
TauDEM with QGis and Sextante Documentation

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Introduction

Installation

The interface

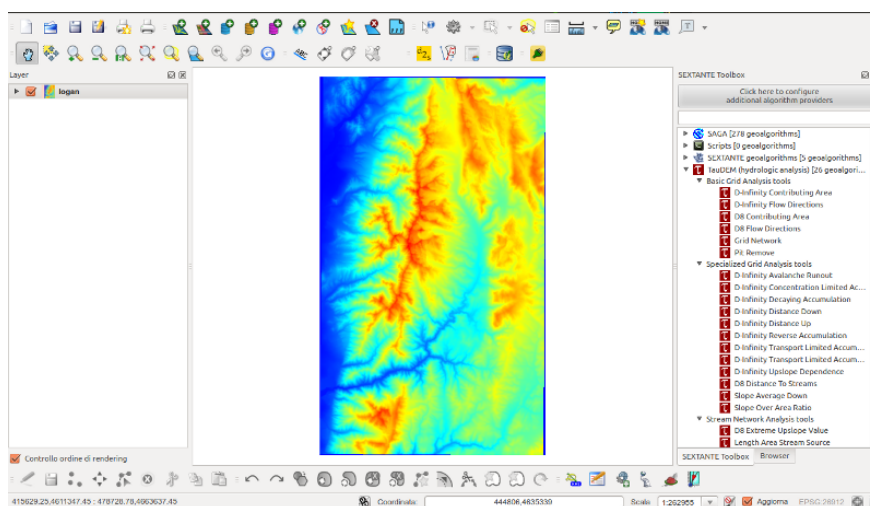


Figure 3.1: TauDEM interface in Sextante plugin.

Available tutorials:

3.1 CSDMS TauDEM Clinic “Hands On” Exercise

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3.1.1 Introduction

Goal

Be able to use TauDEM tools to derive hydrologically useful information from Digital Elevation Models (DEMs)

Purpose

The purpose of this exercise is to introduce Hydrologic Terrain Analysis using TauDEM and to guide you through the steps of running some of the more important functions required to delineate a stream network. Comprehensive documentation on the use of each TauDEM function is given in the online help that is part of the program. TauDEM (Terrain Analysis Using Digital Elevation Models) is a set of Digital Elevation Model (DEM) tools for the extraction and analysis of hydrologic information from topography as represented by a DEM. This is software developed at Utah State University (USU) for hydrologic digital elevation model analysis and watershed delineation and may be obtained from <http://hydrology.usu.edu/taudem/taudem5.0/>. In this exercise, you will perform the following tasks:

- **Basic Grid Analysis using TauDEM functions, including.**
 - Pit Remove
 - D8 Flow Directions
 - D8 Contributing Area
 - Grid Network
 - D-Infinity flow direction
 - D-infinity Contributing Area
- **Stream Network Analysis using TauDEM functions, including**
 - Stream Definition by threshold
 - Move Outlets to Streams
 - Stream Reach and Watershed
 - Peuker Douglas
 - Peuker Douglas Stream Definition
- **Specialized Grid Analysis using TauDEM functions, including**
 - Wetness index derived from slope to area ratio
 - D-Infinity Distance Down

Data

For this tutorial the Logan River watershed is used as an example; you can get it from [demo data link](#) . Once you extract the archive, you will get:

- **logan.tif** - GeoTiff Digital Elevation Model (From USGS)
- **LoganOutlet.shp** - ESRI Shapefile vector data

All data are in EPSG:26912 - NAD83 / UTM zone 12N.

Software

- QGis - You can get it from the [download section of QGis site](#)
- Sextante Plugin with the TauDEM extension for Sextante
- TauDEM

You can get more information about the installation in the main page

3.1.2 Basic Grid Analysis using TauDEM functions

Pit Remove

Pits are grid cells surrounded by higher terrain that do not drain. Pit Remove creates a hydrologically correct DEM by raising the elevation of pits to the point where they overflow their confining pour point and can drain to the edge of the domain. For more info check [Pit Remove in TauDEM help](#).

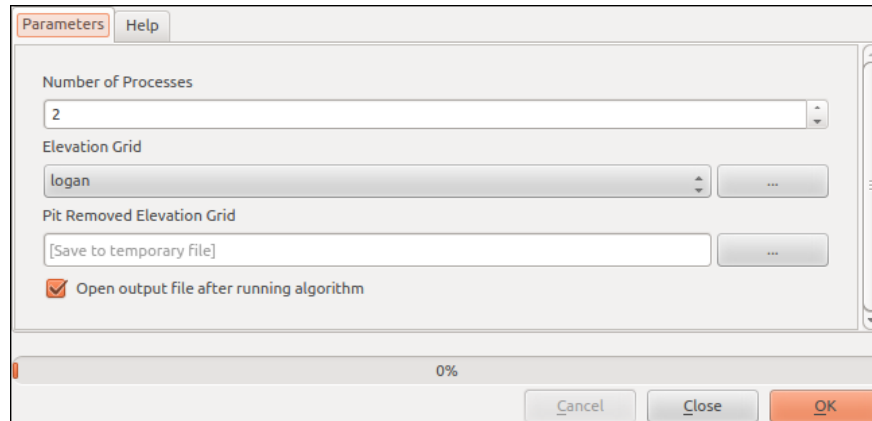


Figure 3.2: Pit Remove Window

Just use **logan.tif** as input and **loganpitrem.tif** as output. To double-check the result you can use Raster Calculator (Raster menu) to create a map made of the differences between the output and the input.

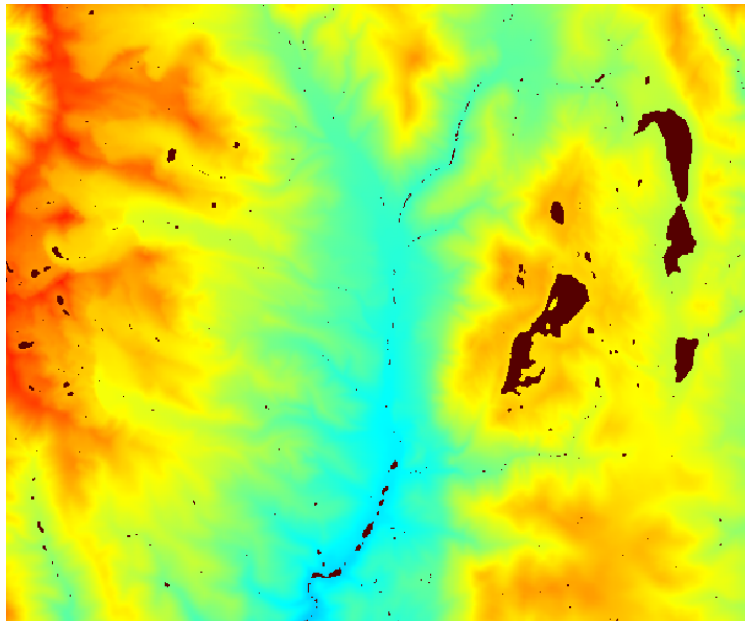


Figure 3.3: Area changed by Pit Remove tool

D8 Flow Direction

This function takes as input the hydrologically correct elevation grid and outputs D8 flow direction and slope for each grid cell. For more info check [D8 Flow Direction in TauDEM help](#).

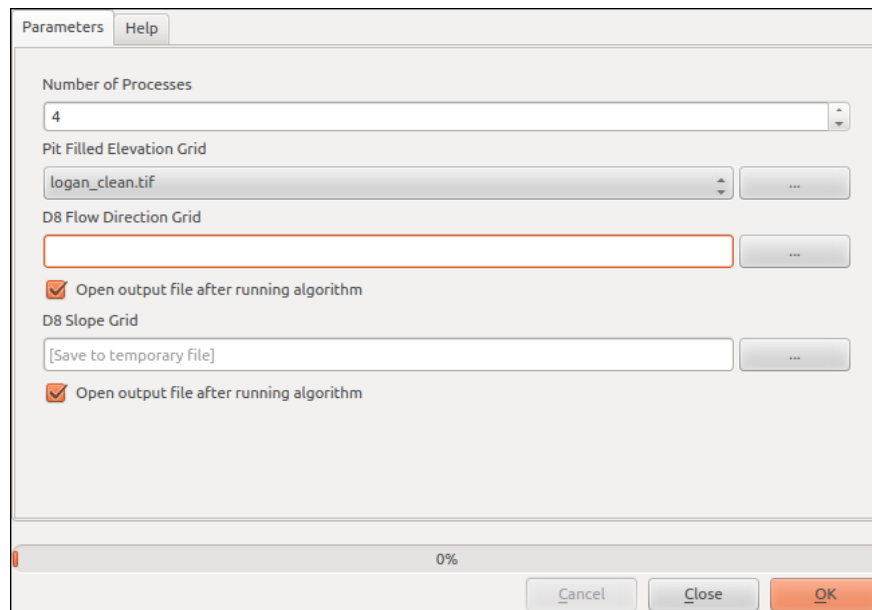


Figure 3.4: D8 Flow Window

The resulting D8 flow direction grid is illustrated in the next figure. This is an encoding of the direction of steepest descent from each grid cell using the numbers 1 to 8 with this encoding: 1 - East, 2 - Northeast, 3 - North, 4 - Northwest, 5 - West, 6 - Southwest, 7 - South, 8 - Southeast. . This is the simplest model of the direction water would flow over the terrain.

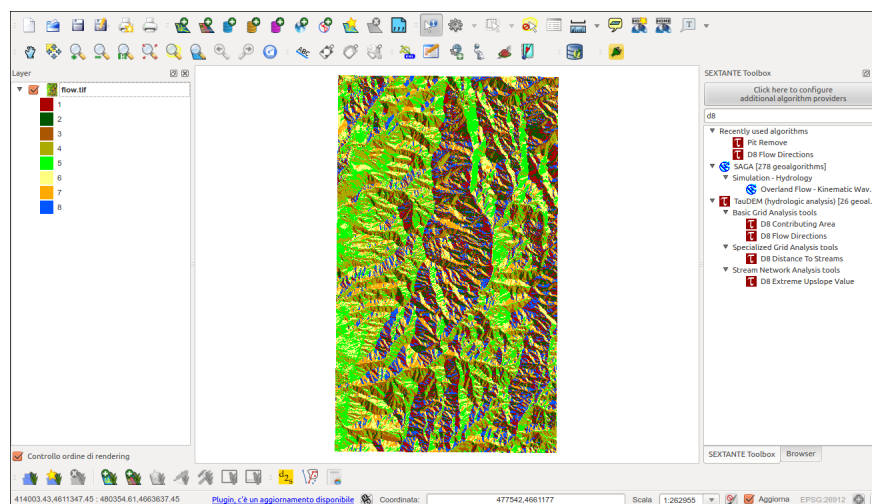


Figure 3.5: D8 Flow Output

Indices and tables

- *genindex*
- *modindex*
- *search*