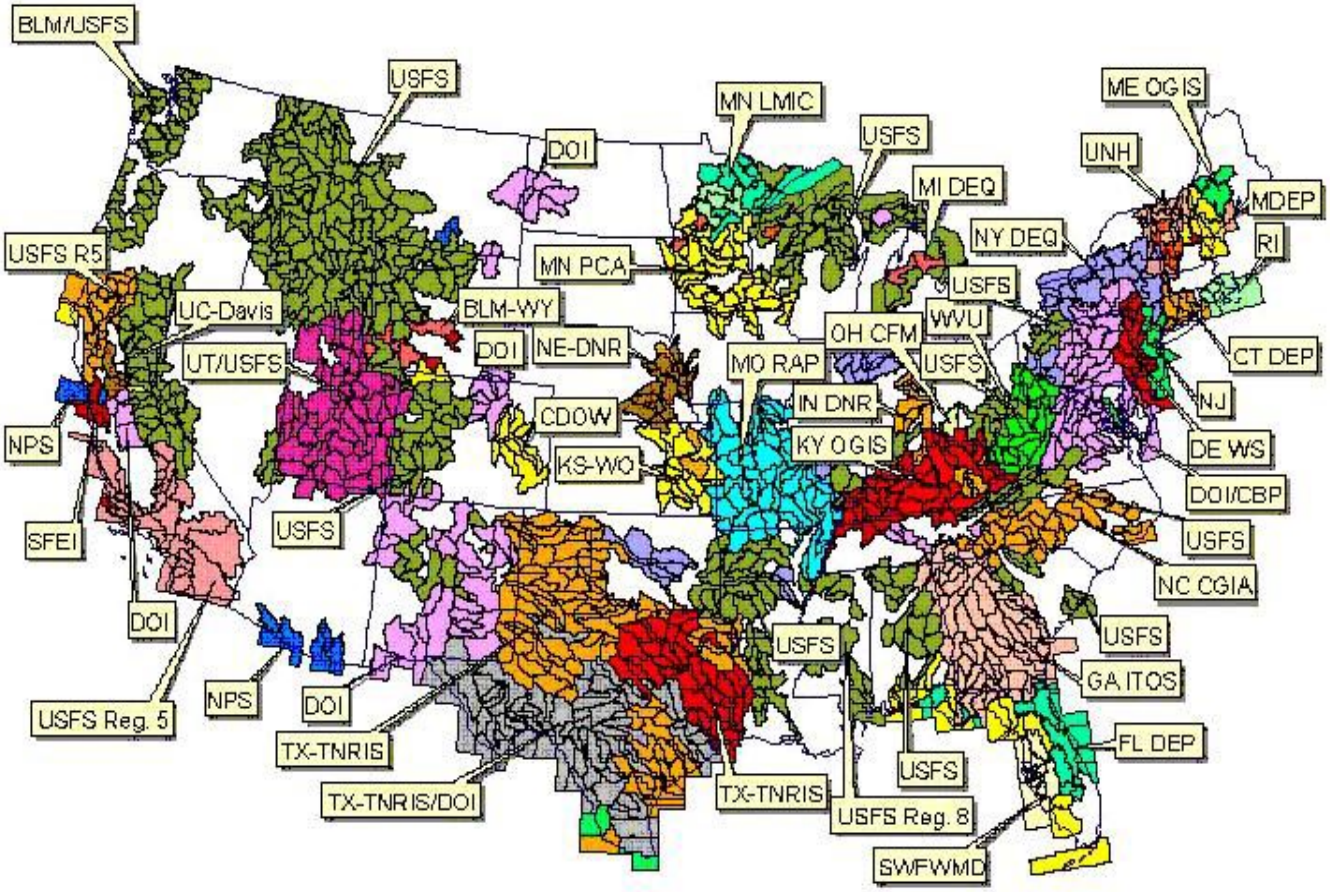
An example of these efforts is innovative partnerships being used to develop the National Hydrography Dataset (NHD), which contains streams, lakes, and other bodies of water in *The National Map*. The data are being developed by a consortium of the USGS, the EPA, the USDA, and five other Federal agencies and groups; 27 States; two regional organizations; and five universities (see figure below).

The program saves money by sharing in the creation of the data and by using it multiple times to meet specific but diverse mission needs. The USGS uses the data for mapping and to model stream flows and nutrient loads. The EPA uses the data to link and integrate water quality information geographically for managing its programs and reporting water quality to the public. The USFS uses the data to manage and analyze aquatic resource information and water improvements and rights. State agencies use the data as the basis for reporting requirements of the Clean Water Act and other laws.

Geology Accomplishments

Geologic Mapping Helps the Navajo Nation with Land-Use Planning

USGS Navajo Nation studies, conducted jointly with members of the Navajo Nation, are resulting in surficial and bedrock geologic maps, water quality maps and reports, and documentation of the impacts of land



Partners working with the USGS to develop high-resolution data in the National Hydrography Dataset (NHD), the integrated, nationally-consistent surface-water data layer of The National Map. Notable among the partners is the USFS, which has adopted the NHD for its bureau-wide activities.

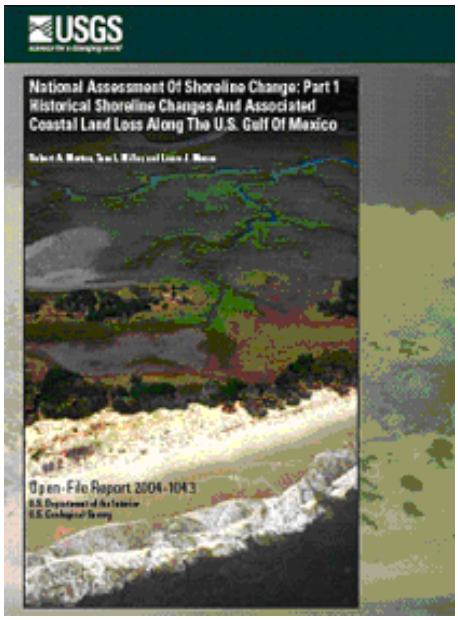
use versus climate change on the Navajo Nation in Colorado. This interdisciplinary work is also determining how local bedrock geology may contribute uranium, arsenic, and other contaminants to local ground-water resources and springs. The Navajo Nation is the largest and most rapidly growing Native American tribe in the United States, with half of the present population of 300,000 under the age of 23 (Census, 2000). These studies provide local governing bodies, who are currently developing land-use plans, the information they need to plan urban development, highways, buildings, bridges, and domestic septic and landfill systems. In addition, USGS assessment of land surface conditions during drought, such as sand dune activity, provides information for revising grazing allocations and drought mitigation by the Navajo Nation Department of Emergency Management. The joint research approach fosters community-based land-use planning and assists in developing Native American science education curricula.

Children from the Dilkon Chapter of the Navajo Nation at Castle Butte Spring assisting USGS in water sampling.

National Assessment of Coastal Change Hazards

Coastal and Marine Geology Program (CMGP) scientists are coordinating national, regional, and topical studies of coastal erosion, storm impacts, and sea-level rise impacts to develop a National Assessment of Coastal Change Hazards. In the process, they are building a consistent and comprehensive information base for the assessment and understanding of coastal change. As coastal populations grow and community infrastructures are threatened by shifting shorelines, there is an increased demand for accurate information regarding past and present trends and rates of shoreline movement. To meet these national needs, the USGS is conducting an assessment of historical shoreline changes along open-ocean sandy shores of the conterminous United States and parts of Hawaii and Alaska. The initial phase of this effort was completed with the publication of a National Assessment of Shoreline Change: Part 1, Historical Shoreline Changes and Associated Coastal Land Loss Along the U.S. Gulf of Mexico (http://pubs.usgs.gov/of/2004/1043/).

This report establishes a standard and repeatable methodology so that periodic updates that are systematic and internally consistent can be made nationally. The report, comparing shorelines from historical sources reaching back into the 1800s with modern airborne laser mapped shorelines, provides policy-makers and coastal managers with consistent long-term measures of shoreline change. The report shows that erosion is widespread throughout the Gulf of Mexico Region, though highly variable. Highest erosion rates are seen in Louisiana along barrier island and headland shores associated with the Mississippi Delta. Erosion is also rapid in Texas, while the barrier islands in Mississippi are migrating along the coast and erosion in Florida is generally localized around tidal inlets. Elsewhere, beaches are stable or growing as a result of both natural processes (low wave energy) and human activities (inlet stabilization, beach nourishment).



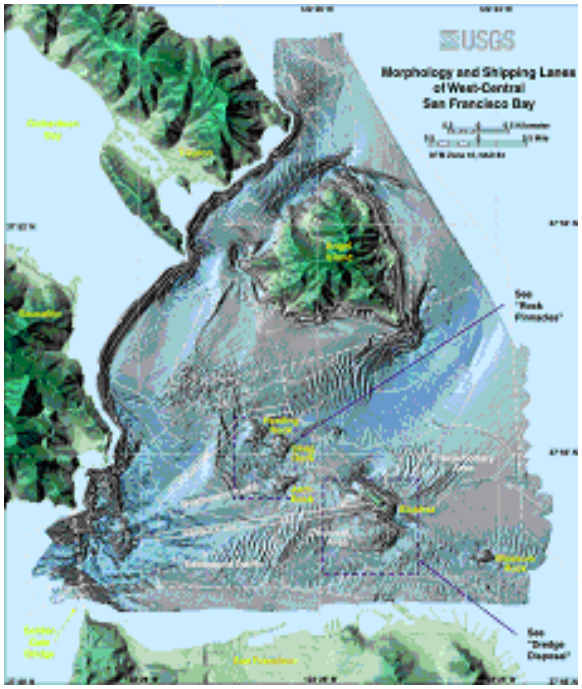
While sandy shorelines are critical resources of national importance, much of the Nation's coast is backed by coastal bluffs and cliffs. Throughout the Great Lakes, New England, and along much of the West Coast, the hazards of coastal change are associated with failing and retreating cliffs. As a first step towards development of national assessment products that appropriately reflect these important coastal settings, the USGS has developed and published a comprehensive review, "Formation, Evolution, and Stability of Coastal Cliffs – Status and Trends" (USGS Professional Paper 1693), that assesses the status and trends of coastal cliffs along the shoreline of the conterminous United States and the Great Lakes.

Coastal Cliff Failure along the California Shoreline at Esplanade Beach, Pacifica.

This report, authored by USGS and academic researchers, provides an overview of the processes that govern the formation and evolution of coastal cliffs as well as regional overviews of the cliffed shorelines of California, Oregon, Washington, New England, and the Great Lakes.

Understanding the Structure of San Francisco Bay: Geologic Foundation of Ecosystem Health and Earthquake Hazards

Coastal and marine geologists have just completed an analysis of the effects of human activities on the submarine landscape of San Francisco Bay as part of a multi-disciplinary effort to understand the history and health of the Bay system. San Francisco Bay is a heavily urbanized estuary extensively modified by human activities. To restore the estuary to a more "natural" condition than at present, scientists and managers must be able to differentiate between natural and anthropogenic processes and define sustainable restoration goals. A clear and concise analysis of the Bay ecosystem, issues, and human influences over the past 150 years is presented in USGS Circular 1259, "Shifting Shoals and Shattered Rocks – How Man has Transformed the Floor of West-Central San Francisco Bay," found at: http://pubs.usgs.gov/circ/2004/c1259.



Bottom Topography from Multi-beam Sonar Mapping of San Francisco Bay.

A related work in San Francisco Bay, produced by coastal and marine geologists, is Professional Paper #1568, "Crustal Structure of the Coastal and Marine San Francisco Bay Region, California." This work is a compilation of seven papers resulting from a five-year project aimed at unearthing the basic structure and processes of the San Andreas fault system. The results of this work establish the geologic framework for the major part of the complex strike-slip fault system that poses a persistent hazard to a large population center.

Enterprise Information Accomplishments

Information Security

The USGS continues to emphasize the improvement of the information technology security program as one of the Bureau's highest overall priorities. Prior to FY2004, the DOI had received a series of failing grades in an OMB scorecard measuring against requirements of the Federal Information Security Management Act (FISMA). DOI revised its internal FY2004 scorecard to more fully align with the OMB scorecard. A score of 83 (letter grade of B) was established as a minimum requirement for all DOI Bureaus for FY2004. USGS finished FY2004 with a score of 99. Highlights of specific USGS FISMA-related accomplishments are:

- All 12 USGS information technology systems were Certified and Accredited as of July 29, 2004. The USGS received $1.385M in appropriated funds in FY2004 for Certification and Accreditation.
- A formal determination has been made that USGS has no Critical Infrastructure Protection systems.
- An inventory of all positions with sensitivity activities has been completed and the processing of investigations begun within the compliance timeframe.
- USGS named an A-130 function coordinator.
- USGS has populated the Department Enterprise Architecture Repository with information technology system information.

Enterprise Publishing

To allow a single source for searching, viewing, and ordering USGS publications, the publications warehouse Web site was launched in January 2004. The USGS publications warehouse (http://pubs.usgs.gov) contains a complete, fully searchable collection of more than 63,000 bibliographic citations (for reports, thematic maps, etc.) in 31 historic and current USGS publishing series (including series begun as early as 1882). For more than 23,000 of these citations, the full text of the source document is now also available online, including documents that have previously only been available in paper form. New citations and online documents are added regularly with about 1,000 existing paper reports scanned and made newly accessible online each month. Historical reports authored by USGS scientists are being identified and these citations are being added to the database. A single, comprehensive site facilitates customer access, assures reliability through multiple servers, and provides certification of USGS report content by serving information from a single official, secure site.

Enterprise Web

The enterprise Web project is developing more efficient and consistent bureau-level tools and practices to ensure that USGS public Web sites are secure, reliable, well organized, and customer friendly. In FY2004, the enterprise Web project established a thesaurus that is used to consistently categorize USGS scientific content on Web pages. The thesaurus also was further used to cross-reference 673 scientific terms with 863 common terms (more likely to be used by our external customers). Using the thesaurus, 1,300 USGS Web pages were indexed or cataloged during FY2004. The enterprise Web project also focused on providing better access to USGS science information by providing immediate replies to approximately 750 Internet queries per month, and quickly pointing customers to specific information that would meet their needs. An integrated "frequently asked questions" database was implemented with over 740 questions highlighting questions from across USGS scientific programs. The enterprise Web project also consolidated 100 USGS public Web servers into a single reliable and highly secure infrastructure that was one of 12 systems that underwent certification and accreditation by July 29, 2004.

Narrowband Radio Conversion

USGS will successfully convert all its remaining Volcano Hazards Program radio equipment to narrowband channels to meet the December 31, 2004 government-wide deadline. USGS received an appropriation of $3.9M in FY2004 and has replaced 1,745 radios this year. Additionally, USGS will complete conversion of all UHF wideband radios to UHF narrowband in 2004 (thereby meeting the January 1, 2008 government deadline). USGS will be the only DOI Bureau to complete conversion of UHF radio band by the end of 2004 and the only DOI Bureau to be completely finished with the narrowband conversion project.

FY2004 Initiative $3.9M
Total expenditures for conversion: $6.239M

Radios Replaced in FY2004: 1,745
Total Radios Replaced or Upgraded: 2,429

NSDI Cooperative Agreements Program

For many years the Federal Geographic Data Committee (FGDC) has used the incentive approach to encourage Federal agencies, States, communities, academic institutions, non-profit organizations, and the commercial sector to participate in the National Spatial Data Infrastructure (NSDI) through the Cooperative Agreements Program (CAP) Grant Program. During FY2004, the FGDC worked cooperatively with the The National Map initiative of USGS and with the Geospatial One-Stop E-Government project to further leverage the dollars provided through CAP. As a result of this partnership, the FY2004 NSDI CAP Grant Program provided funding totaling $1.5 million to 50 different local, State, Federal, academic, and regional organizations. The funding is providing assistance to projects focused on:

- beginning metadata implementation;
- assisting others in metadata training, service and outreach;
- implementing Open GIS-compliant online web mapping services;
- serving key NSDI framework data over the web using consistent, interoperable specifications; and
- broadening participation in *The National Map*.

Facilities Accomplishments

Facilities Operations and Maintenance

The Facilities Maintenance Management System (FMMS) implementation included completing building and equipment inventories at 13 owned USGS installations and the Headquarter's facility. Through the inventory process, USGS identified over 22,000 pieces of equipment. The identification included using a standard naming convention, a standard template, and barcoding. In addition, most equipment was linked to a standard job plan and building system. This data has been captured in one of the FMMS environments and will be used as the foundation for a Preventative Maintenance program and for tracking work orders for day-to-day operations.

The FMMS utilized a Commercial Off-The-Shelf software common to other DOI bureaus and fully supports the key business principles guiding Interior's operations: customer value; accountability; modernization; and integration. Through the use of standard business practices, standard nomenclature, specification templates, and building system definitions, USGS will be able to report our operations and maintenance consistently across the Bureau. Once FMMS is implemented at the initial 14 installations, it will continue to expand to the remainder of the USGS-owned installations, including vessels. In addition to expanding to new sites, additional functionality will be added as funding permits.

Deferred Maintenance

The condition assessments for five of the eight largest USGS research vessels, the Alaska Gyre, Turning Tide, Polaris, Kiyi, and the Sturgeon, were completed. The second round of condition assessments began at six science installations in FY2004. These initial condition reports will establish a baseline of the most critical maintenance deficiencies and help determine future priorities.

Cableways at many of the 113 sites nationwide are being replaced or renovated. Many cableways at these sites do not meet modern design and load-testing criteria to ensure the safe collection of essential scientific data. All 113 sites are scheduled for replacement or renovation.

Science Support Accomplishments

Financial Management

The USGS received a disclaimer audit opinion on the Bureau's FY2001 financial statements and did not receive an audit opinion on the Bureau's FY2002 financial statements. In FY2003, the audit opinion was limited to the Bureau's consolidated balance sheet in order to establish a beginning balance from which future audits could cover the full scope of the Bureau's financial activities. For FY2004, the Bureau underwent a full-scope audit and received an unqualified opinion on the full suite of financial statements. The USGS also met the governmentwide target due dates as published by the OMB.

Activity Based Costing/Management (ABC/M)

ABC/M was successfully implemented in FY2004. USGS developed charts and graphs portraying the information collected during the year, in order to aid the scientists and managers in future planning, execution, and formulation of their budgets. USGS held sessions with the scientists and managers to further refine the activities for better linkages to Interior's activities and the DOI Strategic Plan.

One of the USGS vessel fleet used by the Great Lakes Science Center

Looking Forward

Annually, the USGS produces a program direction document, which is a collaborative effort between the Bureau program coordinators, regional managers, and scientists and is issued by the Director. It contains details on opportunities to address new science thrusts; major changes in direction of, or emphases of, program goals and related increases or decreases in funding; opportunities supported by multiple programs; and identification of new capabilities, facilities, and expertise available to support project work in the coming year. The document describes new directions in integrated science as well as new directions and opportunities from within the disciplines. Information about the possible effects of future events, conditions, and trends are incorporated into specific discussions on a variety of scientific projects. Because the science is integrated and focuses on complex issues, the research outcome will crosscut all DOI goals. The following are highlights of issues that will drive USGS science in the future.

Coastal Environments

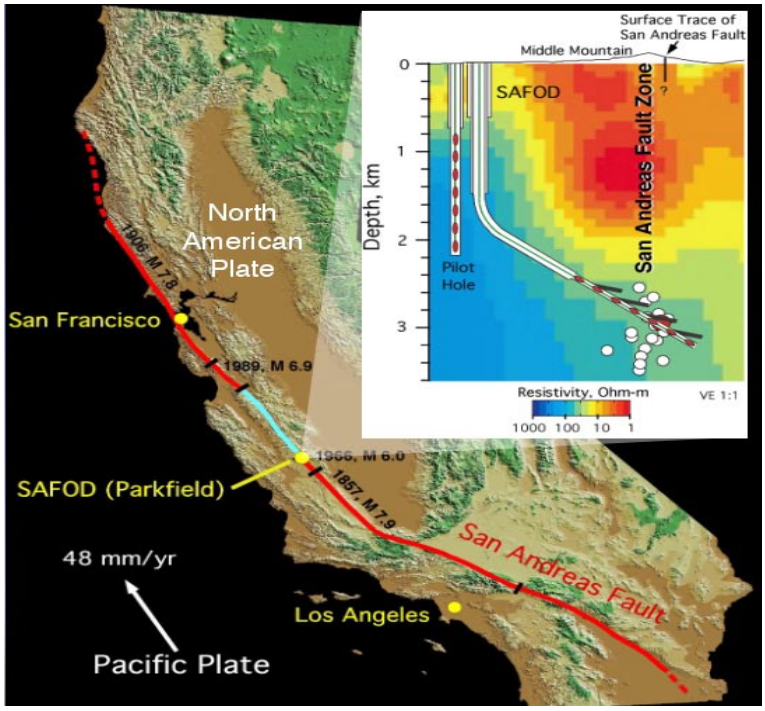
Hawaii – Ridge to Reef Coral Studies to Support Coastal Health

Sediment, nutrients, and other pollutants from a variety of land-based activities threaten coral reef ecosystems around the world. These pollutants are transported in surface-water runoff and ground-water seepage into coastal waters. The U.S. Coral Reef Task Force, for which DOI is a lead agency, identified land-based pollution as one of six priority areas to be addressed in future work by Federal and State agencies to protect coral reefs. Land-based pollution threats are identified for action in the local action strategies of the Task Force's numerous regional partnerships in the Pacific, including Hawaii and the Pacific Islands. Similar threats are present in Guam and other former trust territories for which the DOI has responsibility to provide technical expertise. USGS is using multidisciplinary science capabilities to provide the integrated science needed for making informed decisions on land-based pollution threats in Hawaii. Watershed ecology studies are being used by USGS to illuminate how changes in land-use practices effect land cover and soil retention. Surface and groundwater studies are being used to characterize resulting changes in sediment load and additions of nutrients and contaminants that are carried to the sea by streams and groundwater discharge. Lastly, coastal and marine studies are tracking the transport and fate of sediment and other pollutants in the reef environment to evaluate their impact on reef health and ecology and to help determine the relative role of pollutant threats and other natural as well as human-induced threats to reef health. This information is being used by Federal and local resource managers to build integrative adaptive management approaches to watershed and reef management in Hawaii.

Earthquake Hazards

Drilling of the San Andreas Fault Observatory at Depth (SAFOD)

On June 11, 2004, scientists from the USGS and Stanford University began the drilling of the San Andreas Fault Observatory at Depth (SAFOD), a deep drill hole into the heart of the San Andreas Fault. This partnership project with the academic community receives its major funding from the National Science Foundation through the EarthScope Program. The project will drill an inclined borehole across the San Andreas Fault Zone to a depth of 3 km. SAFOD will help scientists answer fundamental questions about the physical and chemical processes controlling faulting and earthquake generation within a major plate-bounding fault. Through sampling, downhole measurements, and long-term monitoring directly within the San Andreas fault zone at seismogenic depths, USGS will learn the composition of fault zone materials and determine the constitutive



laws that govern their behavior, measure the stresses that initiate earthquakes and control their propagation, test hypotheses on the roles of high pore fluid pressure and chemical reactions in controlling fault strength and earthquake recurrence, and observe the strain and radiated wave fields in the near field of microearthquakes.

Energy

Effects of Coalbed Methane Production on Wetlands in Montana

During the next 10 years, thousands of coalbed methane (CBM) wells in Montana and Wyoming may withdraw millions of gallons of water from target coals and discharge it into infiltration ponds, streams, or injection wells. The full impact of this practice is unknown. Maintaining wetland processes in these human-modified systems requires the understanding of dynamic, historic wetland ecological processes and management strategies, raising not only ecological questions about wetland successional stages, but also geological, temporal, and spatial questions. Little work has been done to identify wetlands in the areas that are most vulnerable to potential impacts from CBM development. Results will provide stakeholders with information about wetlands that might be affected by CBM development in Southeastern Montana. This information will include the potential impacts of CBM development on area wetlands and the waterfowl and water birds that use them.

Ground-Water Resources

Simulated Effects of Aquifer Management Scenarios in Albuquerque, New Mexico

Water availability is a critical issue in the southwest desert. Land and water resource planners and managers are requesting information to help them evaluate impacts of management options on water supplies. Conditions from 2001 through 2040 were simulated to investigate the likely effects of different scenarios of groundwater pumping by the City of Albuquerque on their ground-water system. The study is a culmination of many years of data collection, analysis, and modeling. The information will be used by the City of Albuquerque in future land and water-use planning activities.

Environmental Information Science

Assessment of Spatial and Temporal Scales of Mojave Ecosystem Processes and Critical Habitat in Support of DOI Land Management

The Mojave Desert is a 125,000-km² landscape of contrasts and challenges spread over southern Nevada, western Arizona, southwestern Utah, and a quarter of California. It is within a day's drive of 40 million people; it encompasses six military bases, four national park units, and considerable BLM and other Federally managed lands. The desert is home to active and abandoned mines, off-road recreation areas, and waste disposal sites; it is also a web of utility corridors and aqueducts that sustain Southern California cities and provide local road access across it. Estimating the effects of continued population growth and increased resource use in the region has been difficult given the limited knowledge of biological diversity, mineral wealth, and surface and ground-water hydrology.

USGS work on the Mojave ecosystem processes and critical habitat is moving into integrated efforts to focus on the assessment of multiple spatial and temporal scales to understand the influence of climate and geomorphology on plant productivity/health, soil health, and soil stability for developing monitoring protocols. Through integrated geospatial models, the capability to develop a model that predicts texture as a function of depth and lateral extent, soil texture, and structure, provides a powerful spatial database for evaluating ecological function. Finally, a statistically-based spatial model of desert tortoise habitat for large areas of the Mojave Desert based on abiotic, biotic, and anthropogenic descriptors with decision tree modeling, is being extrapolated across the study area to characterize habitat suitability and will include measures of predictive uncertainty. The goal of this science is to: document past and present changes to the land surface; develop conceptual ecosystem models; develop a methodology for predictive modeling of ecosystem health and sustainability; and assess the condition and status of Mojave ecosystems and the resources they provide. These new models are providing valuable new tools for Federal, State and local land-use managers and planners in the Mojave Desert.

Ecosystem Health, Sustainability, and Land Surface Change

Everglades Restoration and Mercury Contamination

Restoration of the Florida Everglades, estimated to cost $8 billion, is the largest environmental restoration project ever attempted in the United States. The USGS is a key player in providing fundamental scientific information for aiding restoration decisions. The USGS is collaborating with Federal and State agencies

to conduct experimental studies to unravel the complex factors that control mercury toxicity in the Everglades, with particular emphasis on those factors that are expected to change under a restored condition. Mercury toxicity studies will document the toxicological impacts of mercury exposure to several native Everglades species, such as largemouth bass and threatened alligators.

The framework of the Comprehensive Everglades Restoration Plan (CERP) was based originally on large regional-scale hydrologic models, developed by Florida's South Florida Water Management District (SFWMD) and the U.S. Army Corps of Engineers (USCOE), and ecological models developed by USGS. USGS has developed a decision support tool that links ecological models to the regional-scale hydrologic model through a GIS-based data viewing system for use in assessing projects at the sub-regional level. However, design, implementation, and assessment of specific CERP projects to be constructed over the next two-to-three decades, require project-scale predictive models and decision support tools. In partnership with SFWMD and USCOE as well as Federal and State agency leads implementing CERP, the USGS is using the Taylor Slough/Florida Bay Region of Everglades National Park as a 'proof of concept' for linking hydrologic, topographic, and ecological models in developing project-level predictive models and decision support tools.

Rivers

Understanding and Addressing Elevated Nitrate Concentrations in Midwestern Streams in Cedar River Basin, Iowa

The USGS has documented historical increases in nitrate levels in the Missouri and Mississippi River Basins. These increased nitrate concentrations have been implicated in the Gulf Hypoxia Syndrome (low dissolved oxygen zone) that threatens valuable marine fishery resources. High levels of nitrate result from a combination of factors including agricultural expansion and increased nitrogen application rates. These factors are exacerbated by land alterations including loss of riparian corridors, wetland drainage, and widespread use of tile drain systems. A dataset of historical nitrate levels, of particular use for USDA, EPA, and States will provide information critical to informed future land use planning activities.

Integrated Research on the Upper Mississippi River System

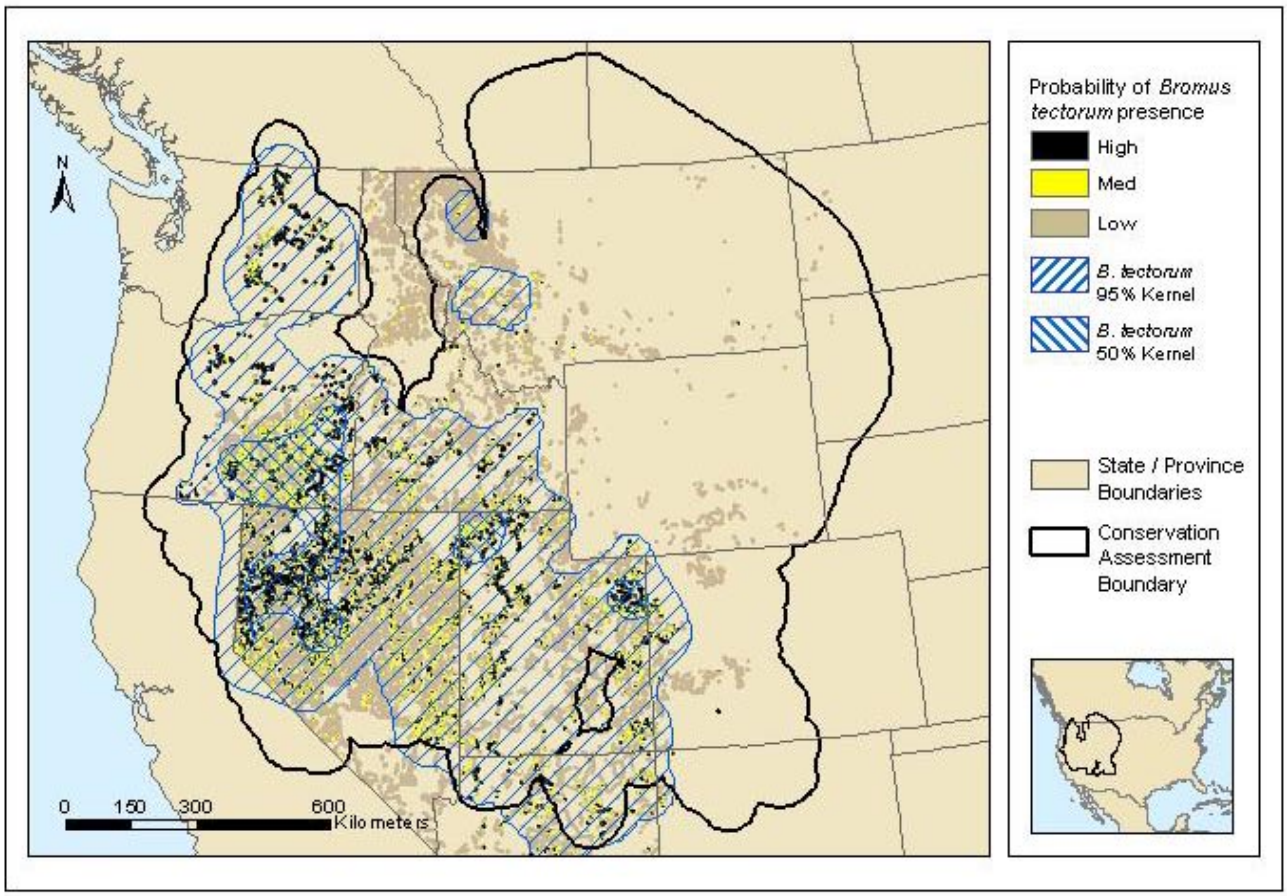
The Upper Mississippi River, a multiple-use resource in the Nation's heartland, suffers from a variety of stresses including wetland loss, agricultural and urban development, and navigation dams and levees that reduce the river's ecological benefits. Important habitats and their species are in decline, and excess nutrients from the basin contribute to hypoxia in the Gulf of Mexico. The USGS provides water quantity and quality, biological, and land-change data in partnership with Federal and State agencies to help overcome these negative effects. Information from biology and water disciplines provide a comprehensive basis for more in-depth studies of large river ecology. The USGS determined how major floods can have long-term benefits on the abundance of desirable fish species but also can increase invasive species, such as common and asian carps. In the future, USGS findings will provide a better understanding of flooding as an important ecological factor and will also influence where and how managers modify river levees to mitigate negative ecological effects. With State and USACE partners, the Long-Term Resource Monitoring Program (LTRMP) is tracking the spread and habitat preferences of invasive asian carps (bighead, silver, and black carp) that are moving up the river from the South. These fish compete directly with native fish for food and habitats with possible drastic effects to the ecosystem. Results from a 10-year review of status and trends for the Upper Mississippi River include information on aquatic vegetation, limnology, macroinvertebrates, and fish. USGS also expanded large river research on nutrients to determine how water-level management techniques can reduce excess nutrient delivery to the Gulf and found that lowering summer water levels can increase plant production, restore critical habitat for fishes and birds, and reduce nitrogen concentrations. Results from this work is being published in the "Journal of the North American Benthological Society and the Canadian Journal of Fisheries and Aquatic Sciences." The effect of nutrients on native mussels in river sediments was recently published in "Environmental Toxicology and Chemistry." Habitat mapping, modeling, and wildlife studies have provided a better understanding of the role of invasive plants in wetlands. Such data will improve future conservation efforts for declining grassland birds that depend on these habitats in the basin and assist National Wildlife Refuge Managers in restoration approaches. This information helps support societal

discussions of the Upper Mississippi River as a national multiple-use resource.

Invasive Species

Adaptive Management for Invasive Species in the Great Basin

Invasive species and their impacts on native plants and animal populations and communities are a major focus of concern for USGS research. In the Great Basin, Sagesteppe Grasslands have been seriously impacted by invasive annual grasses, especially cheatgrass and medusahead. These annual grasses perpetuate a more frequent fire cycle than the historic plant and animal communities have experienced. Researchers are studying how to reduce the problems caused by these invasive species by understanding disturbance dynamics along with determining appropriate plant materials, site-preparation techniques, weed-control methods, seeding equipment, management methods, and monitoring techniques for restoration projects. This research has developed recommendations of improved protocols for rehabilitation and demonstration of the results for land and resource agencies. USGS researchers are also studying the impacts of invasive animals on amphibian larvae, which is important information for resource managers concerned about amphibian declines. For example, studies in the Willamette Valley have shown that replacement of temporary wetlands with deep permanent ponds expand the spread of non-native bullfrogs and fish at the expense of amphibian larvae, and stocking naturally fishless mountain ponds and lakes with trout results in decreased reproduction and abundances of native salamander larvae.



Distribution of cheatgrass (*Bromus tectorum*) determined from field sampling points. (Connelly et al. 2004. Range-wide conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Available at: http://sagemap.wr.usgs.gov).

FY2004 Management Control Assessments

Based on the preliminary results of the USGS independent financial statement audit for FY2004, the USGS can conclude that it is in substantial compliance with Federal Accounting Standards and the U.S. Government Standard General Ledger at the transaction level as required by the Federal Financial Management Improvement Act (FFMIA). However, due to a reportable condition identified in security and application controls in financial management systems, the USGS cannot provide reasonable assurance that it is in substantial compliance with OMB Circular A-130, "Management of Federal Information Resources", and OMB Circular A-127, "Financial Systems and Federal Accounting Standards." The USGS has developed and will implement a remediation plan to resolve the reportable conditions relating to information system security controls and applications, and accounting and reporting standards during the next fiscal year.

Chip Groat
Director

The Federal Managers' Financial Integrity Act of 1982 (FMFIA) and the OMB require all cabinet-level Federal agencies to annually review their management control system. The objectives of DOI's management control system are to provide reasonable assurance that:

- The Department's obligations and costs are in compliance with applicable laws;
- The Department's assets are safeguarded against waste, loss, unauthorized use, or misappropriation;
- The revenues and expenditures applicable to agency operations are properly recorded and accounted for to permit the preparation of accounts and reliable financial reports and to maintain accountability over assets;
- All programs are efficiently and effectively carried out in accordance with applicable laws and management policy.

The efficiency of the DOI's operations are continually evaluated using information obtained from reviews conducted by GAO, OIG, Bureau reviews, and/or specifically requested studies. On a yearly basis, DOI requires all of its Bureaus to conduct self-assessments of their FMFIA compliance. These diverse reviews provide a high level of assurance that Department systems and management controls comply with standards established by the FMFIA.

In conjunction with the annually required DOI Bureau reviews, the associate directors of Biology, Geology, Geography and Water; the regional directors of Eastern, Central, and Western Region; the Chief of Administrative Policy and Services; and the Geographic Information Officer provided signed assurance statements to the Director that their areas of responsibility had assessed the systems of management, administration, and financial controls in accordance with standards, objectives, and guidelines prescribed by the FMFIA and the OMB Circular A-123.

The objectives of the assessments ensured that:

- programs achieved their intended results;
- resources were used consistent with the Bureau's mission;
- resources were protected from fraud, waste and mismanagement;
- laws and regulations were followed; and
- reliable and timely information was maintained, reported, and used for decision making.

In performing this assessment, they relied on the knowledge and experience gained from the daily operations of their programs and systems of accounting and administrative controls, and information obtained from sources such as management control assessments, OIG and GAO audits; program evaluations and studies; independent audits of financial statements; performance plans and reports; and other information. Each assurance statement provided documentation on specific management control assessments conducted and audits and or reviews conducted by the OIG and/or GAO. The USGS Director relied on this extensive documentation to support the Bureau assurance statement provided to the Department on September 15, 2004 (see Appendix C for additional information on the program evaluation).

FY2004 Management Control Automated Surveys

In addition to the department-wide, discipline, region, and office-specific reviews, management control automated surveys were sent to employees of three science centers (Alaska Science Center, Great Lakes Science Center, and Grand Canyon Monitoring and Research Center), two programs (Global Change Program and Safety, Health, and Environmental Program), and one team (Business Leaders Team). The employees were asked to evaluate various aspects of management control at their center, program, or team.

The results of the self-assessment surveys will assist managers to improve the effectiveness of center/program management, and will also be used to support the conclusions expressed in the Director's Annual Assurance Statement to the Secretary of the Interior. These are individual examples of a series of on-going reviews of management practices in USGS programs and organizational units. Results of the surveys are detailed below.

Alaska Science Center (ASC)

As input to an administrative review of the ASC, all science center employees were asked about their satisfaction with various aspects of the administrative services they receive at the ASC and their overall satisfaction with the quality of the service. In addition, they were asked how they learn about administrative policy and procedures, if they use certain specific administrative services, and if they have any suggestions for improving administrative services at the Alaska Science Center. The survey was sent to all ASC employees, a total of 219 persons. Responses were received from 101 (46%). The graph below depicts the percentages of customer satisfaction ASC respondents felt with the various aspects of administrative services listed below provided by ASC.

Great Lakes Science Center (GLSC)

Each science center in the eastern region undergoes periodic reviews to assess how effectively center management, administration, maintenance, technical support programs, and policies support the science mission of the center, the region, and the USGS. Center reviews do not evaluate the quality of the science per se, but do evaluate the management processes that promote quality science within the center as well as the center's strategic direction and health.

Employees of the GLSC were asked to state the degree to which they agree or disagree with a series of 21 statements about conditions and management practices at the GLSC. In addition, they were asked what they think is the center's greatest strength and greatest weakness, and what advice they would give the center director to improve the GLSC.

The results of the employee opinion survey assisted the GLSC review panel to identify apparent strengths and weaknesses of the center and issues that merit further investigation by the review panel. In addition to the opinion survey, all GLSC employees had an opportunity to schedule a one-on-one interview with a member or group of members of the review panel to discuss any issues relevant to the objective of the review that they felt were important.

The survey was sent to all employees and managers in the GLSC (93 persons). Responses were received from 85 (91%).

Great Lakes Science Center questions:

Significantly higher agreement with these statements:

- My supervisor supports my need to balance work and family issues (91%)
- My supervisors/team-leaders are committed to a workforce representative of all segments of society (88%)
- My managers/supervisors/team-leaders give fair and equitable treatment to employees of different backgrounds (84%)
- The GLSC provides the appropriate and necessary Information Technology services and tools to support the science mission (88%)
- My work gives me a feeling of personal accomplishment (83%)
- I know how my work relates to the GLSC's missions and goals (84%)
- The scientific and information products produced at the GLSC are relevant to resource issues and client needs locally, regionally, and nationally (88%)

Significantly lower agreement with these statements:

- The GLSC provides the appropriate and necessary services (including administration and facility operations) to support the science mission (57%)
- The Regional Office and Biology HQ provides the GLSC the appropriate and necessary services and tools to support the science mission (40%)
- Selections for promotion at the GLSC are based on merit (51%)
- I understand the goals and objectives of the six Biology national program elements (50%)

Grand Canyon Monitoring and Research Center (GCMRC)

On October 9, 2003, the GCMRC announced a major reorganization. An Organizational Assessment Committee was formed to develop a mechanism for assessing organizational effectiveness and to prepare a report of findings for submission to the GCMRC management team at intervals of six months and one year from the day of the announced reorganization.

Employees of the GCMRC were asked to state the degree to which they agree or disagree with a series of 39 questions about conditions and management practices at the GCMRC. They were asked to assess eight aspects of GCMRC leadership at four different levels, overall effectiveness of leadership at each level, and personal and organizational morale. In addition, they were asked what they think is working well and not working well at GCMRC, and how efficiency and employee satisfaction could be improved. The survey consisted of two questionnaires, one addressing current conditions at the GCMRC, and one addressing conditions at GCMRC just prior to the reorganization.

The results of the employee opinion survey will assist the GCMRC Organizational Assessment Committee to identify apparent strengths and weaknesses of the center, to highlight issues that merit further investigation by the committee, and to evaluate the success or failure of the reorganization. The survey was sent to all employees and managers at the GCMRC, a total of 31 persons. Responses were received from 24 (77%).

How well did the reorganization work?

GCMRC employees do not feel that the recent reorganization was particularly useful. Just over half feel they can now more effectively implement the mission of GCMRC. However, there are only two statements that more than half of the employees are in agreement with:

- The new organization has greater potential to foster an integrated approach to research and monitoring than the previous organization
- These two surveys adequately cover my concerns about the old and new organizational structures at GCMRC and will help to evaluate the effectiveness of the new organization

There is widespread disagreement with three statements:

- The accountability of the program managers for their performance has improved under the reorganization
- The new positions created in the reorganization made effective use of the FTE's currently available to GCMRC
- It is my perception that the morale of GCMRC in general has improved under the new organization

Global Change Program (GCP)

Principal investigators (PI's) who are or have been involved with the GCP were asked to state the degree to which they agree or disagree with a series of 21 statements about management practices in the GCP. The statements were in three general areas:

- GCP/project review and recompetition process
- Global change program management
- Science center support

In addition, they were asked if they had any suggestions for improving the program in each of these general areas.

Survey results:

There are dramatic differences in opinion between PI's who were funded and those who were not.

- PI's who were not funded are significantly less satisfied with all aspects of the GC program/project review and re-competition process.
- PI's who were not funded are much more likely to want more guidance from the Program Manager and to have a BRD global change PI meeting.
- PI's who were funded are significantly more likely to consider their Center Director and supervisor supportive of their GC project and significantly less likely to think that their Center Director/supervisor see GC funds as a source of funding for other projects.

There is widespread agreement among all PI's that they would like to learn more, interact more, and be more involved with global change scientists/activities. Almost all PI's are very confident that their own research projects will contribute to the U.S. Global Change Research Program (USGCRP) strategic plan.

The survey was designed to identify apparent strengths and weaknesses in the GCP and to assist the program manager to improve the management of the program.

The sample was all USGS PI's who had applied to the GCP for funding in the last two years. This was a total of 40 persons. Responses were received from 29 (73%).

Safety, Health, and Environmental Program

As part of an assessment of the Bureau Safety, Health, and Environmental Program, a random sample of employees were asked to assess a series of statements based upon the Department of the Interior Safety, Health, and Environmental Strategic Plan goals. The purpose of the survey is to assist the Bureau Safety, Health, and Environmental Program Manager in directing future program efforts.

Respondents were asked to indicate their agreement or disagreement with statements about the application of the five safety, health, and environmental strategic plan goals of their cost center/team. The five strategic goals are:

1. Create a safety, health, and environmental culture inclusive of all employees and activities.
2. Improve our ability to identify and abate unsafe practices and conditions.
3. Implement effective safety, health, and environmental resource strategies.
4. Facilitate accountability and program improvement through evaluation and monitoring.
5. Increase organizational safety, health, and environmental awareness and program communication.

In addition, respondents were asked if they had comments about the strategic goals, and also if they had participated in Safety and Health Week activities.

Random samples of 70 employees were selected from the discipline areas of Biology, Geology, Geography, and Water Resources, and from Administrative personnel, for a total sample of 350. Responses were received from 240 (70%).

A similar survey was conducted in 2002. Average agreement in each of the goal areas declined between 2002 and 2004.

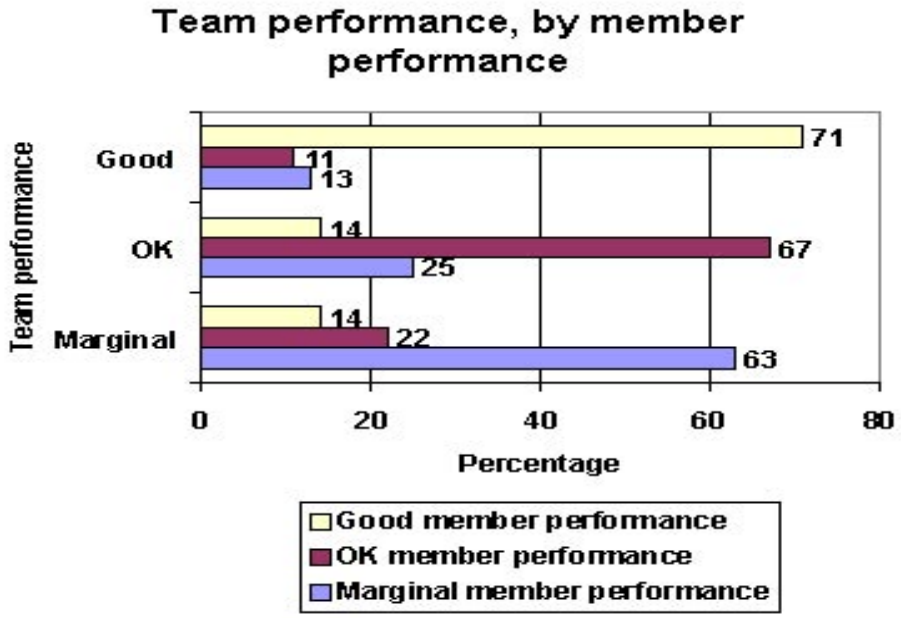
Statement	2004	2002	Change
Goal #1 – Safety culture	73	85	-12
Goal #2 – Unsafe practices	70	80	-10
Goal #3 – Resource strategies	71	83	-12
Goal #4 – Eval./monitoring	77	84	-7
Goal #5 – Safety awareness	67	75	-8
Overall	71	81	-10

Business Leaders Team (BLT)

In conjunction with the one-year anniversary of the formation of the Business Leaders Team, and in preparation for a face-to-face team meeting in Austin, TX, members of the BLT were asked to complete a survey concerning their perceptions about the functioning of the BLT.

Members were asked to rate various aspects of their experience as an individual team member and the effectiveness of the team as a whole. In addition, members were asked what they thought was the team's greatest accomplishment and what could be done to improve the team's performance in the coming year.

The survey was sent to the 28 members of the BLT. Responses were received from 25 (89%). Members' perception of their own performance strongly correlates with their perception of the team's performance.



Human Capital Department-wide Review

The USGS worked with the DOI Office of Personnel Policy to conduct a departmentwide employee opinion survey as part of the DOI Human Capital Accountability System. The USGS administered the survey, tabulated the responses, and analyzed the results. The total sample size was 560; the survey had a 70% response rate.

More than 90% of both supervisory and non-supervisory employees agreed with the statements:

- I know how my work relates to my organization's missions and goals.
- My supervisor supports my need to balance work and family issues.
- I like the work I do.

Fewer than 75% of both supervisory and non-supervisory employees agreed with the statements:

- Information collected on my work unit's performance is used to improve how we get work done.
- I have sufficient resources (for example, people, materials, budget, etc.) to get my job done.
- My work unit is able to recruit people with the right skills.
- I hold my organization's leaders in high regard.

In FY2004, USGS conducted internal processes to standardize ABC/M and Strategic Plan outputs so that a single set will be used for both. This effort led to a substantial refinement in the distinctions among work activities and products, and a new approach to analyzing work fashioned after the OMB's Business Reference Model for Knowledge Creation and Management. Integrating the two management processes with more descriptive definition templates will result in a more meaningful and reliable cost and performance tool for project managers.
Charlene Hall-Raphael, Planning and Performance Management Officer

Resolution of Internal Control Weaknesses and Non-Compliance with Laws and Regulations

The following tables summarize actions taken to resolve material weaknesses, reportable conditions, and instances of noncompliance with laws and regulations reported in the Independent Auditors' Report on the USGS Financial Statements for FY2003.

Material Weakness	Corrective Action	Target Date	Implemented (Yes/No)
Controls over accounts receivables and deferred revenues related to reimbursable agreements	Revise Instructional Memorandum for monthly reviews and quarterly certifications of accounts receivable balances to include exception reporting that identify abnormal balances and provide aging reports; conduct statistical sampling reviews of the reports and the certification and include results in financial performance indicators to cost center managers and regional directors; and automate billing process of Federal bills using PC billing. Status as of 9/30/04: USGS corrective actions were sufficiently effective for this FY2003 material weakness to be downgraded to a reportable condition in FY2004.	9/30/04	Yes

Reportable Condition	Corrective Action	Target Date	Implemented (Yes/No)
Controls over information technology (IT) data security	Complete corrective actions related to: 1. T&A Application – Designate an independent management official; implement restrictions on the reuse of passwords; enforce segregation, or implement alternate controls as appropriate. 2. Physical Access – Continue to ensure that all currently authorized personnel have legitimate business needs for physical access to the USGS data center; obtain and maintain proper authorization documentation; establish a program to review physical access to sensitive areas. 3. User Account Management – Revise mainframe access review and approval in coordination with NBC; document policies and procedures for restricting access to the Solaris system software. 4. Logical Access Control – Review the vulnerability assessment results; ensure thorough, periodic reviews to identify vulnerabilities on the internal network. Status as of 9/30/04: USGS continues to have a reportable condition in certain aspects of information technology.	9/30/04	Yes
Policies, procedures, and controls over intra-departmental eliminations	Designate FTEs devoted solely to reconciliation of intra-departmental expenses and revenues, and assets and liabilities. Status as of 9/30/04: USGS corrective actions were sufficiently effective for this FY2003 reportable condition to be corrected in FY2004.	9/30/04	Yes

Reportable Condition	Corrective Action	Target Date	Implemented (Yes/No)
Policies, procedures, and controls over property, plant, and equipment	Develop and implement reports that identify missing and/or erroneous information; develop procedures for processing capital improvements that extend an asset's useful-life; revise procedures for asset transfers; research alternative useful-life schedules; and implement statistical sampling of transactions based on object classes. Status as of 9/30/04: USGS corrective actions were sufficiently effective for this FY2003 reportable condition to be corrected in FY2004.	9/30/04	Yes

Non-Compliance	Corrective Action	Target Date	Implemented (Yes/No)
FFMIA – Federal Financial Management Systems Requirements and Federal Accounting Standards	Complete corrective actions described for the controls over the IT data security reportable condition. Complete corrective actions described for the controls over the accounts receivable and deferred revenue related to reimburseable agreements material weakness. Status as of 9/30/04: USGS efforts to eliminate material weaknessess in internal control bring USGS into compliance with the FFMIA's Federal Accounting standards portion of the Act. USGS continues to have a non-compliance finding associated with the reportable condition in information technology.	9/30/04	Yes

Unqualified Financial Statement Audits

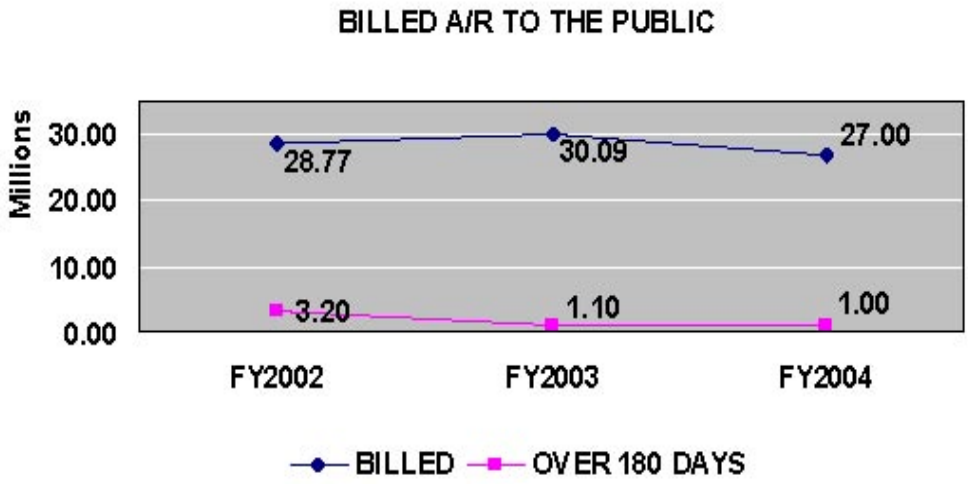
USGS is committed to strong financial management and has recently made much progress in this area. This achievement results from our commitment to strong management control and accountability of our financial resources, a commitment that we are extending into the future as we seek to further improve management of our financial resources. Significant progress was also made in reducing internal control material weaknesses. In FY2001, all nine matters reported by KPMG LLP were considered to be material weaknesses. Though no opinion was issued in FY2002, most matters were still considered to be uncorrected at that fiscal year-end. In FY2003, many prior material weaknesses were corrected, while others were downgraded to reportable conditions. USGS currently has no material weaknesses. This progress illustrates our progression toward full attainment of unqualified audit opinions by correcting material weaknesses.

	KPMG LLP's Opinions Issued to USGS
FY2001	Disclaimer
FY2002	No Opinion
FY2003	Unqualified Balance Sheet
FY2004	Unqualified Financial Statements (all)

Good management sets the foundation upon which agencies can successfully meet their responsibilities to the American public. These responsibilities require that we deploy our resources efficiently and effectively. To meet these responsibilities, USGS strives for management excellence demonstrated by increased accountability for results, more effective leverage of available resources, and continued process and technology improvements.

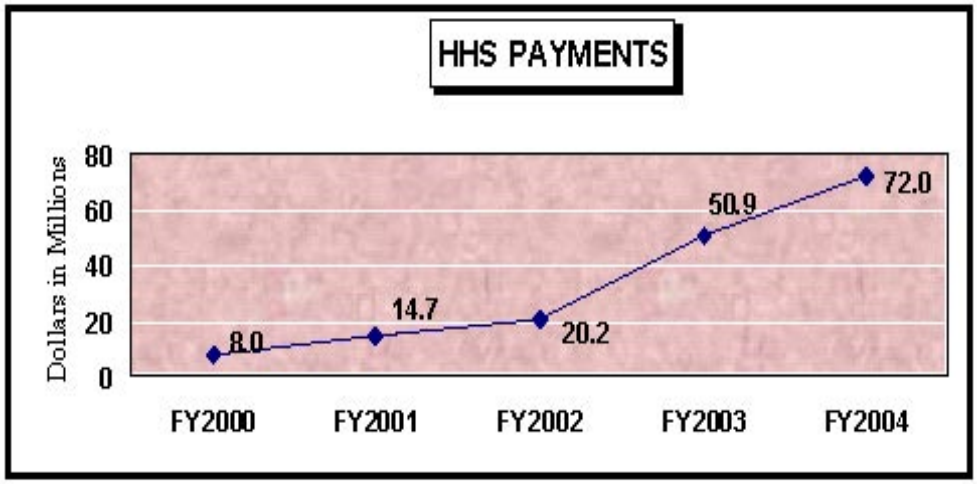
Debt Management and Receivables Due from the Public

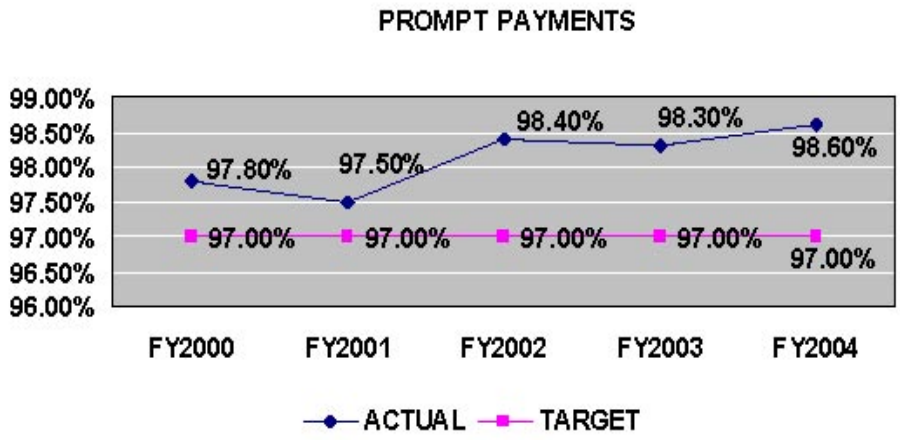
USGS billed accounts receivable from the public decreased from $30 million in FY2003 to $27 million in FY2004. Delinquent amounts over 180 days past due decreased from $1.1 million in FY2003 to $1.0 million at the end of FY2004. The DCIA requires that delinquencies older than 180 days be referred to the Department of the Treasury's Financial Management Service, which was established as the Federal government's debt collection center. The USGS reports the status of receivables on quarterly Treasury Report on Receivables (TROR) reports. As of September 30, 2004, USGS reported on the TROR that $1.0 million in delinquencies had been referred to FMS for cross servicing.



Health and Human Service (HHS) Payment Management System (PMS)

USGS uses the HHS PMS to make disbursements for grants and cooperative agreements with States, municipalities, and universities. In FY2004, USGS issued payments in excess of $72 million through the HHS system, which is an increase of $21.1 million from FY2003. Beginning with all new awards issued after October 1, 2001, USGS initiated a new requirement that all new awards be setup and paid through the Payment Management System. This explains dramatic increase between FY2002 and FY2003. Our use of PMS further increased in FY2004 due to fully implementing the new policy requiring PMS use.



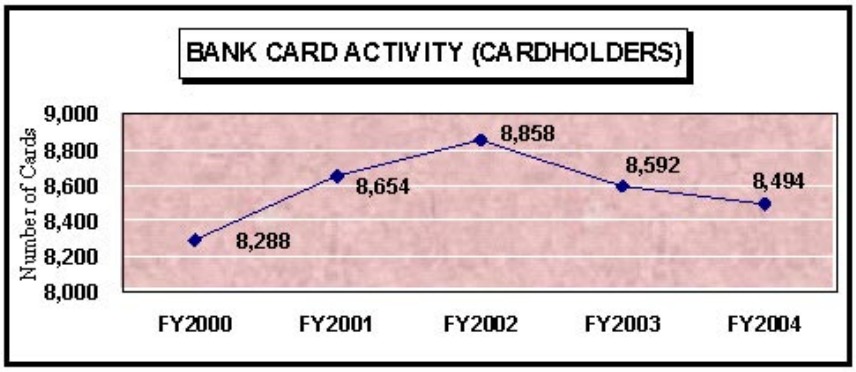


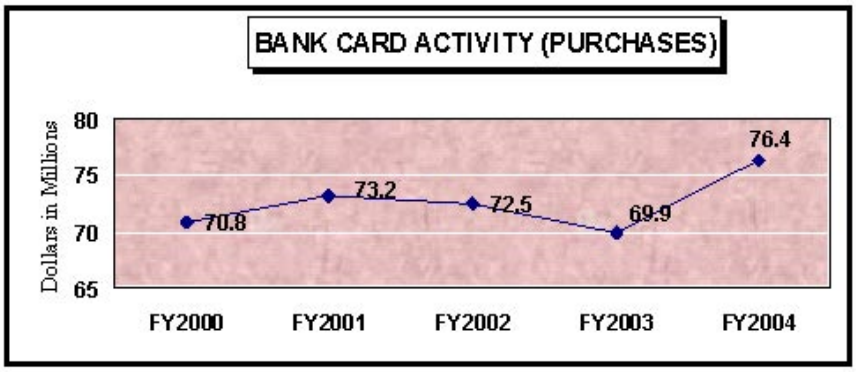
Prompt Payment Act

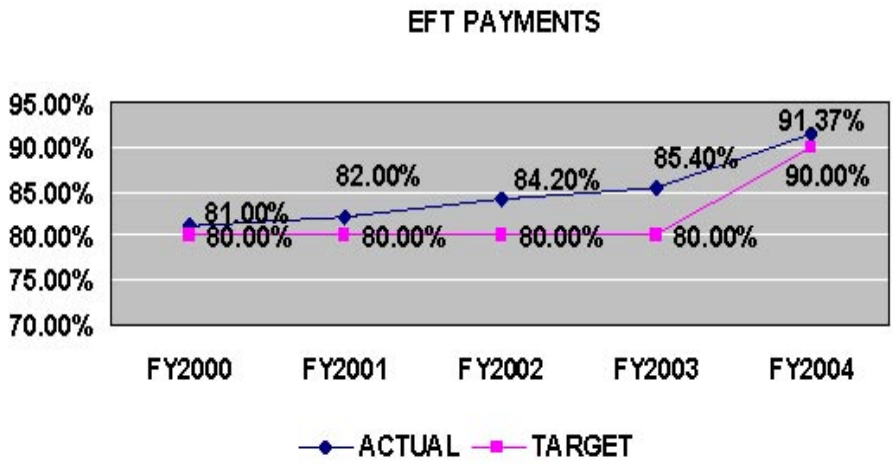
Over 98% of USGS invoices were paid on time in FY2004 and FY2003. In addition, the late payment interest penalties decreased from $21,074 in FY2003 to $19,759 in FY2004. Our performance remains above DOI's goal of 97%. We will continue to monitor our payment performance to ensure our timely vendor payment percentage stays on target.

Bankcards

USGS is dedicated to the use of bankcards as a means of streamlining procurements. USGS workforce size peaked in FY2002, with a small reduction in force occuring over the past two fiscal years. During the past five years, bankcards have become the preferred method of procurement for small purchases. The number of cardholders decreased in FY2003 and further in FY2004 based on recommendations from the OIG in efforts to strengthen internal controls. The value of purchases made using the bankcards increased in FY2004 due to our appropriations being issued later in the year than in previous years. USGS has paid considerable attention to the internal controls surrounding these purchases to ensure that all such purchases are legal and proper.







DCIA – Electronic funds transfer (EFT)

During FY2004, we continued our efforts to maximize the use of payment mechanisms compliant with EFT as required by the Debt Collection Improvement Act of 1996. DOI's overall EFT performance target for FY2004 was raised to 90%. USGS exceeded DOI's goal and made progress with a 6.2% increase in the EFT percentage for vendor payments.

Financial Management

The Office of Administration and Policy Services (APS) within the USGS formulates and prescribes Bureau-wide financial management and accounting policies, procedures, and controls. APS strives to provide:

- Program managers that are knowledgeable, responsible, and accountable fiscal managers;
- Accurate and timely financial data that is readily available to management and stakeholders; and
- Financial management that is conducted through a Bureau-wide financial management system that directly supports work and resource planning and program performance measurement.

APS financial management environment is being improved to ensure compliance with Federal laws and regulations while providing DOI and USGS executives with timely, accurate financial and performance indication. Several major initiatives were underway in FY2003 and continued into FY2004 to help us achieve this endeavor:

- Implement a new financial management system;
- Improve financial performance indication; and
- Improve human resources planning in the financial management community.

Implement a new Financial Business Management System (FBMS)

FBMS is a major enterprise management initiative that will integrate budget formulation and planning, financial management, acquisition, property management, grants administration, and other subsidiary systems and will revamp administrative processes throughout the DOI. FBMS will provide the system and process structure for DOI to modernize its operations and will enable DOI's employees and managers to have better information for decisionmaking about their programs.

The scope of this project is to provide a Department-wide solution that significantly improves access to reliable, accurate, current, and complete financial and business management information to support the decisionmaking process throughout all levels of the Department, affecting all employees and operations. This includes improving our ability to obtain unqualified audit opinions, economic and efficient input and retrieval of data, and ensuring the best use of taxpayer and other available funds to promote proactive management of these funds.

Since its inception, FBMS has been a collaborative undertaking among all the DOI bureaus. USGS is heavily involved with system design efforts and is currently scheduled to fully implement FBMS (and replace existing financial systems) in FY2008.

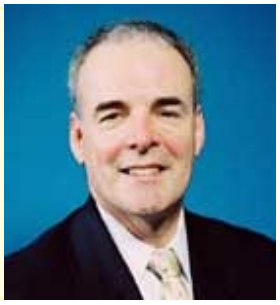
Improve financial performance indication within the Bureau

USGS developed a monthly, and for certain measures quarterly, financial performance indicators system, the results of which are distributed Bureau wide. This new process was designed to facilitate monitoring of the effectiveness of internal controls, disseminate management information needed to evaluate Bureau performance, and provide a consistent manner of measuring results within all Disciplines and Offices within USGS.

Improve human resources planning in the financial management community

USGS financial management workforce plays a critical role in safeguarding USGS financial resources and ensuring that USGS managers have the most accurate, timely, and reliable financial information on which to base science and business decisions. The USGS engaged in workforce planning during the fiscal year, a process that identifies skills that will be needed in the next 5 years and develops strategies for acquiring those skills. Because of the importance of financial management to the Bureau's and Department's success, USGS is developing a workforce plan, to be completed in FY2005, to ensure that our financial management workforce has the skills it needs for the future.

"To be successful, our workforce planning efforts must be linked to our science and business planning and must be meaningful at the science center, regional, and bureau levels. For this reason, we developed a common USGS methodology for workforce planning that is based on science and business plans and allows full flexibility at the science center and regional levels to set goals and address local and regional workforce needs. This commonly applied methodology allows the bureau to roll up science center and regional workforce plans for a bureauwide assessment of our workforce needs." *Robert Doyle, USGS Deputy Director*



Analysis of Our Financial Statements

(all amounts are in thousands)

The USGS basic financial statements, which are included in section II of this report, are prepared in accordance with accounting principles generally accepted in the United States of America as set forth by Federal entities, guidance issued by the Office of Management and Budget (OMB) and the DOI. While the financial statements have been prepared from the USGS books and records in accordance with the formats prescribed by OMB, they are different from the financial reports used to monitor and control budgetary resources that are prepared from the same books and records. The statements should be read with the realization that they are a component of the U.S. Government, a sovereign entity.

The DOI Office of the Inspector General (OIG) is responsible for auditing the basic financial statements of USGS and has contracted these services to KPMG LLP. While the audit of the FY2004 basic financial statements is full scope, the audit of the FY2003 basic financial statements was limited in scope to the Consolidated Balance Sheet as of September 30, 2003.

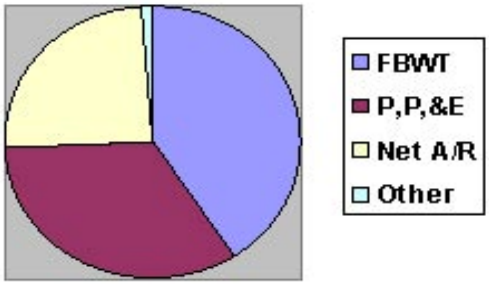
This analysis of the financial statements contains highlights on selected aspects of the accompanying basic financial statements.

Assets – What We Own

The Fund Balance with Treasury (FBWT) of $234,783 represents 41% of total assets at September 30, 2004. The FBWT is primarily composed of appropriated funds available to make authorized expenditures. The USGS Working Capital Fund comprised 36%, or $85,133 million, of the FBWT at September 30, 2004.

The general property, plant, and equipment (PP&E), net of accumulated depreciation amounted to $190,769 at September 30, 2004. This amount includes a satellite reported on the Consolidated Balance Sheet at a net book value of $48,829, as well as land, buildings and improvements, furniture and equipment, and software purchased for internal use. The satellite, transferred to the Bureau by the National Aeronautics and Space Administration in FY2002, represents 26 percent of the value of the Bureau's total PP&E at September 30, 2004. During 2003, the satellite experienced technical problems and is currently operating in a diminished capacity. As a result, the satellite's value was reduced by $81,100 and an impairment loss was recognized in the FY2003 Statement of Net Cost for the same amount.

The total net Accounts Receivable (A/R, net) of $141,860 is represented by 42.8% of amounts owed from other Federal agencies and 57.2% owed from the public. The majority of the accounts receivable is established to cover the direct and indirect costs for reimbursable services performed in support of surveys, investigations, and scientific research. The majority of the receivable balance is unbilled: 88.5% of the $60,776 receivables from Federal agencies are unbilled, while 68.5% of the $81,084 receivables from the public are unbilled. The large unbilled balance is due to the manner that agreements are written for survey and research type work. The revenue for many agreements is recognized as work is completed, but the receipt of payment is often not due until completion of a survey or research report is accomplished. Unbilled A/R decreased in FY2004 due to placing more emphsis on requiring faster billing cycles.



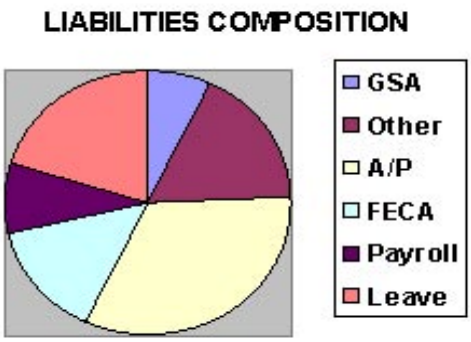
Liabilities – What We Owe

The USGS is a scientific service organization where the majority of its liabilities are payroll and benefit related. The accrued payroll and benefits amount of $135,182, including Federal Employees Compensation Act (FECA) liabilities and annual leave due to employees, represents 47% of USGS total liabilities of $284,723 at September 30, 2004. Of that total liabilities amount, the accounts payable of $92,596 consists of $9,885 of accounts payable with other Federal agencies and $82,711 of accounts payable with the public. Deferred revenue, credits, and the deposit fund liability of $12,392 consists primarily of amounts advanced to the Bureau to cover reimbursable services to be provided at a future date.

Unfunded liabilities, with a balance of $162,186 at fiscal year-end 2004, make up 56.9% of the total outstanding

liabilities. The largest liabilities in this balance consists of $57,652 of unfunded annual leave and $48,510 of the FECA liabilities.

The other unfunded liabilities include the GSA Tenant Improvement liability of $21,216; contingent liabilities of $20,971; and environmental cleanup liabilities of $1,097. The balance of the environmental cleanup costs reported in FY2003 included both environmental clean up and continent liabilities for equipment removal. During FY2004, the environmental costs were adjusted to reflect only those sites identified with hazardous waste. The remaining sites where only cleanup of equipment remains to be completed were reclassified as contingent liabilities.



Budgetary Resources – What We Receive

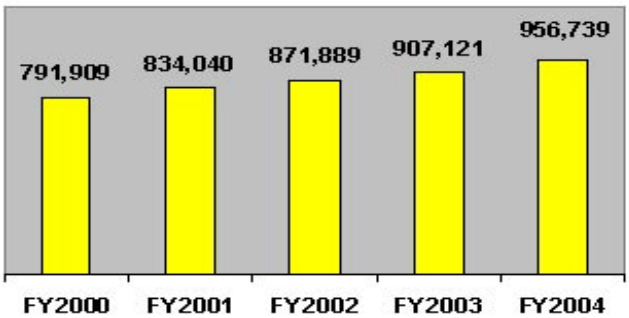
The USGS received approximately 59%, or $951,381, of its total budgetary resources of $1,544,259 through appropriations received in FY2004. Other major sources of budgetary resources include unobligated balances carried over from FY2003 and spending authority from offsetting collections, totaling $155,481 and $443,337, respectively. Of the total budgetary resources, $1,423,949 were obligated as of September 30, 2004.

The majority of the budgetary resources were used during the current year to support surveys, investigations, and scientific research. Of the FY2004 appropriations received, the following restrictions applied: $64,080 in funds available only for cooperation with states and municipalities for water resource investigations; $15,141 to remain available until expended for conducting inquires into the economic conditions affecting mining and materials processing industries; $7,901 to remain available for satellite operations until expended; $21,971 for operation and maintenance of facilities and deferred maintenance and shall be available until September 30, 2006; $170,398 for biological research activity and the operation of Cooperative Research Units until September 30, 2006.

The offsetting collections from the Bureau's reimbursable program include the following: reimbursements from non-Federal sources are from States, Tribes, and municipalities for cooperative efforts and proceeds from sale to the public of copies of photographs and records; proceeds from sale of personal property; reimbursements for permits and licenses of the Federal Energy Regulatory Commission; and reimbursements from foreign countries and international organizations for technical assistance. Reimbursements from other Federal agencies are for mission related work performed at the request of the financing agency.

The USGS also maintains a Working Capital Fund (WCF), established November 5, 1990, that is primarily used to invest funds from appropriations and reimbursable agreements, without fiscal year limitation, to purchase materials, supplies, and equipment for long-term capital investments. The WCF also provides fee-for-service operations internally and allows the USGS to provide more efficient financial management of its telecommunications investments; acquisition, replacement, and enhancement of scientific equipment; facilities and laboratory operations, modernization, and equipment replacement; drilling and training services; and publications.

Appropriations represent the vast majority of the budgetary financing sources of the Bureau. Other financing sources are comprised of $1,141 of transfers-in without reimbursement from other Federal agencies, and $61,242 in imputed financing from costs absorbed by others, which represents costs paid by Treasury's Judgment Fund on the behalf of USGS and from the Office of Personnel Management for USGS retirement, health, and insurance benefits of USGS employees.



Net Costs – What We Spend

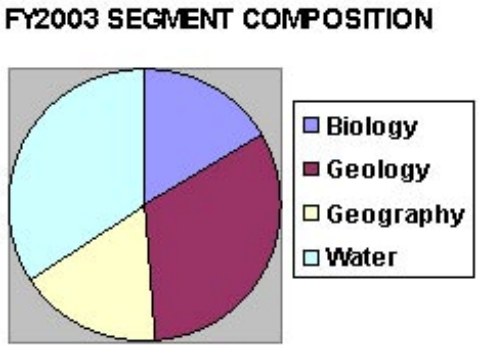
In FY2004 and FY2003, net cost of operations totaled approximately $1,050 and $1,099, respectively. In terms of net cost of operations supporting its strategic goals, comparative information is not available. As discussed in the Management's Discussion and Analysis - Strategic Goals section, DOI created a unified strategic plan for the Department as a whole in FY2004. In this process, the previous DOI GPRA goal, *Provide Science for a Changing World*, which USGS supported with two GPRA program activities, was eliminated. In the new plan, USGS supports three GPRA mission goals with six end outcome goals.

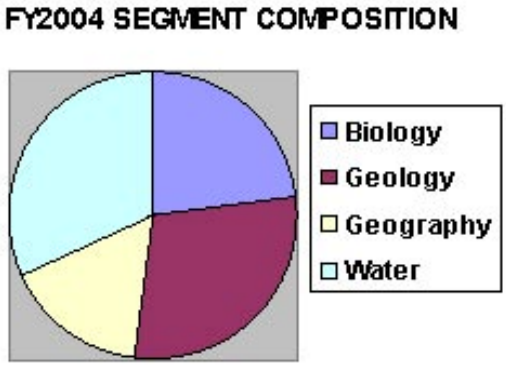
Costs not assigned to an end outcome goal in FY2003 accounted for 7% of total net cost, while all costs in FY2004 were assigned to an end outcome goal.

Because the USGS did not have consistency in operating segments between FY2004 and FY2003, comparison of organizational support of strategic goals was provided through four discipline areas:

- Water,
- Geology,
- Geography, and
- Biology.

The charts below show net costs for each discipline for each fiscal year.





Limitations to Our Financial Statements

The basic financial statements have been presented to report the financial position and results of operations of the USGS, consistent with the requirements of the Chief Financial Officers' Act of 1990. While the statements have been prepared from the books and records of USGS in accordance with generally accepted accounting principles for Federal entities and the formats prescribed by the Office of Management and Budget, the statements are in addition to the financial reports used to monitor and control budgetary resources which are prepared from the same books and records. The basic financial statements should be read with the realization that they are for a component of the United States government, a sovereign entity. Liabilities not covered by budgetary resources cannot be liquidated without the enactment of an appropriation, and the payment of all liabilities, other than for contracts, can be abrogated by the sovereign entity.

Section II
Basic Financial Statements

USGS volcanologist stands near a skylight and uses an instrument to sample molten lava and gather scientific data.

Contents

Consolidated Balance Sheets 57
Consolidated Statements of Net Cost 58
Consolidated Statements of Changes in Net Position 59
Combined Statements of Budgetary Resources 60
Consolidated Statements of Financing 61
Notes to the Financial Statements 62

The Department of Interior

United States Geological Survey

Consolidated Balance Sheets

September 30, 2004 and 2003

(in thousands)

	2004	2003
Assets (Note 3)		
Intragovernmental:		
Fund balance with Treasury (Note 2)	$ 234,783	$ 205,258
Accounts and interest receivable, net (Note 4)	60,776	81,089
Advances and prepayments	3,883	2,654
Total intragovernmental	299,442	289,001
Accounts and interest receivable, net (Note 4)	81,084	91,432
Cash	1	2
Inventory, net (Note 6)	2,433	2,395
Property, plant, and equipment, net (Notes 7 and 8)	190,769	222,126
Advances and prepayments	45	79
Total assets	$ 573,774	$ 605,035
Liabilities (Note 9)		
Intragovernmental:		
Accounts payable	$ 9,885	$ 8,940
Accrued payroll and benefits	4,414	7,367
FECA workers compensation liability (Note 10)	7,941	7,929
Deferred revenue (Note 5)	1,744	2,835
Deposit fund liability (Note 5)	2,997	7,262
GSA tenant improvement liability (Note 11)	21,216	26,051
Other liabilities (Note 3)	231	220
Total intragovernmental	48,428	60,604
Accounts payable	82,711	62,423
Accrued payroll and benefits	24,606	16,975
Annual leave liability	57,652	54,390
Deferred revenue (Note 5)	1,474	1,141
Deferred credits (Note 5)	238	135
Deposit fund Liability (Note 5)	5,939	4,378
Environmental cleanup liabilities (Note 12)	1,097	507
Contingent liabilities (Note 12)	20,971	20,638
FECA actuarial liability (Note 10)	40,569	42,816
Other liabilities	1,038	1,181
Total liabilities	284,723	265,188
Commitments and contingencies (Notes 11 and 12)		
Net position		
Unexpended appropriations	163,343	187,440
Cumulative results of operations	125,708	152,407
Total net position	289,051	339,847
Total liabilities and net position	$ 573,774	$ 605,035

The Department of Interior

United States Geological Survey

Consolidated Statements of Net Cost

For the Years Ended September 30, 2004 and 2003

(in thousands)

	2004		2003 (Unaudited)
Advance Knowledge through Scientific Leadership		**Environmental and Natural Resources**	
Intragovernmental gross cost	$ 163,998	Intragovernmental gross cost	$ 197,831
Less: Intragovernmental earned revenue	155,984	Less: Intragovernmental earned revenue	192,112
Intragovernmental net cost	8,014	Intragovernmental net cost	5,719
Gross costs with the public	825,638	Gross costs with the public	948,651
Less: Earned revenues from the public	166,171	Less: Earned revenues from the public	132,099
Net costs with the public	659,467	Net costs with the public	816,552
Total net cost	667,481	Total net cost	822,271
Protect Lives, Resources, and Property		**Hazards**	
Intragovernmental gross cost	10,075	Intragovernmental gross cost	33,473
Less: Intragovernmental earned revenue	9,690	Less: Intragovernmental earned revenue	32,311
Intragovernmental net cost	385	Intragovernmental net cost	1,162
Gross costs with the public	97,361	Gross costs with the public	228,941
Less: Earned revenues from the public	1,440	Less: Earned revenues from the public	34,074
Net costs with the public	95,921	Net costs with the public	194,867
Total net cost	96,306	Total net cost	196,029
Sustain Biological Communities		**Costs not assigned to any program**	
Intragovernmental gross cost	24,711	Asset impairment (Note 8)	81,100
Less: Intragovernmental earned revenue	23,718		
Intragovernmental net cost	993		
Gross costs with the public	117,779		
Less: Earned revenues from the public	1,766		
Net costs with the public	116,013		
Total net cost	117,006		
Improve Health of Watersheds and Landscapes			
Intragovernmental gross cost	37,673		
Less: Intragovernmental earned revenue	36,286		
Intragovernmental net cost	1,387		
Gross costs with the public	85,554		
Less: Earned revenues from the public	6,693		
Net costs with the public	78,861		
Total net cost	80,248		
Manage or Influence Resources - Energy			
Intragovernmental gross cost	1,690		
Less: Intragovernmental earned revenue	1,610		
Intragovernmental net cost	80		
Gross costs with the public	26,954		
Less: Earned revenues from the public	83		
Net costs with the public	26,871		
Total net cost	26,951		
Manage or Influence Resources - Non-Energy			
Intragovernmental gross cost	3,841		
Less: Intragovernmental earned revenue	3,644		
Intragovernmental net cost	197		
Gross costs with the public	61,944		
Less: Earned revenues from the public	558		
Net costs with the public	61,386		
Total net cost	61,583		
Total		**Total**	
Intragovernmental gross cost	241,988	Intragovernmental gross cost	231,304
Less: Intragovernmental earned revenue	230,932	Less: Intragovernmental earned revenue	224,423
Intragovernmental net cost	11,056	Intragovernmental net cost	6,881
Gross costs with the public	1,215,230	Gross costs with the public	1,177,592
Less: Earned revenues from the public	176,711	Less: Earned revenues from the public	166,173
Net costs with the public	1,038,519	Net costs with the public	1,011,419
		Asset Impairment (Note 8)	81,100
Total net cost of operations	$ 1,049,575	Total net cost of operations	$ 1,099,400

The Department of Interior

United States Geological Survey

Consolidated Statements of Changes in Net Position

For the Years Ended September 30, 2004 and 2003

(in thousands)

	2004		
	Cumulative Results of Operations	Unexpended Appropriations	Total
Beginning balances	$ 152,406	187,440	$ 339,846
Budgetary financing sources			
Appropriations received	-	949,686	949,686
Appropriations transferred in/out	-	87	87
Appropriations used	956,739	(956,739)	-
Transfers in/out without reimbursement	1,491	-	1,491
Donations	1,730	-	1,730
Other budgetary financing sources and adjustments	-	(17,131)	(17,131)
Other financing sources			
Imputed financing from costs absorbed by others (Note 13)	61,242	-	61,242
Transfers in/(out) without reimbursement	(350)	-	(350)
Donations and forfeitures of property	2,025	-	2,025
Total financing sources	1,022,877	(24,097)	998,780
Net cost of operations	(1,049,575)	-	(1,049,575)
Ending balances	$ 125,708	163,343	$ 289,051

	2003 (Unaudited)		
	Cumulative Results of Operations	Unexpended Appropriations	Total
Beginning balances	$ 294,600	179,938	$ 474,538
Budgetary financing sources			
Appropriations received	-	925,286	925,286
Appropriations transferred in/out	-	619	619
Appropriations used	907,121	(907,121)	-
Transfers in/out without reimbursement	984	-	984
Donations	387	-	387
Other budgetary financing sources and adjustments	2,730	(11,282)	(8,552)
Other financing sources			-
Imputed financing from costs absorbed by others (Note 13)	56,237	-	56,237
Transfers in/(out) without reimbursement	(10,253)	-	(10,253)
Total financing sources	957,206	7,502	964,708
Net cost of operations	(1,099,400)	-	(1,099,400)
Ending balances	$ 152,406	187,440	$ 339,846

The Department of Interior

United States Geological Survey

Combined Statements of Budgetary Resources

For the Years Ended September 30, 2004 and 2003

(in thousands)

	2004	(Unaudited) 2003
Budgetary resources: (Note 15)		
Budget authority:		
Appropriations received	$ 951,381	$ 925,987
Unobligated balance:		
Beginning of fiscal year	155,481	127,337
Spending authority from offsetting collections:		
Earned:		
Collected	492,777	514,296
Receivable from federal sources	(31,514)	(3,957)
Change in unfilled customer orders:		
Advance received	(1,165)	(96,939)
Without advance from federal sources	(16,761)	32,151
Recoveries of prior year obligations	11,191	10,765
Permanently not available	(17,131)	(11,420)
Total budgetary resources	$ 1,544,259	$ 1,498,220
Status of budgetary resources:		
Obligations incurred:		
Direct	$ 982,482	$ 908,078
Reimbursable	441,467	434,661
Subtotal	1,423,949	1,342,739
Unobligated balance available, apportioned	95,112	109,779
Unobligated balance not available	25,198	45,702
Total status of budgetary resources	$ 1,544,259	$ 1,498,220
Relationship of obligations to outlays:		
Obligations incurred	$ 1,423,949	$ 1,342,739
Obligated balance, net, beginning of fiscal year	37,228	115,725
Obligated balance, net, end of fiscal year:		
Accounts receivable	142,793	174,307
Unfilled customer orders from federal sources	42,714	59,475
Undelivered orders	(170,158)	(179,547)
Accounts payable	(119,101)	(91,463)
Less: Spending authority adjustments	37,084	(38,960)
Outlays:		
Disbursements	1,394,509	1,382,276
Collections	(491,613)	(417,357)
Subtotal	902,896	964,919
Less: Offsetting receipts	(1,695)	-
Net outlays	$ 901,201	$ 964,919

The Department of Interior

United States Geological Survey

Consolidated Statements of Financing

For the Years Ended September 30, 2004 and 2003

(in thousands)

Resources used to finance activities	**2004**	**(Unaudited) 2003**
Budgetary resources obligated:		
Obligations incurred (Note 15)	$ 1,423,949	$ 1,342,739
Less: Spending authority from offsetting collections and recoveries	(454,528)	(456,316)
Obligations net of offsetting collections and recoveries	969,421	886,423
Less: Offsetting receipts	(1,695)	-
Net obligations	967,726	886,423
Other resources:		
Donations and forfeitures of property	2,025	-
Transfers in/(out) without reimbursement	(350)	(10,253)
Imputed financing from costs absorbed by others (Note 13)	61,242	56,237
Net other resources used to finance activities	62,917	45,984
Total resources used to finance activities	1,030,643	932,407
Resources used to finance items not part of the net cost of operations		
Change in budgetary resources obligated for goods, services and benefits ordered but not yet provided	(9,733)	9,181
Resources that fund expenses recognized in prior periods	41	(81)
Offsetting receipts that do not affect net cost of operations	1,729	(311)
Resources that finance the acquisition of assets	(16,938)	(23,589)
Other resources that do not affect net cost of operations	-	146
Total resources used to finance items not part of the net cost of operations	(24,901)	(14,654)
Total resources used to finance the net cost of operations	1,005,742	917,753
Components of net cost of operations that will not require or generate resources in the current period		
Components requiring or generating resources in future periods:		
Increase (decrease) in annual leave liability	3,262	(1,310)
Increase (decrease) in environmental liabilities	590	(4,679)
Increase (decrease) in exchange revenue receivable from the public	851	(922)
Increase (decrease) in GSA tenant improvement liabilities	(4,835)	26,051
Increase (decrease) in other	(3,908)	18,143
Total components of net cost of operations that will require or generate resources in future periods	(4,040)	37,283
Components not requiring or generating resources:		
Depreciation and amortization (Note 8)	48,256	73,094
Revaluation of Assets or Liabilities (Note 9)	-	81,100
Spending authority transferred from other agencies (Note 16)	1,246	1,466
Bad Debt expense and other	(1,629)	(11,296)
Total components of net cost of operations that will not require or generate resources	47,873	144,364
Total components of net cost of operations that will not require or generate resources in the current period	43,833	181,647
Net cost of operations	$ 1,049,575	$ 1,099,400

Note 1 Summary of Significant Accounting Policies

A. Reporting Entity

The U. S. Geological Survey, a Bureau within the Department of Interior, was established on March 3, 1879 by an act of Congress to conduct systematic and scientific "classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain." The mission of the USGS is to serve the Nation by providing reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; manage water, biological, energy and mineral resources; and enhance and protect our quality of life.

The USGS accomplishes its mission through integrated science programs consisting primarily of:

- the national mapping program that meets the Nation's needs for accurate, nationally-consistent base geospatial data by ensuring access to and advancing the application of these data and related natural science information for users;
- the geologic program that provides earth science information used to evaluate resource potential, to define risks associated with natural hazards, and to characterize the potential impact of natural geologic processes on human activity, the economy, and the environment; and
- the water resources program that continuously assesses the Nation's water availability and quality, provides geographic and cartographic information, and addresses flood hazards by moderating the impacts of floods and improving flood disaster response. The biologic research program that generates and distributes information needed in the conservation and management of the Nation's biological resources.

B. Basis of Presentation

These financial statements have been prepared to report the consolidated financial position, the net cost of operations, the changes in financial position, the budgetary resources, and the financing of the USGS, consistent with the Chief Financial Officers' Act of 1990 and the Government Management Reform Act of 1994. These financial statements have been prepared from the books and records of the USGS in accordance with generally accepted accounting principles (GAAP) using guidance issued by the Federal Accounting Standards Advisory Board (FASAB), the OMB, and USGS accounting policies, which are summarized in this note. These consolidated financial statements present proprietary and budgetary information, while other financial reports also prepared by the USGS pursuant to OMB directives are used to monitor and control USGS use of Federal budgetary resources. The Statement of Budgetary Resources is presented on a combined, rather than consolidated basis, and therefore, Intra-entity eliminations were not made for the purpose of this statement. The Statement of Financing reconciles combined amounts from the Statement of Budgetary Resources to amounts from the consolidated Statement of Net Cost.

C. Basis of Accounting

Financial transactions are recorded on an accrual accounting basis and a budgetary basis. Under the accrual method, revenues are recognized when earned and expenses are recognized when a liability is incurred, without regard to receipt or payment of cash. Budgetary accounting facilitates compliance with legal requirements and mandated controls over the use of federal funds. It generally differs from the accrual basis of accounting in that obligations are recognized when new orders are placed, contracts awarded, and services received that will require payments during the same or future period. The USGS intra-entity transactions have been eliminated in the Consolidated Statement of Net Cost.

D. Fund Balance with Treasury and Cash

Fund Balances with Treasury are cash balances remaining as of fiscal year-end from which USGS is authorized to pay liabilities resulting from operational activity, except as restricted by law. Fund balance with Treasury includes funds received from direct appropriations, transfers, offsetting receipts, recoveries, and funds held in budget clearing accounts. The USGS is permitted by law to use appropriated funds to finance its working capital fund.

E. Revenues, User Fees, and Financing

Appropriations: The USGS receives the majority of the funding needed to support its programs through Congressional appropriations. Financing sources are received in annual, multi-year, and no-year appropriations that may be used, within statutory limits, for operating and capital expenditures.

Upon expiration of an annual or multiple-year appropriation, the obligated and unobligated balances retain their fiscal year identity, and are maintained separately within an expired account. The unobligated balance can be used to make adjustments to existing obligations, but is otherwise not available for expenditures. Annual and multiple-year appropriations are canceled at the end of the fifth year after expiration. No-year appropriations do not expire. Appropriations of budget authority are recognized as used when a liability for goods and services or benefits and grants are incurred.

Exchange revenues: Additional funds are obtained through reimbursements for services performed for other Federal agencies and the public and fees charged for surveys, investigations, and research. Revenue and intra-governmental reimbursements are recognized as earned when the goods have been delivered or services rendered by USGS. Revenues earned from public sources are derived from States and municipalities for making cooperative topographic and geologic surveys and water resource investigations; proceeds from the sale of photographs, maps, and records; proceeds from the sale of personal property; and reimbursements from permits and licenses of the Federal Energy Regulatory Commission. Revenues from certain cooperators represent about half of the total cost; the USGS pays the remaining half of the total cooperators cost. Revenues earned from other Federal agencies are derived from special-purpose mapping and investigations. Revenues are also received through the Department of State, from foreign countries, and international organizations for scientific and technical assistance.

The USGS has specific legislative authority to receive revenue from non-Federal reimbursable customers as budgetary resources. The USGS also has authority to receive contributions from outside organizations to perform work desired mutually by multiple parties. In addition, the USGS receives rental receipts for quarters provided at remote locations.

User fees are set at a level that will recover the full costs associated with the services for specific customers, and prices for the sale of information products are set at a level that will recover the full costs of reproduction and dissemination, or costs incurred after the mission related information is collected and archived. User fees and product prices are developed in accordance with cost components of OMB Circular A 25, with review and approval by the Director, or a delegated party. The annual Cost Recovery Report and regularly scheduled independent pricing reviews by product line are among the methods used to monitor compliance with the USGS policies.

Imputed financing sources: In certain cases, operating costs of the USGS are paid for by funds appropriated with other federal entities. For example, pension benefits for most USGS employees are paid for by the U.S. Office of Personnel Management (OPM) and certain legal judgments against the USGS are paid from the Judgment Fund maintained by Treasury. OMB limits imputed costs to be recognized by federal entities to the following: (1) employees' pension benefits; (2) health insurance, life insurance, and other benefits for retired employees; (3) other post employment benefits for retired, terminated, and inactive employees, including severance payments, training and counseling, continued health care, and unemployment and workers' compensation under the Federal Employees' Compensation Act; and (4) losses in litigation proceedings. The USGS includes applicable imputed costs on the Consolidated Statements of Net Cost. In addition, an imputed financing source is recognized on the Consolidated Statements of Changes in Net Position.

F. Assets

Assets presented on USGS Consolidated Balance Sheets include both entity and non-entity balances. Entity assets are assets that USGS has authority to use in its operations. Non-entity assets are held and managed by USGS, but are not available for use in operations.

Intragovernmental assets arise from transactions between USGS and other Federal entities.

G. Liabilities

Liabilities covered by budgetary or other resources are those liabilities of USGS for which Congress has appropriated funds or funding is otherwise available to pay amounts due. Liabilities not covered by budgetary or other resources represent amounts owed in excess of available Congressionally-appropriated funds or other amounts. The liquidation of liabilities not covered by budgetary or other resources is dependent on future Congressional appropriations or other funding.

Intragovernmental liabilities are claims against USGS by other Federal entities.

H. Accounts Receivable

Accounts receivable consist of amounts owed to the USGS by other Federal agencies and the public. Unbilled accounts receivable represent amounts that have been earned but not yet billed to reimbursable customers. Receivables from Federal agencies result from reimbursable services performed, and from joint funding agreements with State, local, and regional agencies for cooperative work in support of the "Surveys, Investigations, and Research" appropriation. Receivables also include balances owed for credit sales of products and maps to Federal agencies and the public and for interest, administrative costs, and penalties due on delinquent receivables. The majority of USGS accounts receivable are generated from the water resources and the national mapping program.

Amounts due from Federal agencies are considered fully collectible. Receivables due from the public are stated net of an allowance for estimated uncollectible amounts, determined by considering the debtor's current ability to pay, the debtor's payment record and willingness to pay, and an analysis of aged receivable activity.

I. Deferred Revenue

Deferred revenue consists of advances received from Federal and public entities for goods and services that will not be fully earned until the related goods or services have been provided by USGS. The majority of USGS deferred revenue is generated from the water resources program.

J. Property, Plant, and Equipment

Property, plant, and equipment consist of land, structures, facilities and improvements, equipment, and software purchased or developed for internal use. There are no restrictions on the use or convertibility of property, plant, and equipment.

The USGS capitalizes property, plant, and equipment purchases with an acquisition cost in excess of $100,000 for structures, facilities, and software, and $15,000 for all other capital assets. Depreciation or amortization is computed using the straight-line method over the assets' useful lives, of 30 years for structures and facilities, and ranging from 2 to 20 years for equipment and software. Amortization of capitalized software begins on the date of acquisition, if purchased, or when the module or component has been successfully tested if developed internally.

Costs for construction projects are recorded as construction-in-process until completed. Depreciation expense begins once the asset is placed into service.

The USGS leases the majority of its office space and vehicles from the General Services Administration. The lease costs approximate commercial lease rates for similar properties and vehicles.

K. Advances and Prepayments

Payments in advance of the receipt of goods and services are recorded as prepaid charges at the time of prepayment and recognized as expenditures/operating expenses when the related goods and services are received.

L. Inventories

Inventory includes maps and map products that are held for sale and raw materials held for future use. Raw materials consist primarily of paper stock and ink used in the production of maps and map products, film for aerial photographs, and blank CDs for digital data. All inventory products and materials are valued at historical cost, using a method of averaging actual costs to produce like-kind scale maps within the same fiscal year. The USGS estimates an allowance for excess, spoiled, or obsolete map inventory to arrive at a net realizable value, based on inventory turnover and current stock levels.

M. Accrued Annual, Sick, and Other Leave and Compensatory Time

Annual leave and other compensatory leave time are accrued when earned. The accrual is presented as a component of liabilities not covered by budgetary resources in the Consolidated Balance Sheet and is adjusted for changes in compensation rates and reduced for annual leave taken. Sick leave is provided to employees on a use or lose basis and is expensed when taken.

N. Retirement Plans

Civil Service Retirement System (CSRS) and Federal Employees Retirement System (FERS): All USGS employees with permanent status participate in either the CSRS or FERS defined-benefit pension plans. FERS went into effect on January 1, 1987. FERS and Social Security automatically cover most employees hired after December 31, 1983. Employees hired prior to January 1, 1984 could elect to either join FERS and Social Security, or remain in CSRS.

USGS is not responsible for and does not report CSRS or FERS assets, accumulated plan benefits, or liabilities applicable to its employees. OPM administers the plans, is responsible for, and reports these amounts.

For CSRS-covered employees, in both FY2004 and FY2003, USGS was required to make contributions to the plan matching the employee's contribution, which were within a range from 7 to 8 percent of the employee's basic pay. For each fiscal year, OPM calculates the U.S. government's service cost for covered employees, which is an estimate of the amount of funds that, if accumulated annually and invested over an employee's career, would be enough to pay that employee's future benefits. Since the U.S. government's estimated service cost exceeds contributions made by employer agencies and covered employees, this plan is not fully funded by the USGS and its employees. USGS has recognized an imputed cost and imputed financing source for the difference between the estimated service cost and the contributions made by USGS and its covered employees.

FERS contributions made by employer agencies and covered employees exceed the U.S. Government's estimated service cost. For FERS-covered employees, USGS was required in FY2004 and FY2003 to make contributions of 10.7 percent of basic pay. Employees contributed 0.8 percent of basic pay. Employees participating in FERS are covered under the Federal Insurance Contributions Act (FICA), for which USGS contributes a matching amount to the Social Security Administration.

Thrift Savings Plan (TSP): Employees covered by CSRS and FERS are eligible to contribute to the U.S. Government's TSP, administered by the Federal Retirement Thrift Investment Board. A TSP account is automatically established for FERS-covered employees, and USGS makes a mandatory contribution of one percent of basic pay. FERS-covered employees are entitled to contribute up to 14 percent of basic pay to their TSP account, with USGS making matching contributions up to four percent of basic pay. Employees covered by CSRS are entitled to contribute up to seven percent of basic pay to their TSP account. USGS makes no matching contributions for CSRS-covered employees.

Federal Employees Health Benefit (FEHB) Program: Most USGS employees are enrolled in the FEHB Program, which provides post-retirement health benefits. OPM administers this program and is responsible for the reporting of liabilities. Employer agencies and covered employees are not required to make any contributions for post-retirement health benefits. OPM calculates the U.S. government's service cost for covered employees each fiscal year. USGS has recognized the entire service cost of these post-retirement benefits for covered employees as an imputed cost and imputed financing source.

Federal Employees Group Life Insurance (FEGLI) Program: Most USGS employees are entitled to participate in the FEGLI Program. Participating employees can obtain basic term life insurance, with the employee paying two-thirds of the cost and USGS paying one-third. Additional coverage is optional, to be paid fully by the employee. The basic life coverage may be continued into retirement if certain requirements are met. OPM administers this program and is responsible for the reporting of liabilities. For each fiscal year, OPM calculates the U.S. government's service cost for the post retirement portion of basic life coverage. USGS contributions to the basic life coverage are fully allocated by OPM to the pre-retirement portion of coverage, and accordingly, USGS has recognized the entire service cost of the post-retirement portion of basic life coverage as an imputed cost and imputed financing source.

O. Workers' Compensation

A liability is recorded for estimated future payments to be made for workers' compensation pursuant to the FECA. The FECA program is administered by the Department of Labor, which initially pays valid claims and subsequently seeks reimbursement from Federal agencies employing the claimants. Reimbursements to the Department of Labor on payments made occur approximately two years subsequent to the actual disbursement. Budgetary resources for this intra-governmental liability are made available to USGS as part of its annual appropriation from Congress in the year in which the reimbursement to the Department of Labor takes place.

Additionally, the liability estimate includes the expected liability for death, disability, medical, and miscellaneous costs for approved compensation cases. The estimated liability also includes a provision for incurred but not reported claims. Based on information provided by the Department of Labor, DOI allocates the actuarial liability to its Bureaus and Departmental offices based on the payment history for the Bureaus and Departmental offices. The estimated liability is not covered by budgetary resources and will require future funding.

P. Contingent Liabilities

A contingency is an existing condition, situation, or set of circumstances involving uncertainty as to possible gain or loss. The uncertainty will ultimately be resolved when one or more future events occur or fail to occur. USGS recognizes a contingent liability when a past event or exchange transaction has occurred and a future outflow or other sacrifice of resources is measurable and probable. A contingency is disclosed in the Notes to the Financial Statements when any of the conditions for liability recognition are met and when the chance of the future confirming event or events occurring is more than remote but less than probable. A contingency is not disclosed in the Notes to the Financial Statements when any of the conditions for liability recognition are not met and when the chance of the future event or events occurring is remote.

Q. Income Taxes

The USGS, as a Federal agency, is not subject to Federal, State, or local income taxes and, accordingly, no provision for income taxes has been recorded in the accompanying financial statements.

R. Use of Estimates

The preparation of financial statements in accordance with accounting principles generally accepted in the United States of America requires management to make certain estimates and assumptions in reporting assets, liabilities, revenues, expenses, and financial sources; and in the related note disclosures. Actual results could differ from these estimates. Significant estimates underlying the accompanying financial statements include accounts payable; the allowance for doubtful accounts receivable; property, plant, and equipment useful lives and impairments; contingent and environmental liabilities; the FECA actuarial liability; and the allowance for obsolete inventory.

S. Reclassifications

Certain reclassifications have been made to the 2003 balances to conform to the 2004 presentation.

Note 2 Fund Balance with Treasury

Fund Balance with Treasury consists of the following at September 30:

		2004	2003
General funds	$	136,992	105,229
Special funds		1,798	2,984
Revolving funds		85,133	84,029
Trust funds		1,509	1,376
Other funds		9,351	11,640
Total	$	234,783	205,258

USGS maintains balances with Treasury by fund type. The fund types and purpose are described below:

General funds – These funds consist of expenditure accounts used to record financial transactions arising from Congressional appropriations.

Special funds – These accounts are credited with receipts from special sources that are earmarked by law for a specific purpose. When collected, these receipts are available immediately for expenditure for special programs, such as providing housing for employees on field assignments, operations and maintenance for the temporary housing, cleanup associated with the Exxon Valdez oil spill, and operating science and cooperative programs.

Revolving funds – These funds account for cash flows to and from the government resulting from operations of the Working Capital Fund and do not fund normal operating expenses of the Bureau. These funds are also restricted to the purposes set forth in the legislation that established the Working Capital Fund and related investment plans.

Trust funds – These funds are used for the acceptance and administration of funds contributed from public and private sources and programs in cooperation with other Federal and State agencies or private donors.

Other Fund Types – These include miscellaneous receipt accounts, transfer accounts, performance bonds, deposit and clearing accounts maintained to account for receipts, and disbursements awaiting proper classification.

Status of Fund Balance with Treasury at September 30 is as follows:

		2004	2003
Unobligated balances:			
Available	$	95,910	110,355
Unavailable		34,548	57,340
Obligated balances not yet disbursed		104,325	37,563
Total	$	234,783	205,258

Unobligated, unavailable fund balance represents amounts in deposit and budget clearing accounts and amounts from appropriations for which the period of availability for obligation has expired. These balances remain available for upward adjustments of obligations incurred during the period for which the appropriation was available.

Note 3 Non-Entity Assets

Non-entity assets include amounts receivable to USGS from accrued interest and penalties on delinquent debt. A corresponding payable to Treasury is recorded in other liabilities.

		2004	2003
Fund balance with Treasury	$	231	220
Total non-entity assets		231	220
Total entity assets		573,543	604,815
Total assets	$	573,774	605,035

Note 4 Accounts and Interest Receivable, Net

Accounts receivable consist of amounts owed to the USGS by other Federal agencies and the public. Unbilled accounts receivable represents amounts that have been earned but not yet billed to reimbursable customers. This account functions much like a "work-in-process" record of the costs incurred on customer agreements. Due to the nature of agreements with reimbursable customers that frequently require invoicing upon completion of the work, USGS sometimes bills customers years after the project was initiated. This procurement practice results in the majority of accounts receivable being comprised of unbilled balances.

Accounts receivable are reduced to net realizable value by an allowance for doubtful accounts. Federal receivables are considered fully collectible. The allowance for public receivables is estimated quarterly based on identification of specific delinquent receivables, an analysis of aged receivable activity and historical trends adjusted for current market conditions, as well as management's judgment regarding the debtor's willingness and ability to pay.

Interest receivable represents interest income earned on outstanding receivables that has not yet been collected. Interest accrues on a daily basis beginning thirty days from the date the notice of amount due was sent. Interest is charged at the rate established by the Secretary of the Treasury.

Accounts and Interest Receivable at September 30, 2004 and 2003, respectively, consists of:

		2004	2003
Accounts and Interest Receivable from Federal Agencies			
Current	$	6,454	1,271
1-180 Days Past Due		255	4,755
181-365 Days Past Due		276	-
Over 1 Year Past Due		2	500
Total Billed Accounts and Interest Receivable - Federal		6,987	6,526
Unbilled Accounts Receivable		53,789	74,563
Total Accounts and Interest Receivable - Federal		60,776	81,089
Allowance for Doubtful Accounts - Federal		-	-
Total Accounts and Interest Receivable - Federal, Net of Allowance	Total $	60,776	81,089

Accounts and Interest Receivable from Public Agencies			
Current	$	17,553	18,378
1-180 Days Past Due		8,771	10,628
181-365 Days Past Due		686	739
Over 1 Year Past Due		203	349
Total Billed Accounts and Interest Receivable - Public		27,213	30,094
Unbilled Accounts Receivable		55,562	64,667
Total Accounts and Interest Receivable - Public		82,775	94,761
Allowance for Doubtful Accounts - Public		(1,691)	(3,329)
Total Accounts and Interest Receivable - Public, Net of Allowance Total	$	81,084	91,432
Change in Allowance for Doubtful Accounts - Public			
Allowance for Doubtful Accounts, beginning	$	3,329	12,351
Additions		-	-
Deletions		(1,640)	(9,022)
Allowance for Doubtful Accounts - Public	$	1,691	3,329

Note 5 Deferred Revenue, Deferred Credits, and Deposit Fund Liability

Deferred revenue and deferred credits represent receipts of funds for reimbursable work not yet provided to public and Federal entities. Revenue is recognized as reimbursable costs are incurred, and the deferred revenue balance is reduced accordingly.

In some instances, USGS is a party to long-term fixed price agreements that may result in gains or losses in future periods.

The deposit fund liability represents receipts of funds held on deposit prior to completion of a signed agreement to provide reimbursable services to public and Federal entities. The deposit fund liability also consists of monies that were not obligated prior to the agreement expiration that are funded by annual year appropriations, which will be returned to the customer.

		2004	2003
Deferred revenue			
Received from Federal agencies	$	1,744	2,835
Received from the Public		1,474	1,141
Total deferred revenue	$	3,218	3,976
Deferred credits			
Received from Federal agencies	$	-	-
Received from the Public		238	135
Total deferred credits	$	238	135
Deposit Fund Liability			
Received from Federal agencies	$	2,997	7,262
Received from the Public		5,939	4,378
Total deposit fund liability	$	8,936	11,640

Note 6 Inventory

Inventory consists of the following at September 30, 2004 and 2003:

		2004	2003
Finished inventory	$	10,070	10,859
Raw materials		1,252	1,056
Allowance for obsolescence		(8,889)	(9,520)
Total	$	2,433	2,395

USGS disseminates earth, water, and biological science information through various media, including maps, reports, digital data sets, and general interest publications of the USGS and other Federal agencies. Maps and map products are located at the USGS Rocky Mountain Mapping Center in Denver, Colorado, and at several Earth Science Information Centers across the United States. The USGS maintains an inventory of maps and map products that are available to respond to national emergencies and resource management needs, as well as governmental requests.

Note 7 Property, Plant, and Equipment

Property, plant, and equipment consist of the following at September 30, 2004:

		Cost	Accumulated Depreciation		Net Book Value
Land	$	300	-	$	300
Construction in process		6,514	-		6,514
Buildings		100,007	68,040		31,967
Leasehold improvements		23,720	2,504		21,216
Structures and facilities		12,980	9,201		3,779
Equipment		465,756	346,600		119,156
Software in use		8,655	2,914		5,741
Software in development		2,096	-		2,096
Total	$	620,028	429,259	$	190,769

Property, plant, and equipment consist of the following at September 30, 2003:

		Cost	Accumulated Depreciation		Net Book Value
Land	$	300	-	$	300
Construction in process		1,352	-		1,352
Buildings		99,997	64,980		35,017
Leasehold improvements		26,051	-		26,051
Structures and facilities		12,980	8,793		4,187
Equipment		469,231	322,041		147,190
Software in use		8,032	1,581		6,451
Software in development		1,578	-		1,578
Total	$	619,521	397,395	$	222,126

Depreciation expense amounted to approximately $48.3 million and $73 million, for the years ended September 30, 2004 and 2003 (unaudited), respectively. Impairment of property, plant, and equipment was recognized in 2003 for $81.1 million (see Note 8).

Note 8 Property, Plant, and Equipment Impairment

The USGS jointly developed a sun-synchronous, earth-orbiting satellite (Landsat 7) with the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration. NASA incurred the construction and launching costs. In FY2002, the satellite was transferred to USGS and recorded in equipment at its net book value of $258 million. The satellite is being depreciated over its estimated useful life of five years.

The primary objective of the Landsat Project is to ensure a collection of consistently calibrated Earth imagery. Landsat's Global Survey Mission is to establish and execute a data acquisition strategy that ensures repetitive acquisition of observations over the Earth's land mass, coastal boundaries, and coral reefs; and to ensure the data acquired are of maximum utility in supporting the scientific objectives of monitoring changes in the Earth's land surface and associated environment.

On May 31, 2003, the Landsat 7 satellite suffered a component failure that affected the USGS's ability to acquire and distribute data collected by the Enhanced Thematic Mapper Plus instrument, resulting from a failure of the instrument's scan line corrector (SLC). The non-functioning SLC causes individual scan lines to alternately overlap and leave large gaps at the edges of a normal Landsat image.

USGS assembled an anomaly team comprised of a variety of experts and collaborated with NASA, the Aerospace Corporation, Lockheed Martin, Honeywell, Raytheon, SAIC, and others to develop a recovery plan which was approved by USGS leadership. Unfortunately, the full recovery attempt that took place on September 7, 2003, failed.

Subsequent tests and the failed full recovery attempt confirmed that, while it is not possible to acquire 100 percent of the data in a post-failure image, approximately 75 percent of a pre-failure image is still captured. It is also possible, using basic interpolation algorithms, to "fill in" some of the missing pixels toward the center portion of a scene in order to generate a more complete image.

As of May 31, 2003, the net book value of Landsat 7 was $172 million. Based on an internal analysis taking into consideration the diminished capacity of the asset and the potential future marketability of the product sales generated by the asset, USGS management estimated that an economic impairment loss of $81.1 million should be recognized in the FY2003 Statement of Net Cost. Combined with normal depreciation of $16.8 million of the asset for the months of June through September, the remaining net book value of the Landsat 7 satellite was approximately $48.8 million and $74.1 million at September 30, 2004 and 2003, respectively.

At the point of impairment, the normal depreciation rate estimate was changed to equal the net book value at May 31, 2003, divided by the remaining useful life previously established. The following tables reflect the impact of the impairment loss on the financial statements as of and for the year ended September 30, 2004 and 2003, respectively:

2004		**Net Costs**	**Net Position**	**P,P,&E, net**
Reduction in normal depreciation expense	$	(26,062)	26,062	26,062
2003				
Impairment loss		81,100	(81,100)	(81,100)
Reduction in normal depreciation expense		(8,400)	8,400	8,400
Net financial impact	$	72,700	(72,700)	(72,700)

Note 9 Liabilities Not Covered by Budgetary Resources

Liabilities not covered by budgetary or other resources represent amounts owed in excess of available Congressional appropriated funds or other amounts. The liquidation of liabilities not covered by budgetary or other resources is dependent on future Congressional appropriations or other funding source.

	Covered by Budgetary Resources		Not Covered by Budgetary Resources		
	Current	Non-current	Current	Non-current	2004
Intragovernmental					
Accounts payable	$ 9,885	-	-	-	$ 9,885
Accrued payroll and benefits	4,414	-	-	-	4,414
FECA workers compensation liability	-	-	3,176	4,765	7,941
Deferred revenue	1,744	-	-	-	1,744
Deposit fund liability	-	-	2,997	-	2,997
GSA tenant improvement liability	-	-	4,379	16,837	21,216
Other liabilities	-	-	231	-	231
Total intragovernmental	16,043	-	10,783	21,602	48,428
Public					
Accounts payable	82,711	-	-	-	82,711
Accrued payroll and benefits	22,309	-	-	2,297	24,606
Annual leave liability	-	-	2,883	54,769	57,652
Deferred revenue	1,474	-	-	-	1,474
Deferred credits	-	-	238	-	238
Deposit fund liability	-	-	5,939	-	5,939
Environmental cleanup liabilities	-	-	-	1,097	1,097
Contingent liabilities	-	-	-	20,971	20,971
FECA actuarial liability	-	-	-	40,569	40,569
Other liabilities	-	-	-	1,038	1,038
Total public	106,494	-	9,060	120,741	236,295
Total liabilities	$ 122,537	-	19,843	142,343	$ 284,723

	Covered by Budgetary Resources		Not Covered by Budgetary Resources		
	Current	Non-current	Current	Non-current	2003
Intragovernmental					
Accounts payable	$ 8,940	-	-	-	$ 8,940
Accrued payroll and benefits	3,206	-	-	4,161	7,367
FECA workers compensation liability	-	-	3,172	4,757	7,929
Deferred revenue	2,835	-	-	-	2,835
Deposit fund liability	-	-	7,262	-	7,262
GSA tenant improvement liability	-	-	3,664	22,387	26,051
Other liabilities	-	-	220	-	220
Total intragovernmental	14,981	-	14,318	31,305	60,604
Public					
Accounts payable	62,423	-	-	-	62,423
Accrued payroll and benefits	16,975	-	-	-	16,975
Annual leave liability	-	-	2,720	51,670	54,390
Deferred revenue	1,141	-	-	-	1,141
Deferred credits	-	-	135	-	135
Deposit fund liability	-	-	4,378	-	4,378
Environmental cleanup liabilities	-	-	-	507	507
Contingent liabilities	-	-	-	20,638	20,638
FECA actuarial liability	-	-	-	42,816	42,816
Other liabilities	-	-	-	1,181	1,181
Total public	80,539	-	7,233	116,812	204,584
Total liabilities	$ 95,520	-	21,551	148,117	$ 265,188

Note 10 FECA Liabilities

USGS has recorded an estimated, unfunded liability for the expected future cost for death, disability, and medical claims under the Federal Employees Compensation Act of approximately $40.6 million and $42.8 million as of September 30, 2004 and 2003, respectively. This estimated liability is calculated by the Department of Labor using a method that considers historical benefit payment patterns, wage inflation factors, medical inflation factors, and other variables. These actuarially computed projected annual benefit payments are discounted to present value using the Office of Management and Budget's economic assumptions for ten-year Treasury notes and bonds.

The Department of Labor calculated the estimated future benefit payments based on several assumptions. The interest rate assumptions utilized to discount the estimated future benefit payments to present value are 4.88 percent in year one and thereafter. The wage inflation factors (Cost of Living Adjustments) and medical inflation factors (Consumer Price Index Medical Adjustments) used in the calculation are presented in the following table.

	2004		2003	
Fiscal Year	Cost of living adjustment	Consumer Price Index Medical adjustment	Cost of living adjustment	Consumer Price Index Medical adjustment
2005	2.03%	4.14%	2.00%	3.54%
2006	2.73%	3.96%	1.83%	3.64%
2007	2.40%	3.98%	1.97%	3.80%
2008	2.40%	3.99%	2.17%	3.92%
2009	2.40%	4.02%	2.17%	3.92%
Thereafter	2.40%	4.02%	2.17%	3.92%

USGS also recorded an estimated, unfunded liability for the expected future payments to the Department of Labor in payment of outstanding workers compensation claims of approximately $7.9 million as of September 30, 2004 and 2003.

Note 11 Leases and Occupancy Agreements

The USGS has many cancelable occupancy agreements with the General Services Administration (GSA), primarily for office space. Many of these agreements do not have a stated expiration. USGS also has many operating leases, primarily for storage and housing for employees working on location, with public entities. USGS has estimated its future minimum liability for GSA occupancy agreements by adding OMB approved inflationary rate increases per year to the FY2004 lease rental expense. Public operating leases were calculated based on lease agreement terms. Future estimated minimum lease payments as of September 30, 2004 are:

	Real property		Personal property		
Fiscal Year	Federal	Non-Federal	Federal	Non-Federal	Total
2005	$ 71,812	2,400	-	7	$ 74,219
2006	63,909	2,072	-	5	65,986
2007	58,397	1,935	-	-	60,332
2008	52,646	1,881	-	-	54,527
2009	35,371	1,661	-	-	37,032
Thereafter	125,780	6,646	-	-	132,426
Total	$ 407,915	16,595	-	12	$ 424,522

Rental expenses for occupancy agreements, operating leases, and exhibit hall space during FY2004 and FY2003 were approximately $75.4 and $85 million respectively (unaudited in 2003).

In some cases, USGS secures funds from GSA's building fund to finance improvements made to space where USGS is the tenant. Because these improvements are made to convert the existing structures into workable space tailored to USGS needs, USGS is required to repay GSA the cost of the improvements over the term of the occupancy agreement, which is incorporated into the total rent payments billed to USGS by GSA. The principal loan balance of approximately $21.2 and $26 million at September 30, 2004 and 2003, respectively, is recorded as a liability and the corresponding leasehold improvements are recorded in Property, Plant & Equipment, which are amortized over the period of the occupancy agreements.

Note 12 Environmental and Contingent Liabilities

The USGS is a party to various administrative proceedings, legal actions, environmental suits, and claims that may eventually result in the payment of substantial monetary claims to third parties, or in the unplanned reallocation of material budgetary resources to pay for the cleanup of environmentally damaged sites.

The potential liability for legal claims deemed to be probable of loss cannot be reasonably estimated by Interior's Office of the Solicitor as the claims are in a discovery stage or other factors are present that prevent such an estimation of loss. Accordingly, USGS has not accrued any legal liabilities in the Consolidated Balance Sheet for such claims. However, the payment of any judgments against USGS would be made from the U.S. Department of Treasury's Judgment Fund.

Additionally, USGS has several cases that the Solicitor believes are reasonably possible of loss, some of which cannot be estimated. The range of loss for reasonably possible cases that could be estimated by the Solicitor was approximately $3 million to $9 million at September 30, 2004 and 2003.

The USGS has accrued the probable and estimable liability represented by site cleanup, primarily of contaminated groundwater, and for the removal of equipment and land restoration for abandoned data collection stations, observation well sites, and river cableway sites.

USGS changed its classification policy for environmental cleanup costs in FY2004 to include all projects that have estimated environmental remediation costs, and to exclude the non-remediation costs associated with the destruction of wells where the Bureau is liable to do so from the environmental cleanup costs estimate. As such, USGS reclassified the portion of the FY2003 environmental cleanup cost estimate associated with well destruction to contingent liabilities, providing a more comparative footnote analysis below.

Changes in existing estimated environmental cleanup costs are based on progress made in, and revision of, the cleanup plans assuming current technology, laws, and regulations. There are no material changes in total estimated cleanup costs that are due to changes in technology, laws, and regulations. Estimated contingent and environmental liabilities at September 30, 2004 and 2003 are:

		2004	2003
Estimated environmental cleanup costs	$	1,097	507
Contingent Liabilities:			
Abandoned sites		20,971	20,638
Total	$	22,068	21,145

Note 13 Imputed Financing Costs

Imputed financing sources are recorded in the financial statements for amounts paid or to be paid on behalf of the USGS by other Federal agencies. The Office of Personnel Management (OPM) pays Federal employee pension and other future retirement benefits on behalf of Federal agencies. OPM provided rates for recording the estimated cost of pension and other future retirement benefits paid by OPM on behalf of Federal agencies. The costs of these benefits are reflected as imputed financing in the consolidated financial statements. Imputed financing costs for the years ended September 30, 2004 and 2003 consisted of:

		2004	(Unaudited) 2003
OPM:			
Pension expense	$	26,872	26,057
Federal employees health benefits		34,249	30,024
Federal employees group life insurance program		90	84
Total OPM		61,213	56,165
Non-reimburseable claims paid by the Treasury Judgment Fund		29	72
Total	$	61,242	56,237

Note 14 Statements of Net Cost by Segment

Consistent with the FY2003 presentation, USGS's four responsibility segments within the Statement of Net Cost represent the major operating segments by which achievement of USGS's mission and goals are measured: Biology, Water, Geology, and Geography.

As discussed in the Management Discussion and Analysis – Strategic Goals section, DOI changed its GPRA goals and created a unified strategic plan for the Department as a whole. In this process, the previous five DOI GPRA goals (one of which was primarily supported by USGS) were replaced with four GPRA mission areas, supported by seventeen Department-level end outcome goals. USGS activities in FY2004 correspond to all of the new DOI GPRA goals (except providing recreation) and six of the DOI's seventeen end outcome goals, which are presented in the FY2004 Statement of Net Cost by responsiblity segment. The FY2003 Statement of Net Cost by responsiblity segment is presented reflecting the USGS' two major GPRA program activities, Hazards, and Environmental and Natural Resources, that directly correlated to the Bureau's old strategic plan, which has been replaced by the Department unified strategic plan.

As discussed in Note 8, in FY2003, USGS experienced an unusual and infrequent event that resulted in the partial loss of value and operating capacity of our Landsat 7 satellite. This significant and unusual accounting event is shown on our Statement of Net Cost as a non-production asset impairment cost outside of normal operations.

The following tables reflect USGS net cost by responsibility segment for the years ended September 30, 2004, and 2003, respectively.

The Department of Interior

United States Geological Survey

Consolidating Schedule of Net Cost

For the Years Ended September 30, 2004

(in thousands)

	Geology	Water	Geography	Biology	Eliminations	Total
Advance Knowledge through Scientific Leadership						
Intragovernmental Gross Cost	$ 11,313	146,738	37,600	4,812	(36,465)	$ 163,998
Less: Intragovernmental Earned Revenue	10,877	140,591	36,348	4,633	(36,465)	155,984
Intragovernmental Net Cost	436	6,147	1,252	179	-	8,014
Gross Costs with the Public	123,293	469,943	187,311	45,091		825,638
Less: Earned Revenues from the Public	6,639	139,495	19,961	76		166,171
Net Costs with the Public	116,654	330,448	167,350	45,015	-	659,467
Total Net Cost	117,090	336,595	168,602	45,194	-	667,481
Protect Lives, Resources, and Property						
Intragovernmental Gross Cost	10,539	-	-	-	(464)	10,075
Less: Intragovernmental Earned Revenue	10,154	-	-	-	(464)	9,690
Intragovernmental Net Cost	385	-	-	-	-	385
Gross Costs with the Public	97,361	-	-	-		97,361
Less: Earned Revenues from the Public	1,440	-	-	-		1,440
Net Costs with the Public	95,921	-	-	-	-	95,921
Total Net Cost	96,306	-	-	-	-	96,306
Sustain Biological Communities						
Intragovernmental Gross Cost	-	-	-	25,342	(631)	24,711
Less: Intragovernmental Earned Revenue	-	-	-	24,349	(631)	23,718
Intragovernmental Net Cost	-	-	-	993	-	993
Gross Costs with the Public	-	-	-	117,779		117,779
Less: Earned Revenues from the Public	-	-	-	1,766		1,766
Net Costs with the Public	-	-	-	116,013	-	116,013
Total Net Cost	-	-	-	117,006	-	117,006
Improve Health of Watersheds and Landscapes						
Intragovernmental Gross Cost	-	-	-	38,260	(587)	37,673
Less: Intragovernmental Earned Revenue	-	-	-	36,873	(587)	36,286
Intragovernmental Net Cost	-	-	-	1,387	-	1,387
Gross Costs with the Public	-	-	-	85,554		85,554
Less: Earned Revenues from the Public	-	-	-	6,693		6,693
Net Costs with the Public	-	-	-	78,861	-	78,861
Total Net Cost	-	-	-	80,248	-	80,248
Manage or Influence Resources - Energy						
Intragovernmental Gross Cost	1,828	-	-	-	(138)	1,690
Less: Intragovernmental Earned Revenue	1,748	-	-	-	(138)	1,610
Intragovernmental Net Cost	80	-	-		-	80
Gross Costs with the Public	26,954	-	-	-		26,954
Less: Earned Revenues from the Public	83	-	-	-		83
Net Costs with the Public	26,871	-	-		-	26,871
Total Net Cost	26,951	-	-	-	-	26,951
Manage or Influence Resources - Non-Energy						
Intragovernmental Gross Cost	4,195	-	-	-	(354)	3,841
Less: Intragovernmental Earned Revenue	3,998	-	-	-	(354)	3,644
Intragovernmental Net Cost	197	-	-		-	197
Gross Costs with the Public	61,944	-	-	-		61,944
Less: Earned Revenues from the Public	558	-	-	-		558
Net Costs with the Public	61,386	-	-		-	61,386
Total Net Cost	61,583	-	-	-	-	61,583
Total						
Intragovernmental Gross Cost	27,875	146,738	37,600	68,414	(38,639)	241,988
Less: Intragovernmental Earned Revenue	26,777	140,591	36,348	65,855	(38,639)	230,932
Intragovernmental Net Cost	1,098	6,147	1,252	2,559	-	11,056
Gross Costs with the Public	309,552	469,943	187,311	248,424		1,215,230
Less: Earned Revenues from the Public	8,720	139,495	19,961	8,535		176,711
Net Costs with the Public	300,832	330,448	167,350	239,889	-	1,038,519
Total Net Cost of Operations	$ 301,930	336,595	168,602	242,448	-	$ 1,049,575

The Department of Interior

United States Geological Survey

Consolidating Schedule of Net Cost (Unaudited)

For the Years Ended September 30, 2003

(in thousands)

	2003 (Unaudited)					
	Geology	Water	Geography	Biology	Eliminations	Total
Environmental and Natural Resources						
Intragovernmental Gross Cost	$ 21,687	104,580	29,448	71,099	(28,983)	$ 197,831
Less: Intragovernmental Earned Revenue	21,250	101,099	28,087	70,659	(28,983)	192,112
Intragovernmental Net Cost	437	3,481	1,361	440	-	5,719
Gross Costs with the Public	228,347	405,065	128,650	186,589	-	948,651
Less: Earned Revenues from the Public	8,641	95,267	24,865	3,326	-	132,099
Net Costs with the Public	219,706	309,798	103,785	183,263	-	816,552
Total Net Cost	220,143	313,279	105,146	183,703	-	822,271
Hazards						
Intragovernmental Gross Cost	5,980	30,007	-	-	(2,514)	33,473
Less: Intragovernmental Earned Revenue	5,698	29,127	-	-	(2,514)	32,311
Intragovernmental Net Cost	282	880	-	-	-	1,162
Gross Costs with the Public	134,605	94,336	-	-	-	228,941
Less: Earned Revenues from the Public	5,151	28,923	-	-	-	34,074
Net Costs with the Public	129,454	65,413	-	-	-	194,867
Total Net Cost	129,736	66,293	-	-	-	196,029
Costs not assigned to any program						
Asset Impairment (Note 8)	-	-	81,100	-	-	81,100
Total						
Intragovernmental Gross Cost	27,667	134,587	29,448	71,099	(31,497)	231,304
Less: Intragovernmental Earned Revenue	26,948	130,226	28,087	70,659	(31,497)	224,423
Intragovernmental Net Cost	719	4,361	1,361	440	-	6,881
Gross Costs with the Public	362,952	499,401	128,650	186,589	-	1,177,592
Less: Earned Revenues from the Public	13,792	124,190	24,865	3,326	-	166,173
Net Costs with the Public	349,160	375,211	103,785	183,263	-	1,011,419
Asset Impairment (Note 8)	-	-	81,100	-	-	81,100
Total Net Cost of Operations	$ 349,879	379,572	186,246	183,703	-	$ 1,099,400

Note 15 Budgetary Resources

The USGS receives budgetary resources from appropriations, offsetting receipts, and reimbursable activities. At September 30, 2004 and 2003, respectively, approximately $120.3 and $155.5 million of the budgetary resources were unobligated. These amounts include expired budget authority of $25.2 and $45.7 million at September 30, 2004 and 2003, respectively. The expired funds remain available for up to five years to pay expenses against obligations incurred.

		Apportioned		
2004		**Category A**	**Category B**	**Not Subject to Apportionment**
Obligations Incurred:				
Direct	$	-	982,482	-
Reimburseable		-	441,467	-
Total	$	-	1,423,949	-

		Apportioned		
2003 (Unaudited)		**Category A**	**Category B**	**Not Subject to Apportionment**
Obligations Incurred:				
Direct	$	-	908,078	-
Reimburseable		-	434,661	-
Total	$	-	1,342,739	-

The Statement of Budgetary Resources has been prepared to coincide with the President's Budget (the Budget of the United States Government). The FY2004 actual amounts as shown on the FY2006 President's Budget were not available at the time the financial statements were prepared. The FY2006 President's Budget is expected to be available in February 2005 and will be located at http://www.whitehouse.gov/omb.

USGS had differences that existed between the FY2003 Statement of Budgetary Resources and the FY2003 actual amounts reported in the President's FY2005 budget request. The differences relate to amounts posted to expired accounts per the President's Budget that are not reported on the Statement of Budgetary Resources.

Recoveries of prior year obligations are comprised of canceled or downward adjustments of obligations incurred in prior years that were not subsequently disbursed. Resources permanently not available were adjusted pursuant to Public Law 114 Stat 2763A-214, SEC 1403. Canceled authority is returned to the U.S. Treasury at the end of the fifth year of availability for annual and multi-year funds under Public Law 101-510.

Budget and performance integration, highlighted by the President's Management Agenda, lies at the heart of ensuring both the strategic allocation of funds and their efficient use. The USGS approach to this integration extends beyond the cyclic budget-formulation process to include establishing cost and performance information systems that allow employees, managers, and the public to better understand unit costs of performing specific activities, as well as the relationship of those activities to achieving measureable goals and opportunities for greater efficiency and effectiveness.

Note 16 Allocation Transfers

There is a relationship between certain line items reported on the Consolidated Statement of Financing under "Total components of net cost of operations that will require or generate resources in future periods" and the change in components of costs that are included in liabilities not covered by budgetary resources reported in note 9.

The USGS is a recipient of allocation transfers of funds from the Bureau of Land Management, Department of State, and the DOI Office of the Secretary.

The total components of net cost of operations related to transfer accounts where budgetary activity is reported by parent Federal entities that occurred during the years ended September 30, 2004 and 2003, respectively, consist of:

		Reconciling Amount	
Appropriation	Trading Partner, Nature of Transfer	2004	(Unaudited) 2003
14-19-4-1082.08	State Department:		
	American Section - International Commissions	$ 58	524
14x1121	DOI-Bureau of Land Management:		
	Government Hill Central Hazardous Material Fund Site	-	8
14x5198.008	DOI-Departmental Offices:		
	Natural Resource Damage Assessment & Restoration	1,089	925
14-14x1618.008	DOI-Departmental Offices:		
	Natural Resource Damage Assessment & Restoration	99	9
	Total	$ 1,246	1,466

"The Internet has provided us with a powerful communication tool that has an incredible return on the investment that the public makes to support the USGS and its science. We are mindful that we are a public science agency, supported by the taxpayers of this country, and it is a privilege to lead this organization as it marks a significant milestone in its history. We are using our 125th anniversary year to celebrate the past, to showcase how we are meeting the challenges of the present, and how we are preparing for the future with the science that society needs to face the issues of tomorrow and beyond." *Chip Groat, USGS Director*

Section III
Required Supplemental Information

USGS scientist studying acidic water levels in a local stream.

Contents

Combining Statements of Budgetary Resources by Major Budget Accounts 82
Working Capital Fund 86
Deferred Maintenance..... 89

Combining Statements of Budgetary Resources by Major Budget Accounts

Surveys, Investigations, and Research (Treasury Symbol 0804)

The USGS is primarily funded by the Surveys, Investigations, and Research (SIR) appropriation. The SIR appropriation is for expenses necessary for the USGS to perform surveys, investigations, and research covering geography, geology, hydrology, biology, and the mineral and water resources of the United States, its territories and possessions, and other areas authorized by law; classify lands as to their mineral and water resources; give engineering supervision to power permittees and Federal Energy Regulatory Commission licensees; administer the minerals exploration program, and publish and disseminate data relative to the foregoing activities; and to conduct inquires into the economic conditions affecting mining and materials processing industries and related purposes as authorized by law. [Department of the Interior and Related Agencies Appropriations Act, 2004]

The following activities are funded by the SIR appropriation: mapping, remote sensing, and geographic investigations; geologic hazards, resources, and processes; water resources investigations; biological research; science support; and facilities. Each activity is described below.

Geography

The mapping, remote sensing, and geographic investigations activity provides data essential to making informed decisions about complex natural resource, environmental, and hazards issues, as well as public health, land management, and emergency response issues.

USGS efforts in this program are focused on improving geospatial data access, integration, and applications through implementation of the National Map and the National Spatial Data Infrastructure. Partnerships with other Federal, State, and local agencies, the private sector, and academia are the keystone for accomplishing this mission. USGS also provides scientific information to describe and interpret America's landscape by mapping the terrain, monitoring changes over time, and analyzing how and why these changes have occurred. The knowledge gained through these activities is used to model the processes of change and to forecast future events.

The mapping, remote sensing, and geographic investigations program is funded in three subactivities: cooperative topographic mapping, land remote sensing, and geographic analysis and monitoring.

Geology

The geologic hazards, resources, and processes programs provide information used to evaluate resource potential, to define risks associated with natural hazards, and to characterize the potential impact of natural geologic processes on human activity, the economy, and the environment.

The national program of onshore and offshore geologic research and investigations produces: (1) information on natural hazards of geologic origin such as earthquakes, volcanic eruptions, landslides, and coastal erosion; (2) geologic information for use in the management of public lands and in national policy determinations; (3) information on the chemistry and physics of the earth, its past climate, and the geologic processes by which it was formed and is being modified; (4) geologic, geophysical, and geochemical maps and analyses to address environmental, energy and mineral resource, and hazards concerns; (5) hazards, energy and mineral resource, and environmental assessments; and (6) improved methods and instrumentation for detecting and monitoring hazards, disseminating hazards information, and conducting assessments.

The geologic hazards, resources, and processes activity is funded into three subactivities: geologic hazard assessment, geologic landscape and coastal assessments, and geologic resource assessments.

Water

The water resources investigation programs fund work on issues related to water availability, water quality and flood hazards. Over 4,000 scientist and support staff in offices located in every state support work for water resources investigations.

USGS efforts in these water programs produce data, analyses, assessments, and methodologies to support Federal, State, tribal and local government decisions on water planning, water management, water quality, flood forecasting and warning, and enhancement of the quality of the environment. USGS programs also work

cooperatively with other Federal agencies, States, and other entities to leverage Federal resources to meet their mutual water information needs.

The Water Resources activity is funded in four subactivities: hydrologic monitoring, assessments and research, cooperative water program, and the Water Resources Research Act Program.

Biology

The biological research programs generate and distribute information needed in the conservation and management of the Nation's biological resources. Biological research also contributes to improved management of the Nation's water resources, availability of maps and map data, and improved decisionmaking regarding land and water use.

The national program of biological research: (1) conducts biological resources inventory and monitoring; (2) provides scientific information for the management of biological resources; and (3) predicts the consequences of environmental change and the effects of alternative management actions on plants, animals, and their habitats. The program conducts the high priority biological research needed by DOI's land management Bureaus and operates the cooperative research unit program that provides research and information to resource managers and trains natural resource professionals in partnership with university and State scientists.

The biological resources activity is funded in three subactivities: biological research and monitoring, biological information and management delivery, and cooperative research units.

Support Services

The science support activity provides resources for the executive and managerial direction of the Bureau and support services, including human resources and fiscal management, and systems support, to all USGS scientific programs. Science Support is funded in two major programs: bureau operations and payments to the National Business Center.

The facilities support activity provides workspace and facilities for accomplishing the Bureau mission. Facilities is funded in three major programs: rental payments, operations and maintenance, and deferred maintenance and capital improvement.

Working Capital Fund (Treasury Symbol 4556)

The Working Capital Fund was established by law to provide USGS with the ability to finance a continuing cycle of operations in two components: investments and fee-for-service. The investment component provides funding for telecommunications, equipment, facilities, and publications. The fee-for-service component provides continuing funding for the National Water Quality Laboratory, USGS Hydrologic Instrumentation Facility, publications, Eastern Region Research Laboratory, the National Training Center, drilling, and GSA delegated buildings.

Other Aggregated Accounts

The USGS also receives a variety of other funding. Other appropriations include: donations and contributions; reimbursables; miscellaneous receipts; natural resource damage assessment; and operations and maintenance of quarters.

The Department of Interior

United States Geological Survey

Combining Statement of Budgetary Resources

For the Year Ended September 30, 2004

(in thousands)

FY2004	Fund 0804	Fund 4556	Small Funds	Total
Budgetary resources:				
Budget authority:				
Appropriations received	$ 949,686	-	1,695	$ 951,381
Unobligated balance:				
Beginning of fiscal year	78,629	74,704	2,148	155,481
Spending authority from offsetting collections:				
Earned:				
Collected	438,940	53,837	-	492,777
Receivable from Federal sources	(31,514)	-	-	(31,514)
Change in unfilled customer orders:				
Advance received	(1,165)	-	-	(1,165)
Without advance from Federal sources	(16,761)	-	-	(16,761)
Recoveries of prior year obligations	10,744	384	63	11,191
Permanently not available	(17,131)	-	-	(17,131)
Total budgetary resources	$ 1,411,428	128,925	3,906	$ 1,544,259
Status of budgetary resources:				
Obligations incurred:				
Direct	$ 979,877	-	2,605	$ 982,482
Reimbursable	385,252	56,215	-	441,467
Subtotal	1,365,129	56,215	2,605	1,423,949
Unobligated balance available, apportioned	21,101	72,710	1,301	95,112
Unobligated balance not available	25,198	-	-	25,198
Total status of budgetary resources	$ 1,411,428	128,925	3,906	$ 1,544,259
Relationship of obligations to outlays:				
Obligations incurred	$ 1,365,130	56,215	2,604	$ 1,423,949
Obligated balance, net, beginning of fiscal year	26,311	9,325	1,592	37,228
Obligated balance, net, end of fiscal year:				
Accounts receivable	142,793	-	-	142,793
Unfilled customer orders from Federal sources	42,714	-	-	42,714
Undelivered orders	(162,251)	(7,383)	(524)	(170,158)
Accounts payable	(113,727)	(5,040)	(334)	(119,101)
Less: Spending authority adjustments	37,531	(384)	(63)	37,084
Outlays:				
Disbursements	1,338,501	52,733	3,275	1,394,509
Collections	(437,777)	(53,836)	-	(491,613)
Subtotal	900,724	(1,103)	3,275	902,896
Less: Offsetting receipts	-	-	(1,695)	(1,695)
Net outlays	$ 900,724	(1,103)	1,580	$ 901,201

See accompanying Independent Auditors' Report in Section V of this Performance and Accountability Report.

The Department of Interior

United States Geological Survey

Combining Statement of Budgetary Resources

For the Year Ended September 30, 2003

(in thousands)

FY2003 (Unaudited)

	Fund 0804	Fund 4556	Small Funds	Total
Budgetary resources:				
Budget authority:				
Appropriations received	$ 925,287	-	700	$ 925,987
Unobligated balance:				
Beginning of fiscal year	53,724	69,213	4,400	127,337
Spending authority from offsetting collections:				
Earned:				
Collected	391,699	122,597	-	514,296
Receivable from Federal sources	(2,103)	(1,854)	-	(3,957)
Change in unfilled customer orders:				
Advance received	(27,781)	(69,158)	-	(96,939)
Without advance from Federal sources	35,863	(3,712)	-	32,151
Anticipated for rest of year, without advances	-	-	-	-
Recoveries of prior year obligations	10,765	-	-	10,765
Permanently not available	(11,420)	-	-	(11,420)
Total budgetary resources	$ 1,376,034	117,086	5,100	$ 1,498,220
Status of budgetary resources:				
Obligations incurred:				
Direct	$ 905,128	-	2,950	$ 908,078
Reimbursable	392,279	42,382	-	434,661
Subtotal	1,297,407	42,382	2,950	1,342,739
Unobligated balance available, apportioned	32,925	74,704	2,150	109,779
Unobligated balance not available	45,702	-	-	45,702
Total status of budgetary resources	$ 1,376,034	117,086	5,100	$ 1,498,220
Relationship of obligations to outlays:				
Obligations incurred	$ 1,297,406	42,382	2,951	$ 1,342,739
Obligated balance, net, beginning of fiscal year	111,208	2,113	2,404	115,725
Obligated balance, net, end of fiscal year:				
Accounts receivable	174,307	-	-	174,307
Unfilled customer orders from Federal sources	59,475	-	-	59,475
Undelivered orders	(169,574)	(8,430)	(1,543)	(179,547)
Accounts payable	(90,519)	(895)	(49)	(91,463)
Less: Spending authority adjustments	(44,527)	5,567	-	(38,960)
Outlays:				
Disbursements	1,337,776	40,737	3,763	1,382,276
Collections	(363,918)	(53,439)	-	(417,357)
Subtotal	973,858	(12,702)	3,763	964,919
Less: Offsetting receipts	-	-	-	-
Net outlays	$ 973,858	(12,702)	3,763	$ 964,919

See accompanying Independent Auditors' Report in Section V of this Performance and Accountability Report.

Working Capital Fund

The Working Capital Fund (WCF) was established by Public Law (P.L.) 101-512 (November 5, 1990), as codified in 43 U.S.C. 50a. The fund was originally established to support the Washington Administrative Service Center (currently the National Business Center) and to support the replacement of the USGS mainframe computer, telecommunications equipment, and related Automated Data Processing equipment. Congress later expanded the existing Telecommunications Amortization Fund to establish the USGS Working Capital Fund by P.L. 103-332, dated September 30, 1994, which enabled USGS to use the WCF to fund laboratory modernization and equipment replacement; acquisition or development of software; facilities improvements; acquisition and replacement of computers, publications, scientific instrumentation, telecommunications, and other types of equipment replacement.

In FY2004, the USGS developed a database to track the investment plans in the investment component. This reduced manual tracking, strengthened internal controls, and provided an archive process for historical purposes.

The two operating components of the WCF are capital investments and fee-for-service operations.

Investments

A key purpose of the WCF is to plan for long-term capital investments and accumulate the required funds over several fiscal years. The USGS is authorized to use the WCF to invest funds from appropriations and/or reimbursable agreements, without fiscal year limitations, for materials, supplies, telecommunications, and other equipment and facilities renovations in support of USGS programs and other agencies of the Federal Government. Normal operating expenses may not be funded through the WCF. All investments and expenditures from a WCF investment component must be documented in an approved, multi-year Investment Plan (IP). Investments must occur, at a minimum, in two fiscal years before acquisition can occur and are expected to be evenly balanced over the time period defined in the IP. Prior year contributions may not be withdrawn from the WCF under any circumstances; they must be expended from the WCF for an approved capital investment. Current year contributions may be withdrawn, subject to appropriate approvals, in rare instances.

Investment component activities have been structured by use of four funds, based on type of investment activity: telecommunications, equipment, facilities, and publications.

Fee-for-Service

WCF fee-for-service components operate in a business-like manner, recovering fees for services performed based on a fee schedule established through a rate-setting process. WCF fee-for-service components must operate in compliance with OMB Circular A-25, User Charges, and recover the full cost of goods, services, and resources provided to customers. User charges should be based on market prices and create neither a shortage nor surplus of the goods or services. For each component fund, an annual budget and pricing schedule is required. User charges are required to be reviewed no less than biennially.

Fee-for-service component activities have been structured by use of seven funds, based on type of servicing activity: National Water Quality Laboratory, Hydrologic Instrumentation Facility, publications, research laboratories, National Training Center, drilling, and GSA delegated buildings.

The Department of Interior

United States Geological Survey

Working Capital Fund Balance Sheet

For the Years Ended September 30, 2004 and 2003

(in thousands)

	2004	(Unaudited) 2003
Assets		
Intragovernmental:		
Fund balance with Treasury	$ 85,133	$ 84,029
Total intragovernmental	85,133	84,029
Accounts and interest receivable, net	5	-
Property, plant, and equipment, net	8,234	3,421
Total assets	$ 93,372	$ 87,450
Liabilities		
Intragovernmental:		
Accounts payable	$ 263	$ 105
Accrued payroll and benefits	98	70
Total intragovernmental	361	175
Accounts payable	4,225	390
Accrued payroll and benefits	454	329
Total liabilities	5,040	894
Net position		
Cumulative results of operations	88,332	86,556
Total liabilities and net position	$ 93,372	$ 87,450

See accompanying Independent Auditors' Report in Section V of this Performance and Accountability Report.

The Department of Interior

United States Geological Survey

Working Capital Fund Schedule of Net Costs

For the Years Ended September 30, 2004 and 2003

(in thousands)

2004		Fee For Service	Investments		Total
Full cost of goods and services provided	$	38,316	13,854	$	52,170
Related exchange revenues		(38,451)	(107)		(38,558)
Excess of cost over revenues	$	(135)	13,747	$	13,612

2003 (Unaudited)		Fee For Service	Investments		Total
Full cost of goods and services provided	$	27,286	9,514	$	36,800
Related exchange revenues		(29,433)	(1,633)		(31,066)
Excess of cost over revenues	$	(2,147)	7,881	$	5,734

See accompanying Independent Auditors' Report in Section V of this Performance and Accountability Report.

Deferred Maintenance

The facilities function at USGS provides for safe, functional, and high-quality workspace for accomplishing the Bureau's science mission and ensuring that workspaces are maintained in compliance with applicable safety and other standards set by GSA and the Occupational Safety and Health Administration. The USGS has key science facilities that are mission critical, including those that are fundamental to providing timely warnings of geologic hazards, as well as scientific understanding and technologies needed to support the sound management and conservation of the Nation's biological, energy, water, and mineral resources. The USGS is committed to improving the maintenance of existing facilities to ensure the health and safety of the public and employees, protection of cultural and natural resources, and compliance with building codes and standards.

USGS developed a "Five-Year Deferred Maintenance and Capital Improvement Plan" to provide necessary up-keep on property and equipment and to provide facilities that will best fulfill our mission. Deferred maintenance is work that was not performed when it should have been or when it was scheduled, often because of funding or priority ranking of work, and was thus delayed to a future period. Capital improvements include the construction of new facilities or the alteration of an existing facility to accommodate a change of function or unmet programmatic need. All capital improvement components of projects were excluded from the deferred maintenance estimate in this report.

The Five-Year Plan is re-evaluated annually pursuant to the budget process and is subject to adjustments at that time depending on funding levels and revised priorities. Estimations on deferred maintenance are based on condition assessment surveys that are conducted every five years at each USGS site to determine the current condition of facilities and the estimated cost to correct deficiencies. These surveys are conducted by an independent engineering firm and are supplemented by annual condition surveys performed by USGS personnel.

The FY2006 budget formulation process was used to establish the base from which the FY2004 deferred maintenance priority listing was derived. The Office of Management Services (OMS), which formulates the Bureau's deferred maintenance budget, collected project proposals for possible inclusion in the Bureau plan for FY2006 – FY2010. OMS collected proposed regional and headquarters facilities projects, which were then ranked to reflect the criticality of the health and safety deficiencies being addressed. A project that addressed a critical health and safety deferred maintenance need received a higher ranking than one addressing a critical mission deferred maintenance need. Teams of regional and headquarters facility and safety specialists reviewed the ranked proposals to confirm the accuracy of rankings and otherwise ensure the adequacy of the project proposals. Due to funding constraints, only the highest-priority projects received funding and were included in the FY2006 – FY2010 Plan.

A summary of the USGS deferred maintenance estimate at September 30, 2004 is reflected below. The amount of the total estimated as of September 30, 2004 is presented as the low estimate range and the high estimate range is based on a the low estimate plus future funding requests of $1.5 million per year through 2028, including inflation.

		(in thousands)	
		Low	**High**
Buildings	$	32,884	41,943
Other Structures		7,971	10,167
Total		40,855	52,110

In recent years, while the total USGS Facilities budget has remained relatively constant, USGS facilities costs have continued to increase, resulting in a shortfall. To control or reduce cost, the USGS has developed a Strategic Facilities Management plan to achieve its facilities program goal to provide quality space to further science programs while optimizing facilities location, distribution, and use. The plan includes a set of basic operation and maintenance principles, a set of planning and management principles, a set of management actions, and redefined business practices.

Section IV
Required Supplemental Stewardship Information

USGS scientists use a boxcore to collect sediment samples for marine pollution studies in Santa Monica Bay, California.

Contents

General Stewardship Information 91
Heritage Assets — Museum Collections 92
Heritage Assets — Library Collections 94
Research and Development Investments 96

General Stewardship Information

The USGS serves the citizens of the United States as steward for a large, varied, and scientifically important body of heritage assets, and in conducting research and development that is critical to the health of our country and in understanding the Earth. Each year the USGS makes a substantial investment while fulfilling its stewardship responsibilities for the benefit of the Nation.

Costs associated with stewardship initiatives are treated as expenses in the financial statements in the year the costs are incurred. However, these investments in stewardship are intended to provide long-term benefits to the public and are included as required supplementary stewardship information (RSSI) reporting to highlight their long-term-benefit nature and to demonstrate our accountability over them. Stewardship resources are not required to be included in the assets and liabilities reported in our financial statements; they are, however, important to understanding the operations and financial condition of USGS.

Stewardship assets often have physical properties that resemble those of the general property, plant, and equipment that is traditionally capitalized in the financial statements of Federal entities. However, due to the nature of these assets, valuation would be difficult and matching costs with specific periods would not be meaningful. Heritage assets have one or more of the following characteristics: historical or natural significance; special cultural, educational, or aesthetic value; or significant architectural characteristics. We have heritage assets in two categories: museum collections and scientific library collections.

Investments in research and development are expenses incurred to support the search for new or refined knowledge and ideas, the application or use of such knowledge and ideas, and the development of new or improved products or processes with the expectation of maintaining or increasing national economic productive capacity or yielding other future benefits.

USGS research and development activities encompass a wide range of studies.

Making science fun is the first requirement when communicating science to youngsters. Science Camp, a partnership between the USGS and Reston Association, offers children from 8 to 12 an opportunity to meet scientists, participate in science experiments, learn and practice new computer skills, create a newspaper, take field trips, and participate in swimming, boating, crafts, and sports. Science Camp demonstrates the many exciting scientific activities in which the USGS is involved. Meeting real scientists and specialists working at the USGS is a vital part of our camp program. It is our hope that Science Camp provides opportunities for children to think about pursuing a career in science.

Museum Collections

The USGS manages a widespread collection of natural history specimens and cultural objects in many science and administrative centers throughout the United States. These unique collections serve to illustrate important achievements and challenges to the Earth Sciences, to document the history of the USGS, and to enlighten those who use the collections. The collections also provide the public with an interpretive demonstration of the history and enterprise of the USGS. The museum collections are divided into two major categories: historical (including art, history, ethnography, and documents), and zoology.

During the FY2004 management control reporting cycle, DOI required the Bureaus to perform targeted reviews of the museum property activities, which is designed to evaluate overall implementation of Part 411 of the Department Manual. The USGS successfully performed the targeted review in May 2004.

Historical collection

Many historical objects, including the Apache basket (shown above) and oil paintings of many historical figures, are among exhibits in the USGS National Center in Reston, Virginia, hallways or lobbies in regional offices, and science centers around the country.

Our collection includes many special objects related to the cultural history of USGS, including a 1930 Model A Ford used to successfully map the geology of California deserts through the 1960s and the Lunar Rover used in the southwestern deserts to train astronauts in the lunar landing program through the 1970s. Recently the Lunar Rover, which we had previously loaned to NASA to conduct space suit ergonomic studies, fuel-cell power system studies, and vehicle operational capability studies in advance of Mars exploration, was returned to USGS.

Other interesting objects in the collection include John Wesley Powell's commission, one of the few documents signed by President James A. Garfield, appointing Powell as the second director of the USGS (see above); geologic field mapping equipment from Arnold Hague's late Nineteenth Century expedition to map Yellowstone National Park (see Hague's saddle below and chair used during his expedition at right); and Director Thomas Nolan's field equipment and academic robe from St. Andrew's University in Scotland.

Zoology Collection

Our zoology objects are located at the Biological Research Arid Lands Field Station of the Mid-continent Ecological Science Center that retains a collection of natural specimens. A USGS wildlife research biologist and USGS zoology museum specialist stationed at the University of New Mexico's Museum of Southwestern Biology maintain this collection under a joint agreement between the USGS and the University of New Mexico.

Of primary importance in our collection is the unique natural history collection of vertebrates that dates as far back as the late 1920s and was used in support of food habit studies by researchers at the Department of Agriculture's Food Habits Laboratory in Denver, Colorado. Transferred to Fort Collins in the

mid-1970s and then to the University of New Mexico under the aegis of the Biological Resources Division in the 1990s, this collection includes over 8,000 fluid-preserved specimens of amphibians and reptiles, as well as mammal and avian skeletons and skins. Specimens have continued to be acquired as a result of the research emphasis to document mammal species from public lands in the West.

Museum Collections at a Glance

Our museum collections are housed in both Federal and non-Federal institutions in an effort to maximize accessibility to the public.

	2003	Additions	Deletions	2004
Objects in Bureau facilities:				
Art	61	1	-	62
History	390	1	-	391
Ethnography	1	-	-	1
Documents	3	-	-	3
Objects in non-Federal facilities:				
History	1	1	-	2
Zoology	39,448	153	-	39,601
Total	39,904	156	-	40,060

Cataloging efforts have also been a priority within USGS: 100% of our museum collections have been catalogued. During the cataloging process, USGS evaluates the condition of each collection object. "Good" is considered to show little or no sign or aging or wear; "fair" applies to objects that are showing signs of deterioration such as faded color of fabric or wood, and "poor" objects that have missing parts or are extremely worn. Additions to the collection in the current year were donated. No deferred maintenance is necessary for our museum collections.

	Condition Assessments		
Total collection	**Good**	**Fair**	**Poor**
40,060	39,942	104	14

USGS also evaluates the condition of the locations housing the collections. This evaluation is based on a lengthy list of conditions. We have objects in four USGS facilities: two of them have been evaluated as "good," while the other two of our USGS facilities have not been evaluated as they are largely storage areas. Environmental monitoring capabilities of these storage areas did expand in FY2004 as the museum program purchased and placed hydrothermographs in these facilities, which will help the museum staff to determine how the collection's environmental conditions can be improved.

Library Collections

USGS library holdings, collected during more than a century of providing library services, are an invaluable legacy to the Nation. While responding to the current and anticipated subject interests of USGS researchers, such as those in ecology, geology, hydrology, health, and biology, the library maintains its heritage collection of core science publications dating back to the 17th century, providing a unique historical record of the progress of natural science. Besides providing resources for scientific investigations, the library's multi-disciplinary collection provides access to geographical, technical, and historical literature in paper and electronic formats for the general public and industry. Library users bring their questions to the library daily, in person or by phone or email, and expert librarians assist them in using the wealth of well-organized information to find answers. The library was originally located in Washington, D.C., however, the library collection is now housed in four libraries across the country.

In addition to the annual purchases of serials, maps and books, the library has used other means to build the collection. Since its beginning, the library has administered a major program of international and domestic exchange of earth science publications authorized by the legislation that established USGS. The exchange program, with national and foreign geological surveys and research organizations, has enabled the Library to collect materials published in small numbers, never widely distributed, and never reprinted.

During a century of collecting, the library has acquired many treasures such as the George F. Kunz collection. George F. Kunz was a former employee of the USGS, a vice-president of Tiffany & Co., and one of the world's preeminent gem experts at the time of his death in 1932. The Kunz collection includes rare books on gemology, the lapidary arts, the folklore of gemstones through history, and archival gem trade records, including the original provenance of the Hope diamond.

Erin Donnelly of the USGS Library holds an extremely rare 19th century book on gems and precious stones.

Another unusual acquisition was the group of books and maps known as the Heringen collection. These military geology texts and maps were looted by the Nazis from European libraries, including Russia, and hidden in a potash mine in Heringen, Heese, Germany. At the end of World War II they were transported by the U.S. military to the United States and are now part of the USGS library.

The map collections include an archival and working collection of USGS topographical maps, plus thematic and topographical maps of the United States and the World. These maps have provided invaluable aid to authorities and scientists in times of disasters and military interventions. Maps, photographs, and literature in the USGS library have provided evidence to solve boundary disputes and water rights litigation, to trace geographic names, and to research natural and man-made changes in an area over time.

Our Field Records collection in Denver includes items such as field notes, field maps and sketches, and project-related correspondence created or collected by USGS scientists during official project work. The Photographic Archive provides the public with access to over 19,000 photographs and original sketches dating from 1868 to the present. Additionally, USGS maintains a collection of over 500,000 photographs taken during geologic studies of the U.S. and its territories dating from 1868 to present. Some photographs have been used to illustrate publications, but most have never been published.

The Library supports the research of the DOI and other government agencies, universities, and professional communities. Libraries throughout the world, including the largest and most renowned, borrow from our library's unique collection. The USGS library has loaned scientific publications and objects to thousands of libraries in every State and in over 37 foreign countries that were public, State, Federal, nonprofit, company, and academic libraries. Although not defined by Congress as a national library, the library is recognized as the premier national collection of geologic and hydrologic publications, supplementing the Nation's large library collections in major universities and government agencies.

Library Collections at a Glance

The USGS library system (4 libraries) contains over 1.2 million books and periodicals and over 1.8 million non-book items, including maps, photographs, pamphlets, field record notebooks, digital media, and other collectible items, for a total of over 3 million items.

	(in thousands)			
USGS Library Items	**2003**	**Additions**	**Deletions**	**2004**
National Center Library	1,701	23	1	1,723
Denver Branch Library	954	5	-	959
Flagstaff Branch Library	117	4	-	121
Menlo Park Library	289	1	3	287
Total	3,061	33	4	3,090

Materials are acquired from extensive exchange agreements with institutions and agencies worldwide, from research projects and purchases from a wide variety of publishers and institutions. Items are withdrawn only after the professional library staff has made a critical analysis of the collection.

Careful consideration is given to assessing the condition of each item in the library collections. A category of "good" is defined as materials protected for reasonable use which includes publications bound or with sturdy covers, maps loosely shelved in drawers without crowding or in archival grade envelopes with minimal folds, photographs mounted in archival quality albums, or materials protected by archival quality paper or plastic sleeves or boxes. Materials evaluated as "fair" are those which can be circulated, but require binding or further treatment to ensure long-term protection. "Poor" materials are those that cannot be circulated or used without special attention until preservation repairs are made. This includes publications with old brittle or mottled paper, loose pages, loose or thin covers, tears, water-damage or other damage, improper binding with tight covers, flaking binding covers, loose photographs, nitrate or glass photograph negatives, and multimedia and digital disks without containers. No deferred maintenance is necessary for our library collections.

	(in thousands)		
	Condition Assessments		
USGS Library Items	**Good**	**Fair**	**Poor**
National Center Library	1,378	259	86
Denver Branch Library	623	192	144
Flagstaff Branch Library	97	18	6
Menlo Park Branch Library	201	57	29
Total	2,299	526	265

Research and Development Investments

Research and development investments at USGS are a core part of fulfilling our mission and are integral to the work performed in all of our internal operating disciplines (Biology, Geography, Geology, and Water). The scope of our research and development activities spans basic, applied, and developmental research and produces direct outputs and outcomes associated with each activity that are a valuable part of the scientific research performed throughout the Nation.

Total research and development investments were $882.9 and $858.8 million during FY2004 and FY2003, respectively.

	FY2004	FY2003
Basic research	71	77
Applied research	740	681
Developmental research	72	101
Total R&D	883	859

Basic Research

In accordance with OMB Circular No. A-11, USGS defines basic research activities as systematic studies directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind. The table below provides a summary of our basic research and development investments over the past five years and descriptions of selected major programs and selected outcomes and/or accomplishments in these areas for FY2004.

Biology Accomplishments

Program Description

The Cooperative Research Unit Program is a unique cooperative partnership among Federal and State governments and academia and provides one of the strongest partnership links between USGS and Federal and State management agencies. Federal scientists stationed at universities: (1) help identify and respond to natural resource information needs through the pooling of resources among agencies; (2) provide access to scientific expertise among unit scientists, university faculty, and other unit cooperators, especially where the required expertise is not readily available within Federal resource agencies; and (3) provide Federal and other natural resource managers access to a geographically dispersed science organization of units to meet information needs that transcend State and regional boundaries.

Significant Output/Accomplishment

Oregon Cooperative Research Unit

Conducted toxicological and physiological research on Columbia River white sturgeon to determine if body burdens of environmental toxicants are contributing to reduced growth and reproductive fitness in impounded areas of the river.

		2000	2001	2002	2003	2004
Biology						
Cooperative Research Unit	$	Data not available by major program.			12	3
Other Biology programs					13	16
Geography						
Geographic Analysis and Monitoring					3	1
Other Geography programs					5	6
Geology						
National Cooperative Geological Mapping					7	6
Mineral Resources					16	15
Other Geology programs					21	24
Totals (in millions)	$	63	63	82	77	71

USGS studies focus on understanding the effects of environmental contaminants on wildlife including threatened and endangered species. Environmental toxicants, such as pesticides, PCBs, and heavy metals, are persistent, fat-soluble, and tend to bioaccumulate in organisms over time. Many of these compounds can affect behavior, biochemistry, growth, reproduction, development, and survival in a wide variety of species. The lower Columbia River supports one of the most productive white sturgeon fisheries in North America. Fish trapped behind the dams of the hydroelectric system, however, have reduced growth and reproductive success when compared to animals in the free-flowing portion of the river. An understanding of whether contaminants are contributing to this problem is critical for management of this and other species as well as for ecological management of the Columbia River Basin.

These studies have been completed and results have been submitted for publication in peer-reviewed journals. Results have also been made available to the Oregon Department of Environmental Quality (DEQ). Findings reveal that there are strong negative correlations between a variety of physiological parameters that are indicative of growth and reproductive fitness and body burdens of PCBs, pesticides, and mercury. This suggests that environmental contaminants could be playing a role in the reduced growth and reproductive fitness of sturgeon in impounded areas of the river. Results from this research could easily be applied to other major river systems in North America.

Results from this research would be used to develop management measures designed to protect and restore white sturgeon populations. This may be particularly important in areas of the Columbia Basin where sturgeon are now endangered. Findings from this USGS research would be used to identify the types of compounds that need to be regulated by DEQ or EPA as well as for health alerts for people who consume fish from certain areas of the river. Results would also be used to determine point sources of pollution for cleanup and could lead to more efficient operation of the hydroelectric system to minimize toxicant effects on fish.

Geography Accomplishments

Program Description

Geographic Analysis and Monitoring Program (GAM)

The GAM program encompasses three fundamental science issues concerning changes to the Earth's surface: (1) understanding changes that are occurring on the land surface and why; (2) understanding the impacts of these land-surface changes on ecosystem health, climate variability, biogeochemical cycles, hydrology, and human health; and (3) using the best methods available to incorporate scientific findings in the decisionmaking process of natural resource managers and provide the information to the public. This program addresses DOI's strategic goal of advancing knowledge through scientific leadership and inform decisions through the applications of science by assessing the Nation's land resources at spatial and temporal scales to understand rates, causes, and consequences of landscape change over time.

Significant Output/Accomplishment

Real-Time Mapping of Diseases

Many chronic health issues may relate directly to Earth processes and the environment. By knowing the geographic conditions (such as hydrology, soils, and vegetation) necessary for the maintenance of specific pathogens in nature, scientists can use the landscape to identify the spatial and temporal distribution of disease risks using land characteristics and bioclimatic thresholds to map habitats of toxin agents and animal hosts. In 2004, USGS developed the capability to perform near real-time mapping on the Web of disease information related to West Nile Virus. Now an entire set of over 250 maps showing West Nile Virus can be updated in less than two hours from receipt of data. The ability to map risk and disaster formation over the Web in a rapid fashion is a powerful use of The National Map.

Geology Accomplishments

Program Description

The National Cooperative Geologic Mapping Program (NCGMP)

The NCGMP s the primary source of funds for the production of multiple-purpose geologic maps that depict the distribution of the Nation's sediment and rocks and the resources they provide. The NCGMP represents over a decade of successful cooperation among Federal (FEDMAP), State (STATEMAP), and university (EDMAP) partners to deliver modern digital geologic maps to the customers/clients that need them. Each of these three partners has a unique role, yet all work cooperatively to select and map high-priority areas for new geologic maps. Since 1992, the NCGMP has awarded over $50 million dollars toward the production

of geologic maps by 48 State geological surveys. These Federal dollars successfully and efficiently leveraged an equal amount of State dollars. EDMAP works to train the geologic mappers needed for the future and, since 1995, has funded over 110 colleges and universities through its matching grant program. The NCGMP also maintains on its Web site an ongoing effort to present geologic mapping data from all of North America (the National Geologic Map Database) and to develop a common set of geologic map standards.

Significant Outputs/Accomplishments

Geologic Mapping of Karst Terrain in the Shenandoah Valley of Northern Virginia

In FY2004, the Geologic Map of the Winchester 7.5-minute Quadrangle, Frederick County, Virginia, was released as USGS Open-file Report 03-461 funded by NCGMP. This geologic map is part of a series of geologic maps, in digital format, and related databases being used by the Frederick County Sanitation Authority for water resource planning. Rapid residential and industrial growth in the region is taxing water availability, and a drought from 2000-2002 made for critical decisions on water use. By developing a hydrogeologic framework, geologic information included on the maps is used with water data collected by the Virginia district of the Water discipline to better understand ground-water flow through, and storage in, the Karst Aquifer. A Water-Resources Investigations Report (WRIR) entitled "Hydrogeology and Ground-Water Availability in the Carbonate Aquifer System of Frederick County, Virginia" will be released by fall 2004 that describes the hydrogeology and ground-water availability. The digital map layers are also being used with the County geographic information system to delineate Karst areas prone to water contamination. Other 7.5-minute geologic maps are being released in the fall of 2004 and spring of 2005. Information from the geologic maps and the WRIR will be used to evaluate zones of influence around municipal wells and abandoned quarries that are used for emergency water supply. An understanding of the hydrogeologic system around the abandoned quarries may lead to a decision by the County and local authorities to use them as everyday water supplies in this region of rapid growth.

Small planes and helicopters are used successfully and economically by the Geologic Framework of Rio Grande Basins Project to gather aeromagnetic information that is being used to locate shallow subsurface faults.

Geology Influences Water Availability Near Santa Fe, New Mexico

USGS high-resolution aeromagnetic data and on-the-ground geologic mapping in the Espanola Basin, New Mexico, are providing an understanding of how the local geology controls ground-water availability. Subsurface features, such as shallow faults and buried igneous bodies, significantly influence the size and yield of aquifers in this region of limited water resources but increasing population (Santa Fe, Espanola, Los Alamos National Laboratory). These features, which were identified in USGS Open-File Report 03-124, are currently being used by the New Mexico Office of State Engineers and the Santa Fe County Hydrologist

Water fills an inactive quarry in a karst area of the Shenandoah Valley near Strasburg, Virginia, an area where exploitation of aggregate resources is being balanced with water quantity and sinkhole hazards issues. Water from these inactive quarries is being used as emergency water supply in times of drought.

to locate new water wells in the Espanola Basin. The New Mexico Bureau of Geology and Mineral Resources, while conducting a study of individual water wells in the region, is working closely with USGS geologists to relate well data to the subsurface geologic features. In fact, a 2004 New Mexico State report incorporates the entire USGS report due to the importance of its information.

Program Description

The Mineral Resources Program

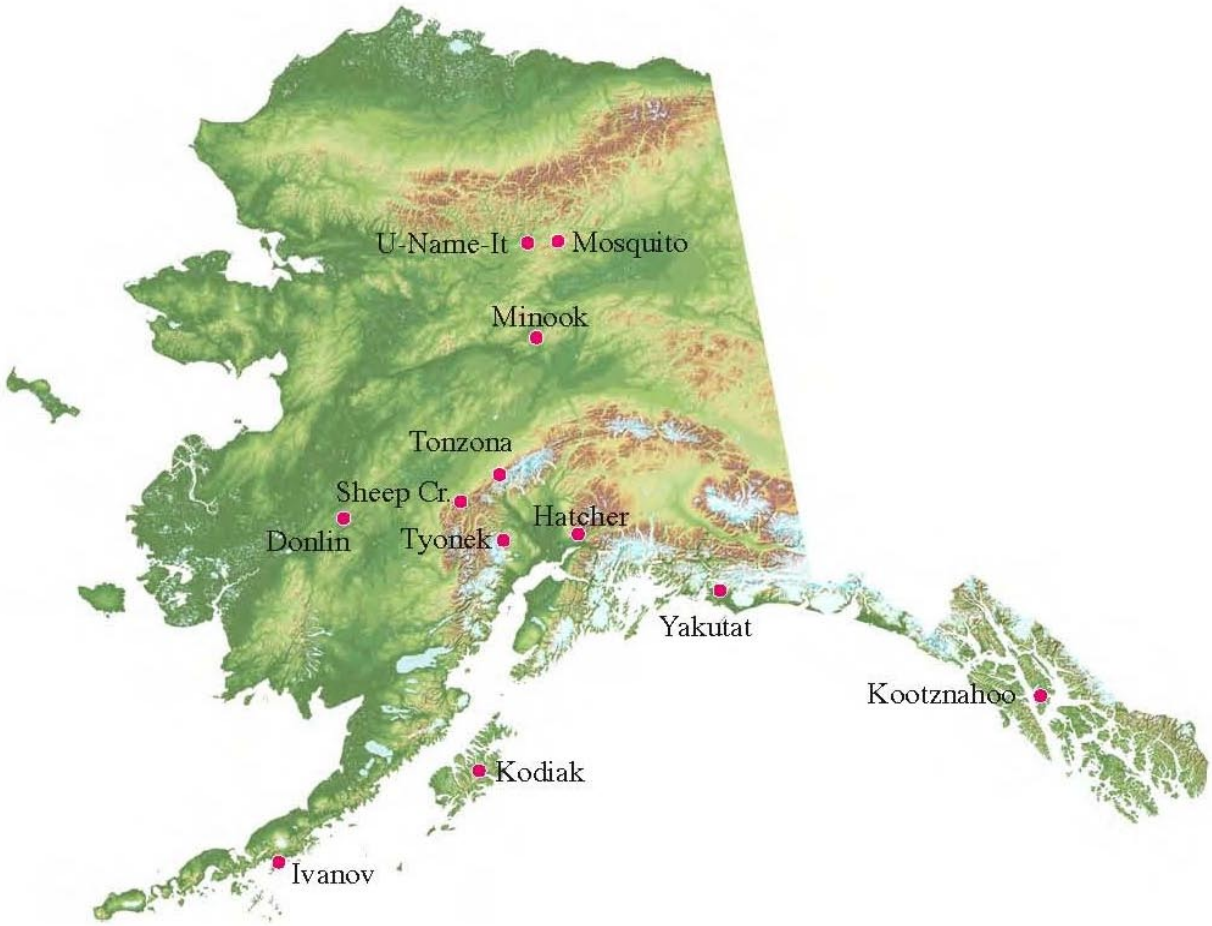
This program provides scientific information, objective resources assessments, and unbiased research results on mineral potential, production, consumption, and environmental effects.

The program supports DOI's strategic goal to manage or influence resource use to enhance public benefit, promote responsible use, and ensure optimal-value of non-energy minerals by ensuring that data are available for managers to make informed decisions about use of resources.

Significant Outputs/Accomplishments

Mineral and Energy Resource Implications of the 'Slab Window' in Alaska

The tectonic plates that make up Alaska overrode an oceanic spreading center (two oceanic plates that pull apart) between 50 and 60 million years ago. In a process known as ridge subduction, the two oceanic plates were forced under the continent of Alaska. The gap created between the plates is known as a slab window. The slab window, likened to a blowtorch that heated Alaska below the surface of the earth, had a huge impact on mineral and energy resources. The geologic effects of the slab window were diverse and widespread, stretching 500 to 1000 km inland from the continental margin; these effects were recently studied by USGS scientists. The most profound effect of the slab window was a complete reorganization of the type and location of igneous rock (formed from molten rock) activity throughout Alaska. Among other findings, results of the study indicate that seven kinds of ore deposits in Alaska (which are sources of gold, tin, nickel, molydenum, and uranium) are

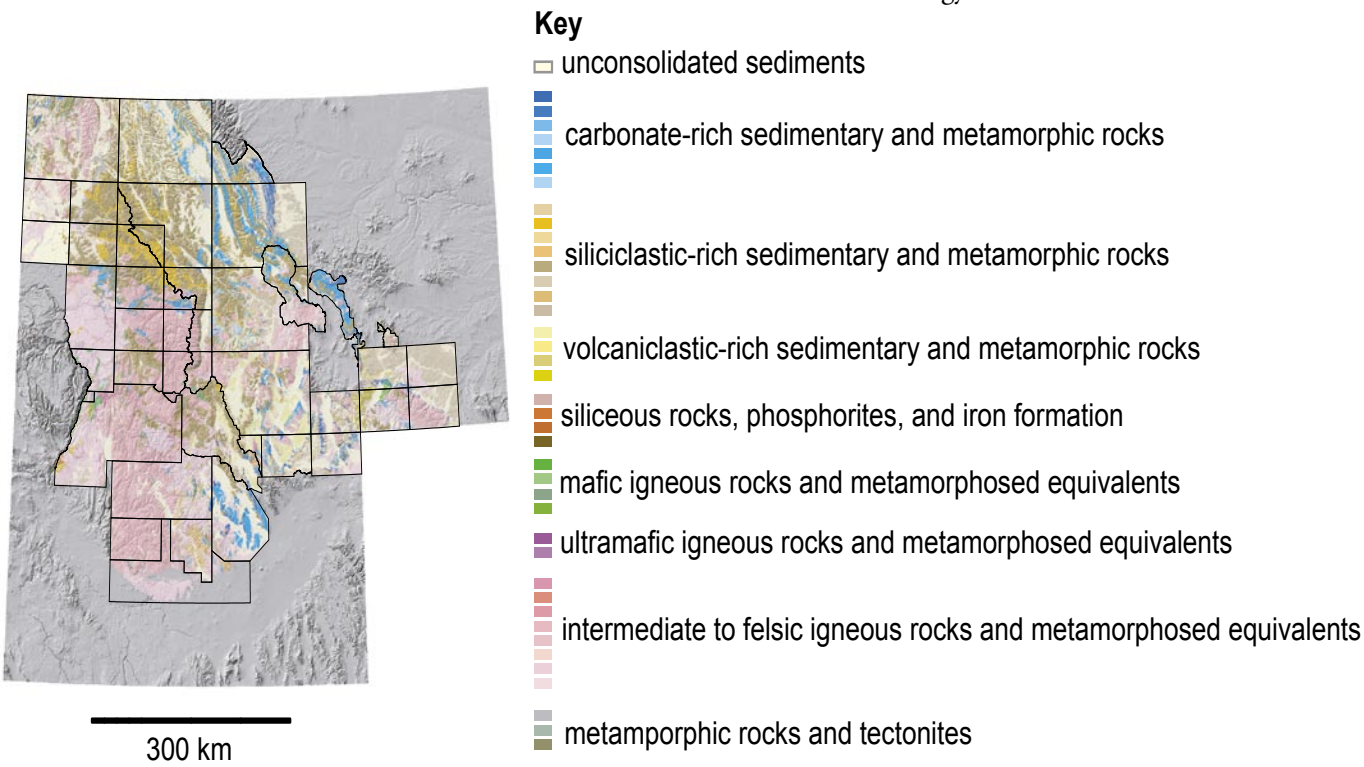


linked to the slab window. The tin granite composing Mount McKinley was also found to have formed as a result of the slab window. For energy resources, the most important slab-window effects involved sedimentary basins. Basins along Alaska's Pacific margin, within the interior of Alaska, and as far away as the North Slope subsided rapidly during slab-window time, leading to development of the major coal beds of the Cook Inlet Basin and the Yukon Flats Basin.

There are six slab windows on the present-day earth, and hundreds of others likely existed in the deep past. The new understanding of slab windows resulting from this project has improved our ability to assess undiscovered energy and mineral resource potential worldwide. This information is extremely useful in USGS global mineral and energy assessment projects and of great interest to exploration research.

Geoscience Data for Land Planning in the Headwaters Province, Idaho and Montana

In a project designed to meet USFS goals of integrating geoscience information into the land-planning process, USGS scientists have provided geologic maps, topical studies, databases (minerals, geochemical, and geophysical) and assessments for the Headwaters Province in northern Idaho and Montana. The province, known for its world-class deposits of gold, copper, silver, platinum, garnet, and talc, also provides critical habitat for grizzly bears, salmon, and bull trout. USGS scientists developed regionally consistent digital datasets to model and provide a range of solutions to questions regarding land-use, forest health, landslide and wildfire hazard, and the potential for future mineral exploration and mining. Among other accomplishments, a regionally consistent and integrated spatial geologic database was compiled for the Northern Rockies. In addition, the locations of active mines and significant minerals deposits were compiled, along with datasets that describe regional variation in magnetic and gravity fields. New geologic maps were prepared for parts of Central Idaho and Western Montana. An in-depth study of the regional stratigraphy, lithologic characteristics, and alteration patterns of a geologic formation hosting world-class copper-silver deposits was conducted; six spatial databases containing geoscience information covering 4,280 square miles of the Western Montana copper belt were developed as a part of this work. This project was conducted in collaboration with the University of Idaho, University of Montana, Idaho Geological Survey, and Montana Bureau of Mines and Geology.



Headwater Providence in Northern Idaho and Montana

Applied Research

In accordance with OMB Circular No. A-11, USGS defines applied research activities as systematic studies to gain knowledge or understanding necessary for determining the means by which a recognized and specific need may be met. The table below provides a summary of our applied research and development investments over the past five years with descriptions of selected major programs and selected outcomes and/or accomplishments in these areas for FY2004.

Biology Accomplishments

Program Description

Biological Information Management and Delivery

The USGS develops and applies innovative information technologies and practices to the management of biological data, information, and knowledge resulting from worldwide research to increase the value of our researchers and other customer groups. This program addresses all facets of the biological information life-cycle including collection, organization, description, discovery, retrieval, analysis and application, dissemination, and disposition.

		2000	2001	2002	2003	2004
Biology						
Biological Information	$	Data not available by major program.			17	36
Contaminants Biology					9	14
Other Biology programs					190	225
Geology						
Geologic Hazard Assessments					47	52
Geologic Resource Assessments					85	84
Other Geology programs					62	94
Geography						
Geographic Analysis and Monitoring					9	15
Cooperative Topographic Mapping					3	5
Other Geography programs					36	6
Water						
Ground-Water Resources					23	12
National Water-Quality Assessments					55	57
Toxic Substances Hydrology					6	8
Hydrologic Research					20	11
Cooperative Water Research					51	45
State Water Resources Research Institutes					33	25
Other Water programs					35	51
Totals (in millions)	$	656	567	799	681	740

Program objectives are advanced through establishing partnerships with other government and non-government organizations; developing standards and methodologies for biological data collection and documentation; developing information products targeted to specific user populations; and introducing technical applications for analyzing and integrating biological data and information.

Significant Output/Accomplishment

Amphibian Deformities and Declines Reporting System

Developed an Internet based mapping and reporting system to allow interested citizens, researchers, and educators to report amphibian deformities and malformations. The system will then enable the review and verification of these incidents by qualified scientists via the various tools and protocols developed.

Amphibians have long been thought of as an indicator species. The ability to accurately report and verify amphibian deformities and malformations is important to identifying and resolving biodiversity issues throughout North America. The Amphibian Deformities and Declines Reporting System provides valuable information to support ongoing research studies. The tools also aid in the distributed review of these reports by training amphibian specialists throughout the country. The tools were available in May 2004. The system can be found at http://frogweb.nbii.gov.

The tools developed support research managers in addressing amphibian declines and deformities on public and private lands. The tools support local and regional conservation planning and management efforts. Furthermore, this supports trend analysis research and studies by making available previous year data and information related to declines and deformities.

Program Description

The Contaminant Biology Program

This program conducts research and communicates information on the exposure and effects of environmental contaminants on the health and viability of natural resources, specifically those held in trust by the Department of the Interior. Contaminant biology information, monitoring tools, and models establish a scientific foundation for restoring departmental hazardous waste sites and informing departmental participation in regulatory processes. Resource managers in the FWS, NPS, BOR, OSM, and other Federal, State, and local agencies use this information to determine, retrospectively, the role of contaminants in species declines and fish and wildlife mortality, or prospectively, what concentrations have no effect on the environment.

Significant Output/Accomplishment

Fire Science: Ecological Impacts of Fire Retardants

Understanding gained in this project is shared with DOI employees with responsibilities for planning and responding to wildland fires, with a focus on environmental considerations for fighting fires with chemical products.

The investigation provides information that enables the Federal government to minimize the unintended, adverse impacts of fire retardants. Several training sessions were provided to the FWS in FY2004. Additional publications are expected in future years. This investigation enables the FWS to provide guidance to fire managers on the ecological effects of the chemicals they use to minimize the unintended, adverse impacts of fire retardants.

Geology Accomplishments

Program Description

Geologic Hazard Programs

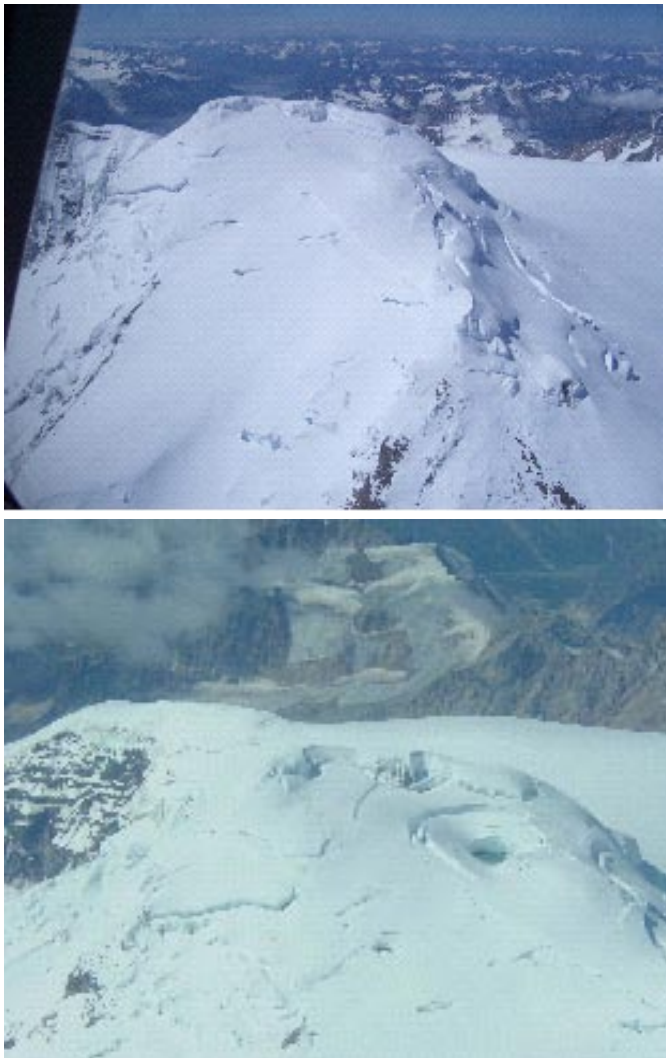
This program provide the Earth science data and information, analyses, and research needed to reduce the loss of life, property, and economic impact of geohazards. The programs conduct hazards assessments, monitoring activities, notification and outreach, and research on the causes and effects of geohazards. These programs support DOI's Serving Communities Strategic Goal of Protecting Lives, Resources, and Property by making information available to communities to use in developing hazard mitigation, preparedness, and avoidance plans. The information is used by DOI, other Federal agencies, States, local governments, and the private sector to make informed decisions pertaining to geologic hazard loss reduction or mitigation.

Significant Outputs/Accomplishments

Web-Accessible Database Shows Active Faults in US

In March, USGS unveiled an up-to-date and comprehensive nationwide compilation of information on known or suspected active faults. Accessible via a user-friendly Web interface at http://Qfaults.cr.usgs.gov/.

The database summarizes geologic, geomorphic, and geographic data for about 2,000 faults in the United States that are believed to be sources of earthquakes greater than magnitude 6 and having documented activity during the past 1.6 million years. Much of the information is based on paleoseismology, which is the geologic study of prehistoric earthquakes. Paleoseismology combines geologic tools such as trenching with archeological-style analysis to determine the times and sizes of ancient earthquakes in the Quaternary Period. The database is designed to fulfill the needs of a broad group of users, ranging from the science community to the general public. The seismic-hazard-assessment community will benefit from public access to all data available on potential earthquake sources in one location. The database will allow these users to identify faults that have likely produced strong ground motion in the geologically recent past and that may contribute to future seismic hazards. Other potential users include the earthquake-engineering community, the insurance industry, and companies managing large infrastructures, such as pipelines or power-transmission networks. In addition, State and local planners can use the database to locate potential earthquake sources on maps. Similarly, emergency-response officials can use the database to plan earthquake drills and to identify and fortify critical infrastructure near active faults. Finally, the general public is becoming increasingly aware of potential hazards in their environment. The USGS as well as State Geological Surveys are frequently called upon to respond to questions regarding the location of hazardous faults that may impact the lives of the population at large.



Recent aerial photographs of the summit of Mt. Spurr. The upper photo taken on June 20 by Bruce Hopper, shows an elliptical crack in the smooth surface facing the camera. The lower photo taken on August 2 by AVO personnel, shows the same area. The elliptical crack is now very prominent, and the area within it has sagged. The center of the area is marked by a collapse pit.

Monitoring Systems Expanded

Upgraded in FY2004, the USGS Alaska Volcano Observatory (AVO) installed new seismic networks on Korovin Volcano and at Mt. Peulik. AVO scientists have successfully developed a system to receive data from modern broadband seismometers and GPS instruments from remote Aleutian volcanoes, and broadband instruments have been installed at four volcanoes. These new instruments enhance both AVO's monitoring and scientific work. New Web-based data analysis tools, which will also enhance AVO's monitoring and scientific efforts, are being tested. The input includes a database of historic activity and bibliography of Alaskan Volcanoes and a database containing all major time-series data from AVO's monitoring networks. Modeling of tsunami hazards resulting from debris avalanches at volcanoes was undertaken at two volcanoes. The risk to communities in lower Cook Inlet to a tsunami from Augustine Volcano continues to be subject to scientific debate and public concern.

During the past year, scientists at the USGS Hawaiian Volcano Observatory (HVO) have installed seven new continuous GPS stations on Mauna Loa Volcano. In addition, seven seismic stations in the HVO network have been rebuilt. Borehole strain and tilt data are being received at HVO from three stations on Mauna Loa, and co-located seismometers have been installed.

Unrest at Active Volcanoes

Mauna Loa Volcano, which last erupted in 1984, continues to swell, as determined by continuous GPS measurements across the summit caldera, yearly dry-tilt reoccupations, and InSAR results. The rate of extension across the summit caldera is about 1.5 cm/yr. More recently, HVO has detected a swarm of small, deep (> 40 km) long-period earthquakes below the south and southeast parts of the caldera, with about 40 quakes occurring from late July to early August 2004. Both deformation and seismicity suggest that Mauna Loa's magma chamber is being refilled and that an eruption can be expected within the next few years.

AVO scientists have responded to extended volcanic unrest at Mount Spurr, Mount Veniaminof, and Shishaldin Volcano by more frequent overflights (at Spurr), continuous Webcam monitoring from a nearby village (at Veniaminof) and more frequent examination of seismic data for all three volcanoes. AVO remains on heightened alert, as all three volcanoes continue to show above-background activity and could quickly move into full eruption.

Global Seismographic Network Surpasses Design Goal

In 2004, the Global Seismographic Network (GSN) surpassed its 128-station design goal for uniform worldwide coverage of the Earth. A permanent network of 136 stations with state-of-the-art seismological and geophysical sensors is now sited around the Globe, connected by available telecommunications. GSN is a partnership between USGS, NSF, and over 100 host organizations and seismic networks in 59 countries worldwide. The USGS Albuquerque Seismological Laboratory is one of the two principal network operations centers for GSN, which serves an essential function for nuclear treaty monitoring, tsunami warning, response to earthquakes and volcanoes, and as a resource in mitigating earthquake hazards.

Focused Seismic Monitoring in Wyoming under ANSS

In the FY2004 appropriation process, Congress directed USGS to incorporate the Teton County, Wyoming, area into the ANSS, replacing an earlier seismic network discontinued by the BOR. The network installation was completed in August, three months ahead of schedule. Data from the network will be integrated into real-time seismic monitoring operation at the USGS National Earthquake Information Center in Golden, Colorado, and will be distributed in real-time to support seismic monitoring operations in Yellowstone National Park, Idaho, Montana, and Utah. The new network was developed and implemented in cooperation with Teton County, Wyoming, the Wyoming Geological Survey, and NPS. The BOR will continue its monitoring of Jackson Lake Dam for strong ground motion and other performance parameters to ensure the safety of the structure. Cost efficiencies were achieved by re-use of previous seismic station sites and deployment of communications equipment.

USGS intern David Fee completes the installation of a seismic station in Wyoming, part of the new ANSS Teton Regional Seismic Network in the Jackson-Hole -Teton area.

Program Description

Geologic Resource Assessments programs assess the availability and quality of the Nation's mineral and energy resources, including studying the economic and environmental effects of resource extraction and use. These programs support the DOI Strategic Plan to enhance public benefit, promote responsible use, and ensure optimal-value by ensuring that data are available for managers to make informed decisions about use of resources.

Significant Output/Accomplishment

Simple, Real-Time Field-Assessment for Prioritizing Oil and Gas Production Sites

The USGS ERP has developed simple, real-time, field-assessment techniques for prioritizing oil and gas production sites on public lands. Public land managers have increasing responsibilities to assess the nature and extent of environmental impacts and to determine the associated risks to human and ecosystem health. Frequently, there are large numbers of sites to evaluate and limited guidance on how to evaluate and prioritize these sites for more detailed assessments and possible remediation. The techniques developed by the ERP focus on the primary sources of human health and

ecosystem risk hydrocarbon releases (evaluated with a photoionization detector and a soil auger), produced water releases (evaluated with conductivity meters and chloride titration strips), and naturally occurring radioactive materials (evaluated with a microRmeters). These three techniques were developed and tested at two NPS units: Big South Fork National Recreation Area and Padre Island National Seashore. NPS personnel plan to adopt the techniques consistently throughout the entire recreation and seashore areas once funds permit. These techniques now will be tested in arid environments to determine the effectiveness in those producing areas.

Geography Accomplishments

Program Description

Geographic Analysis and Monitoring Program

The GAM program encompasses three fundamental science issues concerning changes to the Earth's surface: (1) understanding changes that are occurring on the land surface and why; (2) understanding the impacts of these land-surface changes on ecosystem health, climate variability, biogeochemical cycles, hydrology, and human health; and (3) using the best methods available to incorporate scientific findings in the decisionmaking process of natural resource managers and provide the information to the public. This program addresses DOI's strategic goal of advancing knowledge through scientific leadership and informing decisions through the applications of science by accessing the Nation's land resources at spatial and temporal scales to understand rates, causes, and consequences of landscape change over time.

Significant Output/Accomplishment

National-scale Assessment and Forecast of Wildfire Ignition Potential

Long-term forecasts of fire hazards and fire-related vegetation conditions are important tools for resource managers responsible for planning for wildland fire fighting and mitigation. These forecasts depend on having scientifically sound understanding of the interaction between climate and fire regimes, especially under changing climates. Fire hazard is assessed from conditions of vegetation, weather, and topography. Accurate forecasting of the potential of fire ignition is possible if scientists know the proportion of live and dead vegetation and its moisture content. This project refined the Fire Potential Index model by adding the capability to ingest weather variables over the conterminous U.S. and calculating the correlation of the Fire Potential Index values with the actual fire occurrences during 2001. It also hind-casted for the 2001 fire season the Fire Potential Index for temporal and spatial patterns of change that contributed to daily and seasonal outbreaks of fire in two wildland fire-prone regions in the western U.S.

Program Description

Cooperative Topographic Mapping Program

The CTM program works with partners in other Federal agencies; in State, county, and local governments; and in the private sector to ensure that accurate, current, and complete data that locate and describe the Earth's features are available and that products such as the USGS topographic series maps are kept up to date. This program addresses DOI's strategic goal of advancing knowledge through scientific leadership and inform decisions through the application of science by ensuring the development, maintenance, and availability of base geographic data for the Nation.

Significant Output/Accomplishment

Detection and Analysis of Significant Topographic Surface Change – A Nationwide Assessment

Studies of landscape change have traditionally focused on change in two dimensions, the change in land use and land cover. This project maps and describes the vertical component of landscape change, changes to the physical shape of the land surface. It uses the National Elevation Dataset (NED) (the elevation layer of *The National Map*) as the historical base map, more detailed elevation data from the 2001 Shuttle Radar Topographic Mission (SRTM) dataset for the current elevation setting, and derives surface changes from a differencing equation between SRTM and NED. One of the significant impacts of topographic surface change is caused by changes to surface hydrology features (sub-watersheds and stream courses). Results to date show that activities that modify the local topography, such as mountaintop mining in Appalachia, alter the surface parameters (slope and aspect) that control local drainage patterns.

Water Accomplishments

Program Descriptions

Since its inception in 1879, the USGS has been involved in issues related to water availability, water quality, and flood hazards. This work is conducted by more than 4,000 hydrologists, technicians, and support staff located

in offices in every State. USGS efforts include: (1) collection, management, and dissemination of hydrologic data; (2) analysis of hydrologic systems through modeling or statistical methods; and (3) research and development leading to new methods and new understanding. The following is a basic summary of the USGS Water Resources Investigations programs that are classified primarily as applied research:

The Ground Water Resources Program evaluates ground water in the Nation's major aquifer systems, assesses the interactions of ground water with surface water, and evaluates the various factors that govern the response of aquifer systems to pumping, droughts, and other stresses.

The National Water-Quality Assessment (NAWQA) Program provides nationally consistent data and information on the quality of the Nation's most important water resources, identifying status and trends, determining cause and effect, and eventually providing forecasts or prediction. The program is now in its second decade of investigation. NAWQA plans for the second decade (recently reviewed by the NRC) focus on water-quality trends over time and on environmental conditions that influence contaminant distribution.

The Toxic Substances Hydrology Program provides scientific information and tools that explain the occurrence, behavior, and effects of toxic substances in the Nation's surface water and ground water. Data and information from the program support sound decisionmaking by resource managers, regulators, industry, and the public to improve characterization and management of contaminated sites, to protect human and environmental health, and to reduce potential future contamination problems.

The Hydrologic Research and Development Program focuses on long-term investigations that integrate hydrologic, geologic, chemical, climatic, and biological information related to water-resources issues. This program provides the core research capability of the USGS water programs and supports many of the Bureau's foremost water research scientists.

The mission of the Cooperative Water Program is to provide reliable, impartial, and timely information needed to understand the Nation's water resources through a program of shared efforts and funding with State, Tribal, and local partners to enable decisionmakers to wisely manage the Nation's water resources. This program is a 50:50 matching program in which State, Tribal, and local government agencies provide at least half the funds and the USGS performs most of the work. About 40 percent of the Cooperative Water Program comprises focused water resources investigations, with the goal of seeking solutions to water-resources issues of national concern.

The USGS administers grants for 54 State Water Resources Research Institutes designated by the Water Resources Research Act. The program supports academic research to aid in the resolution of State and regional water problems and related land problems, promotes technology transfer, and provides for the training of scientists and engineers.

Significant Outputs/Accomplishments

Methow River Basin, Washington

Increased use of ground-water and surface-water supplies in the Methow River Basin has created concern that insufficient streamflow will remain to sustain a healthy fish population. Three fish species in the river are listed as endangered or threatened. In addition, management of the water resources of the Methow River Basin is changing in response to State-legislated watershed planning. Management officials are considering options that should minimize adverse effects on human use of water while meeting instream-flow requirements for irrigation and other needs.

In collaboration with Okanogan County, WA, the Ground-Water Resources Program and the Cooperative Water Program supported a USGS study of ground water and surface water in the Methow River Basin to provide information for water-resources managers to make choices about how to allocate water for fish habitat, irrigation, and other uses. Two USGS reports describe the results of the study. The first is entitled, "Hydrogeology of the Unconsolidated Sediments, Water Quality, and Ground-Water/Surface-Water Exchanges in the Methow River Basin, Okanogan County, Washington" and is available on the Internet at http://pubs.water.usgs.gov/wri034244/. The second is entitled, "Precipitation-Runoff Simulations of Current and Natural Streamflow Conditions in the Methow River Basin, Washington" and is available on the Internet at http://pubs.water.usgs.gov/wri034246/. One conclusion of the reports is that seepage from unlined irrigation canals recharges the aquifer in late spring and summer and contributes to streamflow throughout the year. This result illustrates the importance of understanding the

interaction of ground water with surface water.

Contaminant Plumes with Complex Chemical Mixtures

Some research in the Toxic Substances Hydrology Program in FY 2004 focused on identifying processes that control contaminant transport in representative contaminant plumes with complex chemical mixtures, and developing tools to predict contaminant movement as it is affected by natural processes. Results from previous long-term observations of restoration efforts at a wastewater effluent plume in Cape Cod, MA, guided laboratory and field studies of the geochemical processes controlling the natural restorative processes in aquifers contaminated with wastewater effluent. In addition, the USGS tested newly developed field instrumentation at the landfill research site in Norman, OK. This new instrumentation enables scientists to measure the products of reduction and oxidation reactions in the field, thereby providing indications of some natural biodegradation processes that occur in landfill leachate plumes.

Developmental Research

In accordance with OMB Circular No. A-11, USGS defines developmental research activities as systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements. The table below provides a summary of our developmental research and development investments over the past five years and descriptions of selected programs and selected outcomes and/or accomplishments in these areas for FY2004.

Biology Accomplishments

Program Description

The Cooperative Research Unit Program

This program is a unique cooperative partnership among Federal and State governments and academia. Federal scientists stationed at universities: (1) help identify and respond to natural resource information needs through the pooling of resources among agencies; (2) provide access to scientific expertise among Unit scientists, university faculty, and other Unit cooperators, especially where the required expertise is not readily available within Federal resource agencies; and (3) provide Federal and other natural resource managers access to a geographically dispersed science organization of Units to meet information needs that transcend State and regional boundaries.

Significant Output/accomplishment

Landscape Ecology and Resource Management: Linking Theory with Practice

The product of this effort is to develop an edited book (Landscape Ecology and Resource Management: Linking Theory with Practice) that develops linkages between

	2000	2001	2002	2003	2004
Biology					
Cooperative Research Unit				1	2
Invasive Species				2	1
Other Biology programs				29	8
Geology					
Volcano Hazards				3	4
Other Geology programs				24	27
Geography					
Land Remote Sensing				14	13
Other Geography programs				28	17
Totals (in millions) $	53	53	83	101	72

Data not available by major program.

landscape theory and environmental management and practice. Agencies and organizations worldwide have embraced ecosystem management, gap analysis, and metapopulation conservation and have tried to put some of these concepts and ideas into practice. As is the case in many developing disciplines, theory has been borrowed and cobbled together from related fields and provides an incomplete framework for application. Increasingly, the conceptual basis appears to be inadequately confirmed by the data. Use of the cobbled framework in management further exposes the problem of inadequate theory as well as the linkage between theory and practice. This drove the need for developing a more realistic and relevant conceptual basis for guiding management.

A cohesive theory of landscape ecology has not been possible even though much effort has been placed on its development. Additionally little attention has been placed on its application, at least in North America. At the same time, the field of landscape ecology has expanded so rapidly that it is difficult to keep up with new developments and synthesis of ideas into a workable framework.

The USGS explored this concern at the Second International Wildlife Management Congress in 1999 by organizing a session on "Scaling in Conservation Biology: Is There a Mismatch between Theory and Practice?"

The USGS asked, "How can the manager or biologist working for a resource agency or conservation organization put the powerful ideas and concepts that stem from landscape ecology into practice?" In the resulting book, the USGS provided a readable and coherent synthesis from which resource managers can start putting theory into practice.

Program Description

Invasive Species Program

The USGS plays an important role in Federal efforts to combat invasive species in natural and semi-natural areas through early detection and assessment of newly established invaders, monitoring of invading populations, improving understanding of the ecology of invaders and factors in the resistance of habitats to invasion, and developing and testing preventative and alternative management and control approaches. USGS research on invasive species includes all significant groups of invasive organisms in terrestrial and aquatic ecosystems.

Significant Output/accomplishment

Biological Invasions in the United States

The research focuses on developing improved methodologies for documenting, mapping, monitoring, and predicting invasive species, including the development of ecological forecasting models and applications of high performance computing in cooperation with NASA and other partners in the USGS National Institute of Invasive Species Science.

The project provides capabilities for accurate, online, near real-time mapping of invasive species infestations and forecasting the probability of invasions in vulnerable habitats using models that integrate numerous databases on invasive species occurrences and other available datasets. The project supports the ongoing development of an online Invasive Species Forecasting Service that will enable users to obtain rapid multi-scale assessment of the probable spread and threats from invasive species. The project provides essential information and tools for planning and implementing strategies for detection, monitoring, and control of invasive species in U.S. ecosystems.

In FY2004, the USGS delivered (a) a cluster computing infrastructure and suite of predictive geostatistical models that facilitate the integration of multiple datasets to document, map, and predict the locations of invasive plants, and (b) a sophisticated Internet mapping application ("T-Map," using Tamarisk as the initial target species) that facilitates online data entry of invasive species infestations and enables users to view current distributions, map point locations, and upload and download data. The USGS will continue to expand the T-map initiative and to apply these mapping and forecasting capabilities to additional species.

Detailed high-resolution maps of invasive species are used to strategically plan control and restoration efforts to systematically monitor the success of those efforts. Maps of the probability of invasions in vulnerable habitats enable managers to design strategies for early detection of new outbreaks of invasive species and make decisions on the priority, locations, and timing of control actions.

Geology Accomplishments

Program Description

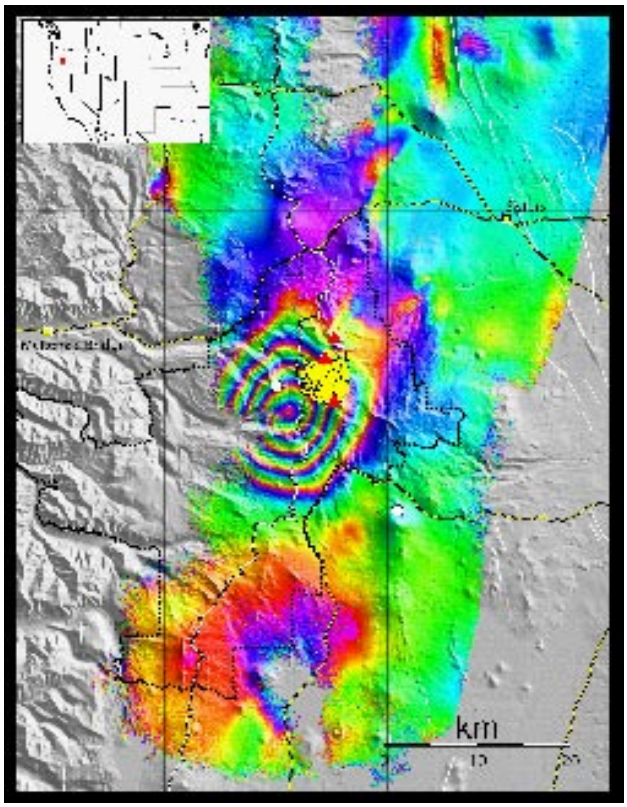
The Volcano Hazards Program's mission is to enhance public safety and reduce losses from volcanic events

through effective forecasts and warnings of volcanic hazards, thereby preventing volcano hazards from becoming volcano disasters. To this end, the Volcano Hazards Program provides earth-science data and information, hazard analyses, and basic and applied research to reduce the loss of life, property, and economic impact of geohazards related to volcanoes. This mission supports DOI's strategic goal of protecting lives, resources, and property by making information available to communities to use in developing hazard mitigation, preparedness, and avoidance plans.

Significant Output/accomplishment

Interferometric Synthetic Aperture Radar (InSAR)

USGS researchers from the VHP and the USGS-EROS Data Center are using a recently developed satellite remote-sensing technique called InSAR to study ground deformation at volcanoes in the United States and around the World. This technique can detect small (centimeter scale) changes in elevation in the Earth's surface by comparing small changes in radar images of the same area collected by satellites at different times. With InSAR, scientists are able to map the area's extent of ground deformation caused by magma accumulation in the crust, strain along earthquake faults, groundwater changes, and other processes that are common near active volcanoes.



Ground Deformation - Three Sisters Volcanic Center

InSAR is providing insight into rates at which subsurface volcanic reservoirs are supplied with magma and on how volcanic centers swell and deform prior to eruption. InSAR has already detected surface deformation at a number of U.S. volcanoes, possibly providing an earlier indicator of volcanic unrest than we have had previously. For example, InSAR has detected more than six years of continuous uplift, expressed as a bullseye of interference colors, at the Three Sisters Volcanic Center in Central Oregon. The uplift is best modeled by the intrusion of 40000 m^3 of magma at a depth of 5 to 7 km beneath the surface. Recently, an unprecedented swarm of more than 300 earthquakes occurred during the period of March 23-25, 2004, indicating that the stresses in the crust induced by the inflating magma chamber had finally reached the fracture strength of the rocks and were producing small earthquakes (yellow circles). Although it is impossible to predict at this time if the unrest will proceed to an eruption, the VHP has increased its monitoring activity at Three Sisters as a result of these events.

Geography Accomplishments

Program Description

Land Remote Sensing (LRS)

The LRS program acquires, archives, disseminates, and uses remotely-sensed data of the Earth's land surface. The program operates the Nation's land remote-sensing satellites (Landsat 5 and Landsat 7), providing moderate resolution imagery of the Earth's surface use in agriculture, geology, forestry, regional planning, education, mapping, and global change research. The program also maintains the National Satellite Land Remote Sensing Data Archive (NSLRSDA), which preserves and distributes remotely-sensed data to the worldwide community.

Significant Output/accomplishment

Expanding AmericaView

The USGS AmericaView Program is dedicated to expanding the understanding and applications of the science of remote sensing. In FY 2004, the Consortium's membership has increased, adding six additional new States as affiliate members (Montana, California, Hawaii, Kentucky, Louisiana, and North Dakota). Additionally, four States have been promoted to associate members (Alabama, Virginia, Wisconsin, and Indiana). The growing State membership in the Consortium has increased participation in universities, colleges, and

State government agencies. Also, USGS has proactively encouraged the establishment of in-State libraries to archive State imagery and expanded the awareness of these data to users and potential users throughout the State.

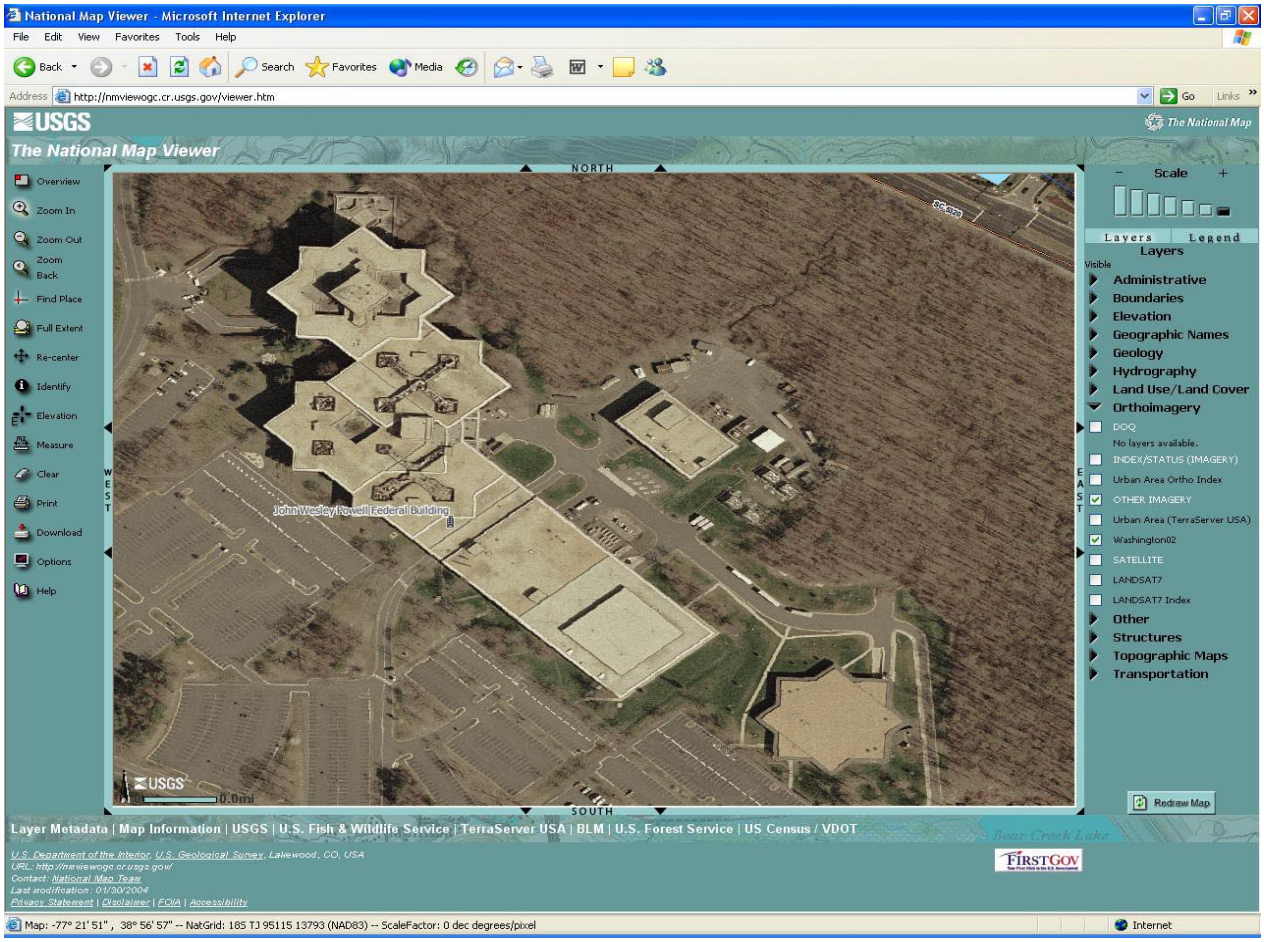
Program Description

The National Map is a resource that stimulates the economic and environmental health of the Nation by enabling and communicating geographic science. It is composed of integrated, high-quality geospatial data and applications for the Nation that allows land managers, policymakers, decisionmakers, and researchers at all levels of government and within academia to describe the Earth's land surface and its dynamic nature. *The National Map* will ensure the development, availability, and integration of continuously-maintained and nationally-consistent basic geospatial data and correlative research and applications for a greater scientific understanding of how the Nation's land surface is changing. This program supports DOI's strategic goal of scientific leadership and informing decisions through the applications of science, which is aimed at expanding the scientific knowledge base and enhancing the quality and objectivity of DOI science.

Significant Output/accomplishment

The National Map Viewer

The USGS is committed to making *The National Map* easily accessible to customers and partners through increased use of advanced computing, archiving, and communication tools and through innovative collaboration with public and private organizations. This ability greatly improves communication tools for responding to public inquiries and expanding cooperation with private industry in product development and dissemination. *The National Map* Web application allows users to access the datasets of *The National Map* through an interactive map viewer, using only their Web browser. This means that users do not have to have special software on their own computers. The viewer allows anyone to interactively view *The National Map* data as a map, customize the view, and print a map. Map tools allow users to move around the map, zoom in and out, identify features, and perform other functions. See http://nationalmap.usgs.gov/.



Section V
Independent Auditors' Report

USGS scientist retreiving portable seismic recorders, which had recorded seismicity of explosive charges as well as earthquakes, following an eruption of the Redoubt Volcano in Alaska.

Contents

Inspector General Transmittal Letter 112
Independent Auditors' Report 114
USGS Response 125

United States Department of the Interior

OFFICE OF INSPECTOR GENERAL
Washington, D.C. 20240

NOV 24 2004

Memorandum

To: Director, U.S. Geological Survey

From: Roger La Rouche
Assistant Inspector General for Audits

Subject: Independent Auditors' Report on the U.S. Geological Survey's Financial Statements for Fiscal Year 2004 (Assignment No. E-IN-GSV-0057-2004)

We contracted with KPMG LLP (KPMG), an independent certified public accounting firm, to audit the U.S. Geological Survey's (USGS) financial statements for fiscal year 2004. The contract required that KPMG conduct its audit in accordance with U.S. generally accepted government auditing standards; Office of Management and Budget Bulletin 01-02, as amended, *Audit Requirements for Federal Financial Statements*; and the Government Accountability Office/President's Council on Integrity and Efficiency *Financial Audit Manual.*

In its audit of USGS (Attachment 1), KPMG found that the financial statements were fairly presented, in all material respects, in conformity with U.S. generally accepted accounting principles. As discussed in KPMG's report and Note 14 to the financial statements, USGS's fiscal year 2004 consolidated statement of net cost is not comparable to its fiscal year 2003 consolidated statement of net cost. This occurred because in fiscal year 2004, USGS revised the presentation of costs and revenues to match Government Performance and Results Act strategic plan applicable to fiscal year 2004, which is different from the plan applicable to fiscal year 2003.

In addition, KPMG identified two reportable conditions related to internal controls and financial operations, neither of which KPMG considers to be a material weakness:

- Controls Over Information Technology Data Security, and
- Controls Over Accounts Receivable and Deferred Revenue Related to Reimbursable Agreements.

KPMG also found that USGS's financial management systems did not substantially comply with the *Federal Financial Management Improvement Act* (FFMIA) because of noncompliance with Federal financial management systems requirements. Excluding FFMIA, there were no reportable findings of noncompliance with laws and regulations tested during the audit.

KPMG is responsible for the attached auditors' report and for the conclusions expressed therein. We do not express an opinion on USGS's financial statements, conclusions on the effectiveness of internal controls, conclusions on whether USGS's financial management systems substantially complied with FFMIA, or conclusions on compliance with laws and regulations.

In the November 10, 2004 response (Attachment 2), USGS concurred with the report's findings and recommendations and indicated corrective actions would be taken. Based on USGS's response, we consider all the recommendations resolved but not implemented. The recommendations will be referred to the Assistant Secretary for Policy, Management and Budget for tracking of implementation.

The legislation, as amended, creating the Office of Inspector General (5 U.S.C.A. App. 3), requires semiannual reporting to Congress on all audit reports issued, actions taken to implement audit recommendations, and recommendations that have not been implemented. Therefore, this report will be included in our next semiannual report. The distribution of the report is not restricted and copies are available for public inspection.

We appreciate the cooperation and assistance of U.S. Geological Survey personnel during the audit. If you have any questions, please contact me at (202) 208-5512.

Attachments (2)

KPMG LLP
2001 M Street, NW
Washington, DC 20036

Independent Auditors' Report

Director of the U.S. Geological Survey and Inspector General
U.S. Department of the Interior:

We have audited the accompanying consolidated balance sheets of the U. S. Geological Survey (USGS) as of September 30, 2004 and 2003, and the related consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing for the year ended September 30, 2004 (hereinafter referred to as the "financial statements"). The objective of our audits was to express an opinion on the fair presentation of these financial statements. In connection with our audits, we also considered USGS's internal control over financial reporting and tested USGS's compliance with certain provisions of applicable laws, regulations, contracts and grant agreements that could have a direct and material effect on its financial statements.

SUMMARY

As stated in our opinion on the financial statements, we concluded that USGS's consolidated balance sheets as of September 30, 2004 and 2003, and the related consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing for the year ended September 30, 2004, are presented fairly, in all material respects, in conformity with accounting principles generally accepted in the United States of America. We did not audit the consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing for the year ended September 30, 2003.

As discussed in Note 14 to the financial statements, USGS's fiscal year 2004 consolidated statement of net cost is not comparable to the fiscal year 2003 consolidated statement of net cost because, in fiscal year 2004, USGS revised the presentation of costs and revenues to match the Government Performance and Results Act strategic plan applicable to fiscal year 2004, which is different than the plan applicable to fiscal year 2003.

Our consideration of internal control over financial reporting identified the following conditions as reportable conditions:

A. Controls over Information Technology (IT) data security
B. Controls over accounts receivable and deferred revenue related to reimbursable agreements

However, none of the reportable conditions are believed to be material weaknesses.

The results of our tests of compliance with certain provisions of laws, regulations, contracts and grant agreements, exclusive of those referred to in the *Federal Financial Management Improvement Act of 1996* (FFMIA), disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*, issued by the Comptroller General of the United States, or Office of Management and Budget (OMB) Bulletin No. 01-02, *Audit Requirements for Federal Financial Statements*.

The results of our tests of FFMIA disclosed instances where USGS's financial management systems did not substantially comply with the following requirement:

C. Federal Financial Management Systems Requirements

The following sections discuss our opinion on USGS's financial statements, our consideration of USGS's internal control over financial reporting, our tests of USGS's compliance with certain provisions of applicable laws, regulations, contracts, and grant agreements and management's and our responsibilities.

OPINION ON THE FINANCIAL STATEMENTS

We have audited the accompanying consolidated balance sheets of the U.S. Geological Survey as of September 30, 2004 and 2003, and the related consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing for the year ended September 30, 2004. The accompanying consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing for the year ended September 30, 2003 were not audited by us and, accordingly we do not express an opinion on them.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of USGS as of September 30, 2004 and 2003, and its net costs, changes in net position, budgetary resources, reconciliation of net costs to budgetary obligations for the year ended September 20, 2004, in conformity with accounting principles generally accepted in the United States of America.

As discussed in Note 14 to the financial statements, USGS's fiscal year 2004 consolidated statement of net cost is not comparable to the fiscal year 2003 consolidated statement of net cost because, in fiscal year 2004, USGS revised the presentation of costs and revenues to match the Government Performance and Results Act strategic plan applicable to fiscal year 2004, which is different than the plan applicable to fiscal year 2003.

The information in the Management Discussion and Analysis, Required Supplemental Stewardship Information and Required Supplemental Information sections is not a required part of the financial statements, but is supplementary information required by accounting principles generally accepted in the United States of America or OMB Bulletin No. 01-09, *Form and Content of Agency Financial Statements*. We have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and

presentation of this information. However, we did not audit this information and, accordingly, we express no opinion on it.

Our audits were conducted for the purpose of forming an opinion on the financial statements taken as a whole. The other accompanying information included in Section VI, Appendices, as reflected in the accompanying table of contents, is an integral part of USGS's *Fiscal Year 2004 Performance and Accountability Report*. However, this information is not a required part of the financial statements and is presented for purposes of additional analysis. We did not audit this information and, accordingly, we express no opinion on it.

INTERNAL CONTROL OVER FINANCIAL REPORTING

Our consideration of internal control over financial reporting would not necessarily disclose all matters in the internal control over financial reporting that might be reportable conditions. Under standards issued by the American Institute of Certified Public Accountants, reportable conditions are matters coming to our attention relating to significant deficiencies in the design or operation of the internal control over financial reporting that, in our judgment, could adversely affect USGS's ability to record, process, summarize, and report financial data consistent with the assertions by management in the financial statements.

Material weaknesses are reportable conditions in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements, in amounts that would be material in relation to the financial statements being audited, may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions.

In our fiscal year 2004 audit, we noted the following matters involving the internal control over financial reporting and its operation that we consider to be reportable conditions. However, the reportable conditions are not believed to be material weaknesses.

A. Controls over Information Technology (IT) data security

USGS has made significant improvements in its IT internal controls environment, however, controls still need to be improved in the areas described below to meet the requirements of OMB Circular A-130 *Management of Federal Information Resources*. These conditions could affect USGS's ability to prevent and detect unauthorized changes to financial information, control electronic access to sensitive information, ensure that data integrity is achieved and protect its information resources.

1. *Information Security and Logical Access Controls* – During the internal vulnerability assessment work performed on-site, KPMG discovered that USGS had not properly configured several Oracle databases so that an appropriate level of access control is applied to each. This stems from the fact that USGS does not have a documented database hardening policy and guide to assist database administrators in properly configuring these databases. The identified Oracle databases had active user accounts with vendor-supplied default usernames and passwords. This was initially noted during the FY 2003 review.

2. *Information Security and Application Access Controls* - USGS's core financial application is the Federal Financial System (FFS), which resides on the SYS 5 LPAR on the mainframe. Access to FFS is controlled by its own security features as well as RACF, the security program that controls access to the mainframe. FPPS is the core payroll application, which resides on the SYS 2 LPAR on the mainframe. Access to FPPS is also controlled by RACF. BASIS+ is a project/agreement management system that interfaces with FFS to provide accounting information. NetWare is one of the key systems that controls access to USGS's Local Area Network, which connects the USGS's users to the mainframe, the BASIS+ system, and other key financial systems.

During our review of the user account management processes for the various systems mentioned above, we noted the following weaknesses:

- There were 15 FFS users, 2 FPPS users, and 3 NetWare users with two or more user IDs;
- There were 17 NetWare accounts and 7 FPPS accounts that were accessed after the password expiration dates; and
- There were 7 FFS and 5 FPPS active user accounts that belong to employees who are no longer employed by USGS. 4 of the FFS accounts and 2 of FPPS accounts were accessed after the employees' termination date.

3. *Access Controls: Encryption* – In prior years, we noted that encryption tools at USGS were not being consistently used for all network related activities and transmission of sensitive or confidential data. During FY 2004, USGS initiated a project to utilize TN3270 encrypted communication to exchange data with the mainframe maintained by National Business Center (NBC). The project required establishing an encrypted port at NBC to receive encrypted data and enabling encryption features on client workstations.

Based on our audit procedures, we noted that the encryption port has been established by NBC and the encryption features have been enabled and utilized for all workstations within the Office of Administrative Policy and Services (APS). However, we also noted the following:

- Encryption features have not been enabled for non-APS workstations;
- Encryption features can be disabled by someone with access to local workstations; and
- Both encrypted and unencrypted ports at NBC are open to receive transmissions.

Recommendations

We recommend that USGS:

1. *Information Security and Logical Access Controls* – Change the passwords, or disable or remove identified user accounts to prevent unauthorized users from gaining access to the Oracle databases and their contents. Additionally, USGS should take steps in developing a database

hardening policy and guide so that database administrators can properly apply the appropriate security to each database, Oracle or otherwise, throughout the bureau.

2. *Information Security and Application Access Controls* – Perform periodic reviews of the access control listings of its various IT resources to ensure that active users have valid business needs for such access and that the access privileges are not excessive. USGS should continue efforts to enforce password policies using the technical tools available and continue efforts to enhance coordination and communication with NBC regarding user account management.

3. *Access Controls: Encryption* – We recognize that USGS encryption implementation project is still in progress. USGS should ensure that the project progresses on schedule and that all USGS workstations that communicate with the mainframe utilize encryption for transmitting data. We further recommend that USGS should limit access to change encryption features on local workstations to FFS security administrators as an interim measure, or devise alternative measures to ensure that users do not use the encrypted communication method, e.g., periodic spot checks of workstations and document the results of the checks and work with NBC to shut down the unencrypted port as a permanent measure.

Management Response

Management has prepared an official response presented as a separate attachment to this report. In summary, management agreed with our findings and its comments were responsive to our recommendations.

B. Controls over Accounts Receivable and Deferred Revenue Related to Reimbursable Agreements

During our substantive testwork over a statistical sample of 252 billed and unbilled accounts receivable and deferred revenue balances related to reimbursable agreements that are reported in the consolidated balance sheet of USGS as of September 30, 2004, we noted the following:

- Eleven instances in which deferred revenue remained on fixed price agreements for a significant period after completion of the agreement (ranging from 1 year to 3 years), which should be recorded as revenue upon completion. In Fiscal 2004, USGS improved the control procedure in which the cost center administrative personnel are to review the 289A report for unusual and incorrect agreement data. The control is now facilitated by a series of exception reports provided to the cost centers by headquarters. However, no exception report has been developed to identify this type of exception.

- Twenty-three instances in which USGS is not billing timely and in accordance with the billing terms stated in the agreement. USGS does not adhere to the billing terms stated in the agreement, and in many cases USGS does not provide the deliverables required by the agreement, which would allow for timely billing. In addition, agreements are not written properly to reflect USGS's goal of improving billing practices. For example, many agreements state that the agreement will be billed upon completion of the project. However, this is not in line with USGS' goal of billing more in line with the recognition of expenditures.

- Four instances in which there is both a billed accounts receivable amount and a deferred revenue amount recorded in the Project Cost Accounting System (PCAS). It is our

understanding that there is a flaw in the PCAS system that prevents the deferred revenue on certain agreements from being depleted when a billed accounts receivable is established.

- Eight instances in which the amount recorded in deferred revenue was not recorded in the appropriate fiscal year of the agreement. The manual process of rolling forward agreements to the next fiscal year is extremely susceptible to error and, therefore, relies heavily on the operating effectiveness of the control procedure discussed above in which the cost center administrative personnel are to review the 289A report for unusual and incorrect agreement data. It appears that the guidance provided by headquarters does not address this issue.

The effect of the above noted instances did not result in a material misstatement of the financial statements. However, the underlying control weakness, if left unaddressed, could result in a future material misstatement.

Recommendations

We understand that USGS has significantly improved internal controls through a centralized review and analysis of agreements with abnormal billed and unbilled accounts receivable and deferred revenue balances. We recommend that:

1. USGS continue to improve internal controls to address the issues noted above;

2. USGS standardize agreements and develop consistent billing practices that permit recovery of unbilled amounts as expenditures are incurred. Billing practices should be more in line with USGS's normal vendor payment cycle, which is currently 30 days as required under the Prompt Payment Act; and

3. USGS evaluate other Federal and commercial practices in order to improve the controls over reimbursable revenue.

Management Response

Management has prepared an official response presented as a separate attachment to this report. In summary, management agreed with our findings and its comments were responsive to our recommendations.

* * * * *

A summary of the status of prior year findings is included as Exhibit 1.

We also noted other matters involving internal control over financial reporting and its operation that we have reported to the management of USGS in a separate letter dated October 29, 2004.

COMPLIANCE AND OTHER MATTERS

The results of our tests of compliance with certain provisions of laws, regulations, contracts, and grant agreements described in the Responsibilities section of this report, exclusive of those referred to in *Federal Financial Management Improvement Act of 1996* (FFMIA), disclosed no instances of noncompliance or other matters that are required to be reported herein under *Government Auditing Standards* or OMB Bulletin No. 01-02.

The results of our tests of compliance with certain provisions of other laws and regulations, exclusive of those referred to in FFMIA, disclosed no other instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards* or OMB Bulletin No. 01-02.

The results of our tests of FFMIA disclosed an instance, described below, where USGS's financial management systems did not substantially comply with Federal financial management systems requirements.

C. Federal Financial Management Systems Requirements

As previously discussed in the "Internal Control Over Financial Reporting" section of this report, USGS did not have adequate information security and general control policies and procedures to meet the Federal financial management systems requirements of FFMIA.

Recommendation

We recommend that management improve controls over information technology systems to ensure adequate security and protection of information resources and to meet the requirements of FFMIA

The results of our tests of FFMIA disclosed no instances in which USGS's financial management systems did not substantially comply with Federal accounting standards and the United States Government Standard General Ledger at the transaction level.

We noted other matters involving compliance with laws, regulations, contracts, and grant agreements that, under *Government Auditing Standards* and OMB Bulletin No. 01-02, were not required to be included in this report, that we have reported to the management of USGS in a separate letter dated October 29, 2004.

* * * * *

A summary of the status of prior year findings is included as Exhibit 1.

RESPONSIBILITIES

Management's Responsibilities

The *Government Management Reform Act of 1994* (GMRA) requires each Chief Financial Officer (CFO) Act agency to report annually to Congress on its financial status and any other information needed to fairly present its financial position and results of operations. To assist the Department of the Interior in meeting the GMRA reporting requirements, USGS prepares annual financial statements.

Management is responsible for the financial statements, including:

- Preparing the financial statements in conformity with accounting principles generally accepted in the United States of America;
- Establishing and maintaining internal controls over financial reporting, and preparing the Management Discussion and Analysis (including the performance measures), Required Supplemental Information, and Required Supplemental Stewardship Information, and
- Complying with laws, regulations, contracts, and grant agreements, including FFMIA.

In fulfilling this responsibility, estimates and judgments by management are required to assess the expected benefits and related costs of internal control policies. Because of inherent limitations in internal control, misstatements, due to error or fraud, may nevertheless occur and not be detected.

Auditors' Responsibilities

Our responsibility is to express an opinion on the September 30, 2004 consolidated statement of net cost, consolidated statement of changes in net position, combined statement of budgetary resources, and consolidated statement of financing and the September 30, 2003 consolidated balance sheet of USGS based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America, the standards applicable to financial audits contained in *Government Auditing Standards*, and OMB Bulletin No. 01-02. Those standards and OMB Bulletin No. 01-02 require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit includes:

- Examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements;
- Assessing the accounting principles used and significant estimates made by management, and
- Evaluating the overall financial statement presentation.

We believe that our audits provide a reasonable basis for our opinion.

In planning and performing our FY 2004 audit, we considered USGS's internal control over financial reporting by obtaining an understanding of USGS's internal control, determining whether internal controls had been placed in operation, assessing control risk, and performing tests of controls in order to determine our auditing procedures for the purpose of expressing our opinion on the financial statements. We limited our internal control testing to those controls necessary to achieve the objectives described in *Government Auditing Standards* and OMB Bulletin No. 01-02. We did not test all internal controls relevant to operating objectives as broadly defined by the *Federal Managers' Financial Integrity Act of 1982*. Because of inherent limitations in internal control, misstatements due to error or fraud, losses, or noncompliance may nevertheless occur and not be detected. Also, projecting our evaluation to future periods is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with controls may deteriorate. In addition, our internal control testing may not be sufficient for other purposes. The objective of our audit was not to provide assurance on internal control over financial reporting. Consequently, we do not provide an opinion thereon.

As required by OMB Bulletin No. 01-02, we considered USGS's internal control over Required Supplemental Stewardship Information by obtaining an understanding of USGS's internal controls, determining whether these internal controls had been placed in operation, assessing control risk, and performing tests of controls. Our procedures were not designed to provide assurance on internal control over Required Supplemental Stewardship Information and, accordingly, we do not provide an opinion thereon.

As further required by OMB Bulletin No. 01-02, with respect to internal control related to performance measures determined by management to be key and reported in the Management Discussion and Analysis section, we obtained an understanding of the design of significant internal controls relating to the existence and completeness assertions. Our procedures were not designed to provide assurance on internal control over performance measures and, accordingly, we do not provide an opinion thereon.

As part of obtaining reasonable assurance about whether USGS's FY 2004 financial statements are free of material misstatement, we performed tests of USGS's compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts, and certain provisions of other laws, regulations, contracts, and grant agreements specified in OMB Bulletin No. 01-02, including certain provisions referred to in FFMIA. We limited our tests of compliance to the provisions described in the preceding sentence, and we did not test compliance with all laws, regulations, contracts, and grant agreements applicable to USGS. Accordingly, noncompliance may occur and not be detected by these tests and such testing may not be sufficient for other purposes. Providing an opinion on compliance with laws, regulations, contracts, and grant agreements was not an objective of our audit and, accordingly, we do not express such an opinion.

Under OMB Bulletin No. 01-02 and FFMIA, we are required to report whether USGS's financial management systems substantially comply with (1) Federal financial management systems requirements, (2) applicable Federal accounting standards, and (3) the United States Government Standard General Ledger at the transaction level. To meet this requirement, we performed tests of compliance with FFMIA Section 803(a) requirements.

DISTRIBUTION

This report is intended for the information and use of USGS's and the Department of the Interior's management, the Department of the Interior's Office of Inspector General, the U.S. Government Accountability Office, OMB, and the U.S. Congress, and is not intended to be and should not be used by anyone other than these specified parties.

KPMG LLP

October 29, 2004

Exhibit 1

U.S. Geological Survey
Summary of the Status of Prior Year Findings
September 30, 2004

FY 2003 Report Reference	Condition Area	Status
A	***Controls over accounts receivable and deferred revenue related to reimbursable agreements***	**Partially Repeated Comment** See Reportable Condition 2004-B
B	***Controls over Information Technology (IT) data security***	**Partially Repeated Comment** See Reportable Condition 2004-A
C	***Policies, procedures, and controls over property, plant and equipment***	Substantial progress has been made by USGS in addressing this issue and it is no longer considered a reportable condition.
D	***Policies, procedures and controls over intra-departmental eliminations***	Substantial progress has been made by USGS in addressing this issue and it is no longer considered a reportable condition.
E	***Compliance with FFMIA – Federal financial management system requirements***	**Partially Repeated Comment** See finding 2004-C in the "Compliance and Other Matters" section.
F	***Compliance with FFMIA – Federal Accounting Standards***	Substantial progress has been made by USGS in addressing this issue and it is no longer considered a reportable condition.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Office of the Director
Reston, Virginia 20192

MEMORANDUM

NOV 1 0 2004

To: Assistant Inspector General for Audits

Through: Bennett W. Raley R. Thomas Weimer NOV 1 2 2004
Assistant Secretary – Water and Science

From: Charles G. Groat
Director, U.S. Geological Survey

Subject: Comments to the Draft Independent Auditors' Report on the U.S. Geological Survey's Financial Statements for Fiscal Year 2004 (Assignment No. E-IN GSV-0057-2004)

Thank you for the opportunity to respond to the Draft Independent Auditors' Report on the U.S. Geological Survey's Financial Statements for Fiscal Year 2004. We have reviewed the report and concur with the findings of two reportable conditions related to internal controls and financial operations, neither of which is considered to be a material weakness. The bureau has begun developing corrective action plans to address the two reportable conditions.

Several of the recommendations for correcting internal controls over Information Technology have been implemented, including updating all workstations that communicate with the mainframe; and development of a report of IP addresses using the open port to the mainframe. This report will be reviewed to ensure there are no U.S. Geological Survey (USGS) customers accessing this port. We note, however, that the National Business Center has indicated they will not be able to shut down the open port to the mainframe just for the USGS. Our Denver-based USGS telecommunications staff controls access to the mainframe via a USGS-owned server. As an alternate solution, we are working with that staff to assess the feasibility of shutting down access to the open port on the mainframe via this server. Additionally, as noted in the Draft Report, the bureau has significantly improved internal controls over accounts receivable and deferred revenue. We are proud of this accomplishment, and during fiscal year 2005, the bureau will further strengthen internal controls in this area by implementing the recommendations.

Should you have any questions regarding this memorandum or any of our responses, please feel free to contact either Carol Aten at 703-648-7200 or Karen Baker at 703-648-7261.

Section VI
Appendices

USGS geologists collecting rock samples in a remote location.

Contents

A. Glossary of Acronyms 127
B. Validation and Verification of Performance Measures 130
C. Program Evaluation Data 132
D. Significant FY2004 Accomplishments by USGS Employees 134

Glossary of Acronyms

ABC/M Activity-Based Costing/Management

ACWI Advisory Committee for Water Information

ANSS Advanced National Seismic System

APS Administration and Policy Services

AR Accounts Receivable

ARMI Amphibian Research and Monitoring Initiative

ASC Alaska Science Center

AVO Alaska Volcano Observatory

BASIS+ Budget and Science Information System

BIS Commerce - Bureau of Industry and Security

BOR U.S. Bureau of Reclamation

BLM U.S. Bureau of Land Management

BLT Business Leaders Team

BRD Biological Resources Division

CA Condition Assessment

CAP Cooperative Agreements Program

CBM Coalbed Methane

CERC Columbia Environmental Research Center

CERP Comprehensive Everglades Restoration Plan

CINDI Center for Integration of Natural Disaster Information

CISN California Integrated Seismic Network

CMGP Coastal and Marine Geology Program

CNMI Commonwealth of the Northern Mariana Islands

CRWA Charles River Watershed Association

CSRS Civil Service Retirement System

CTBT Comprehensive Test Ban Treaty

CTM Cooperative Topographic Mapping

DCIA Debt Collection Improvement Act

DEQ Oregon Department of Environmental Quality

DiGIR Distributed Generic Information Retrieval

DOI U.S. Department of the Interior

DSS Decision Support System

EFT Electronic Funds Transfer

EHP Earthquake Hazards Program

EPA U.S. Environmental Protection Agency

EPCA Energy Policy and Conservation Act

ERP Energy Resources Program

ETM+ Enhanced Thematic Mapper Plus

FASAB Federal Accounting Standards Advisory Board

FBMS Financial Business Management System

FBWT Fund Balance with Treasury

FCI Facilities Condition Index

FECA Federal Employee Compensation Act

FEGLI Federal Employees Group Life Insurance

FEHB Federal Employees Health Benefit

FEMA Federal Emergency Management Agency

FERS Federal Employees Retirement System

FFMIA Federal Financial Management Improvement Act of 1996

FGDC Federal Geographic Data Committee

FICA Federal Insurance Contributions Act

FISC Florida Integrated Science Center

FISMA Federal Information Security Management Act

FMT Field Managers Team

FMFIA Federal Managers' Financial Integrity Act of 1982

FMMS Facilities Maintenance Management System

FTEs Full-Time Equivalents

FWS U.S. Fish and Wildlife Service

GAAP Generally Accepted Accounting Principles

GAM Geographic Analysis and Monitoring Program

GAO Government Accountability Office

GBIP Great Basin Information Project

GCMRC Grand Canyon Monitoring and Research Center

GCP Global Change Program

GIS Geographic Information System

GLSC Great Lakes Science Center

GPRA Government Performance and Results Act

GSA General Services Administration

GSN Global Seismographic Network

HDOA Hawaii Department of Agriculture

HHS Health and Human Services

HVO Hawaii Volcano Observatory

HWATT Hemlock Woolly Adelgid Action Team

ICL International Consortium on Landslides

IEAM Integrated Environmental Assessment and Management

IP Investment Plan

IRIS Incorporated Research Institutions for Seismology

InSAR Interferometric Synthetic Aperture Radar

IT Information Technology

LHP Landslide Hazard Program

LMV Lower Mississippi Valley

LRS Land Remote Sensing

LTRMP Long-Term Resource Monitoring Program

MRERP Mineral Resources External Research Program

MRP Mineral Resources Program

NASA National Aeronautics and Space Administration

NAWQA National Water Quality Assessment

NBC Dept. of Interior - National Business Center

NBII National Biological Information Infrastructure

NCRA National Coal Resource Assessment

NCGMP National Cooperative Geologic Mapping Program

NED National Elevation Dataset

NEHP National Earthquake Hazards Program

NGIC National Geomagnetic Information Center

NHD National Hydrology Dataset

NPS U.S. National Park Service

NRC National Research Council

NSDI National Spatial Data Infrastructure

NSF National Science Foundation

NSIP National Streamgage Information Program

NWIS National Water Information System

NWQL National Water Quality Laboratory

OAFM USGS Office of Accounting and Financial Management

OB USGS Office of Budget

OIG Office of the Inspector General

OGDB Organic Geochemistry Database

OMB Office of Management and Budget

OMS Office of Management Services

OPM Office of Personnel Management

PART Program Assessment Rating Tool

PP&E Property, Plant, and Equipment

PI Principal Investigator

PSNER Puget Sound Near Shore Ecosystem Restoration

RSSI Required Supplementary Stewardship Information

RTS Reports Tracking System (Water Resources)

SAFOD San Andreas Fault Observatory at Depth

SAIN Southern Appalachian Information Node

SETAC Society of Environmental Toxicology and Chemistry

SFWMD South Florida Water Management District

SLC Scan Line Corrector

SGL Standard General Ledger

SIR Surveys, Investigations, and Research

SPRESO South Pole Remote Earth Science Observatory

SRTM Shuttle Radar Topographic Mission

TCOM Tahoe Constrained Optimization Model

TSP Thrift Savings Plan

TROR Treasury Report on Receivables

TRPA Tahoe Regional Planning Agency

USCOE U.S. Army Corp. of Engineers

USDA U.S. Department of Agriculture

USFS U.S. Forest Service

USGCRP U.S. Global Change Research Program

USGS U.S. Geological Survey

VHP Volcano Hazards Program

V&V Validation and Verification

WAN Wide Area Network

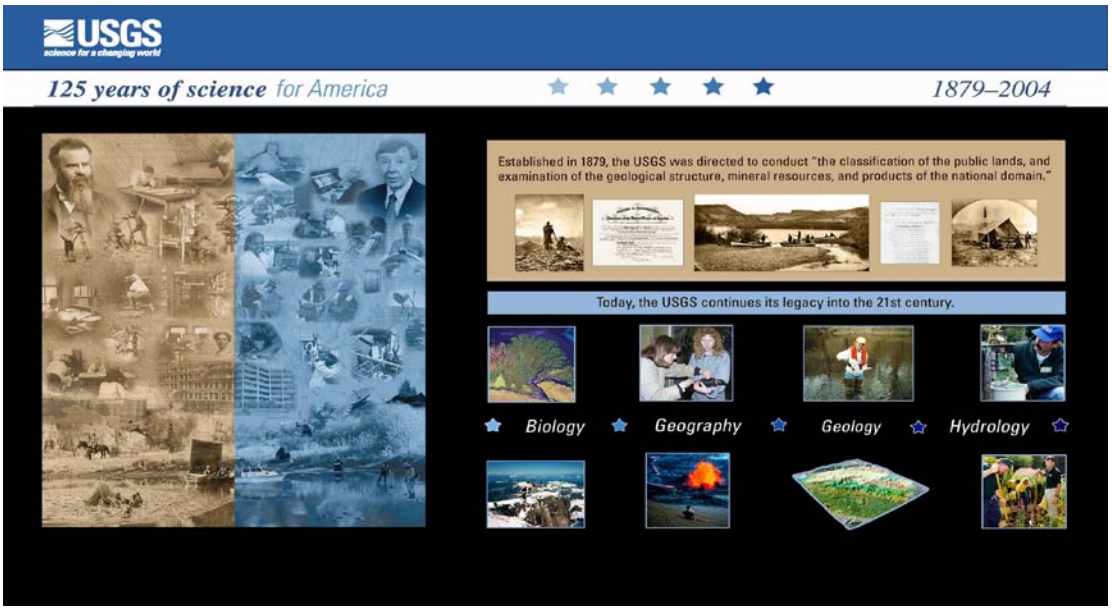
WCF Working Capital Fund

WNV West Nile Virus

WPA World Petroleum Assessment 2000

WRIR Water Resources Investigation Report

YVO Yellowstone Volcano Observatory



Validation and Verification of Performance Measures

In keeping with Departmental and OMB policy for performance data verification and validation (V&V), USGS has complied with requirements for performance data credibility.

During FY2004, USGS GPRA coordinators for each Budget Activity/scientific discipline completed and certified a validation checklist comprised of criteria in the DOI V&V Assessment Matrix for the key and non-key performance measures of the DOI Strategic Plan, bureau specific, PART measures, and outputs to which USGS contributes. USGS will demonstrate accountability by establishing a clear connection between mission, work, and what work accomplishes for the funds that have been authorized and appropriated. Criteria include scrutiny to determine that goals are realistic and measurable, understandable to users, and ultimately used in decisionmaking. In addition, several of the Strategic Plan measures will be assessed by the PART during FY2004, for select Water Resources programs. This will add additional documentation and assurance of credibility and usability of USGS performance measures for management decisionmaking.

Also during FY2004, USGS GPRA coordinators for each Budget Activity/scientific discipline completed and certified a verification checklist comprised of criteria in the DOI V&V Assessment Matrix for all performance measures— key, non-key, and bureau-specific measures, PART measures and outputs. This included assessing data accuracy, completeness, consistency, availability, and inter-control practices that serve to determine the overall reliability of the data collected. GPRA coordinators will document any inconsistencies, inaccuracies or anomalies in performance data to ensure that problems are addressed so that integrity of the performance data are ensured.

Data Validation and Verification Element	Explanation
Status of Data V&V implementation in bureau activity area	**Responses to GPRA requirements and DOI AS-PMB Data V&V directive January 16, 2003.**
1. Extent to which data V&V criteria have been disseminated throughout the Bureau activity area units	Data V&V criteria have been disseminated and reviewed by all USGS GPRA coordinators for each Budget Activity/scientific discipline.
2. Extent to which protocols have been implemented in units providing performance data:	
a) Are collection standards followed	Performance measure names, terminology, and DOI's performance definition templates are understood and being followed. There is no common data entry system or data entry point for collection of performance data, but standard protocols for database queries and retrieval are used. For example: • Facilities Condition Index is defined by DOI guidance as deferred maintenance costs divided by replacement value. Both of these components of FCI are based on common industry standards and used by USGS Facilities to capture and calculate performance data. • For Biology, consistent collection of data is ensured through uniform use of Web site for reporting quarterly accomplishments. Reporting stations are notified at the same time of a reporting requirement and all use the same procedure for reports. • For Geography, consistent collection of data is ensured through uniform use of Web site for reporting GPRA accomplishments. All field stations are notified at the same time of a reporting requirement and all use the same procedure for reports.

Data Validation and Verification Element	Explanation
b) Are data entry and transfer rules used	Systems used to track performance data do not have extensive editing capabilities, but standard processes are used to capture performance data. Program office understands how to obtain information about performance data and maintain data currency. For example, Water Procedures for data entry, data sources and assumptions, and methods are documented by the USGS Office of Budget (OB) discipline coordinator and are available to other OB staff. Facilities procedures for data collection for the Condition Assessment (CA) program are documented in the Departmental Architectural and Engineering contract.
c) Are data security measures implemented	1) Firewalls/password protection, etc. are established according to bureau information system requirements. 2) Access to the Databases and/or Excel spreadsheets are only available to register logged-on USGS users.
3. Does the bureau conduct oversight and certification of data	USGS GPRA coordinators for each Budget Activity/scientific discipline provide oversight, standards to be followed, verify performance data accuracy, ensure documentation is maintained and certify performance data reported. OB provides a second level of oversight.
4. Other relevant actions taken to insure credibility of performance data	Yes, for example, the Facilities CA report is generated by a third party contractor and reviewed by Government personnel. Also, OB makes comments in the DOI database, if for any reason, the data is changed after it has already been entered.
Data Source(s)	Data Sources, such as large databases, local files, excel spreadsheets, reference files and hardcopy files, are documented. For example, Water uses a software query to extract the performance data from the National Water Information System (NWIS), a database and user interface through which the streamgages, ground-water sites, and water-quality sites report their hydrologic data on the Internet. For Facilities, the CA data is kept in hard copy form and on a USGS facilities database.
Data Limitations	Any data limitations are documented.
Corrective/Improvement Actions (Needed, In Progress, or Recently Completed)	No corrective/improvement actions needed at present.

Program Evaluation Data

Program evaluations are an important tool in analyzing the effectiveness and efficiency of our programs and evaluating whether they are meeting their intended objectives. These evaluations are the foundation on which USGS gauges performance relative to the DOI End Outcome measure for soundness of methodology, accuracy, and reliability of science. Our programs are evaluated through a variety of means, including performance audits, PART, financial audits, management control reviews, and external reviews from Congress, OMB, OIG, and other organizations, such as the National Academy of Public Administration and the National Academy of Science. These reviews, which may take several years to complete, are critical to maintaining the USGS's reputation for scientific excellence and credibility as well as providing guidance for future research needs. The evaluations improve the accountability and quality of programs, but also identify and address gaps in programs; redirect or reaffirm program directions; identify and provide guidance for development of new programs; and review and/or motivate managers and scientists. For example, based on a number of factors, including the recommendations of the External Scientific Advisory Committee on Scientific Services (as contained in the March 2004 report, The Future of Regional and National Scientific Services of the Water Resources Programs), the USGS has decided to close the water-quality laboratory in Ocala, Florida, and transfer most of its functions to the National Water Quality Laboratory in Denver. Given the recent budget shortfalls at the Ocala Lab and projected continuing shortfalls, the USGS has determined that consolidation of this function is more cost effective than maintaining two separate laboratories.

Evaluations are critical to maintaining the USGS' reputation for scientific excellence and credibility as well as providing guidance for future research needs. We conduct both internal and external peer and management reviews to improve the accountability and quality of programs; identify and address gaps in programs; redirect or reaffirm program directions; identify and provide guidance for the development of new programs; and review and/or motivate managers and scientists. Reviews are both internal and external, conducted by USGS and non-USGS scientists, technicians, or specialists who are not involved in the specific proposal, project, program, or product under review. Our goal is to conduct an independent external peer review of ongoing programs about every 5 years, combined with more frequent independent internal management reviews.

Program	Scope and Methodology	Status
Geographic Analysis & Monitoring Program	Geographic Science Steering Committee Review	Preliminary feedback from the steering committee has refocused GAM program activities into 4 science themes, which form the basis of the GAM FY05 Science Program Plan. Final report due Fall 2004 from Science Planning Team. The report is expected to impact direction and priorities of GAM science activities.
Water Resources Research Act Program	NRC Review "Confronting the Nation's Water Problems: The Role of Research"	The pre-publication copy of the report was released. Awaiting final report to complete action plan.
Cooperative Water Program	External Review from ACWI	Under the Advisory Committee for Water Information, the USGS convened an external review task force to follow up on the 1999 external review of the Cooperative Water Program, to evaluate USGS's progress in addressing the recommendations from that review. The task force will give a status report at the annual meeting in September 2004 of the Federal/Non-Federal Advisory Committee on Water Information.

Program	Scope and Methodology	Status
Landslide Hazard Program	External Review by NRC on National Landslide Hazards Mitigation Strategy for the Landslide Hazards Program	USGS has taken initial steps within base funding to implement the NRC's suggestions including 1) strengthen partnerships between the USGS and other Federal agencies and States in order to produce an effective national strategy that can be applied at the local level, 2) incorporating the development and dissemination of state-of-the-art risk analysis methods into its 5-yr plans (the LHP has explored the implementation of a "learning from landslide disasters" effort similar to the one funded by the National Science Foundation for earthquakes), and 3) improving education and awareness of landslide hazards and mitigation options through a new fact sheet, participation in Earth Science week activities, and support for a handbook for land-use planners on landslide hazards.
National Cooperative Geologic Mapping Program	Internal/External Panel Federal Advisory Committee/State Mapping Committee	Ongoing. Three panels are involved in prioritizing the Nation's geologic mapping needs.
Coastal and Marine Geology Program; Coastal Charting and Mapping Needs	External review by NRC, review of most important data collection efforts of the CMGP.	Report entitled, "A Geospatial Framework for the Coastal Zone: National Needs for Coastal Mapping and Charting," addressed the breadth of Federal activities related to coastal mapping and charting. USGS programs were part of a larger effort. Recommendations speak to the need for developing consistent standards and protocols, improved agency coordination in setting priorities and developing programs, and improved access to data and tools for data application. Recommendations required multi-agency response; USGS is working with other Federal mapping agencies to develop responses.
Earthquake Hazards Program	External review by Scientific Earthquake Studies Advisory Committee	The EHP 5-yr plan for 2004-08 was reviewed and approved by the Scientific Earthquake Studies Advisory Committee, and USGS. The plan is now being reviewed by the Bureau's OMB examiner and will be published as a USGS circular early FY2005.
Astrogeology Program	Internal Review	Two reviews were conducted in FY2004 to benefit the NASA Planetary Geology and Geophysics Cartographic and Geologic Mapping Working Group. The reviews received positive feedback. Currently awaiting final confirmation of funding award and budget.
Water Resources Research Act Program	State Water Resource Institutes	The Water Resources Research Act, as amended, requires that each Institute be evaluated at least every 5 years. Detailed evaluations of all 54 Institutes are being conducted in 2004 to determine their eligibility to receive grants. Results of the evaluations are being compiled.

Significant FY2004 Accomplishments by USGS Employees

USGS scientist receives water research award: USGS hydrologist **Dr. Michael Meyer** was a co-author for a paper that received the 2003 Rudolf Herring Medal from the American Society of Civil Engineers for research into the removal of antibiotics in drinking water. Meyer, along with Dr. Craig Adams and students Yong Wang and Keither Loftin of the University of Missouri, Rolla, published a paper titled "Removal of Antiobiotics from Surface and Distilled Water in Conventional Water Treatment Process" in the March 2002 issue of the *Journal of Environmental Engineering*.

Government service award goes to USGS scientist: The Society of Environmental Toxicology and Chemistry (SETAC) of North America awarded USGS scientist **Chris Ingersoll** the 2003 Government Service Award in recognition of his service in promoting contaminant risk assessment. SETAC is a global science society with primary interests in the fields of environmental chemistry and toxicology.

USGS scientist appointed to editorial board of new journal: SETAC is launching a new publication, the Integrated Environmental Assessment and Management (IEAM) Journal, with the inaugural issue due in January 2005. USGS scientist **Terry Boyle** (pictured far right in the upper row - photo right), whose research encompasses aquatic ecology and risk assessment strategies for large, complex development projects in the U.S., Russia, the Phillipines, and throughout Latin America, has been appointed to the IEAM Founding Editorial Board. The journal is being developed to bring together scientific research in environmental risk assessment, evaluation of complex environmental issues, and application of science in decision making.

University of Texas honors USGS geographer: **Jean Parcher**, a USGS scientist, was awarded one of the coveted University of Texas Graduate School Outstanding Thesis awards for her work in the Brownsville/Matamoros Urban area. The thesis, Remote Sensing Methods for Estimating Impervious Cover for Hydrologic Modeling Applications: A Case Study of the Brownsville/Matamoros Urban Area, presents geographic models for the flood-prone area and represents a mutually beneficial collaboration between the USGS and the University of Texas. Ms. Parcher (photo far left) was presented the award by Ms. Victoria Rodriquez, Dean of Graduate Studies at the University of Texas.

Denver scientist wins "Superbowl" of public service: USGS scientist **Dr. David Wald** earned the prestigious Legacy Award for his work in developing ShakeMap, a rapidly generated computer map that shows the location, severity, and extent of strong ground shaking within minutes of an earthquake. Over 40,000 Federal, State, and local government employees were eligible to compete during Public Service Recognition Week, and the winners then qualified to win the 42nd annual Legacy Award. Dr. Wald was also awarded other honors this year, including being named the 2004 Seismological Society of America and Incorporated Research Institutions for Seismology Distinguished Lecturer.

Geologist received Fulbright Award: USGS geologist **Richard Harrison** received a Fulbright Award to work in Cyprus with the Geological Survey Department of Cyprus and the Turkish Cypriot Community to research potential seismic hazards in the northern and eastern parts of Cyprus in January through April 2005. The purpose of the Fulbright Program is to increase mutual understanding between the people of the U.S. and foreign countries through the exchange of students, teachers, lecturers, and research scholars. The USGS will benefit through increased cooperation and interaction with the Geological Survey Department of Cyprus and geologists with the Turkish Cypriot Community.

Hydrologist received Fulbright Award: USGS supervisory hydrologist **Sam Luoma** received a Fulbright Award to work with Philip Rainbow, director of Zoology at the British Natural History Museum. Luoma and Rainbow will work on a book on environmental toxicology, which will be directed at managers, policymakers, and students who need to know more about effectively linking science and policy. The book will develop from their combined years of field work in environmental toxicology and will use case studies of how science was used in several contentious pollution episodes throughout the world to illustrate how those lessons might be applied. They also plan to develop an international and multi-institutional field study to test some of the more difficult questions in environmental toxicology in field studies in Southwest England.

USGS Hydrologist receives Charles River award: In recognition of his role in advancing the restoration of the Charles River, the Charles River Watershed Association (CRWA) presented its "2005 Award" to **Dr. Peter K. Weiskel** of the USGS on November 19, 2003. Dr. Weiskel accepted the award on behalf of the team of USGS scientists who collaborated on the studies, including David Armstrong, Lora Barlow, Robert Breault, Leslie DeSimone, Jack Eggleston, Mark Nimiroski, Gene Parker, Jason Sorenson, and Phillip Zarriello.

The CRWA, founded in 1965, is one of the oldest watershed associations in the Nation. Awarded annually since 1999, the award is named for the Clean Charles 2005 Initiative, a partnership of government, private-sector, and non-profit organizations jointly committed to achieving swimmable and fishable conditions in the entire Charles River by the year 2005.

USGS scientist receives hydrology award: USGS scientist **Steve Ingebritsen** received the 2003 O.E. Meinzer award from the Geological Society of America on November 3, 2003. This prestigious award was established to recognize significant contributions in the field of hydrogeology during the previous five years. The 2003 Meinzer Award cites six of Dr. Ingebritsen's recent publications which have significantly improved understanding of the interactions between geothermal heat and ground-water flow, as well as understanding of the amount of ground-water flow in the deep crust, and additionally, have provided significant contributions documenting the effect of ground-water pumping on land subsidence.

Schuster wins by a landslide: On October 31, **Robert L. Schuster** was awarded the first Varnes Medal at the International Consortium on Landslides (ICL) Board of Representatives meeting in Vancouver, Canada. The prestigious award, named after David Varnes, the internationally renowned USGS landslide expert, is given by ICL to recognize professional excellence in landslide research and applications, significant contributions to public education, and mentoring of students. Dr. Shuster has worked on significant landslide issues including dam safety and economic impact of landslides and has greatly influenced the understanding of landslides and geotechnical practice through his interactions with students, his numerous reports and journal articles, and his lectures worldwide. He advises foreign and state governments on landslide disasters and serves on international and national advisory committees concerned with ground-failure hazards.

USGS scientist awarded: USGS scientist **Suzanna Ward** was awarded the "2004 Conservation Professional of the Year" by the Schuylkill County Conservation District on August 2. The honor is for Ward's work in acid mine drainage remediation, which has contributed greatly to the restoration process of the watersheds in Schuylkill County, PA.

USGS biologists honored by State Department: Featured from left to right, **Michael Ruggiero, Annie Simpson,** and **T. Douglas Beard** were recipients of a Group Meritorious Honor Award for their contributions as part of a U.S. Delegation to the Seventh Conference of the Parties to the Convention on Biological Diversity. Assistant Secretary of State John F. Turner presented the award at a ceremony on July 20 at the State Department in Washington, DC.

USGS scientist receives merit award: On July 19, USGS scientist **Beth Middleton** received the Society of Wetland Scientists' Merid Award at the Society of Wetland Scientist's annual meeting in Seattle. Middleton was recognized for her two books, *Wetland Restoration, Flood Pulsing and Disturbance Dynamics* and *Flood Pulsing in Wetlands: Restoring the Natural Hydrological Balance*.

USGS scientist receives Professional Conservationist of the Year award: **Robert E. Stewart, Jr.**, director of the USGS National Wetlands Research Center in Lafayette, LA., (photo right) has been named Professional Conservationist of the Year by the Louisiana Wildlife Federation and commended by U.S. Senator Mary Landrieu and Representative Chris John. Stewart was recognized for developing and guiding the Nation's premier wetlands research facility and lending its expertise to better understand and preserve wetland resources. The award cites Stewart for his involvement in inventorying wetlands across the United States and documenting their extent, values, and rates of loss. The honor notes his use of computer technology, remote sensing, and geographic information systems to guide that work.

USGS scientist receives Mojave Desert research awards: USGS scientist **Matt Brooks** recently received honors from two nonprofit organizations in recognition of extensive research conducted on disturbance effects in the Mojave Desert. Brooks was recognized specifically for how his studies have helped to better manage habitat for the desert tortoise, a Federally threatened species. On January 24, Brooks received the Golden Tortoise Award from the Desert Tortoise Preserve Committee, and on February 21, the Desert Tortoise Council presented Brooks with their Annual Award recognizing his accomplishments during the past 15 years of research.

USGS executives win Presidential Rank Awards:

Every year, the President of the United States confers ranks on a select group of career employees for long-term accomplishment. These Presidential Rank Awards are given in reward, not of one-time professional accomplishments, but of sustained public service and consistent achievement. Award winners are chosen through a rigorous selection process. They are nominated by their agency heads, evaluated by boards of private citizens, and approved by the President. The evaluation criteria focus on leadership and results.

The recognition ceremony took place March 25 in the South Penthouse of the Main Interior Building in conjunction with the presentation of Secretary Gale Norton's Executive Leadership Awards.

In 2004, the USGS is proud to have three Presidential Rank Award winners within its ranks: Senior Advisor for Science Applications **James F. Devine** (photo at top right), Deputy Director **Robert E. Doyle** (photo at middle right), and Associate Director for Water **Robert M. Hirsch** (photo at bottom right).

Doyle and Hirsch were honored with the Meritorious Executive Award, given to career members of the Senior Executive Service recognized as "outstanding leaders, who consistently demonstrate strength, integrity, industry, and a relentless commitment to public service."

Devine was presented with the Meritorious Senior Professional Award, recognizing senior career professionals who "have a sustained record of exceptional professional, technical, and/or scientific achievement that is recognized on a national or international level."

We Welcome Your Comments!

Thank you for your interest in the U.S. Geological Survey's FY2004 Performance and Accountability Report. We welcome your comments on how we can make this report a more informative document for our readers. We are particularly interested in your comments on the usefulness of the information and the manner in which it is presented. Please send your comments to:

U.S. Geological Survey
Office of Accounting and Financial Management
Mail Stop 270
12201 Sunrise Valley Drive
Reston, VA 20192

USGS

science for a changing world

125 years of science for America

1879–2004