

NSGIC EDH for 3DNHD Monthly Forum:

Question and Answers

Michigan EDH Activities - February 17, 2021

Mark Holmes, GISP, Geospatial Services Manager, State of Michigan

Nick Weil, GISP, Michigan State University Remote Sensing & GIS Department

Could you provide more specifics about the "USGS Tool" you used for finding potential culvert locations? Could you provide a reference?

USGS Selective Drainage Toolbox:

<https://www.sciencebase.gov/catalog/item/59971732e4b0b589267bbb22>

The above link provides a download and documentation for the tool that we used. A newer version is available but has not yet been added to ScienceBase. Contact the tool authors for further information.

What flow accumulation threshold did you wind up using? Also, how much manual digitization was required even after 40,000+ culverts were enforced?

Multiple thresholds are used in order to ensure we produce both large-scale data and data that "matches" existing NHD. Our highest threshold was determined through manual examination and seem to be consistent across all areas. This could be adjusted as needed. The lower thresholds provide linework that is not captured by the highest threshold, but matches, at least partially, existing NHD. For example, if an NHD line continues farther than our high threshold line, we display lower threshold lines and include those in our repositioned NHD. For this pilot project, we created small scale lines at 400,000, 500,000 and 600,000 pixels of accumulation. After inspection, the 400,000 pixel threshold seemed to best match the existing NHD extent. We also generated large scale lines at a 25,000 pixel threshold.

What was your DEM resolution, pixel size?

QL2 2-foot resolution. However, we have used 1-meter in the past as well. We prefer to use the native 2-foot resolution.

Who is hungry for the EDH data in Michigan.?

These are some programs that will benefit from improved hydrography: emergency management, Fisheries, Habitat Management, Dam Management, Aquatic Invasive Species Program, Forest Management, Wetland Protection Program, National Forest, Trail programs, Parks and Recreation, Agriculture, County Drain Commissions, Floodplain Program, Great Lakes Program, any programs conducting hydrologic modeling, hydrogeology and groundwater modeling, watershed delineation, coastal management programs, asset management in general, tourism

Do the new flowlines have z-values populated from the DEM?

Lines will have Min, Max and Mean elevation as well as slope of the line populated from the DEM.

Are you using the [USGS EDH specifications](#)?

Yes.

Did you also update WBD for the pilot area?

No, the watershed boundary has not been updated, however one of the end products will be a fully hydro-enforced DEM with channels “burned” into the DEM as well as additional culverts not associated with calculated flowlines. This can be used to generate a new WBD.

What is the end game for the culvert database? A statewide culvert database? What about the pseudo / fake culverts you captured where the DEM was insufficient to model Hydro?

The plan is to implement a culvert inventory repository. Culverts will have feature coding that will differentiate between the culvert types, and pseudo culverts would have their own coding as would culverts under driveways as another example. The goal would be that users of this data could filter to the types of culverts that they would need for their work.

How much manual editing have you found to be necessary?

A considerable amount, but primarily in wetland and wooded areas. Wetlands, in particular, require manual digitization in many cases because even when there is a visible channel, the elevation differences are slight to nil. We also need to digitize when we have missed a culvert – often a pseudo culvert. Finally, we are manually editing lower threshold lines when they “match” existing NHD.

Has anyone discussed legal drains in this project?

Yes, these will need to be part of the project and part of our continued outreach plans include discussion with local Drain Commissions across the State.

You had mentioned including tractor crossings as culverts to include in your analysis; the Kalamazoo River basin is moderately agricultural; are you planning this same level of detailed analysis when you move to evaluating more intensively farmed (and flatter) parts so the state?

Yes. We will continue with this process throughout.

Will the NWI & NHD match at the end?

That is the plan, but more discussion has to occur.

Was smoothing linework all automated, or hybrid? Were other reference sources used [orthoimagery]?

Automated. A conservative smoothing threshold was selected to avoid lines moving outside of their “channel”. This can be adjusted in the future.

Did you incorporate storm sewer pipelines into pilot?

Not at this time. It has been discussed in our hydrography focus group meetings as we have outlined objective and requirements, but it was decided to consider these in a future phase.