

Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence

EPA is announcing the release of the report, *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence (External Review Draft)*, for public review and comment as announced in a [August 24, 2013 Federal Register Notice](#). This draft science report presents a review and synthesis of relevant peer reviewed scientific literature that will inform an upcoming joint USEPA/Army Corps of Engineers rulemaking to enhance protection of the chemical, physical, and biological integrity of our nation's waters by clarifying Clean Water Act (CWA) jurisdiction. Recent decisions of the Supreme Court have underscored the need for EPA and the public to better understand the connectivity or isolation of streams and wetlands relative to larger water bodies such as rivers, lakes, estuaries, and oceans, and to use that understanding to underpin regulatory actions and increase certainty among various CWA stakeholders. This report, when finalized, will provide the scientific basis needed to clarify CWA jurisdiction, including a description of the factors that influence connectivity and the mechanisms by which connected waters affect downstream waters.

This draft science report represents the state-of-the-science on the connectivity and isolation of waters in the United States. It makes three main initial conclusions, summarized below, that are drawn from a broad range of peer reviewed scientific literature.

- (1) Streams, regardless of their size or how frequently they flow, are connected to and have important effects on downstream waters. These streams supply most of the water in rivers, transport sediment and organic matter, provide habitat for many species, and take up or change nutrients that could otherwise impair downstream waters.
- (2) Wetlands and open-waters in floodplains of streams and rivers and in riparian areas (transition areas between terrestrial and aquatic ecosystems) are integrated with streams and rivers. They strongly influence downstream waters by affecting the flow of water, trapping and reducing nonpoint source pollution, and exchanging biological species.
- (3) Finally, there is insufficient information to generalize about wetlands and open-waters located outside of riparian areas and floodplains and their connectivity to downstream waters.

This information was taken from <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=238345>

Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD), Fourth edition, 2013 - by Karen Hanson

The *Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD)*, Fourth edition, 2013 was completed and made available to the public on September 17, 2013. This publication is available electronically at <http://pubs.usgs.gov/tm/11/a3/>. Any future edits to the WBD should reference this 2013 version, which supersedes the *Federal Standards and Procedures for the National Watershed Boundary Dataset, Third edition, 2012*. All incoming WBD edits submitted by in-state WBD Stewards will be reviewed against this fourth edition for compliance.

Section 6 (fifteen pages), within this fourth edition, was entirely rewritten to fully address the current WBD Feature Dataset structure within the USGS NHD Geodatabase data model. In addition, the LineSource domain within Section 6.4.2.4 was expanded to include options for Canada and Mexico.

Special thanks to the WBD National Technical Coordinators, the WBD State Stewardship Work Group, designated peer and technical reviewers, USGS and NRCS management, and the USGS Enterprise Publishing Network participants for their efforts throughout this process.

Network Improvement Project Status by David Kraemer

Hydrologic Regions 2, 21, and 22 were completed this month. For the project overall, Regions 02, 06, 07, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, and 22 have been completed. The Network Improvement Project team is finishing the remaining available sub-basins in Regions 3, 4, and 8; except for those sub-basins checked out by states and the Canadian border east of Lake Superior (see below for completion percentages). Some of the completed Regions are now being rechecked with the EPA VAA software checks to insure all severe errors were corrected. Alaska is in the planning stage for doing the initial Network Improvement checks.

Remaining Region Completion Percentages

01 – 80% – On Hold – Remaining sub-basins will be completed after the Canadian border harmonization

03 – 90% – In Work – Some sub-basins checked out by Alabama and Florida

04 – 80% – In Work – Remaining sub-basins will be completed after the Canadian border harmonization

05 – 85% – On Hold – Some sub-basins checked out by Indiana

08 – 60% – In Work – Some sub-basins checked out by Louisiana, and Mississippi

Hydrologic data collection business plan for buried stormwater conveyance systems in Michigan by Brian Jonckheere

The U.S. Geological Survey (USGS) has recently awarded a grant to the Michigan Association of Drain Commissioners (MACDC) to develop a business plan for collection of hydrographic data within the office of Michigan's primary stormwater management entity. The USGS maintains the National Hydrography Dataset (NHD), which is currently the largest single database related to surface hydrology in Michigan. In order to continue to build a more robust model, the USGS is interested in the capture of information related to subsurface stormwater conveyance in Michigan, which are not currently incorporated as part of the NHD. Consequently, a grant opportunity was created in an attempt to develop a business plan for the eventual collection of this data from all of Michigan's 84 counties. Michigan's Drain Commissioners have primary responsibility to maintain legally established drain infrastructure in order to protect agricultural lands and other properties from inundation. The NHD has significant potential to provide Drain Commissioners with the data necessary for modeling efforts as part of their maintenance activities, as well as to provide a significant basemap for developing GIS programs in the various counties.

The project will document the current state of drain information across the state as well as identifying a priority ranking for data collection, challenges to its collection, and costs associated with these efforts.

The project will consist of three main efforts:

- 1) Assemble information about the current state of drain information in the counties.
- 2) Identify additional ancillary information specific to the business processes of a County Drain Commissioner that would need to be attached the basic NHD data model in order for it to meet Drain Commissioner business needs.
- 3) Work with County Drain Offices that have adopted GIS to develop a Return on Investment associated with using GIS

The contract to collect the necessary data was recently awarded to the firm GIS Inc. which has since begun work on the plan. Project completion is anticipated by the end of 2013. For more information, please contact Brian Jonckheere, Livingston County Drain Commissioner, at 517-546-0040 or bjonckheere@co.livingston.mi.us

USGS Hydrography Grants by Steve Aichele

During Fiscal Year 2013, The National Geospatial Program supported eighteen NHD and WBD projects across the country with almost \$800,000 in grants. These projects focused on building stewardship; increasing the value of the NHD and WBD to users with improved attribution and improved feature content, particularly engineered features; and continuing to explore methods for extracting hydrographic features from LiDAR and IfSAR data. Each month the NHD Newsletter will examine a few of the grants:

Four projects in Alaska support the NGP Alaska Mapping initiative, with a heavy reliance on extracting NHD from elevation sources. Two projects in Denali National Park will create high-resolution NHD from IfSAR elevation and SPOT imagery. This project is the largest high-resolution NHD effort in Alaska, and is of great importance to the National Park Service as well as the many USGS scientists conducting research in the park. If successful, this project will contribute almost 6000 square miles of NHD to The National Map and finalize a process for automated NHD creation in Alaska, significantly improving the quality of the topographic map products being produced. The Kenai Watershed Forum (KWF) will be working clean up topological errors and other geometric issues in 18 subbasins of southcentral Alaska stretching from , including deriving flowlines from LiDAR in two subbasins along the west side of the Kenai Peninsula. The KWF incorporates the needs of a wide range of stakeholders, and this project will improve the National Hydrography Dataset component of *The National Map* by greatly updating flowlines and tying the flowline data to the digital elevation model. In the Port Clarence area, the State of Alaska will be using newly collected IfSAR elevation data to update approximately 3000 square miles of NHD.

Downloads of NHD Data from the USGS in August

During August there was a total of 5,216 ftp downloads of NHD datasets. This is broken into 2,110 downloads of statewide high resolution NHD and 133 medium resolution downloads using file geodatabase. There were 1,709 subregion-based high resolution downloads and 549 medium resolution downloads for file based. There were 592 high resolution subbasin and 123 medium resolution subbasin downloads for personal geodatabase.

Also during the period there were over 1,961 downloads from The National Map viewer, with 1,295 by rectangle extracts of various sizes and 666 by subbasin or county. That brings the download total to 7,177 for August.

NHD Photo of the Month

This month's photo was taken by Jennifer Sharpe, and shows a view of Taughannock Falls on Taughannock Creek which empties into Cayuga Lake near Ithaca, New York. This is HUC12 041402011105. Latitude/longitude 42.53590° -76.61040°. The photo was taken on July 23, 2013 during a high-flow event. To see the photo of the month go to ftp://nhdftp.usgs.gov/Hydro/Images/Taughannock_Falls.JPG. Submit your photo for the NHD Photo of the Month by sending it to kyoder@usgs.gov. This will allow the program to build a library of real-world photos linked to the NHD.

August Hydrography Quiz / New September Quiz

Adam Oestreich of the Washington State Department of Ecology was the first to guess the August NHD Quiz as the harbor at Corpus Christi, Texas on the Gulf of Mexico portion of the Atlantic Ocean. See <ftp://nhdftp.usgs.gov/Quiz/Hydrography97.jpg>

Adam is employed by the Washington State Department of Ecology, which works with citizens, businesses and local governments to develop and carry out environmental permits, implements and enforces federal laws to set standards for clean air, water, and soil, and provides technical support for managing toxic waste, cleaning up spills, and general environmental monitoring. Adam works within the Water Quality Program and review data submitted to our agency's Environmental Information Management (EIM) database, as well as work with data used in the state's assessment of waters for the Clean Water Act's 303(d) list.

Others with the correct answer (in order received) were: Michael Smith, Gerry Daumiller, Ed Carter, Richard Patton, Daniel Button, Jim Sherwood, Linda Davis, Laurie Morgan, Calvin Meyer, Anji Auger, David Asbury, Kitty Kolb, Steve Aichele, Barb Rosenbaum, Peter Cada, Ken Edwardson, David Sinton, Keith McFadden, Ellen Finelli, Barry Puskas, Anne Wynn, Evan Hammer, Rob Dollison, John Kosovich, Dennis Dempsey, Jenny Lanning-Rush, Matt Rehwald, Roger Barlow, David Fetter, Ken Koch, John Giffin, and Mike Major.

This month's hydrography quiz can be found at <ftp://nhdftp.usgs.gov/Quiz/Hydrography98.jpg>. Where is this harbor? Its orientation is a hint. This town is noted for its "shrine" built in 1957 that can hold 73,000 people. Send your guess to jdsimley@usgs.gov.

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

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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.