

Question and Answers

New Jersey EDH Activities - April 21, 2021

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Participant Questions:

Have you used the lidar to update the WBD boundaries?

No. We lost our WBD steward and have been unable to refill the position, so I am now the steward by default. I integrated the HUC 14 into the NHD HUC 12, but approval is pending.

You stated that your ArcHydro processing fails. Have you tried turning the DEM elevation into cm, then turn it into a 16 bit integer? It makes the computation easier.

I followed-up on the suggestion and tested converting it to an integer. On a 10.7.1 box I have installed the Spatial Analyst patch and increased the Advanced ArcMap Settings jet engine setting to 2 million but ArcHydro still fails.

Do you do much linear referencing, i.e. linking data to the NHD using ReachCodes and Measures?

We did early on. We tried to get some of our monitoring groups engaged, especially the dam safety group. We produced a layer but don't maintain it on our server. We also have a Stream Network tracing application to water intakes. Early attempts to use linear referencing and migrate to the HEM tools lacked commitment. A perfect example is the C1 waters which still split the streams layer to fit their needs and coding requirements.

You tested various levels of accumulations and stated that 10 acres was closest to the current NHDFlowlines. Is there any interest to conflate the more detailed 2.5 acre accumulation drainage lines into NHD?

No. A lot of headwaters, roads, etc. that may not be in the right areas. In my slides I mention that I felt that 10 acres for the accumulation from the 10ft DEM was producing a drainage line closest to NHD high resolution detail for current NHDFlowlines. This changes somewhat depending upon the topography. NJ's data is local NHD resolution data which was loaded into in the High-resolution dataset in 2009. Since I do not process outside of NJ, I don't have anything to compare to from other states. Since I have "culverts" coded as connectors, my drainage line results are very close to existing data. I think the question was at the 2.5 acre level should the results be conflated into the NHD, and the answer is No. Too many headwaters and general surface flow is the result. In southern NJ tidal areas, the 2.5 acre accumulation is closest to our current NHDFlowlines.

If you register your names with the GNIS, will that enable the data to conflate?

Yes but the names are only reference points. We don't want to go through the process of registering our names with GNIS. We take the Board of Geographic Names as the official steward for names. Any names in our data which do not have a BGN GNISID are not official. Any new names or changes are handled through the BGN process so local names will not be conflated into the USGS NHD.

Which user applications are the biggest drivers for your local-res hydrography?

Land Use. Waterbodies and streams used by the counties. As the Enterprise database manager for NJ, I see any new data and projects before they go public. Whenever an Agency within NJDEP wants to publish an application involving water features, I check to see if their needs are met with an existing enterprise data layer, rather than having multiple variations. Agencies within DEP that reference our hydrography include Marine Fisheries, Water Quality & Monitoring which have many sampling locations and C! designation rules, Fish and wildlife stocking waters, Dam safety for failure risk assessment, just to name a few. The data has proven useful for locating sources of pollution from known permitted facilities which have mapped discharge outfall pipes. Many if not all NJ counties use the hydrography data layers.

Any special treatment of wetlands? Are they waterbodies? Do they connect as headwaters?

Wetlands are coded in our Land Use/Land Cover data layer and usually do not make it into the Water body feature class. Water level is usually fluctuating, and the use is sometimes related to an Agriculture use, such as cranberries. However, these areas are often coded as water in the LiDAR point clouds and hydro flattened in newer collections. We try to code stable water reservoirs as water, but the flooded agricultural fields are not.

The difference between 40,000 GNIS records and 269000 total records is striking. Please elaborate on the types of records in the local database.

NHD waterbody flow lines. Artificial streams connectors, etc. These two numbers represent the current total number (269,000) of NHDFlowlines arcs (Streams) and, of those, we have 40,000 arcs coded as connectors or "culverts". This was done prior to the 2009 conflation into the NHD so we have continued the model of mapping any stream crossing under a road surface as a connector. Artificial paths flowing under a "Bridge Over Water" are not split.

How large an area are you processing lidar at one time?

Starting in 2007, we switched our land use, which includes water, production mapping unit from Counties to HU8. Any processing of DEMs for Drainage lines has been by HU8 with our resampled 10 ft DEM. LiDAR collections are usually done by county boundaries and require resampling to process by HU8. QL2 LiDAR processing at HU8 level is proving too large to finish in reasonable time. I have been testing processing at the HU10 level and that will probably have to be the largest unit we could handle.

Interview Questions:

What would you now do differently?

We have incorporated the core NHD codes for waterbodies/area feature classes into our Land Use/Land Cover data layer. This statewide layer gets updated approximately every 5 years when a new Imagery collection is captured. For the next update using 2020 imagery, updating these NHD codes is written into the contract, as well as snapping to NHDFlowlines when any water feature is modified. I hope this will speed up the turnaround time of flowline editing and NHD conflation.

What surprised you?

Processing the QL2 data is more of a challenge than I expected. I was hoping to process this QL2 LiDAR derived DEM, which has been hydro flattened, and get better results. Our issues are either DEM format related, software related, or we are simply hitting processing limitations such that burning in culverts has not been successful.

What resources, other than the data (e.g. tool, document, online resource, etc.) did you find of most value to the process?

The USGS NHD community and related TEM mtgs have been extremely helpful in planning how our water features need to be mapped. Participating in webinars where users are sharing their experiences is helpful. Keeping up with the responsibilities of NHD stewardship have been challenging. With new version releases of tools and schema updates, NJ needs to get its updated data conflated as soon as possible.

What resource(s) would you recommend for development to assist the derivation of hydro?

More tools. Would like to learn more about who's been successful and how. NJ developed its own document to serve as a step-by-step guide for processing LiDAR derived DEMS. It needs updating to incorporate hydro flattened products produced by USGS. Understanding what steps USGS takes to process these products for its own needs, would help produce a uniform outcome.