

USGS National Hydrography Dataset Newsletter
Vol. 13, No. 5, March 2014
by Jeff Simley, USGS

NHD Stewardship Activity by Paul Kimsey

Stewardship of the National Hydrography Dataset is a process to maintain the data that relies heavily on contributions from partners across the nation. Through difficult financial times, rapidly changing technologies and complex editing challenges, stewardship of the NHD continues on and is achieving resurgence. In the past twelve months NHD partners have checked out 686 jobs (HU4-HU8 level) for editing and have submitted 585 of those jobs back to the USGS for inclusion into The National Map. The checkouts are spread amongst several agencies (listed below) and address a wide variety of edits ranging from maintenance of the existing data to complex edits such as conflation used to make local resolution data.

Since January 1, 2014, sixty eight partners from various federal and state agencies have been trained remotely via WebEx to checkout NHD data, perform edits, quality control the edits and submit the updates back to the USGS. Perspective editors are encouraged to contact their USGS Geospatial Liaison or hydrography technical point of contact (POC) for further information. For those who are a member of the MyUSGS-Hydrographic Data Community, the training will be posted on the Hydro Community Events calendar: <https://my.usgs.gov/confluence/pages/viewpage.action?pageId=223543429>

Partners editing March 2013 – March 2014:

Alabama Department of Economic and Community Affairs
Alaska Geographic Data Committee
Arkansas Department of Environmental Quality
California - Department of Fish and Game
California State Water Resources Control Board
Florida Department of Environmental Protection
Georgia DNR - Environmental Protection Division
Great Smoky Mountains National Park
Idaho Department of Water Resources
Indiana Office of Technology
Kentucky Division of Water
Louisiana Department of Environmental Quality
Maine Office of GIS
Massachusetts Dept of Environmental Protection
Missouri Department of Natural Resources
Missouri Office of Administration
Montana - MSL Geographic Information
Nebraska Department of Natural Resources
New York State Department Of Environmental Conservation
North Carolina Center for Geographic Information and Analysis
Oklahoma Water Resources Board
Pacific Northwest Hydrography Framework
Pennsylvania Department of Environmental Protection
Puerto Rico - Caribbean Water Science Center
US Forest Service
USGS Water Science Center Utah
Utah - Automated Geographic Reference Center

National Hydrography Dataset version 2.2 by Kevin McNinch

The NHD 2.2 data model release has been defined and is being prepared for release by the USGS. The NHD 2.2 release includes removing some unused and no longer supported content, changes to the way Gaging Stations are classified, a restructuring of how NHD Point Event are classified in the coded-value domain from a one-digit value to a five-digit value, and some new NHD point events.

A release date for NHD 2.2 has not been scheduled as of this writing. The NGTOC Data Management Team is currently coordinating the changes and formulating a release schedule. Further communication on the release schedule and impacts will be forthcoming through future NHD Newsletter articles, the NHD Advisory Committee, the NHD Twitter feed, the NHD website, and the NHD Technical Points of Contact.

NHD Content Removed:

- Hazard Zone, Special Use Zone from NHDArea Subtypes
- Special Use Zone Limit from NHDLine Subtypes
- Domains:
 - Special Use Zone FCode
 - Special Use Zone Limit FCode
 - Hazard Zone FCode
- SpecialUseZoneType attribute from NHDFCode table

Gaging Stations:

The upcoming NHD 2.2 data model release will expand the classification for Streamgage point events in the NHDPointEventFC. [*Note: These were previously called 'Gaging Station'.*] Streamgages will be classified with these new Point Event Types:

- 57001 Streamgage: Streamgage Status=Active; Record=Continuous
- 57002 Streamgage: Streamgage Status=Active; Record=Partial
- 57003 Streamgage: Streamgage Status=Inactive

All streamgage events will be categorized into Active and Inactive status based on the Streamgage status from the previous water year (October 1--September 30). Inactive status gages have had zero daily-value records for the previous water year. Active streamgages have daily-value records for the previous water year, with Continuous record gages having => 355 daily-value records and Partial record gages having < 355 daily-value records. It is planned that the streamgage event status and record classification will be updated on a yearly basis by USGS NGTOC.

Gaging Stations in NHDPoint will be maintained for mapping purposes only. Only the Active, Continuous Gaging Stations will be retained in NHDPoint in the following new domain value:
Add to Gaging Station FCode Domain:

- 36701 Gaging Station: Gaging Station Status=Active; Record=Continuous

Changes to NHD Events:

The Point Event Type is being changed from a one-digit value to a five-digit value to more closely follow the FCode structure of classification. This will allow for more consistency between feature classification and better organization of events.

New NHD Point Events will be added for Flow Alteration and Hydrologic Unit Outlet as seen below.

Changes to NHD Point Events:

- Remove all existing values from Point Event Type domain
- Add new values to Point Event Type domain

- 57001 Streamgage: Streamgage Status=Active; Record=Continuous
- 57002 Streamgage: Streamgage Status=Active; Record=Partial
- 57003 Streamgage: Streamgage Status=Inactive
- 57004 Water Quality Station
- 57100 Dam
- 57201 Flow Alteration=Addition
- 57202 Flow Alteration=Removal
- 57203 Flow Alteration Unknown
- 57300 Hydrologic Unit Outlet

Beyond NHD 2.2:

Requirements for future data model changes beyond NHD 2.2 are already being compiled. Expect changes to support updated Value Added Attributes (VAAs), Provisional Names for features, and reworked feature metadata to more closely follow *The National Map* data schemas. We will keep everyone up to date as these changes are planned.

NHD Update Tool Status by Paul Kimsey

An ArcGIS 10.1 version of the NHD update tool was released to the editing community in January, 2014. The 6.1.0 version was quickly recalled due to polygon editing issues and editors were asked to “roll-back” to the previous version 6.0.1 for ArcGIS 10.1. At the time this seemed to be a safe plan until the v6.1.0 version could be retested and a new release made available. Unfortunately the roll-back was unsuccessful due to an uninstaller issue with ESRI RegAsm. The unsuccessful roll-back resulted in custom qc checks not being returned in the ESRI Data Reviewer queue. A patch has now been created and tested that allows editors to successfully roll-back and is now being distributed.

Full testing has now been completed for the above mentioned 6.1.0 version of the NHD Update tool and issues have been reported for the current development sprint cycle March 18 – April 7, 2014. Post development, the 6.1.0x tool will be retested for a period of two weeks and the results will determine if a release can be distributed or further development is required.

Network Improvement Project Status by David Kraemer

The Network Improvement Project is to insure that the complete high resolution NHD for all 50 states and U.S. territories is ready for running the NHDPlus Value Added Attributes (VAA). The Initial phase of the Network Improvement Project is to update the NHD based on errors found by the NHDPlus QA/QC checks that were run at the Region (HUC 02) level on a late 2011 snapshot of the NHD. Currently the Double Check phase of the Network Improvement Project is running the NHDPlus QA/QC checks on a late 2013 snapshot of the NHD at the Sub-Region (HUC 04) level. The Double Check phase will correct any additional errors that would prevent the creation of the NHDPlus VAA.

During this month Region 01 (New England) was completed for the Initial phase of the Network Improvement Project. Region 06 has been run through NHDPlus QA/QC checks a third time and additional edits are being made to the high resolution NHD before the NHDPlus VAA can be created.

The current status for the Network Improvement Project phases is:

Initial Network Improvement: David Kraemer is editing Region 04 along the Canadian border and Charles Bowker is editing a couple sub-basins within Region 05. Tony Litschewski is editing Region 19 sub-basins as part of preparing for the Alaska Hydro Image Integration projects.

Network Improvement Double Check: Charles Bowker is editing Region 18, Allen Karsh is editing Region 02, and David Kraemer is editing Region 07. David is also preparing additional Regions for editing.

Uncompleted Initial Network Improvement Sub-Basins Checked-Out by States (Lower 48):

Indiana (05120111, 05120201, 05120202) Mississippi (08030202 and 08030207)
As States check-in their jobs we will edit these uncompleted Initial Network Improvement Sub-Basins.
Initial Network Improvement NHD Regions Completed: 01, 02, 03, 06, 07, 09, 10, 11, 12, 13, 14, 15, 16,
17, 18, 20, 21, and 22.
Network Improvement Double Check NHD Regions Completed: 06 and 20.

GeoConflation Tool development update by David Anderson

The GeoConflation tools (GCT) tools have been undergoing major development of both the conflation and queued editor tools. The development re-implements the actions of the tools into ArcObjects code and away from any ArcInfo requirements. This is due to ESRI no longer providing support for ESRI ArcInfo workstation beyond ArcGIS 10.1. The re-implementation is not a simple task because the AML (ArcInfo) tool was pretty well refined at identifying where problems could occur during the process. Converting all of the actions from AML code into ArcObjects code has been ongoing for several months, and we are getting closer to a time when a release will be available for the end users.

Currently, both tools are undergoing beta testing and are involved in a development cycle. The testing not only includes making sure the tools run without error, but testing that the actions of the automated and non-automated conflation perform as expected. For the automated tasks, testing includes making manual comparisons between Target and Source data to ensure automated captures of reachcodes are performing as they should. Unfortunately, all this takes time, but be aware that getting the re-implementation made available to our users is the top priority this year.

Keep abreast of current activity in all areas of the NHD/WBD by visiting the MyUSGS Hydrographic Data Community (HDC) at <https://my.usgs.gov/confluence/display/hdc/Hydrographic+Data+Community>. If you do not have a MyUSGS account and are not a DOI employee, please contact David Anderson (danderson@usgs.gov) to obtain an account.

NHDPlus Updates

You're invited to visit the latest changes on the NHDPlus web site -- <http://www.horizon-systems.com/NHDPlus/index.php>, as follows:

- Documentation: The NHDPlusV2 Documentation page has been restructured and now contains a new NHDPlusV2 User Guide, metadata, training exercises, technical papers, and more presentations.
- Tools: The NHDPlusV2 Tools page has been activated and contains two new tools: NHDPlusV2.1 Toolbox and NHDPlusV2.1 Flow Table Navigator.
- Data: A number of corrected components have been released over the past several weeks. There is a tool in the NHDPlusV2.1 Toolbox that will enable you to compare your local data holdings with the versions that are available on the web site. Please don't forget to read the release notes for additional details about the data updates.

Coming soon! - VAA Navigator, Basin Delineator, and CA3T tools for V2 and a major update on NHDPlus applications. Also, look for NHDPlus-related presentations at the upcoming National Water Quality Monitoring Conference (Cincinnati, OH – Apr 28-May 2, 2014) and the American Water Resources Association Spring Specialty Conference on Water Resources (Salt Lake City, UT – May 12-14, 2014).

Thanks for your continued interest in, and use of, NHDPlus – a collaborative effort between the USEPA and the USGS. As always, we welcome your comments and feedback.

NHD Update Process Training by Joel Skalet & Bill Smith

Currently the NHD Team is scheduling monthly training sessions via the webex. Principal Stewards in each state (if one exists) should be contacted for approval prior to submitting a request for training. The current training being conducted is using ArcGIS 10.1. Training consists of reviewing of the NHD Stewardship/Stewardship Beta website, NHD website, MYUSGS HDC, and the NHD User Guide. Also NHD Basics overview, Important NHD Concepts, ordering data, accessing GNIS Geonames website, the Update Tool and Process including all functions and QC of data is reviewed. This is a two-part course in which everything is conducted via webex in two 5 hour sessions. After attending Part 1, trainees are allowed to check out training data (from the Stewardship Beta/Training website) and editing that data over the course of two weeks on their own. Part 2 of the training takes place two weeks after Part 1, and consists of a review of the Update Tool and Process and a Question and Answer session. Please visit the Hydrographic Data Community Events Calendar on Confluence/MYUSGS to see potential dates. The link to the Events Calendar on the HDC is

<https://my.usgs.gov/confluence/pages/viewpage.action?pageId=223543429>.

For more information about this training please email Joel Skalet at: jjskalet@usgs.gov or telephone: (608) 238-9333 x152.

The Network Value Added Attribute of the Month

Do you know your VAA's? This NHD Newsletter article is the second 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 there are actually two Network VAA's to examine: UpHydroSeq and DnHydroSeq.

Last month's article looked at HydroSeq – the Hydrologic Sequence Number. This is an “intelligent” method of looking at flowline features in either an upstream or a downstream hydrologic order. See last month's newsletter for the full story. Let's say that a stream, made up of many stream segment features, is being examined and somewhere in the middle of that stream a particular stream segment has been identified. It has a HydroSeq value of “45.” The next segment upstream can be identified with the field UpHydroSeq - Upstream mainstem hydrologic sequence number. The term “mainstem” means the primary path. There could be two or more segments immediately upstream, but only one of them will be the primary or mainstem path. That's the one identified with UpHydroSeq. Looking at the flowline with HydroSeq of “45”, it makes sense that the UpHydroSeq will be a higher number, such as “47”, right? It doesn't have to be the next higher number, just a higher number.

Conversely, the next segment downstream of HydroSeq “45” is identified with the field DnHydroSeq - Downstream mainstem hydrologic sequence number. Again, mainstem has meaning because downstream could have a divergent path as well as a primary or mainstem path. Let's say that the next downstream (mainstem) HydroSeq is “44.” The value “44” happens to be one less than “45”, but it doesn't have to be. It could have been any number less than “45.” So, for the particular stream segment, or flowline, being examined, the HydroSeq is “45”, the UpHydroSeq is “47” and the DnHydroSeq is “44.”

Downloads of NHD Data from the USGS in February

During February there were 4,439 ftp downloads. This is broken into 1,622 downloads of statewide high resolution NHD and 101 medium resolution downloads. There were 1,958 subregion-based high resolution downloads and 758 medium-resolution downloads. Usually there are an equal number of National Map Viewer downloads, but these are no longer being reported.

2014 AWRA Spring Specialty Conference GIS and Water Resources VIII – Data to Decisions

Geographic Information Systems (GIS) are an indispensable tool in providing timely and accurate information necessary for making excellent water resources decisions. Emerging technologies in data collection, information management, web and cloud services, and visualization have opened up significant new avenues for sharing solutions across local, state, federal, and international levels. Come and discover new solutions for your organization. The conference is May 12-14, 2014 at the Snowbird Resort in Snowbird, UT. See <http://www.awra.org/meetings/SnowBird2014/>

NHD Photo of the Month

This month's photo was submitted by Dennis Dempsey of the New York EPA. The Ashokan Reservoir is one of several reservoirs created to provide the City of New York with water. See ftp://nhdftp.usgs.gov/Hydro_Images/Ashokan_Res.JPG. Submit your photo for the NHD Photo of the Month by sending it to kyoder@usgs.gov. This will allow the program to build a library of real-world photos linked to the NHD.

February Hydrography Quiz / New March Quiz

Daniel Button of the USGS was the first to guess the February NHD Quiz as a bend in the Ohio River between Ohio and West Virginia near Racine, OH and Ravenswood, WV. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography103.pdf>

Dan is a Physical Scientist at the USGS Ohio Water Science Center and has been with the NAWQA (National Water-Quality Assessment) program at some capacity for almost 20 years. Dan's career started with a heavy emphasis on GIS due to his interest in both landscape features, maps, water quality and computer science. Dan currently manages extensive amounts of data for the NAWQA Regional Stream-Quality Assessment team for recent sampling done in the Midwest and is involved with the planning for a similar effort in the Southeast. Dan is interested in the impacts of toxics and nutrients on lake and stream ecosystems, serves on the Lake Erie Lakewide Management workgroup, and is a member of the USGS Water-Quality Users Group. Occasionally, and when given the opportunity, Dan still likes to sit down and read a good map.

Others with the correct answer (in order received) were: Steve Shivers, Calvin Meyer, Amy Prues, Evan Hammer, David Asbury, Johathan Labie, Dave Straub, Matt Rehwald, Stephanie Kula, Ellen Lesch, Edwin Abbey, Kitty Kolb, Ken Koch, Joanna Wood, John Kosovich, Richard Patton, Tom Shearin, Janet Kellam, Janet Brewster, and Richard Campbell.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography104.jpg>. What's the name of the lake in the island in the lake? The river entering the larger lake from the west and exiting the lake to the east is a VAA Level 1 river (meaning it empties directly into the ocean), about 2,200 miles from its mouth. 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, Kevin McNinch, David Kraemer, David Anderson, Joel Skalet, Bill Smith, Kathy Yoder, John Varndell, Katrina Burke, 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.