Minutes

Hydrography TWG: 12 September 2019

Attendees:

Wilma Robertson, IDWR	More attendees from Atlantic
Missy Harris, IDWR	Ryan Thompson
Bill Nielsen	Kevin Reid
Rebecca Land	Rodney Cope
Matthew Taylor, Atlantic	Joel Harrison
Wes Sharp, Atlantic	Sabine Krier

Feature Presentation: A Selective Drainage Toolbox to Hydro-enforce Culverts and other features in LiDAR-based Elevation Rasters: Ryan Thompson, Hydrologist, USGS, rcthomps@usgs.gov

Study Background

- Create method to use LiDAR to find culverts and bridges.
- See slide 3 for details.

Collaboration

- State and local cooperators provided funding and man power for ground truthing of the culverts and bridges

Background

- Study area is the Big Sioux River watershed in the Prairie Pothole Region
- 12 digits HUCs were used

Method

- Builds on a previous study (see slide 9)
- Without hydro-enforced culverts, bridges and culverts look like dams
- See slide 22 of the method chart
    - The tool will identify areas that need to be filled and blend that with the DEM

Example

- The tool does not necessarily match the real world exactly, but it doesn't cause a lot of detail to be lost

Data Availability

- See slides 14-15

Global Selective Drainage Toolbox

- The tool works on Arc 10.6 or Pro
- Will be available on Science Base

Processing with Global Selective Drainage Toolbox

- The tool chooses the low point closets to the lowest point of the nearest water way
- If after the tool is downloaded some functions are not available make sure that the extensions needed in Arc have been activated
    - A list of the needed extensions is found in the User Guide

Tool 1: Create elevation derivatives

- See slide 19

Tool 2: Create fill zones

- Creates products based on the data created with the 1st tool
- Identifies fill zones

Tool 3: Create selective drainage flowlines

- Creates the drainage raster

Tool 4: Burn elevations raster

- Creates potential culvert locations
    - User chooses where culverts are
- Hydro-enforce the identified culverts
    - User chooses the depth at which to trench the culverts
    - User can wall in lines to account for floodwalls or levies
    - User can identify waste water ponds and make sure they don't add to the stream system

Tool 5: Create synthetic drainage network

- Allows user to choose the density of the stream network shown

Tips for Processing with Global Selective Drainage Tool

- Depending on the DEM resolution available, the user might want to divide the data into HUC 12s or smaller areas and then combine the datat once the analysis is complete
- Tool works best when a buffer around the study area is used
- Add a note in the data's attribute table to identify a known culvert in case the tool doesn't catch it due to vegetation or other reason

Reviewing assumed culvert locations

- The 1st example on slide 27 shows the difference between the hydro lines based on the DEM and the tool

- The 2nd example on slide 29 shows where the tool can't see the culvert due to vegetation
    - Multiple data sources are very helpful in identifying these type of areas

WBD Updates and Additions

- The tool created a more detailed HUC boundary
- HUCs can be divided into smaller HUCs if needed

Collaborator Applications

- Useful in urban planning
    - Helps developers to plan for existing culverts

Questions:

- What is the average processing time on a HUC 12?
    - The LiDAR available was resampled to 3 meters with no significant loss of detail
    - 1 HUC 12 ran in about 3-4 hours depending on the resolution size
- What was done with the areas that were hydro-flattened?
    - There weren't that many areas that were hydro-flattened, so there aren't any good recommendations on how to deal with that

Updates: Wilma Robertson, IDWR

- NHD
    - VisFilter:
        - VisFilter attribute is being populated. Plan to update your NHD this year
        - Still waiting on one HUC 8 in 1704 (Eastern Idaho)
            - As of July NHD Newsletter, just us and New York
        - Represents appropriate use of individual features through scale
        - There are 8 scales – 1:24000 through 1:5,000,000
        - Will be on NHDFlowline, NHDWaterbody, NHDArea, and NHDLine
- WBD
    - Some model changes coming. Plan to update your WBD
    - Increase LineSource attribute field length from 30 to 75 characters
        - Feature classes: WBDLine, NonContributingDrainageLine, and NWISDrainageLine
        - Updates to LineSource domain will be reflected in the new WBD standard
    - Decrease HUType attribute field length from 255 to 1 character
        - Feature classes: WBDHU10, WBDHU12, WBDHU14, and WBDHU16
    - Add ToHUC field
        - Feature classes: WBDHU14 and WBDHU16
    - Add ReferenceGNIS_IDs attribute
        - Feature classes: WBDHU2 - WBDHU16
        - Comma delimited list of up to three GNIS_ID's identifying the hydrologic, geologic, or geographic features for which the Hydrologic Unit is named

        - GNIS_ID attribute will be removed
- NHDPlus HR
    - Region 16 & 17 in beta
    - If you want to submit QC edits, see IDWR website.
    - Refresh cycle starting with Regions 6, 1, & 2.
    - VAA Webpage
    - Expanded descriptions of some of the attributes in the NHDFlowlineVAA table. Keep checking back as more attributes are added
- Markup Reviewer
    - For submitting small edits to all 3 datasets
    - Constantly making improvements
    - There is a "how to use" video – link?
    - Contact Linda Davis at IDWR if you have questions
        - Linda.Davis@idwr.idaho.gov

Other Business

- None Presented

Upcoming Events

- URISA GIS-Pro
    - Sept. 28 – Oct. 2, 2019 New Orleans, LA
- Northwest GIS Conference
    - Nov. 3-7, 2019 Bend, OR
- AWRA Annual Conference
    - Nov. 3-7, 2019 Salt Lake City, UT
- IWUA Water Law & Resource Issues Seminar
    - June 8-9, 2020 Sun Valley, ID

Next Hydrography TWG

- Mar. 12, 2020