

USGS National Hydrography Dataset Newsletter

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by Steve Aichele and Al Rea, USGS

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NHDPlusHR Data Preparation Issues Identified

by David Anderson, Elizabeth Stevens-Klein, Christine Lund, Cynthia Ritmiller, and Ellen Finelli

The National Hydrography Dataset Plus High Resolution (NHDPlusHR) based on High Resolution NHD (1:24,000-scale or better) has been a priority within the hydrographic community for some time. The U.S. Geological Survey's , National Geospatial Technical Operations Center (NGTOC) is currently working with some of the very same NHDPlus team members to complete beta datasets utilizing the same techniques utilized to create the NHDPlus (based on Medium-Resolution NHD at 1:100,000-scale). The initial NHDPlus QC tasks identified problems with the NHD and WBD source data and identified tools that needed improvement for proper NHDPlusHR generation to occur.

Several issues identified resulted in improvements to the NHD utilities software. The NHD Utilities code is shared among NHD Utilities, NHD Update, and Enterprise extraction software. The Build Flow utility was amended to detect inflow and outflow from external data (at 4-digit and 8-digit hydrologic unit levels) and to handle issues with circular flow around islands in the coastal regions. The Inflow/Outflow process finds any NHDFlowline that overlaps a WBD boundary, and then it contacts a web service to obtain the ID of any connecting feature external of the HU, and adds the external feature ID to the NHDFlow table record. The second Build Flow enhancement improves the handling of coastlines around islands to prevent circular flow within the NHDFlow table. Additionally, the NHD M-Values utility was enhanced by improving how m-values are built along reaches including when a feature may have micro-gaps. Network gaps still will cause a failure in the M-Values utility.

During the NHD QC and NHDPlus QC, a number of data inconsistencies between WBD and NHD were identified. The problems ranged from NHDFlowline end nodes coinciding with WBD boundaries, or having several upstream NHDFlowlines being in adjacent HU's, and in some

cases identified additional pour points or transfer points across the HU boundaries that had not yet been captured. These issues don't come as a surprise to most folks in these communities, but is something that must be addressed as we move into upcoming stewardship projects and NHDPlusHR. The NGTOC Partner Support group can help stewards in both project areas get in touch with each other and help provide coordination among WBD and NHD. On March 2nd the NHD TEM will be dedicated to user information about preparing the data for HR-NHDPlus.

The NHD and WBD integration issues / inconsistencies were identified nationally at the 4-digit HU level by using intersections of WBD boundary lines and NHD flowlines. From this set, the intersections along the international boundaries, coastlines, and identified HU pour points were removed as non-issues. Out of more than 28,000,000 NHDFlowlines nationally, approximately 3,900 intersections at the 4-digit HU level were discovered. Not an extensive number if you consider the quantity of the data. The intersections are being reviewed by NHD Operations and the WBD National Technical Coordinators who will be working with data stewards to correct specific inconsistencies. In support of FY16 goals, starting in region 12 and continuing work in regions 02, 14 and 15, (Regions 1 and 6 have been addressed) the plan is to work with stewards in both programs to correct major issues. Minor issues, such as disconnecting a NHDFlowline node from the WBD boundary can be handled internally.

The NGTOC operations personnel are working diligently to create an efficient workflow and cross-team coordination to handle these NHD & WBD inconsistencies in the future. The idea is to keep ahead of the NHDPlusHR production schedule as much as possible to keep that workflow moving along.

EPA's StreamCat Dataset

EPA's Office of Research and Development (ORD) has developed the [Stream-Catchment \(StreamCat\) dataset](#), an extensive collection of landscape metrics for 2.6 million streams and associated catchments within the conterminous U.S. StreamCat includes both natural and human-related landscape features. The data are summarized both for individual stream catchments and for cumulative upstream watersheds, based on the National Hydrography Dataset Plus Version 2 geospatial framework.

StreamCat data are being utilized to develop national maps of aquatic condition and watershed integrity, and can be used to model and predict reference condition for the [National Rivers and Streams Assessment](#) (NRSA). The data will also be useful to states that are conducting similar assessments. StreamCat data, which are available to the public for download, provide an important tool for stream researchers and managers to understand and characterize the Nation's rivers and streams.

Seventh USGS Hydrography Seminar

The seventh USGS Hydrography Seminar will be held on March 17 at 2:00 Eastern. The focus will be on hydrography for ecosystems and fisheries applications. Howard Reeves of the USGS Michigan-Ohio Water Science Center and Dan Isaak of the US Forest Service's Research Branch.

For more information or to register go to <http://nhd.usgs.gov/HydrographySeminarSeries.html>

WBD News

by Kimberly Jones, Elizabeth Stevens-Klein

The WBD program has submitted 2 potential data model changes to the USGS NGTOC Data Model Change Control Process (DMCCP) team for review and acceptance. Both proposed changes involve updates to the WBDLine feature class attribution.

The first proposed change will be renaming the HUClass field to HUDigit. The WBD National Technical Coordinators (NTC) along with the WBD State Stewardship Work Group (SSWG) feel that HUDigit better represents the value that is being recorded within this field. After this change has been made the WBD program will begin work on the second proposed change which is the removal of the HULevel field from the WBD data model. This will be accomplished by phasing out the HULevel field over a 6 month period which will allow WBD users the opportunity to update any processes that reference this HULevel field. The HULevel field is a legacy field and hydrologic units are no longer commonly referred to by this classification. If you have any questions or comments about these changes, please reach out to the WBD National Technical Coordinators, Elizabeth Stevens-Klein, Kimberly Jones, and Laura Davenport.

Also, please see the article "NHDPlusHR Data Preparation Issues Identified". A new preprocessing technique for preparing the NHD and WBD for the NHDPlusHR dataset identifies inconsistencies/ intersections between the two datasets at the HU 4-digit boundaries. The WBD National Technical Coordinators will coordinate with state stewards individually for any proposed edits to the WBDHU4 boundaries as part of this new NHDPlusHR preprocessing.

HRBS Update

by Steve Aichele

The draft data report for the Hydrography Requirements and Benefits Study was delivered this month, and the project team is reviewing it. The written report, related tables and appendices really drive home the detail, richness, and complexity of the data collected. Review and feedback to Dewberry will take a couple weeks, and the final report should be completed by the end of April.

The project team is also developing a series of potential scenarios based on the data gathered through HRBS. Significant user requirements have been identified for improved positional accuracy, greater feature content, and better integration with elevation data. Over the next several months we will be investigating methods and costs to implement the scenarios, towards making a program recommendation later this year.

February 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. Recent enhancements to the NHDUpdate, NHDUtilities and EPA QAQC tools are helping to increase efficiency and throughput. Coordination with appropriate NHD POCs will begin prior to review. Please see status information for details.

Network Improvement- Status:

Network Improvement Regions Completed: 06, 20, 21 and 22

Network Improvement Regions In Work:

Region 01- Sub-regions 0101-0109 were sent to Horizon systems. Sub-region 0110 will be sent to Horizon Systems soon. Cynthia Ritmiller is reviewing and completing any necessary edits.

Region 02- Chris Helm is reviewing sub-regions 0202- 0208.

Region 04- Several sub-basins need to be reviewed and may need edits, sub-regions include 0409, 0414, and 0415. Cynthia Ritmiller will complete these edits.

Region 07- Tanya Torres and Steve Howard are reviewing sub-regions 0712-0714. As new data becomes available sub-regions 0701-0714 will go through the QA/QC process.

Region 10- Bob Merson is reviewing sub-regions 1001-1014. Cynthia Ritmiller will be reviewing 1018, 1019, 1024, 1025, 1026, 1029, and 1030

Region 12- As this is a priority region for HiRes NHDPlus several editors including Allen Karsh, Charles Bowker, Chris Helm, Cynthia Ritmiller, Erik Ahl, and Tanya Torres are reviewing this region.

Region 13- Erik Ahl is reviewing sub-regions 1301, 1303, 1304, 1306, 1308 and 1309. As new data becomes available it will go through the QA/QC process.

Region 14- Erik Ahl is reviewing sub-regions 1401-1408.

Region 15- Allen Karsh is reviewing sub-regions 1501-1508.

Region 16- Carol Brady is reviewing sub-regions 1601-1606.

Region 17- One sub-basin needs to be reviewed and may needs edits in sub-regions 1707. Cynthia Ritmiller will complete these edits.

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

NHD Quiz

Marc Weber was the winner of December's Hydrography Quiz, correctly identifying Malheur and Harney Lakes as the two largest lakes in the image. See

<ftp://nhdftp.cr.usgs.gov/Quiz/Hydrography126.png>.

Marc works as a geographer for the EPA Office of Research and Development Western Ecology Division in Corvallis, Oregon. He has worked there for the last 7 years and prior to that worked with the US Forest Service LANDFIRE program at the Fire Sciences Lab in Missoula, MT. Marc works with the NHD and NHDPlus data developing GIS sample frames for the EPA National Aquatic Resource Survey (<https://www.epa.gov/national-aquatic-resource-surveys>). He has also been involved in developing a dataset of landscape metrics tied to the NHDPlus recently (<http://www.epa.gov/national-aquatic-resource-surveys/streamcat>).

Marc has actually spent time at Malheur Refuge over the years and recommends the wonderful Frenchglen Hotel just down the road (<http://www.frenchglenhotel.com/>).

The area in and around the wetlands and large lakes in this image has been in the news lately. It is known as the Malheur National Wildlife Refuge, near Burns, Oregon. The areas of the lakes have been known to fluctuate greatly in the last several decades in response to changes in precipitation. During wet years in the mid-1980's Malheur Lake more than doubled its "normal" size, from 67 to 160 square miles, and was getting close to overflowing into the Malheur River. This potentially could have introduced invasive carp from the lake into the Snake River system, and caused quite a bit of concern at the time. Also, some ranch houses were flooded, then destroyed by moving ice. Then a few years later in the early 1990's it shrank to less than 1/3 square mile. Clearly, it's a challenging neighborhood.

Others with the correct answer (in the order received) were: Katherine Kolb, Bob Harmon, David Hockman-Wert, David Straub, Matt Rehwald, James McDonald, Jill Templeton, and Stephanie Kula.

This month's hydrography quiz can be found at: <ftp://nhdftp.usgs.gov/Quiz/Hydrography127.png>

The almost blank space, as is common in the NHD, an urban area. What is the name (spelling counts) of the river indicated with the gaudy purple arrow? Drew Carey bonus points (that is, they don't matter) if you include an additional notable feature along the river.

Send your responses to saichele@usgs.gov.