

# USGS National Hydrography Dataset Newsletter

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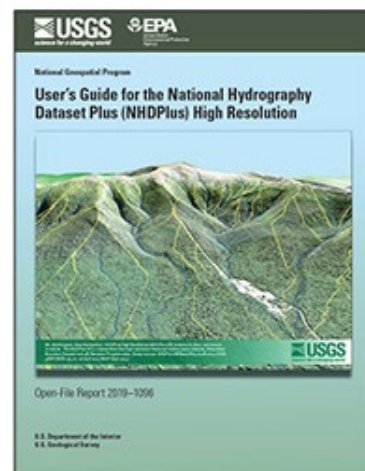
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## NHDPlus High Resolution User Guide Released!

Contact: Rich Moore ([rmoore@usgs.gov](mailto:rmoore@usgs.gov)), Al Rea ([ahrea@usgs.gov](mailto:ahrea@usgs.gov))

The much-anticipated [NHDPlus High Resolution \(NHDPlus HR\) User Guide](#) has been released and is available on the [NHDPlus HR webpage](#) of the [USGS National Hydrography website](#). The NHDPlus HR user's guide covers an array of topics such as:

- How the user can download NHDPlus HR data
- The structure of the NHDPlus HR data
- Components of the data (feature classes and raster data – streams and catchments)
- Stream flow and velocity estimates for each flowline
- Other NHDPlus HR tables including a Value Added Attributes table (NHDPlusFlowlineVAA) which includes many flowline attributes
- Other tables of attributes assigned to catchments such as climate data



A section on the “Concepts for Understanding and Using NHDPlus HR data” provides examples of how the data can be used for tasks involving navigation. A final section on how the NHDPlus HR data was created is also provided for those who want “look under the hood” and gain a greater understanding of the NHDPlus HR data. Because of this large array of topics, numerous links and bookmarks are provided throughout document so that the user's guide can be more easily navigated. The newly released user's guide is only available electronically.

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## USGS Method to Calculate Streamflows in International Watershed

Contact: Pete Steeves ([psteeves@usgs.gov](mailto:psteeves@usgs.gov))

The U.S. Geological Survey has developed a method that supports its popular [StreamStats](#) application for use in international transboundary watersheds. StreamStats is web-based geographic information system tool developed by the U.S. Geological Survey that allows users to obtain streamflow statistics, basin characteristics, and other information.

A binational study was initiated to update statistical equations that are used to estimate the magnitude and frequency of peak flows on streams contained within the binational Lake of the Woods–Rainy River Basin upstream from Kenora, Ontario, Canada. The study area covered parts of Manitoba and Ontario, Canada, and Minnesota, U.S.A. Hydraulic engineers use peak streamflow data to inform bridge, culvert, and dam designs, and water managers use peak streamflow data to inform regulation and planning activities.

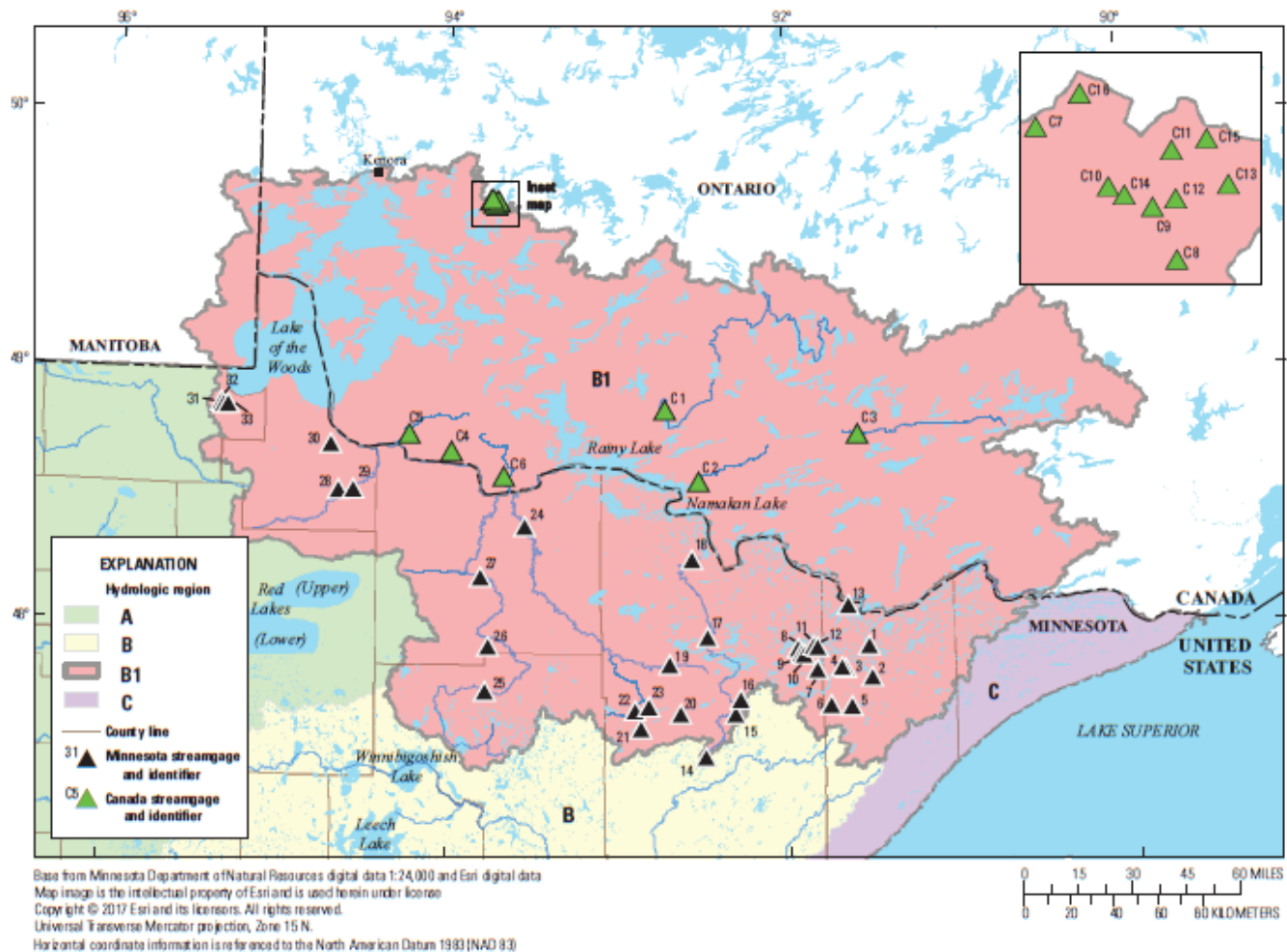
Long-term streamflow measurements are available at 49 streamgages along the more than 20,000 miles of stream/ditch networks within the binational Lake of the Woods–Rainy River Basin. Peak-flow frequency information was used in regression analyses to develop equations relating peak flows for selected recurrence intervals to various basin and climatic characteristics.

Canadian maximum instantaneous peak-flow data were converted from a calendar year to a water year (October 1 to September 30), and where the annual maximum instantaneous peak-flow value was not available in HYDAT, the Sangal method was applied to known average daily flow values to estimate an annual maximum instantaneous peak-flow value. GIS software was used to calculate eight characteristics investigated as potential explanatory variables in the regression analyses.

The procedure for estimating peak-flow frequency for selected exceedance probabilities for a specific ungaged site depends on whether the site is near a streamgage on the same stream or is on an ungaged stream. For an ungaged site near a streamgage on the same stream, the drainage-area ratio method can be used. For an ungaged site on an ungaged stream, the regional regression equations developed for this study should be used.

All equations presented in the study will be incorporated into StreamStats.

Study results have been published in the report, [\*Techniques for Estimating the Magnitude and Frequency of Peak Flows on Small Streams in the Binational U.S. and Canadian Lake of the Woods–Rainy River Basin Upstream from Kenora, Ontario, Canada, Based on Data through Water Year 2013\*](#)



Streamgages used to estimate peak-flow frequencies and magnitudes for new hydrologic region B1, which represents the Lake of the Woods–Rainy River Basin upstream from Kenora, Ontario, Canada.

### Links to related articles

<https://www.watercanada.net/u-s-geological-survey-launches-method-to-calculate-streamflows/>

[https://www.ifallsjournal.com/news/local/usgs-launches-method-to-calculate-streamflows-in-international-watershed/article\\_fad7019b-e2b3-5440-88db-45bac3c0afce.html](https://www.ifallsjournal.com/news/local/usgs-launches-method-to-calculate-streamflows-in-international-watershed/article_fad7019b-e2b3-5440-88db-45bac3c0afce.html)

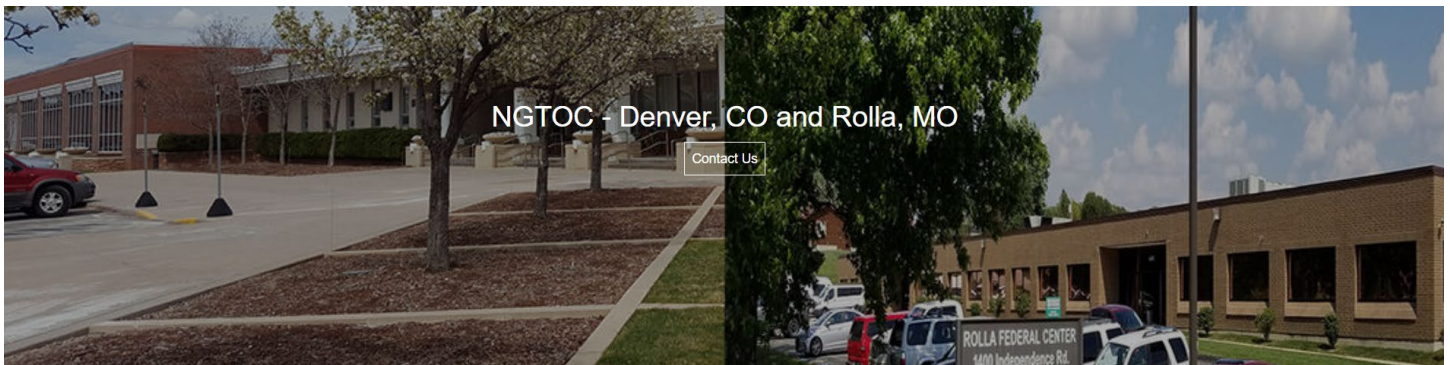
<https://www.stormh2o.com/home/article/21109823/usgs-tool-calculates-streamflows-in-international-watershed>

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## National Geospatial Technical Operations Center Celebrates Tenth Anniversary of Combined Unit Operations

Contact: David Anderson ([danderson@usgs.gov](mailto:danderson@usgs.gov)), Hannah Boggs ([hboggs@usgs.gov](mailto:hboggs@usgs.gov)), Alex Kaufman ([akaufman@usgs.gov](mailto:akaufman@usgs.gov)), Mike Tinker ([mdtinker@usgs.gov](mailto:mdtinker@usgs.gov)), Karen Adkins ([kadkins@usgs.gov](mailto:kadkins@usgs.gov))

Ten years seems like a long time, but it passes by quickly! Ten years ago, the Rolla and Denver USGS National Mapping Centers, which had operated independently up to that point, combined to become the National Geospatial Technical Operations Center (NGTOC). On GIS Day this November, NGTOC celebrated their anniversary of becoming a single center with a unified mission to support The National Map (TNM).



*Denver and Rolla NGTOC facilities*

Today, NGTOC produces and manages the geospatial products used for The National Map, including the National Hydrography Dataset (NHD), NHDPlus High Resolution (NHDPlus HR), Watershed Boundary Dataset (WBD) in collaboration with the USGS Water Mission Area, and 3D Elevation Program (3DEP), and as well as many other USGS GIS-related products and services. NGTOC is responsible for National Hydrography tool production, partnership agreements, training and support for tools and data, and management of the national NHD/WBD distribution databases. All of these are accomplished through the hard work of dedicated NGTOC teams.

Over the past ten years, the NHD Production Operations team has edited thousands of network connections to ensure the compatibility of the dataset for modeling projects such as NHDPlus HR and StreamStats. This team coordinates closely with the National WBD Team to implement Markup revisions and other tasks associated with prepping the data for NHDPlus HR production and maintenance of the NHDPlus HR data. In addition, the team has populated the VisibilityFilter attribute for 100% of the NHD in the conterminous U.S. to allow users to perform on-the-fly generalization.

The Vector Tools Development team has built upon previously manual methods used for NHD and WBD maintenance, automating dozens of actions into toolsets to maintain the hydrography datasets including QC and a large list of tool improvements. This has been critical in increasing efficiency for NHD and WBD job

checkouts from the National databases. Jobs which once took several months to complete, are now checked out for an average of three to four weeks.

The Data Management team has had a key role in managing the NHD and WBD databases, maintaining multiple versions of NHD and WBD data. The Distribution team automates staged datasets that post to the cloud on a regular basis so that all users can access the most current data.

The Partner Support team, subject matter experts on the NHD and WBD, has provided training to hundreds of stewards, sub-stewards, and contractors. The team provides support information through the MyUSGS Confluence Hydrographic Data Community pages and direct support for tools used in NHD and WBD maintenance. The team works with the USGS National Map Liaisons to provide accurate information and assisting in the development of NHD and WBD Stewardship memorandum of understanding agreements.

The Topographic Applied Research Section team has been involved with NHD and WBD tool development, researching new methods for meeting requirements, analyzing tool productivity, and many other activities. The team coordinates research issues with practical applications outside of USGS development to ensure our hydrographic datasets are compatible with other modeling techniques.

It takes many teams working together within and outside of NGTOC to get the job done. Examples of this teamwork includes the development of tools such as the Hydro Maintenance Portal (HMP), the Markup tool, WBD Web tool, NHD Update tool and production of the NHDPlus HR data. With a team that includes a contractor, Water Mission Area staff, the National WBD Team, and NGP Headquarters, NGTOC has completed production and public distribution of most of the conterminous United States (CONUS) for NHDPlus HR Beta.

The NGTOC has been the critical force in moving the USGS National Geospatial Program Hydrography mission and National Map programs forward. A huge thanks to the teams for all the work they have completed over the past ten years!

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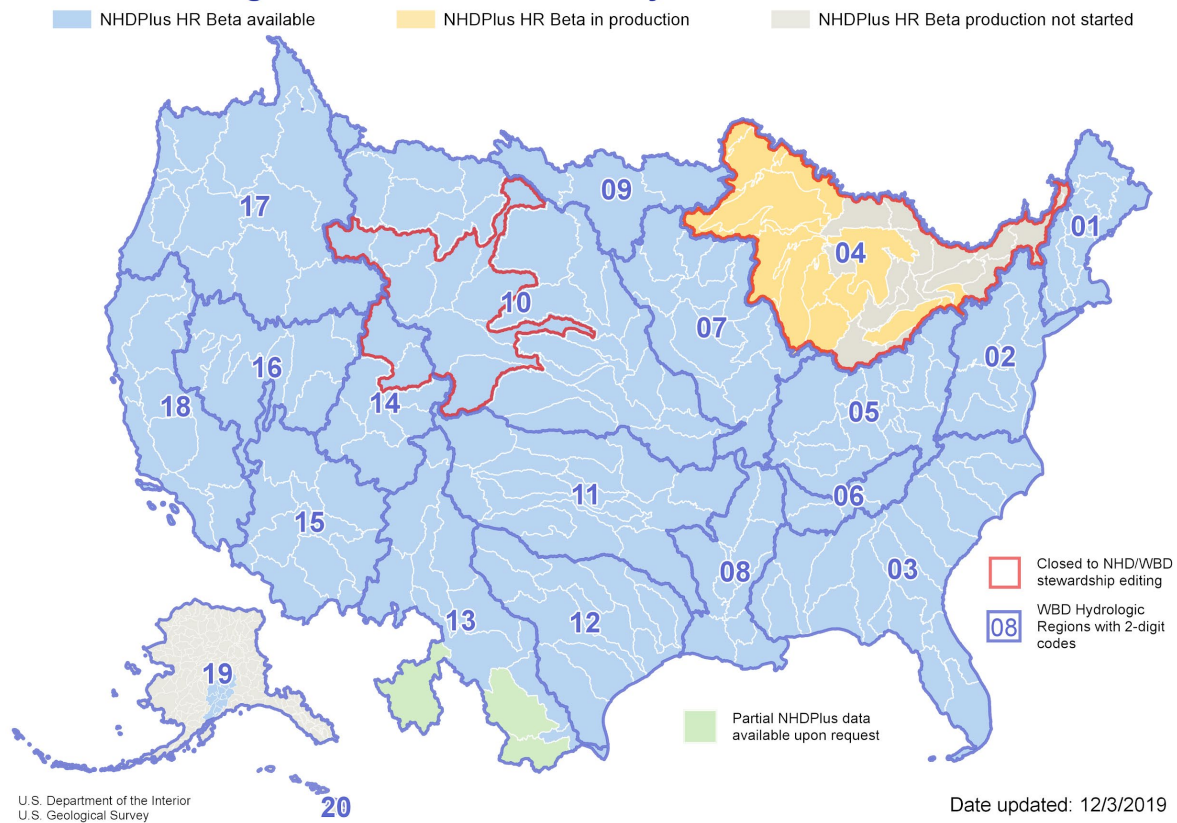
## NHD, WBD, and NHDPlus HR Status Updates

### NHDPlus High Resolution Beta Production Status

*Contact: Karen Adkins ([kadkins@usgs.gov](mailto:kadkins@usgs.gov)), Hayley Thompson ([hnthompson@usgs.gov](mailto:hnthompson@usgs.gov))*

The map below provides an overview of NHDPlus HR availability. This status map is updated frequently on the [NHDPlus HR webpage](#).

## NHDPlus High Resolution Availability



- Red outline - These areas are currently closed to NHD and WBD editing. Please contact the [NHD/WBD Point of Contact](#) in your area for more information.
- Blue areas - NHDPlus HR Beta is currently available and Beta QC is either in process or completed for these areas. Please see the [NHDPlus HR Beta QC](#) section of the [NHDPlus HR webpage](#).
- Yellow areas - The NHDPlus HR Beta is in production and the USGS is currently seeking volunteers for the upcoming Beta QC for these areas. Please see the [NHDPlus HR Beta QC](#) section of the [NHDPlus HR webpage](#) for more information. Please contact the National NHD Point of Contact (Joel Skalet, [nhd@usgs.gov](mailto:nhd@usgs.gov)) or National WBD Point of Contact (Lily Niknami, [Iniknami@usgs.gov](mailto:Iniknami@usgs.gov)) for more information on the status of NHD and WBD editing in these areas.
- Gray areas - NHDPlus HR Beta will be produced at a later date. These areas are currently open for NHD and WBD editing.
- Green areas - The NHDPlus HR Beta was produced using contributing areas in Mexico to improve the NHDPlus HR Beta along the Rio Grande River. Minimal hydrography was included in the Beta build but will be improved when the areas are refreshed. The NHDPlus HR Beta production data with minimal hydrography content is available upon request.

## WBD 4-digit Improvement Status

Contact: Kimberly Jones ([kjones@usgs.gov](mailto:kjones@usgs.gov)), Lily Niknami ([lniknami@usgs.gov](mailto:lniknami@usgs.gov))

### WBD 4-digit Improvement - Work Completed

- Regions - 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 20
- Mexico contributing 4-digit hydrologic units in Region 13
- Region 19 - 19020202, 19020301, 19020302, 19020401, 19020402, 19020501, 19020502, 19020503, 19020504, 19020505, 19020601, and 19020602, 19020800

### WBD 4-digit Improvement - Currently in Work

- Region 19 - 19020101, 19020102, 19020103, 19020104

### WBD 4-digit Improvement - Future Work

- Regions - 19, 21 and 22
- 

## New Release of NHD Utilities

Contact: [nhd@usgs.gov](mailto:nhd@usgs.gov)

We are excited to announce that a new release of NHD Utilities (v3.4.2.0) is now available! NHD Utilities v3.4.2.0 addresses a bug found in the Build Flow Utility and the embedded help links within each Utility are now functioning. No changes were made to other utilities. For additional information about tool changes, please read the release notes within the software folder.

Users should transition to this newest release as soon as possible. NHD Utilities v3.4.2.0 is only compatible with ArcMap 10.5.1 and Windows 7 and 10.

The NHD Utilities can be found at either of these locations: [Hydrographic Data Community \(HDC\) site](#) or the [USGS National Hydrography tools page](#) (contact Lily Niknami at [lniknami@usgs.gov](mailto:lniknami@usgs.gov) for HDC access).

### **Important Reminder!**

*When upgrading your ArcGIS version, you must uninstall all USGS tools **prior** to uninstalling ArcMap. This prevents a known problem within the Windows registry. Please refer to the tool installation instructions for each tool for additional information.*

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## New Release of NHD Update Tool

Contact: [nhd@usgs.gov](mailto:nhd@usgs.gov)

We are excited to announce that a new build of NHD Update (6.7.2.0 Prod) is now available! The new build is compatible with ArcMap 10.5.1 and will increase security and efficiency. Some highlights include: **updated**

**Import Geometry, improved Fix Microgap Utility, local Metadata Template validation, and reverted Reach Partition code.** For additional information about tool changes, please read the release notes within the software folder.

We are asking all users to transition to this newest build of NHD Update as soon as possible.

The software can be downloaded using the link below on the Hydrographic Data Community (HDC). If you do not have access to the HDC, please contact Lily Niknami ([lniknami@usgs.gov](mailto:lniknami@usgs.gov)).

<https://my.usgs.gov/confluence/display/hdc/NHD+Software+Downloads>

### Important Reminder!

*When upgrading your ArcGIS version, you must uninstall all USGS tools **prior** to uninstalling ArcMap. This prevents a known problem within the Windows registry. Please refer to the tool installation instructions for each tool for additional information.*

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## Photo of the Month

This photo, taken by Becci Anderson, is of sockeye salmon in Cooper Creek, Alaska (reach code 19020302002950). Cooper Creek, a tributary of the Kenai River, runs through the Chugach National Forest just east of the Russian River. The Russian River had an amazing 2019 sockeye early run, with a total of 125,942 fish counted above the Russian River Falls as of July 14 when counting stopped. In contrast, the 2018 early sockeye run had a total of 44,110 fish counted at the weir by the same date.

We'd love to see photos of the hydrology near you or from your travels! Please send submissions to Alexander Jones ([ajonesi@usgs.gov](mailto:ajonesi@usgs.gov)).





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## Hydrography Quiz

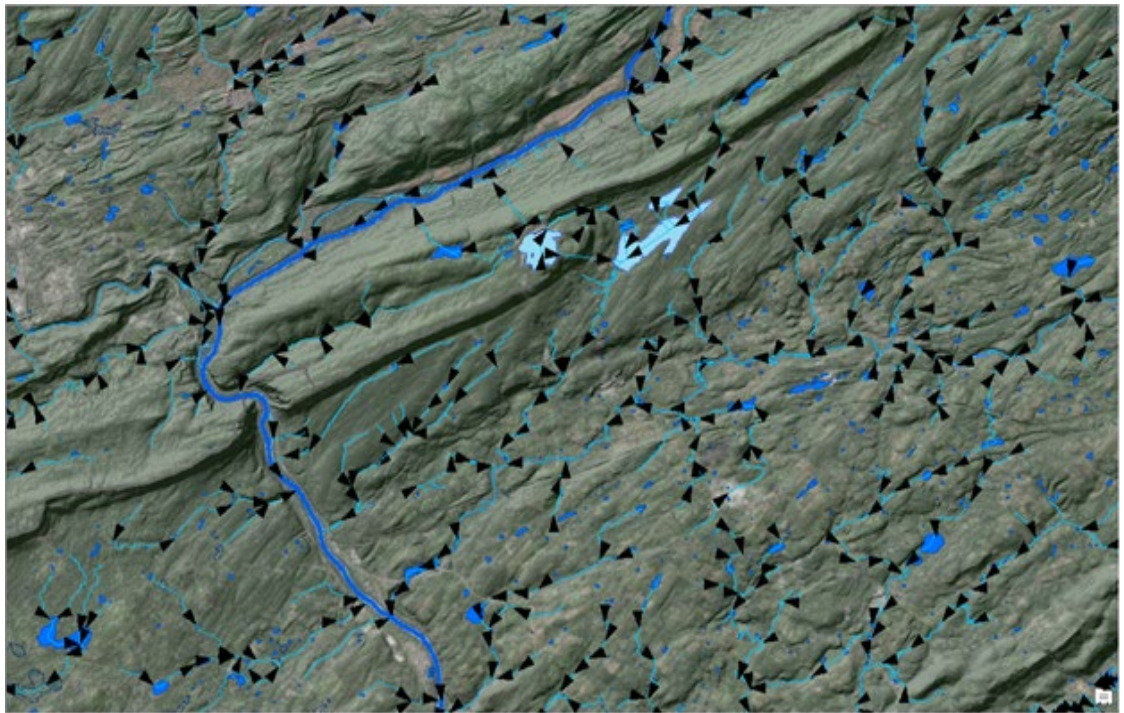
Congratulations to **Marc Weber** who won last month's Hydrography Quiz with the correct answer of the **Purgatoire River**. Marc has worked for the last 10 years as a geographer at the US EPA Pacific Ecological Systems Division Research Lab in Corvallis, Oregon in the Freshwater Ecology Branch, and prior to that worked on the LANDFIRE program at the USFS Fire Sciences Lab in Missoula, MT. He uses the NHD and NHDPlus, and will likely soon be using the NHDPlus HR, in his day to day work putting together the GIS framework for the USEPA National Aquatic Resource Surveys, as well as using in the [StreamCat](#) and [LakeCat](#) datasets they have published. Marc also serves as an alternate EPA representative on the National Hydrography Infrastructure Working Group (NHI WG). Well done, Marc!

**Thanks to everyone else who played along:** Robert Thomas (who missed winning by 30 seconds!), Barbara Rosenbaum, Jen Crea, David Anderson, Stephanie Kula, Beth Anderson, Robert Brantlinger, Roger Barlow, and Evan Hammer.

This Month's Quiz

*By Alexander Kaufman. Email your answer to Becci Anderson ([rdanderson@usgs.gov](mailto:rdanderson@usgs.gov))*

This river forms the border between two states. There was a plan to install a dam on this river in the 1960s, but it was never built and the land that was purchased for the dam was converted into a recreational area instead. This river was involved in some of the battles for our independence, and it is used for recreation by many outdoor enthusiasts in the area. What is this river, and can you name this specific location along the river?



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## Upcoming USGS Hydrography Calls, Trainings, and Meetings

Please check the Events Calendar on the Hydrography Data Community (HDC) site for the latest upcoming training dates. Principal Stewards should be contacted for approval prior to submitting a request for training. The current training being conducted is using ArcGIS 10.5.1.

For more information about this training please contact, Joel Skalet ([jjskalet@usgs.gov](mailto:jjskalet@usgs.gov), 608-238-9333 x152), or Bill Smith ([wjsmith@usgs.gov](mailto:wjsmith@usgs.gov), 573-308-3593).

Date	Time	Event
1/8	12:00 PM ET	WBD Technical Exchange Meeting
1/28	1:00 PM ET	NHD/WBD Advisory Call

To be added to the NHD/WBD Advisory Call email list, please contact [nhd@usgs.gov](mailto:nhd@usgs.gov). For more information on technical exchange meetings and trainings, please see the [Hydrographic Data Community \(HDC\)](#) site. For access to the HDC site, please contact Lily Niknami ([lniknami@usgs.gov](mailto:lniknami@usgs.gov)).

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### Thank you to this month's USGS National Hydrography Dataset Newsletter contributors:

Pete Steeves, David Anderson, Hannah Boggs, Alexander Kaufman, Mike Tinker, Kimberly Jones, Karen Adkins, Hayley Thompson, Lily Niknami, Joel Skalet, Ray Postolovski, Vanessa Baez, Alexander Jonesi, Al Rea, Sue Buto, and Becci Anderson.

## Join Our Community!

For more information, to sign up for the newsletter, or to contribute, please contact Becci Anderson, Hydrography Management and Planning Lead, at [rdanderson@usgs.gov](mailto:rdanderson@usgs.gov).

Visit us anytime at [usgs.gov/NatHydro](http://usgs.gov/NatHydro) and follow us on Twitter @USGSNHD

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