StreamStats Data Preparation Tools Documentation
Release 4.0beta

Theodore Barnhart

Jan 22, 2020

CONTENTS:

ABOUT

The StreamStats Data Preparation Tools are meant to aid in the processing of digital elevation models (DEM) and hydrography data for ingestion into the US Geological Survey's Stream Stats application. The tools and the associated workflow examples can be used to prepare DEM and hydrography subsets for local Stream Stats folders, prepare those data for use in hydro-enforcement, hydro-enforce the digital elevation model, and processe the resulting flow accumulation and flow direction grids for use in the ArcHydro data model.

TWO

INSTALLATION

Clone these tools onto your machine using the git clone commands. Or download the the repository using the link in the upper right of the repositry page here: ***Link to repo***

Once downloaded, the data preparation ESRI ArcGIS toolbox can be accessed from the ArcCatalog pane in ArcMap or navigated to from ArcPro. The toolbox is compatable with both ArcMap and ArcPro, except for the final processing step, which relies on ArcHydro and only works with ArcMap.

The ArcGIS toolbox is build from a set of Python libraries that can be called from the command line or a scripting environment to facilitate processing large volumes of data. Please refer to the documentation of the Python libraries and the test_scripts folder for information and examples on the usage of the tools on the command line. The tools run fastest via ArcPro or Python 3, but can still be used with ArcMap and Python 2.

CITATION

Please cite these tools and documentation as:

Barnhart, T.B., K., Kolb, A. Rae, P. Steeves, M. Smith, and P. McCarthy, Stream Stats Data Preparation Tools, USGS Software Release, ***Citation URL Here***

3.1 Data Preparation Workflow

3.1.1 Exercise 1: Hydro-Enforcement

Document overview

Editor's Note: This exercise is run on the data in the Exercise 1 workspace. These instructions were originally developed by Al Rea and Pete Steeves for trainings over the years. These were updated by Dave Stewart in 2011. This version annotated by Kitty Kolb and others in 2016, 2018, and 2019. Last edits made before archiving were 13 September 2019.

Step 0: Preparation

Check Equipment

To run the StreamStats Toolbox you will need the following installed on your machine:

- ArcGIS version 10.3.x
- ArcInfo Workstation
- ArcHydro

Without these programs installed, and *these exact versions* installed, the toolbox will not work!

Obtain necessary data

File Structure

- Create four folders, all at the same level on your file directory
- They should be named
    - NED

- – WBD
- – NHD
- – archydro

- Do not nest them or give them alternate names, or else the tools will not be able to find the files when they are needed

NED

- For this exercise, 4 tiles have already been downloaded from the USGS seamless server.
- Important Notes: if you are using custom data instead of 3DEP
    - – Put the elevation grids here anyhow.
    - – They do not have to be named the same as 3DEP grids.
    - – If they are in their own projection instead of decimal degrees, that is okay.
    - – The rasters need to be stored as rasters in grid or tif format, preferably grid
    - – If you store it as a Raster Dataset in a geodatabase, it will not work

WBD

Using Exercise Data

- Use sample HUC data file that I tweaked to match NRCS WBD Data.

Real-world data prep

- If you are using official WBD for real-world (not test) data prep:
    - – Use the watershed boundaries stored in the most recent NHD downloads for your study area. ← This is the preferred option
    - – Or, from the NRCS Data Gateway: https://datagateway.nrcs.usda.gov/
        - ∗ On the lower right-hand side, under "I Want To" click the link for "Order by state."
        - ∗ Choose your state in the center of the page.
        - ∗ Then download the '12 digit Watershed Boundary Dataset 1:24,000.'
        - ∗ These are updated quarterly, however.
- Important Notes: If you are using your own in-house derived local boundaries
    - – Save it as a shapefile to the WBD folder.
    - – Make sure the fields names in your shapefile are the same as the field names for regular WBD.
- Field Naming Conventions
    - – You should have at least two fields in your shapefile
        - ∗ HUC_8
        - ∗ HUC_12
    - – Note: Current naming conventions for the NHD geodatabases are "HUC8" and "HUC12" with no underscore.