

## **Biological Information Management and Delivery Subactivity**

Subactivity	FY 2000 Estimate	Uncontrol. & Related Changes	Program Changes <sup>1</sup>	FY 2001 Budget Request	Change from FY 2000
Biological Information Management and Delivery	10,484	+259	+10,500	21,243	+10,759
Total Requirements \$000	10,484	+259	+10,500	21,243	+10,759

<sup>1</sup> See Program Change Section for details on Decision Support-Resource Management (+\$2,500), Community/Federal Information Partnerships (+\$8,000).

### **Current Program Highlights**

Information and data are critical to scientific discovery and application. Researchers need to know what has been done previously and what is currently being done by other organizations to help guide studies and prevent unnecessary duplication of research and monitoring. Land managers rely on information and data related to biological resources to make informed land management decisions. Databases, maps, and publications are vital sources of this information. Electronic networks enable identification and distribution of this data and information faster than traditional methods and in formats that are easily adaptable for various uses. Rapid access to information will help guide decisions and influence management practices resulting in improved stewardship of the Nation's natural resources.

Research information support is developed and maintained through sound management of the organization's information resources. The infrastructure is comprised of networks, data (spatial and non-spatial), publications (print and electronic), libraries, records management, and standards. Attention must also be directed to planning for requirements of the future as the need to stay current intensifies and new technologies emerge to facilitate the exchange of information among partners and customers. This is accomplished by developing, adapting, and distributing tools and technologies that enhance managers' abilities to use scientific information to answer resource questions, and to share and exchange data and information with others. The goal is to make the broadest possible use of the biological data collected through research and monitoring.

**National Biological Information Infrastructure (NBII)** — Fundamental to the USGS mission is making biological data, information, and associated technologies more accessible for customers and partners to use in making natural resource management decisions. USGS is leading the cooperative development of the NBII as a "national partnership" for sharing biological information to accomplish this goal.

The NBII uses the capabilities of the World Wide Web and other advanced technologies to establish a distributed "federation" of biological data and information sources through which people can find specific information, retrieve it electronically, and apply it to resource management questions. Partners and customers in this ongoing effort include government agencies at all levels, private sector organizations, natural history museums, libraries, educational institutions, international scientific organizations, and the public.

The USGS continues to work with its partners on four major fronts in implementing the NBII: (1) make the data and information products resulting from USGS biological research and monitoring activities electronically accessible; (2) collaborate with public and private partners to help them make the significant biological data and information they produce more accessible to others; (3) work cooperatively with other agencies and organizations to develop, refine, and provide training on new tools, standards, and technologies that provide the necessary infrastructure components of the NBII federation; and (4) begin development of regional nodes in collaboration with other government agencies and educational institutions.

**Gap Analysis** — Gap analysis is a scientific method of identifying the degree to which native animal and plant species are represented in our present day mix of conservation lands (those species not adequately represented constitute conservation "gaps"). The Gap Analysis Program (GAP) provides broad geographic information on the status of species and their habitats. From GAP's inception in FY 1988 and through FY 1999, the program has expended approximately \$23 million. The FY 2000 funding level is \$3.4 million. Research and development dominated the GAP agenda through its first decade resulting in ground breaking technical methodologies and standards for conducting projects nationwide. Recent innovations that expand the application of GAP analysis include decision support prototypes for determining impacts of development on biodiversity and providing assessments of key habitats associated with refuges. In addition, digital databases describing statewide land cover assemblages, vertebrate distributions, and characterizations of land stewardship have been created for most of the country.

**Standards Development** — Standards are developed, adapted, and refined to facilitate the exchange and use of biological data and information among diverse communities using multiple computer platforms and formats. The USGS works with Federal and non-Federal partners to develop and support needed biological data and information standards as part of the NBII program. These include a national standard for scientific names of U.S. plant and animal species, development of biological nomenclature, and a new Federal standard for describing and documenting biological data sets that is based on the Federal Geographic Data Committee's Content Standard for Digital Geospatial Metadata.

**Information Resources Management** — The Information Resources Management infrastructure includes telecommunications, networking, office automation, records management, computer security, electronic-mail, distributed data systems, applications technologies, and the training, procurement, and technology research necessary to support each of these activities.

**Technology Transfer** — Technologies are identified, adapted, developed, and distributed to enhance the collection and usability of biological data and information in a variety of formats for various purposes. Included are geographic information systems, remote sensing technologies, global positioning systems, decision support systems, scientific visualization, and computer modeling and simulation tools.

**Information Transfer** — Information transfer activities are an integral part of all USGS research activities. Information is distributed electronically (through the NBII and through special services such as "Fax-on-Demand"), via print media through the libraries and publications programs, and through other outreach activities (conference exhibits, fact sheets, etc.).

**Publications Program** — The Publications Program responds to the information needs of customers and partners at local, regional, and national levels. In addition, the program is

actively involved in shaping the field of scientific literature published in peer-reviewed journals through partnerships with publishers and participation in professional scientific information societies. The publications program is linked to the NBII program through joint initiatives designed to promote the creation and collection of citations for scientific information products. The focus of this project is to create tools that assist USGS researchers and publishers in producing information products that document their research and inventory activities. The system will provide a searchable database of USGS information products.

**Science Information System** — The Science Information System, currently under development, is a web-based database that includes information such as project title, purpose, objectives, investigators, science programs, clients, and partners for all biological research and monitoring activities that are being conducted at the USGS.

**Geospatial Initiatives** — Geospatial initiatives address the use and application of geographic information systems, remote sensing technologies, global positioning systems, image processing, and telemetry. The initiatives provide strategies and methodologies to meet national goals and plans relating to geospatial data development and management. They also provide guidance for sharing expertise and information. The ability of the USGS to use and apply geospatial technology across all disciplines depends upon its success in transferring this technology to field biologists and researchers as well as offering assistance to partners. Geospatial assistance is provided to a variety of users through the provision of guidance, technical assistance, tools, and training to improve and analyze their natural resources data and information and make it easily accessible.

## **Recent Accomplishments**

**National Biological Information Infrastructure** — The NBII program (<http://www.nbii.gov>) continues to make significant biological databases and information products broadly accessible over the Internet. This includes biological data and information resulting from USGS research and monitoring, as well as data and information collected and maintained by other agencies and organizations. The USGS worked with partner agencies and organizations to significantly expand the NBII in 1999 by:

Increasing the content in the NBII clearinghouse (<http://www.nbii.gov/clearinghouse.html>), a free, online “catalog” containing complete, accurate descriptions of many hundreds of biological databases and information products.

Developing new Internet-based search and indexing tools specifically designed for biological data. These tools have made it easier for resource managers, researchers, students, and the interested public to use the NBII to find existing data on a given biological resources subject, a certain species, or a certain geographic location.

Assisting partner agencies and organizations in establishing eight new distributed clearinghouse “nodes” of the NBII gateway. New nodes have been established for the USGS National Wetlands Research Center, Environment Canada (Ottawa), Texas/Mexico borderlands area, Eastern Sierras, Wyoming, Texas, New Mexico, and the Olympic Peninsula.

Developing a new standard format for effectively describing biological data sets. The “biological metadata standard” was officially endorsed as a government-wide standard by the Federal Geographic Data Committee.

Providing training on how to use this standard to more than 200 USGS scientists, resource managers and scientists from National Park Service, Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Bureau of Reclamation, Corp of Engineers, and state fish and game agencies and many others.

As a result of these innovations and accomplishments, the NBII was awarded a 1999 “Government Technology Leadership Award” by the *Government Executive* Magazine and was one of only 16 programs across the Federal Government selected as 1999 “Best Feds on the Web.”

**Integrated Taxonomic Information System (ITIS)** — The USGS works with several other Federal agencies and with taxonomic specialists across the U.S. to continue to enhance and support the only comprehensive national database that provides free access (directly over the Internet) to standard scientific names for all United States plant and animal species.

The ITIS has joined with Canada and Mexico to begin to build a North American base of data and is cooperating with Species 2000 to be part of the global base of data. The ITIS is accessible as part of the NBII and can be used by any customer as a standard reference on plant and animal species names and synonyms, thus making exchange of biological data between two different data sources possible, even when they may have each applied a different scientific name to the same species.

**Center for Biological Informatics (CBI)** — By facilitating Internet access to a broad array of biological data collections and supporting unique data development activities, CBI helps decisionmakers obtain the information needed to support the sound management and conservation of our Nation’s biological resources. Public and private interests—including university researchers, students, private landowners, and the general public—are also served through these activities. Specific 1999 accomplishments include: *Data development:* This year, in cooperation with Federal, State, university, and local organizations, CBI led or supported biological data collection in 49 States and 20 National Park Service units. Through mapping of vegetation, selected vertebrate species, and current and historical land use patterns, CBI has helped to better characterize our Nation’s environment. To aid in improving *Internet access*, CBI collaborated with State Heritage Programs and Data Centers to provide Internet access to State-developed data.

**Accessing Data from Natural History Collections** — The USGS is collaborating with other Federal agencies, including the Department of Agriculture, Environmental Protection Agency, and the National Science Foundation, as well as many non-Federal partners in natural history museums and universities around the U.S., in developing new approaches to provide broad electronic access to data on biological specimens of the Nation’s numerous natural history collections. These efforts will result in new NBII Internet-based tools to help customers access, learn from, and use biological specimen information from collections without having to physically visit each museum.

**Data from State Fish and Wildlife Agencies and State Heritage Programs** — The USGS is working with State fish and wildlife agencies around the U.S. and with the Association for Biodiversity Information, the Nature Conservancy and the network of State natural heritage

programs, in efforts to increase access to the biological data they collect and maintain by these through the NBII. This partnership data important to major USGS programs such as Gap analysis. Furthermore, state and county planners use decision support systems and other technologies developed through the Gap Analysis Program to protect and manage resources.

**Habitat Information System** — The USGS is currently supporting the development of information and technology transfer activities for habitat management research projects. Projects include the development of tools and decision and information systems for wetlands management, economic and ecological sustainability of the Colorado Plateau, ecology of western reservoirs, and the restoration of soils and plants in disturbed, arid lands.

**Expertise Database** — The expertise database provides users with access to information about subject matter available within USGS biological science and technology centers. The expertise listing includes a search engine capability so that records may be retrieved using keywords. Users may search the entire database by keyword, browse the entire database for suggestions, or print the expertise list for each USGS science and technology center. The database was established in the summer of 1997.

**Publishing Utilities for the Biological Sciences (PUBS)** — The PUBS system is a suite of web-based software tools and databases designed to assist in the production, access, and distribution of electronic publications that document biological research activities. The system coordinates the distributed publishing capabilities of the USGS biological science and technology centers and maximizes the visibility and benefits of electronic publishing.

During 1998, the PUBS team developed a database structure and input screens, and began populating a User Profile Database which serves as a searchable directory of users of USGS biological information products, with web-based input screens that permit registration of new users. This database allows biologists and other personnel involved in creating information products the ability to target distribution of the product to the appropriate audience based on self-selected interested areas.

In addition, it provides up-to-date address information to facilitate distribution. In 1998 the team also worked to refine a web-based software tool that speeds the creation and collection of citations about biological information products. Prototyped in 1997, MetaWebber as the tool is called, is now in use throughout USGS biological libraries and programs involved in creating metadata for information products. Metadata created using MetaWebber are being added to the NBII Clearinghouse. Existing publications databases from the science centers are also being converted to MetaWebber records and added to the Clearinghouse.

Providing rapid dissemination and online access to USGS biological science reports and publications is one key component of the overall National Biological Information Infrastructure (NBII) program.