USGS National Hydrography Dataset Newsletter
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By Jeff Simley, USGS

Integration of the WBD and NHD

An initiative is underway to integrate the Watershed Boundary Dataset program with the National Hydrography Dataset program. The WBD is administered jointly by the U.S. Department of Agriculture Natural Resource Conservation Service and the U.S. Geological Survey. The NHD is administered by the U.S. Geological Survey. A memorandum of understanding between the NRCS and the USGS will help further define responsibilities as integration moves forward. The goal is to improve the power of the WBD and of the NHD through their integration on a programmatic, technical, operational, and stewardship level. One important step forward is the design of an integrated geodatabase to jointly house the WBD and NHD. A multi-agency task force has been launched to propose a suitable design. It will develop a design that encompasses (1) common data relationships between the two datasets such as outlet reach codes, (2) the NHD change management system, (3) feature-level metadata, (4) a common hierarchal geodatabase architecture, (5) feature identifiers, (6) flow modeling, and (7) integrated editing.

USGS Maintenance Program

The USGS is in the middle of a two-year program to incrementally improve the NHD to bring it up to the full design standard and provide stewards with cleaner data to work with. The first year of the program is known as Maintenance Lite, the "Lite" referring to the fact that this is only a partial quality improvement. The second year of the program is known as Maintenance II and will bring the data more fully into compliance. Stewardship is an important complement to this and will have a major impact following the Maintenance II phase. See the April 2008 newsletter on how to obtain status information.

Maintenance Lite: (1) Resolve line 1-d topology errors, (2) Resolve Gapped or Branched Reach Codes, (3) Resolve Gapped GNIS Names, (4) Verify all major GNIS Names exist in NHD, (5) Verify Geometric Network connectivity including: check all sub basin/sub region/region connections, and (6) Load XML Extract into copy of original data (XML2Pgdb) and re-run QC checks
Maintenance II: (1) Re-check data integrity based on previous Sub Region Maintenance Lite, (2) Resolve polygon 2-d topology errors, (3) Check all reaches to ensure that they have MValues, (4) Remove Branched GNIS Names, (5) Check all WBAreaComID's and correct or add as necessary, (6) Check all Coastlines (Coincident with 2-d features) and correct as necessary, (7) Load XML Extract into copy of original data (XML2Pgdb) and re-run QC checks.

The NHD in Arkansas – Bill Snead

The NHD is progressing well in Arkansas. The state has formed a very active technical working group, called the NHD Technical Working Group (TWG). A GeoEdit training session was held the week of June 17-19 in Little Rock hosted by Arkansas Department of Environmental Quality (ADEQ). The TWG consist of identified sub-stewards, the primary steward (ADEQ), the Arkansas Geographic Information Office and the USGS geospatial liaison. The sub-stewards mainly represent the various state agencies using NHD. This is a big step for NHD stewardship in Arkansas. Prior to the formation of the TWG it was discovered that not only were the state agencies not using the same hydro dataset, but there were

departments within the same agency using different datasets (a situation common throughout the country - JS). These meetings have proved to be a vital step in the stewardship process for Arkansas to get all departments and agencies to migrate to NHD.

American Water Resources Association GIS in Water Resources Conference

The American Water Resources Association bi-annual conference on GIS in Water Resources was held in San Mateo, California March 17-19. The conference featured 230 papers. Here is a continuation from the March and April newsletters of a sampling of papers presented.

Regression Modeling and NHDPlus to Improve Pathogen Beach Advisories and Source Detection – Michele Cutrofello discussed a process for looking at the watershed upstream of a beach and analyzing bacteria transport to the beach for Santa Barbara, California. This uses NHDPlus, land use/land cover data, discharge points, and farm/animal operations in conjunction with time of travel estimates using stream gages, precipitation data, and NHDPlus velocity estimates. In addition, ten years of water quality data were available from the city. Many variables are used in the linear regression model, which made predictions matching actual observations 78% of the time. The area within three miles of the beach contributed the most bacteria. The problem is severe enough that when it rains the beach often must be closed. The modeling approach hopes to give hour-by-hour estimates of bacteria load based on rainfall.

The Not So Great Escape

During the Second World War over 400,000 German prisoners of war were held in 500 POW camps located throughout the United States. Camp Unit 84 located in Papago Park, Arizona near Phoenix was one such camp that held captured U-Boat crews. These prisoners were particularly “enthusiastic” about the war and were quite eager to escape. In an operation almost an exact duplicate of the Anglo-American escape made famous by the movie “The Great Escape”, 25 prisoners made their way out of the camp through a 180 foot tunnel on Christmas Eve, 1944 – with civilian clothes, forged documents, escape rations and all. One of the escape teams had some months earlier obtained a map of Arizona and noticed the Gila River located south of the camp. Their plan was to build a collapsible boat, take it out the tunnel, hike four nights to the Gila, float downstream to Mexico, and meet up with sympathizers who would smuggle them back to Germany. The three-man team had built a canvas and wood flatboat with supplies coerced from the guards in exchange for Iron Cross awards fraudulently made from melted down toothpaste tubes. After the escape and four nights lugging the sections of the boat, the team finally reached the Gila. Their spirits must have hit rock bottom when they found the big river on the map was actually mostly mud. The trio then continued on foot to Gila Bend where they were discovered by local cowboys and turned over to the police. All of the 25 escapees were eventually caught. Had the team downloaded the NHD and clicked on the streamgages located in NHDPointEventFC, it would have linked them directly with NWIS and the 30-day hydrographs for the Gila. According to historical NWIS data, the Gila River was flowing at 320 cfs on that Christmas Eve at Coolidge farther upstream, but other NWIS gages often show 0.0 to 0.1 cfs on the Gila directly south of the camp in later years. Water diversions and a whopping 0.9 inches of rain in December are the likely cause of the dry Gila encountered by the escapees.

New Hydrography Intern

Ariel Bates has joined the USGS as an intern specializing in hydrography. Ariel will graduate after the fall semester at CU-Denver in Environmental Studies. A native of Alaska, she developed a strong interest in geography after a round-the-world semester at sea, and is particularly interested in GIS. She would

like to make a career out of working for the USGS. She has a good knowledge of GIS and will be a good fit into the program. Ariel replaces Janel Day who has moved on to ESRI in Redlands.

May Hydrography Quiz / New June Quiz

Steve Aichile, the NSDI Geospatial liaison to Michigan was the first to correctly guess last month's hydrography quiz ftp://nhdftp.usgs.gov/Quiz/Hydrography35.pdf as North Platte, Nebraska where the Platte River is formed by the confluence of the North Platte and South Platte Rivers. It is also home to Union Pacific Railroad's huge Bailey Yard where 10,000 cars of east-west transcontinental freight traffic are processed daily. Steve works for the USGS in Lansing, Michigan where he links USGS geospatial programs with the geospatial programs of federal, state, and local agencies located in Michigan. Steve has a strong background in water science, geography, and GIS.

Others with the correct answer were (in order received) David Asbury, Dan Sandhaus, Jim Sherwood, Richard Patton, Ken Koch , Calvin Meyer, Katy Hattenhauer, Travis Hamrick, Dan Button, Thom DeGriselles, James Ray, Gary Penn, David Straub, Al Rea, Dan Saul, Tom Denslinger, Allen Karsh, Jennifer Campbell-Allison, and Elaine Blok. Tom Denslinger adds: "The name 'Platte' is French for flat & was given by Canadian hunters because the stream for much of its length is broad, shallow, and flat but still below the wide level valley. It is pre-eminently the flat river. GNIS also indicates the variant name for the Platte River is the Nebraska River."

This month's hydrography quiz can be found at ftp://nhdftp.usgs.gov/Quiz/Hydrography36.pdf. The light blue is ocean, the medium blue is stream/river, and dark blue is lake/pond. Perhaps those big stream/river areas should actually be estuaries. The red line is coastline, the magenta line is artificial path. Where is this? Send your guess to jdsimley@usgs.gov.

Upcoming NHD Geo Edit Tool Training

July 8-10, Montgomery, Al, Contact Carl Nelson cwnelson@usgs.gov or Phillip Henderson Phillip.Henderson@adeca.alabama.gov
July 22-24, Sacramento, CA, Contact Steve Char sjchar@usgs.gov or Carol Ostergren costergren@usgs.gov
July 22-24, Urbana, Illinois, Contact Tim Hines thines@usgs.gov or Shelley Silch ssilch@usgs.gov
August 4-8, Tallahassee, FL, Contact Carl Nelson cwnelson@usgs.gov or David Anderson David.S.Anderson@dep.state.fl.us

Upcoming NHD Applications Training

August 12, Monterey, California, contact Carol Ostergren at costergren@usgs.gov
August 13, Sacramento, California, contact Carol Ostergren
Sept. 16-17, Portland, Oregon, contact Sheri Schneider at sschneid@usgs.gov
Sept. 18, Lacey, Washington, contact Allyson Jason at ajason@usgs.gov
Oct. 21, Laramie, Wyoming, ESRI SWUG, contact Paul Caffrey at Caffrey@uwyo.edu
October 7 and 8, Boise, Idaho, contact Scott Van Hoff at svanhoff@usgs.gov
November 3-7, additional California workshops in planning stages, contact Carol Ostergren

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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.