

USGS National Hydrography Dataset Newsletter  
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by Jeff Simley, USGS

### **Geodatabase Conversion**

The Nation's hydrography community is anxiously awaiting the conversion of the NHD to Geodatabase to take advantage of the most recent developments in GIS technology. So exactly when will the NHD be converted? The best guess right now is that National coverage will be available in January. There are five modules that must be operational for the conversion to happen; (1) data loading, (2) data distribution, (3) data validation, (4) web functionality, and (5) server configuration. All of these are nearly complete, but not quite ready to become operational. Look for an update in the next NHD Newsletter and periodically check the NHD website <http://nhd.usgs.gov> for information.

### **Update on High Resolution Status Web Site**

The NHD status website <http://rockys44.cr.usgs.gov/nhdgeo/viewer.htm> is normally operational. Some people have reported problems, but these are exceptions resulting from server performance. We are working to improve reliability. Also try <http://ssgic.cr.usgs.gov/statgraph/viewer.htm>, which has been developed to provide information on all USGS geodata. You will need to zoom in to see the subbasins.

### **Stewardship of the National Hydrography Dataset**

The USGS has long understood that a geospatial database is not a durable good. It depreciates with time, steadily losing value. This is caused by (1) the changing landscape, progressively making the data snapshot out-of-date, (2) user demand for better resolution and accuracy, and (3) advancements in database technology. The people who designed the National Hydrography Dataset realized that the huge investment made in producing the data could not be sustained indefinitely in a cycle of constantly replacing obsolete data. To preserve and even enhance that investment, they saw the need to (1) create a data model designed for maintenance tasks [disconnected editing, transactional updates], (2) create efficient tools to make maintenance easy [NHD Edit Tools], and (3) create a mechanism to manage the maintenance program. This later facet has evolved as the NHD Stewardship Program. A data steward has a vested interest in the quality of the data in their geographic area and takes the responsibility to maintain that data to a standard serving all users. They can authoritatively adjudicate updates and changes because they have the knowledge and skills about the data and the geography it represents. They will have a long-term interest in the data, be responsive, and will have the resources to serve on behalf of all users. Because the maintenance of the NHD will be a huge task requiring specialized knowledge, it must be distributed throughout the user community in a partnership of stewards. The primary task of the USGS will be to support and coordinate stewardship with most of the hands-on work being done by the local users. In some cases a single agency will conduct all stewardship duties. In other cases multiple agencies will share in the workload, perhaps concentrating on different aspects of the data, but then funneling their work to a primary steward who will provide a review and submit transactions to the database for all users to share. In the end, the USGS will provide quality assurance by monitoring the program, but not necessarily quality control of the individual transactions.

The data steward for the medium resolution NHD for the Nation is the Environmental Protection Agency. For the high-resolution NHD, states will often serve as the steward. In Kentucky this will be the NHD oversight committee of the Geographic Information Advisory Council <http://giac.ky.gov/>, or in Utah, the Automated Geographic Reference Center <http://agrc.its.state.ut.us/>. Similar efforts will take place in Wyoming and Montana. In Alaska, the federal/state Alaska Geographic Data Committee will provide statewide stewardship although the actual work will be done in member agencies. In Florida, the St.

John's Water Management District will provide stewardship for part of the state while other water management districts will cover the rest of the state <http://www.florida-water.com/waterlinks.htm>. In California, it is likely that a number of local stewards will come forward due to the many individual agencies interested in the NHD. The U.S. Forest Service at all levels will be an active part of stewardship, but individual Forests and Ranger Districts are more likely to be the primary stewards rather than the USFS as a whole. The NHD stewardship is most logically done at the hydrologic unit level, such as the subbasin. However, political jurisdictions such as states, counties, or National Forests are often more practical and thus many subbasins may be split and shared as they cross boundaries. Specific interest in the NHD stewardship program needs to be determined and a registration process established. To register as a steward an agreement such as a Memorandum of Understanding will exist between the steward and the USGS. In some cases this will be done through an established cooperative agreement for *The National Map*. The USGS will not provide funding for stewardship except in unique circumstances. Stewardship is the responsibility of the user community. The role of the USGS is to facilitate the availability of the NHD and it is the role of the user community to adopt the NHD and become its owner. The USGS will assume stewardship responsibility if local users do not participate.

NHD stewardship should not be a major task for general applications of the data and it is not intended that stewardship be a highly involved process. There may be an initial flurry of activity to review the data, make it current, and correct any errors, but after this, stewardship should be a low-key operation. For some users with very demanding applications, however, considerable effort will be made in maintenance. In Vermont, for example, an ongoing effort is being made to provide a consistent representation of hydrography at 1:5,000-scale. This is being done using State resources to conduct photointerpretation of high-resolution imagery. Many users will likely pursue similar activities now that new imaging technologies are coming on line. Other users will have other needs. In Florida, for example, large efforts may be expended to better understand flow, sometimes resulting in new connectors being added to the data to establish flow where it is currently not mapped. In the western United States, canals and ditches are extremely important and will require that flow be added. In Albuquerque, NM, for example, half of the flow of the Rio Grande River is channeled through canals, which currently do not have flow encoded. Although users will want to add considerable amount of information to the NHD, the basic model and standards should remain unaltered. Any ancillary information to the hydrography can be incorporated in event themes and tables. Most changes to the NHD itself will likely involve the geometry and network flow. Computed attributes such as stream level are not revisable and instead will be corrected in periodic recalculations. Attribute revisions such as perennial/intermittent classifications will likely be maintained in event tables. In order to make revision efficient and consistent, the USGS and its partners will provide robust editing tools, standards, recommended practices, and regularly host training sessions.

The web will likely be the primary interface for information on stewardship. Currently, the USGS NHD status page (above) information icon provides the name, phone and email of the entity responsible for maintenance. At least in the initial stages of the program, this will provide contact information for NHD stewardship. The fields are currently populated with USGS points of contact until actual stewards are registered. The USGS will likely provide a web site to provide a central focal point for stewardship activities. Ideally, data stewards should have their own web site to publicly report local activities. A good example of how this may be done in relation to *The National Map* can be found at the Delaware DataMIL <http://datamil.udel.edu/>. Here stewards and users are able to direct their comments on hydrography and register pertinent information.

The completion of the medium-resolution NHD and the current production of the high-resolution NHD for much of the country are prompting strong interest in the need to secure a strong future for the dataset. The USGS, its partners, and the user community can respond by ensuring the long-term viability of the data through stewardship.

## **Update on the NHD for Alaska**

It is now possible to download 93 out of 133 subbasins in Alaska. Of the remaining 40 subbasins, 25 are very close to completion, while 15 will take a little longer due to their very complex hydrography. The Alaska project should be almost complete by March with one or two stragglers taking a bit longer. The Alaska NHD is at 1:63,360-scale resolution and is archived in the high-resolution database. An active maintenance program is already underway by the Alaska Geographic Data Committee and the USGS to review and improve the data. See attached Alaska status map.

## **NHD Edit Tools and ArcHydro Training in Rolla**

The Mid-Continent Mapping Center hosted two ESRI Instructor-led training courses October 27-31; ArcHydro GIS for Water Resources and NHD Edit Tools. Dr. Dean Djokic lead developer of the ArcHydro tools at ESRI, taught both courses. (1) ArcHydro – GIS for Water Resources – This course is geared toward support of water resources applications in the ArcGIS environment. Arc Hydro is built on the geodatabase design, which is the next generation data model in ArcGIS. The NHD data model is also moving toward ESRI's geodatabase design. ArcHydro provides a standardized way to describe hydrologic data. It also provides a means to visualize and model (geospatially and temporally) water resource information. (2) NHD Edit Tools – The U.S. Forest Service and the USGS contracted to ESRI to develop NHD maintenance tools that are compatible with the geodatabase model. This course provided tools and hands on exercises for updating NHD data. These tools will be beneficial to users who will be maintaining the NHD. Participants in the course will be able to provide training to others as the need for maintenance increases. A total of 36 participants from throughout the USGS attended the courses held in Rolla, MO. Both courses will benefit the NHD program through increase use of NHD for applications and by providing tools to partners to maintain the NHD. In the future, the USGS will conduct similar training for the user community.

## **NHD Production in Fiscal-Year 2003**

The NHD partnership produced 616 high-resolution subbasins in Fiscal-Year 2003 running from Oct. 1, 2002 through September 30, 2003. That brings the total to 1,027, about halfway through the program.

## **Attached Status Table**

The [attached status table](#) lists all subbasins in the NHD program. The status field "1" means that high-resolution NHD is planned, "2" means that high-resolution is in work, "3" means that high-resolution is complete, and "4" means that the original medium-resolution is available. A number of subbasins with a status of "2" are available for use, but do not have inter-subbasins connections complete, particularly in Texas and Utah.

## **Upcoming NHD Training**

December 4, Orlando, FL. Spatial Odyssey 2003. National Park Service. Half-day. Jeff Simley. <http://www.nps.gov/gis/odyssey/>

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