USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

NHD Update tool for ArcGIS 10.X by Paul Kimsey

As it stands today, the USGS should be able to officially release NHD Update v.5.0.1 (ArcGIS 10.0) this week. This version corrects issues discovered from the v5.0.0 release (Dec, 2012). Testing for the NHD Update v6.0.1 for ArcGIS 10.1 will begin next week.

February 2013 Status Report for NHD Network Improvements by David Kraemer

There are four Regions completed for the Network Improvement project; Regions 9, 16, 17, and 18. The State of Minnesota was completed in November, 2012 (parts of Regions 4, 7, and 9). The team is working in Regions 03, 05, 06, and 15 plus rechecking jobs run with the version 5.0 NHD edit tools.

Region Completion Percentages

01 – 24%	03 – 01%	04 – 06%	05 – 01%	06 – 77%	07 – 34%
09 – 100%	10 – 94%	11 – 77%	12 – 13%	13 – 60%	14 – 28%
15 – 01%	16 – 100%	17 – 100%	18 – 100%		

Version 5.0.1.11 of NHD Tools was released in-house on February 22. The previous tools version had issues producing valid Final QC results; so the previous 10 weeks of jobs are being rechecked. The first six weeks of those jobs were already submitted back to the Geodatabase; so new jobs will be created to recheck the edits. The completion percentages have been decreased to reflect this additional work. The 5.0.1.11 version has FTP connection issues and requires Initial QC to be run to find backflow errors.

The Network Improvement project has returned to the working the lower 48 states from west to east, since Region 3 is no longer a high-priority. In-house projects and partners are working some sub-basins so that Regions can't be completed. As these groups check-in their jobs then the Network Improvement project will edit those sub-basins. JTX software cannot process jobs with high density networks, so the Network Improvement jobs are 3-6 sub-basins. This allows the jobs to process, but is increasing the number of jobs to complete the project.

Coastal areas have high density sub-basins with many errors; so to expedite the Network Improvement project these areas are being set aside until the rest of the project is completed and NHD Tools has available a "line to polygon" snapping function.

Looking Ahead – The NHD for the Next Three Years

The USGS hydrography program continuously maintains a strategy for the future based on information it receives from its customers. Through teams like the NHD Advisory Team, NHD Management Team, as well as the USGS National Geospatial Program strategic plan, a review of the literature, papers presented at conferences, NHD workshops, feedback from the Geospatial Liaisons, networking, and other information, this strategy forms the basis for the direction of the USGS hydrography program and ultimately forms the foundation of the annual budget and guidance for hydrography. In preparation for the next three years, the NHD program is organized into six main themes or tracks. These are (1) Data Acquisition, (2) Data Operations, (3) Data Delivery, (4) Hydrography-Elevation Integration, (5) Linking Water Observations, and (6) Dataset Integration.

Data Acquisition is the strategy for populating the base content of the NHD. These are the familiar features such as streams, rivers, lakes, ponds, canals, ditches, coastline, springs, and many others. For fiscal years 2014 (starting October 1, 2013), 2015, and 2016, the objective is to obtain most of this content through data stewardship practices. For Data Operations, the strategy falls into five sub-themes. The first is for the next three fiscal years to quality assure and process updates to the acquired stewardship data for NHD. The second is to specifically develop improved hydrography for Alaska all three years. Third is to phase-in a new web based NHD edit tool to enhance stewardship and maintenance with more advanced capabilities added each year. Fourth is to develop that tool with specific objectives each year. Fifth is to continuously maintain the NHD tool set for stewardship and maintenance each of the three years.

Data Delivery objectives are divided into four sub-themes. The first is to produce approved staged products for NHD and post to the cloud for storage and external delivery each of the next three years. The second is for the development of web site content and to produce educational tutorials each year. Third is to develop web feature services for NHDLite, with better functionality provided each year as technology improves. Fourth is to focus on access to feature level metadata in fiscal year 2014, implementing stream tracing and event discovery in fiscal year 2015, and on elevation-hydrography dataset delivery in fiscal year 2016.

Hydrography-Elevation Integration is also organized into four sub-themes. The first has to do with enriching the attribution of the NHD. In FY14 this will commence with the production of NHDPlus-style Value Added Attributes. Then in FY15 attention will turn to development of updated periodicity attributes for flowlines, followed in FY16 by the calculation of those attributes. The second deals with LiDAR/IfSAR technologies for development of techniques for extraction of higher resolution LiDAR/IfSAR-based hydrography data. FY14 research is to be followed the next year by the actual production of higher resolution LiDAR/IfSAR-based hydrography data. Then in FY16 that production will continue. The third theme goes along with the second in that in FY14 the USGS will develop an integrated and enhanced hydrography/elevation data model known as Ele-Hydro. The next year will then focus on the development of improved packaging for the Ele-Hydro data model. The forth sub-theme will focus on drainage catchments. In FY14 the USGS will develop an integrated (with hydro and elevation) drainage catchment production capability. In FY15 half the country will produced with the other half produced in FY16.

The Linking Water Observations Theme will address three sub-themes. The first will be to add intelligence to hydrography data by linking events such as diversions and water use in FY14. FY15 and FY16 will focus on maintaining events with a refresh cycle on gages, dams, water quality stations, diversions, and water use. The second sub-theme will be to support the user community to add their own non-base category data, such as fish passage barriers, aquatic habitat, channel classifications, etc. in all three years. Supporting this, the third theme will address the Hydrography Event Management tool to assume development of the tool from BLM is FY14, then maintain and develop the tool in the next two years.

Dataset Integration involves the incorporation of other hydrography themes to work interoperably with the NHD/WBD architecture. In general, these themes are the core responsibility of other organizations, but all part of an integrated hydrography infrastructure. This track consists of three sub-themes. The first will focus on integrating springs and wells in FY14, urban stormwater systems in FY15, and floodplains in FY16. The second sub-theme supports this by developing the necessary technology for wetlands, stormwater, and floodplain integration in FY14. FY15 will investigate the technology necessary for groundwater integration, while the following year will begin actual integration activities. The third sub-theme addresses conflation. Each of the three years will address the development and maintenance tools using in-house of vendor solutions.

Can the USGS actually do all of this? All of the above activities are active technologies and are not new to water science. The goal is to mature these technologies when the time is right so that they can actually be implemented into *The National Map* maintaining its relevancy to the sciences. Hydrography is a primary investment in the strategic plan of the National Geospatial Program. Therefore funding should be relatively stable. With the right skills, these are all achievable objectives. Furthermore, all of these goals correspond with the advancement of water science currently underway in the United States. The USGS will strive to provide the leadership and production to support the advancement of the science.

Navigating NHD for Maryland Biological Stream Survey (MBSS) event in StreamStats by Pete Steeves

StreamStats is a great site for showcasing the ability to navigate the NHD network for point events. Several NHD-supported event types, including dams, gages, and water quality locations, have been hosted in StreamStats for some time now. More recently, the ability to navigate the NHDPlus network to identify the locations of point discharges in the EPA's National Pollutant Discharge Elimination System (NPDES) system has been added for a number of States, with the goal of eventually making this functionality available for all states where StreamStats is available. And now, Maryland StreamStats becomes the first State to add a state-centric event layer, the Maryland Biological Stream Survey (MBSS) (http://www.dnr.state.md.us/streams/MBSS.asp). Navigating the network up or downstream from a point can now locate MBSS sites of interest which then allows the user to link to the host MBSS page for any given site. The page offers up an amazing amount of information related to the biological health of sampled area. Here is an example: http://mddnr.chesapeakebay.net/mbss/SA_site2k.cfm?siteyr=TOWN-108-R-2002.

To try for yourself, go to Maryland StreamStats: (http://water.usgs.gov/osw/streamstats/maryland.html), choose "Interactive Map" and follow these steps.

1. Check on the "Bio_Sampling" event theme in the Map Contents
2. Zoom to a location of interest.
3. Delineate a watershed
4. Click on the Configure Network Trace tool (the wrench).
5. In the menu that pops up, toggle "Network" to the high-res "HYDRO_NET" (MBSS was linked to the high-res)
6. Choose whether you want to trace up or downstream and be sure to leave Bio_Sampling checked on. Click OK to exit the menu.
7. Click on the Trace From Outlet Tool (just to the left on the Configure Network Trace <wrench> tool)
8. Scroll to the bottom of the pop-up trace report
9. Note the Bio_Sampling sites attribute "Source_FeatureID", which has a hyper link to the MBSS site of interest. Click this link to get the detailed information.

Watching Our Watersheds (WOW)

"Watching Our Watersheds" is a project to map the creeks, urban drainage network, watersheds, baylands, and points of interest in Santa Clara Valley. It can be found on the Santa Clara Valley Water District website at www.valleywater.org/wow.aspx. See a youtube video on this at: http://www.youtube.com/watch?v=hMwqqlGIbzg&feature=youtu.be

Spheres representing all of Earth's water

The drawings illustrated in the link below show various blue spheres representing relative amounts of Earth's water in comparison to the size of the Earth.
http://ga.water.usgs.gov/edu/2010/gallery/global-water-volume.html

NHD Photo of the Month

This month's photo was submitted by Elizabeth McCartney of the USGS. It highlights the confluence of the Missouri and Mississippi Rivers. To see the photo of the month go to ftp://nhdftp.usgs.gov/Hydro_Images/Miss_Missouri_Confl.jpeg. 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.

January Hydrography Quiz / New February Quiz

Gerry Daumiller of the Montana State Library was the first to guess the December NHD Quiz as Hungary Horse Reservoir in Montana. See ftp://nhdftp.usgs.gov/Quiz/Hydrography90.pdf. Gerry has been a GIS analyst at the Montana State Library since 1988. He's been managing the downloadable GIS data and the GIS pages of the web site since they first got on the web in 1994. Gerry spends a lot of time helping GIS professionals and the public with Montana data and with geographic questions about the state. He is Montana's Geographic Names Advisor, which means that he makes the State's recommendations to the U.S. Board of Geographic Names on any name changes that are proposed to Montana's natural features. He is the state steward of the Geographic Names Information System, which means that he tries to keep the State's copy of the GNIS synched with the federal database, and has been the primary person in Montana who tries to get the GNIS corrected when someone finds errors.

Others with the correct answer (in order received) were: Evan Hammer, Daniel Button, Richard Patton, Steve Shivers, Kevin Amick, Roger Barlow, Barb Rosenbaum, Chris Cretini, John Kosovich, Matt Rehwald, Jim Mitchell, Rich Stein, Steve Char, Jeremiah Poling, Ellen Lesch, David Straub, Tom Denslinger, and Ken Koch.

This month's hydrography quiz can be found at ftp://nhdftp.usgs.gov/Quiz/Hydrography91.jpg . What is this large tan feature and where is this. The blue lines are intermittent streams (which are probably more ephemeral), the black lines are canals, the purple lines are reservoirs. The drainage pattern is a big hint. 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.
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.