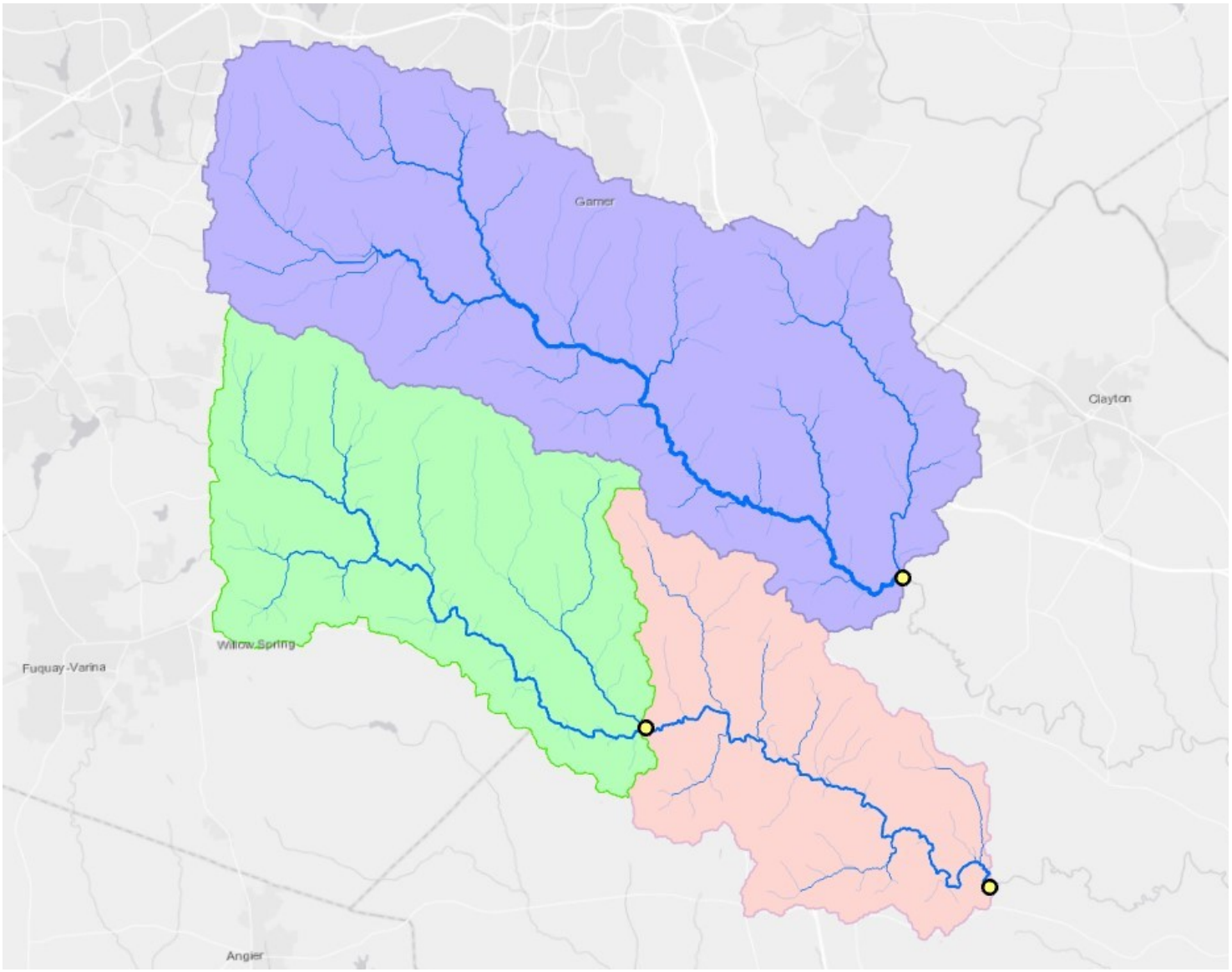
Watershed Stream Delineation Tool

Title Watershed Stream Delineation Tool

Description

This tool allows a user to delineate watersheds and streams using Digital Elevation Model (DEM) raster(s) and outlet point(s) provided as an input in ArcGIS Pro. The tool is built on ArcPy module, an ESRI Python package to extend the functionalities of ArcGIS products. It is suitable for students or professionals, such as hydrologists, researchers and consultants, working on watershed modeling, hydrologic data analysis and/or civil engineering projects.

Illustration



Usage

This tool can be used to determine the geographical extent of an upstream area which drains into a specific outlet located downstream.

Syntax

WatershedStreamDelineationTool_ (Input_DEM_Raster, Input_Outlet_points, {Aggregate_watershed?}, Outlet_snap_sensitivity, Stream_network_sensitivity)

Parameter	Explanation	Data Type
Input_DEM_Raster	Dialog Reference Select a single or multiple Digital Elevation Model (DEM) raster(s). Multiple rasters are automatically joined to create a single raster. DEMs should be selected from your local drive and file path should not contain space character to avoid any errors. A few example DEMs are provided in the `data` folder for testing purposes. The folder `test_1` has a single DEM for an area in Wake County, NC. The folder `test_2` has 4 DEMs that geographically align next to each other. These can be used to see how multiple DEMs are handled. More DEMs can be found at USGS's National Map service. There is no python reference for this parameter.	Multiple Value
Input_Outlet_points	Dialog Reference An outlet, or a pour point, is a point through which the upstream water drains and flows out of the watershed. There are two ways to load outlet point(s): 1. Load a shapefile containing point feature(s) from your local drive. Make sure the file path has no space characters. Ideally, move your shapefile to `data` folder in the `Watershed-Stream-Delineation-Tool` parent directory. 2. Use the pencil tool located next to the drop down button on the geoprocessing pane for this tool. Note - Outlet(s) should be located near a stream of flow accumulation and should lie within the extent of the DEM(s). A few example of shapefiles are provided in the `data` folder for testing purposes. The folder `test_1` has a shapefile with a single point feature from Wake County, NC. The folder `test_2` has a shapefile with 3 point features. This can be used with multiple DEM input rasters. There is no python reference for this parameter.	Feature Set
Aggregate_watershed? (Optional)	Dialog Reference If multiple outlets are provided, the user has a choice to either join the watersheds pertaining to each outlet or keep them separate. If checked, this input will aggregate separate smaller watersheds into 1 big watershed. If left unchecked, all the watersheds will be kept separate as their own polygon features. If only 1 outlet point is provided, any input for this field will not affect the output. There is no python reference for this parameter.	Boolean
Outlet_snap_sensitivity	Dialog Reference Specify the distance, in map units, within which the outlet point will be snapped to the pixel with the highest flow accumulation. A default value of 50 units is set. Increase the magnitude if you are uncertain about the proximity of your point features to a flowing stream.	Long

	There is no python reference for this parameter.	
Stream_network_sensitivity	Dialog Reference Specify the threshold of flow accumulation that makes up a stream. It is the number of pixels that should flow into 1 pixel to determine a raster of branches that represent the extent of a stream network. For instance, a value of 5000 for stream network sensitivity means that any cell in the flow accumulation raster having a value less than 5000 will not be a part of the delineated stream network. In other words, higher the sensitivity value, lower the branching of streams and lower the number of stream orders. There is no python reference for this parameter.	Long

Code Samples

There are no code samples for this tool.

Tags

watershed delineation, stream delineation, drainage basin, outlet, pour points, hydrology

Credits

ENVIRON 859 2020, John Fay

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Use limitations

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