

## USGS National Hydrography Dataset Newsletter

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by Steve Aichele and Al Rea, USGS

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## Delineation of Maine Coastal Waters in the National Hydrography Dataset (NHD)

By Vicki Schmidt, Maine DEP, Becky Schaffner, Maine DEP and Anji Auger, MEGIS

### INTRODUCTION

The NHD representation for the coastal waters of Maine was arbitrary in its differentiation between freshwater, estuarine and marine environments. The goal of this project was to develop more meaningful and scientifically-based division of estuarine features along the coast of Maine, and incorporate them into the NHD.

As a coastal state, Maine is required to manage extensive coastal assets, including estuaries, aquaculture sites, fisheries, and anchorages, among other resources. The NHD is useful for managing coastal resources and in Maine it is used widely for these purposes. Continuing to build the utility of the NHD for managers and scientists is of value to local, state and federal agencies.

Refining estuarine waters was particularly important to Maine's GIS community and the public as regulations are based on the status of such waters. Whether water is tidal, or saline, or estuarine, or sheltered is strategic to sound land use planning. More accurate delineations increase the likelihood that such rules fulfill their purpose, without imposing undue burdens on property owners. In addition efficiencies are generated for regulators when areas not impacted by legislation are quickly evident due to more accurate mapping.

### METHODOLOGY

Spatial data used to form the draft National Hydrography Dataset (NHD) Estuarine Waters for Maine was obtained by using Coastal Assessment Unit (CAU) spatial data created by the Maine Department of Environmental Protection (MEDEP) - Bureau of Water Quality, along with historical estuarine waters previously mapped and provided by the Maine Office of GIS

(MEGIS). These two datasets were combined to form one major dataset that was then spatially edited based on several criteria.

Additional spatial data development and evaluation for this project began with an extensive literature review for historical and more recently obtained monitoring data. Spatial data was coded for waters/areas discussed in estuarine related reports which had scientifically established biomonitoring data that confirmed their estuarine characteristics. Areas were also coded as “likely” or “non-likely” estuarine based on geographical and hydrological characteristics. These areas were later reviewed and confirmed with professional judgement by MEDEP staff who are highly experienced in performing field work and evaluating characteristics of Maine’s estuarine and coastal areas. Using the NHD Edit tools and by checking out Jobs from the USGS repository, features determined as estuary were used in the background when comparing NHDArea and NHDWaterbody. Existing NHDArea features were used as the actual estuary features to assure that the geometry would stay consistent with existing NHD features. Selected NHDArea features were split at the delineation determined by MEDEP to create the actual feature that was to be used as estuary; this resulted in some parts of the NHDArea stream/river remaining behind or changed to sea/ocean.

In areas where estuary meets sea/ocean directly, new NHDFlowline coastline features had to be added. These coastal flowlines were added by doing a feature to line on the original NHD feature polygon, exporting them to Import\_Line feature class and then importing into NHDFlowline as newly created coastline features. Areas where stream/river features met the sea/ocean and were changed to estuary did not affect the coastal flowlines. New reachcodes were assigned to the estuarine features and new coastline and GNIS names were added to estuary features where they existed. The completed datasets were published back to the USGS repository.

## CONCLUSION

The NHD along the Maine coast now depicts a more meaningful division between environmentally defined coded features. This project is subject to updates, corrections, and revision. It is expected to encourage further discussion and refinement as it is used which in order to provide a more accurate dataset.

An ArcGIS Online map was created to represent this project.

<http://maine.maps.arcgis.com/apps/PublicGallery/map.html?appid=d4f603ed37de47faa793342d1c9ff93c&webmap=742c38798586430bb2da2b30a32a284c>

## NHDPlusV2 National Seamless File Geodatabase Released

by Cindy McKay

NHDPlusV2 is built from medium resolution NHD and has been available since 2012. Until recently, NHDPlusV2 data has been available in shapefiles, ESRI grids and dbfs and distributed for 25 geographic areas (approximately equivalent to 2-digit HUCs). The vector and attribute components of NHDPlus are now available in a national seamless file geodatabase. To facilitate applications where joins and relates are inconvenient, the NHDPlus attribute data in the fgdb has been permanently joined into the vector feature classes. A prototype of this

national dataset was developed in the Spring of 2015 and evaluated for usability by several organizations. Based on that review, the data model was improved and a new fgdb was constructed from the most recent versions of the NHDPlus component data and released on May 2, 2016.

The NHDPlusV2 National Seamless File geodatabase, along with its user guide, can be downloaded from <https://www.epa.gov/waterdata/nhdplus-national-data>. Use the pulldown menu labeled "Filter files by component name" to get download links for the National Seamless Geodatabase and Seamless Geodatabase User Guide, near the bottom of the above page. It is the intention of the NHDPlus Team to keep the National Seamless FGDB updated as the NHDPlusV2 components are updated.

## WBD News

By Elizabeth Stevens-Klein, Kimberly Jones, Susan Buto

### WBD Model Updates - Implementation Plan

Over the past several months the WBD national technical team has been communicating (NHD Newsletters, Hydrographic Data Community, and various calls) to the WBD community about a couple of model changes. At this time we would like to outline a user implementation plan to ease the change process for all users.

To summarize, four changes to the current WBD model 2.2 have been proposed and approved by the WBD State Steward Work Group, the Data Model Change Control Process Board, and the Acting WBD Product and Service Lead. The four changes are: renaming the HUClass field to HUDigit on the WBDLine feature class, removing HULevel from the WBDLine feature class, and renaming NonContributingAcres and NonContributingSqKm fields on WBDHU12, WBDHU14 and WBDHU16 feature classes to NonContributingAreaAcres and NonContributingAreaSqKm. These four changes will bring our current WBD Model 2.2 to WBD Model 2.2.1.

We plan to migrate our production database (The National Map and the Stewardship Website) to WBD Model 2.2.1 on or around August 1st, 2016. Impacts are as follows:

1. Before August 1st, please check your own custom software and/or tools to make sure these changes will not impact anything you currently have pointing to the WBD 2.2 model, and please disseminate this to your user communities so that they can also assess any possible impacts.
2. We will release WBD Model 2.2 compatible tools (for ArcGIS 10.2 and 10.3) as soon as they become available. However, these tools will not work properly with the new WBD Model 2.2.1. Before August, our ArcGIS 10.3 tools will go back into development to make them compatible with the new WBD Model 2.2.1. Once the new 2.2.1 model is released, you will only be able to edit WBD using WBD Editor Tools for ArcGIS 10.3. WBD Editor Tools for ArcGIS 10.2 will be retired. We understand that some of you are waiting for NHD 10.3 tools to become available before you make the switch to ArcGIS

10.3, so we will do our best to coordinate getting both NHD and WBD tools for ArcGIS 10.3 released within a reasonable timeframe.

3. WBD Model 2.2 job check-outs will need to be checked back in prior to migrating to WBD 2.2.1. This will happen within a given 2-4 week time period towards the end of July. No new jobs can be checked out while the migration is occurring (a maximum of a few days). We will communicate with you when these things occur as the time nears.

### WBD and GNIS Names

The WBD program is in the process of working with the U.S Board on Geographic Names to synchronize the WBD hydrologic units (HU) with the Geographic Names Information System (GNIS). This process includes: ensuring that the names assigned to each HU are derived from features within the GNIS dataset, adding the HU to the GNIS database, and finding a way to manage and update the HU names when the GNIS names are updated or added.

We are asking the WBD stewards, editors and user community to assist with maintaining this effort. If you come across a feature with a misspelled or incorrect GNIS name that you're trying to use to name your HU, please e-mail me (Elizabeth) and I will coordinate with the GNIS team (and NHD team/stewards if necessary) to get it updated in the GNIS database (and the NHD) if appropriate. I would recommend waiting to populate/update the HU name until AFTER the other feature's name is rectified in GNIS and/or the NHD. If you see an HU name that is misspelled but the name of the feature that the HU was named after is correctly spelled in GNIS and/or NHD, you can update the HU name in a job check-out for 10, 12, 14, and 16-digit HUs. E-mail me, Kim, and Laura for any proposed 2, 4, 6, and 8-digit HU name changes. Contact information is available on the NRCS WBD Steward list at

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/?cid=nrcs143\\_021620](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/watersheds/?cid=nrcs143_021620).

If you want to add a new GNIS name for a feature that doesn't yet exist in GNIS, please use the form located on the Geonames website under (<http://geonames.usgs.gov/domestic/index.html>) under propose or change a name. A list of approved name changes that the GNIS team puts out quarterly can be found here: [http://geonames.usgs.gov/domestic/quarterly\\_list.htm](http://geonames.usgs.gov/domestic/quarterly_list.htm). If you're aware of any name changes in your state, please reference these lists to make sure WBD is also getting updated with GNIS name changes. We plan to further discuss this, so if you have any ideas on what might be the best way to keep HU names synchronized with the features that they are named by, please share!

## NHD Quality Control Errors and How to Resolve Those Errors

By BJ Smith

This month's article will discuss one NHD Quality Control (QC) error that has appeared in several cooperators' NHD Jobs. We shall follow the same format as the last article by noting the errors, discuss the errors, explain why the errors are showing up, and provide guidance on how to resolve these errors.

Error: 'NHDWaterbody or NHDArea Permanent Identifier is NULL or Blank'

QC Check: Database Integrity Checks (WBArea\_PermanentID):

NOTES Description:

'WBAREA\_PERMANENT\_IDENTIFIER is not populated for this artificial path'

REVIEWSTATUS Description:

'(WBAREA\_PERMANENT\_IDENTIFIER is NULL or WBAREA\_PERMANENT\_IDENTIFIER = ' ')

Severity: 3

Description of Error:

The error is indicating you have an Artificial Path (AP) feature in the NHDFlowline table that is not associated with the appropriate polygon feature the AP resides within. In the NHDFlowline table the field 'WBAREA\_PERMANENT\_IDENTIFIER' is 'Null' or blank and does not contain the appropriate Permanent Identifier for the associated polygon, either the NHDArea or NHDWaterbody.

Why are we now seeing this error?

For some reason the Permanent Identifier for the associated polygon (NHD Waterbody or NHDArea) is 'Null' or blank and does not contain the appropriate NHDArea or NHDWaterbody Permanent Identifier in the 'WBAREA\_PERMANENT\_IDENTIFIER' field of the NHDFlowline table. Since this is a Severity 3 error, this could be caused by the previous editor not finding and resolving the issue noted in the previous editing session. Once this error is corrected, it should not appear in future QC sessions.

Error Resolution:

The resolution for this error is to place the appropriate Permanent Identifier for the associated polygon feature into the 'WBAREA\_PERMANENT\_IDENTIFIER' field of the NHDFlowline table.

You may resolve one or many of these errors by highlighting the appropriate record(s) in the Reviewer table, hover your cursor over any of the blue highlighted records, right mouse click, and select 'Select Feature Geometry' from the dropdown menu. This will select the feature geometry for all offending features. Open the NHDFlowline table and verify you have the appropriate number of records selected.

Under the 'Utilities' tab, select 'Assign Waterbody Area PermID values' button in the dropdown menu. This action will open the 'Assign Waterbody Area PermID values' dialog window. Select the desired metadata session you wish to be tied to these edits. Notice the three options. 'Entire Layer' will look at all APs in your dataset and assign the appropriate polygon Permanent Identifier value to the AP. 'Edited Features' will look at all APs you edited in the current editing session and assign the appropriate polygon Permanent Identifier value to the AP. 'Selected Features' will look at all APs currently selected in the NHDFlowline table. In this example,

select 'Selected features', this is the most efficient method. Finally, select the 'OK' button in the 'Assign Waterbody Area PermID values' dialog window.

Open the NHDFlowline table and quickly review the results. All Artificial Path records should now have the appropriate Permanent Identifier for the associated polygons in the 'WBAREA\_PERMANENT\_IDENTIFIER' field of the NHDFlowline table. It is a good habit to review the 'Edit History' file and verify these edits are present and saved. This guarantees your edits will be reflected in the National Geodatabase once your edits have been uploaded.

Next month, I will find several other errors and discuss the issues in a similar fashion. If anyone has an error they would like to see discussed in this forum, please contact BJ Smith at 573.308.3593 or via email at [wsmith@usgs.gov](mailto:wsmith@usgs.gov), and we shall attempt to get that error in a future article. Also please note the NHD Technical Exchange Meeting (TEM) held on a regular basis is an excellent forum to discuss any NHD editing issue. Use your MyUSGS Hydrographic Data Community (HDC) Confluence account to determine the dates and times for the weekly NHD TEM, typically held the first Wednesday of each month at 11:00am cdt.

## May 2016 NHD Network Improvement Project Status Report

By Cynthia Ritmiller, Project Manager

The NGTOC continues its focus on the Network Improvement Project with the goal of identifying and correcting network and data quality issues existing in the high resolution NHD. One of the key drivers for this effort is the need to provide data ready to use for the production of NHDPlus High Resolution (NHDPlusHR). Data is being reviewed and edited to support the production schedule for NHDPlusHR beginning with Regions 06, 01, 12, 02, 14, and 15. Coordination with appropriate NHD POC's will begin prior to review. Please see status information for details.

Network Improvement- Status (As of May 27, 2016):

Network Improvement Regions Completed: 06, 01, 12, 20, 21 and 22

Network Improvement Regions In Work:

\*\*\*Note: For all regions listed below, as new data becomes available it will go through the QA/QC process.

Region 01- Sub-regions 0101-0110 were sent to Horizon systems.

Region 02- Chris Helm is reviewing sub-regions 0205 - 0208. Sub-regions 0201- 0204 have been reviewed.

Region 07- Cynthia Ritmiller completed the remaining sub-basin in sub-region 0714.

Region 10- Bob Merson, Tanya Torres, and Allen Karsh is reviewing sub-regions 1005 - 1030.

Region 12- All sub-regions 1201 through 1211 have been sent to Horizon Systems for NHDPlusHR production.

Region 13- Cynthia Ritmiller is reviewing sub-regions 1301, edits should be complete within the next few days. Sub-regions 1302- 1309 have been reviewed.

Region 14- QC's were ran for sub-regions 1401 - 1408. Edits in sub-region's 1401 - 1406, and 1408 were completed by Chris Helm and Tanya Torres. Tanya Torres is reviewing sub-region 1407. New data was received May 26 and will be reran through QC.

Region 15- QC's were ran for sub-regions 1501 - 1508. Edits will be completed by Cynthia Ritmiller and Tanya Torres. Sub-region 1506 has been reviewed.

Region 16- Carol Brady is reviewing sub-regions 1601-1606.

Network Improvement Regions Remaining: 03, 04, 05, 08, 09,11, 17, 18, and 19

## NHD Photo

This month's photo was contributed by Jennifer Crea of State of Minnesota, Data Administration and GIS. She took the photo on Brule Lake in the Boundary Waters Canoe Area Wilderness, Minnesota. NHD reachcode 04010101008452 (artificial path).

Check it out at [NHD Photo of the Month](#)

## NHD Quiz

The answer to last month's hydrography quiz was The Delaware Canal. Matt Rehwald of the Wisconsin DNR was the first with the correct answer.

Matt is a currently a Database Manager and GIS Analyst with the Waterway and Wetland Protection program in the Wisconsin Department of Natural Resources. The program is responsible for regulating activities such as piers, stream crossings, erosion control, and wetland fill/restoration in Wisconsin's public and navigable waterways. In previous positions with the Wisconsin DNR, Matt worked extensively with Wisconsin's hydrography data, the NHD, and the WBD, and before that spent ten years as a meteorologist making weather observations and forecasts. Matt is a student of many earth sciences, and enjoys recognizing and interpreting natural shapes and patterns that occur across the globe.

This month's hydrography quiz can be found at the [Hydrography Quiz](http://nhdftp.usgs.gov/Quiz/Hydrography130.png)  
<http://nhdftp.usgs.gov/Quiz/Hydrography130.png>

The hatched area is a Lake/Pond according to the Medium Resolution NHD (1:100,000-scale NHDPlus Version 2.1) and the tan areas are Inundation Areas for the lake in the MR NHD. Old topographic maps show a lake as depicted in the MR NHD. The small blue polygon and streams

are from the High Resolution NHD. All the streams in the image except the one going from the southwest to the lake are classified as intermittent in the High Resolution NHD. What is the name of the lake, and why does it appear to have shrunk so much?

Send your responses to [saichele@usgs.gov](mailto:saichele@usgs.gov)