

USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

NGP to release new ArcGIS 9.3.1 version of NHD Update toolbar by Paul Kimsey

The U.S. Geological Survey announced the release of NHD Update toolbar v4.0.1 on March 14, 2012. Since the release of the new toolbar and stewardship website, 180 user accounts have been created or migrated from the previous website and 40-plus editors have downloaded the new software and requested 169 Job checkouts. Although the new process has been an overall success, the user community has been instrumental in evaluating the tool and submitting issues back to the National Geospatial Technical Operations Office (NGTOC) development team. To date 25 issues have been addressed and are currently undergoing internal testing. The most significant major fixes include; Memory “cleanup”, allocation of reachcodes for Null or Blank reachcode values, and allowing for multiple source citations within a metadata session. The remaining issues addressed were considered to be significant enough to warrant a fix prior to the ArcGIS 10x version being released. If all goes well, the NHD Update toolbar v4.0.2 will be released within the next week or two and will allow the development team to focus on the migration to ArcGIS 10x.

NHD/WBD Stewardship Conference - Continued

The fourth bi-annual NHD/WBD Stewardship Conference held March 29 and 30 was a huge success with over 120 people attending from 45 states and 45 people making presentations. The conference was held in New Orleans, Louisiana in conjunction with the American Water Resources Association’s 2012 Spring Specialty Conference on Geographic Information Systems and Water Resources VI.

Day Two, Morning I

Josh Lear from Nebraska started the day by talking about Value Added Attributes (VAA) for high resolution NHD. The objective of the work was to improve navigation analysis using the capabilities of VAA’s. The process first involved improving the data with the NHDPlus QAQC tools on a subbasin which found 457 divergences, many of which were not correct, but could be corrected when provided with adequate information. As a result, the VAA process for navigation turned out to be a superior solution and assigning them to the hi res NHD would enhance analytical functionality.

A panel led by Tommy Dewald of USEPA then discussed the suitability of the high resolution NHD for NHDPlus. Tommy started the discussion by outlining the main points of NHDPlus (1) Enhanced NHD network and names, (2) Value Added Attributes, (3) Catchments with attributes, (4) Flow direction and accumulation grids, and (5) Flow volume and velocity estimates. Susanne Maeder from Minnesota then talked about a project to pilot the NHDPlus in Minnesota using high resolution NHD. The process involves using the 24 step NHDPlus version 2 tools, which are designed with minimal intervention. Ten-meter DEM’s would also be used with locally derived WBD. Ancillary data such as streamgages were also needed. A major objective of the project was to simply understand the issues involved so solutions could be developed for full scale production. Data preparation using QAQC tools is very important and more stringent than former tools. Determining flows at divergences is required as is solid GNIS naming practices. Improving the network is one of the initial major objectives, particularly ensuring main paths.

A panel led by Mark Olsen of the Minnesota Pollution Control Authority then focused on stewardship in California with Christina Boggs of the California Department of Water Resources, Kristen Cayce of the San Francisco Estuary Institute, and Brian Quinn of Marin County. Stewardship in California poses a problem because there are a very large number of players in the state who are all doing something with

stewardship, or who are on the verge of doing something with stewardship. As a result, it's a mass undertaking that will take considerable effort. The California Department of Water Resources is well positioned to take the lead in this role and is making an effort to formally assume stewardship leadership responsibilities. Christiana Boggs discussed this aspect of the issue. Kristen Cayce talked about efforts to produce hydrography mapping standards for the state. Brian Quinn covered local scale mapping to improve stream density at the 1:2,500-scale level.

Paul Kimsey then talked about the new NHD Update Tool outlining the principal objectives of the tool and then demonstrating it. Primary objectives of the tool were to streamline the process through (1) an external and internal desktop, (2) ease of use, (3) full QC on the client side, (4) remove USGS people from the job process, (5) make it an A-Z job experience, and (6) offer on-line help. The major components of the software infrastructure are (1) data management development, (2) website development, (3) desktop development, (4) services framework, and (5) an overall framework. The software infrastructure is composed of (1) Esri workflow manager – JTX, (2) check in/out framework supporting multiple projects and status tracking, (3) posting, (4) synchronization of production, publication, and NHD community, (5) ID management, validation services, and (6) JTX web services for status tracking, workflow management, and user authentication. The overall framework was based on (1) project code reorganization, (2) efficient and consistent look and feel, and (3) re-useable utilities. The major components are (1) request job, (2) get job, (3) open job, (4) edit, (5) QC, (6) check-in validation, (7) check-in, and (8) posting. Step 4, editing, consists of (1) metadata, (2) apply rules, (3) the actual editing, and (4) workflow and visual functionality. Paul then went on to actually demonstrate the tool.

Day Two, Morning II will be covered next month.

Access to NHD/WBD Stewardship Conference Powerpoints

The powerpoint presentations presented at the 2012 NHD/WBD Stewardship conference will be made available through the NHD web site <http://nhd.usgs.gov>. Look for the stewardship conference section on the home page. You can also access these at <ftp://nhdftp.usgs.gov/Workshops/Conference12>. Use the agenda in this folder as a guide.

Using Complete Replacement to Assist Louisiana with Coastal Revision of the NHD by Bill Smith

Revising the NHD in coastal Louisiana has presented special problems unique to coastal areas. In Louisiana's case, the data used to create the NHD was typically collected in the 1950's, or 60's, and has changed significantly when compared to current imagery. Hurricanes, subsidence, and age of data collection have combined for a perfect storm, making revision of the NHD in coastal Louisiana a nightmare.

In an effort to provide Louisiana a more efficient method to revise the NHD, the USGS is proposing a completely new phase of revision, currently named 'Complete Replacement'. In Complete Replacement, all NHD features currently in a subbasin will be deleted, including all attached reachcodes. New replacement linework (including points, lines, and polygons) will be 'imported' into the NHD using the import function in the new NHDUpdate Toolbar v4.0.1.

Past editing experience using the NHDGeoEdit Tool v3.3.3 and process has proven that the sheer number of features in Louisiana coastal subbasins cannot be efficiently revised with this method. There are simply too many 'delete features' and 'add features' to make this process efficient. Likewise, past experience using the NHDConflation Tool and process has proven that in coastal Louisiana, features collected in the 1950's and 60's have moved or disappeared when compared to newer, more current imagery. This means vectors collected from the newer imagery do not intersect with the older NHD

vectors. This creates many issues when using the conflation process that depends on the intersection of source features to target features. The 'conflation ratio' in past projects in coastal Louisiana has been less than 50%. This leads to significant manual attribution, which is prone to human errors.

Since past experience is indicating the above two revision methods are not time efficient, a new process is required for revising coastal areas. 'Complete Replacement' may be the answer! It is possible for the USGS to simply delete all features in a particular subbasin. This process will also delete all reachcodes previously attached to the deleted spatial features. This is critical to note! All reachcodes previously attached to NHD features in this subbasin will be retired, forever! It is possible for a user to access the new NHDUpdate Toolbar v4.0.1, then use the 'import' function in the tool to add new geometry and attributes to replace the deleted features and attributes.

The complete replacement process is not problem-free. All reachcodes previously attached to the deleted NHD spatial features will be retired. New reachcodes will be attached to the new, imported linework and select polygons. But the NHDUpdate Toolbar v4.0.1 will create a new reachcode for each new feature imported, following reach delineation rules. Since all previous reachcodes were retired, all events previously attached to the deleted NHD spatial features will need to be re-linear referenced to the new, replacement linework. The Hydrography Event Management (HEM) Tool available from the USGS will assist users in reattaching all events to the new linework.

If you are interested in discussing this new, proposed method of 'Complete Replacement' to assist with editing of the NHD, please contact Bill Smith at wjsmith@usgs.gov or 303.202.4493.

Study of Perennial and Intermittent Stream Classification by Keven Roth

The NHD stream classification of perennial, intermittent or ephemeral hydrographic categories generally is based on the original 1:24,000-scale topographic maps. The streams courses shown on the maps were delineated from stereo photos, and were then classified in the field. Over the years, the procedure for capturing this field information varied, but most notes were inked on a mylar overlay or photographs by the field crew. Such systematic field work is no longer being done; it is too expensive. However, many agencies are doing field work as part of water quality monitoring, aquatic habitat studies, riparian conditions, and zoning. It would be very useful to compare this contemporary field information with the original field classification done for the topographic maps. This analysis would provide valuable data on the accuracy of existing NHD classifications and identify general areas that may need to be improved.

A study would need to look at data from different parts of the country. For example, Loudoun and Fairfax counties in northern Virginia have done extensive field work to assure that development does not affect perennial streams. The state of Kansas (and all states to some extent) is working to improve statistics about perennial versus intermittent streams for the EPA EMAP program. The Idaho DEQ Beneficial Use Reconnaissance Program (BURP) collects field data every year to assess biological conditions for water quality. The NHD program would like to collect databases/spreadsheets from these field efforts that have information about whether streams are perennial or intermittent and compare the recent field observations to the NHD data. With good lat/long values or events already tied to the NHD, this can be done easily. The USGS will also need the criteria and the methodology used to collect the field samples, especially when the samples were taken (spring high water or summer low water, for example).

To participate, please contact Keven Roth at kroth@usgs.gov or Jeff Simley at jdsimley@usgs.gov.

The Bonnet Carre Spillway

Here is an excellent video on an fascinating aspect of the nation's surface water infrastructure:

<http://www.mvn.usace.army.mil/recreation/bonnet%20carre.wmv>

NHD Photo of the Month

This month's photo was submitted by Linda Davis and features Hanauma Bay, a marine embayment formed within a volcanic cone and located along the southeast coast of the Island of Oahu (just east of Honolulu) in the Hawaiian Islands. Hanauma is both a Nature Preserve and a Marine Life Conservation District, the first of several established in the State of Hawaii (from Wikipedia). You can find Hanauma Bay at 21.273066 degrees north and -157.695508 degrees west. To see the photo of the month go to <ftp://nhdftp.usgs.gov/Hydro/Images/Hanaumabay.JPG>. 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.

March Hydrography Quiz / New April Quiz

Claire DeVaughan, the USGS Geospatial Liaison to Texas, was the first to guess the March NHD Quiz as Monroe Lake in scenic Indiana, about 50 miles south of Indianapolis and near Bloomington. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography80.pdf>. Claire is collocated at the USGS-Texas Water Science Center in Austin. She has been heavily involved in Texas geospatial coordination activities at the Federal, state, and local levels since 2003, developing partnerships for various data themes including hydrography, orthoimagery, elevation, and geographic names. She currently is working with the steward for NHD and WBD in Texas, the Texas Natural Resources Information System (TNRIS), on planning stewardship implementation strategies, including training sessions for potential participants and formation of an advisory committee. In her free time, she can often be found exploring the hydrographic features of central Texas from a kayak. She highly recommends using [The National Map viewer](#) as a tool to quickly identify features in the NHD quiz.

Others with the correct answer (in order received) were Kevin Amick, Ken Koch, Al Rea, Tom Denslinger, Roger Barlow, Edwin Abbey, David Straub, Janet Brewster, Matt Rehwald, Kim Jones, David Asbury, Jim McDonald, Jim Mitchell, Richard Patton, John Lynam, and Florence Thompson.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography81.pdf>. Name the lake. It's one of the most important lakes in the U.S. because it supplies water to one of the nation's largest cities. The water enters the lake from the (orange) canal to the east with water originating in Rocky Mountain National Park. Send your guess to jdsimley@usgs.gov.

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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.