

## Issues Facing the Hydrography Stewardship Program

In a recent roundtable discussion with NHD stewards, a number of issues were noted that, if addressed, could help the program become more successful:

1. The NHD maintenance process is too complicated. Although the process can be successful, the typical person who wants to edit the NHD is faced with a process they are unable to master. As a result, they tend not to make the edits to the NHD, but sometimes make them to their own copy of the NHD. Also related, the training for NHD is very difficult and many people who take the training decide not to pursue NHD maintenance.
2. When NHD maintenance is performed, that data that comes out of the process sometimes contains errors that did not appear to exist when the data was submitted to the USGS. This is frustrating for stewards, and requires another round of editing to fix the data they just fixed. It adds another layer of frustration to stewardship.
3. It would be desirable to forgo the transaction process cycle and allow stewards direct access to the production database or a version or replication of it. This would provide a “what you see is what you get” consistency in editing work. It is important to have working data immediately following editing and not have to wait two weeks to see what comes out.
4. It is not possible to make quick and simple edits of the NHD. Just about any editing is an involved process, often requiring a half-day investment even for simple tasks. This discourages editing.
5. The tool is very sensitive to system configuration and getting it to work properly takes some effort. The tool is often out-of-sync with current versions of ArcGIS. May be hard for sub-stewards to access licenses.
6. A number of agencies within states do not use the NHD. Often they have a hydrography dataset that meets their needs. Although these datasets may not be advanced and can be somewhat limiting, they meet current business needs. Often a lot of legacy data is tied to these datasets that would be difficult to transfer to the NHD. There are various reasons for not adopting the NHD ranging from issues with the model, lack of flexibility, and difficulty improving the NHD. States sometimes have multiple hydrography datasets being used in the state. This duplicates effort, discourages sharing of data, and leads to stovepiping of programs. Many states do not have central geospatial data policies.
7. States have difficulty getting the resources and funding necessary to make stewardship work. Often the necessary investment to do stewardship is beyond reach. This obviously has to do with state budgets, but it also has to do with business models in state agency operations that do not permit the necessary structuring for the needed resources.
8. The NHD model needs to be more flexible. The needs of hydrography users are varied and are dynamic. The NHD could be more adoptable if it could better accommodate user needs. These range from more FCodes, identifiers, route systems, networking, HEM capabilities, and alternative links to other data. A simple model can make high volume editing more successful.
9. A more sophisticated navigation capability is needed in the NHD. The Utility Network Analyst capabilities are too basic for much of the scientific analysis that is needed in hydrography studies. The navigation system needs to be flexible to handle a wide variety of unique problems.
10. Accompanying the NHD must be a suite of applications, application developers, and consultants to help customers put the NHD to work. The USGS attitude is that they just provide the data and

it is up to the user community to figure out the applications. By addressing applications, the USGS could not only help states produce more effective science, it could also help promote and encourage the use of the NHD.

### **Datum Shift Update Program** by Ariel Bates

Wyoming is currently being reviewed for possible datum errors and corrections are being made. Colorado is currently undergoing updates. States that have been inspected and corrected include; Oregon, Nevada, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Tennessee, Kentucky, Ohio, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Texas, Oklahoma, Kansas, North Dakota, Montana, Idaho, New Mexico, Arizona, California and Washington. It has been found that 0.2% of quadrangles in the NHD require a datum correction fix.

### **NHD Image Update Program** by Ariel Bates

In an effort to inspect and correct major changes to hydrography; Kentucky, Kansas, Oklahoma, Tennessee, Minnesota, Pennsylvania, Texas, Virginia, Indiana, Iowa, North Carolina, Delaware, Wisconsin, Michigan and Vermont have been photoinspected and corrections made. States currently being corrected include Minnesota, New Mexico, Georgia and Arizona. Multiple other states are currently being photoinspected.

### **Obtaining Dams from the NHD**

The USGS has a continuing program to index the nation's dams to the NHD. This means snapping the dam to the NHDFlowline that drains the NHDWaterbody impounded by the dam, and deriving its network address. The network address aides in analytical studies of water systems. This process requires that the dam be positively identified by photointerpretation and connected to the nation's water network. Many scientist find this a considerable improvement over other dam databases. The dams database in the NHD is refreshed every week and can be obtained as a personal or file geodatabase at:  
<ftp://nhdftp.usgs.gov/DataSets/National/>

### **Rivers From Space**

This comes to us from Wired.com: "Rivers connect Earth's mountains and lakes to its oceans, creating lifelines that provide water, food, transportation and recreation along the way. Some rivers, like the Nile, bring life to barren landscapes that would otherwise be uninhabitable. Others, like the Mississippi, defy our best efforts to tame them. Rivers carve their way across the continents, some becoming ever more entrenched while others meander freely across the surface. The myriad paths they carve make patterns that are best seen from above. In this gallery, we've collected images from satellites and astronauts of some of the longest, twistiest, most beautiful and interesting rivers in the world." See:  
<http://www.wired.com/wiredscience/2010/03/gallery-rivers/>

### **Feature Catalog – Fun Facts** by Keven Roth

**INUNDATION AREA** - An area of land subject to flooding.

Inundation Areas generally represent the area that lies between the normal operating level of an impounded lake/pond and the highest possible level of the impoundment. Inundation area is usually dry. Because of that, other features within inundation area are collected as if the inundation area were not there. It is not always easy to delineate impounded lake/ponds and associated inundation area. USGS

“topographic instructions” probably have more pages of descriptions for this than for almost any other features. On the 1:24,000-scale topographic maps, impounded lake/ponds were delineated based on “normal pool” or the “spillway elevation” depending on how stable the water elevation was. The agency that managed the impounded lake/pond was contacted for this information. Because the maps were originally created using stereo photographs, the normal pool or spillway elevation was delineated as the edge of the lake/pond, *regardless of the water level in the photos*. Inundation areas were delineated for most large impounded lake/ponds and were collected based on the elevation of the highest controlling structure. During NHD revision by data stewards, if elevation data is not available, and the impounded lake/pond already exists in the NHD, we recommend data stewards not revise the delineation, even if the water level looks different on an orthoimage. Impounded lake/ponds can be used for flood control, water supply, irrigation, and power generation, and water levels can vary several feet a day. It is often more useful to delineate the lake/pond at a stage that can be maintained over time. Otherwise, the lake/pond would have to be revised every time a new photograph is taken. With the addition of the National Inventory of Dams to the NHD as point events, information on dams and impoundments, including water levels, is readily accessible. Inundation area is also used for smaller impoundments that do not usually contain water, but may be flooded infrequently, such as areas behind debris dams. These types of inundation areas are defined as “controlled” inundation areas. Controlled inundation areas require an elevation defined as “flood elevation” in the NHD. In extremely flat coastal areas where the coastline varies with meteorological conditions like wind, the area between mean lower low water and the extent of flooding may be collected as “uncontrolled” inundation area. These areas are not common in the NHD and were generally identified by NOAA

### **New Video on The National Map**

The USGS has produced a new video that tells the story of The National Map. It highlights hydrography with comments presented by Tommy Dewald of the EPA. Also joining Tommy are testimonials from Jack Dangermond of ESRI and Allen Carrol of National Geographic. You can see the video at <http://www.youtube.com/watch?v=ISzUIINb4o>.

### **New Intern at USGS**

Michael Tinker is interning at the USGS for the spring 2010 semester, specializing in hydrography. He has a previous BA in Philosophy from Colorado State University, an AA in Technical Communication from the University of Washington, and a BA in Biology with a minor in Education from the Metropolitan College of Denver. He is currently working towards an MS in Environmental Science with GIS certification from University of Colorado Denver. His internship duties include creating a hydrographically accurate map of the conterminous US, and mapping major pipeline and canal diversions of the Colorado River. Michael’s career aspiration is to perform Geographic or Environmental Science, specifically related to hydrography or water resources in the service of the US Government.

### **NHD Photo of the Month**

This month’s photo was submitted by Jeff Simley. It shows Cherry Creek, a natural stream that has been heavily engineered all along its original route through the city of Denver. Cherry Creek is paralleled by a heavily used hiking/biking path that links downtown with a number of Denver neighborhoods. One of the main functions of Cherry Creek is to act as a stormwater artery for the majority of Denver’s water and snowmelt runoff. Cherry Creek drains into the South Platte River, which flows into the Platte, which flows into the Missouri River that flows into the Mississippi River. Therefore, Cherry Creek is a Level 5 stream. The map showing where the photo was taken was created by Kathy Isham. To see the photo of the month go to <ftp://nhdftp.usgs.gov/Hydro/Images/CherryCreek.pdf>. To submit your photo for the NHD Photo of the Month, please send it to [krisham@usgs.gov](mailto:krisham@usgs.gov).

## February Hydrography Quiz / New March Quiz

Al Rea, a hydrologist with the USGS Idaho Water Science Office, was the first to correctly guess the February hydrography quiz as the Des Moines Lobe in Iowa. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography55.pdf>. Al stated "That looks like the Des Moine Lobe, a glacial feature. The town and river bear the same name. I suppose geomorphologists would say the terrain, having been very recently glaciated, has not had time to develop as much drainage structure." According to the Iowa Department of Natural Resources "The last glacier to enter Iowa advanced in a series of surges beginning just 15,000 years ago and reached its southern limit, the site of modern-day Des Moines, 14,000 years ago. By 12,000 years ago, the ice sheet was gone, leaving behind a poorly drained landscape of pebbly deposits from the stagnant decaying ice, sand and gravel from swiftly flowing meltwater streams, as well as clay and peat from glacial lakes. Today, broadly curved bands of ridges and knobby hills set among irregular ponds and wetlands punctuate the otherwise subtle terrain of this freshly glaciated landscape."

Others with the correct answer were (in order received): David Straub, Tom Denslinger, and Matt Rehwald

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography56.pdf>. "Soon after the beginning of the 20th century a group of visionaries saw the potential benefits of converting the swamps into an area that would be suitable for habitation. They knew if they drained the swamp the soil beneath the water would be some of the richest soil in the nation for farming. There had been talk around 1900 about draining the land. Finally, in January 1905 a meeting was called to discuss how the project could be completed. At this meeting the ground work was laid for undertaking what soon would become the largest drainage project in the United States. A plan for construction of an elaborate network of drainage ditches, canals, and levees was devised and eventually carried out." Where is this and what was the name of the project? Send your guess to [jdsimley@usgs.gov](mailto:jdsimley@usgs.gov). Thanks to Craig Johnston for the idea for this quiz.

## Upcoming NHD Training

April 13 - 14, 2010: "HEM 2 Day Classroom": Denver, CO, Contact [HEM@usgs.gov](mailto:HEM@usgs.gov), registration information at <http://nhd.usgs.gov/tools.html#hem>

May 18, 2010: "HEM Basics": WebEx, Contact [HEM@usgs.gov](mailto:HEM@usgs.gov), registration information at <http://nhd.usgs.gov/tools.html#hem>

June 2 - 4, 2010: Conflation, Manhattan, Kansas, Contact Tim Hines ([thines@usgs.gov](mailto:thines@usgs.gov)) or Ingrid Landgraf ([imlandgraf@usgs.gov](mailto:imlandgraf@usgs.gov))

June 10, 2010: "Advanced HEM Functions": WebEx, Contact [HEM@usgs.gov](mailto:HEM@usgs.gov), registration information at <http://nhd.usgs.gov/tools.html#hem>

June, 22, 2010: Applications, New York City, N.Y., Contact David Anderson ([danderson@usgs.gov](mailto:danderson@usgs.gov)) (This event subject to change)

August 4 - 5, 2010: "HEM 2 Day Classroom": Denver, CO, Contact [HEM@usgs.gov](mailto:HEM@usgs.gov), registration information at <http://nhd.usgs.gov/tools.html#hem>

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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.