

USGS National Hydrography Dataset Newsletter  
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By Jeff Simley, USGS

## **The Future for Hydrography Names**

The official repository for geographic names in the United States is the Geographic Names Information System (GNIS) managed by the U.S. Geological Survey (USGS) for the U.S. Board on Geographic Names. Only names stored in this database and meeting Board standards can be used on official federal government publications including The National Map and its hydrography component, the NHD. In the NHD, each nameable feature contains fields for GNIS Name and GNIS ID, and can only be populated with names coming from the GNIS. The GNIS geographical context for named features is identified by using the endpoint pair for streams, and a single point for area names and point features. Now that the NHD is available nationwide, the opportunity exists to advance the geographical context of the GNIS to take advantage of NHD geometry. In the NHD, hydrography features are represented very discretely with vertex spacing available at the sub-meter level. This means that the geographical context of a name can be applied with considerably more precision than the existing GNIS endpoint or point method. An initiative is now underway to develop the geographic context of GNIS using The National Map vector databases such as the NHD. This could mean that the GNIS architecture would be designed to interface with the NHD to effectively integrate the GNIS and NHD into a common dataset. There would still be a GNIS, but behind the scenes, the GNIS would actually reference the NHD for names representations.

## **Example of Web-enabled Services using the NHD**

Commercial web mapping APIs such as Microsoft Virtual Earth, Google Maps, and Yahoo! Maps and open source Application Programming Interfaces (API's) like OpenLayers are the perfect frontends for quick and easy geographic data display on the web. Tie one of these to a spatial database and you have a ready-made solution that can be embedded in a website or enterprise web application. Vendor Systalex provides a good example of how Microsoft Virtual Earth is used to help users explore data in a project management application for the U.S. Environmental Protection Agency and directly submit geographic project boundary data to an Oracle database without a heavyweight GIS implementation. See [http://www.systalex.com/capabilities/web\\_dev.html](http://www.systalex.com/capabilities/web_dev.html). Go about half way down the page to the two "red" demo links and go to Demo 2. The demo will run for about five minutes.

## **Watershed Boundary Dataset in the NHD**

The Watershed Boundary Dataset (WBD) portrays watersheds in a six-level hierarchical subdivision scheme ranging from Regions such as the Missouri River system all the way down to Subwatersheds in the 10,000-40,000 acre range. A cooperative effort between the Natural Resource Conservation Service (NRCS), the USGS, the U.S. Environmental Protection Agency, and many state agencies, is providing an outstanding analysis and representation of this system. The data are available from the NRCS at <http://datagateway.nrcs.usda.gov/>. But because the WBD is so integral to the NHD, a representation of the WBD is also available in the NHD using the Hydrologic Units feature dataset within the NHD model. States (and territories) with six-level WBD currently available in the NHD are Connecticut, Georgia, Illinois, Massachusetts, Maryland, New Hampshire, Ohio, Rhode Island, South Carolina, Utah, Vermont, Wyoming, and Puerto Rico. Soon to come will be Arkansas, Florida, Indiana, Michigan, Montana, Nebraska, New Mexico, Oklahoma, Virginia and Wisconsin.

## **NHDGeoEdit Tool ArcGIS 9.2 Version Available**

The NHDGeoEdit tool is now available in the ArcGIS 9.2 version including all associated tools and utilities. The tool itself is now the 3.2 version. It can be accessed at the NHD stewardship website at [http://webhosts.cr.usgs.gov/steward/scripts/st2\\_software.pl](http://webhosts.cr.usgs.gov/steward/scripts/st2_software.pl). A password is required for downloading. The user can select the appropriate tools and utilities needed from the list. The zip files to be downloaded contain (1) the tool or utility, (2) installation PowerPoint, and (3) readme files. Complete updated and improved documentation for the ArcGIS 9.2 package remains in-work, but will be made available from the website as soon as possible. The next generation of the tool will operate against a file-based geodatabase.

## **NHDPlus Workshop**

The NHDPlus team is conducting a Technical Workshop “Putting NHDPlus to Work: Applying a National Geospatial Surfacewater Framework” to be held on February 26-28, 2008 at the U.S. Geological Survey (USGS) facilities in Denver, CO. The Workshop is intended for Geographic Information System (GIS) practitioners, hydrologic modelers, and water resource analysts, and will provide the opportunity to learn more about applying NHDPlus through the experience gained by the NHDPlus team and other users, since NHDPlus was first released in early 2006. Techniques, tools, and data enhancements will be among the many topics covered. Attendees will have the chance to interact and share their own lessons learned with others from a growing and diverse NHDPlus user community. The Workshop will be conducted by the joint EPA-USGS NHDPlus team that developed and supports NHDPlus. The NHDPlus is a suite of geospatial products that build upon and extend the capabilities of the National Hydrography Dataset (NHD) by integrating the NHD with the National Elevation Dataset and the Watershed Boundary Dataset (where it exists). NHDPlus includes improved NHD names and networking, value-added attributes (such as stream order) that enable advanced query, analysis and display, elevation-derived catchments that integrate the land surface with the network, stream flow volume and velocity estimates for pollutant dilution modeling, and associated flow direction and accumulation grids. Additional information on NHDPlus is available on the Web at [www.epa.gov/waters](http://www.epa.gov/waters). Click on the NHDPlus workshop list on the right. If you are interested in attending the workshop, contact Tommy Dewald at [Dewald.Tommy@epamail.epa.gov](mailto:Dewald.Tommy@epamail.epa.gov).

## **December Hydrography Quiz / New January Quiz**

Mike Wiedmer was the first to correctly guess last month’s hydrography quiz <ftp://nhdftp.usgs.gov/Quiz/Hydrography30.pdf> as San Andreas Lake on the San Francisco peninsula in California. Mike retired as a Habitat Biologist with the State of Alaska and is now in the PhD program at the University of Washington. His dissertation will use the NHD as a foundation in the development of habitat predicative models for Alaskan freshwater fish.

Others with the correct answer (in order received) were Al Rea, Laurie Morgan, Dave Straub, Calvin Meyer, Tom Christy, Richard Patton, Bruce Nielsen, Roger Barlow, Jim McDonald, Guy Whitaker, Connie Shannon, Steve Goldman, and David Asbury.

Calvin commented: "The northern-most lake is San Andreas Lake, which formed along the San Andreas rift zone, a geologically active fault. San Andreas Lake serves as a water supply reservoir for the city of San Francisco. The San Andreas fault runs a length of roughly 800 miles through western and southern California, and also runs directly underneath the dam of San Andreas Lake. In 1895 Professor Andrew Lawson of the University of California at Berkeley first discovered and named the fault after the name of the lake. The devastating San Francisco earthquake was caused by movement along the San Andreas fault in April 1906." Jim also notes: "The San Andreas Lake is located next to the San Andreas Fault. The lake is a down-dropped graben or basin, formed by the right-lateral strike-slip movement of the San Andreas Fault." Al pointed out: "What a place to build a dam!" Guy adds: "the water is pumped in from the Hetch Hetchy Reservoir which is the next valley north of Yosemite National Park." David also noted: "The building of the dam creating the reservoir flooded the Grand Canyon of the Tuolumne River, which was described by John Muir as "second only in beauty to Yosemite Valley". The dam is the subject of a controversial debate regarding its removal and the subsequent restoration of the canyon."

San Andreas Lake is the northernmost of three lakes laying in the strike-slip fault. The other lakes are Lower Crystal Springs Reservoir and Upper Crystal Springs Reservoir. These lakes hold the water supply for the City of San Francisco. The water first comes via aqueduct from Hetch-Hetchy reservoir in the Sierra Nevada mountains more than a hundred miles away, then in a tunnel under the Southern part of San Francisco bay, again in a tunnel up the San Francisco peninsula, and finally enters the reservoirs. San Andreas Lake (from which the fault takes its name) is a "sag pond" that naturally formed in the valley of the San Andreas fault. Strike-slip faults are good places for lakes; the fault both creates a low spot to collect the water, and grinds up the rock underneath making an impermeable layer to hold the water in. Man has enlarged San Andreas lake with a dam, and created the two additional lakes in the same valley.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography31.pdf>. This quiz was created by the new USGS hydrography intern Janel Day. Janel is a student at the University of Colorado-Boulder studying GIS and has a good background in water science.

### **American Water Resources Association**

Be sure to mark your calendar for the 2008 AWRA Spring Specialty Conference – GIS and Water Resources V in San Mateo, California on March 17-19, 2008. See [http://www.awra.org/meetings/San\\_Mateo2008/index.html](http://www.awra.org/meetings/San_Mateo2008/index.html)

### **Upcoming NHD Geo Edit Tool Training**

February, 2008, Anchorage, Alaska (tentative), Contact Paul Kimsey [pjkimsey@usgs.gov](mailto:pjkimsey@usgs.gov) or Carl Markon [markon@usgs.gov](mailto:markon@usgs.gov)

### **Upcoming NHD Applications Training**

February 27, 2008, Lake Geneva, Wisconsin, contact Dick Vraga at [rsvraga@usgs.gov](mailto:rsvraga@usgs.gov)

March 5, Richmond, Virginia, contact Diane Eldridge at [deldridge@usgs.gov](mailto:deldridge@usgs.gov)

March 6, Reston, Virginia, contact Diane Eldridge

March 13 and 14, Reno, Nevada, contact Tom Sturm at [tsturm@usgs.gov](mailto:tsturm@usgs.gov)

March 20, Menlo Park, California, contact Carol Ostergren at [costergren@usgs.gov](mailto:costergren@usgs.gov)

April 21, 2008, Kansas City, Missouri, (stewardship), see

<http://www.magicgis.org/magic/symposiums/2008/index.cfm>

May 7, Dearborn, Michigan, contact Steve Aichele at [saichele@usgs.gov](mailto:saichele@usgs.gov)

May 8, Lansing, Michigan, contact Steve Aichele

May 19-23, Oregon and Washington, contact Sheri Schneider at [sschneid@usgs.gov](mailto:sschneid@usgs.gov) or Allyson Jason at [ajason@usgs.gov](mailto:ajason@usgs.gov)

Hawaii in planning stages, contact Henry Wolter at [hwolter@usgs.gov](mailto:hwolter@usgs.gov)

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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](mailto:jdsimley@usgs.gov).

You can view past NHD Newsletters at [http://nhd.usgs.gov/newsletter\\_list.html](http://nhd.usgs.gov/newsletter_list.html)

Jeff Simley, USGS, assumes full responsibility for the content of this newsletter.