USGS National Hydrography Dataset Newsletter
Vol. 3, No. 2, December 2003
by Jeff Simley, USGS

NHD Data Availability

The upcoming conversion of the National Hydrography Dataset (NHD) to the Geodatabase model will have no near-term effect on users who wish to obtain the traditional NHD-in-Arc model for data produced before January 15, 2004. Users can obtain this data by checking http://nhd.usgs.gov. This data holding will then be converted to the Geodatabase starting on February 1 and will be available to download in the Geodatabase model around April 1, baring any major malfunctions. Any new data completed after January 15 will not be available for download until the April 1 timeframe. The NHD web site and an upcoming Newsletter will provide the URL to obtain the NHD in the Geodatabase. The standard distribution format after April 1 will be in Geodatabase. After April 1, users can alternatively receive the NHD-in-Arc with a few extra mouse clicks and a short lag for processing. This data will be extracted from the Geodatabase model and thus some characteristics of the NHD will be changed to reflect a revised model. See http://nhd.usgs.gov/summary_changes.html for a list of changes. After April 1, all medium-resolution subbasins that also have high-resolution coverage will be deleted. This will result in a mixed-resolution NHD database with the highest resolution made available for each subbasin. Each subbasin will have the flow network joined to the surrounding subbasins as appropriate.

A User's Perspective on Using the National Hydrography Dataset

The NHD is currently being used by the National Park Service Water Resources Division to fulfill requirements which call for the development of a Service-wide water resources inventory attributed for Clean Water Act water quality standards and impairments. The NHD is used to generate hydrographic statistics while building the water resources inventory. In the process of using the NHD for this work, certain problems have been observed that may also affect other NHD users. One problem revolves around how to define which NHD water bodies are adjacent to the park boundary. Since hydrographic features can take complex forms, such as braided streams, multi-channeled polygonal waters, confluences, and straddling polygonal streams, several sets of geospatial rules ultimately had to be developed to define adjacency, somewhat complicating the work involved. This is a problem inherent in the geospatial portrayal of hydrography rather than with the NHD itself. Another problem developed while building the water resources inventory when it came time to define and count stream miles. Although "stream/river" is a feature type in the NHD, it is not inclusive of all streams. For the purposes of the water resources inventory, streams were defined to be the stream/river feature type plus those artificial paths located under polygonal streams and areas of complex channels. Counting stream miles, however, proved to be more problematic than simply defining streams. Artificial paths that create branches in polygonal streams and braids do not represent true stream miles. Parsing out centerlines from branches and braids, however, can be difficult. Where a branch transitions into a tributary can appear arbitrary and what constitutes a braid can be less than obvious in marshy and desert areas. Finally, using the NHD to build a water resources inventory has illustrated some of the peculiarities and idiosyncrasies in the NHD. For instance, rivers can appear disjointed if sections are digitized from source maps created decades apart from each other. Lakes sometimes show neat lines, a remnant of the source topographical maps, which complicates measuring shoreline miles and performing simple lake counts. The NHD has proven to be a valuable tool for building a water resources inventory, but there can be limitations. The USGS takes such concerns seriously, and in coordination with its partners, resolves as many problems as possible through enhanced database designs and improved techniques. A number of the problems described above, for example, will be eliminated in the new NHD Geodatabase model.

Measuring High Resolution Progress in Hydrologic Units

Last month we reviewed the hierarchal organization of hydrologic units and looked at the status of the basins, the parent to the NHD subbasin. This month we will look the 21 hydrologic regions, the largest hydrologic units, 18 of which subdivide the conterminous U.S. From the list below we can see the percentage of regions completed, or scheduled to be completed by next Fall. Hawaii, and the Caribbean are 100% complete, while Alaska will be completed in the June timeframe. The Upper Colorado will be 95% complete, needing just three more subbasins for complete coverage. On the other hand, the Lower Colorado will have only 21% completion. The Rio Grande, Mid Atlantic, Tennessee, South Atlantic-Gulf, Texas-Gulf, and California will additionally have over 75% completion. The Great Lakes, Missouri, and Arkansas-White-Red will be under 50% completion. Some regions can be completed without too much difficulty, such as the Tennessee, Rio Grande, and Souris-Red-Rainy, along with the Upper Colorado; while others, particularly the Missouri, have a long way to go.

Region	Region Name	Subbasins	Scheduled	Unscheduled	% Scheduled
01	New England	54	28	26	52
02	Mid Atlantic	96	78	18	81
03	South Atlantic-Gulf	198	148	50	75
04	Great Lakes	111	48	63	43
05	Ohio	120	84	36	70
06	Tennessee	32	25	7	78
07	Upper Mississippi	131	79	52	60
08	Lower Mississippi	82	44	38	54
09	Souris-Red-Rainy	42	26	16	62
10	Missouri	311	134	177	43
11	Arkansas-White-Red	173	81	92	47
12	Texas-Gulf	122	91	31	75
13	Rio Grande	70	58	12	83
14	Upper Colorado	62	59	3	95
15	Lower Colorado	85	18	67	21
16	Great Basin	71	37	34	52
17	Pacific Northwest	219	133	86	61
18	California	134	101	33	75
19	Alaska	133	133	0	100
20	Hawaii	8	8	0	100
21	Caribbean	11	11	0	100

High Resolution Status Web Site

The high-resolution NHD status can be found at: http://rockys44.cr.usgs.gov/nhdstatus/viewer.htm or you can try http://statgraph.cr.usgs.gov.

Thanks to Paul Wiese and John Christiansen (NPS).
Jeff Simley, USGS, assumes full responsibility for the content of this newsletter.