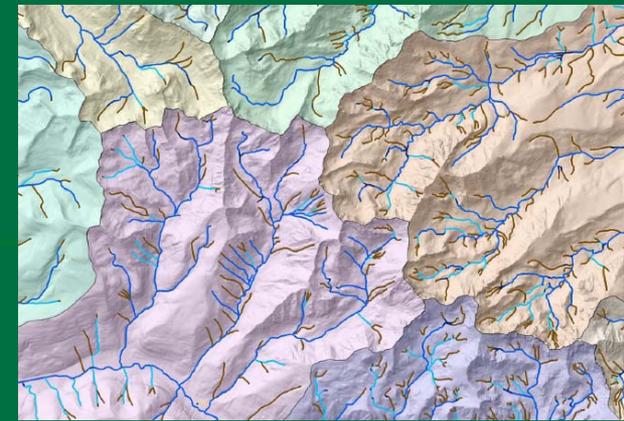


Water over the Bridge and Other Challenges of NHD Stewardship



**Ohio GIS 2015
September 23**

Charley Hickman - USGS

David White - Ohio EPA

Bill Mellman -

Clermont County Water Resources

Outline

National - Charley

NHD overview, history, status

State – David

County - Bill



National Hydrography Dataset

National Hydrography Dataset

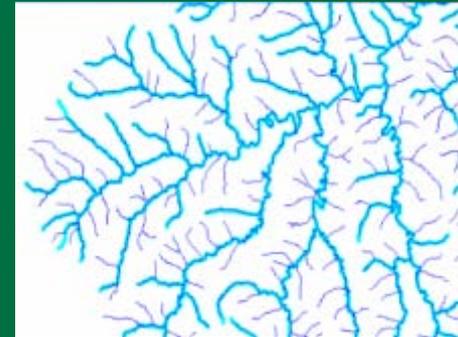
NHD is a digital basemap of surface waters, such as streams, rivers, lakes, and reservoirs.

Includes names. Watershed boundaries.

Supports network and flow analysis.

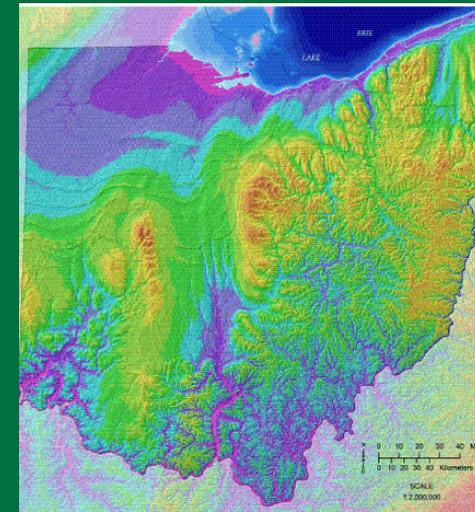
Common framework for referencing surface-water related features, such as stream gages, pollution sources, and water quality test sites.

Maintained via stewardship.



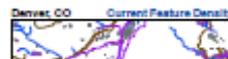
History, Status, Future

- Topo maps, DLG, RF3, WBD
- 100K, 24K, local resolution
- Expanded stewardship
- Lidar, other themes, NHD Plus
- HRBS hydro study, update model



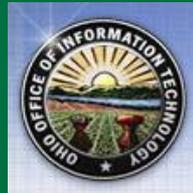
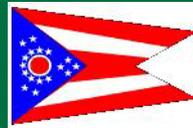
Kristiana Elite¹, Jeffrey Simley²

Importance of Urban Drainage Features in the National Hydrography Dataset



What is NHD? Who is involved?

- Common shared basemap
- Vector dataset
- National standards
- Lakes, ponds, streams, rivers, canals
- Network
- For mapping and modelling
- Linear referencing
- Maintained locally through stewardship
- Lots of partners, some active stewards
- Coordinated with WBD



FEMA



Names - GNIS

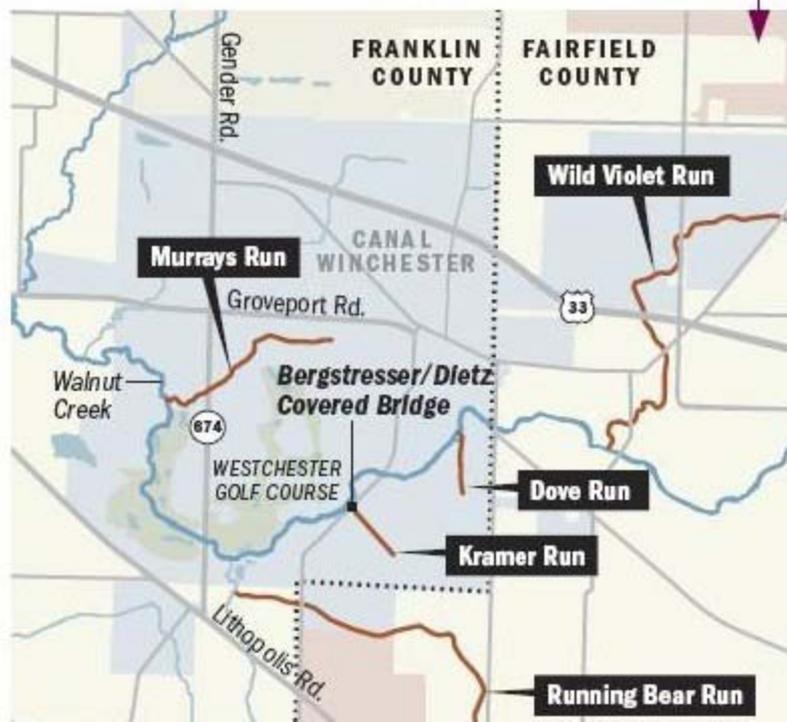
- Geographic Names Information System
- U.S. Board on Geographic Names
- Ohio BGN

Naming of Green Twp. streams opposed
By Eric Bradley ebradley@enquirer.com

Sunday, December 14, 2008 8:58 AM

Proposed names

The U.S. Board of Geographic Names prefers names with historical meaning for the area. Here are some being proposed for creeks, runs and ditches near Canal Winchester:



THE PLAIN DEALER

Name that creek yourself and get feds to back you

Friday, December 02, 2005

Wonder if that creek behind your house has a name? You can check the topographic map for your neighborhood. They are probably available at the nearest library or town hall.

If it doesn't have a name, or you think the one on the map is inappropriate, you can come up with a moniker and ask the U.S. Board of Geographic Names to make it official.

The board says any American has the right to propose a new name or a change. It has one hard and fast rule: No names of living people. And it might help your cause to get some backing from the county commissioners, township, village or city.

An application is available through the Internet at:

geonames.usgs.gov, where you can reach the board's Web site.

If you don't have Internet access, here's the address:

U.S. Board on Geographic Names, U.S. Geological Survey, 12201 Sunrise Valley Drive, MS523, Reston, Va. 20192-5500

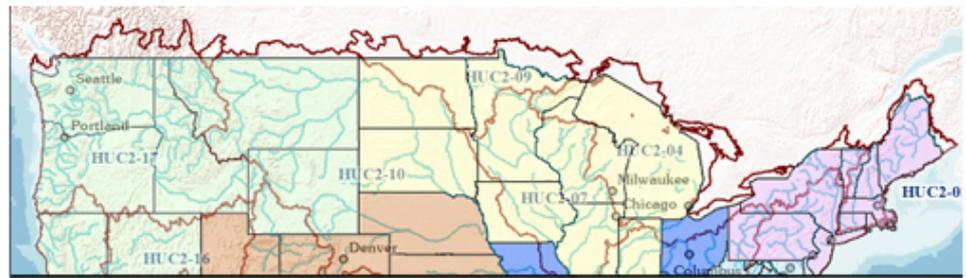


Hydrography

- Home
- News
- Get Data
- Stewardship
- User Resources
- Tools
- Applications
- Contact Us
- Watershed Boundary Dataset
- Hydrography Seminar Series
- Report Data Issue

Hydrography

National Hydrography Dataset Watershed Boundary Dataset

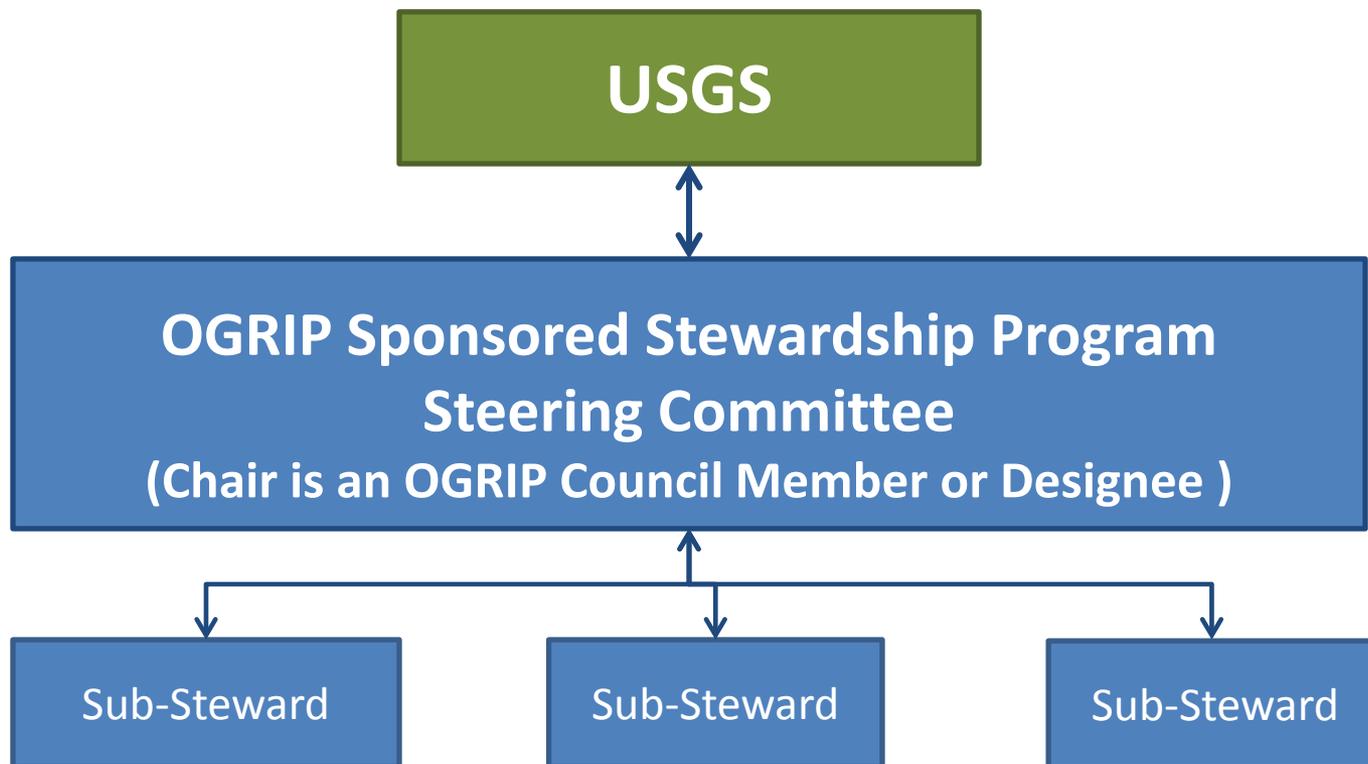


The National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) are used to portray surface water on The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and streamgages. The WBD represents drainage basins as enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail.

The NHD and WBD are digital vector datasets used by geographic information systems (GIS). These data are designed to be used in general mapping and in the analysis of surface water systems. In order to make a map these data must be used by a GIS to render the data and then print a map or make an image. The NHD is portrayed on the [US Topo](#) map product produced by the USGS and the NHD and WBD can be viewed on the [Hydrography Viewer](#) or the general mapping oriented [The National Map Viewer](#).

In mapping, the NHD and WBD are used with other data themes such as elevation, boundaries, transportation, and structures to produce general reference maps. The NHD and WBD are often used by scientists using GIS. GIS technologies take advantage of a rich set of attributes imbedded in the data to generate specialized information.

A Vision for Ohio Stewardship



←→ Memorandum of Understanding

OGRIP – Ohio Geographically Referenced Information Program



Ohio NHD Steering Committee

Chaired by OGRIP Council or their designee

Responsibilities:

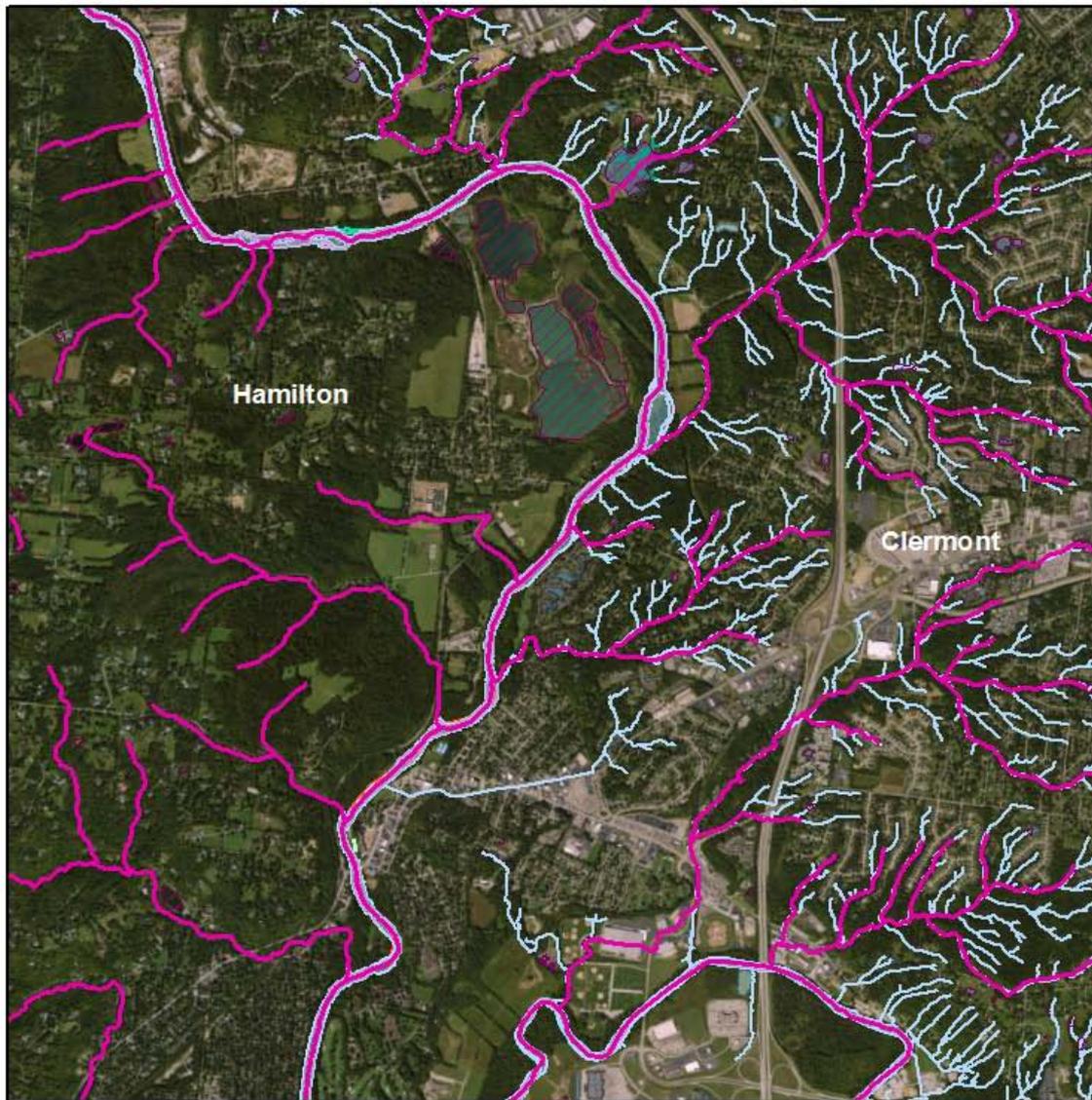
- Identify maintenance goals
- Recruit sub-stewards
- Provide guidance and technical support
- Report on submittal decisions
- Provide a publicly accessible forum for input on NHD maintenance

OGRIP – Ohio Geographically Referenced Information Program



Stewardship Goals for Ohio

- Balance best available local hydrographic data with consistent positional accuracy and level of detail statewide
- Local and regional governments participate in creating and maintaining an accurate and current hydrographic dataset
- Provide hydrographic data product(s) that meet or exceed the business needs of Ohio and national hydrographic data users



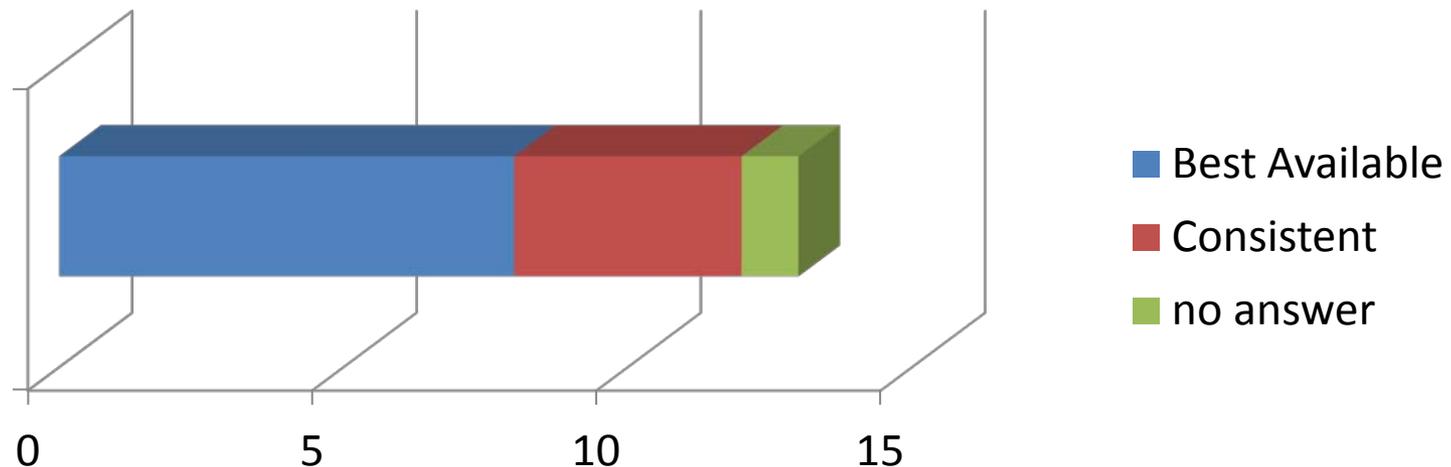
- NHD Rivers & Streams
- ▨ NHD Lakes Ponds
- Clermont Streams
- Clermont ponds

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and

Ohio Responses to USGS HBRS

Best Available or Consistent Level of Detail

For the selected Mission Critical Activity is it more important for hydrographic data to have the best available level of detail or is it more important to have a consistent level of detail?



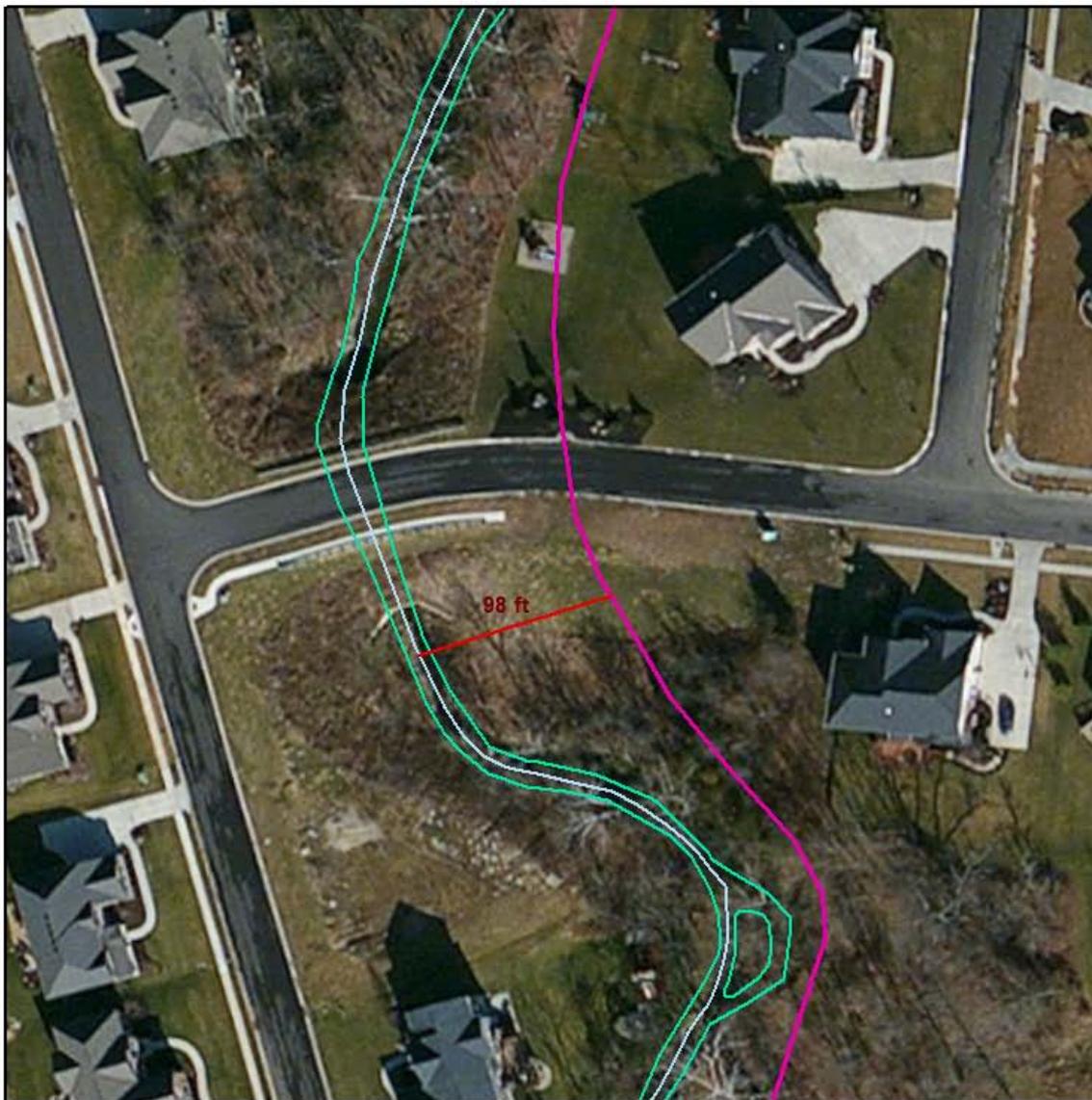
Best available – the quality and detail may vary

Consistent – quality and detail will be the same,

but better data for some areas may be available from other sources

Preliminary results for Ohio respondents only

9/23/2015

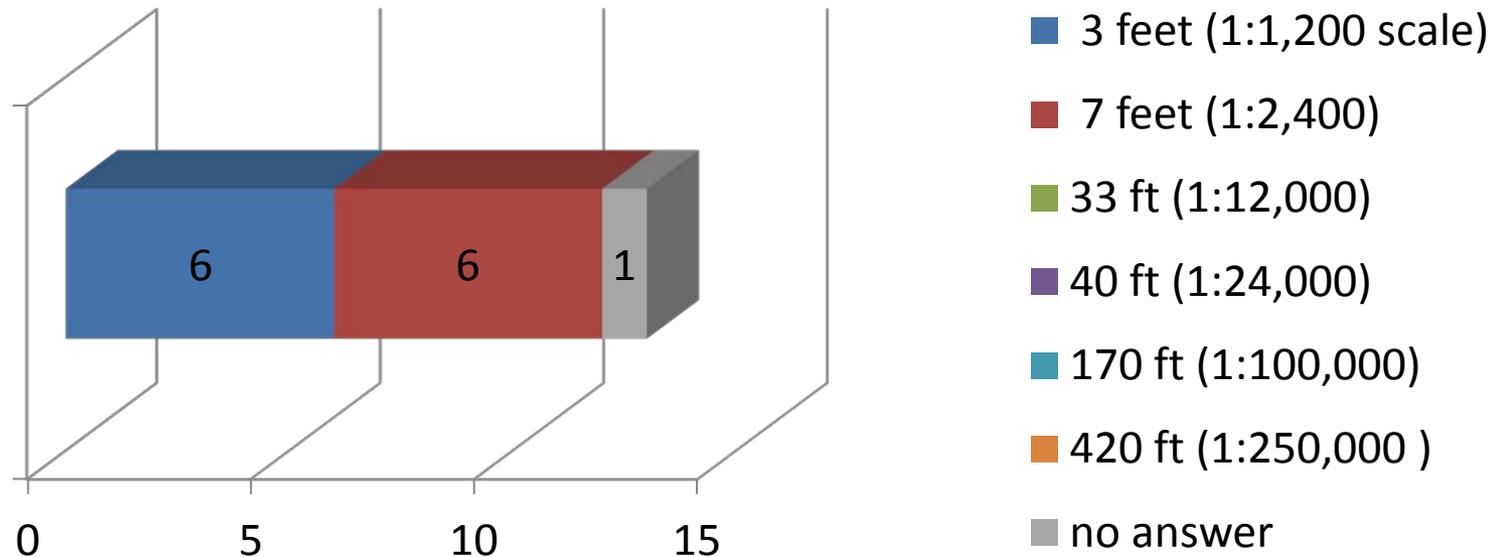


- NHD Rivers & Streams
- ▨ NHD Lakes Ponds
- Clermont Streams
- Clermont ponds

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and

Ohio Responses to USGS HBRS Positional Accuracy Required

“For the Mission Critical Activity that you selected, what positional accuracy is required for geographic features in the hydrography data? ”



Preliminary Summary of Ohio responses to the National Hydrography Requirements and Benefits Study (HRBS)

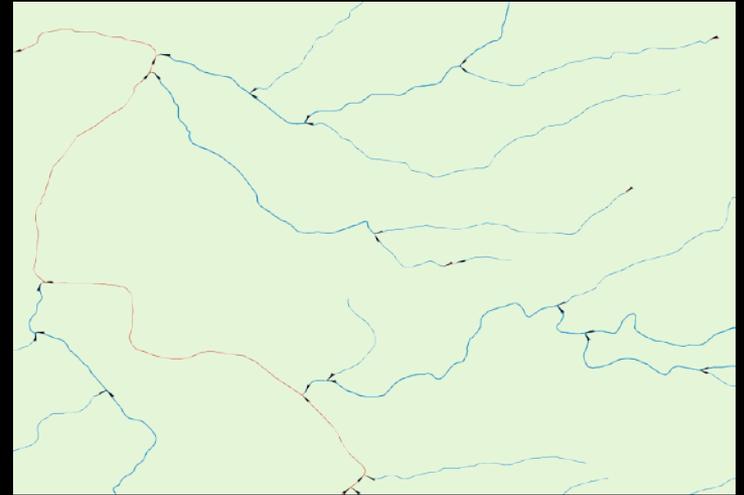
Existing Content

- Two stream layers
- First is too high-level
 - Good for county engineer's public map
 - Not so good for Stormwater use
- The other...



Local Needs

- What we wanted
 - Geometric Network
 - Simple lines
 - Meaningful sub-types
 - Consistent methodology
 - End-to-end connectivity
 - Rich metadata and attribution



Why was the NHD Appealing?

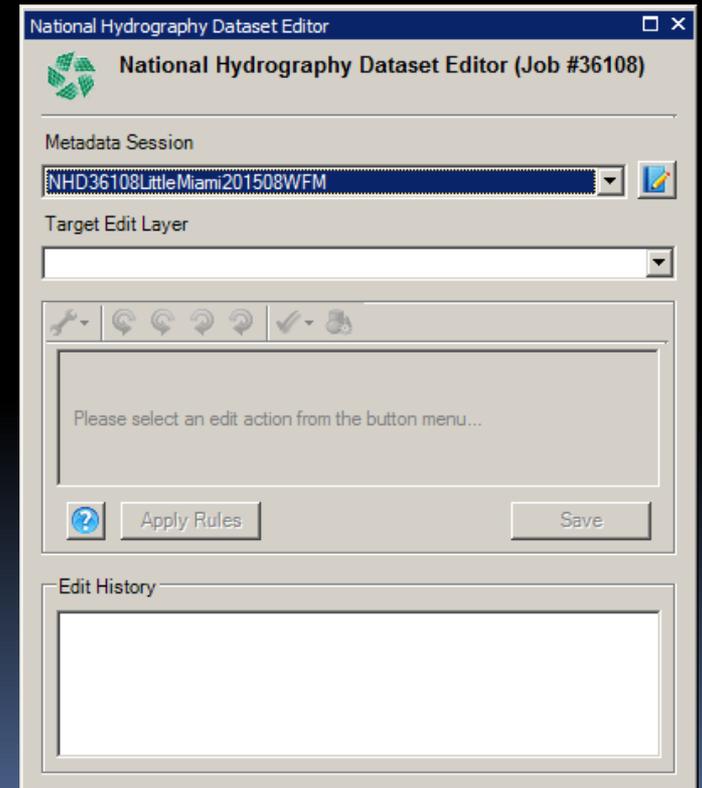
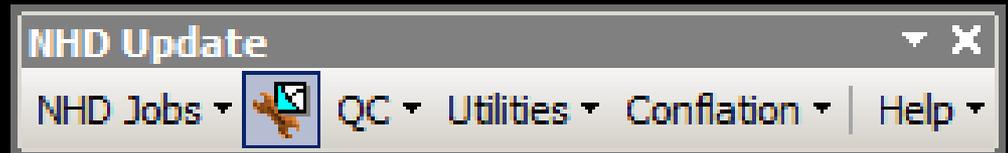
- Strongly controlled editing
- A “Goldilocks” stream density
- An authoritative umbrella
- Collaboration built into its DNA

Strongly Controlled Editing

- “Proprietary” Tool
 - USGS writes and maintains its own NHD editing tool
- Methodology is enforced by the tool
- Metadata is enforced by the tool

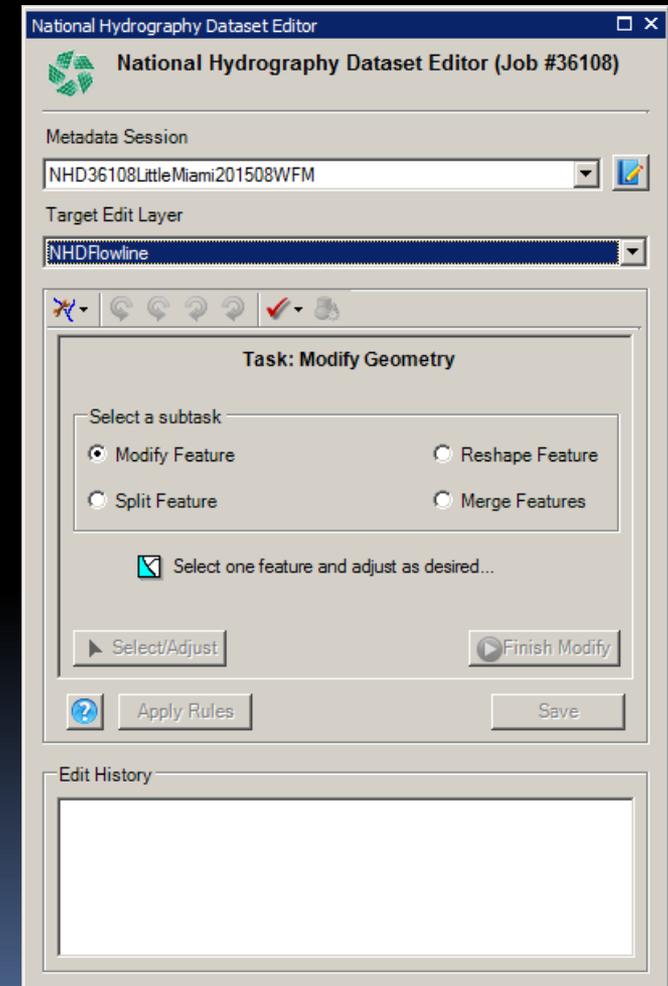
The NHD Editing Tool

- Written by USGS
- Limited use of
 - Data Reviewer
 - Production Mapping
- Kept “current – 1”
 - Now on v10.2



Example: Modify Geometry

- Constrained process
 - Limits non-standard methodologies
 - Ensures each step is properly closed out
 - Full edit history preserved



Attributes, not just Blue Lines

- Reachcode
- Perm_ID
- GNIS_Name
- Sub-type

OBJECTID *	PERMANENT_IDENTIFIER *	FDATE	Resol	GNIS_ID	GNIS_NAME	LENGTHKM	REACHCODE *	FlowDir	WBAREA_PERM	FType	FCode	Shape *	GLOBALID *
28558	80582647	4/15/2003	High	01037742	Beaver Creek	0.4	05090202000528	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Perennial	Polyline ZM	{E547DAD0-FFB1-11E2-9CA2-00144F81BC}
28562	80583433	4/15/2003	High	<Null>	<Null>	1.75	05090202000983	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Perennial	Polyline ZM	{E548C1A8-FFB1-11E2-9CA2-00144F81BD}
28564	80584817	4/15/2003	High	<Null>	<Null>	0.419	05090202002888	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E5492513-FFB1-11E2-9CA2-00144F81BD}
28567	80585453	4/15/2003	High	01068088	Lytle Creek	0.37	05090202000293	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Perennial	Polyline ZM	{E549F93B-FFB1-11E2-9CA2-00144F81BD}
28568	80586123	4/15/2003	High	01047982	Wilson Creek	0.128	05090202001346	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Perennial	Polyline ZM	{E54A2977-FFB1-11E2-9CA2-00144F81BD}
28569	80586567	4/15/2003	High	<Null>	<Null>	0.121	05090202001369	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E54A511D-FFB1-11E2-9CA2-00144F81BD}
28573	80589085	4/15/2003	High	<Null>	<Null>	0.568	05090202003525	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E54B17C8-FFB1-11E2-9CA2-00144F81BD}
28585	80593859	4/15/2003	High	01043160	McCullough Run	1.357	05090202001915	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E54DBE80-FFB1-11E2-9CA2-00144F81BD}
28587	80594409	4/15/2003	High	<Null>	<Null>	1.467	05090202004261	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E54DE53D-FFB1-11E2-9CA2-00144F81BD}
28589	80595383	4/15/2003	High	<Null>	<Null>	0.878	05090202004384	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{E54E4528-FFB1-11E2-9CA2-00144F81BD}
38641	80583371	4/15/2003	High	<Null>	<Null>	0.278	05090202001012	WithDigitized	80597039	ArtificialPath	Artificial Path	Polyline ZM	{EA593FF6-FFB1-11E2-9CA2-00144F81BD}
38642	80583455	4/15/2003	High	<Null>	<Null>	0.088	05090202002772	WithDigitized	80597139	ArtificialPath	Artificial Path	Polyline ZM	{EA59685E-FFB1-11E2-9CA2-00144F81BD}
38644	80586415	8/7/2015 12:2	High	01065969	Cowan Creek	<Null>	05090202000284	WithDigitized	163193975	ArtificialPath	Artificial Path	Polyline ZM	{EA59BA2E-FFB1-11E2-9CA2-00144F81BD}
136604	80584933	3/4/2011 6:47	High	<Null>	<Null>	0.193	05090202002925	WithDigitized	80598549	ArtificialPath	Artificial Path	Polyline ZM	{60D42062-FFB2-11E2-9CA2-00144F81BD}
136734	80594205	4/15/2003	High	<Null>	<Null>	0.04	05090202001545	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Intermittent	Polyline ZM	{60EEEBE1-FFB2-11E2-9CA2-00144F81BD}
136733	80588479	4/15/2003	High	<Null>	<Null>	0.48	05090202001426	WithDigitized	<Null>	StreamRiver	Stream/River: Hydrographic Category = Perennial	Polyline ZM	{60EE75C3-FFB2-11E2-9CA2-00144F81BD}
214141	80582297	4/15/2003	High	01066805	Little Miami River	0.662	05090202000489	WithDigitized	120007107	ArtificialPath	Artificial Path	Polyline ZM	{819F18B6-FFB2-11E2-9CA2-00144F81BD}
214142	80583221	4/15/2003	High	<Null>	<Null>	0.058	05090202001003	WithDigitized	80596901	ArtificialPath	Artificial Path	Polyline ZM	{819F42FE-FFB2-11E2-9CA2-00144F81BD}
214143	80585005	4/15/2003	High	<Null>	<Null>	0.201	05090202002939	WithDigitized	80598579	ArtificialPath	Artificial Path	Polyline ZM	{819F641B-FFB2-11E2-9CA2-00144F81BD}
214144	80586531	4/15/2003	High	<Null>	<Null>	0.019	05090202003193	WithDigitized	80599809	ArtificialPath	Artificial Path	Polyline ZM	{819F8F48-FFB2-11E2-9CA2-00144F81BD}

Exhaustive QC Process

- Feature checks
- Geometry checks
- Network checks
- Rule checks
- More checks

RECORDID	OBJECTID	SUBTYPE	CATEGORY	CHECKTITLE	ORIGINABLE	NOTES	SEVERITY	REVIEWSTATUS
685	12589002	ArtificialPath	Feature Record	NHDFlowline FEATURE_TO_FEATURE	NHDFlowline	Feature-to-Feature Checks - All (Feature-to-Feature):Record	3	An NHDFlowline:ArtificialPath feature with OID=12589002 is not
686	12589002	ArtificialPath	Feature Record	NHDFlowline FEATURE_TO_FEATURE Artificial Path	NHDFlowline	Feature-to-Feature Checks - Artificial Paths (Feature-to-	3	An NHDFlowline:ArtificialPath feature with OID=12589002 is not
727	12589002	ArtificialPath	Feature Record	NHDFlowline WB_AREA_PERMANENT_ID	NHDFlowline	Database Integrity Checks (WBArea PermanentID):WBAREA_PERMANENT_IDENTIFIER is NULL or WBAREA_PERMAN	3	(WBAREA_PERMANENT_IDENTIFIER is NULL or WBAREA_PERMAN
728	11687826	StreamRiver	Feature Record	NHDFlowline FLOW_CHECK_VALIDATION_WARNING	NHDFlowline	Main Flow Checks (Flow Check Validation):NHDFlowline Flow	3	Isolated Network Feature
729	18910935	StreamRiver	Feature Record	NHDFlowline FLOW_CHECK_VALIDATION_WARNING	NHDFlowline	Main Flow Checks (Flow Check Validation):NHDFlowline Flow	3	Isolated Network Feature
730	3642179	ArtificialPath	Feature Record	NHDFlowline FLOW_CHECK_VALIDATION_WARNING	NHDFlowline	Main Flow Checks (Flow Check Validation):NHDFlowline Flow	3	Isolated Network Feature



Extensive Help

- Every tool has a help page
- Most pages show detailed step-by-step instructions
- Help up through the chain
- Very knowledgeable “PoC”s
- Monthly “Technical Exchange” calls

Rich Web Help Pages

The screenshot shows a web help page with a table of contents on the left, a search bar at the top, and a Windows Start menu on the right. The search bar contains the text "sysdm.cpl".

Contents

- What Is New in NHD Update 6-2
- Introduction to the NHD
- Stewardship Website
- Check Out Data
- Download Software
- Generate a Report
- Create New Account
- Reset Password
- Stewardship Home Editor Ac
- Stewardship Home Public Ac
- NHD Update Installation
- Install Mapping and Charting S
- Install NHD Update Tool 6
- NHD Update Process
 - Tool GUI Overview
 - Conflation Menu
 - Help Menu
 - Editing Menu
 - Quality Control Menu
 - Invalid Geometry Checks
 - Spatial Checks - Overview
 - Database Integrity Check
 - Flow Checks - Overview
 - Back Flow Checks - Ove
 - Check For Pseudo Nodes
 - Check Spatial Vertical Re
 - Optional Load Edit History
 - New Quality Control Chec
 - Review QC Check Proce
 - Final QC Check Process
 - Initial QC Check Process
 - Quality Control Check Pro
- Jobs Menu
- Utilities Menu
- Frequently Asked Questions
- Video Library

Search

For best results when dealing with large editing jobs, it is suggested that the user increase their machine's virtual memory. From the Windows Desktop press the Start button and in the "Search Programs and Files" box enter "sysdm.cpl", and then press the Sysdm.cpl link that appears.

System Properties

Computer Name | Hardware | **Advanced** | System Protection | Remote

You must be logged on as an Administrator to make most of these changes.

Performance
Visual effects, processor scheduling, memory usage, and virtual memory

Settings...

User Profiles
Desktop settings related to your logon

Settings...

Startup and Recovery
System startup, system failure, and debugging information

Step 8

In the System Properties window choose the Advanced tab, and then under the Performance section press the Settings... button.

The Stewardship Web Page



USGS Home
Contact USGS
Search USGS

NHD/WBD Stewardship

Welcome Bill!

[See my profile](#)
[Log out](#)

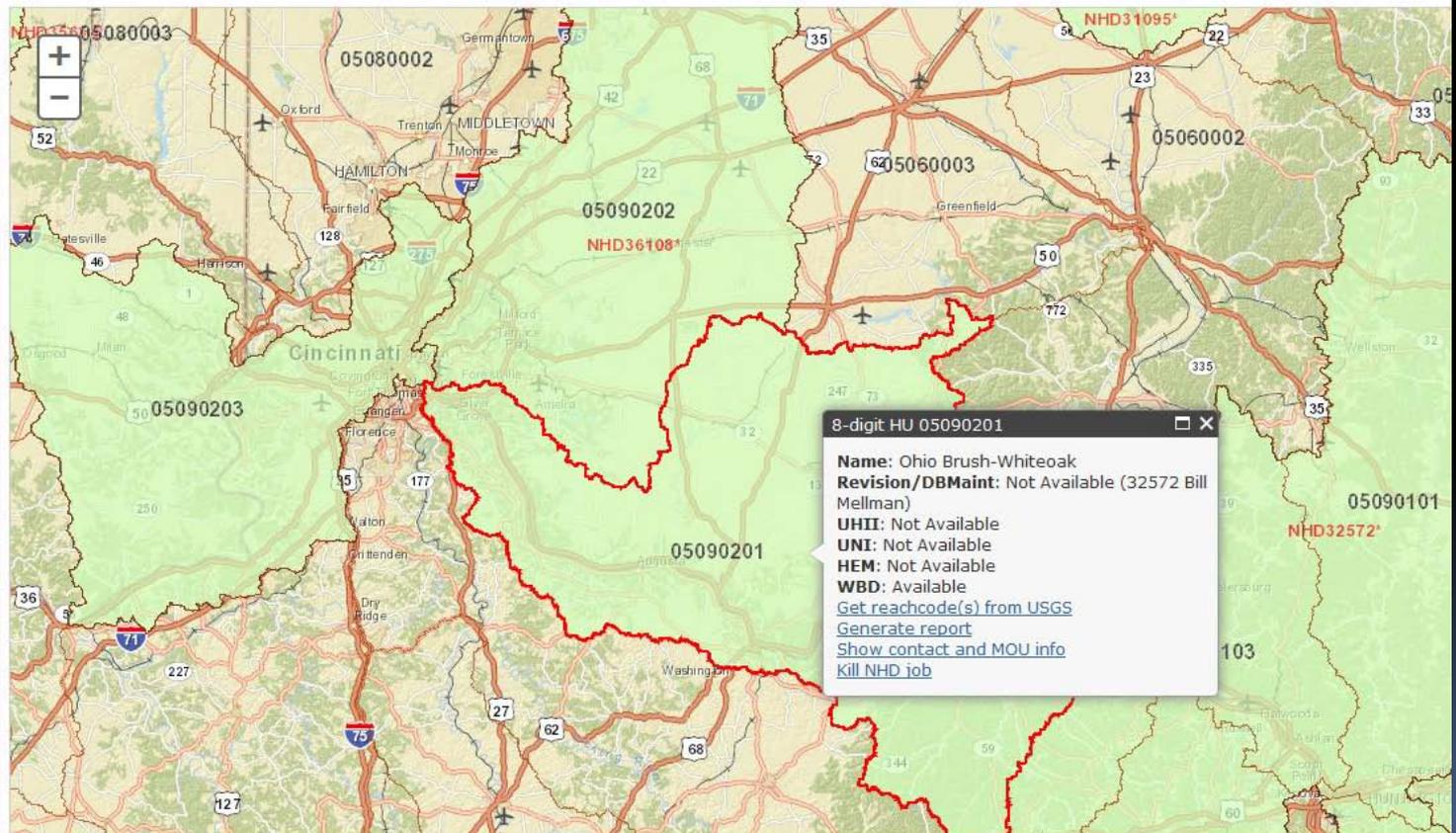
- [Home](#)
- [User Guide](#)
- [Download Software](#)
- [Report Bugs](#)
- [Regional USGS POC Map](#)

Layers:

- 8-Digit HU
- NHD Revision
- WBD Revision

[show more layers](#)

Revision Status



Zoom to HUC: 10190003

[Find](#)

Zoom to State:

Zoom to Job by ID:

[Find](#)

<http://nhd.usgs.gov>

- **Bill Mellman**
- - bmellman@clermontcountyohio.gov
- **David White**
- - David.White@epa.ohio.gov
- **Charley Hickman**
- - chickman@usgs.gov

