

Question and Answers

This Takes Longer Than You Think: Hydro Coordination in Pennsylvania

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Participant Questions:

As you create new line work for your PAHD, are you submitting the new line work to the USGS through the Markup application?

No. But we would like to identify a process to do so.

You mentioned that the DEM did not have the resolution available in the point cloud - what value do you see in the point cloud?

DEM files are a generalization from the actual point data to a grid. The QL2 data we have is 2 points per square meter whereas the DEM portrays a 1-meter grid of elevation values. Tools and systems have been developed to work with DEM but we think there might be value in urban areas where the point cloud and/or TIN could portray local nuances like surface conveyance along curbs. Not sure the tools are there yet but we keep getting higher data density. This question is also part of the discussion about data management too. Do we want to store multiple versions of DEM's and point clouds? How many, and are there some standard compilations?

Matt Mercurio (matt.mercurio@civictmapper.com) works in urban hydrography and can provide good insights into the value of the point cloud data and enjoys a thoughtful conversation.

You obviously have strong interest in crowd-sourcing, geomorphons, and other new approaches. Where do you intend to go?

We are considering development of a crowd-sourcing app that would encourage the public to identify headwaters. That seems like a later phase, and the "crowd" could be pre-qualified contributors like the local Conservation District or watershed association volunteers.

We have a large demo area with data derived by multiple techniques that can function as a lab for evaluating and comparing derivation methods.

What potential do you see for the application of Artificial Intelligence (AI) and Machine Learning (ML) to derive hydrography?

It's coming. Machine Learning has great potential to apply to the workflow. Those won't make sense until we have the new 3DHD models in place so the work can be automated from start to finish (raw data to attributed and validated flowlines).

You've talked about flow line updates. Are you also considering updating your Huc boundaries to 12 digit codes (HUC12)?

Not at this time, but this is certainly the moment of opportunity at which watershed boundaries are an integrated part of the stream derivation, derived as part of a unified process. That is the promise of 3DNTM.

Interview Questions:

What would you now do differently?

Nothing, honestly. It was all part of the learning process.

What surprised you during this process?

We were surprised by the diversity of methods and approaches employed by different USGS contributors.

We have a great appreciation for the patience and support USGS demonstrates when dealing with multiple contributors and data.

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

NHD Training. Ellen has taken the training multiple times and learns something new every time. These NSGIC 3DHP Forums have also been valuable. We not only learn about different approaches but we are developing a community of practitioners that share information and field questions. Basically, it's the people – the ones that have interest and are willing to share information and explore new ideas.

What resource(s) would you recommend be developed to support the derivation of hydrography using elevation data?

More studies like the [geomorphon work published](#) by Matthew Baker and the Chesapeake Conservancy. Also need continuous dialog:

- it's important that you talk to your counties or other local partners as they can validate and enhance what we can do on a statewide basis.
- different ecologies need different representations
- Easy data access for on-the fly data update recommendations from filed practitioners
- Simplified update tools.

The biggest resource is patience and iteration. It takes longer than you think but is well worth the effort.