USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

Fourteenth Year of the NHD Newsletter

With this edition the National Hydrography Dataset Newsletter starts its fourteenth year. So far 157 Newsletters have be produced on a continuous monthly release schedule totaling over 785 pages of information designed to keep the NHD and WBD communities up-to-date on the product and program. Much of the content has been written by contributors making up the vast team of people it takes to make the NHD and WBD the premier datasets of the GIS industry. As always, if you work in any segment of the NHD or WBD enterprise and have information that can help your colleagues, please submit an article to the Newsletter. The Newsletter is directly sent to 525 recipients and is then forwarded to many more people in numerous agencies.

Change to Staged NHD Products by Jerry Ornelas

As of October 15, 2014 the USGS has introduced a new framework to support pre-staged datasets for the National Map Delivery capabilities. If you request a pre-staged product from the TNM Viewer Website, http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd, your request is coming from the new framework. The product itself is very close to the same older product deliverable (which is now called a Legacy Product), with the exception that a populated NHDFlow Table is not delivered. Additionally "Complete Reaches" are not delivered. "Complete Reaches" are those reached features that fall outside of the staged product footprint that share the same HU8 Code of the requesting footprint. The USGS has included an additional staged product footprint at the HU8 level, to complement the HU4 and State footprints. With this new framework, the overall goal is to ensure that the latency of the data is up-to-date within a few days, and that this can be sustained going forward. Once the USGS is comfortable that the framework is doing its job, the plan is to make legacy products, no longer available. The USGS will continue to serve the legacy product and dynamic requests until further notice.

To download NHD data there are currently two options:

1. Use the Download option in the TNM Viewer for the new NHD Product and Dynamic Requests
    a. http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd
2. For legacy products go to :
    a. ftp://nhdftp.usgs.gov/DataSets/Staged/SubRegions/
    b. ftp://nhdftp.usgs.gov/DataSets/Staged/States/

High Resolution NHDPlus

The high resolution NHDPlus project continues to ramp up in anticipation of full scale production of Hydrologic Region Six, the Tennessee River system. This region, consisting of just four HU4's (subregions) in mostly hilly terrain (read dendritic network) will provide a good and manageable testbed for the rest of the project. The next anticipated region is Region One, New England. This will introduce some new challenges including the coastline, Canadian, and local resolution data. So far, all project team members are confident the processes to produce the high resolution NHD will be successful. The largest wildcard to contend with is the ability to create a solid network for the NHDPlus software. Nature does not make this easy for cartographers with streams disappearing in sinkholes, being absorbed by wetlands, engineered by people, and diverging and re-converging connections. All of this must be interpreted by cartographers to produce a clean topology of the data, and then re-interpreted by software to process many millions of calculations into a virtually flawless flow network.

Streamer

Streamer has been showcased as a USGS Science Features Top Story. It is a powerful, yet easy way to explore our major waterways. With a simple map click, anyone can trace rivers and streams from a starting point all the way downstream to where a stream drains. Even more impressive, they can click on a stream and trace all others that drain to that point. Streamer also produces a report that includes a map and information about the people and places encountered along the streams traced. To see the story, go to: http://www.usgs.gov/blogs/features/usgs_top_story/launch-your-next-river-trip-from-your-computer-using-the-latest-streamer/?from=textlink

NHD Geospatial Metadata and The National Map by Christy-Ann Archuleta and Calvin Meyer

According to the Federal Geographic Data Committee, a geospatial metadata record is a file of information, usually presented as an XML document, which captures the basic characteristics of a data or information resource. Executive Order 12906, issued and signed by President Clinton in 1994, began the initiative to create the National Spatial Data Infrastructure (NSDI), which has the goal of improving the efficiency of data gathering and sharing among federal agencies, states, counties, cities, tribal nations, academia, and the private sector. Most NSDI stakeholders, including the USGS, use the Content Standard for Digital Geospatial Metadata (CSDGM), also known as the "FGDC Metadata Standard", for creating metadata. However, a new international standard, ISO 19115, is emerging in the GIS user community. ISO 19115 has been endorsed by the FGDC, who is encouraging federal agencies to transition to ISO metadata as they are able to do so. Research into the transition from CSDGM to ISO 19115 is occurring within the USGS. Current CSGDM metadata may be accessed for NHD products from The National Map, before download or as an associated file with the downloaded dataset. Two Methods for Accessing NHD Metadata:

View Metadata before Download
Select the "Download Data" tool near the top right corner of The National Map viewer (http://viewer.nationalmap.gov/viewer). Select an area by one of the various methods for the area you wish to download. After you have selected an area, the "USGS Available Data for download" window will appear. Select "Hydrography (NHD) & Watersheds (WBD)" for the theme, and click on "Next". Click the "Info" link in the far right column of the list of products in the subsequent "USGS Available Data for download" window. Dynamic products are linked to the NHD home page (http://nhd.usgs.gov/), but staged products will open a second web page showing information from the ScienceBase Catalog. At the top of the ScienceBase Catalog web page, you can click on "Original Metadata" to view the metadata file for that staged product.

Access Metadata after Download
After download of a NHD product, you will receive an archive (.zip) with various files. One of those files has an .xml extension, which will be the metadata file in extensible markup language (XML). For example, "NHD_10290203_Lower_Gasconade_HU8.xml" is the name of a metadata file. Metadata files in XML format may be read with a stylesheet applied through many software packages to make the file appear more readable to the human eye without the code tags.

Network Improvement Project Status by Cynthia Ritmiller

Highlights:
- During October Region 14 was completed for the Network Improvement project Double Check phase.
- Currently in work for Double Check phase edits are Regions: 05, 16, and 22.

- Region 19 is the final Initial phase Network Improvement Region in work and is being edited as part of preparing the Alaska Hydro Image Integration project.
- Preparation of the NHD Geodatabase for the NHDPlus contract is occurring in Region 01, and 06.

Initial Network Improvement Regions Completed:
01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, and 22.

Initial Phase Network Improvement – Remaining
Region 19 (Alaska) is being completed by Charles Bowker as part of the Hydrographic Image Update project using the 2012 Horizon Systems QA/QC check results.

Double Check Network Improvement Regions Completed:
01, 02, 06, 07, 09, 12, 13, 14, 15, 18, 20, and 21.

Double Check Phase Network Improvement- Status
Region 01-Allen Karsh has completed Sub-Regions 0109 and most 0110 subregions. For the remainder of Region 01 the Sub-Basins are mostly checked out by partners; see the spreadsheet for specifics. Sub-Basin 01080103 (Job 57687) will be fixed by Cynthia Ritmiller after training from Paul. This job will require population of the Reach Code Maintenance and Reach Cross Reference tables. The remainder of Sub-Region 0108 has about 1,500 lakes without reach codes and these Sub-Basins will need to wait for a new tool update before assigning.

Region 02- new pre-staged Sub-Regions were received and QA/QC checks will need to be run. Subbasins will then be assigned..

Region 03- sub-basin 03070205 needs to complete the Double Check phase. All other subbasins have been completed.

Region 04-needs to go through the Double Check phase. Before starting a Region the POC in the area will be contacted.

Region 05- needs completed. Sub-Regions 0511 and 0513 have been assigned to Allen Karsh. Double Check edits in the Sub-Regions 0512 and 0514 need to be run through QA/QC checks and assigned. Joel Skalet will be contacted to see if it is okay to work in Indiana on Sub-Regions 0512 and 0514.

Region 06- new pre-staged Sub-Regions were received and QA/QC checks were run. Subregion 0603 had one minor edit which was researched and completed by Cynthia Ritmiller and will be loaded back to the database soon. All other subregions passed QA/QC checks.

Region 07- completed double check phase in May

Region 08- needs to go through the Double Check phase. Before starting a Region the POC in the area will be contacted.

Region 09- completed double check phase in September

Region 10- needs to go through the Double Check phase. Before starting a Region the POC in the area will be contacted.

Region 11-needs to go through the Double Check phase. Before starting a Region the POC in the area will be contacted.

Region 12-new pre-staged Sub-Regions were received and QA/QC checks will need to be run. Subbasins will then be assigned.

Region 13- completed double check phase in July

Region 14- completed double check phase in October

Region 15- completed double check phase in September

Region 16 (Great Basin) is being completed by Catlin Reusch-Zess and Allen Karsh.

Region 17 -needs to go through the Double Check phase. Before starting a Region the POC in the area will be contacted.

Region 18 - completed double check phase in May

Region 19 (Alaska)- Initial Phase Network Improvement in progress see above.

Region 20 - Completed double check phase in August

Region 21 - Completed double check phase in August

Region 22 (Pacific Islands) Sub-Basins 22020000 (Job 57537) and 22030000 (Job 57538) will be fixed by Cynthia Ritmiller after training from Paul. This job will require population of the Reach Code Maintenance and Reach Cross Reference tables.

Note: Regions will be edited as per the NHDPlus contract schedule. Before starting a Region the area POC will be contacted. This status report is current as of November 18 2014.

The Network Value Added Attribute of the Month

Do you know your VAA's? This NHD Newsletter article is the tenth in a series to describe each of the Network Value Added Attributes. The flow network embedded in the NHD is what gives NHD its analytic power. The Network VAA's boost this power by pre-calculating a number of network characteristics to make network analysis richer and easier to exploit. This month will examine RTNDiv or Returning Divergence Flag.

Returning Divergence Flag is related to Divergence discussed last month. All NHDFlowlines will be linked to a Return Divergence Flag in the VAA table. If RTNDiv = 0, no upstream divergences return at the top of this NHDFlowline feature. If RTNDiv = 1, then one or more upstream divergences return to the network at the top of this NHDFlowline feature. RTNDiv is very important during accumulation of network attributes. Generally, accumulation starts at the top of the network and proceeds downstream. For each flowline where RTNDiv = 0, the accumulated values on the immediately upstream inflows are added to the attribute value for the flowline to arrive at the accumulated value for the flowline. When RTNDiv = 1, the accumulated values on the immediately upstream inflows include a duplication of the accumulated value that was routed down multiple paths at an upstream divergence. To compute an accurate accumulated value when RTNDiv = 1, it is necessary to navigate upstream including tributaries and add the individual flowline attribute values from all upstream flowlines.

NHD Photo of the Month

This month's photo was submitted by Jeff Simley of the USGS.
See ftp://nhdftp.usgs.gov/Hydro_Images/BoulderLake.JPG. It is a picture of Boulder Lake in the Gore Range of Colorado. In the NHD the lake is 0.025 square miles in size. As seen in the photo the lake has a lot of emergent vegetation. Combining the open water and marsh areas, the lake is probably twice the size as indicated in the NHD. According to StreamStats, the drainage basin to the lake is 7.44 square miles with mean annual precipitation of 32.81 inches. StreamStats estimates a mean annual flow of 11.1 cubic feet per second (cfs) discharge from the lake. At the time the photo was taken, in August, StreamStats estimates flow at 7.97 cfs. Submit your photo for the NHD Photo of the Month by sending it to jdsimley@usgs.gov.

October Hydrography Quiz / New November Quiz

John Lynam of the Maine Department of Environmental Protection was the first to guess the October NHD quiz as Tomahawk Lake in northern Wisconsin. See ftp://nhdftp.usgs.gov/Quiz/Hydrography111.jpg. John is a GIS Programmer\Analyst. He's just finishing his twentieth year supporting Maine's Department of Environmental Protection's GIS program which is now at 190 potential users (approximately half the department's staff).

Others with the correct answer (in order received) were: Jonathan Labie, Bruce Nielsen, Jennifer Sharpe, Mark Olsen, Michael Wiedmer, Matt Rehwald, Steve Aichele, Alex Hall, Baron Howe, Dave Straub, John Kosovich, Ron Wencl, Dan Button, Ellen Lesch, Mark Sommer, Linda Davis, Evan Hammer, Thomas Denslinger, Joanna Wood, Bernard Sroka, Janet Kellam, John Miller, Barbara Simpson, Andrew LeBaron, Amy Zuber, Steve Shivers, and Kitty Kolb.

This month's hydrography quiz can be found at ftp://nhdftp.usgs.gov/Quiz/Hydrography112.jpg. What is the name of this harbor? Send your guess to jdsimley@usgs.gov.

Thanks to Jerry Ornelas, Christy-Ann Archuleta, Calvin Meyer, Cynthia Ritmiller, and Cindy McKay.
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.