

USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

New NHD/WBD Viewer – by Kathy Isham

A new interactive mapping viewer is available to explore the NHD and WBD replacing the previous *The National Map (TNM) Viewer* and an even older viewer that had been in place for several years before. The new viewer is designed around the interests of hydrography users providing views and symbology that water scientists can easily relate to. When *The National Map Viewer* went live last year, many NHD users preferred to utilize the newer and more robust viewer, however its symbology was designed for general applications and made it difficult to understand the underlying hydrography. Creating a NHD/WBD instance using new technology became an important task by providing better cartographic representation important to water community. For example, NHD users wanted arrows on flowlines to symbolize which way the water flowed. It was also important that the user be able to distinguish between SwampMarsh and LakePond or CanalDitch and StreamRiver. Another major issue was that features were not scale dependent, so both Medium and High Resolution features were visible at the same time. Once these cartographic changes were finalized, the NHD Viewer was ready to go live. After zooming-in to 1:500,000-scale, the live NHD will appear. Scales above this are cached images.

The new NHD Viewer is an instance of *TNM Viewer* and therefore has the same look and feel, functionality, and speed. Notice that viewing and downloading Hydrography data from the new NHD Viewer is much easier. The difference between the *TNM Viewer* and the NHD Viewer is that the NHD Viewer has two new basemaps. The NHD basemap is designed to highlight hydrography features. This basemap is automatically visible when you go to the Viewer. The Imagery basemap is different from the one on the *TNM Viewer* in that it shows Hydrography data overlaying imagery. You can still use the *TNM* basemap or if you want to view overlay data only, there is also a blank basemap option. Try the NHD Viewer by visiting <http://viewer.nationalmap.gov/viewer/index.html?p=nhd>. Feedback on the new viewer is encouraged. Go to <http://tinyurl.com/4lkevp9> to leave feedback. For help navigating the viewer and downloading data please visit <http://nhd.usgs.gov/help/index.html?overview.htm>.

Massachusetts NHD MOU Signed – by David Anderson

The state of Massachusetts has been working vigorously for several years to join in partnership with the U.S. Geological Survey to maintain and revise the National Hydrography Dataset (NHD) in lower New England. Problems with resources and project expansion issues caused some hardships for the partnership development, but in the past year the state and USGS have developed a very good bond that will lead the NHD partnership into the future. Fortunately it can be reported that this past month, the Massachusetts Department of Environmental Protection (DEP) and Office of Geospatial Information Services working with their USGS Geospatial Liaison, Water Resources, and NHD Partner Support personnel have signed an agreement to assume hydrographic stewardship in the state. Brian Brodeur and Robert Hames of the Massachusetts Department of Environmental Protection will lead future endeavors in the state for NHD support and maintenance, and Pete Steeves of USGS Water Resources will be leading the Watershed Boundaries Dataset (WBD) update in cooperation with the Massachusetts DEP. The NHD/WBD partnership has the right people in place now to work in lower New England that will provide a productive and progressive partnership.

Alaska Stewardship – by Hank Nelson

The Alaska National Hydrography Dataset (NHD)/Watershed Boundary Dataset (WBD) Subcommittee met February 25th in Anchorage, Alaska. Lee Koss of the Bureau of Land Management will continue as

chair of the subcommittee and Eric Johnson of the U.S. Forest Service accepted the vice-chair position. Three major challenges were addressed: (1) Formalizing an interagency agreement (MOU) on stewardship for the Alaska NHD/WBD, (2) Finalizing protocols for editing, and (3) Developing an interagency funding stream to support a State Data Steward for Alaska who would coordinate the work of agency data stewards. Selecting a State Steward is very important because there are several major NHD projects going on in Alaska and coordinating these activities would fall under the purview of the principal steward. The USFS and Alaska Department of Fish and Game are updating southeast Alaska with Southeast Alaska (SEAK) hydrography data. The National Park Service is updating coastlines and estuarine features for several National Parks. Sheryl Boyack of the USGS is working on updating NHD and WBD for the BLM managed National Petroleum Reserve on the north slope of Alaska using more recent IFSAR coverage. Consensus at the meeting was for Sheryl to continue in the role of NHD/WBD Data Steward for the foreseeable future, eventually to be replaced with an in-state steward.

NHD Image Integration Status - by Chris Lund

The NHD Image Integration project is currently focusing on the state of Oregon. 2009 NAIP imagery has been inspected against over 1,900 quadrangles planned for USTopo production later in the fiscal year. The inspection process resulted in the identification of 126 quadrangles needing NHD updates. The USGS will share information related to proposed edits with the NHD Point of Contact, Hank Nelson, and the State Data Stewards and Technical Point of Contacts; Dan Wickwire, Bob Harmon, and Jay Stevens, prior to executing updates to the database. Many proposed edits focus on the ocean, coastline, estuary, and foreshore features.

NHD Image Integration has also been completed for the state of Montana and is still planned for Puerto Rico and the Virgin Islands. These are the last requirements supporting the USTopo program of work for Fiscal Year 2011. As 2010 NAIP becomes available, the USGS will begin inspection of imagery covering states planned for the 2012 USTopo program. States planned in a draft schedule for 2012 include: Arizona, Nebraska, Alabama, Maine, Missouri, Nevada, California, Louisiana, New Hampshire, Mississippi, Vermont, Wyoming, Connecticut, Massachusetts, Illinois, Rhode Island, South Dakota, Florida, and Hawaii.

NHD Update Process Improvement Project - by Paul Kimsey

As of March, 2011 the USGS NHD Update project team is currently working on Sprint 10 (March 15-30) which focuses on (1) completing the metadata functionality, (2) editing (feature to feature and reach delineation rules), and (3) enabling check-out from the stewardship web site and check-in to USGS. Internal BETA testing will begin April 4-15, 2011 and will create issues to be handled in upcoming sprints. In addition to resolving issues, the team will continue on with new development and complete the quality control and utilities. Once the major toolbar functions are in place a second round of BETA testing will begin and will be expanded to include external partners. The project team remains hopeful that an official release will be available in mid to late July of this year.

VMware and the NHD - by Bill Smith and Ray Postolovski

National Hydrography Dataset (NHD) maintenance software is specifically written to edit NHD data and is fairly complex. In the past, several partners have had issues running NHD maintenance software due to various issues. One of the most common problems involves registration conflicts between NHD software and other software previously loaded on the cooperators workstations. This has been difficult, if not impossible to resolve in some cases.

USGS personnel have been investigating software provided by VMWare, which allows a user to run a virtual machine on their local workstation. Once the VMware session is created all applications running on the VMware session are completely separated from the host workstation. The virtual session is simply another window on the workstation. The VMware session and the host workstation are totally separated so any issue that may develop on the external hard drive is separated from the host workstation.

USGS and the State of Utah are in the process of creating and using VMware to complete NHD editing in a virtual environment. Utah purchased two external hard drives at a minimal cost. Utah IT personnel loaded proprietary software on the external hard drives, including: XP Professional Operating System, Microsoft .Net Framework v 2.0 sp2 (service pack), v3.0 sp2, and v3.5 sp1, ArcGIS v9.3.1 with ArcInfo license and Desktop VBA Developer Resources, Python with PyWin 32-bit extension, and Microsoft Office 2007. The external hard drives were then forwarded to USGS where USGS personnel loaded all required NHD editing software, including: Task Assistant v1.0, NHDGeoEdit Tool v3.3.3, NHDUtilities, NHDFlowCheck and NHD Tools Toolbox. In addition, ActivePerl and Adobe Reader freeware were loaded. Once tested, the hard drives were shipped back to Utah. When Utah personnel wish to complete NHD editing, they simply plug the external hard drive into a USB port on their local workstation and activate VMware player (a free download). Once VMware Player is active, a user simply selects the appropriate VMware session, and starts an NHD edit session. All steps in the editing process are completed in the usual manner.

Advantages of this process include: (1) the ability to complete all NHD editing functions without interfering with other software previously loaded on the host workstation, (2) the ability to load USGS NHD editing software on your host workstation without overwriting previous registration of other software, and (3) keeping all NHD projects on an external hard drive for easy access and organization. Disadvantages are few, including slightly lower performance speed, but this can be kept to a minimum with the use of a high speed (7400rpm) hard drive. From a USGS perspective, this process provides many advantages, particularly for training. In the past it was always a concern that NHD software loaded on a cooperators training workstation would operate properly. By setting up a VMware session prior to traveling to the training location, the USGS NHD trainer is assured all software will function properly. This is critical in a training scenario. For questions concerning VMware, particularly VMware and NHD, please contact Ray Postolovski rpostolovski@usgs.gov (303-202-4363) or Bill Smith wjsmith@usgs.gov (303-202-4493).

IJC Recognizes USGS for U.S.-Canada Border Work – by Pete Steeves

The International Joint Commission (IJC) recognized the USGS for its work in developing harmonized geospatial hydrography data on the U.S.-Canadian border stating that: "Unprecedented progress has been made over the last year with respect to hydrographic data harmonization in the transboundary drainage areas shared by Canada and the United States." The statement went on to: (1) Highlight some of the accomplishments over the past year; (2) Direct focus on next steps, including populating "the newly synchronized sub-basin areas with two levels of hierarchical, topographically derived watersheds and sub-watersheds"; and (3) Emphasize the applicability of the harmonized data, including the modeling of flow characteristics across the geopolitical border. Data is now officially checked back into NHD for all hydrologic units West of the Great Lakes. The process will continue east and be complete by the end of the calendar year. Pete Steeves, Karen Hanson, Paul Kimsey, Tim Hines, and Kim Jones of the USGS were all instrumental in the success of this effort.

News from April 1, 2011

Lexington County Moves Stream to Match the NHD

When NHD steward Lexington County found that the NHD did not show a nearby stream in its correct position, they attempted to edit the NHD to make it correct. However the task was so difficult they found it actually easier to move the stream to make it match the NHD. See a photo of the stream relocation at ftp://nhdftp.usgs.gov/Hydro_Images/Edit_Tool_01.JPG.

Artificial Paths Identified With New Technology

Scientists at the Department of Geographic Information Systems at the College of New Technology have developed a remote sensing system that can identify Artificial Paths for the first time. The system uses spectrographic images from high-altitude flights to reveal the Artificial Paths. This new finding has stunned the NHD community which was lead to believe that Artificial Paths were purely an artificial method of representing the network through polygons.

Glitch Has Major Impact on Flow Direction

Hydrologic modelers using the ROBBIN software for nutrient modeling have discovered that all of their results are the opposite of what they should be. The software, which traces potassium in the Nation's rivers, shows high concentrations where they are not expected. The problem was detected when a downstream trace sent potassium from New Orleans to Sioux Falls, South Dakota. The error occurred when all arcs in the NHD were flipped when somebody accidentally bumped into the NHD server.

NHD Photo of the Month by Kathy Isham

This month's photo was submitted by Matthew Hoagberg of the Dakota Consulting at the U.S. Bureau of Reclamation. This is McChivvis Reservoir in Colorado. To see the photo of the month go to ftp://nhdftp.usgs.gov/Hydro_Images/McChivvis_4_11.jpg. The map was made by Kathy Isham. Submit your photo for the NHD Photo of the Month by sending it to krisham@usgs.gov. This will allow the program to build a library of real-world photos linked to the NHD.

February Hydrography Quiz / New March Quiz

Richard Patton was the first to correctly guess the January hydrography quiz as 11,726 square miles for the drainage area of the Allegheny River above its confluence with the Monongahela River to form the Ohio River. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography67.JPG>. Richard is a hydrologist for the George Washington and Jefferson National Forests, and is stationed in Harrisonburg, Virginia.

Others with the correct answer were (in order received): David Straub, Ken Koch, and David Hockman-Wert. Many people correctly guessed that this was the Allegheny River drainage, but the quiz asked for the drainage area, which can easily be found using StreamStats.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography68.jpg>. We'll have some fun this time. This is actually Keven Roth's granite kitchen countertop in which she had a craftsman engrave a section nearby well-known river using concrete. This Montana river was the subject of several court cases involving an investment banker (Charles Schwab) and a rock and roll legend (Huey Lewis). It took the state Supreme Court to decide the case. Once the decision was handed down, it was set in stone (actually concrete). What is this river? Send your guess to jdsimley@usgs.gov.

Upcoming NHD Training

Hydrography Event Management tool 4-hour WebEx training.

Sign up at: <http://nhd.usgs.gov/tools.html#hem> Contact: HEM@usgs.gov

Getting Started Part 1 - April 13, August 17

Advanced Editing Part 2 - June 7, September 7

Data Maintenance Part 3 - June 22, September 28

April 5-7, 2011 - NHD Conflation Tool Training, Baton Rouge, Louisiana. Contact Elizabeth McCartney (emccartney@usgs.gov) or Bill Smith (wjsmith@usgs.gov)

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

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

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