USGS National Hydrography Dataset Newsletter

Vol. 15, No. 10, August 2016

by Steve Aichele and Al Rea, USGS

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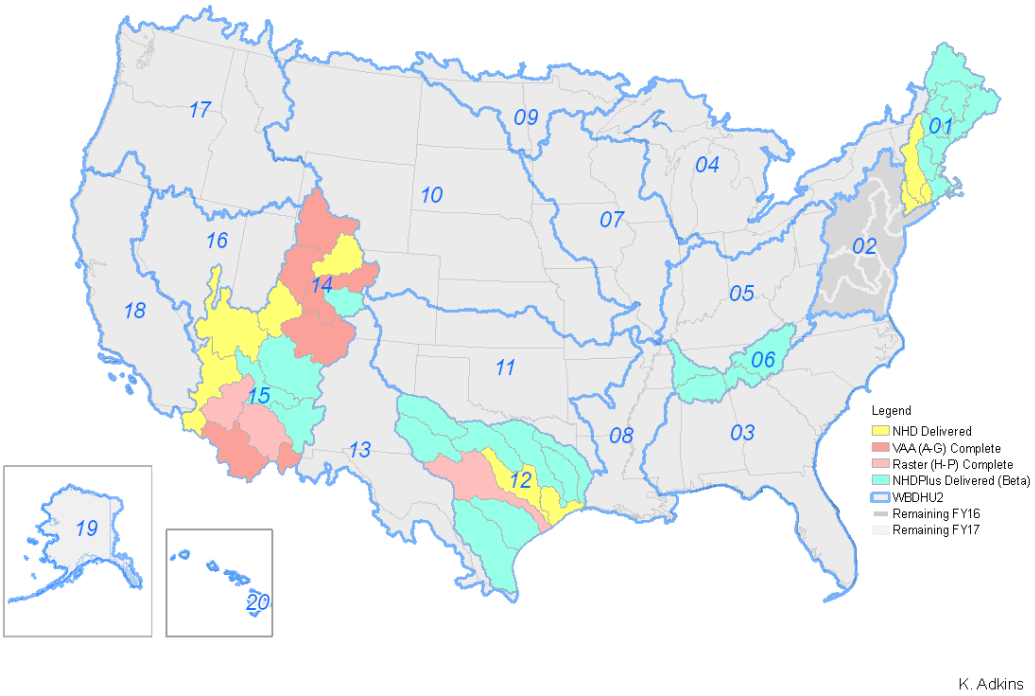
NHDPlus High Resolution Status

By Al Rea and Ellen Finelli

Progress on the NHDPlusHR continues, and the effort now is in full production mode. Here is a map showing the current status of NHDPlusHR data production:

NHDPlus - Status 8/29/16



The cyan colored SubRegions are completed through the production process and we currently are finalizing the distribution data model, and hope to release “beta” NHDPlusHR data products for several regions in the next few weeks.

Following the release of the NHDPlusHR Beta datasets, we plan to engage the user community to help identify problems in the data, which will be fixed, and then data will be “Refreshed”. We have begun reaching out to stakeholders to participate in this QC process, beginning with Region 06 (the Tennessee River Basin). In the next few weeks we will provide the reviewers with Beta datasets, instructions, and some simple tools to aid with their review. We will use the experience of the Region 06 reviews to help guide the design of a web-based markup tool, which we hope to begin using in subsequent QC reviews.

NHD and WBD stewards can help to make the initial NHDPlusHR Beta datasets better by ensuring that both NHD and WBD data in their area are in good shape. QA/QC tools are available to ensure the data will be ready to go into the process. In particular, it is important that the WBD and NHD are correct and in agreement along the boundaries of SubRegions (HU4s). Additionally, connecting isolated networks that should be connected to the main stream network will help to

make the initial Beta datasets better, and will reduce the effort required in the Beta QC process. For more information, contact your POC or Paul Kimsey.

WBD Model Implementation and Required WBD Editor Tools

By Elizabeth Stevens-Klein, Kimberly Jones, Susan Buto
WBD Editor Tools 2.3.2.5 for ArcGIS 10.3.1 and WBD Model 2.2.1 were released July 26th and the WBD Model 2.2.1 was implemented August 8th. In conjunction with the model implementation, the stewardship website was opened back up to allow WBD job checkouts, which can now only be edited using the newly released 2.3.2.5 WBD Editor Tools for ArcGIS 10.3.1.

Please remember to uninstall all ArcGIS 10.2 tools before upgrading from ArcGIS 10.2 to 10.3. NRCS stewards, the new WBD Editor Tools are still undergoing the NRCS IT certification. NRCS editors, please contact me at estevens-klein@usgs.gov if you need to start editing before the tool certification process is complete.

WBD Staged Products

WBD Staged Products reflecting the new model can be found on The National Map. There is an August WBD National Seamless as well as HU2 products available.

NHD staged products with WBD feature classes reflecting model 2.2.1 are currently being reviewed and will be generated and available on The National Map soon.

Release of NHD Update tool v6.3.0 for ArcGIS 10.3.1

By Kristiana Elite
The USGS, National Geospatial Technical Operations Center (NGTOC) is pleased to announce the official release of NHD Update tool v6.3.0 for ArcGIS 10.3.1. The tool installer and release notes are available for download from http://usgs-mrs.cr.usgs.gov/usgssteward/software_nhd.html or http://usgs-mrs.cr.usgs.gov/usgsstewardbeta/software_nhd.html

Transition from NHD Update tool v6.2.1 (ArcGIS 10.2.2) to NHD Update tool v6.3.0 (ArcGIS 10.3.1):

NHD Update tool v6.3.0 has the same functionality as NHD Update tool v6.2.1. The change to note is ESRI changed the functionality in Data Reviewer for reviewing QC results. To view these changes, please see the help documentation provided within the tool installer software folder. Editors currently using NHD Update v6.2.1 can continue to work on existing job checkouts (NHD Model 2.2.1 and WBD model 2.2) and check them back in.

All job checkouts after 9/30/2016, editors must upgrade to ArcGIS 10.3.1 and NHD Update tool v6.3.0. Job checkouts starting 9/30/2016 will have WBD model 2.2.1 and the NHD Update tool v6.2.1 will no longer function.

Please contact your NGTOC regional technical POC if you have questions

August 2016 NHD Network Improvement Project Status Report

By Cynthia Ritmiller, Project Manager

The NGTOC continues its focus on the Network Improvement Project with the goal of identifying and correcting network and data quality issues existing in the high resolution NHD. One of the key drivers for this effort is the need to provide data ready to use for the production of NHDPlus High Resolution (NHDPlusHR). Data is being reviewed and edited to support the production schedule for NHDPlusHR beginning with Regions 06, 01,12,02,14,and 15. Coordination with appropriate NHD POC's will begin prior to review. Please see status information for details.

Network Improvement- Status (As of August 30, 2016):
Network Improvement Regions Completed: 06, 01, 12, 20, 21 and 22

Network Improvement Regions In Work:
***Note: For all regions listed below, as new data becomes available it will go through the QA/QC process.

> Region 02 - New QC's were ran for sub-regions 0201- 0208, Cynthia Ritmiller and Tanya Buxton-Torres are reviewing.
>
> Region 07 - Charles Bowker and Allen Karsh are reviewing sub-region's 1701 - 1714.
>
> Region 10 - Chris Helm, Allen Karsh, Travis Landauer, Bob Merson, and Tanya Buxton-Torres are reviewing sub-regions 1002 - 1030.
>
> Region 14 - Subregions 1401 through 1408 have been reviewed and sent to Horizon Systems for NHDPlusHR processing.
>
> Region 15 - Subregions 1501 through 1508 have been reviewed and sent to Horizon Systems for NHDPlusHR processing.
>
> Region 16- Carol Brady is reviewing sub-regions 1601-1606.

Work started and will continue begin within regions 03, 04, 05, 08, 11, 13, and 17.

Network Improvement Regions Remaining: 03, 04, 05, 08, 09, 11, 17, 18, and 19

Indiana NHD Leadership Group recognized for special achievement

The challenge of this project was to improve the spatial accuracy, completeness, and level of detail of the National Hydrography Database (NHD) using local city, county and state geospatial data. The high quality of the data is an important part of this project, but, beyond that, this team achieved something very special—it engaged a large number of people from the GIS community to work together toward a common goal while performing important, often pioneering, work. After 6 years of collaboration, Indiana is the first state to substantially complete an NHD improvement project leveraging statewide lidar. This team worked through the creation of new processes, multiple iterations of target software, new and unique situations (mapping stream flow for karst, incorporating stormwater data). The Indiana NHD team worked cooperatively and successfully to create an outstanding information resource about Indiana's surface waters. As a result of this project, the improved NHD exists within the state geospatial data library, the IndianaMap, and the USGS National Map.

NHD Data Model Improvement Efforts

By Al Rea

The NHD data model has been in its current form for more than 15 years, and has served the community well. However, there is a general sense among the user community and the NHD Management Team that the complexity of the data model presents a barrier to new users, as well as increases the maintenance burden on the USGS as well as stewards and other partners. In light of the dramatic increase in the number and density of features expected to result from acquisition of lidar-derived hydrography in the future, the NHD Management Team tasked a working group to review the NHD data model and to recommend improvements.

The working group has been reviewing the current NHD data model for more than a year. Three different strategies are beginning to take shape, each aimed at different time frames. In the short term, the group is preparing several proposals that would remove several infrequently-used feature classes and feature types, and that would relax some of the reach delineation rules that currently cause reach codes to be changed unnecessarily, and that add complexity to the update and conflation tools. In the medium term, we are planning a limited project to look at what can be

done to distribute a somewhat simpler NHD in a format more geared toward use with free or open-source software tools. For the longer term, research into semantic ontologies, graph and other non-relational database structures is being conducted. It is too early to tell what may come from this long-term research, but it is important to do it to remain aware of potential opportunities to make NHD work better for the user community.

Hydro Network Connectivity Work Group

By Al Rea

Understanding how hydro networks connect, including connectivity that varies over time and under different hydrologic conditions is key to making NHD and NHDPlus more useful as the geospatial framework for hydrologic modeling. To improve our understanding of the issues involved, we invited a group of modelers and other NHD users within USGS to meet with our team August 3-5 in Fort Collins, Colorado, while many of us were there attending a USGS Lidar Science Workshop. We got some really good feedback about possible ways to handle situations like karst, prairie potholes, arid region hydrology, and many other conditions. We formed some work groups that are going to meet further to formulate some specific recommendations. We will share those recommendations with the community once we have them. Look for more information in future newsletters and Advisory Team calls.

NHD Photo

This month's photo was contributed by John Todesco. Standing at an elevation approximately 11,200 ft, South St Vrain Creek is feeding Lake Isabelle located in the Indian Peaks Wilderness Area, Colorado. Check it out at http://nhd.usgs.gov/photo_month.html

NHD Quiz

Last month's quiz was Spotted Lake, in British Columbia, Canada. We gave you the name and location of the lake. The challenge was to find the NHD Reach Code for the lake. The Reach Code for the lake NHDWaterBody is 17020006058696.

The first correct answer came from Brad McMillan, a GIS Specialist with the Washington State Department of Ecology. Brad graduated from the University of Washington with a degree in environmental science and GIS. He works as a GIS Specialist for the Washington State Department of Ecology where he helps update and maintain the NHD and hydro event layers for Washington. He is also involved in developing agency policy and operating procedures regarding the use of UAVs at the Department of Ecology. Outside of work, Brad designs and builds UAVs for environmental surveying and has worked with several non-profit organizations to use UAVs for habitat restoration, vegetation monitoring, mapping, and 3D modeling. Brad lives in Olympia, WA with his wife Kathleen and together they enjoy kayaking, backpacking, and traveling.

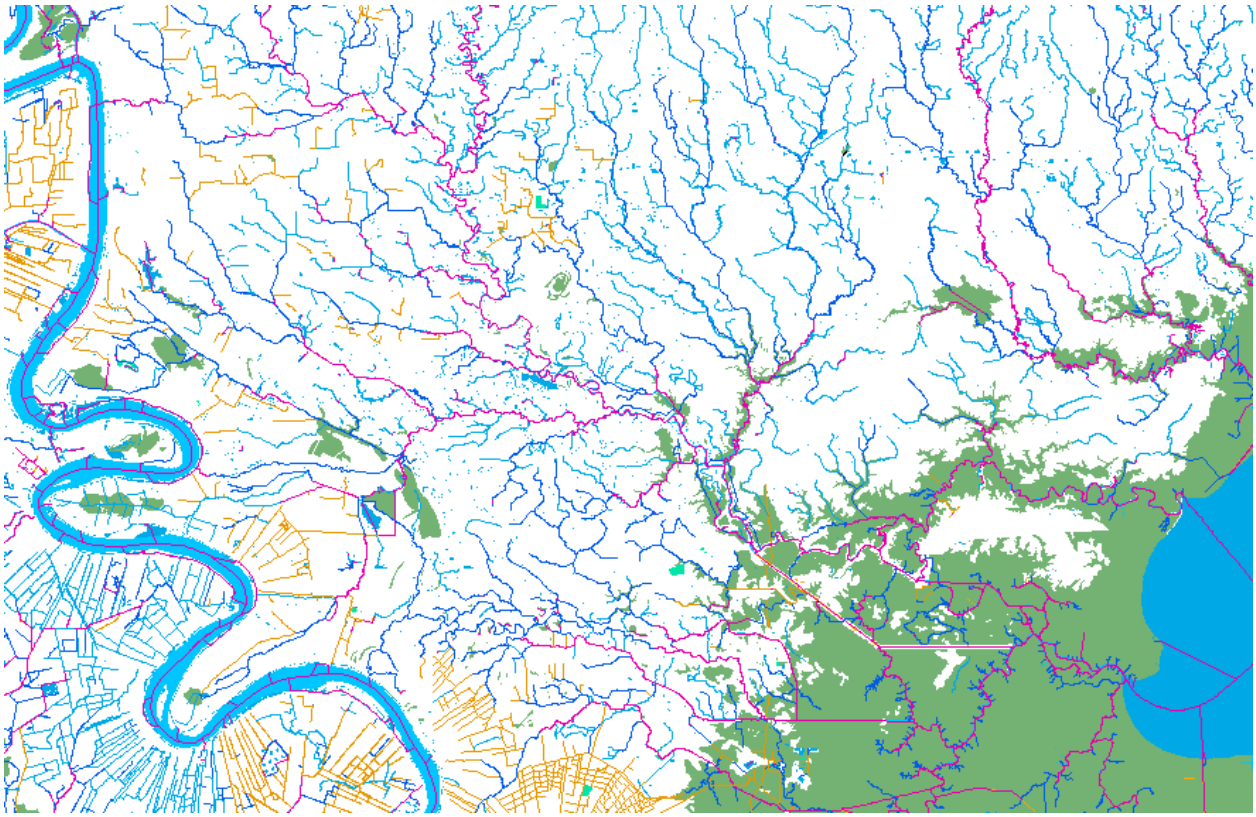
Matt Rehwald also had the correct answer. Partial credit goes to Linda Davis and Jon Becker. Linda and Jon gave us Reach Codes for artificial paths in Spotted Lake, but didn't give the Reach Code of the NHDWaterBody.

The New York Times had a nice article and video about Spotted Lake here:

http://www.nytimes.com/2016/07/21/science/spotted-lake-british-columbia.html?_r=0

An interesting thing about this quiz is it points out that we have NHD Reach Codes for many features in Canada. The USGS has worked for several years with our counterparts in Canada, both in the Natural Resources Canada and Environment and Climate Change Canada bureaus, to "harmonize" the NHD and WBD with the Canadian National Hydrography Network (NHN) and the Canadian Fundamental Drainage Areas. The 8-digit hydrologic units of the U.S. WBD were first reconciled with the Canadian hydrologic units. Then all the hydrographic features in the NHN within the "swath" of 8-digit hydrologic units that straddle the border were transferred into the NHD and given NHD Reach Codes. Conversely, all the NHD features in those hydrologic units have been transferred into the Canadian NHN dataset. When a user downloads either NHD or NHN data for a hydrologic unit along the border, they get seamless data crossing the border in a familiar format. The harmonization process is complete for all hydrography data and for 8-digit hydrologic units across the entire U.S.-Canada border, including the Alaska-Canada border. Work is underway now on 10- and 12-digit HUs in the border swath. A similar process has been done along the U.S.-Mexico border. Each country maintains the datasets within their borders, but have agreed to periodically update data from the neighboring country within the swath of 8-digit hydrologic units straddling the border.

Finally, here is a tip and a tool that can help you with future NHD quizzes and other NHD tasks. Finding the Reach Code or other information about NHD is easy using this ArcGIS Online web map: http://arcg.is/29cPsbt

This web map needs no login or special software, and provides access to the NHD data live from the USGS The National Map (TNM) servers. You can use the Search tool in the upper right to zoom quickly to an area or feature by name. Once you have zoomed in and the NHD data display on the map, simply click on a feature to see its attributes. Answering last month's quiz using this web map takes about 1 minute or less, and involves no downloading or software other than a web browser. You can bookmark the above URL and be looking at NHD for any place in 30 seconds or less.

This month's quiz is an area that has been in the news a lot this month. The area of less dense drainage in the upper left just east of the large river is an urban area that is the capital of the state covered by most of the map. What is the name of the city? Send your responses to saichele@usgs.gov. First correct answer wins.