

## Strategic Goal 4: Provide Science for a Changing World

Political leaders, policymakers, and the public have never had a greater need for accurate and timely scientific information than they do today.

As a Nation, we face vital and perplexing questions concerning our environment and natural resources. How can we ensure an adequate supply of energy, water, and mineral resources in the future? What impact do we have on our natural environment when we use these resources? How has our planet changed over time, and what can the past tell us about the future? How can we predict, prevent, and mitigate the effects of natural hazards?

These are not abstract questions. They are immediate and pressing, framing conservation and resource decisions at every level of government. Identifying and conducting the current and best science to help policy officials make those decisions is the fourth strategic goal of the Department.

The U.S. Geological Survey (USGS) serves as the principal science bureau within the Department. In addition, several DOI bureaus have established effective partnership with the Nation's universities, increasing the scientific expertise available to the Department.

Scientific principles and research add to our knowledge and understanding of the physical and natural environment. Collecting, analyzing, and disseminating the scientific information needed to answer the questions listed above, and providing the critical science for resource management decisions, are major responsibilities of the Department. We assess and provide information about the quality and quantity of our Nation's water resources. We collect, process, archive, and provide access to remote sensing data; and develop multi-purpose geologic maps depicting the Nation's geologic formations, which are vital to the exploration and development of mineral, energy, and water resources.

The USGS also serves as the Department's electronic connection with citizens in search of current scientific information. The Federal government's spatial data assets are a vital source of data for citizens, businesses, and governments. Through the intergovernmental Geospatial One-Stop project,

which it leads, the Department provides access to spatial data through a single portal; makes State and local data more accessible; promulgates standards to facilitate data exchange; and creates a marketplace for future planned data acquisition.

Interior, as the managing partner for Geospatial One-Stop initiative, unveiled the first one-stop portal providing access to a wealth of public-sector geospatial data in June 2003. On September 30, 2003, the Department, on behalf of the 11-organization intergovernmental Board of Directors for the project, submitted 13 draft data standards for the most common categories of geospatial data to the American National Standards Institute to become national standards.

Other examples of online assets include the National Water Information System, a distributed network of computers, databases, and supporting software that helps users make critical decisions concerning lives and property based on real-time water information, and the National Biological Information Infrastructure, a gateway into biological data and information sources held by Federal, State and local government agencies; private sector organizations; and other parties from around the world.

## Performance Results

The Department of the Interior measures its performance in providing science for a changing world against two long-term measures: the extent to which we add to the environmental and physical science knowledge base, and our success in increasing knowledge and warning of natural hazards.

### Counting on the Cutting Edge of Tradition



Fishwheels—traditional tools used for subsistence salmon fishing on interior Alaska rivers—have recently found an improved application. They're assisting fisheries managers in estimating the number of chum salmon on the Yukon River, a critical factor for effective resource stewardship.

The simple wooden framed devices have proved to be an

effective tool for capturing previously marked fish for examination, but the procedure required holding the recaptured fish in a live box until biologists could net them for examination and release them back into the river. This holding and handling time has been linked to increased stress and possible mortality of individual fish, resulting in inaccurate abundance estimates.

To correct this flaw in the system, the Fish and Wildlife Service's (FWS's) Fairbanks Fish and Wildlife Field Office has developed a recapture system using computerized, video-based imaging that negates the need to hold and handle recaptured fish. Instead, fish captured by the rotating net quickly slide over a white surface, their colored tags recorded by digital video, and then drop back into the river.

In FY 2003, the Alaska Department of Fish and Game adapted this system to generate an abundance estimate for Tanana River chum salmon, an important sub-stock of the Yukon River. The system was installed on a fishwheel operated by a contracted fisherman near the village of Nenana. Fish and Wildlife Service staff provided technical expertise and support for set-up, operations, and data management, as well as mentoring the local contractor in video and computer operations.

This Federal/State/private partnership has resulted in considerable cost savings (One computer operator can now replace a 24 hour-a-day field crew of 6!) and reduced handling of captured fish. This cutting-edge technology is now being transferred to other projects in remote Alaska, empowering local residents to participate in research and management of their resources.

Interior's science programs focus on collecting data and understanding, modeling, and predicting how multiple forces affect natural systems. The data we gather, translated into useable information, helps resolve environmental issues and assists in effective Federal land management and natural resource decision-making.

More accessible data leads to better decisions. To ensure the continued availability of long-term environmental and natural resource information, Interior's USGS maintained 44 long-term data collection/data management efforts and supports 2 large data infrastructures in partnership with others against its target goal of 47 for FY 2003. Its result fell short of the target due to the malfunction of

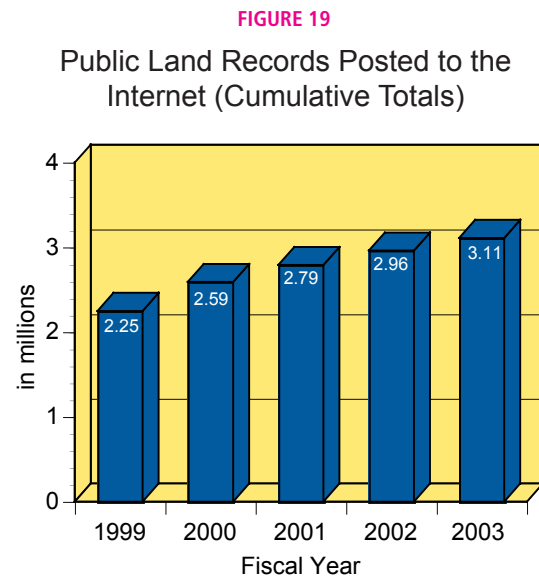
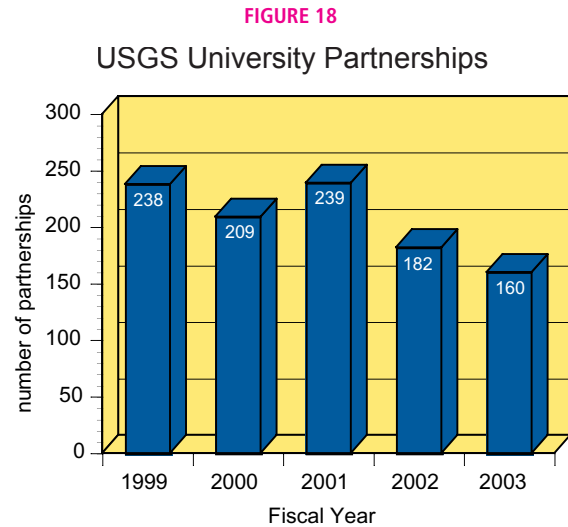
the Landsat 7 satellite at the end of May 2003. The malfunction prevented the collection of the bulk of information that was contributing to the long-term data collection “National Satellite Land Remote Sensing Data Archive.”

The USGS delivered 1,081 new systematic analyses to customers, including Interior bureaus and other Federal agencies, States, Tribes, local governments, and the public, exceeding the target of 971. It also developed, improved, and delivered 11 decision support systems and predictive models to customers, exceeding its target of 8.

In order to improve our understanding of natural systems and encourage sound management practices, the USGS collaborated with university partners through 160 external grants and contracts, against a target of 209 (*Figure 18*).

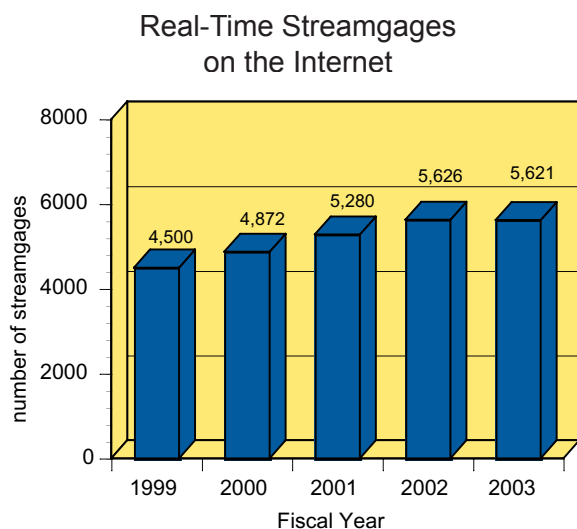
Interior’s BLM also contributes to the body of scientific knowledge. The BLM produces voluminous amounts of information in support of land management and scientific activities for many government agencies and the private sector. It provides cadastral survey data for over 30,000 townships and has converted more than 4 million General Land Office land title records to digital form. These records are now accessible to citizens thanks to the Internet and geographic information system (GIS) technologies. In FY 2003, BLM posted 151,739 public land records on the Internet against its target of 200,000 for a total of over 3 million records available on-line (*Figure 19*). In addition to conducting on-line title searches, citizens also use these records in historical and genealogical research. Web-based land status, boundaries, and geographic coordinates data are available for 36 percent of western townships for which BLM collects information, exceeding its FY 2003 target of 16 percent. As energy development and urban growth become a major issue in the western United States, the BLM’s cadastral and land records will increasingly serve as a critical foundation for addressing these issues.

The ability to understand processes that produce natural disasters, to use that information to create more reliable predictive models, and to deal more effectively with the aftermath of a disaster can help save untold lives and costs. For Interior,



research and predictive model development for hazards is primarily conducted by scientists at the USGS through their work on earthquakes, flooding, volcanos, and coastal storm damage. In FY 2003, the USGS developed and maintained 5 monitoring networks, against a target of 6, aimed at assessing risks from these natural events. It also maintained 5,621 stream-gages, against a target of 5,462, to deliver real-time data regarding stream flow and water levels so that decision-makers have the instant data they need to issue flood warnings or assess drought conditions (*Figure 20*).

FIGURE 20



To help the Nation respond to earthquakes, the USGS maintained 476 real-time earthquake sensors against a target of 499. Although the backlog of sensors from the previous year was installed in the first quarter, the delayed appropriation in FY 2003 forced a postponement in purchasing new equipment. Additionally, improving communications links and other network elements to improve data delivery was a priority defined by stakeholders.

The USGS stays in touch with its customers by actively listening to their concerns. In FY 2003, it held 43 different meetings, exceeding its target of 28, with interested citizens and policy-makers regarding various hazards projects, and held another 806 stakeholder meetings, against a target of 544, for environment and natural resource projects and technical assistance. These meetings help USGS conduct frequent “reality-checks” regarding the top challenges facing the Nation as decision-makers and community leaders struggle to deal with the forces of nature and man-made environmental issues. In this way, the USGS truly ensures that it is developing science to meet changing world needs.

### Looking Forward

We will work to improve the usability and accessibility of science for public policy-makers, to unite the Department’s scientists across bureau lines, and to reinforce a culture of collegiality, rigorous

### New Seismic Equipment Unveiled

The USGS unveiled new seismic stations in the Memphis, TN, area that are part of the Advanced National Seismic System (ANSS), the first line of defense in the war on earthquake hazards. Federal, State and local partners and emergency responders attended this event, held at the University of Memphis. The USGS is improving its earthquake monitoring and reporting capabilities through the Advanced National Seismic System (ANSS), a nation-wide network of modern strong motion seismometers that can provide emergency-response personnel with real-time “shaking” information within 3-5 minutes of an earthquake. The new seismic data will be used to improve earthquake characterizations in the mid-continent region by the USGS and regional partners, and by researchers studying seismic wave propagation, attenuation, and earthquake hazard.

internal and external peer review, and the highest quality data.

Continued outreach to our customers, partners, and the public will be critical to the direction of our science initiatives. Listening to their needs is the best way to increase the relevance and utility of Departmental science. We will continue our efforts to consult, cooperate, and communicate with our colleagues and our many external customers, including other Federal agencies, local and State governments, Tribes, the educational community, professional societies, the private sector, nonprofit organizations, foreign governments, Congress, and the general public. The more active our interactions and the stronger our ties, the more effective we can be.

The scientific issues we face are complex, with regional, national, and global implications. Solving them will require an integrative approach and many different disciplines.

The Department’s bureaus are working together with the USGS to develop and coordinate strategy. The result will be the incorporation of DOI science priorities into USGS five-year strategic plans and annual operational plans for their major scientific programs and for all of their major disciplines, including biology, geology, hydrology, and geography, integrated when appropriate.

The keys to implementation will be the same as for our new, broader Departmental strategic plan: developing realistic concrete program goals, measuring progress toward them, and holding people accountable for results. Examples of ongoing inter-bureau models include a USGS and BLM cooperative study of coalbed methane in Wyoming, and a long-term USGS and MMS partnership to understand ecosystems on the Outer Continental Shelf.

## Performance and Costs At a Glance

Tables 8 and 9 summarize FY 2003 performance and cost data for Strategic Goal 4.

Interior incurred costs of about \$1.54 billion for Strategic Goal 4, a small decrease of less than 1% compared to FY 2002. The Department established 16 performance measures for Strategic Goal 4. Of the 16 measures, Interior achieved or exceeded the goals for 9 measures (56%) and did not meet the goal for 7 performance measures (43.8%).

The largest GPRA program activity, "Environmental and Natural Resources", incurred about \$1.18 billion or 76% of Strategic Goal 4 costs. The resources devoted to this GPRA Program were approximately 2% less than the FY 2002 total. Of the six performance measures for this GPRA program activity, FY 2003 results show that 67% of the measures were met or exceeded which is approximately the same as in FY 2002. Of the measures that were not achieved, one was not achieved because of the malfunction of the Landsat 7 satellite. A court case on information technology security requirements affected 3 other performance

### Creating a Code of Science Ethics

Integrity remains the foundation of all DOI science: impartiality, honesty in all aspects of scientific enterprise, and a commitment to ensure that information is used to benefit the public as a whole.

The Department is committed to common standards for its scientific methods, experiments, and research. Departmental standards and practices, developed through an exercise in the 4Cs among Interior's scientists, were introduced as a draft "Code of Science Ethic" in FY 2003 with new commonly agreed-upon guidelines on information quality, objectivity, utility, and integrity. Coordinated through the Department's human resources leadership, and vetted throughout the Department and within the Office of Management and Budget (OMB), the Code will help guide the conduct of employees, contractors, and consultants engaged in science-based projects. It will also help employees meet the Secretary's directive to make decisions based on the best science available.

The Code was drafted by Department scientists in partnership with a panel of ethicists and scientists from premiere scientific organizations. Created in response to internal Interior Office of the Inspector General recommendations and a new Federal policy published by the White House Office of Science and Technology Policy, the Code will become a permanent part of the Department's policies and ethical standards by the beginning of calendar year 2004.

The Code is similar to the codes of conduct of many scientific organizations, including the Wildlife Society, American Fisheries Society, and Ecological Society of America, to which many Interior scientists belong. All scientific activities conducted or funded by the Department are covered by the Code. These involve inventory, monitoring, study, research, adaptive management or assessments that are conducted in a manner specified by standard protocols and procedures. The Code defines research misconduct as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.

Any allegations brought under the Code will be handled in accordance with Interior personnel policies, with the Department's Handbook on Charges and Penalty Selection for Disciplinary and Adverse Actions serving as a guide. The new policy includes safeguards for subjects of allegations, including timeliness, objectivity, and confidentiality.

"It is vitally important that any organization that does as much scientific research and analysis as the Interior Department have a well-founded code of scientific conduct that governs the full range of scientific activities," said Dr. Deborah Brosnan, president of the nonprofit Sustainable Ecosystems Institute and head of the independent review panel. "Our panel felt that this was a strong code that meets three key goals of building trust between science and the public, giving guidance, and providing support for scientists."

measures related to "Improve Land, Resources, and Title Information."

More detailed information concerning performance results is available in Part 3, Performance Section.

TABLE 8

Strategic Goal 4 FY 2003 Performance Measure Scorecard						
GPRA Program Activity	Number of Measures	Exceeded Goal	Met Goal	Did Not Meet Goal	No Report	Percent Exceeding or Meeting Goal
Improve Land, Resources, and Title Information	4	1	0	3	0	25%
Hazards	6	3	1	2	0	67%
Environment and Natural Resources	6	3	1	2	0	67%
TOTAL	16	7	2	7	0	56%

TABLE 9

Strategic Goal 4 Costs (in millions)		
GPRA Program Activity	FY 2003	FY 2002
Improve Land, Resources, and Title Information	\$104	\$113
Hazards	264	238
Environment and Natural Resources	1,175	1,205
Total Gross Cost Prior to Eliminations	1,544	1,557
Less: Elimination of Intra-Department Activity	(93)	(91)
Total Gross Cost After Eliminations	\$1,451	\$1,466