Exercise Supplement: Adding Raster Data

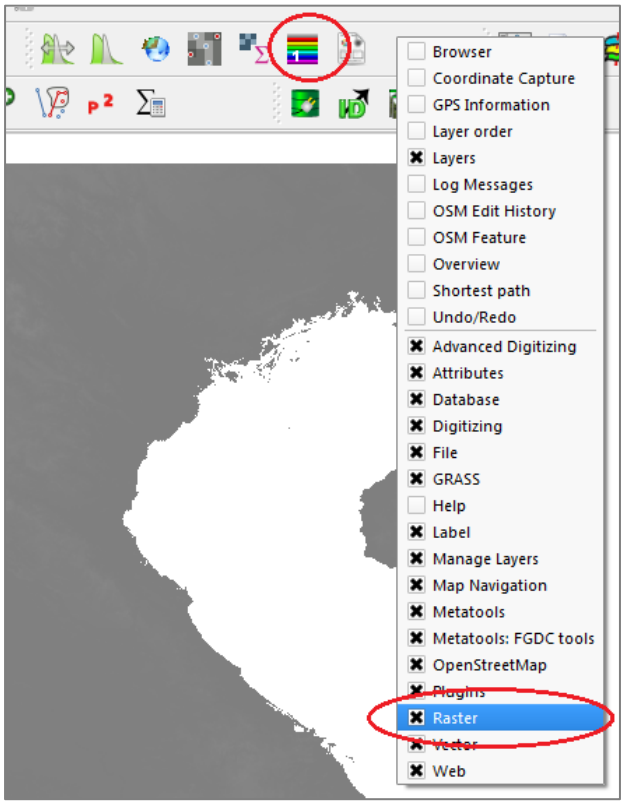
This exercise will teach you how to add and work with raster data in QGIS. In this exercise you will learn how to:

- Add a raster layer to QGIS
- Symbolize the raster layer
- Extract values from the raster layer
- Create a hillshade layer for more advanced terrain visualization

You will be working with a Digital Elevation Model (DEM) in this exercise. A DEM is a representation of the Earth's surface. Each pixel of the DEM provides the elevation value for that particular pixel area. Elevation values are computed from satellites equipped with specialized radar antennae.

Section 1: Adding and symbolizing a raster layer

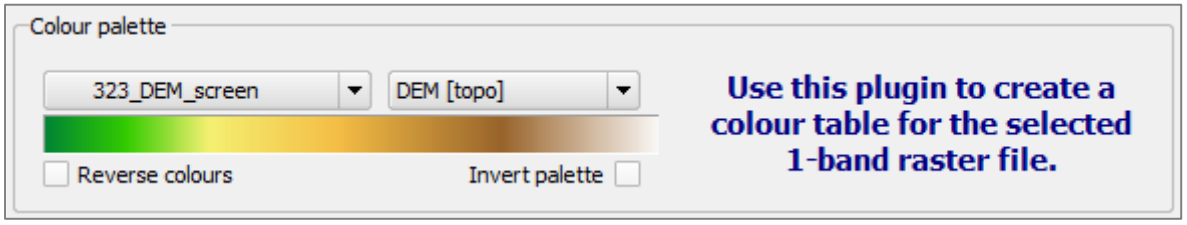
1. Start QGIS Desktop.
2. Click the *Add raster layer* icon. 
3. Browse to //Vietnam_Training/05_Data/02_Raster/VNM_dem.tif and click *Open.*
4. Click on the DEM layer in the Layer Panel to highlight it.
5. Click on the 1-Band Raster Colour Table v1.x icon. The tool allows you to customize the symbolization of raster layers. If you don't see it right click the toolbar section and make sure the Raster toolbar is turned on. If you still don't see the *1-Band Raster Colour Table V1.x*. icon you might need to add the plugin. See exercise 0 for details of this process.



6. Click the drop down menu for *All palettes* and select *DEM [topo].* This will select all of the color palettes that

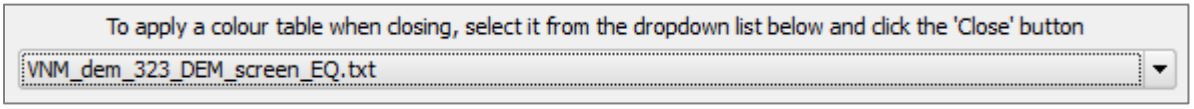
have been specially designed for representing elevation.

7. Click the drop down menu for **ColorBrewer Palette** and select the color ramp that is green on the left, then yellow, then brown, and white on the right side. Once the proper color ramp has been selected, you should see the following:



8. Click the *Create* 

button.
9. Select VNM_dem_323_DEM_screen_EQ.txt from the drop down menu at the bottom of the window.



10. Click *Close.*

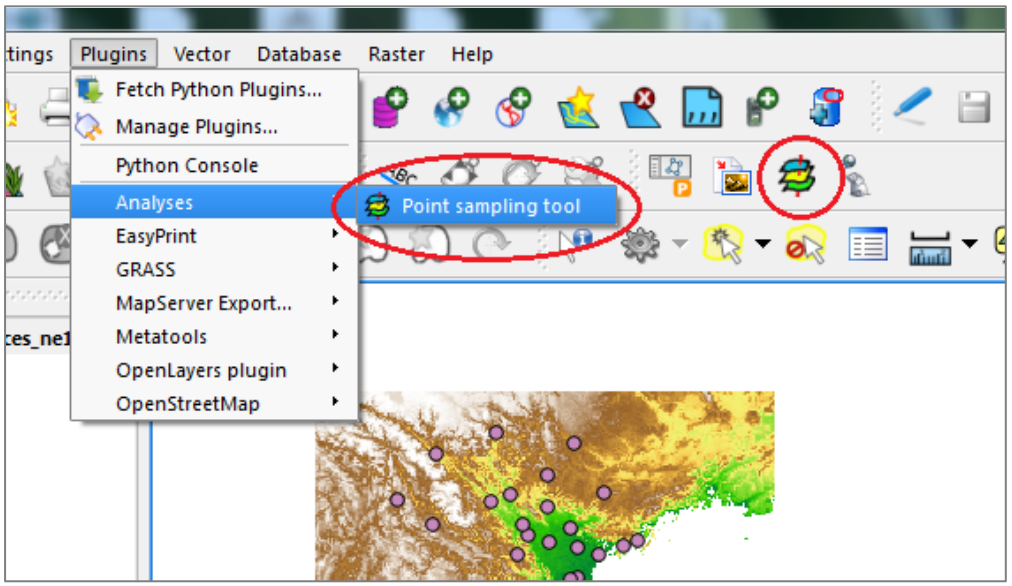
Section 2: Extracting raster values to a point layer

This section will teach you to extract the value of the raster at the exact location of a point and add that value to the attribute table of the point layer.

1. Add the *VNM_populatedPlaces_ne10m* layer from

   //Vietnam_Training/05_Data/03_Shapefiles/00_Country/Cities

2. Select *Analyses > Point sampling tool* from the *Plugins* menu or click on the icon in the Plugins toolbar.

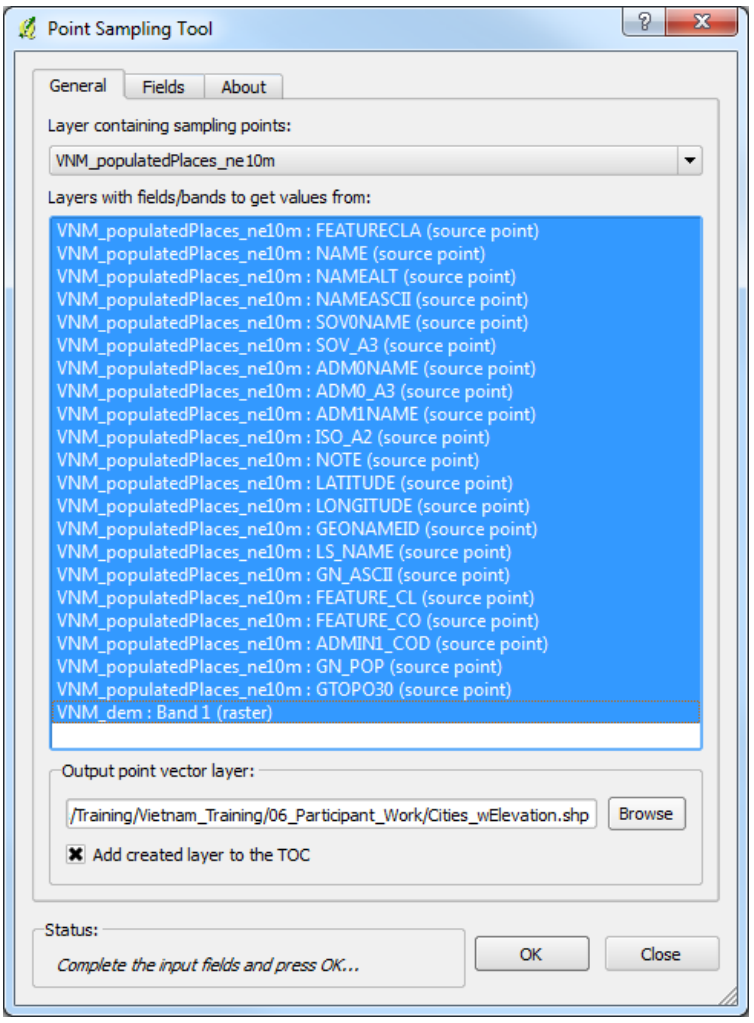


Note: If you don't see the Point sampling tool in the menu you might need to add it. See exercise 0 for

details of this process.

3. Select the *VNM_populatedPlaces_ne10m* layer from the drop down menu for *Layer containing sampling points* under the *General* tab.
4. For *Layers with fields/bands to get values from,* select all fields that start with *VNM_populatedPlaces_ne10m* and *DEM : Band 1 (raster).*

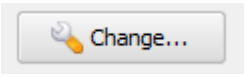
   Note: You must select all the fields from the layer containing the sampling points for the attribute data to from the original layer to be included in the new layer that will contain the extracted raster values.
5. For *Output vector layer,* browse to \\Vietnam_Training\06_Participant_Work and name the file Cities_wElevation.shp
6. Check the box next to *Add created layer to the TOC.* Your *Point Sampling Tool* window should now look like the following image.



7. Click *OK.*
8. Close the *Point Sampling Tool* window.
9. Right click on the layer *Cities_wElevation* in the layer panel and select *Open attribute table.*

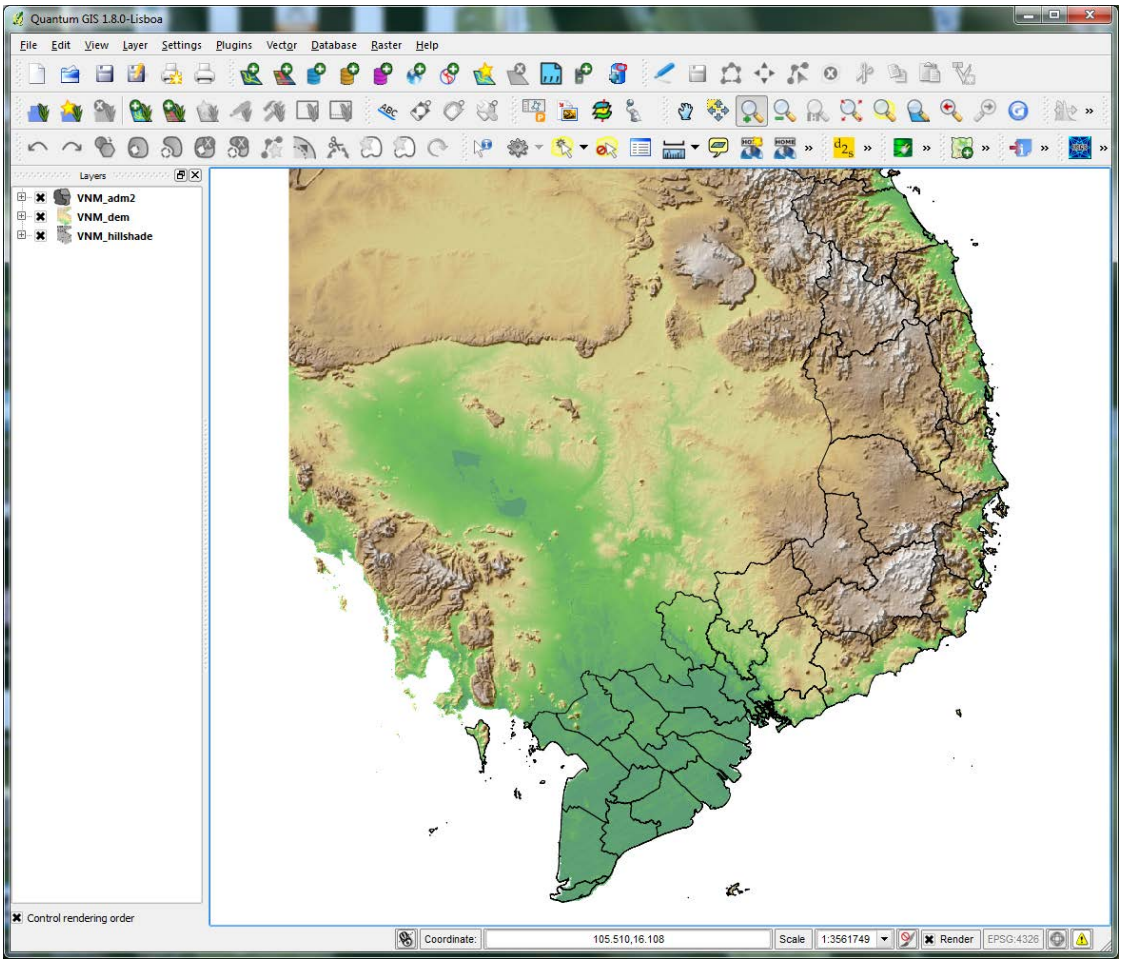
10. Scroll to the last field in the attribute table called NVM_dem that contains the elevation (in meters) for each point location in the file.

Section 3: Creating a hillshade layer

1. From the *Raster* menu click *Analysis > DEM (Terrain models).*
2. Set *Input file to VNM_dem*
3. Set *Output file* to *//Vietnam_Training/06_Participant_Work/VNM_hillshade*
4. Change the *Scale (ratio of vert. units to horiz.)* to "11210"
5. Check the box for *Load into canvas when finished.*
6. Click *OK.*
7. A message should tell you Processing completed. Click *OK.*
8. Click *Close.*
9. In your TOC drag the *VNM_hillshade* layer below the *VNM_dem* layer.
10. Open layer properties for *VNM_dem* and go to the *Transparency* tab.
11. Set the *Global Transparency slider to 50%* and click *OK.*
12. Add *//Vietnam_Training/05_Data/03_Shapefiles/00_Country/Admin/VNM_adm2.shp* to your map.
13. Open properties for *VNM_adm2* and go to the *Style* tab.
14. Click the Change… button 

15. Set *Fill style* to *No Brush* and *Border color* to black.
16. Click *OK.*
17. Click *OK* and return to the map.

Explore your map with pan and zoom to observe the results. Turn on and off the various layers. At what zoom levels does the map look best? Is the level good enough for a city map or is it more appropriate for a map of the entire country?



End Exercise.

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