

USGS National Hydrography Dataset Newsletter
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by Jeff Simley, USGS

New NHD Support Regions – by Paul Kimsey

The National Hydrography Dataset (NHD) Support Regions are being modified as shown in the linked images. This is necessary from time-to-time as roles change and the USGS strives to provide the best service possible with the Point of Contact (POC) staff. The effective date of the change is October 1, 2011. Please feel free to contact your Geospatial Liaison or your current POC if you have any immediate concerns. Please see ftp://nhdftp.usgs.gov/Hydro_Images/ModifiedNHDSupportRegions.bmp for the new realignment and ftp://nhdftp.usgs.gov/Hydro_Images/CurrentNHDSupportRegions.bmp for the current NHD support regions. You will note that Ray Postolovski is no longer listed as a POC. Ray has moved on to work on the USTopo project. He will be sorely missed.

South Carolina Investigating LiDAR Derived Hydrography – by Dave Arnold

Florence County, South Carolina is looking into the possibility of using LiDAR extracted streams at 1:4,800-scale in the NHD. For several months the county worked together with the USGS on a watershed level pilot project with the goal of finding and documenting a process to update the NHD with LiDAR derived hydrography data. The project was wrapped up early this year. Ultimately the process included importing LiDAR derived hydrography shapefiles into an NHD geodatabase schema, properly researching and attributing all hydrography geometry to fit the NHD schema, and then running the resulting geodatabase through the Geo-Conflation process. The largest problem encountered while developing this process was that the hydrography break lines were digitized in random directions, resulting in many of them needing to be flipped to match the actual flow direction. Part of this problem could be rectified by having the vendor collect all break lines in a single direction. The activity that took the most time was researching attribution and then assigning FType, FCode, and flow direction to every feature. While it took a significant amount of time to prepare the LiDAR data for Geo-Conflation, the end result was more accurate NHD data at a local resolution scale. If South Carolina elects to add this local resolution data for the state it would be used to track storm water flow and to maintain hydrography based events on a denser network. Partnerships between the USGS and the states are important to keeping the NHD accurate and current. It is hoped the process South Carolina went through will help other state stewards who are interested in putting LiDAR derived hydrography into the NHD. All data and documents associated with the South Carolina pilot project can be found at: ftp://ftpext.usgs.gov/pub/er/sc/columbia/z_LiDAR/Florence_County_LR_NHD_Pilot/. If you have questions you can contact Dave Arnold at 573-308-3533 or by e-mail at darnold@usgs.gov.

NHD Collection Standards for Local Resolution Data – by Elizabeth McCartney

As higher resolution imagery and LiDAR becomes more cost effective and accessible, many states and agencies are interested in completely revising high resolution NHD to local resolution. USGS Standards and Feature Catalog are based on high resolution NHD and the 1:24,000 scale USGS Topographic Map Content. Local resolution is anything better than 1:24,000 and typically between 1:2,400 and 1:12,000. Currently the only requirement for the collection of local resolution data is that it must "at least" meet the high resolution standards. Since many stewards are already moving or planning on moving to local resolution, the USGS would like to hear what guidelines have been used. The intent is to use this to compile general guidelines that would be helpful to the NHD Community as a whole. Please contact Elizabeth McCartney at emccartney@usgs.gov with information or documentation that may assist in this process.

Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD), Second edition, 2011 - by Karen Hanson

The *Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD)*, Second edition, 2011 is published and available electronically at <http://pubs.usgs.gov/tm/tm11a3/pdf/tm11-A3-Ed2.pdf>. Any future edits should reference the 2011 version, which supersedes the 2009 *Federal Guidelines, Requirements, and Procedures for the National Watershed Boundary Dataset*. Review of incoming WBD edits, which are submitted by in state WBD Stewards, will be reviewed against this standard for compliance.

This second edition focuses primarily on protocol for 14- and 16-digit hydrologic unit delineation. These two additional nested levels of hierarchy are not required, but for those states which choose to incorporate these smaller delineations into the WBD, requirements are provided. In addition, updates and clarification to terminology and definitions are provided throughout. Links to references were reviewed and brought current, and dated information was reworded or reorganized into appendixes. Many figures received updates to the legends and text. WBD being incorporated into the new data model was introduced and stewardship is briefly discussed. The reference to calling hydrologic units by their 2-, 4-, 6-, 8-, 10-, and 12-digit was emphasized, rather than using Level 1-6, or the names Region, Subregion, Basin, Subbasin, Watershed and Subwatershed. Additional explanation has been incorporated into the WBD coastal guidance. Dated techniques for delineation were retired. Initial reference to higher resolution base information (IFSAR and LiDAR) were mentioned. Downstream Codes and Modifications for 10-digit hydrologic units are no longer required, as they can be derived from the 12-digit hydrologic units. The 12-digit Polygon Modification field is expanded, as well as definitions for those, and the Line Modification field was added along with the domain and definitions for options that may be used. The domain for the Linesource was expanded.

Special thanks to the WBD National Technical Coordinators, the WBD State Stewardship Work Group, designated peer and technical reviewers, USGS and NRCS management, and the USGS Enterprise Publishing Network participants for their efforts throughout this process.

Work now begins on the Third edition which will focus on the new NHD/WBD data model and associated aspects, stewardship, improved definitions for the line and poly modification fields with special attention to Water Transfers. This version will provide references to WBD Tools and manuals, much better definitions for non-contributing areas coordinated with USGS National Water Information System (NWIS), interbasin transfer, closed basins, etc.

Adding NHD Events at the USGS by Michael Tinker

Over the last five years the USGS added some 23,000 streamgage and 53,000 dam point events to the NHDFlowline network. The streamgages came from the National Water Information System (NWIS). The dams were added using the approximate locations from the National Inventory of Dams (NID) and then positively verified and positioned aerial and satellite imagery. Now the USGS is adding 131,902 new point events from NWIS to index to the NHD. These point events are locations of stream gages, water quality stations, and springs. The USGS will index most of these points to the NHDFlowline network within one year using the Hydrography Event Manager (HEM) Tool. The HEM tool is a joint project of the BLM and USGS. The tools are developed by the BLM, with testing and user support by the USGS. The HEM tools allow users to rapidly create and manage events in the NHD. Events are external data that are linked to the NHD using linear referencing. They allow external scientific information to be linked to the NHD while keeping the original NHD design simple. The use of events makes advanced analysis techniques possible because they are a part of the flow network.

The HEM tool handles the linear referencing mechanics to make working with events easy. An identifier value is created that provides the link between the event location and the informational data tied to the location. It also creates metadata linked to the event. The tool also provides network measuring to determine distances through the flowline network. In the case of the 131,902 NWIS points the USGS received earlier this year, the USGS will use the HEM tools to automatically snap the points to an appropriate position on a flowline within a certain threshold distance. Points outside this threshold must be checked manually, but the process still proceeds rapidly. It is possible to index at least one subregion per day with the HEM tools. Gages and water quality stations that cannot be logically associated with a flowline, or lie far outside the threshold distance are not indexed and saved for later resolution. These points will ultimately be reviewed and quality checked by the USGS Water Science Centers (WSC) in each state. With the HEM tools users can add point events to the NHD in a fraction of the time it used to take. Customers of the NHD benefit by gaining an improved NHD with the added value of events that describe the underlying hydrography.

Watershed Boundary Dataset Refresh – by Stephen Daw

The WBD data found in the NHD has recently been refreshed. This refresh updates the WBD data from a January, 2011 snapshot to a June, 2011 snapshot. Major changes have occurred along the borders with Canada and Mexico where unofficial, provisional WBD data was removed from this update. Only official WBD data was included. Also, major edits to the West coast are included along with significant updates in Virginia, Alaska, and Georgia. The Lake Michigan hydrologic unit was also added to this snapshot update. The WBD is a very dynamic database and changes have been submitted to the WBD since this June snapshot. Until WBD/NHD integration is complete, always refer to the NRCS Data gateway website for the latest WBD data. If you have any questions or need information related to a specific 8-digit hydrologic unit (Subbasin) please feel free to contact Stephen Daw at sgdaw@usgs.gov.

NHD Job Opening in Washington Department of Ecology

The Washington Department of Ecology is advertising for a GIS analyst with NHD experience to fill in behind Rick Jordan when he retires in January, 2012. The agency is being proactive in seeking someone early, to assure that there is an adequate transition period to allow the person who is hired to learn the ropes at Department of Ecology while Rick is still around. This announcement is of special interest to all the experienced NHD people reading the NHD Newsletter and should be passed on to others who might be interested in working on NHD in Washington state. The agency would really like to hire someone who could “hit the ground running” when it comes to the NHD. Learn more at:

<http://agency.governmentjobs.com/washington/default.cfm?action=viewJob&jobID=355867>

Esri Map Book

A map using the NHD entitled The Hydrographic Setting for Mercury Sampling was included in this year’s Esri Map Book, Volume 26. The map was produced by Kathy Isham of the USGS. Kathy used the NHDPlus symbolized for flow volume, symbology for mercury concentrations in fish, and symbols for mining operations to provide an integrated view of how the three interrelate. This was done for four locations in the U.S. The California location was used for the Map Book. You can view this at:

http://www.esri.com/mapmuseum/mapbook_gallery/volume26/natural-resources-water/natural-resources-water-2.html.

American Water Resources Association – Specialty Conference on GIS

The 2012 AWRA Spring Specialty Conference on Geographic Information Systems and Water Resources VI will be held March 26-28 in New Orleans, Louisiana at the Sheraton New Orleans. Abstracts are due October 3, 2011. See <http://www.awra.org/meetings/Spring2012/index.html>

NHD Photo of the Month

This photo was submitted by Eric Simley. It is Island Lake in the Wind River Wilderness Area in Wyoming. To see the photo of the month go to ftp://nhdftp.usgs.gov/Hydro/Images/Island_Lake.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.

July Hydrography Quiz / New August Quiz

Tia Morita of the DHS Office of Infrastructure Protection was the first to guess the June NHD Quiz as Summersville Lake in West Virginia. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography72.pdf>. As a Senior Consultant with Booz Allen Hamilton, Tia serves as a Regional Geospatial Analyst supporting the Department of Homeland Security Protective Security Advisors in the Southwest (CA, AZ, NM, NV, HI). She uses GIS daily to assist the Protective Security Advisors in their mission of infrastructure protection, and to that end, uses the NHD and other datasets to understand potential flood zones and natural hazard impacts on critical infrastructure. Tia received her Master of Science in GIS from the University of Redlands in California, and also has a Master's in Public Administration from the University of Washington.

Others with the correct answer (in order received) were Jim Sherwood, Liz O'Dea, Christina Boggs, Dave Straub, Linda Davis, Ken Koch, Roger Barlow, Ron Abelson, Tom Morey, Tim O'Neil, Richard Patton, Katy Hattenhauer, Karri Rogers, and Craig Neidig,

Liz O'Dea found this in Wikipedia about how the lake got its name: "The US Corps of Engineers broke a long-standing tradition in naming what was called the Summersville Project. Tradition holds that the project will be named after the town nearest the site of construction, unless named for a person (such as Hoover Dam). However, the town of Summersville was not the one nearest the dam. The village of Gad (located near the present-day marina) was literally flooded at the opening of the reservoir. After briefly considering the name "Gad Dam," it was instead decided to name the project after the next nearest town – Summersville."

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography73.pdf>. This is on the subject of "Know your Subbasin." Where is this subbasin and why is it significant? Send your guess to jdsimley@usgs.gov.

Upcoming NHD Training

- September 12 - 14, NHD Maintenance and NHDGeoEdit Tool Training, Gatlinburg, Tennessee, Contact Dave Arnold at darnold@usgs.gov or Tom Colson at Thomas_Colson@nps.gov for information on attending.
- September 6th - Federal Partners Workshop, FEMA Region 1 Office, Boston, MA; please contact Lauren McLane (FEMA Planning and GIS Coordinator) at lauren.mclane@fema.gov or David Anderson at danderson@usgs.gov
- September 8th - Maine Office of GIS, Augusta, ME; please contact Anji Auger at anji.auger@maine.gov or David Anderson at danderson@usgs.gov

- Hydrography Event Management tool 4-hour WebEx training.
Sign up at: <http://nhd.usgs.gov/tools.html#hem> Contact: HEM@usgs.gov
Advanced Editing Part 2 - September 7
Data Maintenance Part 3 - 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.