

USGS National Hydrography Dataset Newsletter
Vol. 12, No. 8, June 2013
by Jeff Simley, USGS

NHD and WBD at the Esri International User Conference

NHD Stewardship and Development

Tuesday, July 9, 1:30-2:45 PM. Room 23B

Torture: Evaluating Costs and Benefits of Stewardship – Christina Boggs, California Department of Water Resources

NHD Stewardship in Alaska: A Regionalized Approach – Erik Johnson, USDA Forest Service

The National Hydrography Dataset for the Pacific Region – Drew Decker, USGS

A National Diversion Database – Karen Hanson, USGS

National Datasets – NHDPlus V2, WBD, and Ele-Hydro

Tuesday, July 9 3:15-4:30 PM. Room 23B

Catching Up on NHDPlus2 – Cindy McKay, Horizon Systems Corporation

NHDPlus Version 2 Web Services – Cindy McKay, Horizon Systems Corporation

The National Watershed Boundary Dataset (WBD) Current Events – Karen Hanson, USGS

The Ele-Hydro Concept – Karen Hanson, USGS

June Status Report for the Network Improvement Project by David Kraemer

The Network Improvement Project is intended to “tighten the screws” on the NHD to deliver a level of impeccable quality necessary to produce highly advanced network analysis. Most of the fixes are transparent to the general user, but in the process a few major errors are discovered and corrected. The USGS is currently working in Hydrologic Regions 2 and 3 – the Atlantic/Gulf Coasts, and 4 - the Great Lakes. Known problems exist in these areas involving missing or incorrectly compiled large features. These include missing/duplicate sections of the Chesapeake Bay, missing parts of Lake Michigan, missing Cape Lookout barrier islands, and missing Great Dismal Swamp. Also corrected are thin strips of land between the coast line and ocean polygons. All of these errors affect network improvement, because they cause duplicate features, artificial paths outside water bodies, and streams within water bodies.

The northern border with Canada is on hold awaiting full completion of the harmonization program. At that time a mass sweep of the border will commence to correct any errors. The border team is still working within Minnesota. Until this harmonization is completed the Network Improvement team cannot work the border from Michigan to Maine.

NHD Specifications – How Wide Should a River Be To Be A Double-Line Stream?

How wide should a river be to be a double line stream? There’s a NHD specification for that. To find out what it is, go to the NHD web site at <http://nhd.usgs.gov>. Then click on User Resources. Next, click on NHD Feature Catalog. Then again click on Feature Catalog in the left panel. We want to know about the NHD so click on National Hydrography Dataset. It assumed you know that a double-line stream is an NHD Area, so click on Area. Then click on Stream/River. Then you will see a screen defining Stream/River. Now comes the tricky part. Scroll down to the bottom of the screen and click on Feature Template. Look for the section on Delineation. The specification has several conditions, but basically when the river becomes larger than 0.025 inches wide, then collect as a polygon, also referred to as a double-line stream. At 1:24,000-scale, 0.025 inches is multiplied by 24,000 inches and then converted to feet by dividing by 12 inches per foot. The inches cancel and the answer is 50 feet.

How big should a lake be to qualify for collection at “local resolution?” Do the same thing as above, but instead of clicking on Area, click on Waterbody > Lake/Pond. Then click on Feature Template. Scroll to Data Collection. The shortest axis of the lake must be greater than 0.05 inches. At 1:5,000-scale this is 0.05 times 5,000 divided by 12, or 20 feet. At 1:24,000-scale it is 100 feet.

Does the USGS really want lakes as small 20 feet on the shortest axis? Not particularly, but if the steward does and has the resources to do collection at 1:5,000-scale the USGS will accept it. For smaller scale maps they can always be pruned out easily in a GIS. If the steward is going to collect, use, and store them in a geospatial dataset, then they should be stored in a single national dataset so that the nation doesn't have dozens of disparate databases with lakes in them. The cost of storing and managing the small lakes in the NHD is minimal compared to storing and managing multiple datasets.

USGS Hydrography Grants by Steve Aichele

During Fiscal Year 2013, The National Geospatial Program supported eighteen NHD and WBD projects across the country with almost \$800,000 in grants. These projects focused on building stewardship; increasing the value of the NHD and WBD to users with improved attribution and improved feature content, particularly engineered features; and continuing to explore methods for extracting hydrographic features from LiDAR and IfSAR data. Each month the NHD Newsletter will examine two of the grants:

The newly organized NHD workgroup of the New Mexico Geospatial Advisory Committee is actively working with the Office of the State Engineer to make the NHD the primary water resources database for the state. In the coming year, the State Engineer and the NM Geospatial Program are collaborating to add nearly 20,000 conveyance features to the NHD using a combination of aerial imagery, hydrographic survey sheets, and other records. During this process existing flow lines will be edited as necessary, omissions corrected, and GNIS entries updated. Finally, state operated gages will be added statewide, as will dams and reservoirs.

Many projects seek to improve the feature content of the NHD. The Coeur d'Alene Tribe of northern Idaho will be updating NHD across the tribal lands to agree with new LiDAR and imagery collected. The NHD is used extensively by other Tribal departments to manage the stream recovery and restoration efforts. Idaho Department of Water Resources will update the NHD within the Bear River Watershed, a river originating and ending in Utah, but critical to agriculture and communities in Utah, Idaho, and Wyoming. IDWR will also update areas around Mud Lake and the Great Feeder Canal System, incorporating many engineered changes to the flow system. The State of Missouri is undertaking a state-wide, high-resolution NHD maintenance project to 1) address known errors and omissions compiled by staff, and 2) update NHD Waterbody features to support National Point Discharge Elimination (NPDES) permit processing. The Utah Automated Geographic Reference Center will work to update eight subbasins in the Bear River area, the Lower Uintah basin, and the Escalante Desert to improve engineered feature content (canals, dams, diversions), add or correct hydrographic names for NHD and GNIS, and do general editing of the existing NHD. Each of these basins have significant challenges in water resources, including urbanization, hydraulic fracturing and tar sands development, and seasonal water shortages.

Alaska NHD production standards

The NHD for Alaska is undergoing photo inspection to eliminate “blunders” in the data. Photo inspection results indicate that the Alaskan NHD is generally of very good quality. However, in some situations, such as changes to oxbows in meandering rivers in floodplains, or lakes formed or depleted, the position of the hydrography can change drastically. The following conditions will trigger a correction. As time goes on, these specifications may be tightened to further improve the quality of NHD features.

(1) Add lake/ponds 400,000 sq. meters or larger.

The model will find all lake/ponds that need to be added which are 400,000 sq. meters or larger.

(2) Modify position of lake/ponds that do not have an elevation, are greater than 1.0 sq. km., and the shorelines are off by more than 350'.

The model will catch any changes in lakes larger than 1.0 sq. km. and where shorelines have shifted by 350' or more. This includes scenarios where the initial NHD lake is larger than 1.0 sq. km and the shoreline is either larger or smaller by 350' based on breakline data. It also includes checks for breakline lakes that are larger than 1.0 sq. km. and the NHD is either 350' larger or smaller. Thus, it's looking for 8 different scenarios since there are both Fugro and Intermap breakline data.

(3) Realign 2-D stream/rivers greater than 100' wide and the position of the banks have moved more than 750'.

The model was not able to be built with the 100' wide parameter. So, the results will show all 2-D stream/rivers that have shifted by more than 750'. It will also be looking for "islands" that are 750' within the initial data which could be either breakline data or NHD data. It's basically looking for the same 8 scenarios listed above only with rivers in this check. It will be editor's discretion to determine if areas of the stream/rivers need updating since the model is not checking for the 100' width parameter. It should be noted that we found a possible issue with the breakline data with the way it was captured. You may be driven to areas that indicate need updating but you'll notice there is no breakline data – in these cases use the imagery available. They are looking into this issue for future corrections.

(4) Add new area of complex channels if total width of area is greater than 100'. Do not worry about existing area of complex channels.

The model is not capable of checking for this item. It will be up to the editor to look for these manually.

Glaciers and single line drains are not addressed in this phase of production.

NHD Update tool release on the horizon! by Paul Kimsey

Beta testing for NHD Update tool v6.0.1 (ArcGIS 10.1) is nearly complete and an official release will be distributed soon! The desire to release an ArcGIS 10.1 compatible tool sooner rather than later is a pressing issue for the USGS but this has been tempered by a desire to provide a quality product for our user community and has extended the testing period. Although no software is perfect, the NHD team believes stewards will be impressed by a much improved and enhanced capability to edit the NHD. The NHD Update Tool will raise the standard for the content, accuracy and integrity of the NHD data. Next on the horizon for the NHD Update process will be the integration of the conflation process and allow the entire process to be accessed within the NHD Update toolbar and function within a replica checkout.

Downloads of NHD Data from the USGS in May

During May there were 2,323 downloads from The National Map viewer, with 1,849 by rectangle extracts of various sizes and 474 by subbasin or county. Normally an additional 4,000 pre-stored datasets are downloaded every month from the NHD ftp site.

NHD Photo of the Month

This month's photo features Roger Barlow, a USGS Liaison at the top of Scotchmans Peak overlooking Lake Pend Orielle, ID. To see the photo of the month go to <ftp://nhdftp.usgs.gov/Hydro/Images/ScotchmansPeak.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.

May Hydrography Quiz / New June Quiz

Steve Shivers of the U.S. Geological Survey was the first to guess the May NHD Quiz as Lake Marion near Charleston, South Carolina. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography94.jpg>

Steve is the USGS Geospatial Liaison for South Dakota and North Dakota and is based in Rapid City, South Dakota. His job is to engage and support State, local, Tribal, regional, Federal and other partners in improving currentness, quality and accessibility of geospatial data for the community and The National Map.

Others with the correct answer (in order received) were: Ken Koch, David Asbury, Mike McManus, Joanna Wood, Ellen Damico, Tom Densligner, Richard Patton, Eric Simley, Matt Rehwald, David Straub, Kitty Kolb, Roger Barlow, Evan Hammer, Baron Howe, Daniel Button, Jason Piwarski, Janet Brewster, Keith McFadden, and Dennis Dempsey.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography95.jpg> . Where is this harbor? Send your guess to jdsimley@usgs.gov.

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Thanks to Paul Kimsey, David Kraemer, Steve Aichele, Gary Ott, and Kathy Isham.

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.