

USGS National Hydrography Dataset Newsletter
Vol. 3, No. 5, March 2004
by Jeff Simley, USGS

The Geodatabase Conversion

The National Hydrography Dataset (NHD) in the Geodatabase model is expected to be available on April 19, 2004. This includes all the NHD produced as of January 30 in all three resolutions. The NHD produced since January 30 will become available in the later half of April. To check on actual availability go to <http://nhd.usgs.gov> and look for the NHD in Geodatabase announcement. You will also see a link to the NHD in Geodatabase that will enable you to begin downloading data. You will have two sets of options for downloading: (1) download the medium, high, or local resolution data, and (2) download data in the Geodatabase model, known as NHDinGEO, or the Arc model, known as NHDGEOinARC. You also have a third option to download the NHDinARC. This is the original NHD model used before January 30, which is being saved for legacy applications. Since the central repository for the NHD is in Geodatabase, and since the model has undergone some fundamental changes, the new NHDGEOinARC format is being implemented to allow ArcInfo and ArcView users to take advantage of new data and new model changes. The primary data format, the NHDinGEO is to be used with ArcGIS 8.3 and higher versions.

Viewing and Downloading the NHD

The link to the NHD will display a map of the United States. You can get a sneak preview by going to <http://nhdgeo.usgs.gov> although the download capability is temporarily turned off. From here you need to zoom in to your area of interest for data layers to start becoming active. As you begin to zoom in, the subbasins will appear. You can turn on the NHD Status early in the zooming process to find out what data is available. The Identify function can be used to display more information on the subbasin. Ancillary reference data will be available as you zoom to help you orient yourself on the landscape. The first is shaded terrain, then roads, orthoimagery, Digital Raster Graphics, and others. You can choose which data to display. Look under Base Map for more options. If you zoom in far enough you can begin to view the NHD data directly in the Geodatabase by choosing the appropriate resolution. Once you have clicked on the resolution, you have a choice of five feature classes to select from. Typically you will want to make the NHDFLOWLINE and NHDWATERBODY visible to give you a general view of the hydrography. By making one of the five feature classes active, you can use the Identify function to look at the attributes associated with the feature, e.g. find out the name of a lake. Be sure to click on Legend at any time to view the symbology. If you want to extract data to load into your GIS, click on Hydrologic Units and make Subbasins active. Then use the Polygon Extract to draw a polygon over a portion of your subbasin of interest. A new menu will appear asking for the proper data resolution and whether you want the NHD in Geodatabase (NHDinGEO) format or the Arc format of the Geodatabase data (NHDGEOinARC). You will also need to give your email address. The system will extract your subbasin of data and email notification that you can download the file from an ftp site. This should only take a few minutes, but could be longer depending on the system load at the time. If you want another type of polygon rather than the subbasin, simply make that theme active, such as county, and again use the Polygon Extract.

Using the NHDinGEO

The zip file you download will be labeled "NHD" followed by a transaction number. After using WINZIP Extract you will have one file with the same name, but a ".mdb" extension. This is a personal geodatabase which is basically an Access file containing many tables. Simply start ArcMap and check on an "Empty" map. Then click on the "Add Data" icon, navigate to your directory in the pop up window, and click on your .mdb file and then "Add." You will then get a listing of your tables. Click on

“Hydrography” and then “Add.” You will then see a map of your NHD and on the left margin you will see a list of six feature classes, including Hydro_NET_Junctions on top. Click on the check mark to turn off this theme to unclutter the map. Your first point of interest will be the NHDFlowline and NHDWaterbody feature classes, so turn off the remaining three feature classes. The other three: NHDPoint, NHDLine, and NHDArea, will give you map feature information, which you can add later for more detailed analysis. It will be useful to turn on certain Toolbars under the View category to aide in using the data. You can use the Identify function to view the attributes of a particular feature by clicking on a feature in the map. Note you will find the ReachCode and ComID identifiers, perhaps a GNIS_Name, a Length/Area, a Feature Type and Feature Code attribute, the time of feature creation, and the resolution. The NHDPoint, NHDLine, and NHDArea do not have reach codes. Note that a double-line stream area extent is found in NHDArea rather than NHDWaterbody. You can change symbology by double-clicking on the symbol. Then turn on Utility Network Analyst under Toolbars in View. This now allows you to perform simple navigation. Click on the Add Junction Flag icon and select your start navigation point on the map. In NHDinGEO, the NHDFlowline is the network. The navigation utility works from junctions, so be sure to place your flag near a junction. The flag will then snap to the nearest junction. Then go to the Trace Task and select an option. To start, try Trace Upstream. Then click on the icon to the right to execute. You should see all upstream paths highlight. You can Clear Results and Clear Flags under Analysis. Then try Trace Downstream. You will note that navigation is extremely fast and simple, but will soon find that the navigation options are not as complete as NHD Navigate in the old model. This will require development. Keep working with the data and exercise as many commands as you can to get used to what you can and cannot do at this stage of development.

Using the NHDGEOinARC

After you extract the zip file you will find a folder named “8-digit subbasin”+”geodatabase resolution”, e.g. 10080001GM. The “G” stands for Geodatabase and the “M” stands for Medium Resolution. An “H” will stand for High Resolution, while an “L” will stand for Local Resolution. Inside this folder you will find the familiar NHDinARC type files. Go to ArcView 3.x, use the NHD Load/Unload Workspace extension, and use Load NHD workspace. You might get the dreaded Segmentation Violation warning, but it should still work. The same themes you are used to will appear and the data will display. A look at the fields in the themes reveals a few changes, most notably to the “drain” theme, which looks similar to the NHDinGEO NHDFlowline Feature Class. Don’t be surprised if other NHD Tools do not work. They will be modified in the near future to accommodate the changes to the Arc model found in NHDGEOinARC.

The NHD in *The National Map*

The hydrography theme of *The National Map* will display the NHD very similar to what you see in <http://nhdgeo.usgs.gov>. The hydrography theme is essentially a direct reflection of the NHDinGeo.

High Resolution Status Web Site

To find out the status of NHD production, go to <http://nhd.usgs.gov>. Click on Data and then NHD Status Map, or just click on: <http://webhosts.cr.usgs.gov/nhdstatus/viewer.htm>. You can also use <http://nhdgeo.usgs.gov> and use the options described under Viewing and Downloading the NHD. The March status will be updated on April 6.

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Thanks to Paul Wiese and Sandy Piksa.

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