

USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

Status of USGS NHD Maintenance Lite by Chris Lund

The USGS is working on a program to improve fundamental characteristics of the NHD. This has been called the Maintenance Lite project. The term “Lite” refers to the fact that this is not a complete and comprehensive maintenance, but rather focused on resolving certain data quality issues of polygon features on a subregion-by-subregion basis. This work should be completed by September 30, 2011. To date, 72% of the conterminous United States has been processed through the Maintenance Lite workflow. Regions 1, 9, 10, 12, 13, 14, 15, and 16 are 100% complete. The USGS currently has 10 Subregions in work; only 40 additional Subregions remain before project is complete. The USGS will coordinate maintenance activities with active state partners prior to initiating the Maintenance Lite. The process is focused only on improving existing data quality issues, no updates to geometry or additions of features are included in the scope of this project.

Stream Network Navigation in StreamStats by Pete Steeves

The StreamStats team has been busy incorporating high-resolution NHD navigation functionality into its suite of tools for a number of public sites, including Ohio, New Jersey, New York, Massachusetts, Connecticut, New Hampshire, Vermont, Illinois, Indiana, Pennsylvania, and Maryland. All remaining active States should have these NHD tools available within a month. These tools perform a series of actions, which are described in detail on the StreamStats home page "User Instructions" link (<http://water.usgs.gov/osw/streamstats/ssonline.html>), pages 16, 17, 19 - 23. NHD Navigation-dependent tools include:

- Getting Streamflow Statistics and Water-Use Summaries for an Ungaged Site to Obtain Estimates Based on Flows at Nearby Similar Gages
- Stream Network Navigation (Network Tracing),
 - this tool currently allows for upstream/downstream tracing of reaches, gages and dams
- Raindrop Trace to Network
- Show Network Path Profile
- Trace Network Path within Watershed and Show Profile

These tools not only give immediate results (for example, determining distance and elevation change between two user specified events on the network), but also allow a platform for any number of water-resource programmatic needs related to: Cause and effect; trends; hypothetical situations; or even simulations. One approach for those who would like to use these tools for their own needs would be to run the tools on their own web sites through web services. Another may be for users to upload their own point events on to the StreamStats website and include them in upstream/downstream queries. The next stage of navigation development on the StreamStats site is to display NHDPlus networks, which can be used to navigate to a suite of EPA hosted point events related to water quality.

StreamStats has the ability, known as “stream-network navigation” or “network tracing”, to analyze the stream network upstream and downstream from a user-selected point and to identify and provide information for other points of interest that are located along the network. An explanation of stream networks, focusing on the National Hydrography Dataset (NHD), is needed before this functionality can be fully understood and utilized.

A stream network is a digital representation of streams and constructed channels for a given area as would be seen on an aerial photograph or on a topographic map. As with photographs and maps, stream

networks can be shown at various scales, with smaller scales having less detail than larger scales. In a digital stream network, connecting lines are drawn through lakes, wetlands, bridges, culverts, and any other features where the stream channel is not visible from maps or photographs, thus eliminating any breaks in the network.

In a stream network, reaches are segments of surface water with similar hydrologic characteristics. Reaches are commonly defined by a length of stream between two confluences, or a lake or pond. Each reach is assigned a unique reach code, flow direction, reach length, reach type, and other characteristics that are stored as reach attributes. Points of interest along a network, such as the locations of dams, streamgaging stations, and effluent discharges, can be assigned a reach address, which consists of a reach code and the percentage of the distance along the reach from the downstream end. These points of interest are called point events. In addition, activities or designations that affect an entire reach, a part of a reach, or multiple reaches, such as an impaired water-quality designation, are called linear events. This stream network data structure allows users to navigate upstream or downstream from a user-selected point on a stream to locate and obtain information for the associated reaches, point events, and linear events. Navigation also can be accomplished along the NHDPlus stream network and attributes from the dataset can be obtained through StreamStats for states where this functionality has been implemented.

StreamStats can navigate upstream, downstream, or in both directions from a user-selected site. The network may be a version of the NHD or any other stream network that is available in StreamStats, as different events may be associated with different stream networks. The *Config* tool is used to specify the network upon which tracing (searching upstream or downstream) will be done, the direction of the trace, and the map layers of point events that will participate in the trace. Tracing can be done either by first delineating a drainage basin for a selected site and then using the *Config* tool and the *Trace From Outlet* tool in sequence, or by first using the *Config* tool and then using the *Ad Hoc Trace* tool and selecting any point on a stream to begin the trace. Directions for using these tools are provided on the User Instructions page. When the process is completed, a window will appear that contains a table that lists the reaches and events found from the trace. Items in the table usually will contain links from the items to additional information about them. In addition, the map frame will redraw, with the stream reaches identified in the trace highlighted.

The primary benefit of the trace functionality is to understand how the flow at a particular site may be affected by upstream activities or how downstream flow may be affected by existing or proposed activities at the selected site. The USEPA and many state and local agencies have worked to associate their water-related data to the NHD, and many similar efforts are underway. Dams and USGS streamgaging stations have also been associated to the

New NHDGeoEdit Tool Proposed Schedule by Paul Kimsey

The USGS is cautiously moving ahead with development of the new NHD editing capability to make sure stewards are provided with the most mature tools and processes. The following schedule is planned to provide strong beta testing before release to stewards. This schedule is subject to change based on outcomes in testing.

1. Initial beta release to USGS (Minus QC and NHD Utilities), April 6, 2011
2. Second beta release to USGS (Complete editing functionality, Metadata and resolve submitted bugs, Minus QC and NHD Utilities), May, 2011
3. Beta release to select steward community (Dependent of success of internal USGS beta tests), June, 2011
4. Final beta release to full USGS steward community (Full functionality), July, 2011

WBD/NHD Integration Status by Stephen Daw

Work is underway to provide a new Watershed Boundary Dataset refresh in the NHD, which means that the joint NHD/WBD database will contain more up-to-date WBD. The goal is to accomplish this refresh by the middle of June, 2011. A full integration of NHD and WBD is falling a bit behind schedule. The WBD editing tool used for the integration with the NHD is stalled due to a few development issues.

Locate Your Watershed

An excellent resource to locate and identify a hydrologic unit can be found on the web at http://water.usgs.gov/wsc/map_index.html. Using this interactive tool you can see a map of U.S. HU-2's, then click on one to see the nested HU-4's, then on HU-4's to see the HU-6's, then again to HU-8's. Both the HU code and name are displayed. Also displayed are rivers. By hovering your cursor over the river, the river name will be displayed. The website is part of a larger USGS "Science in Your Watershed" Web site. The purpose of this site is to help you find scientific information organized on a watershed basis. This information, coupled with observations and measurements made by the watershed groups, provides a powerful foundation for characterizing, assessing, analyzing, and maintaining the status and health of a watershed.

USGS Provides Grants to States

The USGS is in the process of providing grants to several states to assist them in developing and applying hydrography in The National Map using the NHD and/or the WBD. These grants include:

Colorado – Updating hydrography and adding events.

Massachusetts – Stewardship start-up and local resolution pilot.

Maine – Improve network connectivity.

Michigan – Working with the Association of County Drain Commissioners.

Missouri – Updating NHD primarily with new waterbodies.

Oklahoma – Update NHD for surface water allocation modeling.

Virginia – Editing of coastal subbasins.

North Carolina – Improve NHD in urban areas.

Nebraska – Populate value added attributes to improve network modeling.

Utah – Improve urban drainage features and improve hydrography names.

Wyoming – Improve hydrography names.

John Chaney Retires

John Chaney retired from the USGS in April following a career that started in 1988. To see a picture of John at work, go to ftp://nhdftp.usgs.gov/Hydro_Images/NHDPeople/Chaney.JPG. John is best known for his meticulous research to provide highly accurate dam locations in the NHD and then using linear referencing to position the dams on the flow network. This allows scientists to perform network analysis to study the relative location of dams to conditions in hydrologic models. A great example of the impact of his work can be found in some versions of StreamStats which allow the detection of dams in navigation solutions. John also worked to improve the quality of streamgage locations in the NHD using linear referencing. You can access NHD dams and streamgages at:

<ftp://nhdftp.usgs.gov/DataSets/National//>

NHD Photo of the Month by Kathy Isham

This month's photo was submitted by Jeff Simley of the USGS. This is the Wisconsin River near Port Andrew, Wisconsin on 4/29. The river is flowing right at 20,000 cfs. To see the photo of the month go to

ftp://nhdftp.usgs.gov/Hydro_Images/WisconsinRiver.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 May Quiz

Gregory Winters of the USGS Geographic Names Office was the first to correctly guess the March hydrography quiz as Mitchell Slough of Bitterroot River, previously known as the East Branch of Bitterroot River. Yes, Keven Roth actually had this engraved into her granite countertop! See <ftp://nhdftp.usgs.gov/Quiz/Hydrography68.jpg>. Gregory is a Physical Scientist working for the Names layer and supports the US Board on Geographic Names as a staff researcher at the USGS National Center in Reston.

Others with the correct answer were (in order received): Al Rea, Marc Weber, Tom Denslinger, Richard Patton, Dave Vincent, Roger Barlow, Greg Enstrom, and Ken Koch.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography69.pdf> . The red line is the boundary between hydrologic regions 4 and 7. It is being spanned by a canal connecting the river in the northeast to the very large river in the southwest. What is this canal? 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 - August 17

Advanced Editing Part 2 - June 7, September 7

Data Maintenance Part 3 - June 22, September 28

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.

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.