What's New With the NBII and Web 2.0?

Eighteen months ago, the NBII established a working group to facilitate the development of Web 2.0 applications with partners and across the network. *Web 2.0* is a broad term applied to Internet applications that encourage interactions with users, improve the ability to share information, and enable the repurposing of Web content for diverse applications.

Perhaps the NBII's strongest use of Web 2.0 technology is RSS (Really Simple Syndication) feeds. Web pages throughout the NBII site <http://www.nbii.gov> now use RSS, and many RSS information sources are consumed across NBII applications and are generated for use by NBII partners and others. A wide variety of

follow NBII

content is delivered via RSS, including news, publications, meeting and event information, and geo-referenced content that can be displayed on maps.

Web services, a system architecture, and computer-to-computer methodology for distributing information across a network have also improved our users' access to biological information.

For example, the correct names of species are essential to any species information system, and the Integrated Taxonomic Information System is now available as a Web service containing 383,887 valid/accepted scientific names and 110,102 common names, against which many Web 2.0 content items can be validated.

The NBII has also begun to develop a presence in social media platforms. We have a blog <http://nbii-info.blogspot.com> that is updated at least weekly; a growing presence on Twitter with 184 followers <http://www.twitter.com/nbii>; and a Facebook page <www.facebook.com/nbii.gov>. These allow users to learn about NBII products and services, and also

Raptor Was Bound to Get Even Better!

The need for a new NBII Program search engine — and the NBII's implementation of that search engine — have been dutifully recorded in the pages of *Access* (the fall 2008 and spring 2009 issues, respectively). More recently, we announced its chosen name: Raptor (winter 2010).

For *Access* readers who may not be completely familiar with Raptor, its chief capabilities include that: (1) it taps more than 40 key biodiversity repositories to ensure searchers have easy access to a highly refined wealth of information; (2) users can conduct a basic search with keywords, specifying which of the repositories to search and which to turn off; advanced searches are also possible; and (3) results arrive

in a list and also in "clusters" — related results generated from the texts of searched documents that can unlock new and often "hidden" concepts.

The latest enhancements to Raptor have a geospatial focus. In a nutshell, Raptor users will be able to find data keyed to a specific geographic region by drawing a "bounding box" (a geographic area delineated by the user to target a search area) on a map. Users can then interact, visually, with the search results on that map.

As for the motivation for this change, for biologists and many others attuned to ecological concerns, geographically referenced information is highly prized. Biologists have come to rely on geographically referenced

information to make decisions. Often, such information helps them find patterns and relationships they wouldn't

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NBII Engages With the Conservation Science Community

The U.S. Protected Areas Database was among the conservation-related products and tools demonstrated at the workshop.

The NBII's mission to provide increased access to data and information on the nation's biological resources makes it a natural partner for organizations conducting scientific research in the area of conservation. Along with its interest in assisting the new USGS National Climate Change and Wildlife Science Center, the NBII is reaching out to non-governmental organizations and the academic conservation science community.

The Society for Conservation Biology (SCB), recognizing the advantage to conservation science organizations of partnering with the NBII, agreed to assist the NBII in gaining greater insight into the needs of conservation scientists and the organizations in which they work.

The first step taken by the SCB was to hold a small, one-day workshop at its headquarters in Washington, DC, on March 4, 2010. The attendees were ten executive, science, research or policy directors, and librarians from conservation-oriented organizations based in the area. Organizations represented included the American Fisheries Society, Defenders of Wildlife, Ecological Society of America, The Nature Conservancy, NatureServe, Society for Conservation Biology, Society for Ecological Restoration, Wildlife Society, and World Wildlife Fund.

The focus-group facilitator conducting the day's discussions asked the participants to state what their goals were in coming to the workshop. Some of the responses were about creating new networking possibilities, both with regard to data and connecting with other organizations doing similar work. Others were keenly interested in learning how to access and use existing information, finding ways to make information available to "on-the-ground" conservation workers, and exploring means to create a usable data center where conservation information could "live and thrive" and be used to build models to advance conservation efforts. All were interested in how the NBII might facilitate these activities.

The workshop agenda included demonstrations of several of the conservation-related products and tools available through the NBII, including:

- Raptor, the NBII's new search engine, available from the NBII

Another significant Web 2.0 achievement is the collaborative, inter-node work of developing species pages, or mashups...

provide a platform for users to interact with the NBII. Several staff members dedicate long hours to maintaining and monitoring the pulse of these and other social media networks as they relate to the NBII.

Another significant Web 2.0 achievement is the collaborative, inter-node work of developing species pages, or mashups, which use Web services and RSS feeds from reliable sources to generate a standard look and feel for detailed information on species of greatest conservation need (SGCN). The Southern Appalachian Information Node and the Pacific Basin Information Node have been leaders in developing NBII species mashup pages. Mashups are a class of applications that combine content from several sources to create a single information resource. The NBII Species Dashboard is a tool for creating species mashups. With it, species names can be added to the species mashup database and associated with data sources to generate species mashup pages. The Dashboard is being used to create SGCN mashup pages for all NBII nodes. Representatives from across the NBII have worked to extract species from 33 State Wildlife Action Plans and develop the NBII Species Dashboard. The dashboard can also be used to create mashups for other groups of species or topics, such as threatened and endangered species, focal birds, pollinators, and invasive species. An example of species mashups can be found at: <http://www.nbii.gov/portal/ server.pt/community/species_in_ need_of_conservation/1642>.

Additional NBII resources are being committed to generating Web 2.0 features such as podcasts (video and audio files); tag clouds, which allow for both content browsing and visualization; and the collaborative generation of content using wiki technologies.

We expect the collaborative platforms of Web 2.0 (and even Web 3.0) technologies to continue to play an important role in the development of biological data-delivery tools and infrastructure that are implemented by the NBII. Handheld applications and interaction with our users are likely to increase in importance, and our IT staff and content developers will continue to adopt innovative tools and Web applications to better serve our partners and users.

NBII in the News

The NBII is mentioned throughout the year in a variety of venues. Recent examples include:

- The February 2010 edition of *PLoS Biology* featured an article on "Vertnet: A New Model for Biodiversity Data Sharing" <http://www.plosbiology.org/ article/info:doi/10.1371/journal. pbio.1000309>. The VertNet project is being developed as a result of the work by many in the scientific community to increase our understanding of the Earth's biodiversity and the ongoing threats to its survival. Meeting this challenge has emerged as a global priority. The community of vertebrate natural history collections has begun to play its role in solving this challenge by establishing social and technological infrastructures that provide open access to species occurrence data. The PLOS article mentions that the NBII is helping to fund this work through establishing a programmer position to offer network support to meet the growing demands on the systems under development.

- In 1996, a group of Minnesota school children on a field trip made a disturbing discovery: dozens of frogs with missing limbs and eyes, extra limbs, and underformed limbs. Reports surfaced around the nation of frogs with similar malformations. In the past decade, extensive research into the malformations phenomena has been undertaken by scientists from government, academic, and non-profit sectors. Scientists have identified several variables that may be contributing to the malformations, such as diseases, ultraviolet radiation, contaminants, and predation. The debate over the malformations phenomena is far from conclusive, however, and research continues. Managed by the NBII Southern Appalachian Information Node in partnership with the University of Georgia's Savannah River Ecology Lab, the North American Reporting Center for Amphibian Malformations (NARCAM) offers an online reporting form to those who observe malformed amphibians. An article in the February 25, 2010, edition of *The Oak Ridge Observer*, an Oak Ridge, TN, publication, talked about work that Information International Associates, an NBII partner, has done in assisting NARCAM by upgrading site content, the citizen-centered reporting application, and the searchable database at <http://www.nbii. gov/portal/server.pt/community/ amphibian_malformations/386>.

detect otherwise. This in turn can give them a deeper understanding of the issues they face.

For instance, suppose you're interested in bald eagles and want to search only in Colorado. Instead of typing "bald eagle" and "Colorado" into the search box, type in "bald eagle" and click on the map button above "search." That brings up a map of the world. Zoom in to North America and then to Colorado to draw your bounding box ("click and drag" to draw your box). Having already typed in "bald eagle" for your search term, hit "search" to send Raptor on his way.

Raptor will retrieve and display the bounding box search results as "pin drops" on the map (see graphic above, right). The pin drops are lettered to correspond to the standard, text-based results displayed below the map. Users can click on the pin drops to see basic metadata information and visualize the data associated with it.

"The purpose is to geographically display search results on a map that are relevant to the search terms, and give users a new way to discover and visualize datasets and information," says Tim Woods, NBII IT specialist and
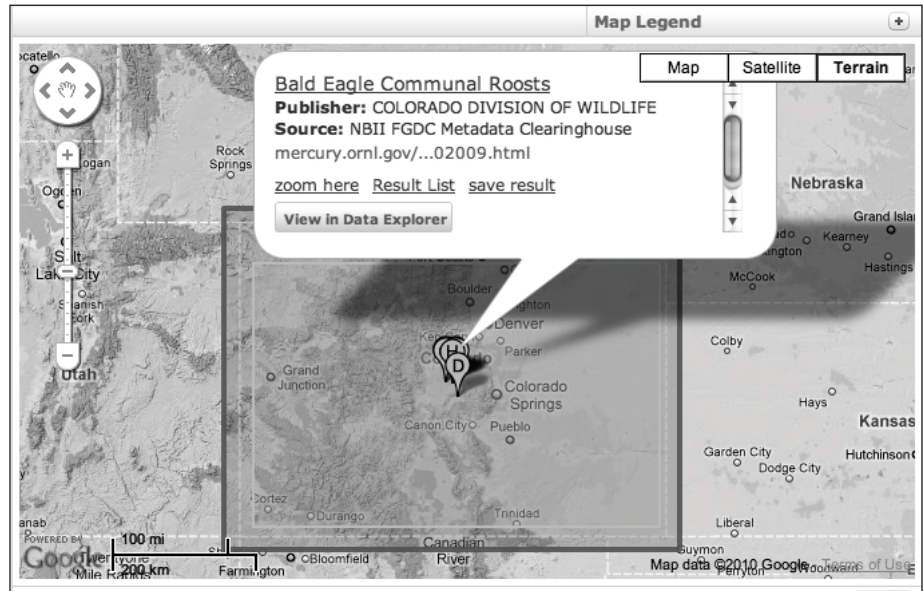
team leader for this enhancement.

That's not all! Once you see the pin drops on the map, richer data will be available with a button called "visualize data." Activating this will open a new application we call the Data Explorer. This powerful tool will visualize WMS map layer data; for instance, geospatially rich NBII products, including the Gap Analysis Program (GAP) landcover map <http://www. gap.uidaho.edu/landcoverviewer.html> or PAD-US (Protected Areas Database-United States) < http://gap.uidaho. edu:8081/padus/padus2.do>. Searchers

can turn these map layers on to visually compare information among them all.

"We're giving users the ability to refine their searches geographically, and also to visualize a raw dataset, all in a one-stop shop," says Woods. "If they like what they've found, they can save it all as an XML file to their desktop, and perhaps use a geospatial modeling tool to perform new or additional computations."

Contact Tim Woods at <twoods@ usgs.gov> with any comments about Raptor's new bounding box capability or Data Explorer.

Mark Your Calendars for the 7th International Conference on Emerging Infectious Diseases

On July 11–14, 2010, the Centers for Disease Control will host the 7th International Conference on Emerging Infectious Diseases <http:// www.iceid.org/> in Atlanta, GA. The conference will bring together public health professionals to encourage the exchange of scientific and public health information on global emerging infectious disease issues.

The NBII Program represents one of the many key agencies and organizations participating in the conference as cosponsors, which will further NBII efforts to facilitate data and information exchange across the natural resources community. For example, the NBII's Wildlife Disease Information Node (WDIN) <http:// www.nbii.gov/wildlifedisease>

exemplifies a key thematic focus area of the NBII that addresses the need for information on a variety of wildlife diseases and their implications, including those affecting wildlife, domestic animals, and humans.

Join us in Atlanta for a series of presentations and posters on NBII efforts related to the conference topics, such as the Wildlife Disease News Digest and Global Wildlife Disease News Map, which brings together national and international wildlife disease news for users around the world. See you at ICEID!

"Metadata Dashboard" Under Development for Partners

The NBII is developing a "Metadata Dashboard" to more fully engage metadata providers in the Clearinghouse <http://metadata.nbii.gov/clearinghouse/> process. The Dashboard is being designed to keep providers informed about the number of records they are contributing in a given month and how often those records are being accessed compared to the rest of the records contained in the Clearinghouse.

In addition, providers will be alerted to the number of records they are providing that may need some attention, particularly with regard to broken links within the record. Links to data are essential to maintaining the integrity of the metadata record for both the provider and the user, and will therefore be highlighted as a service of the NBII to the provider. In future versions of the Dashboard, there will be a way for providers to simply click on the record and launch an application that allows them to easily update the

link. Finally, metadata providers will also have a distinct view of popular keywords, giving a better indication of how records are being accessed in the Clearinghouse.

The Dashboard is slated to be available to providers in early June; users will be provided with login instructions to the NBII portal to access their provider pages. Further, the NBII will be coordinating a webex for providers to introduce the new features, ask questions, and provide feedback.

The NBII encourages new providers to join the Clearinghouse. Recently, the NBII welcomed the National Park Service (NPS) to the Metadata Clearinghouse! NPS has partnered with the NBII to provide the Clearinghouse with over 17,000 new metadata records. The records are a valuable addition to the holdings of the Clearinghouse, and will serve to enhance the experience of NBII users seeking information about NPS science. The NBII Clearinghouse gives

NPS another avenue for their metadata records to be accessed by scientists, land managers, and others.

The requirements for contributing records are relatively painless. Providers make their records available in a Web-accessible folder in XML format and alert the NBII as to the folder's address. Each week, the NBII harvests the records from the folder, leaving the metadata records solely in the control of the provider. Any updates to existing records or new records will be reflected in the next week's harvest. The NBII asks only that providers pay careful attention to the quality of their records, with a special focus on the construction of titles, selection of keywords, geographic coordinates, and online linkage.

For guidance or assistance on metadata record creation, please contact the NBII Metadata Program Coordinator, Viv Hutchison at <vhutchison@usgs.gov>.

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home page <www.nbii.gov>,
- OBIS-USA Data Dashboard <http://www.nbii.gov/portal/server.pt/community/marine_data_%28obis-usa%29/791/data_dashboard/2256>,
- US Protected Areas Database (PAD-US) Mapper <http://gap.uidaho.edu:8081/padus/padus2.do>,
- Gap Analysis Program (GAP) Land Cover Viewer <http://www.gap.uidaho.edu/landcover.html>,
- GAP Online Data Explorer Tool (see "GAP Online Tool" link under each regional GAP listing at <http://www.gapserve.ncsu.edu/>), and
- Two more tools in production but not yet ready to be publicly released.
After the demonstrations, the remainder of the day included facilitated discus-

sions. The first considered the potential uses of the demonstrated tools, and what suggestions the attendees had for making the tools even more useful. A number of recommendations were made for content and Web sites to include in Raptor's searches, as well as ideas for improving some of the other online tools, particularly those made available by the Gap Analysis Program.

Subsequent discussions elicited ideas about how the NBII and the conservation science community could partner to advance mutual goals. Many suggestions were offered, including ideas for creating awareness of the NBII, and how the NBII could get tools into the hands of more users. Some attendees requested that the NBII provide interactive training on the

tools, as well as materials to help their organizations promote the NBII.

The report from this workshop was given to the NBII during April 2010, and will help the NBII as it plans for the future. One recommendation from the workshop is already being carried out: there will be SCB-NBII focus groups held this summer (July 3–7) at the International Congress on Conservation Biology in Edmonton, Canada, where conservation managers and planners will be invited to provide input for future versions of several of the tools NBII makes available.

In addition, leaders of yet another group of conservation organizations will be engaged in facilitated discussions to further refine the recommendations from the March 4 workshop.

The North American Invasive Species Network

For more than 10 years, there have been efforts across the United States to create a National Center for Invasive Alien Species (IAS). None of the results are recognized as "The National Center," but all have developed areas of expertise. Under the auspices of Dan Simberloff and Don Schmitz, a workshop was recently held on this subject at a North American level, including scientists from Canada, Mexico, and the United States. At the meeting, there was an important change in direction: to recruit membership from all interested invasive species centers across North America and form a network consortium to foster collaboration among these hubs. The North American Invasive Species Network (NAISN) will share information, work collectively to develop new information, define, and communicate the problem of invasive species to the public. It will also expand efforts to improve invasive species prevention, early detection–rapid response, research, and management. For more information, visit the developing Web site at <http://www.naisn.org>.

The Nonindigenous Aquatic Speces Database Now Offers Interactive Species Maps

The Nonindigenous Aquatic Species (NAS) Database <http://nas.er.usgs.gov>, an NBII partner, now offers species point distribution maps. These appear as separate links from any species search and from the top of any species page with the NAS. The maps depict spatial accuracy of the point and species status at each location. Each can be modified. Additional environmental layers are planned. Some examples of interactive nonindigenous species maps available include:

- Silver carp (*Hypophthalmichthys molitrix*) <http://nas2.er.usgs.gov/viewer/omap.aspx?SpeciesID=549>
- Northern Snakehead fish (*Channa argus*) <http://nas2.er.usgs.gov/viewer/omap.aspx?SpeciesID=2265>
- Nutria (*Myocastor coypus*) <http://nas2.er.usgs.gov/viewer/omap.aspx?SpeciesID=1089>

Also, the NAS site has been converted from classic .ASP to .NET. As a result, all of the **Web page addresses have changed**: the basic URL remains the same, but will contain an "x" after any ".asp."

New Online Invasive Species Journal Available

Dr. Jim Graham, ISIN partner and developer of the Global Invasive Species Information Network system, has been asked to serve on the advisory board of a new international, online, open access journal called *Management of Biological Invasions*. The journal accepts contributions on the ecological, conservational, environmental, methodological, and social aspects of bioinvasions. All contributions must be oriented to real practice, or demonstrate implications important to wildlife management. This journal is expected to launch two issues per number and year. Articles are published immediately after acceptance; more information is available at: <http://www.managementofbiologicalinvasions.net/>.

The ISSG Invasive Species of the Week button as it appears on the NBII Invasive Species Information Node.

Global Invasive Species Database (GISD) Creates Invasive Species of the Week Button

The Invasive Species Specialist Group (ISSG) has launched the "Invasive Species of the Week" Web site "button" to raise awareness of the impacts of invasive species on native biodiversity and threatened ecosystems. The idea is based on a similar application, the International Union for Conservation of Nature (IUCN) Red List's Species of the Day. The Invasive Species of the Week button is a short string of html code that can be placed on a Web site, which will link to a PDF file of the weekly species fact sheet maintained by ISSG and Global Invasive Species Database (GISD). This code, once embedded into a Web page, needs no further changes; the button will link to a different invasive species each week automatically. The code, which needs to be embedded onto a Web site, is as follows: <iframe src="http://www.issg.org/invasive_species_ofthe_week/is_ofthe_week.html" frameborder="0" width="185" height="205" scrolling="no"></iframe>

For more information, visit: <http://www.issg.org/about_is.htm>.

NBII at Weeds Across Borders 2010

NBII Node Managers Annie Simpson, Elizabeth Sellers, and Marcia McNiff are providing logistical support to Elizabeth Galli-Noble, Director, Center for Invasive Plant Management, in planning the biennial Weeds Across Borders (WAB) tri-national conference, a meeting of invasive plant experts from Canada, Mexico, and the United States. The meeting will be held June 1–4, 2010, at the National Conservation Training Center in Shepherdstown, WV.

At the conference, Simpson will chair a plenary invasive species early detection and rapid response session, and she and Sellers will give presentations and a poster on invasive species tools and partnerships. Marcia McNiff and NBII partner Dr. Les Mehrhoff, Invasive Plant Atlas of New England, will represent the Northeast region, and Drs. Randy Westbrooks, USGS National Wetlands Research Center, and Gary Ervin, Mississippi State University, will represent the mid-South.

The NBII has participated in Weeds Across Borders since its inception in 2002, when the Invasives Information Network (I3N) of the Inter-American Biodiversity Information Network (IABIN) was described to participants. The goal of the conference is to "provide a forum for educating, sharing, and disseminating knowledge about weed management, regulatory issues, and concerns about weed dispersal across and between all jurisdictional boundaries in Mexico, Canada, and the United States." Organizers limit each conference to no more than 150 attendees to encourage partnership building and one-on-one interactions of experiences in weed policy and management. The 2010 conference, whose theme is "Plant Invasions:

Policies, Politics, and Practices," will also discuss a Memorandum of Understanding between Canada, Mexico, and the United States on weed control, first proposed at the 2008 meeting.

For more information, contact Annie Simpson at <asimpson@usgs.gov> or 703-648-4281.

NBII Contributes to U.S.-European Ecoinformatics Technical Working Group

The NBII, the U.S. Environmental Protection Agency (EPA), and the European Environment Agency (EEA) are collaborating through an Ecoinformatics Technical Working Group to exchange experiences in environmental information. Their goal is to increase the efficiency of environmental information gathering and provision and bring added value to U.S./European efforts to protect the environment.

The working group has two general objectives:
- To foster the exchange of experiences on standards and information technology issues in ecoinformatics to improve the exchange and comparability of environmental data and information; and
- To promote the exchange of information on the development of environmental knowledge in ecoinformatics to facilitate and

support legal and voluntary actions to protect the environment.

In January 2010, the biannual meeting of the organizations was held at the U.S. EPA office in Seattle, WA. The meeting was informed by several initiatives regarding environmental information networks, integration, and display that rely on the ecoinformatics partners for support and expert consultation.

At the meeting, the EEA sought global partners for its Eye On Earth partnership with Microsoft. Eye on Earth, available at <http://eyeonearth.cloudapp.net/>, displays information from 22,000 water-quality monitoring stations and 1,000 air-quality monitoring stations across Europe, and allows users to personally rate and comment on air and water quality. Over the next five years, the system will grow to include information on a range of environmental topics, including biodiversity, coastal erosion, and real-time environmental threats.

The United Nations Environment Program (UNEP) and the environment agency of Abu Dhabi are advancing their partnership for a global environmental networks summit meeting in 2010 and the development of an environmental information network in developing countries. The NBII will be involved through expert/executive engagement and the development of proof-of-concept projects and collaborations.

The meeting also facilitated follow-up discussions, including USGS participation in the Annual EPA GIS Conference. This allows for greater sharing of geospatial standards and data within the EPA, USGS, and internationally.

For more information, contact Mike Frame at <mike_frame@usgs.gov> or 865-576-3605.

Upcoming Events of NBII Interest

NatureServe Conservation Conference
2010, Austin, TX.   April 26–28

NatureServe Southeast Natural Heritage
Conference, Austin, TX.   April 29–30

Southeast Exotic Pest Plant Council and
Southeast Chapter of the Society for
Ecological Restoration International 2010,
Chattanooga, TN.   May 11–13

National Native Seed Conference,
Snowbird, UT.   May 17–21

The Wilson Ornithological Society
Meeting, Geneva, NY.   May 21–23

Weeds Across Borders,
Shepherdstown, WV.   June 1–4

State of the Coast,
Baton Rouge, LA.   June 8–10

American Society for Photobiology,
Providence, RI.   June 12–16

International Symposium on Genetic
Biocontrol of Invasive Fish,
Minneapolis, MN.   June 21–24

2010 Joint Meeting of the
Ichthyologists and Herpetologists,
Providence, RI.   July 7–12

The 7th International Conference on
Emerging Infectious Diseases,
Atlanta, GA.   July 11–14

2010 ESRI Conference,
San Diego, CA.   July 12–15

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