

### **U.S. Forest Service to Launch New Initiative**

The U.S. Forest Service (USFS) is launching a new \$1 million initiative in its campaign to complete the National Hydrography Dataset (NHD) over its lands. The exact number of subbasins and their location will be determined soon. A big factor in the planning will involve the availability of the substantial amount of source data needed to feed the NHD production process. A total of 883 subbasins are needed to cover Forest Service lands of which nearly 700 are complete. This leaves some 200 subbasins to go, although not all of these will be completed as a result of the new effort. Much of the program thus far has been accomplished through an extensive partnership program between the Forest Service and the U.S. Geological Survey (USGS), and additionally involving dozens of states. The Forest Service has also produced 137 subbasins by contracting to Titan Systems Corporation (see Vol. 1, No. 10). The second phase will rely exclusively on contracting by the Forest Service. The USGS hopes to contribute to the Forest Service program through data archiving, the production of an undetermined amount of source data, and new production co-sponsored by other agencies. Just as the first phase served as a catalyst to launch an additional wave of projects by other agencies, this second phase will also likely serve as an impetus to agencies to fill in remaining gaps. With 40 percent of the Nation's subbasins in its program, spanning from Alaska to Florida, the Forest Service is primarily responsible for turning the high resolution NHD program from a series of USGS co-sponsored state initiatives into a truly national effort.

### **NHD and the U.S. Forest Service NRIS-Water Module**

The aquatic module of U.S. Forest Service Natural Resource Information System (NRIS), known as NRIS-Water, is a database and set of applications designed to assist resource managers in performing functions that require aquatic resource information. The Water module is an agency-wide tool meant for use in planning, prescribing, implementing, and monitoring resource management activities. The targeted users for NRIS are decision makers, forest and district planners, and aquatic resource specialists who (1) work with a core set of aquatic information, (2) need a robust and friendly tool to manage aquatic data, (3) assemble data and produce analyses, resource characterizations and interpretations in support of Agency decision-making, (4) produce or use repeatable data and activity reports, and (5) share information about aquatic resources with other management agencies or the public. To make this work, a Forest Service GIS with a data dictionary is needed to provide a core set of geographic data that are collected according to a common agency-wide standard. A standardized linkage structure will exist between geographic features in the Forest Service GIS and the tabular data about the features stored in agency relational database management systems. The U.S. Forest Service has chosen the National Hydrography Dataset to serve as the source for geographic features in this data dictionary. The NHD provides a consistent data model for hydrography used by many federal and local agencies in partnership. Important characteristics of the NHD include (1) ease of sharing data, (2) use of the linear referencing model, (3) stewardship to keep the data current and accurate, and (4) ease of incorporating USFS resource data on streams and lakes into *The National Map* and Geospatial One-Stop. To better serve the Forest Service, the NHD model has been extended to incorporate local features that may not be applicable to the national dataset. NHD data stewardship allows the Forest Service to have an active role in updating the NHD in coordination with local partnerships.

### **New NHD Editing Tools from the U.S. Forest Service**

The U.S. Forest Service has sponsored the development of a new toolset for the update and maintenance of the NHD. This will be a valuable asset for the many organizations throughout government and

industry that now use the NHD. These land and resource management agencies are more familiar with the current state of the hydrography than the original data producers. They are finding that spatial and attribute edits are necessary to record unmapped features on the landscape affecting the flow network. Recognizing the need for a more robust editing tool for its users, the U.S. Forest Service and the U.S. Geological Survey contracted with Environmental Systems Research Institute for the development of new tools in order that new Geodatabase technology could be utilized. A two-day training session was hosted by the USFS to unveil the NHD Geodatabase Edit Tools and provide a “train the trainer” class so that expertise can be spread to other organizations and to provide needed feedback to the ESRI developers. In the future, USGS and USFS trainers will hold additional seminars for the user community. Users will be able to perform editing, which is later reviewed by a data steward to ensure that the integrity of the NHD is maintained. Minimum system requirements to use the toolset include ArcGIS 8.3 and .NET framework library. This library is available for free from Microsoft. The interface, called the Editor’s Assistant is a user-friendly interface and steps through the editing process. The NHD Geodatabase Edit Tools allow (1) spatial edits including creation of new features, (2) edits to the network flow (flow errors are handled in an error table), (4) edits to feature attributes, and (5) metadata updates. Before cooperators can begin to use the tool, a mechanism must be in place to dispense permanent database identifiers and reach codes. Some development work remains. Future NHD Newsletters will note upcoming training sessions.

### **What’s New With the NHD In Geodatabase?**

The NHD keeps getting better and better. Find out what the developers of the NHD in Geodatabase are doing to make your life easier. Learn about the Reach Application, New Attributes, Multi-Scale Data, the Flow Model, Metadata, and Simplified Content by going to: [http://nhd.usgs.gov/summary\\_changes.html](http://nhd.usgs.gov/summary_changes.html). Keep in mind that the good old NHDinArc will still be around, but some design aspects will change as a result of the new Geodatabase design.

### **Geodatabase Extract**

With Geodatabase your options will be expanded for extracting the NHD for download to your GIS. You will be able to extract by the subbasin [eight-digit code] hydrologic unit as currently offered, but also by: (1) USGS quadrangle tiles, (2) Federal lands, (3) counties, (4) computer screen area, and (5) Congressional districts. As it becomes available from the Watershed Boundary Dataset, you will also be able to extract by smaller hydrologic units such as the (1) watershed [10-digit code], and (2) subwatershed [12-digit code]. Also in the future, you will be able to extract by your own custom polygon. With these new extract polygons, any feature crossing the polygon perimeter will be included in full and not clipped. Additionally, the personal geodatabase will include a geometric network with flow direction. Due to bandwidth and processing capacity limitations, the personal geodatabase extracts will be limited in size. The exact size of this limitation is still being evaluated. If you exceed this limit, you may have to make multiple requests. The USGS will also support ArcSDE extracts by special request. Although you will still be able to download NHDinArc, it will only be available by subbasin and it will require a separate extract request.

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

Two new websites are available to check on the status of the high-resolution NHD. These have been developed to make it easier to orient your query to the landscape and to incorporate new geodatabase characteristics. Along with the subbasin outline and number, you can see the terrain, roads, and state boundaries. Go to: <http://rockys44.cr.usgs.gov> and click on nhdgeo. The second site is more oriented for public inquiries. Go to: <http://statgraph.cr.usgs.gov>, zoom-in to general area of interest, click on layers and then NHD. New status categories will be: yellow – medium resolution available, blue – high resolution planned, green – high resolution in-work, and red – high resolution available.

## **Transactional Updates**

Editing will become increasingly important to the NHD as data stewardship begins and consequently change management will play a critical role. As pioneered by the NHD, change management can be more effective through transactional updates, which replace only the feature being updated rather than a geographic block of data. If a user wants to change the course of a stream segment, or change a name, only that specific change is reported back to the main database. There are two types of transactional updates, (1) tracked changes, and (2) disconnected edits. With a tracked change, the edit application captures the change when a user makes an edit. The application packages the change as a transaction when the updates are transmitted to the main database. This form of transaction is already supported in existing NHD systems, but requires custom software to support the change tracking. These tracked changes will also be supported within the ArcGIS NHD Editor (above). With a disconnected edit, available with geodatabase data in ArcGIS 8.3, the edit is tracked by ArcMap and does not require custom application software to capture the change. The NHD geodatabase systems will support disconnected edits shortly after the release of the geodatabase data. The USGS and the USFS are also investigating the application of transaction exchanges to synchronize NHD holdings within each agency.

## **Louisiana Workshop**

A three-day NHD Workshop was held at the NASA/University of Louisiana Regional Applications Center - Lafayette (RAC) August 26–28. Representatives from the Louisiana Environmental Quality, Louisiana Department of Transportation, National Wetlands Research Center, Natural Resource Conservation Service, and RAC were in attendance. Attendees suggested additional workshops in Introduction to the NHD, NHD Applications, and NHD Problem Solving. The Workshop generated cross agency communication, greater understanding of the NHD datasets and tools, as well as their applications, and fostered the creation of a Louisiana NHD user forum through the USGS Louisiana Map Partnership Office. Participants are looking forward to the completion of the high-resolution NHD for the entire state.

## **Geodatabase Conversion**

The conversion to Geodatabase is still scheduled for November.

## **Upcoming NHD Training**

October 2, Denver, CO. GIS in the Rockies. All-day. Jeff Simley

October 8, St. Paul, MN. Minnesota GIS/LIS Consortium. Half-day. Terry Bixby and Jim Ellickson

October 20, Missoula, MT. USFS Region 1 Geospatial Conference. All-day. Greg Enstrom

October 27, Jackson, WY. Southwest User's Group (ESRI). Half-day. Jeff Simley

October 27-31, Rolla, MO. Edit Tools Training for USGS. Dean Djokic.

October 30, Ironwood, MI. USFS Region 9, Ottawa NF. Half-day. Brian Sanborn

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