

USGS National Hydrography Dataset Newsletter
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By Jeff Simley, USGS

High Resolution NHD Nationwide Coverage Complete

U.S. Geological Survey Director Mark Myers announced the completion of nationwide coverage of the high resolution National Hydrography Dataset at a ceremony at USGS headquarters in Reston, Virginia, on August 9, 2007.

Comments from U.S. Geological Survey Director Mark Myers

Director Mark Myers addressed the audience at the ceremony expressing an “appreciation for the grass roots effort it took to produce the NHD” and noted the “persistence of scientists, resource managers, and regulators who saw a need for such a dataset at a national scale.”

Myers spoke of the vast development across the landscape of the United States by pointing out the large number of resources required to sustain the population and the energy it consumes. “It is overwhelming to see how many of us there are and how much we are modifying the surface. Underpinning all of this is an assumption that our water resources will be adequate and that we can protect those resources.”

He described several examples of the demand for water, highlighting several huge new demands created for energy production. He continued in stating that the added dynamics of climate change and population growth will increase the challenges we face to sustain people and agriculture. “This problem is national in scope, this problem is huge, this problem is immediate. How do we address this problem with all of the agencies and stakeholders?” he asked.

The Director offered the “importance of the national integration of data” to understand the scale of the problem. He explained, “We cannot see the national perspective when you look out the window. When we look at these issues we need a national perspective, but also to see down to the local person on the ground. The NHD is really a national visualization. It is a tool that allows you to look at the local level and to look systemically at a national level.”

In facing the issues before us he pointed to the NHD as a “huge accomplishment.” He observed, “The amount of effort, the decade it took, to make this dataset is in startling contrast to the need to have the data now.”

Myers then looked at the role of the NHD as a part of *The National Map*, “If you look at the mission for *The National Map*, this (the NHD) is a key layer. There are other key layers like elevation and land cover that are absolutely necessary to have in the same sort of national framework to make this hydrography data usable within context. All of this is necessary for agencies to allow the individual person to understand the affects and changes to the landscape to help shape local and national policy. I haven’t talked to anybody that doesn’t recognize the issue. But what you do about it is the hard part.”

In reference to the NHD he said “This group actually did something about it. They created a vision for the framework to put the data into context that is objective and can be used by all sides of the political and economic spectrum. It is a very powerful tool that gives hope that we can address these problems. We need to do this for all layers of *The National Map*.”

Director Myers gave credit to the Department of Agriculture for doing this for the National Agriculture Imagery Program (NAIP), pointing out both program’s need to balance local and national need for content. “It takes national leadership to do that. We as agencies have to demonstrate a framework that gets the whole nation covered rather than just focus on the last crisis” observing that the next crisis will not be where the last one was.

He pointed out that “we need to do this for all layers (of *The National Map*). Here is a shining star, an example of where folks got together. It wasn’t just a single agency, but agencies working together,

putting funds together, looking at the true needs of the country” and stated that “this is a model for the Survey”.

The Director then outlined strategic objectives for the Survey noting the recent publication of the USGS circular: Facing Tomorrow’s Challenges – U.S. Geological Survey Science in the Decade 2007-2017. He pointed out six major science thrusts (1) Understanding ecosystems, (2) Climate variability and change, (3) Energy and minerals for America’s future, (4) A national hazards, risk, and resilience assessment, (5) Role of environment and wildlife in human health, and (6) A water census of the U.S.

Myers noted that we are looking at these issues holistically at a national level. “Underpinning that, what data do we need, what data systems do we need, and how do we integrate that data?”

He then pointed out the challenges of collecting and integrating that data to a standard, noting as an example that John Wesley Powell started on a mission of mapping the West with no precedent or standard. “How do you do that? There were no standards. We ended up over a hundred year period being able to map the baseline layers of the topographic map. That product was a total compromise product. You could have put a hundred other layers on there, but they reached a consensus nationally. You guys did this with a hydrological dataset, a remarkable example. It’s the wave of the future. It’s a great challenge, but here is a case where it was done. It is a model for other areas. We have not yet done this for some other data areas. I would ask that our partners work with us strategically to make this happen.”

He continued, “Strategically we have to find a way nationally to build data models to cohesively capture that data, but also the maintenance of that data.” Also that “Most states recognize the need for someone to step up and take the lead. We need to work cooperatively to create that kind of leadership.”

Director Myers concluded by stating “I really appreciate what has been accomplished here because it is a big step towards our goals to create data at a national scale, but making it relevant and usable down to the local community or individual level. I will say that one other thing that excites me is this idea to get the information out to the user, the individual person. We have had great success of this at the Survey. As we think about these layers and *The National Map*, the performance of it, how we archive it, we are creating a relevance to the user. I express my thanks and admiration to the folks that worked hard together to make this happen. It is always nice to have these examples of success and then challenge our staff to repeat the process.”

Comments from Tod Dabolt, U.S. Environmental Protection Agency

Tod Dabolt, representing the Office of Water at the U.S. Environmental Protection Agency, spoke on the National Hydrography Dataset, noting that “two words come to mind: perseverance and persistent, at the grass roots level” referring to the team of people that “made the NHD what it is.”

“As a customer, the NHD is invaluable to the EPA,” he continued, noting the spectrum of uses by the agency ranging from measuring surface water protection programs and overall budget performance, to more scientific programs such as national monitoring for lakes and rivers, to emergency response applications and called the NHD a “very broad ranging product.”

Dabolt reflected on where we would be without the \$50-million investment made, noting that the “partnership has saved government and taxpayers a lot of money” and asked, “how much would have been needed by our partners to duplicate this resource.”

Commenting on the NHD partnership Dabolt said, “I commend the marriage of agencies” and of the benefits it has produced he noted that “as a civil servant, this is a proud day.” In elaborating he said it is “very rewarding to see the program mature and develop partnerships with state and locals who have the expertise and bring it to a central depository.”

Dabolt emphasized the federal-local relationship of letting the local governments produce the data and the federal government being the collector and repository of that local knowledge, pointing out that “this is the direction the NHD took and continues to be the pioneer that helps fulfill the vision.”

In reference to the stewardship of the NHD, he commented on the challenge of stewardship, saying that unlike transportation data, “there isn’t a strong marketplace for hydrography data, so it will be a challenge”, but noted that the stewardship program is “taking it in the right direction.”

He further stated that, “We must work with the locals and local government to capture the information they have in a unified way and then distribute that.”

Dabolt then talked about how technology can benefit the citizen saying with regard to the NHD. “This infrastructure has the ability to deliver information to them that’s relevant and collaborates across federal agencies to deliver water information in a unified picture that the local citizen understands.”

He concluded, “It is the citizens who are the most knowledgeable about the local water and the challenge is: how do we, as a federal government, use it to adjust our policies.” Pointing out “that’s where the NHD heads.”

Comments From Brian Sanborn, U.S. Department of Agriculture Forest Service

Brian Sanborn, representing the U.S. Department of Agriculture Forest Service, provided a perspective of the National Hydrography Dataset from his agency. He began by saying, “This is a big event for the Forest Service. The dataset, the model, and the whole process were big lessons for our agency and will be a model we can use for other sets of data.”

Sanborn elaborated on the U.S. Forest Service’s involvement saying, “The (USFS) Natural Resource Information System develops applications and databases for the collection, storage, and analysis of field level data to make and support land management decisions.”

In pointing out the data needs of resource managers, he continued, “The data needs to be spatially located and has to be tied to streams” and described resource manager’s concern that “what we do on Forest Service lands moves off of Forest Service lands, what happens off of Forest Service lands moves on to Forest Service lands.”

To address these issues Sanborn noted that the Forest Service is a very distributed agency and that it is “an uphill battle to have a standard data model we could utilize.”

He noted the importance of the existing medium resolution NHD, but stressed the role of the new high resolution NHD, saying, “The NHD program gave us two things we needed ... a high resolution data model...and stewardship.”

In reference to stewardship, he pointed out “the foresight to incorporate the change management system, and the concept that these data would be stewarded by the people on the ground...were really important.”

With regard to the high resolution data, Sanborn noted, “We needed the high resolution data...at the project level the streams we were managing were represented in the high resolution dataset.” With these two objectives met, Sanborn said, “it’s been a big success.”

He also discussed the importance of the partnership stating, “All of the agencies involved is a good thing, but it also created a NHD community” noting the value of the concept of various people working together across agency boundaries. He stated that doing so builds applications that can be used by other agencies and the general public.

Concluding, Sanborn commented that, “These things have been a big value to our agency. We use these data on a regular basis to model data in: our national GIS dictionary, referencing all of our data in support of fisheries and hydrology programs, watershed programs, and just about all of our land management programs.”

AWRA Spring Specialty Conference – GIS and Water Resources V

Geographic information systems have become a necessary component in the planning and management of water resources, and the natural and human systems affected by water resources. This Specialty Conference continues the AWRA biennial tradition of surveying the state of knowledge in this field, following the 2004 Conference in Nashville and the 2006 Conference in Houston. AWRA provides a unique professional home for GIS in water resources specialists, and important decisions have emerged from past AWRA conferences. For example, the informal gatherings at the Nashville Conference led to a critical convergence of thinking on the synthesis of national datasets for hydrography, elevation and land cover that resulted in the new NHDPlus dataset now available for the nation.

Exciting new developments that will be presented at the 2008 Conference include the acquisition and mass processing of LiDAR representation for land surface terrain, the maturing of the FEMA Map Modernization process and the emergence of Hydrologic Information Systems which place water observation time series data such as rainfall, streamflow, water quality and groundwater level data in a geospatial context.

The organizing Committee invites you to share your experiences and knowledge with an oral presentation that will be published in the Conference Proceedings, or present a Poster in a gallery at the conference and in a virtual gallery on the proceedings DVD. There will be an opportunity to present your freeware and public domain scripts on a Conference server so that other attendees can download them as well as learning about them in your Conference papers. See

http://www.awra.org/meetings/San_Mateo2008/index.html

NHD Documentation

Look for a new and revised set of NHD documentation in draft form available for your review and comments. The documents: (1) [Standards for National Hydrography Dataset – High Resolution](#), (2) [Best Practices for the Revision of the National Hydrography Dataset](#), (3) [The National Hydrography Dataset Concepts and Contents](#), (4) [Introducing the NHDinGeo](#), and (5) [Stewardship of The National Hydrography Dataset](#) can be found at <ftp://nhdftp.usgs.gov/Docs>.

July Hydrography Quiz / New August Quiz

Ray Fox, the USGS Geospatial Liaison to Missouri, was the first to correctly guess last month's hydrography quiz <ftp://nhdftp.usgs.gov/Quiz/Hydrography25.pdf> as Mono Lake, California. Ray is based in Rolla, Missouri, home of one of the two National Geospatial Technical Operations Centers. He is one of a large cadre of National Spatial Data Infrastructure (NSDI) liaisons between the USGS and each of the states and their constituent agencies. His job is to assure coordination and cooperation between the state and the USGS involving the NSDI.

In order to provide water for growing Los Angeles, water was diverted from the Owens River and then from the tributaries that fed Mono Lake. In 1941 the city of Los Angeles extended an aqueduct system into the Mono Basin, diverting water that would otherwise have entered Mono Lake. Water diversion soon rapidly reduced the surface area, resulting in a loss of nearly 27 square miles of lake area. Enough water was diverted that evaporation soon exceeded inflow and the lake level fell rapidly, exposing alkaline sands and once-submerged tufa towers (subject of the beautiful photos), and turning Negit Island into a peninsula, exposing the nests of gulls to coyotes and forcing them to abandon the island. In 1976 a University of California-Davis graduate student was instrumental in alerting the public of the effects of the lower water level and formed the Mono Lake Committee in 1978 and joined up with the Audubon Society to fight a now famous court battle to protect Mono Lake through state public trust laws. Despite these efforts, the lake is still lower than historic levels and exposed shorelines are a source of significant alkali dust during periods of high winds. Mono Lake was spared, when the California State Water Resources Control Board issued an order to protect Mono Lake and its tributary streams. Since that time the lake level has steadily risen. From http://en.wikipedia.org/wiki/Mono_Lake

Others with the correct answer were Ken Koch, Mark Reichert, James Seay, Jennifer Campbell-Allison, Bill Samuels, Jim Sherwood, Joanna Wood, Mac McKay, Jory Hecht, Al Rea, Steve Char, Ed Carter, David Asbury, Laurie Morrow, Ralph Haefner, Gail Jackson, Deborah Naslund, and Lee Galt.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography26.pdf>. The hydrography of the United States flows into five major ocean drainage areas (except that which flows internally). Here we are looking at the intersection of three of them. Where is this?

Upcoming NHD Geo Edit Tool Training

September 18-20, 2007 San Diego, CA, Contact Steve Char sjchar@usgs.gov or Carol Ostergren at costergren@usgs.gov
September 17-19, 2007 Columbus, Ohio, Contact Hank Nelson hpnelson@usgs.gov or Charles Hickman at chickman@usgs.gov
October, 15-19 Tallahassee, Florida, Contact Carl Nelson cwnelson@usgs.gov or David Anderson at David.S.Anderson@dep.state.fl.us
Fall, 2007 (Possibility), Anchorage, AK, Contact Paul Kimsey pjkimsey@usgs.gov or Carl Markon markon@usgs.gov

Upcoming NHD Applications Training

September 11, 2007, Oklahoma City, OK, contact Darryl Williams at dwilliams@usgs.gov
September 18-19, 2007, Ft. Collins, CO, limited to National Park Service, contact Lisa Nelson at Lisa_L.Nelson@partner.nps.gov
October 2, 2007 Austin, TX, contact Claire DeVaughn at cdevaugh@usgs.gov
November, 2007 (Possibility), Hawaii, contact Henry Wolter at hwolter@usgs.gov
February, 2008 (Possibility), Michigan, contact Steve Aichele at saichele@usgs.gov

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The NHD Newsletter is published monthly. Get on the mailing list by contacting jdsimley@usgs.gov.

You can view past NHD Newsletters at http://nhd.usgs.gov/newsletter_list.html

Jeff Simley, USGS, assumes full responsibility for the content of this newsletter.