

## Highlights from the Pennsylvania NHD Mini Conference

The Pennsylvania NHD Mini Conference was held September 8<sup>th</sup> and 9<sup>th</sup> at the Pennsylvania Geologic Survey office in Middletown, PA. The purpose of this meeting was to discuss the current status and applications, issues, challenges, and opportunities for working with and enhancing the PA NHD. A wide range of specific topics were addressed by invited speakers: David Anderson (USGS), Amanda Hasemeier (NRCS), David Terrell (USGS), and David Gilbert (GeoDecisions/PAMAGIC). The mini conference was attended by 30 individuals from different organizations including state, local, and federal government agencies, industry, and nonprofit organizations.

The following is a discussion of the sessions, feedback from participants, and outlines of next steps.

### National Hydrography Data: Issues and Applications

Pennsylvania has two separate, but inextricably connected problems as identified by the Committee: a need to use our statewide Lidar dataset to convert the NHD to a 1:2,400-scale dataset known as the PHD – Pennsylvania Hydrography Dataset; and a long-term need to construct a multi-partner, flexible stewardship arrangement to keep that more demanding dataset accurate and current. The conclusion, through much discussion, is that we need to raise \$100,000 for a first-phase treatment of both issues, consisting of a needs assessment, a requirements study, and construction of specifications for conversion to local resolution.

### What can NHD do for you?

- A) **Hydro Event Manager:** Two of the NHD feature classes - NHDFlowline and NHDWaterbody contain reach codes on certain feature subtypes and can be used as an “addressing system” to assign events. Change management is contained in the NHD model schema to assist in using the Hydro Event Management (HEM) tool. Point, lines or areas are in HEM, dams, stream gauges and divergent structures are contained in the NHD EventFC schemas. States can develop their own NHDEvent databases including public intakes, TMDLs, impaired water systems, etc. Many states use it for aquatic species habitats and STORET data.
  
- B) **Additional Tracking:** NHD can be used for tracking pollution discharges, intakes, impairments, habitats, stream classes etc. These water quality web sites , BASINS, SPARROW, NRIS, NHD stream flow predictions (stream stats regression equation – above and below gage predictions) use the NHD. Stream flow visualization is being done to track loss to stream flow out west. Michigan and other agencies are tracking invasive species. Anadromous fish are being tracked in Alaska and Washington states. Emergency Operations Command: ICWater (Incident Command Water) can calculate the time and flow of a contamination from source to intake. In addition,

Vermont has SWAMT NHD (Surface Water Maintenance tracking tool (web application) for end users to submit change requests to stewards.

- C) **Land Surface:** NHD is also being used to monitor pipelines for storm water systems. New York City is evaluating the use of NHD for integration of storm water piping.
- D) **Problems in the Database:** There are still a small number of errors, relative to the size of the database, with the NHD. Problems in the database can include misclassifications and density differences. The generalization tool being developed will prune out density differences to equalize the density. There are hierarchical differences and geographic names differences, specifically branch names in water bodies. In addition, Karst breaks in hydro network were problematic but NHD is now taking 3D network where it is known.
- E) **NHD Expectations:** USGS needs stewardship to maintain the database. Local knowledge is needed. The USGS maintenance projects are designed to perform minimal maintenance on the NHD for the entire country. USGS only has 15 people currently maintaining the database and therefore local stewardship is necessary to revise the data. There are opportunities for cost sharing and grants to maintain the data. Cost shares are beneficial to the maintenance process
- F) **Advantages to Stewardship:** One advantage is that stewardship crosses political boundaries. So far, 36 states have signed up for stewardship. DEP has not provided much input so USGS is looking to get other entities involved including academia.
- G) **Short comings in PA:** Shortcomings include stream movement, urban areas that hide streamflow, and stream changes caused by development.
- H) **Advances in New York:** NY State just completed a 3 year revision to modify and update their NHD.

PA Lidar may or may not be the best base for NHD. NJ used LIDAR and found that small depressions unrelated to hydrography were captured and had to be removed before completing hydrographic extraction. PA NHD data currently can be expressed as 85% correct. PA state level data stream system was built for DEP but this data was not integrated in USGS model.

#### Watershed Boundary Dataset and NHD

The history of the Watersheds Boundary Dataset started in the early 1990's. A national, seamless 12-digit watershed dataset was completely certified in April 2010 based on national guidelines that changed over the course of the process and expanded with increasing demand for data needs, data requirements and technological advancement to assist with more accurate and precise delineations. Currently, updates and maintenance by state stewards are continuing with discussions underway for a revised set of guidelines. The WBD and the NHD integration

successfully occurred in the spring of 2010. The NHD now uses the 1:24,000 scale watershed boundaries instead of the 1:250,000 scale; work on the integration model and tools are being developed for updates and maintenance of the WBD.

There is national discussion about the future delineation of 7<sup>th</sup> and 8<sup>th</sup> level hydrologic units, although PA is not moving forward with a plan at this time. NHD and WBD data is distributed by the USGS and NRCS will serve WBD data through the Geospatial Data Gateway.

## NHD Model Concepts and Contents

### Model Concepts and Contents

- New WBD federal standard TM 33 11A that will recommend moving away from using terms such as ‘subbasin’ and call WBD features by their number: ‘8 digit Hydrologic Units’.
- Resources to get or view data: NHD home page (<http://nhd.usgs.gov>), The National Map Viewer (<http://nationalmap.gov/viewers.html>), and The NHD Stewardship web site (<http://usgs-mrs.cr.usgs.gov/steward/st2maps.html>)
- Monthly NHD Newsletter is available. Contact David Anderson or Jeff Simley at USGS to be added to the mailing list.
- East and SE USA are most involved with NHD. Stewards can go in and ‘check out’ the data for the period of time they want to edit. Editing tools, technical status of any region is available. Feature level metadata is available.
- MY USGS (<https://my.usgs.gov/home/>): technical forums for WBD, NHD, and HEM tools, technical information exchange. Once you sign up for the group you can post documents, files, etc for use.
- National Map Viewer 2.0 (<http://nationalmap.gov/viewers.html>): allows you to directly download any national map layer including the new US Topo products.
- NHD Model Concepts & Contents
  - This presentation discussed the history and attributes in the model. David stated that this is normally an 8 hour presentation and is the “first course” in learning NHD.

## Strategies and Policies

There were several important questions raised at the session and participants provided feedback for new strategies and policies.

*What do we want to accomplish and why?*

- In the short term we need a 1:2,400 NHD for PA
- Long term, stewardship is needed to maintain the dataset (to make it current and versatile to support applications for its end users)
- Define the reasons for local NHD such as: scientific and practical: storm water, pollution tracking, hazard risk, conversion to DFIRM, etc.

*What resources are needed to accomplish this?*

- Stewards are needed working with the potential council.
- Summary of importance is needed.
- White paper is needed for reasons.
- A partnership for original conversion is required
- A stewardship model is needed.
- Identification of resources (financial and other end user needs).

*Whom do we ask for these resources?*

- Defined by the requirements gathering
- To whom to we ask for this to happen?
- PAMAP program?
- Statewide geospatial council.
- When?

NHD committee can become the NHD subcommittee to the geospatial council.

**Bottom line: the data creation and maintenance needs to be followed by on line applications for its use.**

### Opportunities for Collaboration

The results of the meeting showed an interest in having a multi phase approach moving forward:

**1. Needs, Requirements, & Standards:**

Develop a Determination of Need, Requirements and Standards for High Resolution P-HD Provided funding is available, an RFP will be released that will cover a Needs Assessment, Requirements Documentation, and Standards / Procedures Document for high resolution NHD development for Pennsylvania.

**2. A Pilot Initiative:**

Provided funds are available, a Pilot initiative will be conducted to generate P-HD and document the achievement of meeting the requirements identified in phase 1 and modify the standards / procedure document where necessary.

**3. Statewide Conversion:**

A statewide conversion phase provided funds are available, the remaining portion of the state to be converted to P-HD

**4. Stewardship Program:**

A Stewardship program for maintenance of the P-HD and timely submittals of NHD compliant data to USGS This stewardship program may include multiple and tiered partners and potentially take advantage of crowd sourcing.

**Initial steps in this process to include:**

1. The development of a summary of importance to identify current situation, opportunities and purpose.
2. The development of a white paper to further expand on the potential for P-HD.
3. A meeting of the NHD committee will be held to discuss the specifics of the Needs Assessment, Requirements Documentation and Standards/Procedures for P-HD.