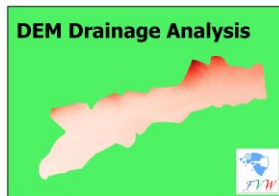
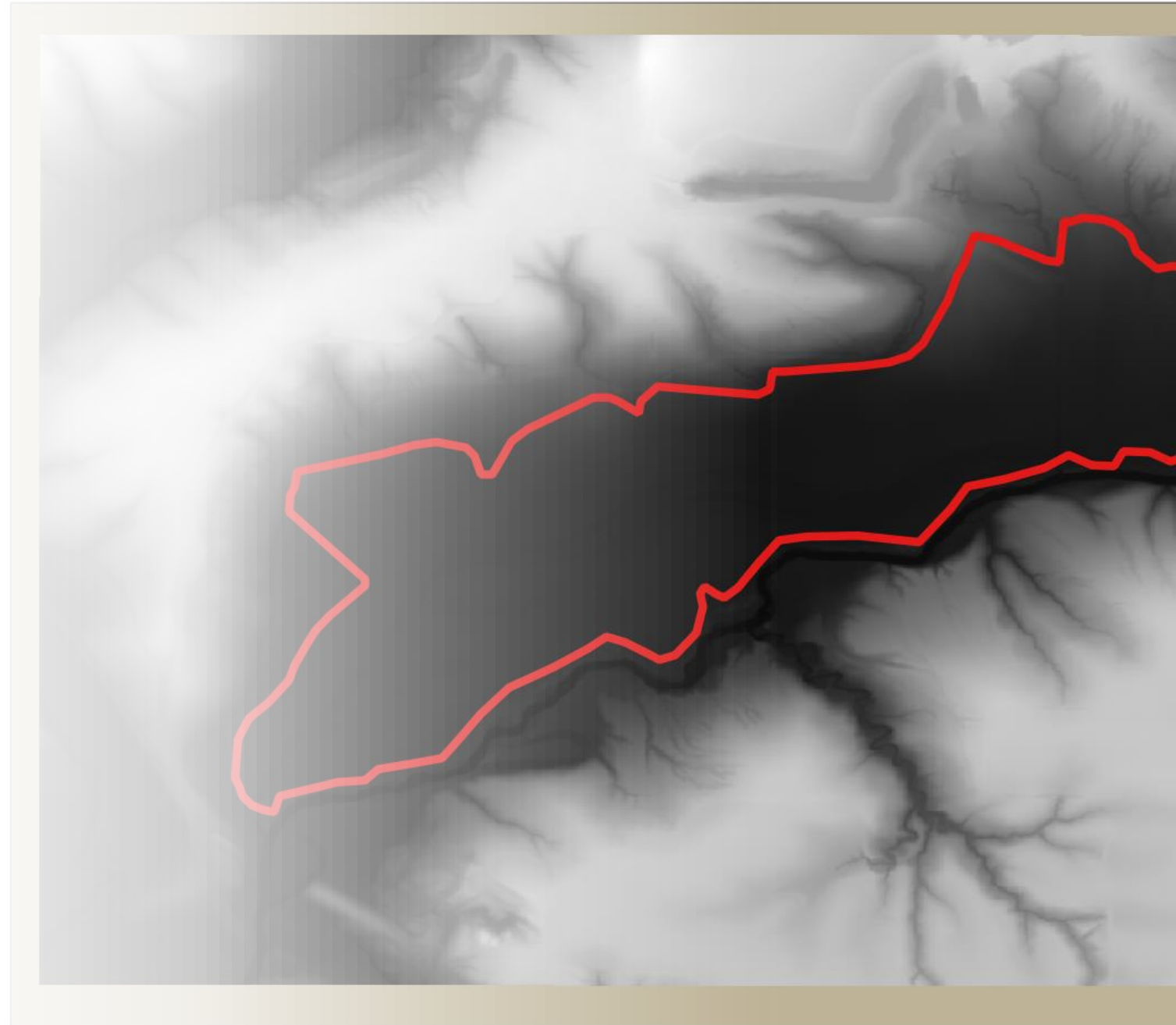


Starting up Plugin Installation for “DEM Drainage Analysis”



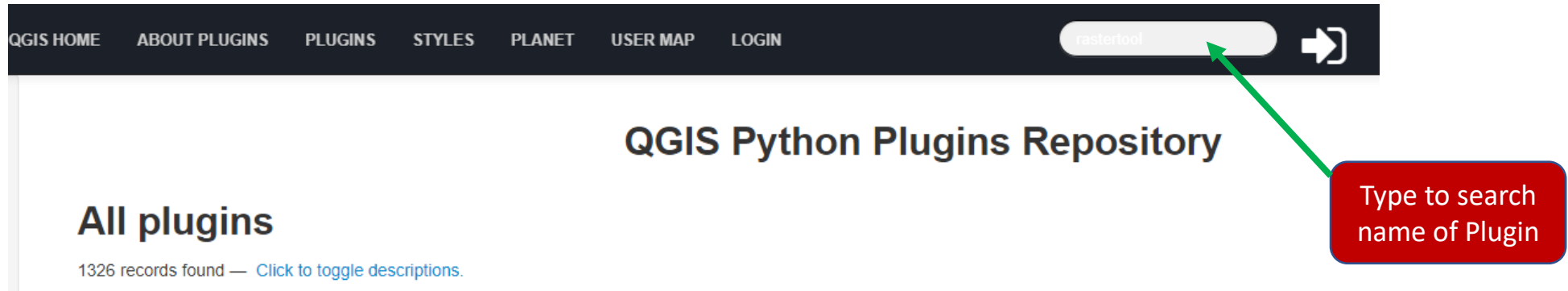
Plugin Logo



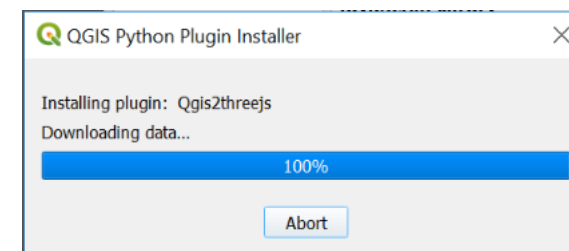
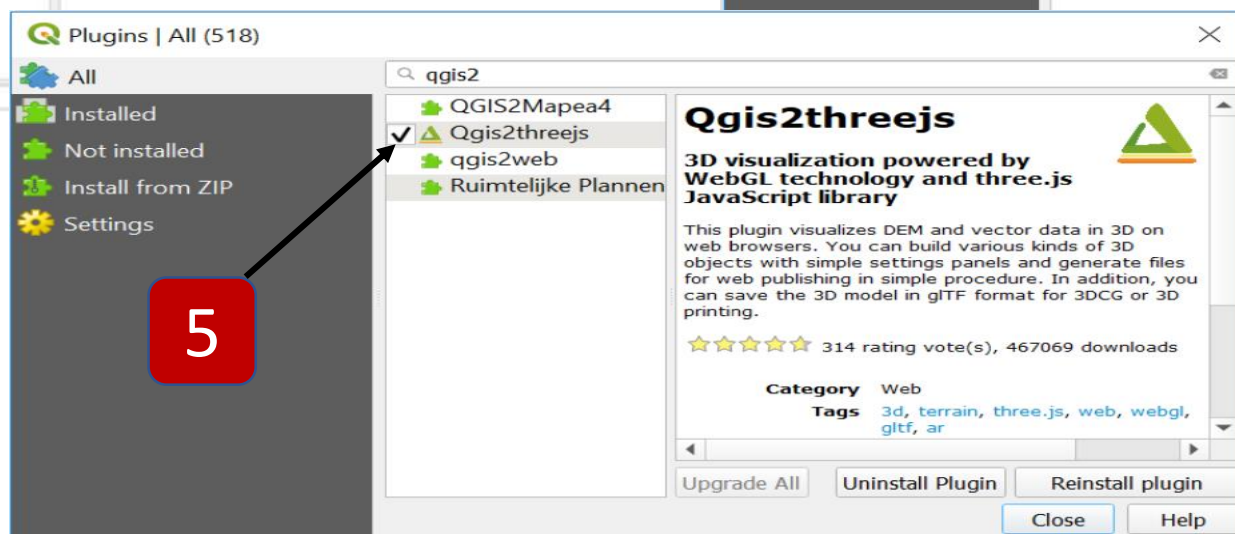
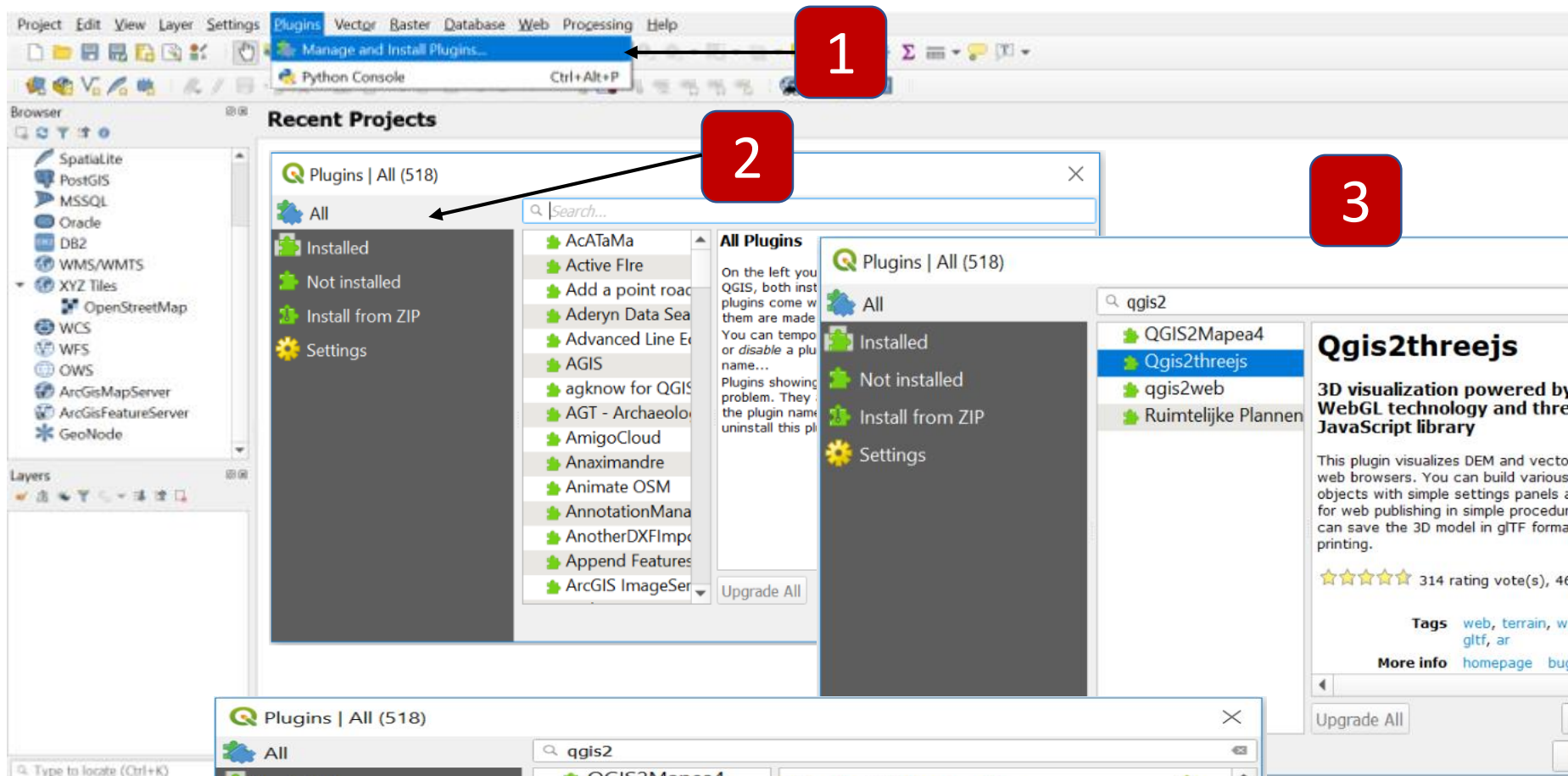
Method 1 Installation Guide



Online from the QGIS Plugin Repository directly (<https://plugins.qgis.org/plugins/>), just type to search the name of the plugin. Once it appears, click to download it.



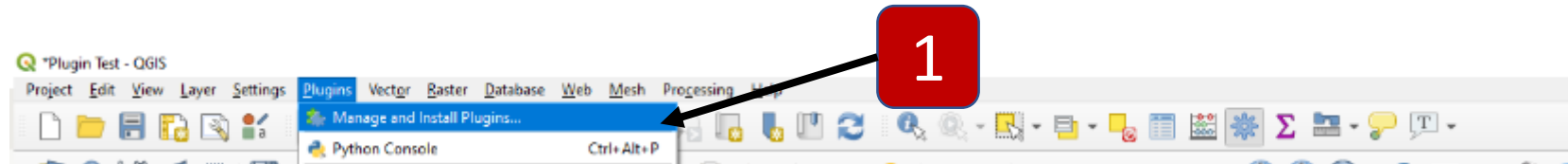
Here, a direction is given on how to install the “**DEM Drainage Analysis**” plugin from the plugin function of the menu bar in QGIS Software window, using the example provided below for downloading and installing a plugin into QGIS. Type “**DEM Drainage Analysis**” Instead of “**Qgis2threejs**” in the search field. Simply follow the directions given by the arrows. To begin, first launch the QGIS software and then follow the directions below.



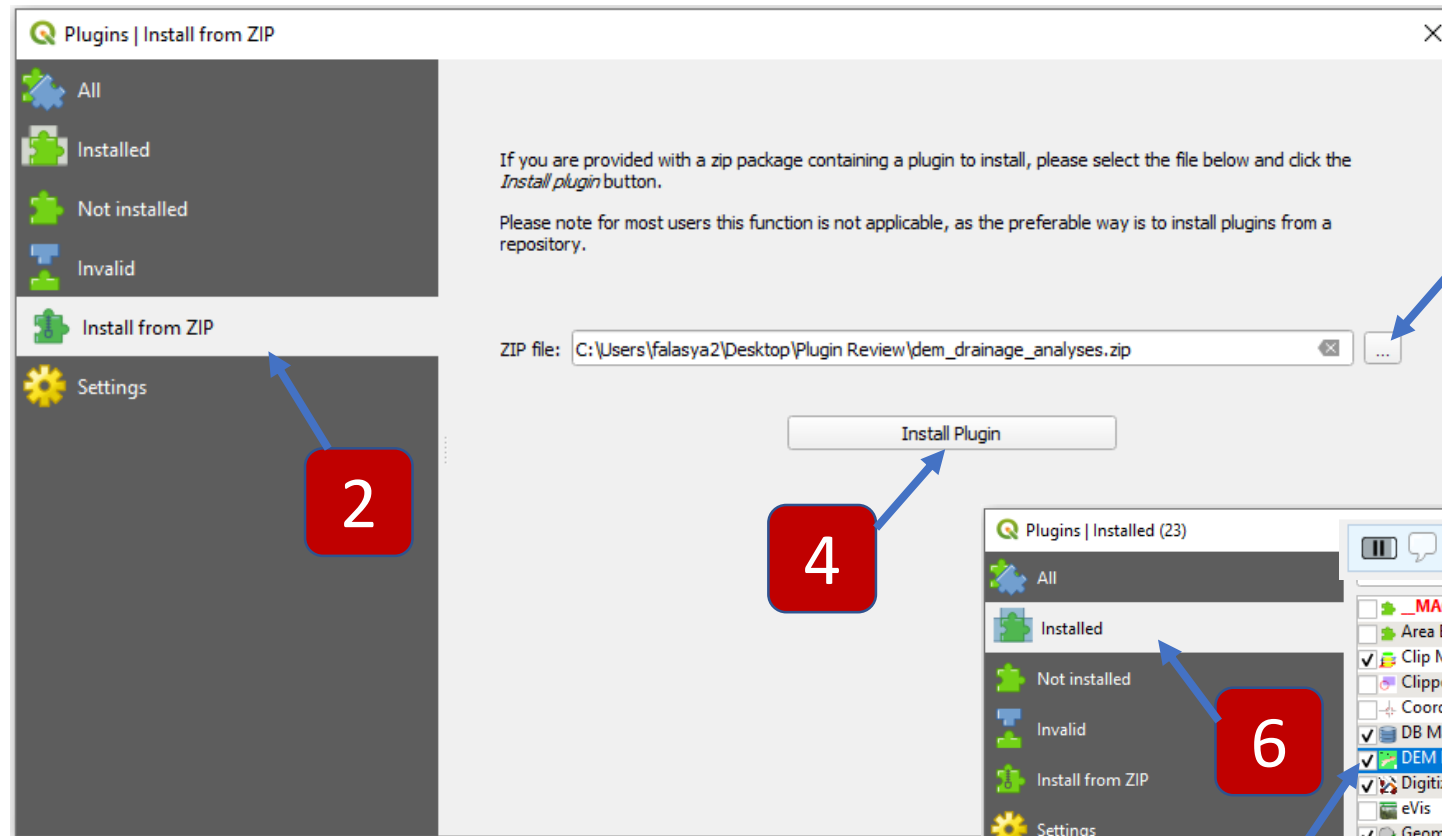
Method 2 Installation Guide



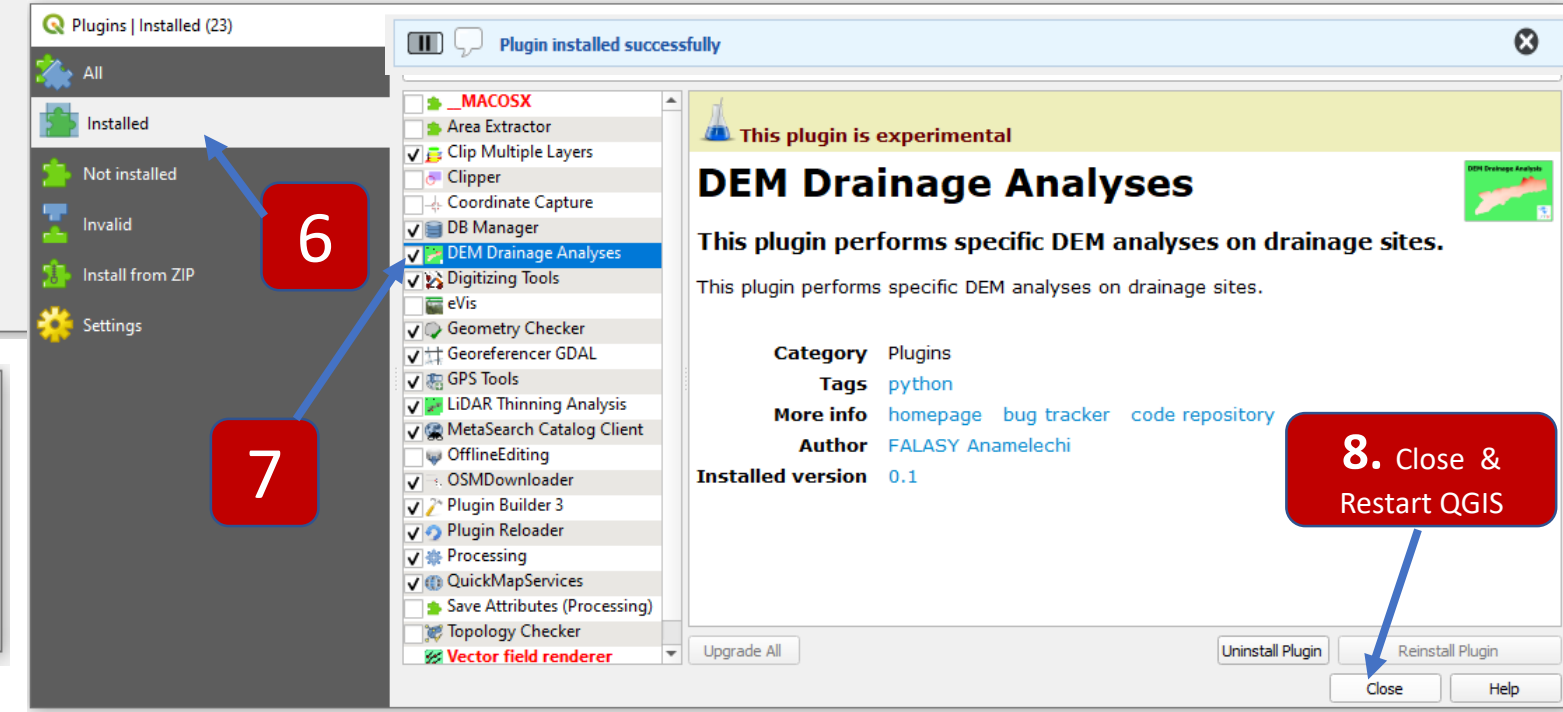
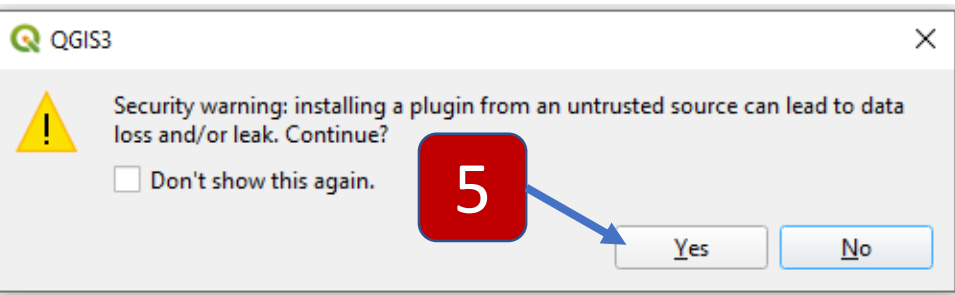
Here, a direction is given on how to install the “**DEM Drainage Analysis**” plugin from the plugin function of the menu bar in QGIS Software window, using the example provided below for downloading and installing a plugin into QGIS. To begin, first download the plugin zip file unto your computer desktop. Next, launch the QGIS software and then simply follow the directions given by the arrows below.



Here, a direction is given on how to install the “**DEM Drainage Analysis**” plugin from the plugin function of the menu bar in QGIS Software window, using the example provided below for installing a plugin into QGIS. Simply follow the directions given by the arrows. To begin, first launch the QGIS software and then follow the directions below.



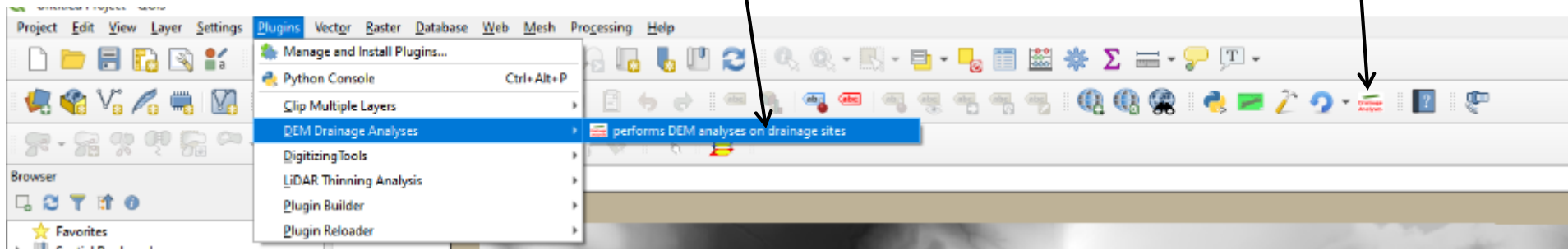
3. Browse and load the plugin zip file



8. Close & Restart QGIS

“DEM Drainage Analysis” – Plugin Installation Check

Menu Panel → Plugins → DEM Drainage Analysis (or check for plugin icon symbol on the Tool Bar)



Here, a direction is given on how to check and confirm the installation of the “**DEM Drainage Analysis**” plugin from the plugin function of the menu bar or Tool Bar. Simply follow the directions given by the arrows on the slide.

Method II - Plugin

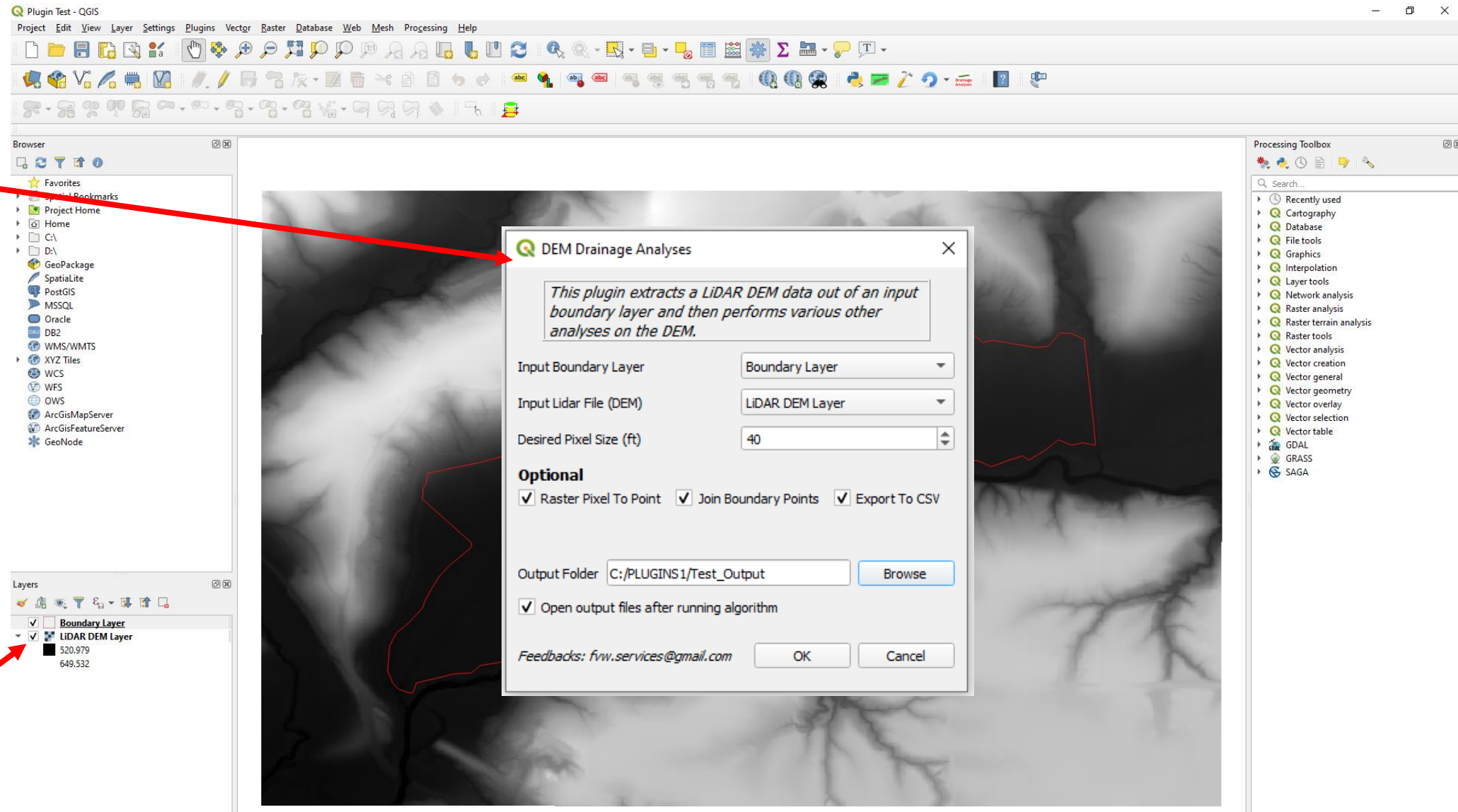
2: Call Plugin →

Menu Panel → Plugins →
DEM Drainage Analysis (or
check for plugin icon
symbol on the Tool Bar).

See next page.

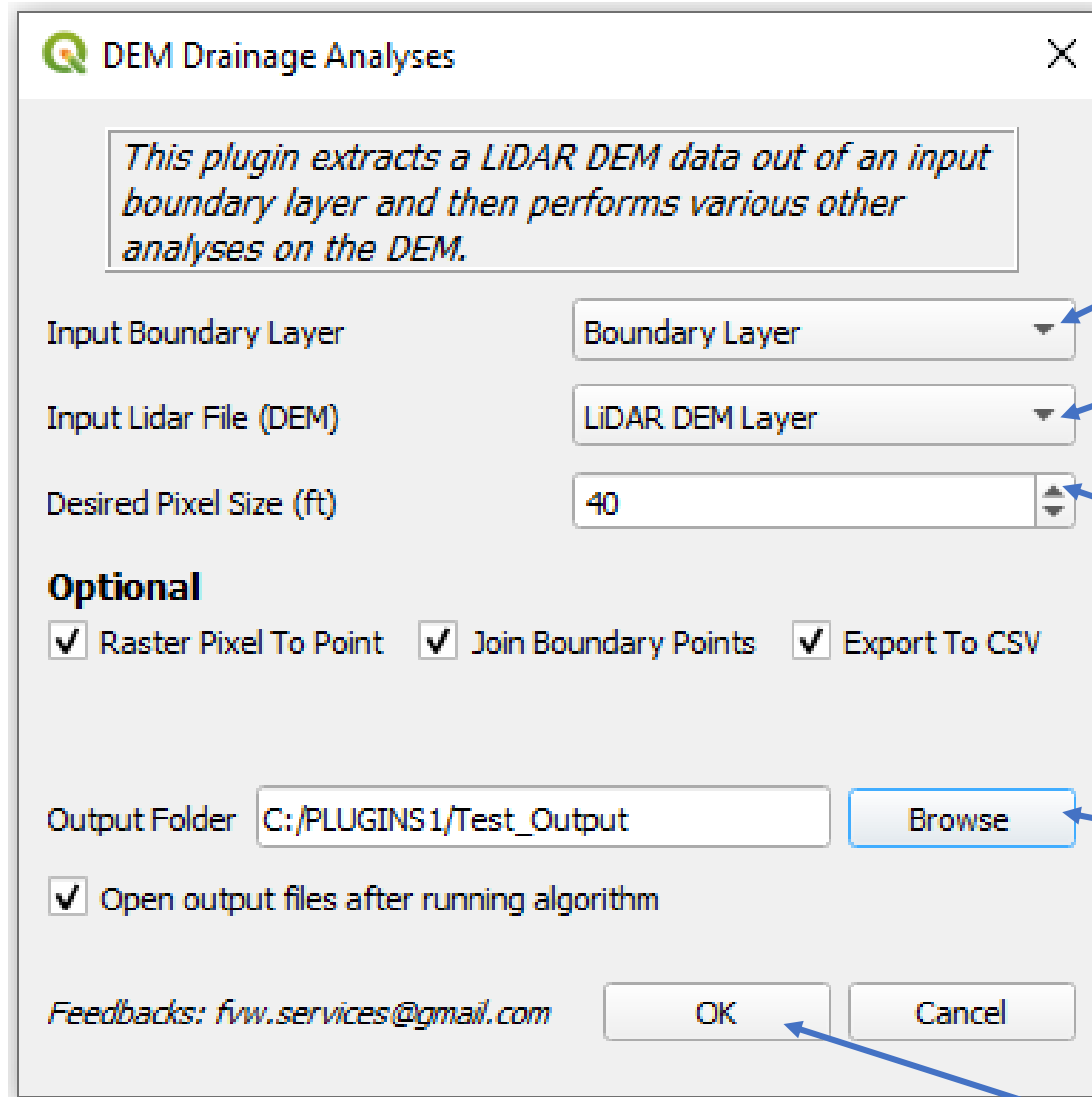
1: Load Layers →

Boundary Data (vector
layer), LiDAR DEM regional
data (raster layer), Web
Base Map (optional).



“DEM Drainage Analysis” - Plugin GUI

All Analyses Tasks
Performed by the Plugin,
checked at default.
However, you can uncheck
the task not desired.



The image shows the 'DEM Drainage Analyses' plugin GUI. It features a title bar with a QGIS logo and a close button. Below the title bar is a text box describing the plugin's function. The main area contains several input fields and checkboxes. On the right side, there are five red boxes with numbers 1 through 5, each with an arrow pointing to a specific GUI element. An orange arrow points from the first text box to a bracket on the left side of the GUI. A blue oval at the bottom left contains a note. A blue box at the bottom right contains a note about the OK button.

DEM Drainage Analyses

This plugin extracts a LiDAR DEM data out of an input boundary layer and then performs various other analyses on the DEM.

Input Boundary Layer: Boundary Layer

Input Lidar File (DEM): LiDAR DEM Layer

Desired Pixel Size (ft): 40

Optional

☒ Raster Pixel To Point ☒ Join Boundary Points ☒ Export To CSV

Output Folder: C:/PLUGINS1/Test_Output

☒ Open output files after running algorithm

Feedbacks: fww.services@gmail.com

1: Input Boundary Layer dropdown

2: Input Lidar File (DEM) dropdown

3: Desired Pixel Size (ft) spinner

4: Browse button

5: OK button

Note: Once the
Process is completed,
cancel all prompt ups.

5: Press OK and wait for a few
seconds depending on the density
of point cloud data within the extent
of the boundary layer extracted.

Plugin Function:



Extracting and Thinning of LiDAR Data for a Field

LiDAR Thinning is a process that reduces the density of a point cloud data based on a specified threshold spacing. 'Thinning' is the process of discarding LiDAR data from a file, in order to generate a smaller, less detailed file.

This plug-in extracts a LiDAR DEM data out of an input boundary layer and then performs specific DEM analyses on drainage site. Such analysis includes:

- a. Extracts out all loaded checked vector and raster files within the boundary layer extent on the map canvas. Note: uncheck all web map layers from "QuickMapServices" like Google Satellite or Google Hybrid or OSM in the layers panel before pressing the OK button in the plugin.
- b. Performs raster resampling to the desired pixel size desired. Note range of executable pixel size: 20 – 100 (ft).
- c. Converts the resampled raster layer to a vector point layer, by creating point features for each individual pixel's center in the raster layer.
- d. Generates boundary lines into points layer and then join points to vector point layer
- e. Exports the boundary lines points layer and the converted vector point layer to CSV files respectively, using the boundary layer extent. The CSV files can then be opened in excel. This function adds X and Y (or latitude/longitude) fields to the vector point layer.
- f. All operations are saved in your specified subfolders accordingly. After all tasks have been executed and analyzed, go to the specified save folder and there you will see all 3 subfolders containing all files: "CSV_Files", "Rasters", and "Vectors". The entire task of the plugin takes few seconds depending on the density of point cloud data within the extent of the boundary layer extracted.

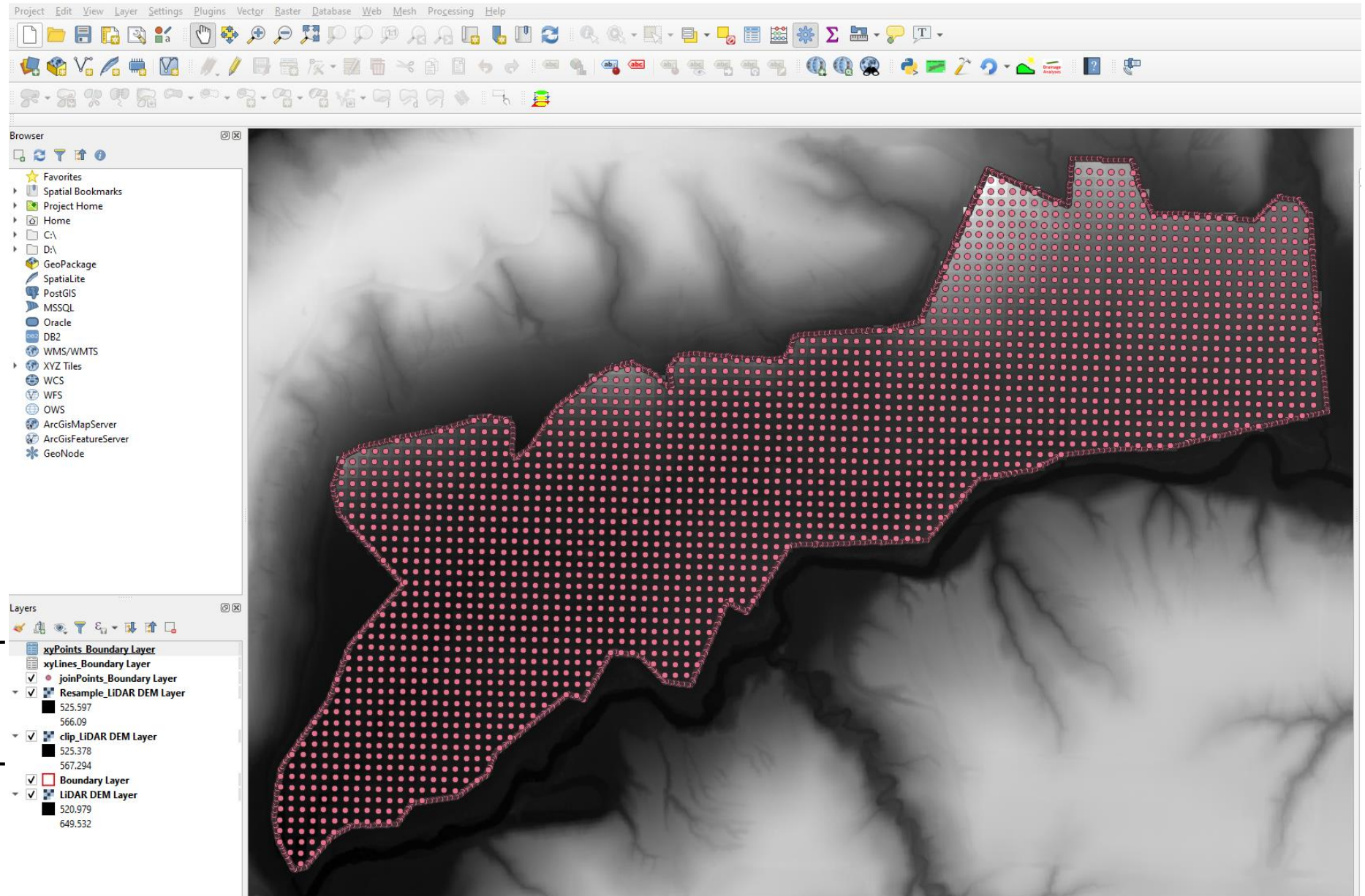
“DEM Drainage Analysis” Plugin Processing Module Flow-chart

S/N	Functions	Actions	Processing Module
A	Input Boundary Data (vector layer)	Setup Parameters	
B	Input LiDAR File DEM (raster layer)		
C	Specify the Desired Resampling Pixel Size (in Feet)		
D	Browse to Select the Output Folder Location		
E	Open output files after running (Default: Leave Box Checked)		
E	Check all needed Boxes (Default: All Checked)		
F	Creates 3 Storage Subfolders (CSV files, Vectors, and Rasters)	1st	QGIS
G	Extracts all selected and displayed Raster layers within the boundary extent	2nd	GDAL
H	Resamples extracted Raster Layer to the specified pixel size	3rd	SAGA
I	Converts Resampled Raster pixel to Vector Point layer	Optional Tasks	QGIS
J	Generates boundary lines into points layer and then join points to vector point layer		QGIS
K	Exports the boundary lines points layer and the converted vector point layer to CSV files respectively, using the boundary layer extent		QGIS
L	Saves all extracted and analyzed data into the respective subfolders created	4Th	QGIS

Completed Plugin Task Window

Output from all Analyses Tasks
Performed by the Plugin →

- Clipped LiDAR DEM regional data (raster layer)
- Resampled LiDAR DEM regional data (raster layer)
- Joined Points of Boundary Lines & Inner regional points (vector layer)
- Exported XY data files for both boundary points and inner points, respectively (csv layer)



Note: Once the
Process is completed,
cancel all prompt ups.