



# Section:Raster Analysis

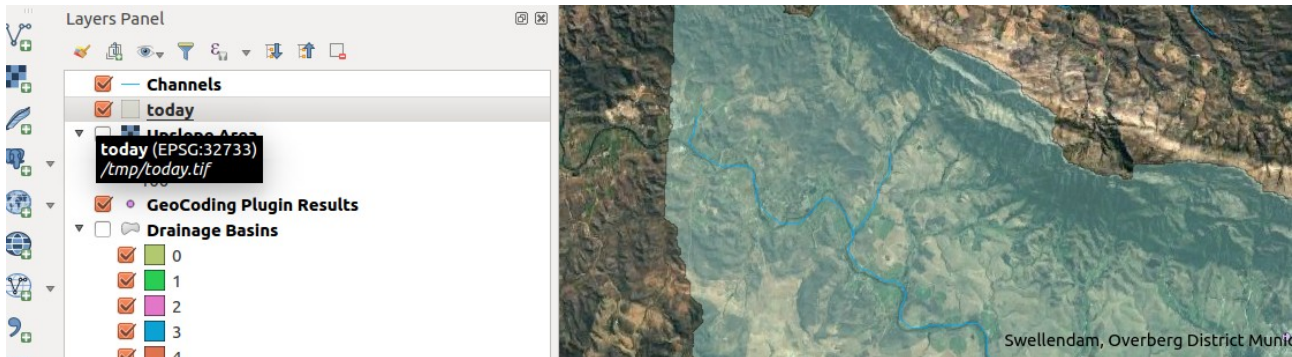
Module :Stream catchment delineation



## Stream catchment delineation Context

“DEM(digital elevation models) represents raster data where each cell value depicts elevation. From DEM we generate useful by products which can help us understand the terrain. Example of products generated from DEM’s are slope, aspects map”

In this module, we explore how to derive drainage maps and delineate a catchment area from the DEM.



### You try:

**Goal:** To determine the streams and catchment area for swellendam.

**NB:** You need the mentioned plugins

**Data:** appendix3-local-data/SRTM/

- \* Load the raster from the data path
- \* Run the fill sinks algorithm (save the filled dem and flow direction only)
- \* Apply the flow style to flow direction layer
- \* Run the strahler alg and use the filled dem as input.
- \* Use raster calc to create a boolean raster (use rast calc expression and input raster is from strahler alg)
- \* Apply the boolean style on the boolean raster
- \* Add an additional no-data value 0 on the boolean raster
- \* Run chaneln alg with Filled Dem as the input. Set the threshold to 8. (save channels and drainage basins only)
- \* Activate plugins
- \* Search Swellendam using geocode plugin
- \* Zoom to a river near the point added by geocode plugin.
- \* Use co ord capture plugin to capture a point along the vector river.
- \* Use the slope alg. Substitute x,y for values in the coordinate capture. Use values representing correct CRS of the raw raster layer.
- \* Proceed to generate the catchment and streams as vector layer.

Name	Value
Fill sinks algorithm	Fill sinks (wang and liu)
Flow style	d8_flow_directions.qml
Strahler alg	Strahler order
Raster calc	"strahler@1" >= 7
Boolean style	strahler_boolean.qml
Channels alg	Channel network and drainage basins
plugins	Coordinate capture,geocoding
Slope alg	Upslope area



## More about

Geoprocessing analysis is performed to recondition the digital elevation model and generate data on flow direction, flow accumulation, streams, stream segments, and watersheds. These data are then be used to develop a vector representation of catchments and drainage lines from selected points that can then be used in network analysis



### Check your knowledge:

**1. DEM is an abbreviation for:**

- a) Data emission problems.
- b) Digital elevation Movie
- c) Digital elevation model

**2. Which of these represents a derivative of a digital elevation model:**

- a) A satellite image showing mountanous areas.
- b) A slope curvature map that is used by surveyors to determine the direction at which the sun shines
- c) A vector data that represents natural phenomen.

**3. Plugins are extensions in QGIS:**

- True
- False

Answers: 1c, 2b, 3t



### Further reading:

[http://docs.qgis.org/2.14/en/docs/user\\_manual/processing\\_algs/taudem/basic\\_grid\\_analysis\\_tools.html](http://docs.qgis.org/2.14/en/docs/user_manual/processing_algs/taudem/basic_grid_analysis_tools.html)

[http://docs.qgis.org/2.14/en/docs/user\\_manual/processing\\_algs/saga/terrain\\_analysis\\_channels.html](http://docs.qgis.org/2.14/en/docs/user_manual/processing_algs/saga/terrain_analysis_channels.html)

[http://docs.qgis.org/2.14/en/docs/user\\_manual/processing\\_algs/saga/terrain\\_analysis\\_hydrology.html#upslope-area](http://docs.qgis.org/2.14/en/docs/user_manual/processing_algs/saga/terrain_analysis_hydrology.html#upslope-area)