HANDS-ON EXERCISES

Data Acquisition, Preparation, Processing

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OVERVIEW

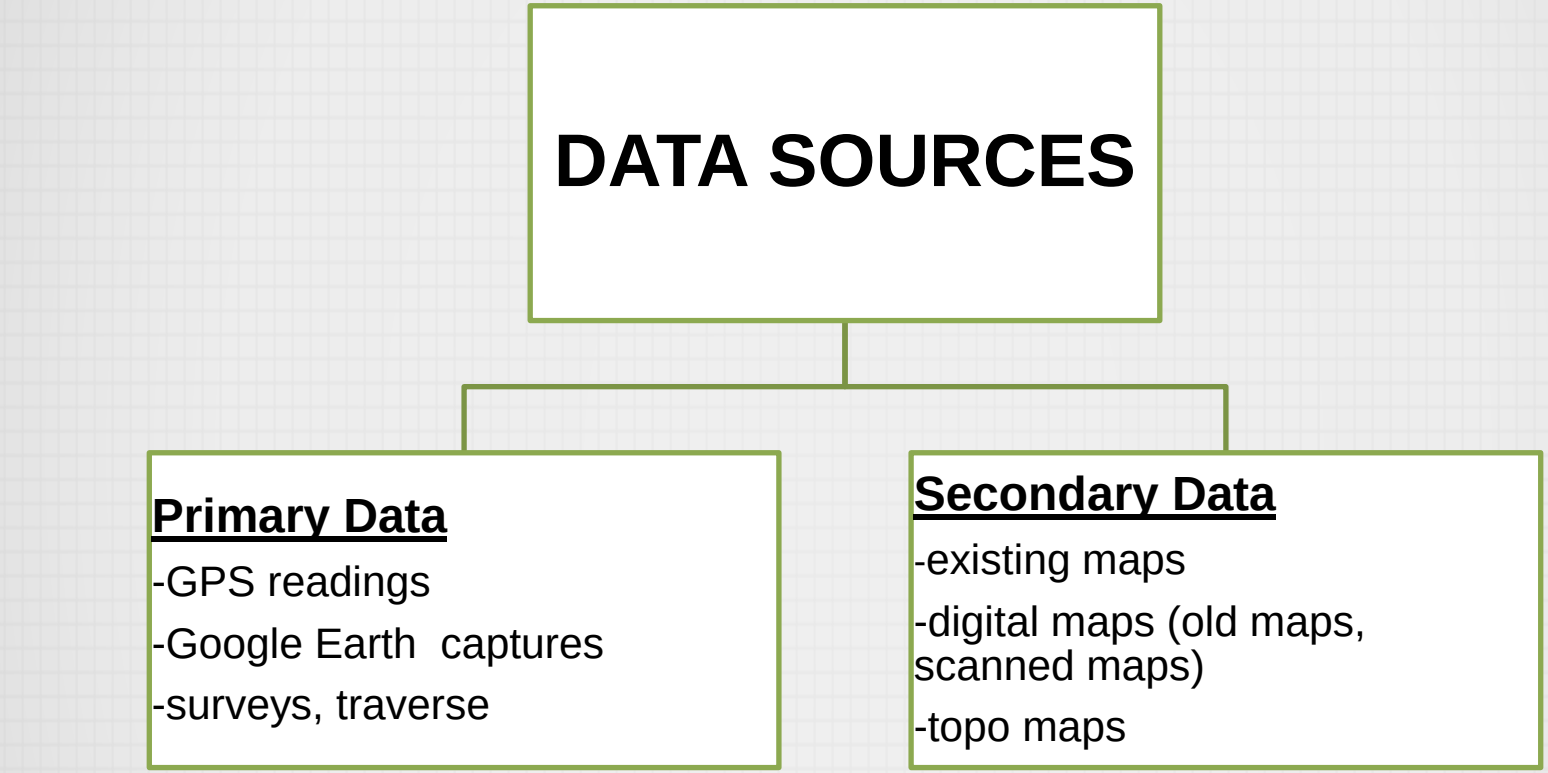
- This module is basically where we do the ‘nitty-gritty’ part of the GIS training to come-up with final outputs
- You will learn how to obtain, create, manipulate, edit geospatial data by series of tools and commands
- The exercises will be done step by step, along with actual demonstration
- The exercises will make you “connect” the theoretical part of GIS to its actual applications

Because this module is a step-by-step process…

You need to do GIS!

- G – ive attention to details
- I – t's as easy as 1, 2, 3
- S – tay focused but relaxed

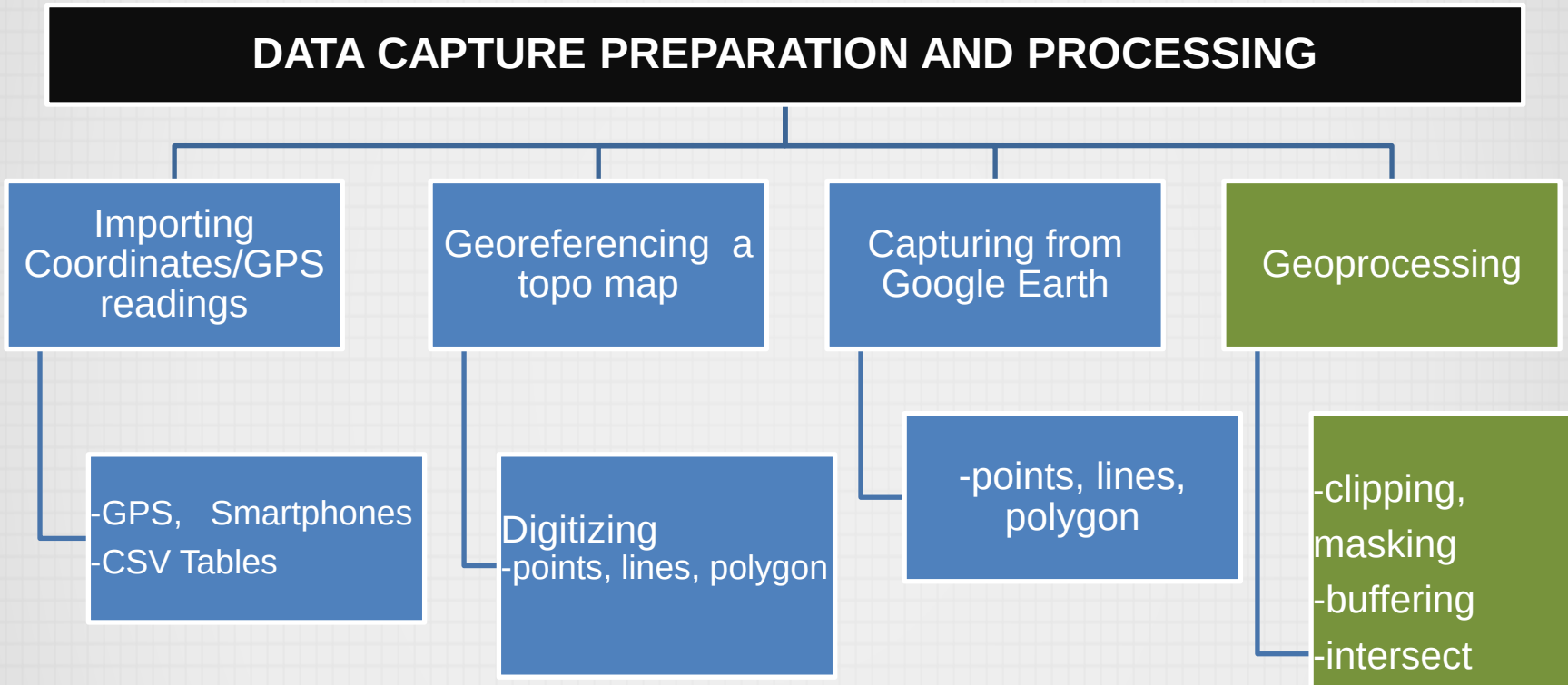
Data Acquisition



KEY WORDS

Primary Data
Secondary Data

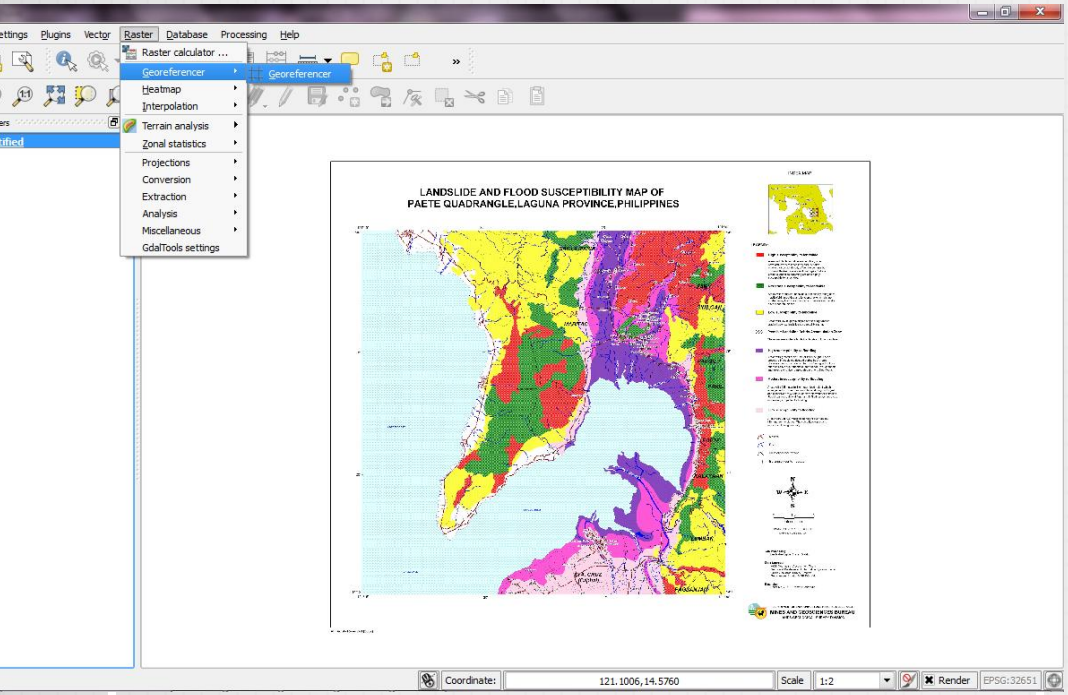
Data Capture, Preparation and Processing



This part is where data is exported to QGIS, edited, processed, projected into UTM, and clipped, buffered, intersected to area of interest

EXER 1 GEOREFERENCING

WE WILL NOW TRANSFORM OUR SCANNED MAP TO A GIS MAP BY PUTTING ITS ACTUAL LOCATION ON EARTH!



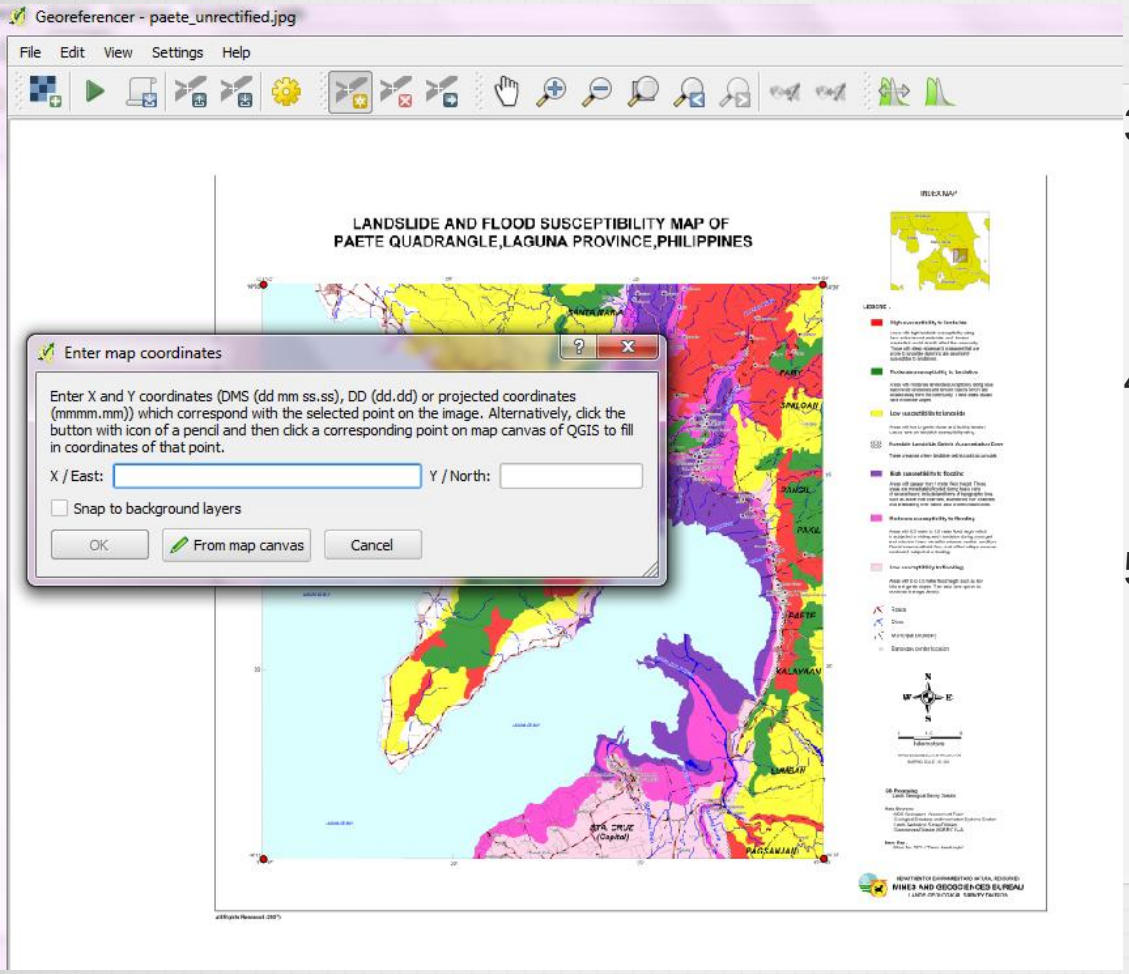
OBJECTIVE

To georeference a scanned map to be used in digitizing

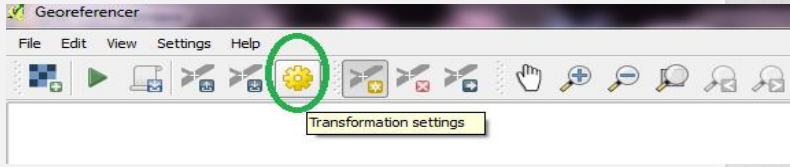
STEPS

1. Click Raster > Georeferencer
   *it will open a new window

2. Click Open Raster and load the image

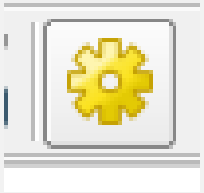


3. Click add points



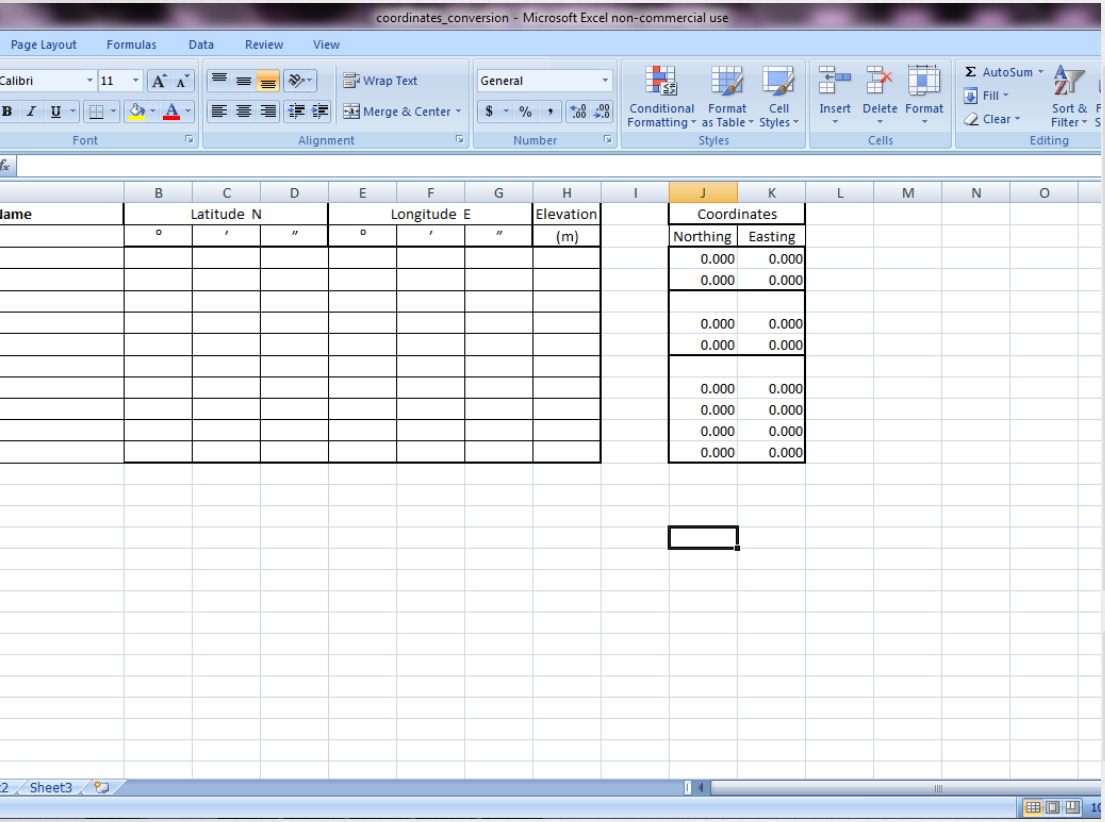
4. Zoom to the coordinates and encode

5. Click Transformation settings



BE CAUTIOUS!

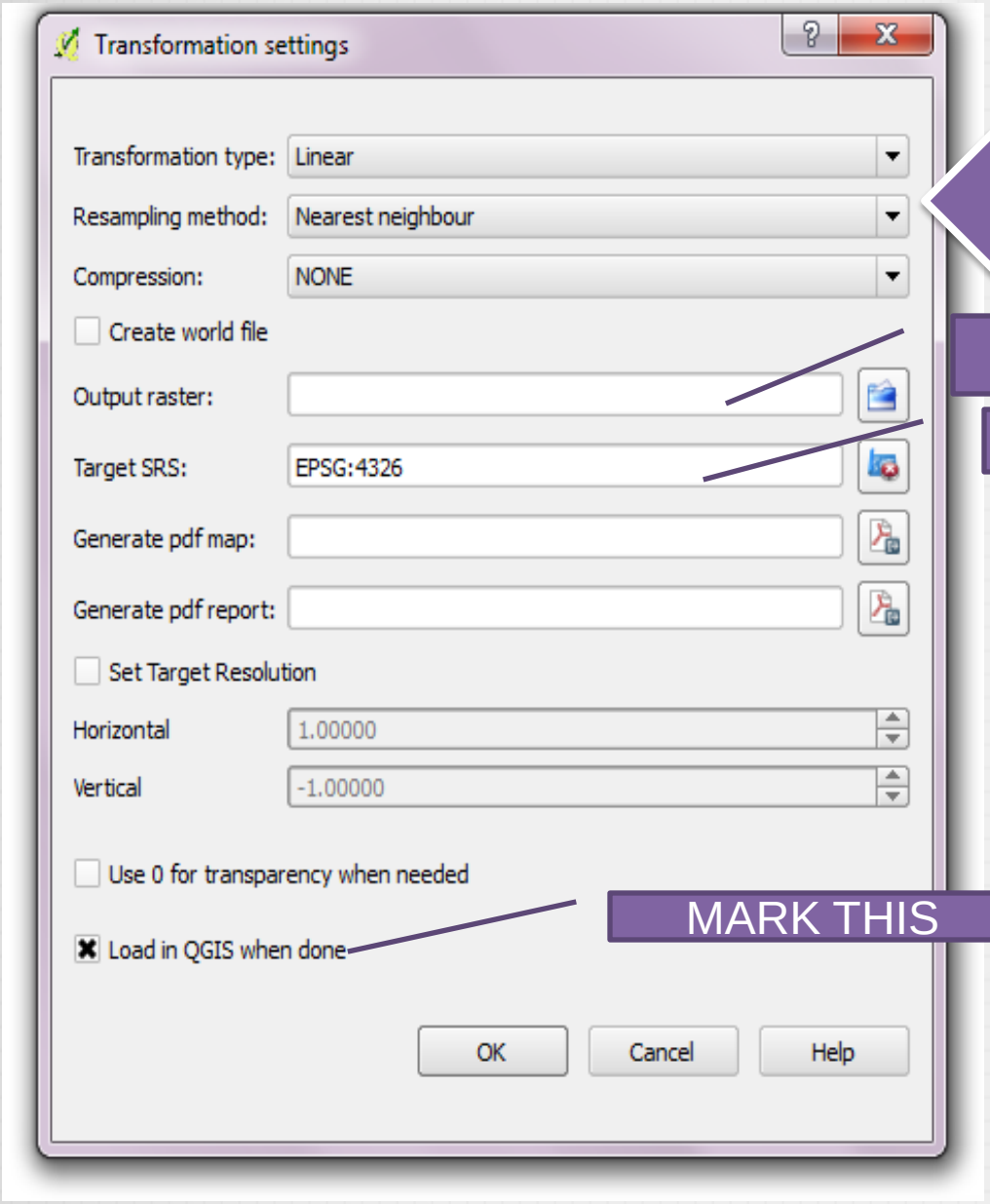
WE NEED DECIMAL DEGREES FORMAT OF COORDINATES, EXAMINE THE TOPO MAP



6. Convert coordinates to Decimal Degrees using MS Excel (coordinate_converter)

7. Re-enter the coordinates to the add points

8. Start Georeferencing when done



DEFAULT VALUES

SAVING DIRECTORY

COORDINATE SYSTEM

MARK THIS

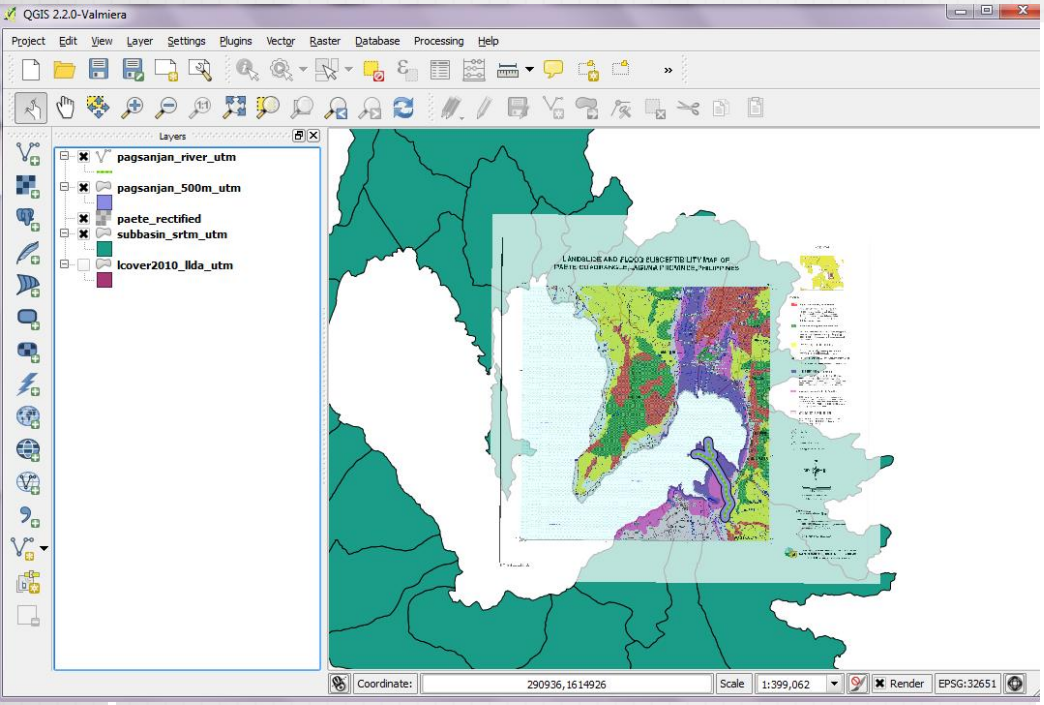
NOTES AND TIPS

NOTE:
THERE CAN BE ERRORS FROM UPLOADING CONTROL POINTS, MOSTLY TYPOGRAPHICAL

TIP:
TO CHECK FOR THE CONSISTENCY OF THE GEOREFERENCED MAP, OPEN OTHER PROJECTED MAPS FOR COMPARISON

EXER 2 DIGITIZING

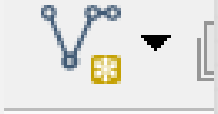
USING OUR NEWLY GEOREFERENCED MAP, WE WILL NOW EXTRACT FEATURES FROM IT!

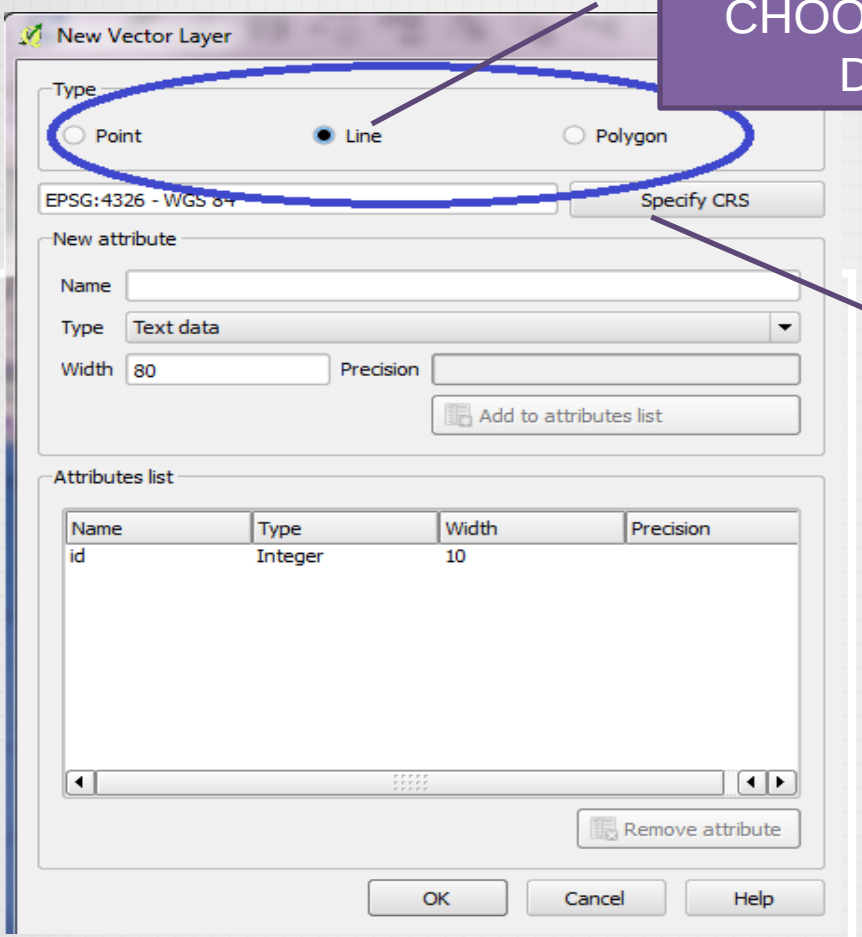


OBJECTIVE

To digitize polygons, lines, points from the georeferenced topo map

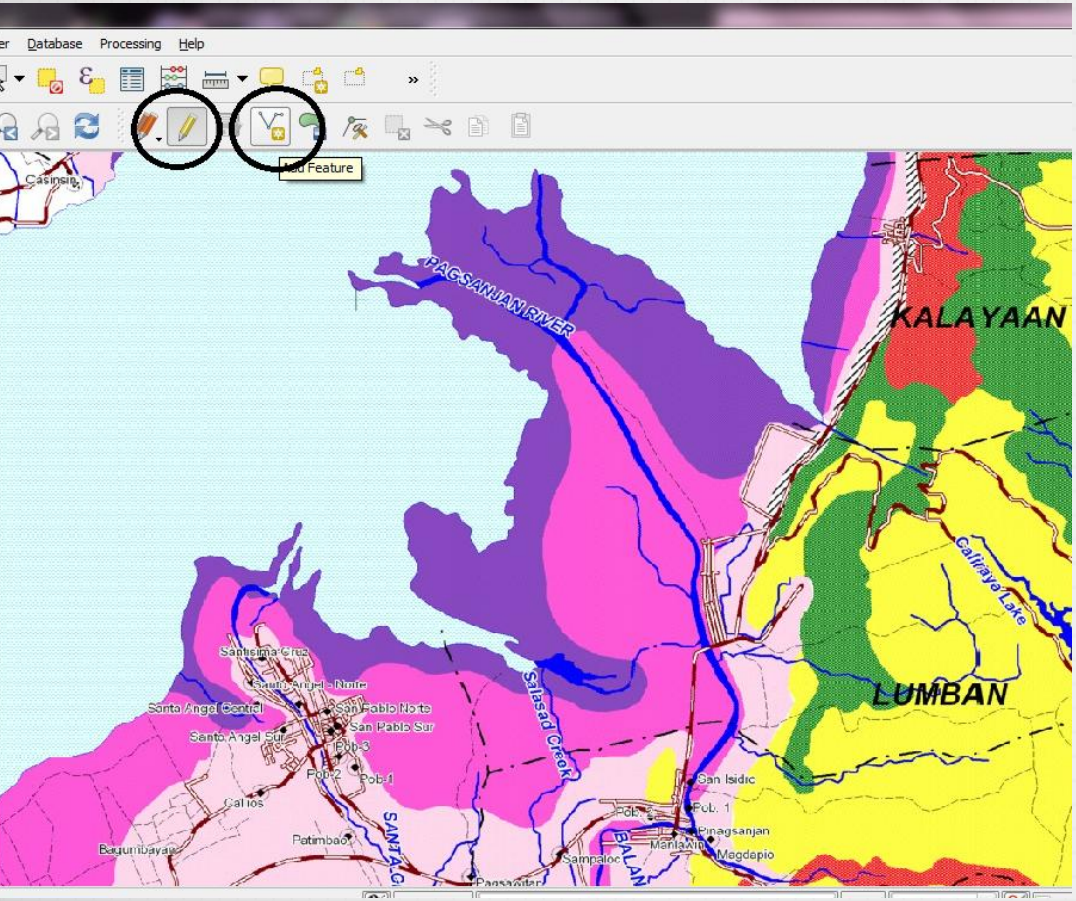
STEPS

1. Open georeferenced map
2. Cick new shapefile layer 
3. Select type
4. Zoom to area of interest

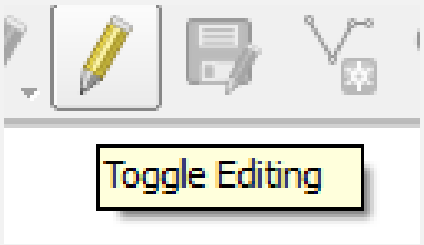


CHOOSE LINE IF YOU WILL DIGITIZE RIVERS

CHOOSE UTM_ZONE51N



4. Click ‘Toggle Editing’



5. Click ‘Add Features’

6. Trace

7. Save edits

#Note

Digitizing is basically tracing the features from the base map

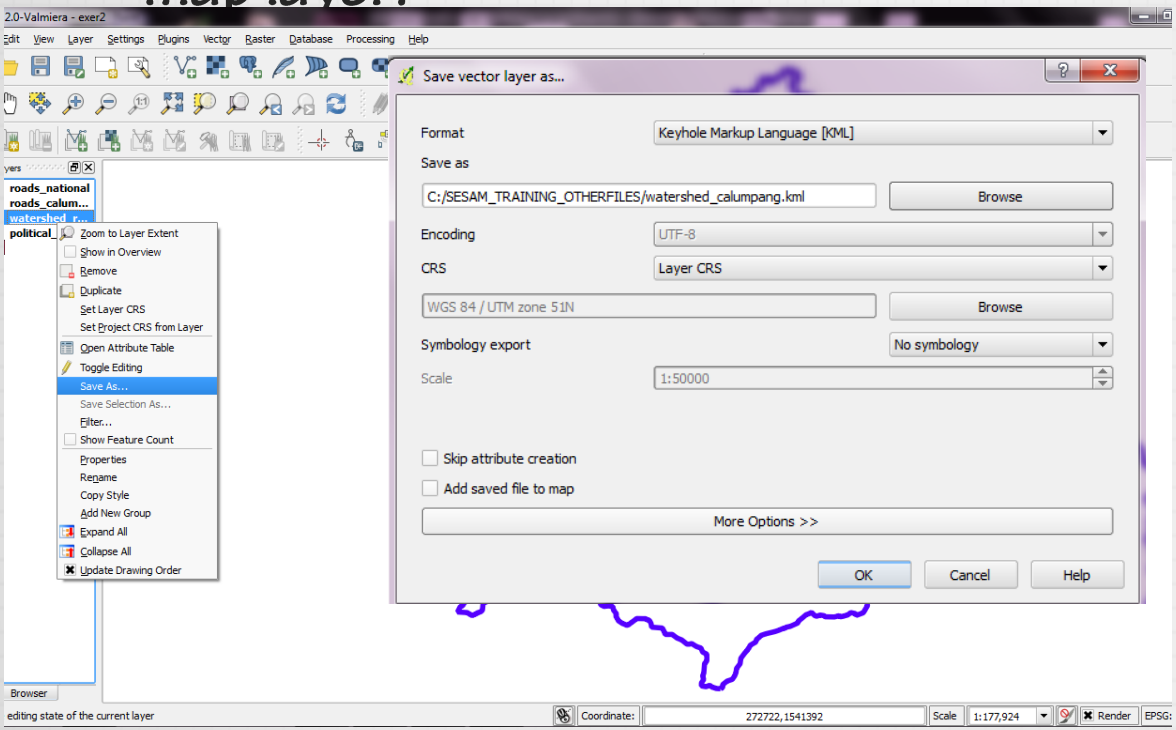
Tips:

Zoom as much as possible and stay focused, use a better mouse and try adjusting mouse cursor speed at the control panel

You can switch buttons to pan or zoom the map, just click again the 'add features' to get back from digitizing

EXER 3 CAPTURING FROM GOOGLE EARTH

Now, we will go to the globe to capture features and put it to our map layer!



OBJECTIVE

To obtain spatial features from Google Earth and import it to QGIS

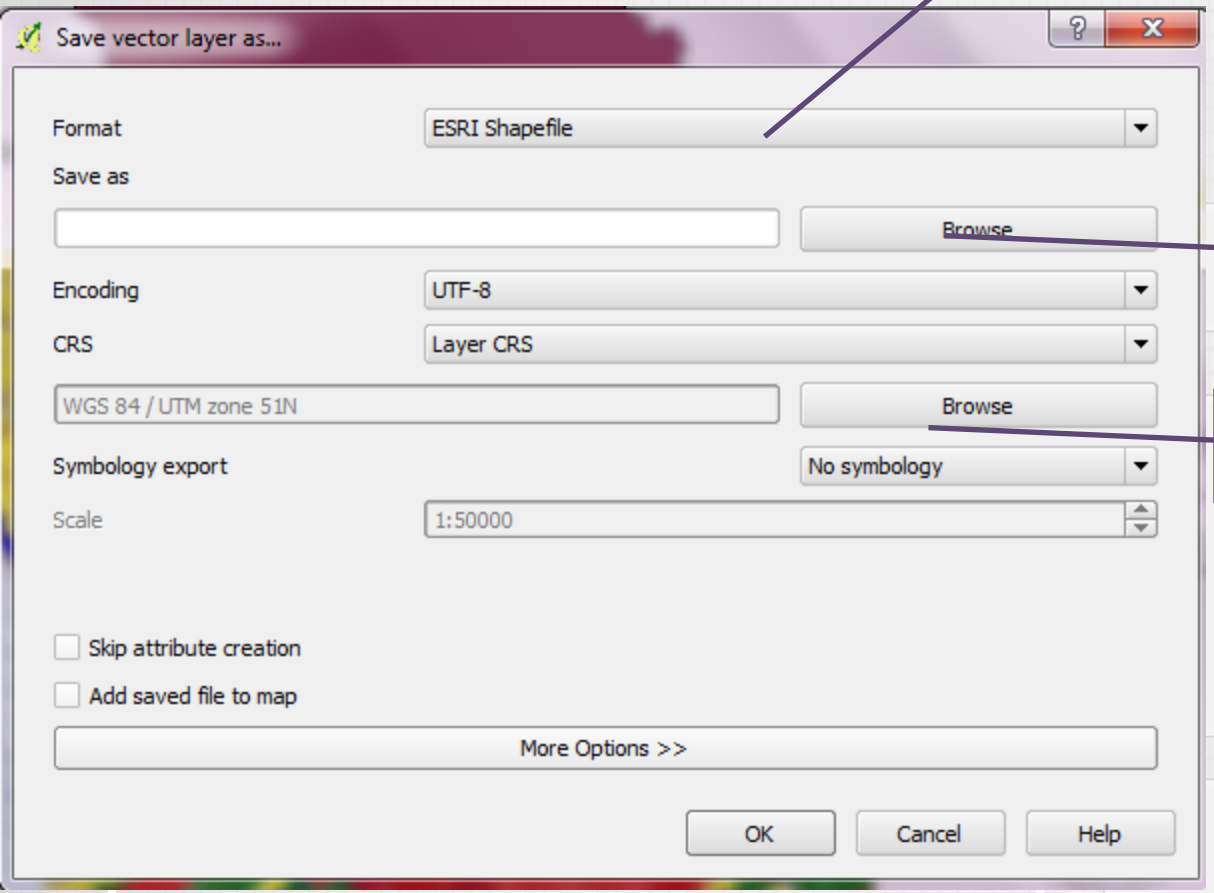
STEPS

1. Save our area of interest as .kml

Resulting icon will be like this

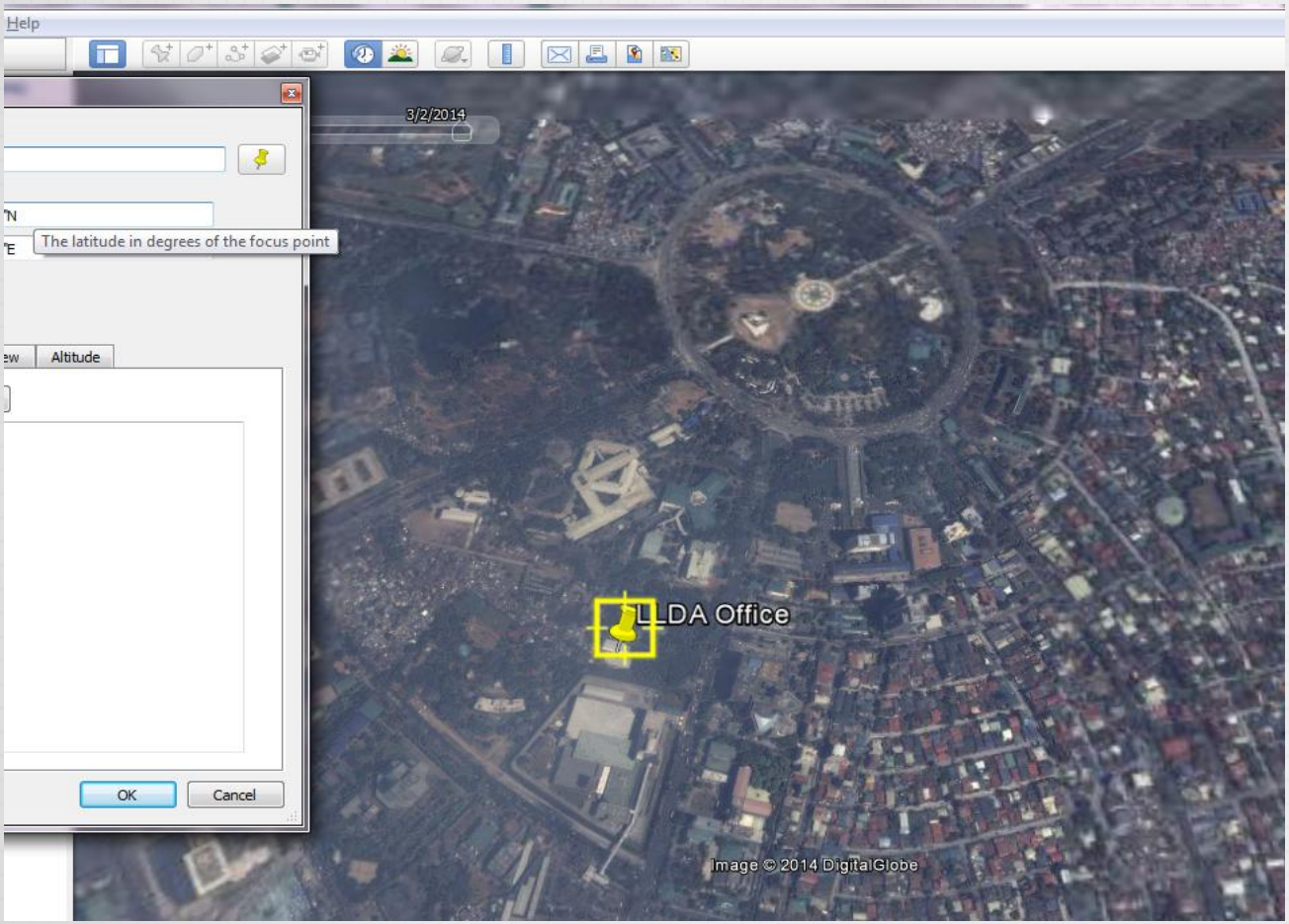
2. Open it to Google Earth

CHOOSE KEYHOLE MARKUP LANGUAGE (.KML/GOOGLE EARTH FILE EXTENSION



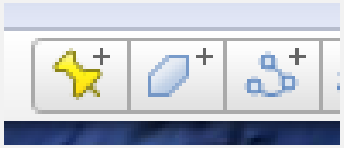
SAVING DIRECTORY

CRS



3. Navigate and zoom to area of interest

4. Add features



5. Save and open to QGIS

6. Save the kml as .shp by clicking ‘save as’ after right clicking the kml

#Note

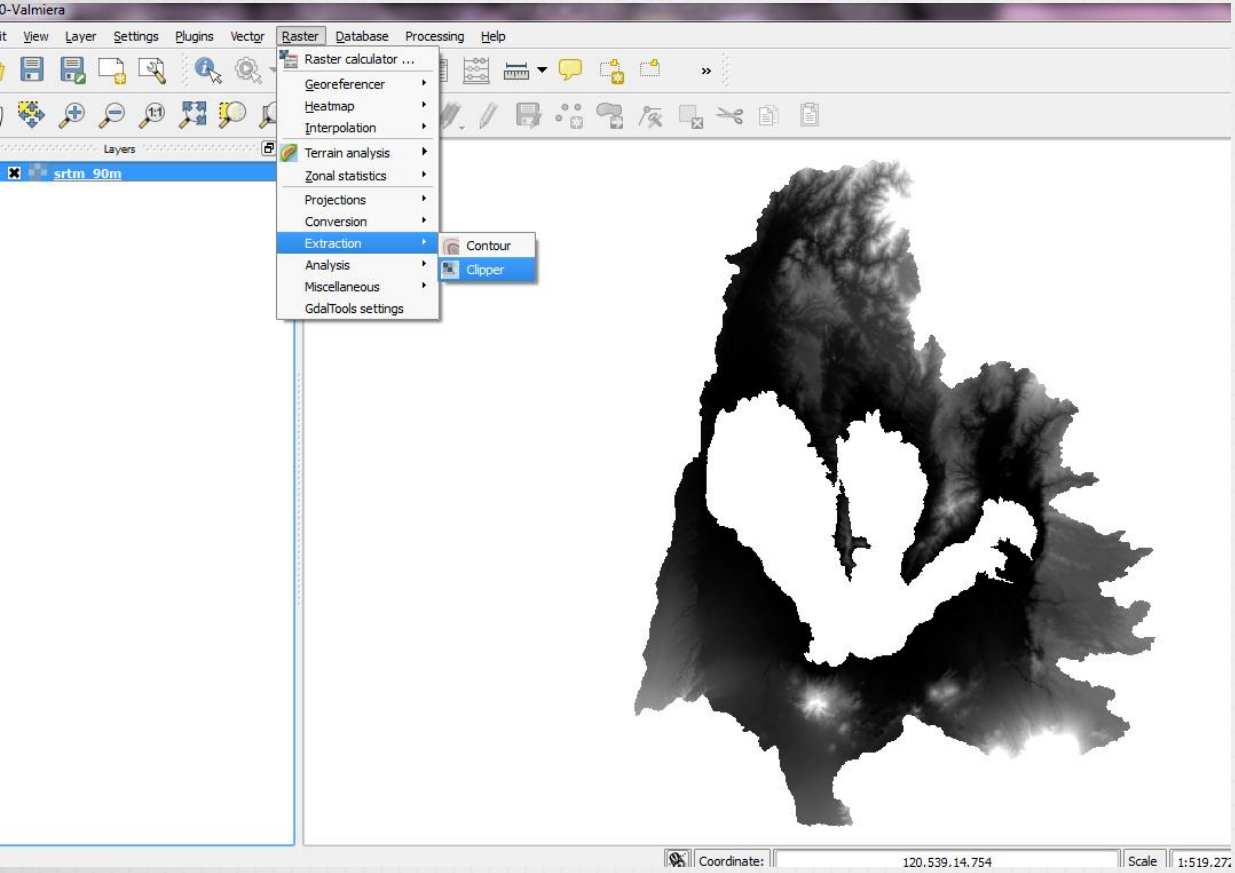
Captures from Google Earth are not yet projected into UTM

Tips:

Make it a practice to check and project every new entry

EXER 4a Clipping a Raster

Now that we have features, we will add more map layers to our project! Let's now clip some features from the surface! This time it's a raster

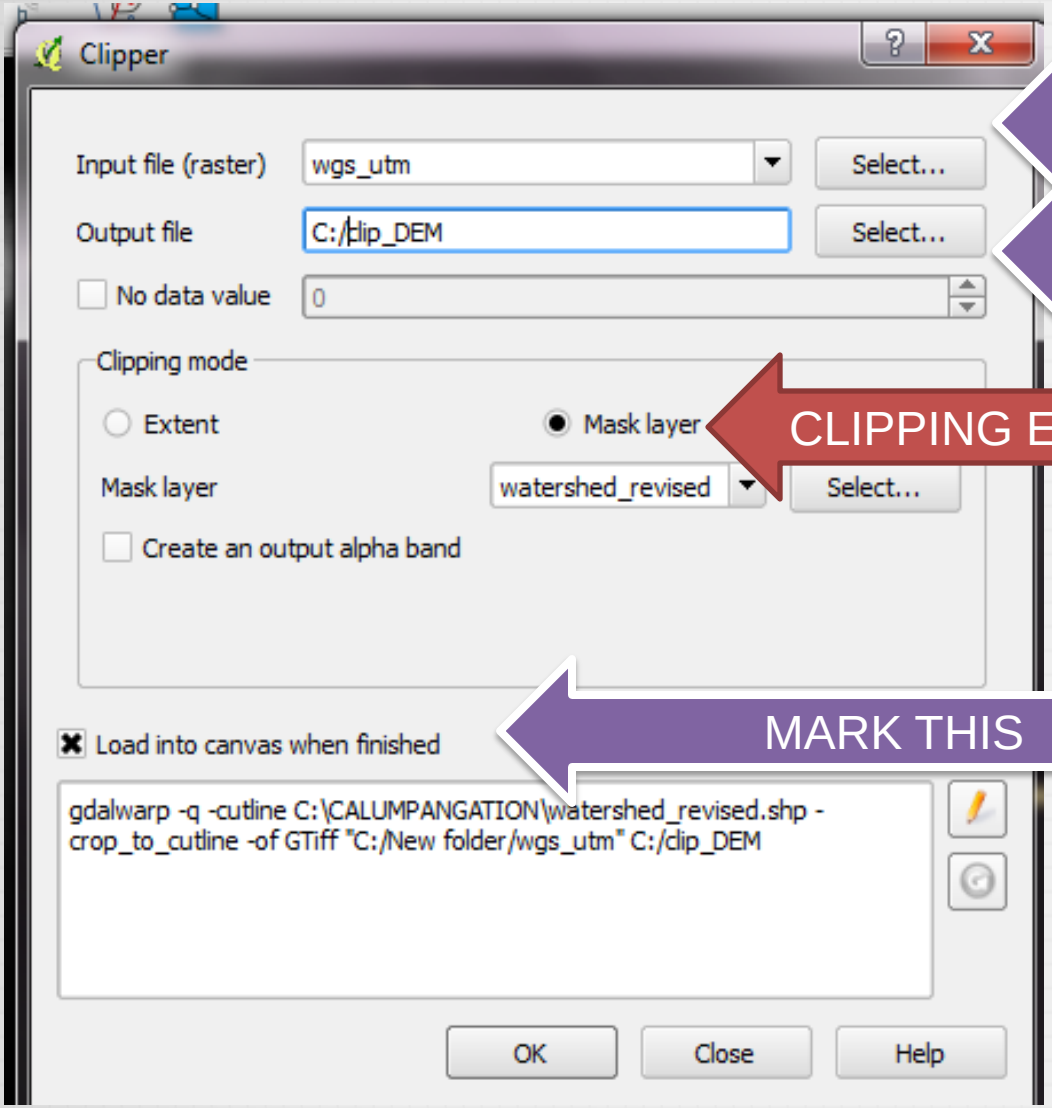


OBJECTIVE

To clip a DEM raster to the scale of interest

STEPS

1. Add DEM file
2. Click 'Raster', Extraction, Clipper



SOURCE OF RASTER FILE

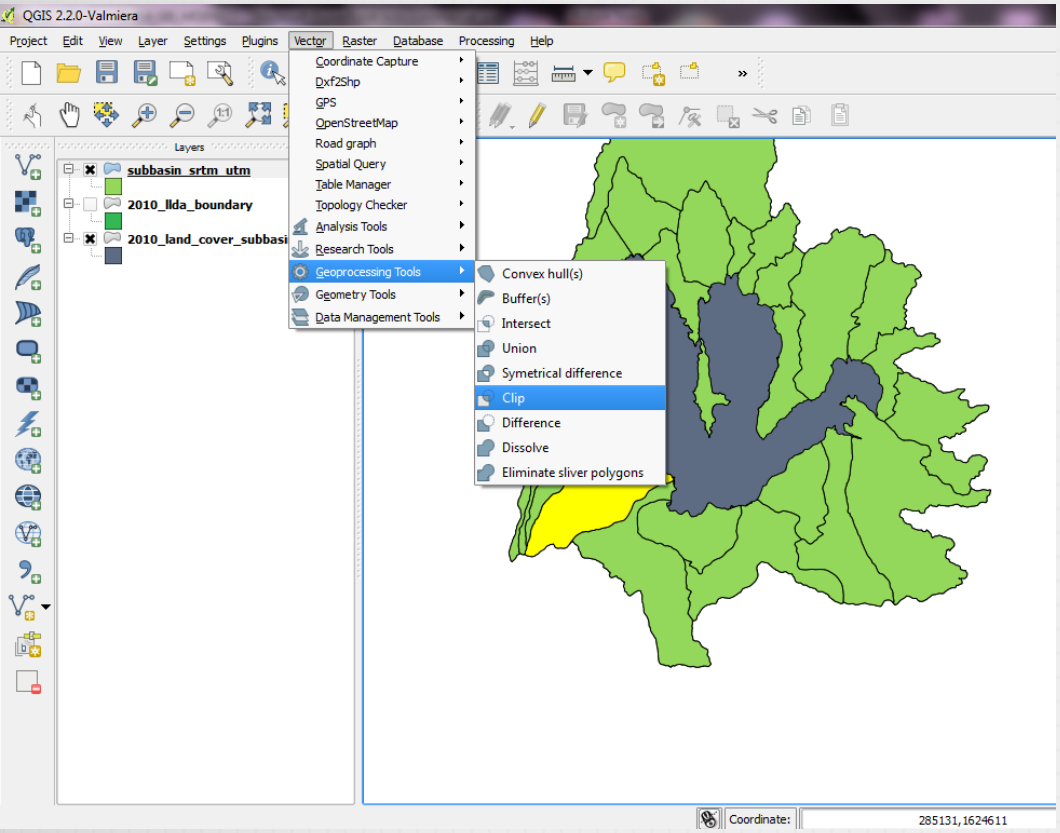
WHERE TO SAVE

CLIPPING EXTENT (AREA OF INTEREST)

MARK THIS

EXER 4b Clipping a Vector

WE WILL BASICALLY DO THE SAME CLIPPING, THIS TIME IT IS A VECTOR FILE!

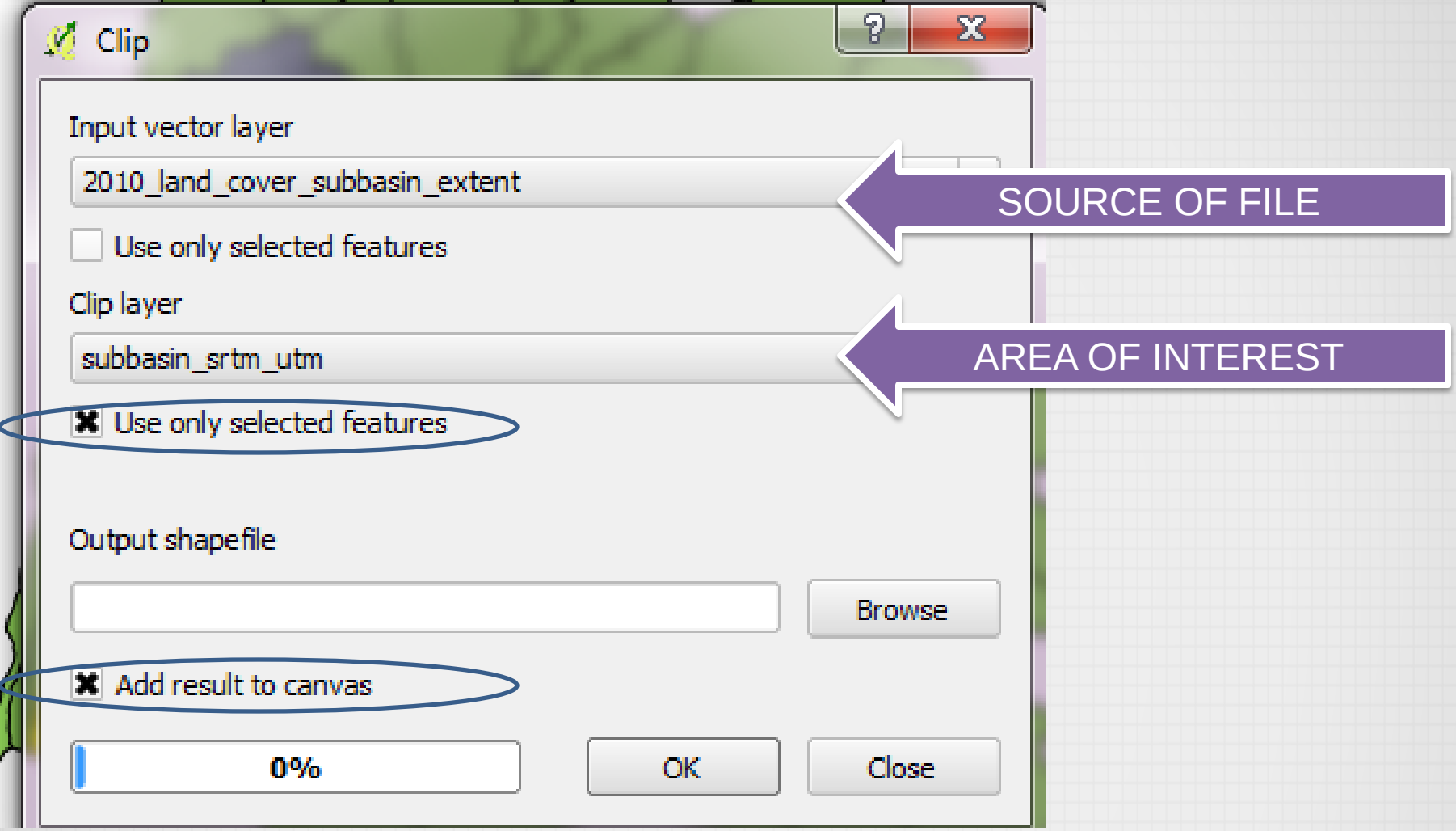


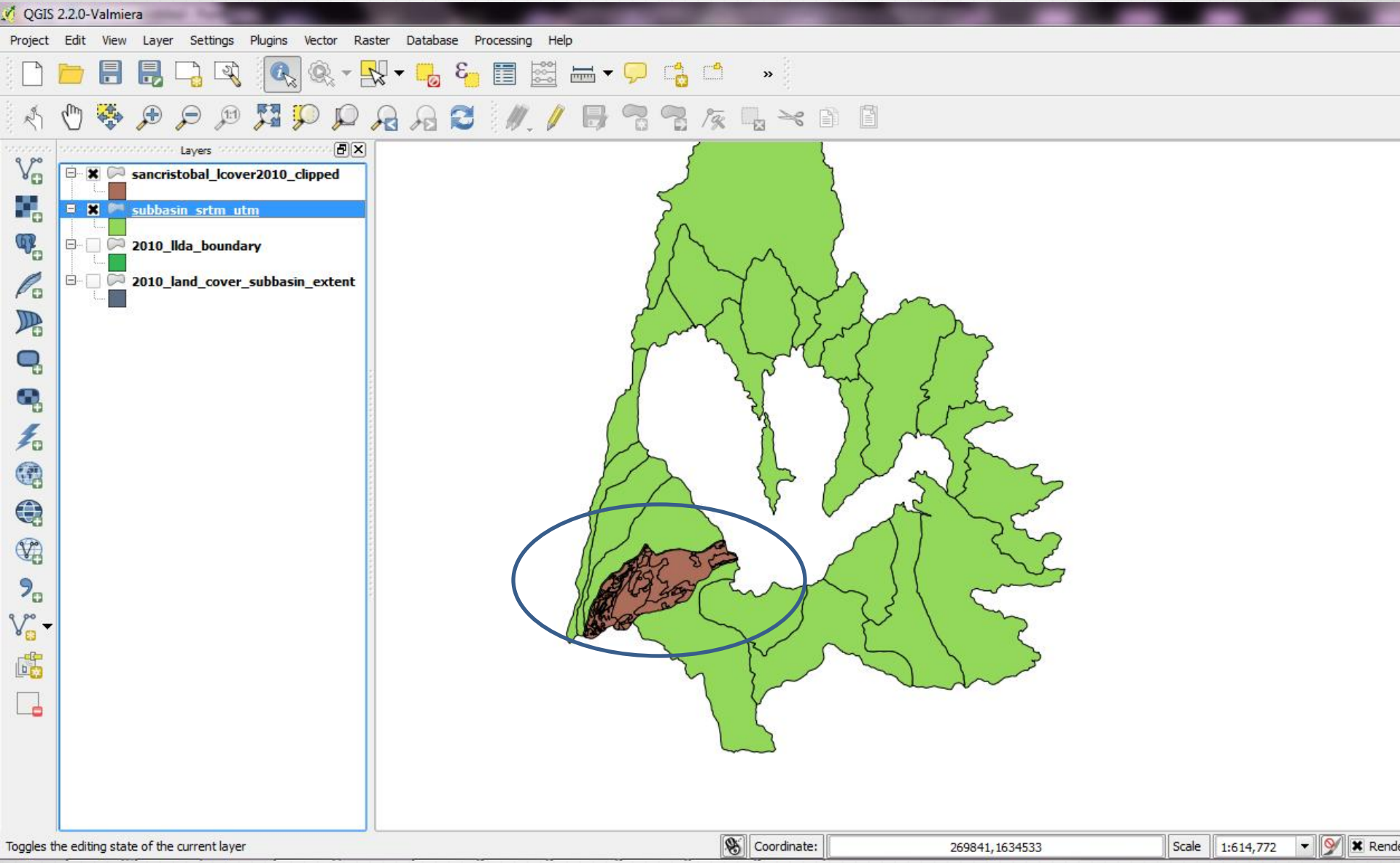
OBJECTIVE

To clip land cover map to area of interest

STEPS

1. Add vector files
2. Click Vector > Geoprocessing tools > Clip
3. Fill-in the clip window


Clip
Input vector layer
2010_land_cover_subbasin_extent
Use only selected features
Clip layer
subbasin_srtm_utm
Use only selected features
Output shapefile
Browse
Add result to canvas
0%
OK
Close
SOURCE OF FILE
AREA OF INTEREST


QGIS 2.2.0-Valmiera
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Layers
sancristobal_lcover2010_clipped
subbasin_srtm_utm
2010_llda_boundary
2010_land_cover_subbasin_extent
Toggles the editing state of the current layer
Coordinate:
269841,1634533
Scale
1:614,772

#Note:

There are various raster processing from DEM including slope, elevation, contour, and so on

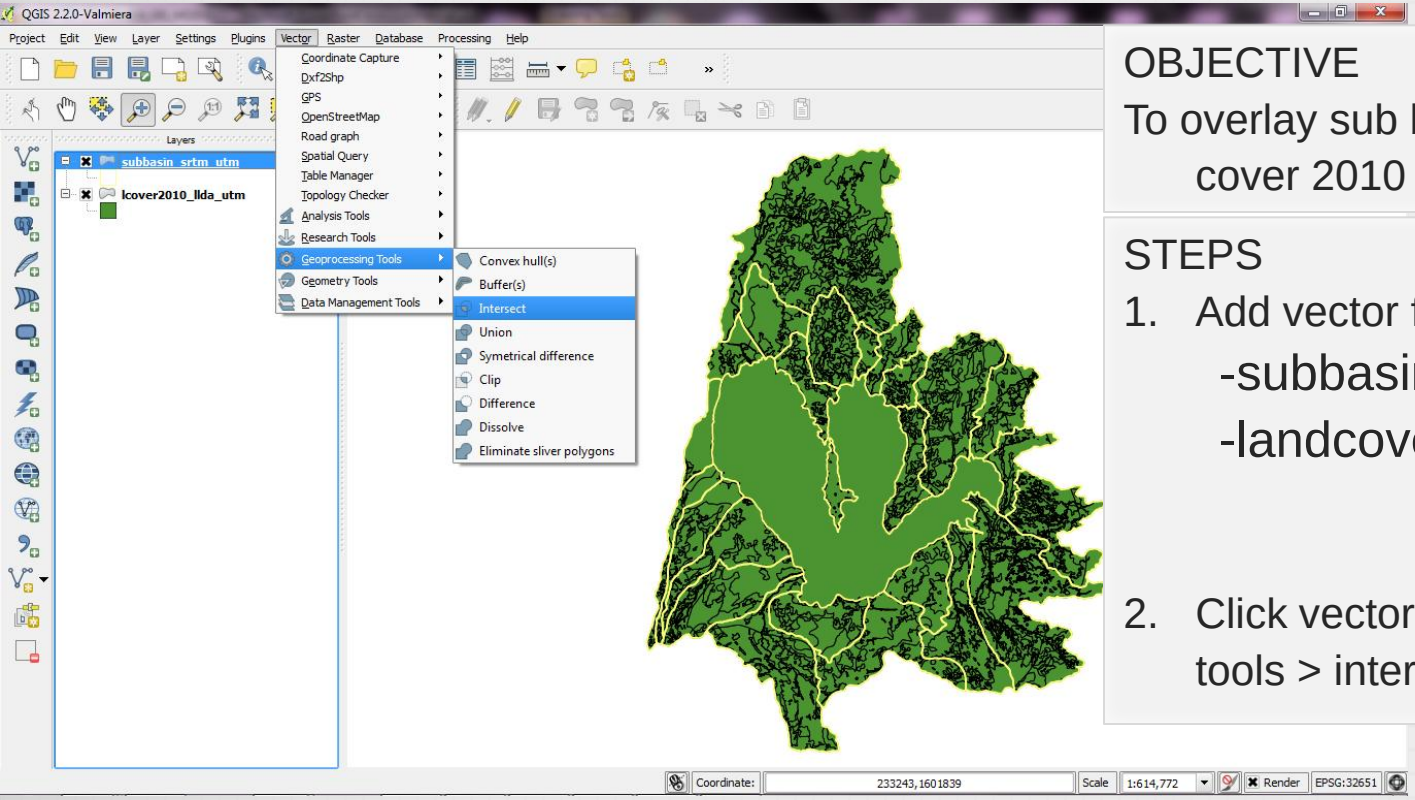
Tips:

Explore the 'terrain analysis and other raster commands

EXER 5 INTERSECTING

We will continue to add map layers to our scale of interest!

This time, we will *overlay* two features



OBJECTIVE

To overlay sub basins and land cover 2010

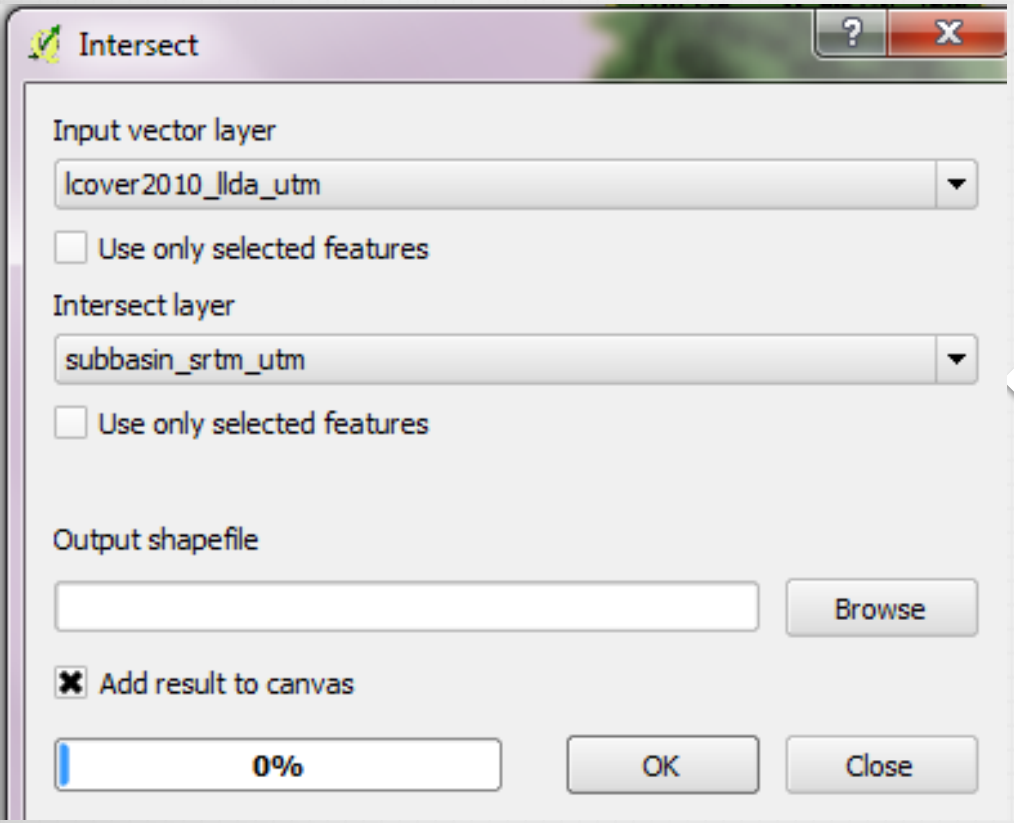
STEPS

1. Add vector files
   -subbasin_srtm_utm
   -landcover2010_llda_utm

2. Click vector > geoprocessing tools > intersect

2. Fill-in the intersect window

3. Save



LAYER 1 (AREA OF INTEREST)

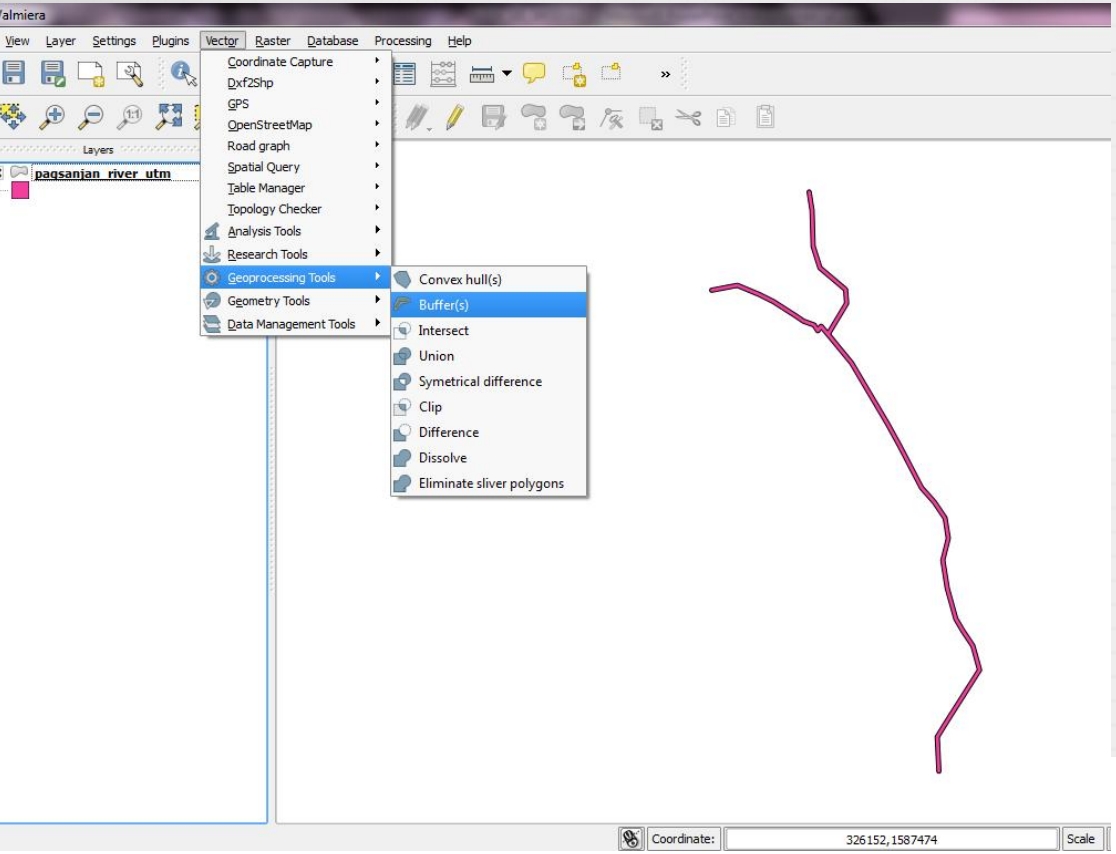
LAYER 2 (USUALLYLARGER SCOPE)

OUTPUT FILE DIRECTORY

EXER 6 BUFFERING

Buffering is creating easements from a line (i.e river) and perimeter. It is important in defining buffer zones for policy implementation and planning

Now, we will generate buffer zone from our main rivers!



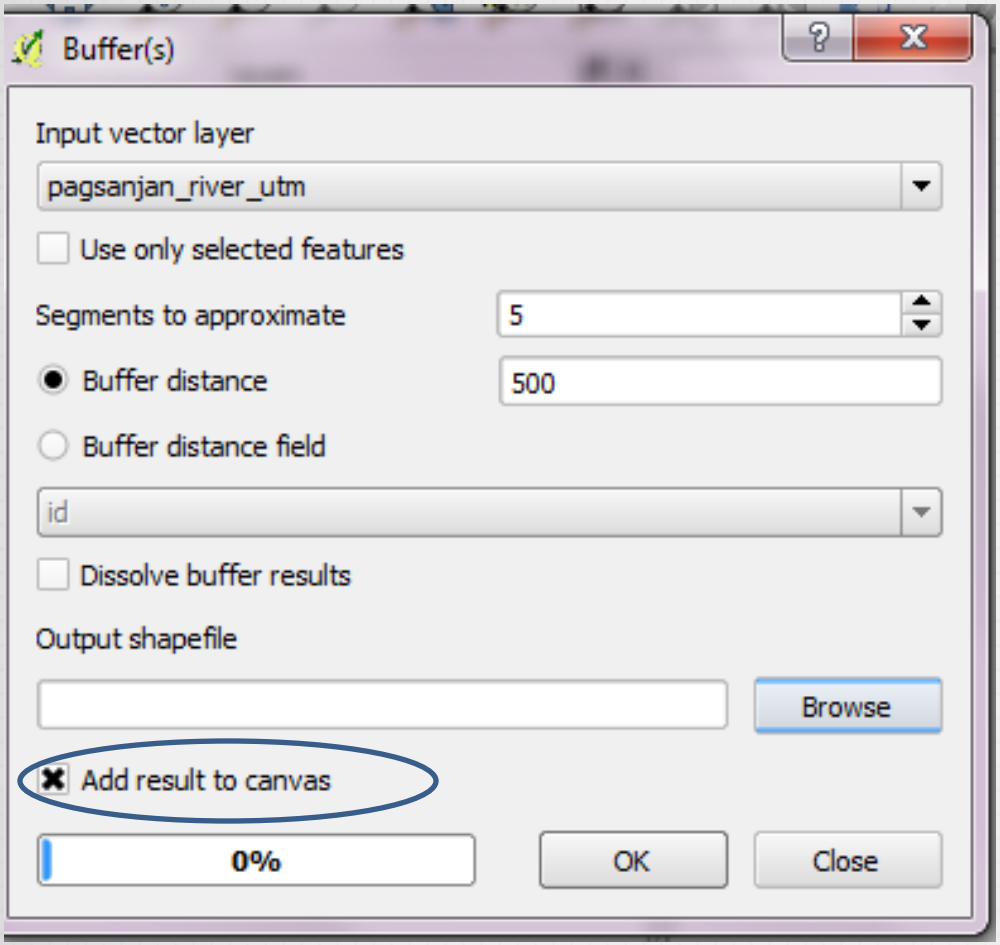
OBJECTIVE

To create buffer of varying distances

STEPS

1. Open river of interest
2. Click Vector > Geoprocessing tool > Buffer

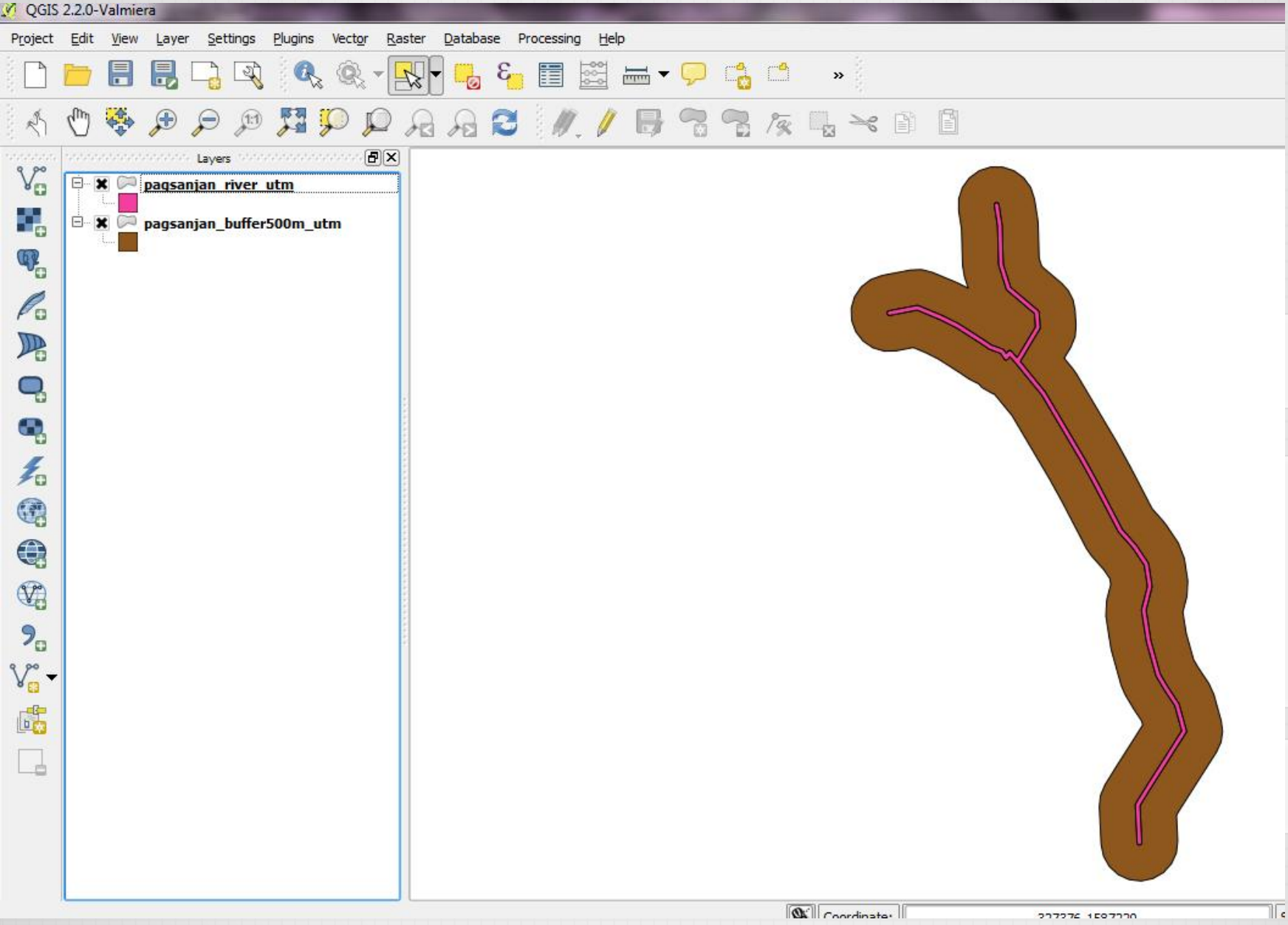
3. Fill the buffer window



River (or any) line or polygon

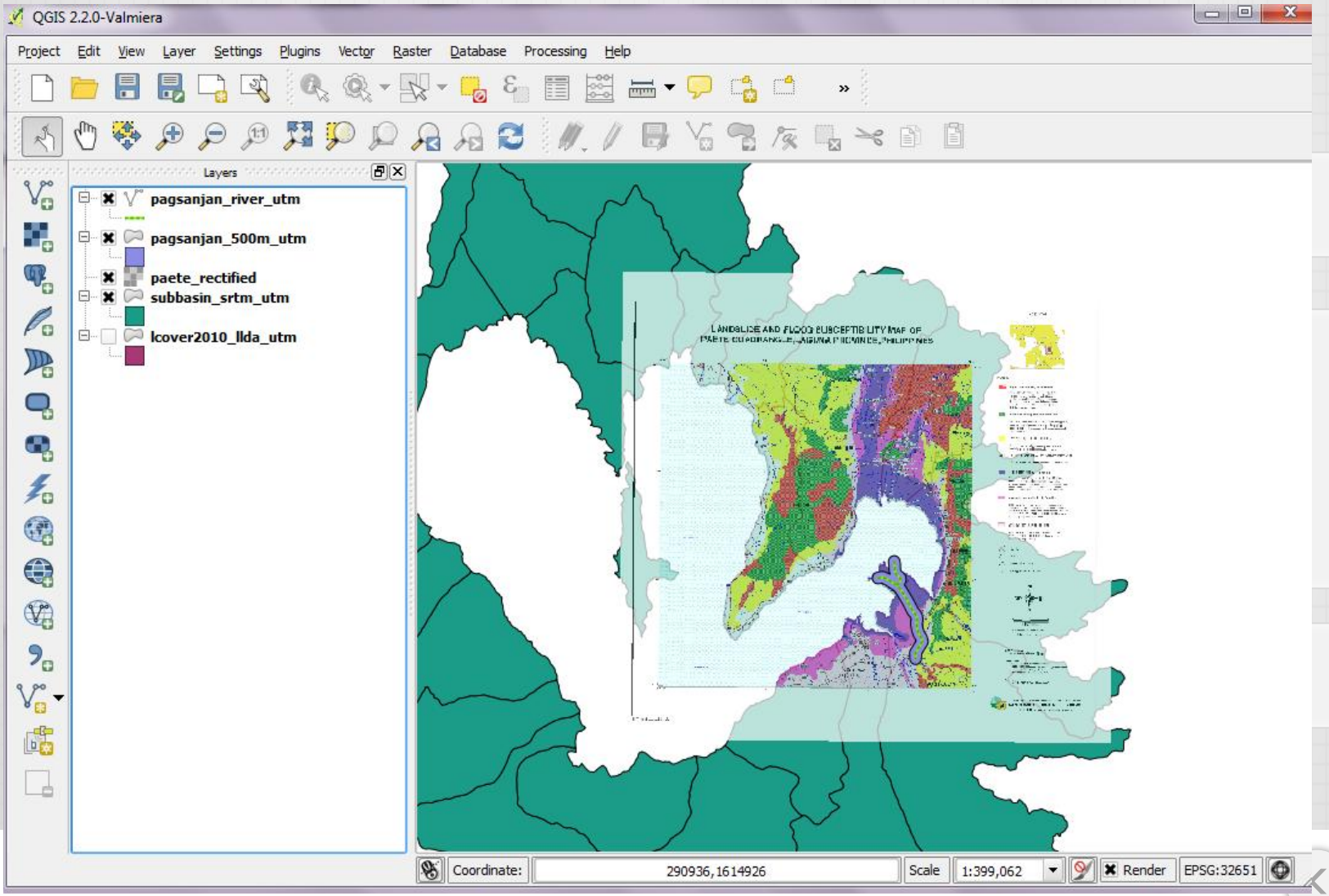
Buffer distance in meters

Directory of output file

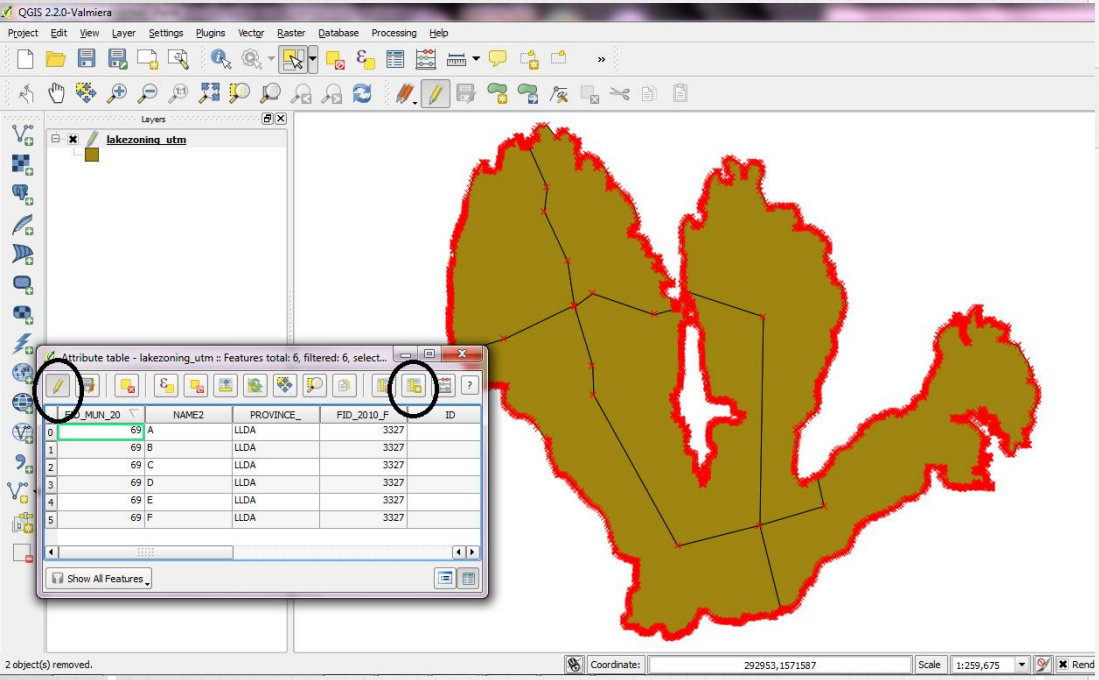

QGIS 2.2.0-Valmiera
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Layers
pagsanjan_river_utm
pagsanjan_buffer500m_utm

STEPS

4. Repeat this procedure for other buffer distance



EXER 7 EDITING THE ATTRIBUTE TABLE



OBJECTIVE

To add data on lake and compute density of fish pens/cages

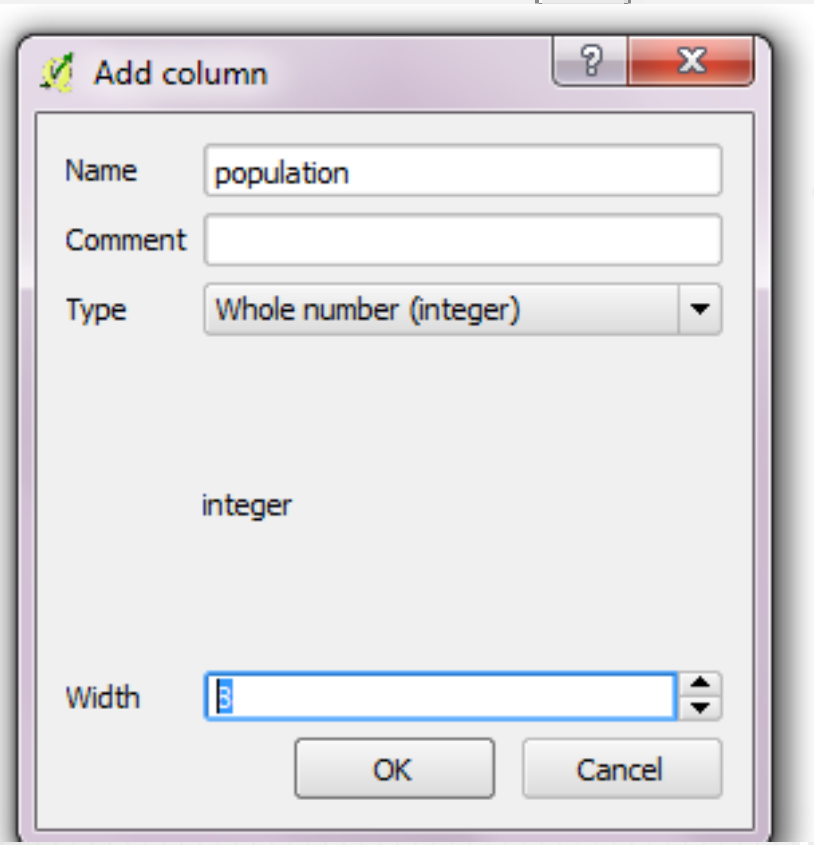
STEPS

1. Insert zoning map of LL
2. Open attribute table, toggle editing

3. Add columns on number of fish pens, cages, ponds (if necessary)
4. Compute for its density

4. Add column (encode data on fisheries)

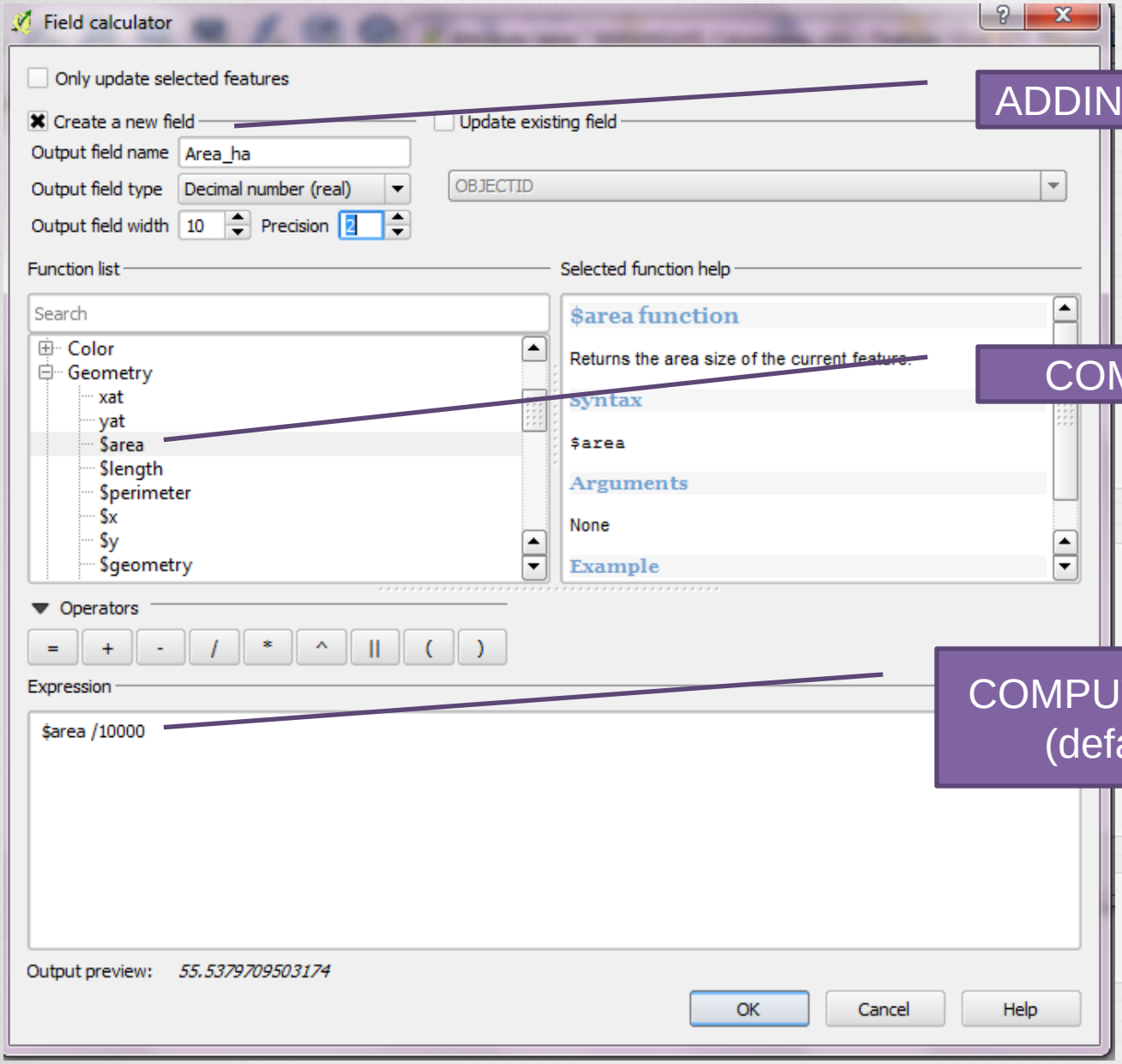
5. Save edits



Added field/column

What to enter (whole number, with decimal, text)

Length of character



ADDING COLUMN FOR AREA

COMPUTING FOR AREA

COMPUTING FOR HECTARES
(default area is in sq.m)

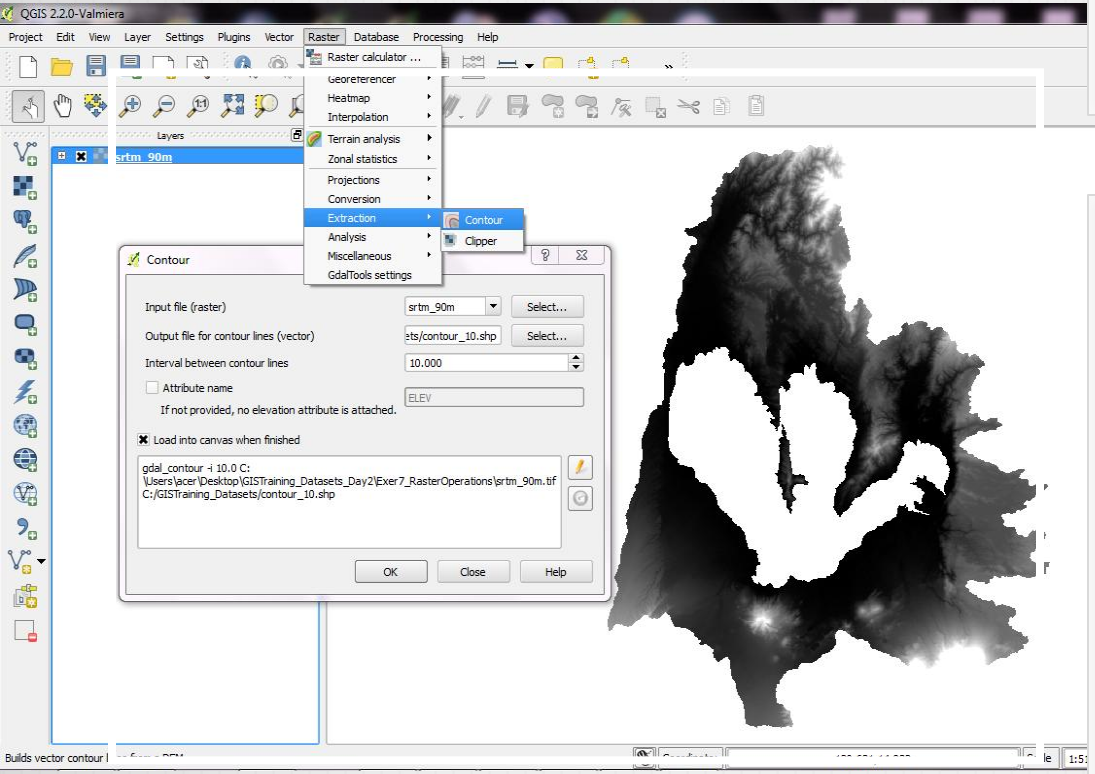
#Note

Computed areas for a political entity (i.e. barangay, municipality, city, province) can vary from its official area

Tip:

Use the GIS computed area of political jurisdiction for computation purposes only to avoid inconsistencies of attributes

EXER 8 RASTER OPERATIONS

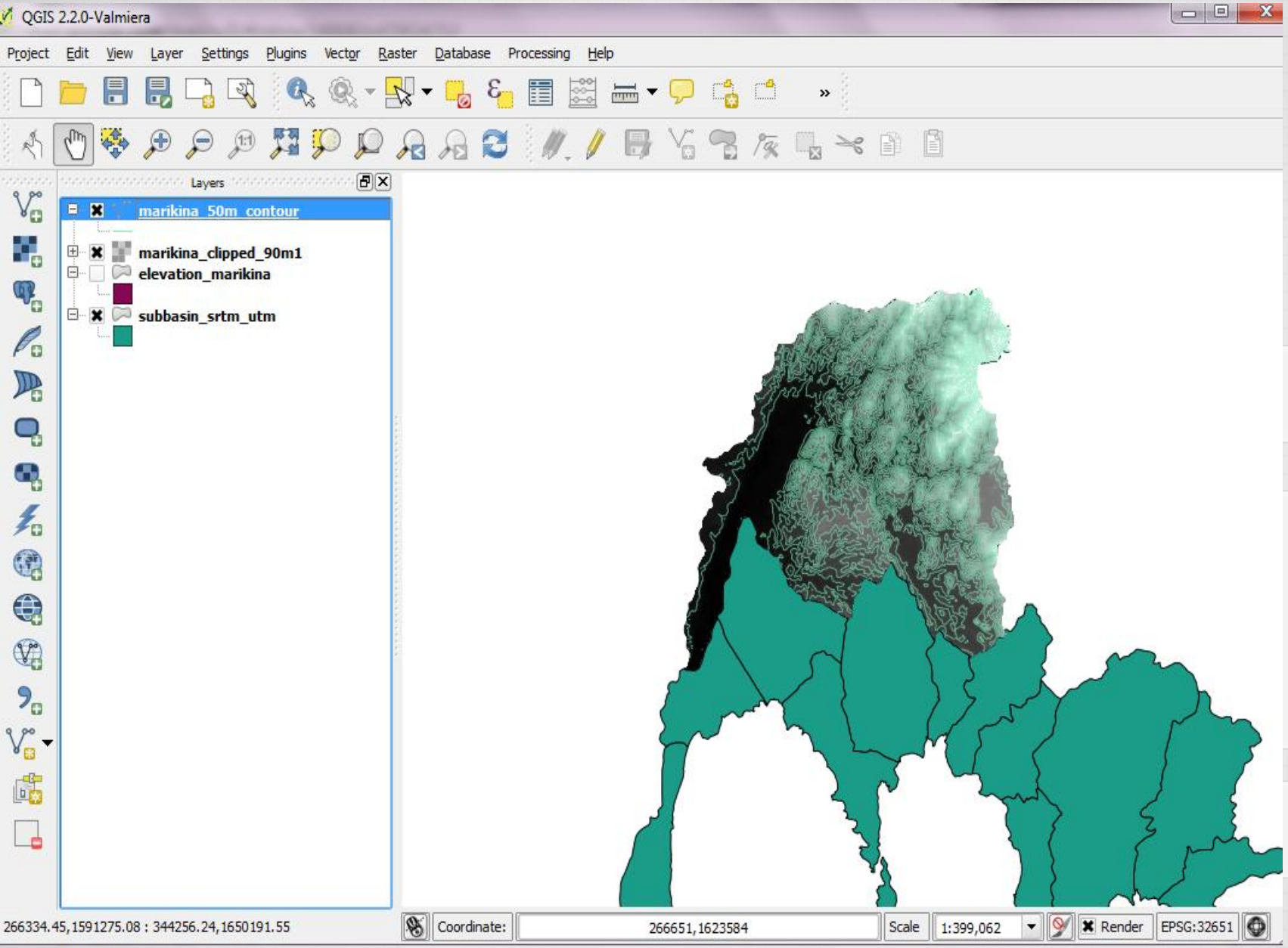


OBJECTIVE

To perform common raster operations from DEM

STEPS

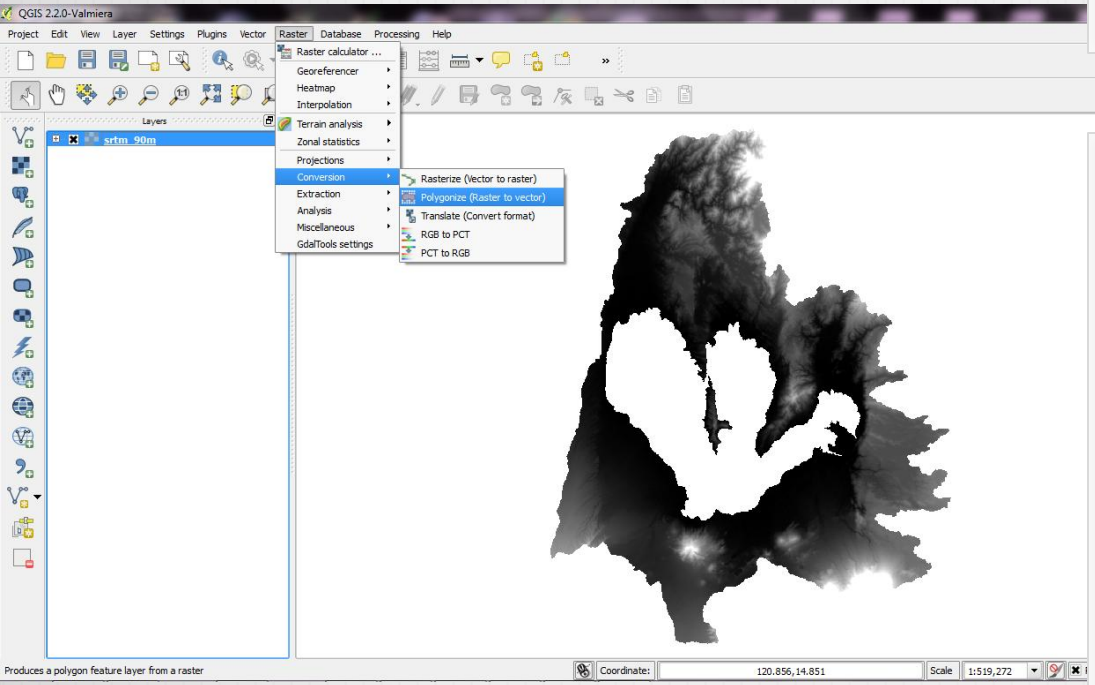
1. Insert srtm_90m
2. Create contours by clicking Raster > Extraction > Contour
3. Define contour interval and save


QGIS 2.2.0-Valmiera
Project Edit View Layer Settings Plugins Vector Raster Database Processing Help
Layers
marikina_50m_contour
marikina_clipped_90m1
elevation_marikina
subbasin_srtm_utm
266334.45,1591275.08 : 344256.24,1650191.55
Coordinate:
266651,1623584
Scale
1:399,062
Render
EPSG:32651

EXER 8 RASTER OPERATIONS

OBJECTIVE

To perform common raster operations from DEM



3. Convert into vector (polygon) by clicking Raster > Conversion > Polygonize

THANKS FOR YOUR TIME