

Question and Answers

Creating a Hydro-enhanced Elevation Surface Using the Fully Integrated Elevation and Hydrography 3DHP Product

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Participant Questions:

What's the logic of putting provisional NHD in 3DHP?

It would be great to start the dataset with the brand-new data, but we needed some minimal network from NHD to connect the areas of new data. By expanding that to include most of the NHD flowlines and waterbodies, users will be able to work with the NHD using some new 3DHP tools and we'll replace the NHD data with the 3DHP data as it becomes available.

Would USGS be willing to consider state hydrography datasets in lieu of NHD?

Yes, we're working on the process to ingest state data. The data will need to meet core aspects of the acquisition specifications and be delivered in the elevation-derived hydrography schema so that we aren't doing a custom evaluation each time. We also need to consider how to categorize and integrate the data, for example as 'provisional' or 'with variance', so that it is clear the data are neither NHD nor 3DHP products. We recognize that these state data products have critical updates that are important to capture within 3DHP.

Are catchments (and HUCs) an EDH deliverable, or will they be derived by USGS from delivered EDH?

Catchments will be derived by USGS from the EDH deliverables as part of the ingestion process into 3DHP. The NHD that is ingested into 3DHP will not have catchments.

Who is going to be developing the elevation products? States, feds...?

We are currently planning to create a new 1-meter seamless elevation layer derived from lidar sources to use for hydrography derivatives. The plan is to incorporate that production in the ingestion of EDH data into 3DHP. This will guarantee a consistent production process and products.

Is there a national status map of the different enhancement/enforcement levels?

We are developing hydrography data acquisition status maps similar to those used by 3DEP. We will post those on a webpage as soon as possible.

Are the techniques to determine the locations that have to be breached or cut automated or will there be a human assisting with this. Also will these techniques be proprietary by the vendors doing the work or can states take on these techniques and help "start" the process in their state?

We don't prescribe methods for contactors to use, and they are often proprietary. We do validate the data and incorporate numerous checks to identify areas where culverts may

have been missed. Some of those validation techniques could be used as a start to the process of identifying culverts. We will share those techniques at a later meeting.

Are there guidelines yet for how much hydro-enforcing of culverts is necessary for 3DHP? Like how far up the stream network to include culverts?

If it's on the stream network, it should be captured. There is no minimum number. We recognize that there will be culverts on the landscape that are not captured because a hydrography feature was not captured as part of the delivery. Many small ditches and agricultural canals have culverts, and those features not required to be collected by the specification.

Will provisional data replace NHD, be in EDH, or be another reference layer?

To clarify, EDH is an input to 3DHP – an ingredient, not the final product. Provisional data will be tagged provisional, or whatever label is decided, until they can be validated to meet the specification.

Does USGS have a "3DHP Explorer" similar to the LiDAR Explorer or application being planned? Curious on what products/deliverables will be available to the public. Specifically, will both the conditioned DEMs and the enforced DEMs be shared?

We are definitely planning to have an interface to access the data. The 'views' to the data will be part of the data delivery. There will be annual snapshots of the data for download and with an identifier that can be referenced. Part of the delivery will be some form of raster product, but we are still unsure if it will be the hydro-enhanced surface or another variation. We're still in the design stage for delivering the raster products and still working out the deliverable. The raster products are huge, so we need to plan delivery of products carefully.

Will the USGS Validation Rules be Published to document the RUBRIC used?

We'll publish guidelines to describe the validation methods used and to explain the specifications. The validation rules are all directly linked to the specifications. We don't have the validation rules in the queue for release, but will now plan to add that.

Will the breachlines or cutlines, and any other features that modify the DEM, be available as a product we can use in the future? I suppose since we will be part of a BAA and that since the State helped pay for it, it should be a product in the deliverables, right?

It will be part of the 3DHP product and deliverable.

Will the culvert capture rule follow the 1M under bare earth surface rule previously mentioned?

Breaching features don't have to be within one meter of the surface. Breaching features include culverts, connectors through dams, and terrain breaches through artifacts in the elevation surface. The feature being breached, for example a road or railroad, is often well over 1-meter above the stream feature below it. The culverts or other breaching features just need to match the elevation of the stream entering and leaving the culvert.

If contractor developed EDH is ingested into 3DHP, is that 3DHP creation done by USGS? Is that ingestion primarily a data validation process?

USGS performs the ingestion which is more than just data validation. The data is first validated and corrected until it meets the specification. The validated data is then submitted to a process that converts the EDH schema to the 3DHP data model including assignment of mainstem-ids, edgematching with adjacent deliveries, and hydroconditioning to create catchments.

Will future deliverables have products that have the functionality of NHDPlus and Stream Cat?

The deliverables are still being designed. The objective is to capture the best of NHDPlus and Stream Cat and enhance operations by linking to other resources and the Internet of Water. At this point, there is no intent to include stream cat attributes.

How can stakeholders engage with the development of the draft guidelines document?

We are collecting feedback at this time via the 3DHP Technical Working Group and intend to distribute the recommendations more broadly once vetted. The primary role of the document is to meet the needs of 3DHP but we also want to ensure that it is useful to the 3DHP stakeholders.

Could you discuss how the stream permanence was populated in the original NHD and how will it be populated in the 3DHP?

Early hydrography maps included intermittent and perennial streams, then ephemeral streams were added. These features were primarily categorized by field crews and were highly variable in interpretation. The streams were then compiled into the topographic maps. When the hardcopy maps were converted to Digital Line Graphs (DLG), the coding did not always come across correctly. As corrections were digitized into the DLGs, additional inconsistencies were introduced. Going forward we will be adopting a probabilistic expression of stream permanence such as days per year or percentage. The objective to get to a continuous vs discreet descriptor.

How do you handle ag tile lines in the specifications. Is it an underground conduit? in Minnesota, we have ditches that flow then go underground through tile and then back to an open channel, and storm sewers.

We don't require them to be captured. We know that these features can significantly affect the way that water flows so would likely use a culvert or some form of connector to maintain flow integrity. If a State has an accurate dataset that can be used, we can provide that to the contractor so that those connections are mapped correctly.

Do you have an underground feature, primarily karst, but would like it to be a verified vs estimated path. Can talk about adding them?

We intend to include ground water components in the model, and they would certainly capture some of that. We currently include the feature type 'underground conduit' but would like it to be used with caution. We have draft collection criteria for karst terrain. If

an underground connection has been verified using a dye trace or other method, we can add those in using the 'underground conduit' feature type.

Other Federal Agencies and Many States have written Law/Policy based on the Blue Lines on the current Quad Maps - how will USGS inform/address this as 3DHP data rolls out?

The USGS is not a regulatory agency, we provide data. Other agencies will have to evolve their application of standards and protocols to build upon the improved data.

How are wetlands addressed?

We collect open water polygons and channels visible in the elevation surface within wetland areas. We have regular meetings and some pilot projects with the National Wetlands Inventory team to coordinate collections and specifications.