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By Jeff Simley, USGS

A Desktop Application to Assess the Sustainable Basin Yields and Surface-Water Resources in Massachusetts - Peter A. Steeves (USGS) and Stacey A. Archfield (USGS)
Federal, State and local water supply, regulatory, and planning agencies require easy-to-use, technically-defensible, decision-support applications that can be used to evaluate potential impacts of proposed water withdrawals, determine baseline streamflow conditions needed for sustainability of aquatic habitat, and estimate inflows to drinking-water-supply reservoirs for safe yield analyses at ungaged locations. Building on NHD and StreamStats (http://water.usgs.gov/osw/streamstats/index.html), a desktop application termed the Massachusetts Sustainable Yields Estimator (MA SYE), was developed to address these needs. The decision-support application estimates daily streamflow under natural flow conditions at any user-selected location – gaged or ungaged – on a perennial stream in Massachusetts. Estimated natural flows can be compared to a user-defined instream-flow target to determine sustainable yield – the amount of water available for withdrawal without adversely impacting the ecology. Users can also obtain information on any existing water withdrawals or discharges that may be affecting the streamflow at the site. In Massachusetts and around the country the application of NHD and StreamStats is expanding beyond the core functionality to provide a multi-purpose, decision-support foundation for a variety of applications.

NHDPlus Video Available
The video footage of the NHDPlus workshop held in Denver, Colorado on February 26-28, 2008 is now available in downloadable movie files on the NHDPlus Web site. Also available are the presentation slides. See http://www.epa.gov/waters and click on the NHDPlus quick link on the right side.

WATERS Lite Viewer - Randy E. Hill (EPA), Michael Plastino (EPA), Dwane Young (EPA), and James Rineer (RTI International)
The Watershed Assessment, Tracking & Environmental ResultS (WATERS) Lite Viewer, or WLV, is a lightweight, Web-based mapping interface and architecture that provides the framework and functionality to collect, review, and edit U.S. Environmental Protection Agency (EPA) spatial information. The WLV architecture leverages EPA's license to Microsoft's Virtual Earth (MSVE) platform, in combination with a collection of reusable Web services, to provide the best low-cost, high-reusability solution for specific EPA programs. The MSVE platform provides basic Web-based geographic information systems (GIS) viewer functionality at a fraction of the time and cost it can take to develop similar basic GIS viewer functionality with other viewer platforms. This cost savings, combined with a flexible, service-oriented (SOA) approach, including reusable web services for higher-level functionality, is the cornerstone for the next generation of internet-based GIS viewers.

WATERS Web services that can be easily used in conjunction with the WLV viewer include basics, such as the "Zoom to" feature, as well as more advanced functionality, such as the NHDPlus feature for indexing and catchment navigation. In addition, the WLV's design allows for any Web Map Service (WMS) services to be overlayed dynamically with no prerendering. EPA's Clean Watersheds Needs Survey (CWNS) WLV currently displays all of the NHDPlus lines and polygons on top of any of MSVE views, including 3-D mode. For EPA's STOrage and RETrieval (STORET)/Water Quality Exchange Program, the WLV design will be used as part of a formal CDX flow of monitoring station location and data. The purpose of the WLV for STORET/WQX is to help users visualize and quality check results from batch indexing STORET/WQX monitoring locations to NHDPlus. Users will be able to review results one at a time, jump to specific result(s), and manually correct indexing results. Other programs are considering using the WLV framework and/or the WATERS Web services for indexing to meet their program goals, including BEACHES and GRTS.

The benefits of using a WLV framework and the associated Web services include flexibility, low cost, and reusability. The flexibility of the framework allows programs to develop their own interfaces (map– or non-map–based), either in a bare-bones format or with many user comforts. The framework is low-cost and reusable in that it separates applications from direct connections to databases using a Web service layer, which greatly reduces long-term maintenance costs and troubleshooting. In addition, users of the Web service layer no longer need to be concerned about database changes as long as the database parameters do not change. The WLV framework is being explored for several additional EPA programs. For more information on the WLV framework, please contact James Rineer jrin@rti.org (919) 990-8435 or Randy Hill Hill.RandyE@epamail.epa.gov.

Illinois NHD Steward
A NHD stewardship agreement was recently signed for the State of Illinois. The USGS Illinois Water Science Center (IL-WSC) has agreed to take on the role of Primary Steward for the State. The office is located in Urbana, Illinois (http://il.water.usgs.gov/). For more information or questions about the NHD in Illinois, please send emails to: il.nhd@usgs.gov or call Jennifer Sharpe at: 217-344-0037, x3048.

New Hampshire and Vermont NHD Stewards
The New Hampshire and Vermont NHD stewardship agreements have now been signed. The steward for New Hampshire will be the New Hampshire Geological Survey. The steward for Vermont will be the Vermont Center for Geographic Information.

Memorandums of Understanding between state stewards and the USGS are now signed in 15 states (NH, VT, NY, PA, NJ, DE, FL, MI, IL, NE, KS, MT, ID, WA, OR) and pending in 8 states (NC, AR, LA, OK, TX, MN, WY, UT). Extensive information on stewardship agreements is available on the NHD Stewardship web pages at http://webhosts.cr.usgs.gov/steward/index.html. Click on the Agreement Status tab on the map to see who has signed and pending agreements, who the contacts are, and review the actual stewardship agreement for each state.

American Water Resources Association GIS in Water Resources Conference
The American Water Resources Association bi-annual conference on GIS In Water Resources was held in San Mateo, California March 17-19. The conference featured 230 papers. Here is a sampling of papers presented continued from the March and April newsletters.

A Geo-Referenced Assessment of the Niger River Basin – Georgette Koty discussed the effect of water shortages and floods in the Niger River basin where the population is 70% rural and very poor. A GIS is very fundamental to integrate data for analysis and is used for an inventory of water resources. A hydrography network was created that allows analysis of irrigation water supply, power potential, and water shortages. The network of reservoirs can be analyzed and studied to optimize water allocation through simulation and real-time operations.

Spatially Distributed Sedimentation Modeling in the Lake Lanier Watershed – Jitendra Sharma gave a talk on the Lake Lanier watershed on the Chattahoochee River that has been experiencing a drought with reservoir levels down 30 ft. It was pointed out that most reservoirs have a 50:1 ratio of drainage area to reservoir area, but Lake Lanier has a 14:1 ratio, resulting in a very long recharge cycle. The drainage area is about 1,000 square miles. An important issue is sediment load into the lake. The area within 30 meters of the contributing streams represents 2.6% of surface area, but is responsible for two thirds of the sediment load.

Using the NHDPlus in ArcHydro – Al Rea talked about importing the NHDPlus into ArcHydro to take advantage of the suite of tools available in ArcHydro. Al outlined a detailed process that is still very

manual, but could be automated. Other important ArcHydro functions are computing basin characteristics, computing longest flow path with slope, and creating a global database of upstream summary statistics. ArcHydro provides a standard data model in geodatabase, load-and-go tools, and a good platform for future development. Producing and distributing the result is not very easy. Therefore the recommendation is to concentrate on developing the underlying NHDPlus.

April Hydrography Quiz / New May Quiz

Bob Harmon, GIS Coordinator for the Oregon Water Resources Department in Salem, Oregon was the first to correctly guess last month's hydrography quiz as Galveston Bay, Texas ftp://nhdftp.usgs.gov/Quiz/Hydrography34.pdf. Bob oversees procurement and maintenance of the agency's spatial data, and its use in support of the agency's business. The OWRD administers the state's surface and ground water resources on behalf of its residents largely through a system of water rights. Bob is also Oregon's representative to the Pacific Northwest Hydrography Steering Committee, a Framework coordinating group with members from the State of Washington, and local and federal agencies in the region.

Others with the correct answer were (in order received) Al Rea, Jim Sherwood, Lee Galt, David Straub, Joanna Wood, James Ray, Ron Wencl, Jennifer Campbell-Allison, Ken Koch, Jared Bostic, Mark Solem, John Lynam, Bob DenOuden, Jory Hecht, Michael Smith, Thom DeGriselles, Roger Barlow, Gail Jackson, David Asbury, Tom Denslinger, Andrew Suppiger, Richard D. Patton, and Elaine Blok. Lee Galt adds – "The long island to the south is Galveston Island and the small island just above it at the inlet is Pelican Island. Houston/Baytown metroplex lies on the north and west edge of Galveston Bay where the San Jacinto River and Buffalo Bayou empty into it".

This month's hydrography quiz can be found at ftp://nhdftp.usgs.gov/Quiz/Hydrography35.pdf. Where is this? It is the confluence of two rivers from the west flowing into one going east. The transcontinental railroad heading west followed the main river until it reached this spot in 1866, choosing then to follow the south fork rather than the north. There is a town here named after one of the two branches. This small town is home to the world's largest railyard that processes 140 freight trains per day. Most railroads follow river drainages to take advantage of gentle and consistent gradients made possible by many thousands of years of earthmoving erosion. Send your guess to jdsimley@usgs.gov.

Upcoming NHD Geo Edit Tool Training

June 18-20, Little Rock, AR, Contact Tim Hines thines@usgs.gov or Katy Hattenhauer hattenhauer@adeq.state.ar.us

Upcoming NHD Applications Training

June 4, Ottawa, Ontario, GeoTech Event 2008, see http://www.geoplace.com/ME2/Default.asp
Aug. 12-15 Monterey, California, and possible other California locations, contact Carol Ostergren at costergren@usgs.gov
Sept. 16-17, Portland, Oregon, contact Sheri Schneider at sschneid@usgs.gov
Sept. 18, Lacey, Washington, contact Allyson Jason at ajason@usgs.gov
Oct. 7 and 8, Boise, Idaho, contact Scott Van Hoff at svanhoff@usgs.gov
Oct. 21, Laramie, Wyoming, SouthWest User's Group, contact Paul Caffrey at Caffrey@uwyo.edu

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The NHD Newsletter is published monthly. Get on the mailing list by contacting jdsimley@usgs.gov.
You can view past NHD Newsletters at http://nhd.usgs.gov/newsletter_list.html
Jeff Simley, USGS, assumes full responsibility for the content of this newsletter.