USGS National Hydrography Dataset Newsletter
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**Fifth Year of NHD Newsletter**

This issue marks the beginning of the fifth year of the U.S. Geological Survey NHD Newsletter. A newsletter has been distributed each month for the past four years keeping the NHD user community up-to-date on the latest developments in the program with a total of 122 pages of information so far. The newsletter is sent to over 300 people each month, and then is forwarded to many others.

**New York High Resolution NHD Complete**

With the completion of the Southern Long Island subbasin, full coverage of High Resolution NHD for the entire State of New York was achieved on September 9, 2005. The completion of New York involved several partnerships between the USGS and outside agencies including the New York State Department of Environmental Conservation (NYSDEC), the Pennsylvania Geological Survey, and the New Jersey Department of Environmental Protection. Work began on this statewide effort in 2001 as part of the Department Of Interior High Priority Digital Base Program, which began to receive requirements for NHD in 2001. A workshare between the USGS and NYSDEC, Division of Water, in which each organization does a share of the work, soon followed and became a good example of the importance of partnerships in making the NHD possible. NYSDEC funded a significant portion of the 1:24,000-scale hydrography source collection as well as the NHD production. This initiative continues beyond the completion of the NHD and now has moved into the stewardship phase with NYSDEC performing work scoping and resource allocation for state-wide updates.

**NHDPlus Development Underway**

The development of the NHDPlus database is well underway with Region 17, the Pacific Northwest, already available and the 6 regions of the Mississippi River drainage system to be released in early 2006. This will be followed by the remaining drainage areas of the U.S. by late spring 2006. The NHDPlus is an initiative of the U.S. Environmental Protection Agency and the U.S. Geological Survey to add several parameters to the basic 1:100,000-scale medium resolution NHD. These parameters enhance the ability to perform hydrologic analysis by providing calculated values for network operations, reach drainage polygons, and reach flow estimates, amongst others. See the August 2005 edition of the NHD Newsletter for more details about this dataset. Look for additional information in future newsletters. To obtain the Region 17 data, contact ldm@horizon-systems.com.

**Plans for Local Resolution NHD in West Virginia**

The West Virginia statewide water resources working group is beginning development of a local resolution, 1:4,800-scale, National Hydrography Dataset for West Virginia. Local resolution NHD would ultimately map every surface water feature in the state at a high level of detail, while also providing a framework for many water resource applications. The local-resolution NHD will provide a highly detailed cartographic base map of rivers, streams, lakes and ponds that will correspond with the recent West Virginia Statewide Addressing and Mapping Board (SAMB) photography and street maps at the 1:4,800-scale. This will be invaluable in efforts requiring detailed water feature maps, such as emergency and floodplain management, water quality permitting, and many other projects at the local or municipality level. In addition to the use of local-resolution NHD as an important cartographic base layer, NHD forms a framework for modeling flow of water and pollutants throughout the stream network. The NHD can provide a mechanism for mapping and modeling point locations along streams (such as discharges or

water intakes) and properties of stream segments. The local-resolution NHD in West Virginia may provide additional detail on changes to stream drainage due to activities such as mining or construction that has not been previously captured. According to EPA estimates, up to 1,208 miles of streams (over 2% of all stream miles) in the multi-state mountaintop removal/valley fill study region (including large portions of southern West Virginia) have been lost or directly impacted by filling and mining activities. These stream alterations are not mapped in the current NHD for West Virginia (medium/high resolution) but would potentially be identified and more accurately mapped by the local-resolution NHD. Finally, the development of the local-resolution NHD for West Virginia is particularly important following the passage of the WV Water Resources Protection Act (SB-163) by the WV Legislature in 2004. This Act effectively claims the waters of the state as public natural resources for all citizens. The Act requires that the state quantify the "nature and extent" of its water resources as an aid in monitoring water usage and consumption. State agencies and institutions are also urged by the Act to provide relevant water resources information, and the development of the local NHD will directly further this effort.

The primary source of stream geometry for the local-resolution NHD will be hydrologic features mapped using stereo pair orthophotos by the SAMB project contractors. The West Virginia GIS Technical Center (WVGISTC) has assembled a list of likely partners and included these stakeholders in initial feasibility assessments. These include, but are not limited to: The Natural Resource Analysis Center, Canaan Valley Institute, WV Department of Environmental Protection, WV Department of Natural Resources, USDA Forest Service, U.S. Environmental Protection Agency, and the Federal Emergency Management Agency. Funding for the pilot project will come from the office of the West Virginia State GIS Coordinator. Future funding will most likely originate from a combination of federal grants and partnerships. USGS conflation and quality control routines will be used in order to actually create the local resolution NHD from source data. The conflation process transfers required information (such as stream coding and flow) from the high resolution NHD to the newly created local dataset. The final products from this project will include the newly created local resolution NHD, data standards for local NHD, and a framework for data stewardship. See http://www.wvgis.wvu.edu/stateactivities/lrnhd.html .

**The NHD at the Nature Conservancy**

The Nature Conservancy seeks to meet human needs for water while sustaining healthy freshwater ecosystems. The Conservancy's approach to this challenge is to advocate Ecologically Sustainable Water Management (ESWM) -- the compatible integration of human and natural ecosystem needs. The goal is to protect the ecological integrity of freshwater ecosystems while meeting inter-generational human needs for water and sustaining the full array of other products and services provided by freshwater ecosystems. TNC has developed a conceptual framework for achieving ecologically sustainable water management, which requires an improved understanding of ecosystem needs and human needs, and culminates in a management prescription that better sustains both objectives. Complex spatial analyses are key to this effort.

Setting priorities for freshwater biodiversity conservation across large geographic areas requires the collection and analysis of data and information using computer-based spatial analysis to identify priority areas for future conservation action. The data and information used for these analyses generally includes the location of specific target species or species assemblages acquired through sampling as well as through assessment of spatial information. Priority setting for any group of species, communities or ecosystems at a large geographic scale also requires techniques for narrowing the field of inquiry from all biodiversity found within a specific geographic region to specific species, communities, or physical features (e.g., geology, elevation, hydrography), or a combination of both biotic and abiotic features. The approach adopted by The Nature Conservancy uses data on physical and geographic features, combined with available information on patterns of native fish zoogeography, to establish ecological classifications across freshwater ecosystems. The tools and standards developed by the Conservancy are being used in

ecoregional planning throughout the Americas by The Nature Conservancy and by partner organizations such as World Wildlife Fund and the USGS Aquatic Gap Program. The Nature Conservancy uses a set of GIS tools for regional-scale ecological classification of streams and lakes. The tools can also be used to generate quality indicators (based on watershed characteristics) for those same streams and lakes. The tools will work with the National Hydrography Dataset and also with other datasets that satisfy certain requirements. The tools are intended for experienced GIS users, and function in ARC/INFO, ArcView, and MS Access. The latest version of the tools supersedes the previous version, which worked with the EPA's RF3 hydrography. For more information, see http://www.freshwaters.org/

**Answer to October Hydrography Quiz / November Quiz**

Mike Wiedmer of Alaska Fish and Game was the first to correctly name the location of last month's hydrography quiz (see ftp://nhdftp.usgs.gov/Quiz/Hydrography5.pdf ). Mike stated "The segment is part of Alaska's Susitna River. Trapper Lake is the large northwestern lake, drained by Trapper Creek which flows to Kroto Creek (locally called the Deshka River). The large eastern tributaries are the Kashwitna River and Willow Creek." This large river starts at Susitna Glacier in the Alaska Range and runs 260 miles southwest to Cook Inlet. Many different fish abound such as king, sockeye, coho, pink and chum salmon, rainbow trout, northern pike, grayling and whitefish. The Susitna discharges an average low of 7,026 cubic feet per second in March and an average high of 135,800 cfs in July with a drainage area of 19,400 square miles. The section of the Susitna River shown in the October quiz is a good example of a braided river on steroids. Braided rivers exhibit numerous channels that split off and rejoin each other to give a braided appearance. The number and location of the channels and small islands, known as braid bars, may change quickly. Braided rivers typically carry fairly coarse-grained sediment down a fairly steep gradient and the water discharge tends to be highly variable. Consequently, braided rivers usually exist near mountainous regions, especially those with glaciers. Braided channels are caused by erodible banks, an abundant supply of sediment, and rapid and frequent variations in stream discharge.

The November quiz is located at ftp://nhdftp.usgs.gov/Quiz/Hydrography6.pdf. Can you identify where this is? The inland blue lines and polygons are streams, lakes, and double-line streams, while the green polygons are marshes and orange lines are canals. The pink shaded areas are foreshore (tidal zones), the tucsan red lines are non-earthen shoreline, and the dark blue lines found in the large blue area are reefs.

**Upcoming NHD Workshops**

Olympia, Washington – January, 2006. Contact Sam Bardelson at stbardelson@usgs.gov.
Portland, Oregon – January, 2006. Contact Nancy Tubbs at ntubbs@usgs.gov.
Lafayette, Louisiana – February 15, 2006. Contact Pat O'Neil at pat_oneil@usgs.gov.
Phoenix, Arizona – March 2, 2006. Bureau of Land Management.

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