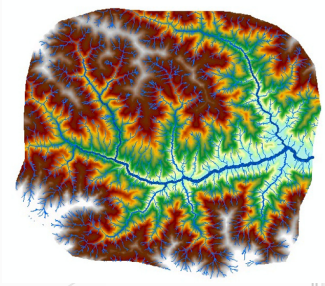
Workflow To Produce a Stream Network



A sink is a cell with undefined drainage direction; no cells surrounding it are lower. The pour point is the boundary cell with the lowest elevation for the contributing area of a sink. If the sink were filled with water, this is the point where water would pour out.

Raw DEM

DEM's almost always contain depressions that hinder flow routing. The initial first step is to create an adjusted depressionless DEM in which the cells contained in depressions are raised to the lowest elevation value on the rim of the depression.

Fill Sink Tool

There are two options to filling sinks in the input DEM surface with the fill sink tool. You can specify a specific fill depth or fill all to fill all sinks regardless of depth.

Filled DEM

Direction Raster Tool Options

NORMAL – If the maximum drop on the inside of an edge cell is greater than zero, the flow direction will be determined as usual; otherwise, the flow direction will be toward the edge. Cells that should flow from the edge of the surface raster inward will do so.

FORCE – All cells at the edge of the surface raster will flow outward from the surface raster.

Flow Direction Raster Tool

Flow Direction DEM

The flow direction raster is a raster that shows the flow direction from each cell to its steepest down slope neighbor.

Flow Accumulation Raster Tool

INTEGER output

INPUT

Optional weight raster

Flow Accumulation DEM

The flow accumulation raster is a raster where each cell is assigned a value equal to the number of cells that flow to it. Because all cells in a depressionless DEM have a path to the data set edge, the pattern formed by highlighting cells with values higher than some threshold delineates a fully connected drainage network. As the threshold value is increased, the density of the drainage network decreases.

Use of the CON tool creates an output raster where the value one represents the stream network on a background of NoData. A threshold value is used to select cells with a high accumulated flow. For example, all cells with more than 500 cells flowing into them are assigned the value one and all other cells are assigned NoData.

CON Tool

INPUT

Constrained DEM

Minimum number of cells (default is 500)

Strahler Ordering

OR

Shreve Ordering

Stream Order Tool

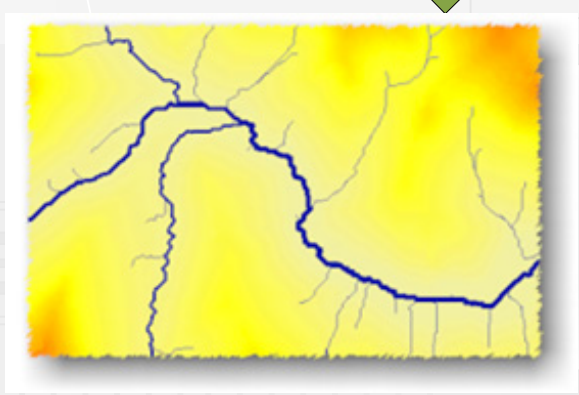
Stream ordering is a method of assigning a numeric order to links in a stream network. This order is a method for identifying and classifying types of streams based on their number of tributaries. Some characteristics of streams can be inferred by simply knowing their order.

Stream to Feature Tool

Stream Order DEM

Stream to Feature is a vectorization program designed primarily for vectorization of stream networks or any other raster representing a raster linear network for which directionality is known.

Stream Network Output



PGT Hydro Tools - Stream Network Tool		
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