NBII Nodes (Finally!) Get the Nod

Fiscal Year (FY) 2001 marks the beginning of some exciting progress for the National Biological Information Infrastructure (NBII) <www.nbii.gov>, a Web-based system that provides access to data and information on the nation's biological resources. While we have long been aware of the dramatic strides possible in the management of the nation's scientific and technical information through the development and promotion of a structured system of nodes, the resources have not been in place – until now – to commence this

important work (the nodes will be interconnected entry points that, taken together, will form the NBII). We are delighted to report that, in the waning days of FY 2000, lawmakers on Capitol Hill took the time to ensure the funds would be made available for this effort that can and should be delayed no longer.

Each NBII node is being designed to focus on a narrowly defined scope or purpose, or on a group of issues related by a single geographic region. Against that backdrop, there are three types of nodes: regional, thematic, and infrastructure.

Regional nodes, such as the Central Southwest/Gulf Coast Information Node, will manage content important to that area of the country, such as sustainable development, with special emphasis on the application of spatial digital data analysis due to the large and often remote nature of the land and Gulf mass. It is being developed through the cooperative efforts of the Houston Advanced Research Center and the USGS Center for Biological Informatics. Other regional nodes underway include: Pacific Basin, Pacific Northwest, California/ Southwest Ecosystems, Greater

NBII Usability Testing Looks at Real-World Use

As part of its ongoing commitment to make data and information on the NBII easily accessible to the widest range of users, the NBII recently completed a usability analysis of the program's site. Testing the efficiency and effectiveness of the recent redesign of the NBII site, the usability sessions provided valuable insights regarding customer preferences and behaviors while accessing and utilizing data/information within the NBII.

Usability testing takes a Web site off of the information designer's desktop and out into

the street of real-world use. It shows not only what customers seek from the site, but also how they define the information need and then translate that definition into a system for locating the desired information. Analysis of the results obtained from these user sessions provides feedback to site developers and leads to better design, a more intuitive structuring of information, and easier access to the data by the various customers and partners of the NBII program.

The NBII usability sessions were conducted over a two-day period last October, utilizing

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facilities at the Bureau of Labor Statistics in Washington, DC. The team recruited participants from a variety of educational and occupational backgrounds to represent the wide user community that the NBII serves. The 12 subjects who ultimately participated included biologists, Congressional staffers, information science professionals, computer specialists, students, and communications specialists.

Participants were videotaped as they maneuvered through the NBII site seeking information that could answer 15 standardized questions regarding biological resources and the NBII program. A usability consultant, with Human Factors International, Inc., facilitated the user sessions, encouraging participants to "think out loud"

as they analyzed the information need specified in the question, examined the site's organization, interpreted major categories and sub-sections, and navigated through the pages. NBII Web Team members observed the sessions through a one-way mirror, and utilized session notes, videotapes, and recommendations by the usability consultant to determine needed structural and design improvements.

As hoped, the usability sessions yielded some expected outcomes, as well as a few surprises. Overall, participants were impressed with the integrity and variety of information resources presented on the site, and expressed enthusiasm for the quality of the site's design and ease of use.

Several common themes for improving the site also emerged

during testing. Multi-color navigational structures thought to enhance category distinctions were instead found to be distracting to users. Non-scientist users encountered problems interpreting certain category buttons because they were unfamiliar with terminology specific to the biological community, underscoring a need to provide clearer labeling of concepts. Site designers also learned that offering too many choices often makes decisions difficult; the range of site search tools tailored to different audiences and information needs overwhelmed, rather than aided, some users. Screen viewing strategies by participants underscored their desire to scan rapidly through most information and reserve actual reading for a very small number of pages. This observation pointed to a need for condensed information presentation or the use of bulleted lists on higher-level pages to facilitate user scanning and focusing.

The challenges of designing and maintaining a dynamic Web site that serves a wide variety of users with different information needs are numerous and complex. The usability testing of the NBII site benchmarked our strengths, articulated structure and design issues that hinder access, and pointed to future directions for growth and development. As we begin a new year, we're renewing our commitment to providing our nation's land managers, scientists, educators, and environmental stewards with clear and easy access to the natural resources data and information contained within the NBII.

Report from the 90th International Association of Fish and Wildlife Agencies Conference

The National Biological Information Infrastructure (NBII) traveled to Indianapolis, Indiana, over the weekend of September 16-17, 2000, to participate as an exhibitor at the 90th International Association of Fish and Wildlife Agencies (IAFWA) Conference. The IAFWA works on behalf of state and provincial fish and wildlife agencies and the biologists who staff them to promote the sustainable use of natural resources. The organization encourages cooperation and coordination among fish and wildlife agencies and conservation groups at all levels of government, and advises and negotiates at federal and international levels to encourage effective and complementary policies and regulations.

Visitors to the NBII booth learned about NBII programs directly relevant to state and regional natural resources issues,
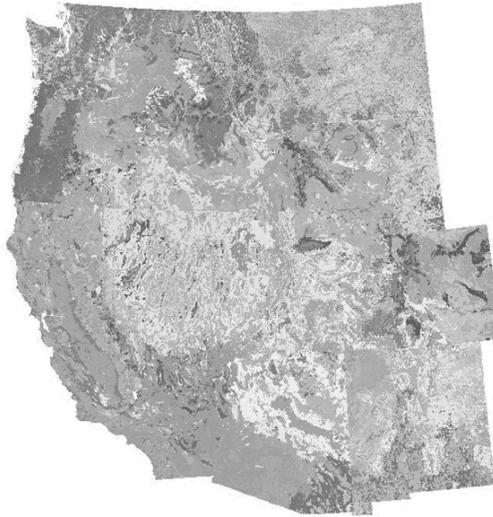
The Gap Analysis Program (GAP), an NBII component, provides broad geographical information on biological diversity. This GAP image of vegetation land cover in the West was made using high resolution satellite imagery.

including the Gap Analysis Program, the Vegetation Mapping Program, and the Land Use History of North America Program, as well as the NBII Metadata Clearinghouse. Also

highlighted were key partnership programs with the U.S. Geological Survey's Biological Resources Division, the Conservation Management Institute's Fish and Wildlife Information Exchange, and the Integrated Taxonomic Information System.

The conference's capstone General Session, "Putting Technology and Partnerships to Use for You," moderated by Fish and Wildlife Information Exchange Director Jeff Waldon, offered state, academic, federal, and private sector examples of cooperative efforts to address the exchange and dissemination of natural resources data and information. The session underscored the NBII's guiding principle, "building knowledge through partnerships," as well as the tangible benefits of collaboration among all agencies and organizations interested in biological resources.

Research Directions in Biodiversity and Ecosystem Informatics

The National Science Foundation (NSF), NASA, and the U.S. Geological Survey (USGS) are developing a strategic partnership to advance cutting-edge computer and information science research and research in biodiversity and ecosystem sciences. As a result of a national workshop held in June 2000, a biodiversity and ecosystem informatics research agenda has been developed.

Dr. John L. Schnase, Senior Biodiversity Informatics Scientist at NASA's Goddard Space Flight Center, reports, "the workshop was a tremendous success. We had a great mix of some leading

academic and industry experts in computer science and information technology, together with a small, representative group of biological scientists and resource managers who have specific needs for biodiversity and ecosystems informatics research."

The researchers who participated in the workshop created a set of specific recommendations on research issues; how to build more effective interdisciplinary linkages between the computer science and ecosystem science communities; how to communicate important research challenges in this area to the broader research community;

and how to implement and support the research agenda by identifying new resources and leveraging existing opportunities.

A key recommendation endorsed by the workshop participants was that NSF, NASA, and USGS should demonstrate strong leadership in this effort by initiating an interagency bioinformatics R&D effort. Schnase comments, "Such an activity would significantly benefit biodiversity and ecosystem science, advance the computer and information sciences, and provide a framework for addressing the

Yellowstone Ecosystems, and Southern Appalachian.

Thematic nodes focus on developing, acquiring, and managing content in a defined subject area. At present, two such nodes are under development: the North American Avian Conservation Node and the Fisheries Node.

Infrastructure nodes promote and support the continued research and development of technologies, techniques, standards, and applications for the management and accessibility of NBII content worldwide. These nodes will focus initially on Knowledge Integration through a public-private partnership, and Network Standards and Technology, in cooperation with leading universities including Columbia University in New York.

Although we are just beginning to implement what will

Data and information on the snowy owl will be greatly enhanced with the development of the North American Avian Conservation Node.

be a nationwide system of nodes offering coast-to-coast coverage and specialized information on a wide array of topics, support and planning for such a system has

developed over the last decade. As early as 1990, a federal report issued by the Office of Technology Assessment called *Helping America Compete: The Role of Federal Scientific and Technical Information* recognized that continuous information technology advancements are critical to the continued growth of the body of scientific knowledge. "Scientific and technical advancements are information-intensive, and those who know how to obtain and use [scientific and technical information] will have a competitive edge – whether the competition is over market share or over intellectual leadership on global issues." Although, it acknowledges, critical scientific and technical information is created by all sectors, the report supports development of a federal framework in which to lead

Denotes single-node partnership

The NBII nodes will provide national coverage on a range of major biodiversity and environmental issues.

information management efforts. "In the U.S. Government, the long-term objective is to develop a 'virtual' interagency information system... 'Virtual' means that the information system will be a family of decentralized data centers."

The birth of the NBII a few years later under the National Biological Service was a major step toward realizing this goal. In 1997, the need for an even more robust NBII was articulated in former Vice President Gore's report to the nation titled *Access America: Reengineering Through Information Technology*. In this National Performance Review briefing, Gore describes a hypothetical situation that, with minor modifications, is echoed throughout the country hundreds of times every day. He portrays a team of planners faced with the restoration of a publicly owned property that has become a shambles, much to the dismay of local citizens. The team, quite realistically, begins approaching their problem by finding the information they need by computer.

"Some of this information comes from a natural history museum in New York, some comes from a university in California, and some comes from the Department of Agriculture in Washington. In a short time, the team is able to retrieve and combine this information to learn what plants and animals lived on the site in the past. They can begin to plan how they could restore much of the natural habitat and return the site to its former

The new NBII nodes will provide data and information on a variety of forest ecosystem issues.

state as a healthy natural ecosystem."

This example is realistic due to the existence of the NBII. And, though hypothetical, the cooperating information owners mentioned – the American Museum of Natural History in New York, the University of California, and the Department of Agriculture – all are actual NBII partners.

The concept of individual, specialized information nodes is

The regional node on California/ Southwest Ecosystems will provide information on the Saguaro cactus, a species that grows in California, Arizona, and Mexico.

generally traced to this call to action. However, *Access America* embraced and elaborated on a concept that was articulated one year earlier in Executive Order 13011, which charged federal agency heads with the responsibility to "structure major information systems investments into manageable projects as narrow in scope and brief in duration as practicable...to reduce risk, promote flexibility and interoperability, increase accountability, and better correlate mission need with current technology and market conditions."

In 1998, in *Teaming with Life: Investing in Science to Understand and Use America's Living Capital*, the President's Committee of Advisers on Science and Technology noted that not only is distributed, interoperable information development a good federal IT investment strategy, it's good for science as well. The Committee pointed out that, in its current form, the NBII can provide access to only one database at a time and significant benefits could be realized through combined access. Calling it the "next generation NBII" or "NBII-2," they envisioned that, "Through the NBII-2, a shared digital library system, scientists and policy makers will be able to collaborate with colleagues across geographic and temporal distances....The research nodes of the NBII-2 should be...considered a long-term commitment by all the partners."

We couldn't agree more. 🐊

IABIN Stands 2-2 for the season...

Both the U.S. Agency for International Development (USAID) and the U.S. State Department have recently awarded grants to the USGS to further Inter-American Biodiversity Information Network (IABIN) development in 2001. USAID has provided $35,000 to support a study to examine various options for funding IABIN development and recommend a strategy to ensure the network's financial sustainability. Implementation of IABIN as an integrated network has been hampered by the lack of a recurring financial base. The study will consider all the suggestions on funding sources offered by IABIN participants in meetings to date, as well as other options that may be discovered.

As part of an Invasive Species Project funded by the State Department, 11 IABIN countries will each receive $12,000 to inventory their invasive species information. Earlier IABIN invasive species projects defined four types of information as priorities for the invasives community: species considered invasive; experts in invasive species; invasive species projects; and data sets relevant to invasives research and management. Acknowledging those priorities, the Terms of Reference for the State Department project will request that the national information inventories focus on these four areas. Additional funds from the State Department, as part of the same project, will provide seed money to begin the integration of invasive species data sets into "Species Analyst" (a decision support tool), to host a workshop to develop a strategy for the establishment of invasive species nodes, and to implement such nodes in Mexico and South Africa.

IABIN also submitted proposals this fall to the Organization of American States and to InfoDEV, a World Bank program. Both of these proposals requested funds to further metadata creation and catalog development in the Americas. Unfortunately, neither of these two proposals was selected for funding.

...and leads in the bottom half of Game 5

A proposal to the Global Environment Facility (GEF), requesting $350,000 for IABIN development, has been completed and is ready for submission to the World Bank, pending receipt of letters of support from the five countries that are submitting the proposal on behalf of all of IABIN. This grant would fund a consultative process to allow IABIN to develop a strategic plan for network development and a large-scale (around $6 million) proposal to GEF to initiate implementation of that plan.

IABIN is an international initiative to promote greater coordination among Western Hemisphere countries in the collection, sharing, and use of biodiversity information. You can find information on IABIN at <www.iabin.org> (international site) and at <www.iabin-us.org>, the new URL for the U.S. site.

technological needs of various core science objectives of NSF, NASA, and USGS. Discussions are underway among the agencies on how to implement such a program, and we are hoping to get some activities underway this year."
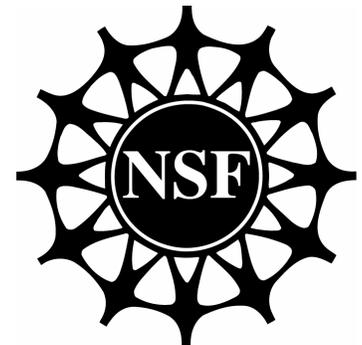
Schnase says that several publications and reports relating to the workshop are being prepared and should be available soon. "An important outcome of the workshop was the creation of a biodiversity and ecosystem informatics track at one of our
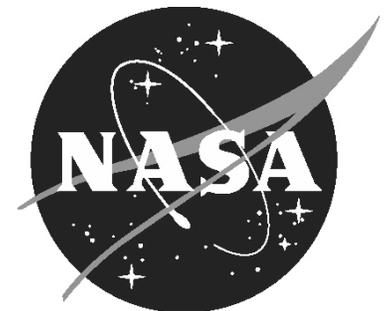
most important computer science conferences. The 26th International Conference on Very Large Databases (VLDB2000), which was held in Cairo, Egypt, September 10-14, 2000, featured biodiversity informatics as a key area for computer science research in the coming years."

Biosafety Clearing-House Pilot to be Developed

High on the agenda of the first meeting of the Intergovernmental Committee on the Cartegena Protocol (ICCP-1) was the establishment of a pilot Biosafety Clearing-House (BCH). The Cartegena Protocol on Biosafety, concluded in Montreal in January 2000, seeks to ensure the safe transfer, handling, and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity. Article 20 of the Protocol calls for a BCH to be established as part of the Clearing-House Mechanism (CHM) of the Convention on Biological Diversity to facilitate the exchange of information on LMOs and to assist the parties to implement the Protocol. The types of information required to be included in, or accessible from, the BCH are defined in the Protocol.

ICCP-1 delegates outlined a project plan that will result in a pilot BCH being developed and available for review by the second meeting of the ICCP, tentatively scheduled for October 2001. It was recommended that the BCH pilot build upon BIO-BIN, a biotechnology database system developed jointly by the United Nations Industrial Development Organization and the Organization for Economic Cooperation and Development. BIO-BIN is on the Web at <www.oecd.org/ehs/biobin>.

While the United States is not a signatory to the Cartegena Protocol, development of the BCH is significant for the U.S. government as it will help developing countries make scientifically-based import decisions. The USGS is providing technical expertise to the effort.

The Cartegena Protocol will enter into force 90 days after 50 countries have ratified it. As of early December 2000, 80 countries had signed the Protocol, and two countries, Bulgaria and Trinidad and Tobago, had ratified. Additional information on the Protocol is available at <www.biodiv.org/biosafe/Protocol/Index.html>.

The CHM, an international initiative of the Convention on Biological Diversity (1992), is designed to facilitate technical and scientific cooperation among countries and to provide global access to and exchange of information on biological diversity. Additional information is available at <www.biodiv.org/chm/>.

Upcoming Events of NBII Interest

21st Session of the United Nations Environment Governing Council. Nairobi, Kenya.	February 5-9
National Federation of Abstracting and Information Services Annual Conference. Philadelphia, PA.	February 25-28
SIMBA Online Information: Conference 2000. "Innovative Strategies for Accelerating Growth." Scottsdale, AZ.	March 4-6
Internet Content Europe 2001. The Grimaldi Forum, Monaco.	March 12-14
Sixth Meeting of the Scientific, Technical, and Technological Advice (SBSTTA-6). Montreal, Canada.	March 12-16
Computers in Libraries 2001. Washington, DC.	March 14-16
Association of College and Research Libraries (ACRL) National Conference. Denver, CO.	March 15-18
National Science Teachers Association (NSTA) National Convention. St. Louis, MO.	March 22-25
Internet Librarian International 2001. London, England.	March 26-28
Workshop on Agricultural Biodiversity and Indigenous and Local Communities. Montreal, Canada.	March 26-30

NBII Metadata Training

Metadata training workshops prepare participants to create metadata.

Typical two-day workshops include discussion of:
- The Federal Geographic Data Committee's Content Standard for Geospatial Metadata and the Biological Data Profile.
- Metadata creation tools.
- FGDC and NBII Clearinghouses.
- Metadata quality issues.
- Metadata submission.

Shorter workshops may exclude computer-based training.

For current information regarding locations, dates, and metadata training content and training workshops, go to <http://www.nbii.gov/datainfo/metadata/training/index.html>, or contact:

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Training Schedule

Southern California Coastal Research Project, Westminster, CA. 2 day computer-based workshop.	January 18-19
IABIN/NBII Workshop, Miami, FL. 2 day computer-based workshop.	January 30-31
NBII-National Park Service Workshop, Denver, CO. 2 day computer-based workshop.	January 30-31

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