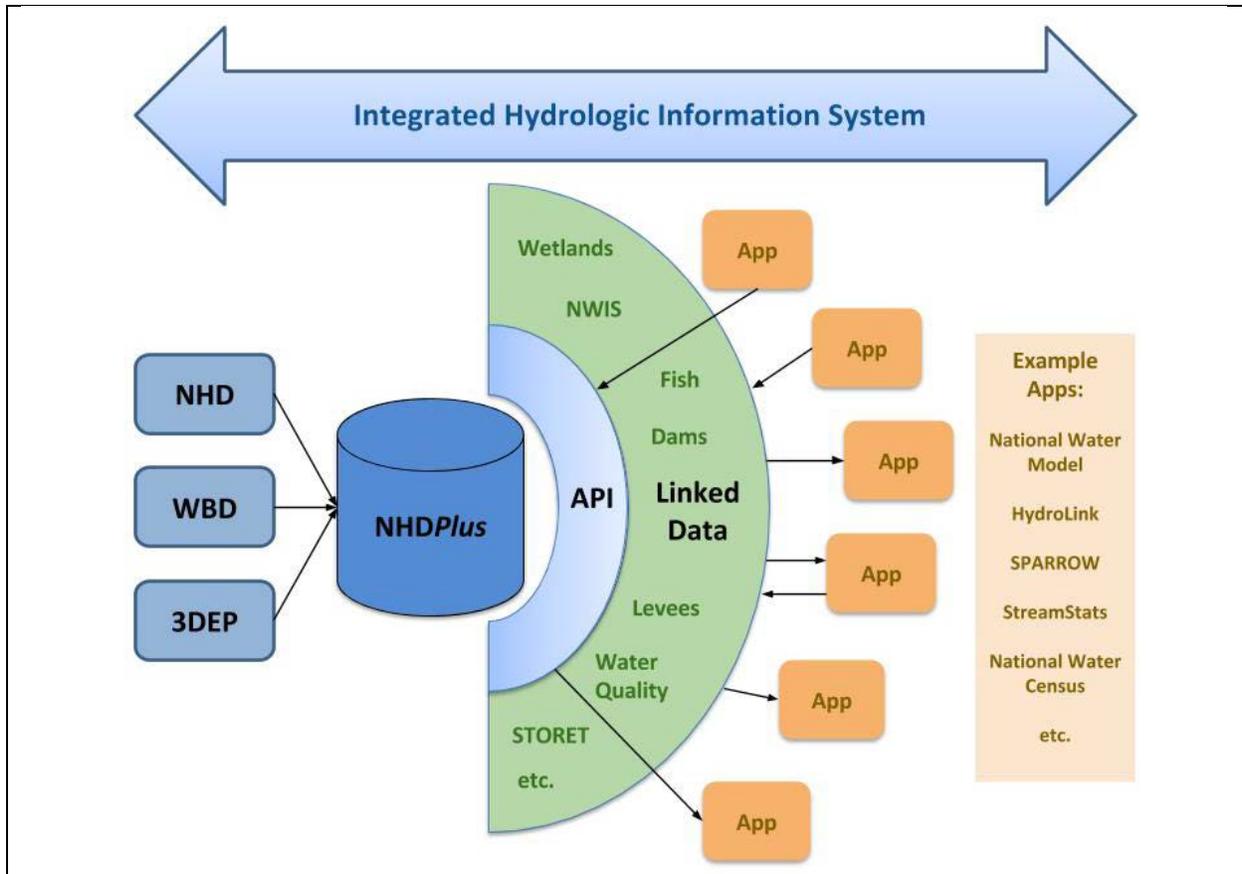# Hydrography TWG Minutes 03/09/2017

USGS Hydrography Related Products: The Hydrography Alphabet Soup

The Integrated Hydrologic Information System Consists of Framework Data and Applications. This provides a networked foundation for Big Data Analysis of Water Information.

The Framework: NHD + WBD + 3DEP = NHDPlus

The Hydrography Program at USGS consists of the National Hydrography Dataset (NHD), Watershed Boundary Dataset (WBD) and the NHDPlus.

The NHD provides the network for the Integrated Hydrologic Information System. It contains the streets (reachcode) and addresses (measures). The WBD are the Zip Codes
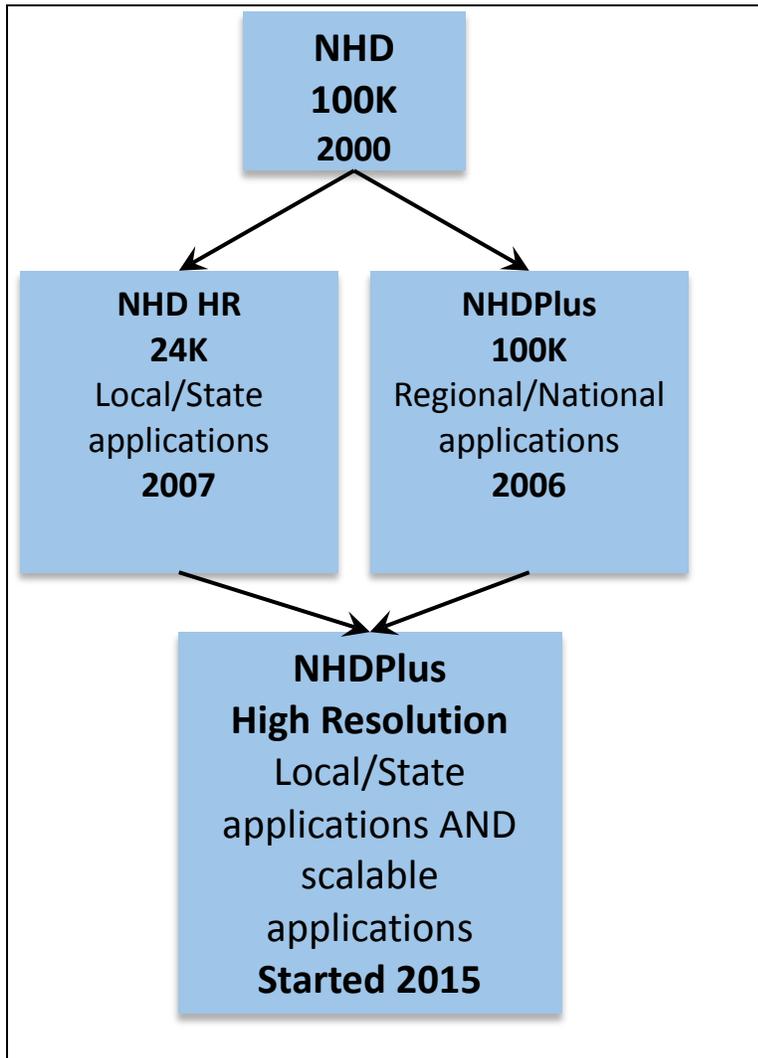
The USGS and State Stewards edit the NHD to keep it up with change.

Future for WBD is for automated derivation with 3DEP and field verification.

The NHDPlus High Res is being developed for the country. Region 17 is due for processing in FY18.

Note: For more information on NHDPlus High Res, please see the minutes and presentation for the March 10, 2016 Hydro TWG (https://idwr.idaho.gov/files/gis/20160310-Minutes-HydroTWG.pdf)

Edits will be requested. Hopefully by the time Region 17 is done, the Web QC Markup Application will be available.

NHD
100K
2000

NHD HR
24K
Local/State
applications
2007

NHDPlus
100K
Regional/National
applications
2006

NHDPlus
High Resolution
Local/State
applications AND
scalable
applications
Started 2015

The National Water Inventory System (NWIS) is one of the linked datasets in the NHD. It is represented as events in the NHDPointEventFC feature class. (https://maps.waterdata.usgs.gov/mapper/index.html)

There are other datasets linked to the NHD including the National Inventory of Dams and HUC-8 Outlets.

The USGS "wants you to share hydro-linked data". Data can be tied to the NHD using the Hydro Event Management Tools (HEM) available at https://nhd.usgs.gov/tools.html#hem.   Then you can post the events (with metadata) on Sciencebase under the NHD Linked Data Repository (https://www.sciencebase.gov/catalog/item/530d0115e4b08f991722dce3?community=National+Hydrography+Dataset+Linked+Data+Registry)

The USGS future plans are to move the NHD related tools and products to the web. Tools in development include:

1) The Web QC Markup Application

2) The HydroLink Tool or "Web-HEM" is another

Applications

Applications that use the Framework (mostly NHDPlus) include Sparrow, StreamStats, National Water Census, etc.

National Water Model (http://water.noaa.gov/about/nwm)

Network Linked Data Index (NLDI)

A search engine for hydro networked-linked data. Queries using the stream network.

Info page: https://cida.usgs.gov/nldi/about

Open source: https://github.com/ACWI-SSWD

Water Quality Portal: https://www.waterqualitydata.us/

Back to Framework

3D Elevation Program (3DEP): Historically called the National Elevation Dataset (NED)

Call for community action to accelerate the acquisition of LiDAR through the continental US. Want an 8 year cycle. 3DEP requires a QL2 Quality Level.

Quality Level	Source	Vertical Accuracy RMSEz	Nominal Pulse Spacing (NPS)	Nominal Pulse Density (NPD)	DEM Post Spacing
QL1	Lidar	10 cm	0.35 m	8 points/sq. meter	1 meter
QL2	Lidar	10 cm	0.7 m	2 points/sq. meter	1 meter
QL3	Lidar	20 cm	2.0 m	0.7 points/sq. meter	3 meters
QL4	Imagery	139 cm	5 m	0.04 points/sq. meter	5 meters
QL5	Ifsar	185 cm	5 m	0.04 points/sq. meter	5 meters

Hydrography Requirements and Benefits Survey (HRBS) (https://nationalmap.gov/HRBS.html)

Looked at benefits by Business Use.

Showed that integration with Elevation and Streamflow datasets very important.

Note: For more information on HRBS, please see the minutes and presentation for the Sept. 8, 2016 Hydro TWG (https://idwr.idaho.gov/files/gis/20160908-Minutes-HydroTWG.pdf)

The "Ele-Hydro" Concept: Derive hydrography from LiDAR

Not really a program. In the research stage.

With the 3DEP program, LiDAR is coming. Based on HRBS, it is important to users that hydro and elevation be vertically integrated.   How do we derive hydrography from LiDAR?

Need to conflate with existing NHD. Need to accommodate 8 year refresh cycle.

The NHD Provisional Names Tool

USGS National Hydrography Requirements and Benefits study result: more than 15 state identified the need for the NHD to be able to efficiently incorporate and ingest name that are not currently in GNIS, but are entrenched in the business processes of the states. So developing a tool to expedite the inclusion of provisional names became critical to our partners and users of the NHD.

- U.S. Board on Geographic Names (BGN): Approves and standardizes geographic names for the Federal Government.
- The Geographic Names Information System (GNIS): Repository of domestic geographic names data
- Geographic Names (GNIS) and Hydrography (NHD) are under USGS
- All Named features in NHD are already in GNIS

Current process for all names
- Research and Create Documentation
- Submit Documentation to BGN through BGN website
- Wait for Approval
- NHDStewards add name to NHD

Provisional Tool: Current process only for new names

- Research and Create Documentation
- Submit Documentation through tool interface
- Wait for Approval
- In future, USGS add name to NHD via automated process

Still need to research and create documentation. Documentation submitted with the tool. Name will only be added after Board of Geographic Names approval. Intent is to automate new name additions once approved. Current process, Stewards or USGS still has to check-out a job to add the name after approval. Provisional names only visible to USGS and stewards until approved.

The tool to be used on an NHDEdit checkout. Can only be used by NHDSteward or Substewards.

Future: Web interface for GNIS staff review and documentation format and guidelines.

<u>Other Updates</u>

➢ Watershed Boundary Dataset
1) Provisional gaged drainage area represent draining areas upstream from gage locations stored in the USGS National Water Information System (NWIS). Not all gage locations stored NWIS were delineated for those states - only real-time gages active at the time of the pilot. These data are the NWISDrainageArea and NWISDrainageLine feature classes in the WBD.
    a. Provisional gaged drainage area was released for 13 states.
        i. Which 13 were released? (AK, AZ, CA, CO, ID, MA, ME, MN, NY, SD, UT, WI, and WY)
        ii. Schedule for when the data for Regions 17 and 16 will be released? Parts of 16 and 17 have been completed, Idaho is mostly covered. USGS doesn't have funding to add more delineations to the dataset in FY17 with the exception of delineations done in cooperation with the US Army Corps of Engineers in Texas.
        iii. They are only available in the National WBD for now, until the USGS Staged Product Generation team can configure an extraction method for them to be included in the other staged products.

2) The WBD team will start a research project in FY 2017 to identify areas where NHDPlus HR catchments and WBD differ and to propose solutions to resolve those differences. Proposed solutions may include changes to NHD reach rules or to WBD delineation rules.

➢ National Hydrography Dataset
    ➢ NHD Network Improvement Project: The Network Improvement Project's goal is to identify and correct network and data quality issues existing in the high resolution NHD.
        o Based on new NHDPlusHR priorities, Network Improvement edits within region 17 have been postponed.
        o Prior to the schedule change the following work occurred:
            ▪ 1701 - 2/3 complete
            ▪ 1704 - 1/2 complete

- 1705 - No work has been done
- 1706 - No work has been done
- Region 16 (1601 - 1606) on the other hand has been delivered to our Contractor Horizon Systems and is in the process of having NHDPlusHR being built.

One other note, Hannah Boggs has taken over managing the Network Improvement project from Cynthia Ritmiller

➢ Naming of Staged Products

Vector Staged Products that span the entirety of TNM's seven vector data themes, including hydrography. The file naming conventions for Vector Staged Products have been quite varied, leading to confusion from both the data creation and download perspectives. To mitigate these problems, the USGS is implementing a cross-theme naming standardization of all Vector Staged Products.

The proposed new naming conventions for NHD Products:

Product	Current Naming Convention (ex.)	Proposed Naming Convention (ex.)
NHD HU8	NHD_H_17050122_GDB	NHD_H_17050122_HU8_GDB
NHD HU4	NHD_H_1701_Shape	NHD_H_1701_HU4_Shape
NHD State	NHD_H_17_Idaho_GDB	NHD_H_Idaho_State_GDB
WBD HU2	WBD_16_GDB	WBD_16_HU2_GDB
NHDPlus HR HU4	NHDPlus_H_1704_GDB	NHDPlus_H_1704_HU4_GDB

➢ NHD/WBD Tool Status

All USGS tools were required to be HTTPS-compliant by the end of 2016. Must upgrade to the HTTPS compliant tools.

Editor Tools: All require ArcGIS 10.3.x
1) NHD: version 6.3.3.2
2) WBD: version 2.5.0.0
3) GeoConflation: available from USGS

Tools available from NHD.usgs.gov
1) HEM: version 2.8.1.0
2) Utilities: version 3.0.4.0
   a. Network Builder Requires ArcGIS Standard or Advanced License
3) Metadata Viewer: version 1.0.0.4