Hands-on

Coral Reef mapping

Training Course on
" Geospatial Techniques for coastal mapping and monitoring "
26th to 30th November, 2018

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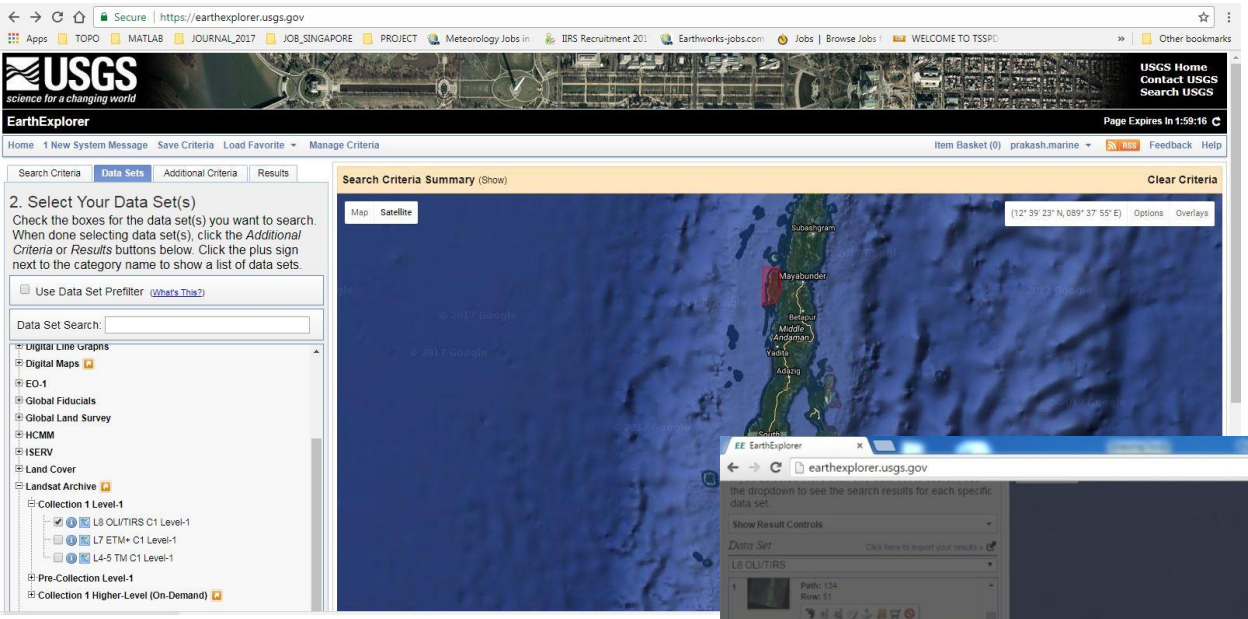
Outline:

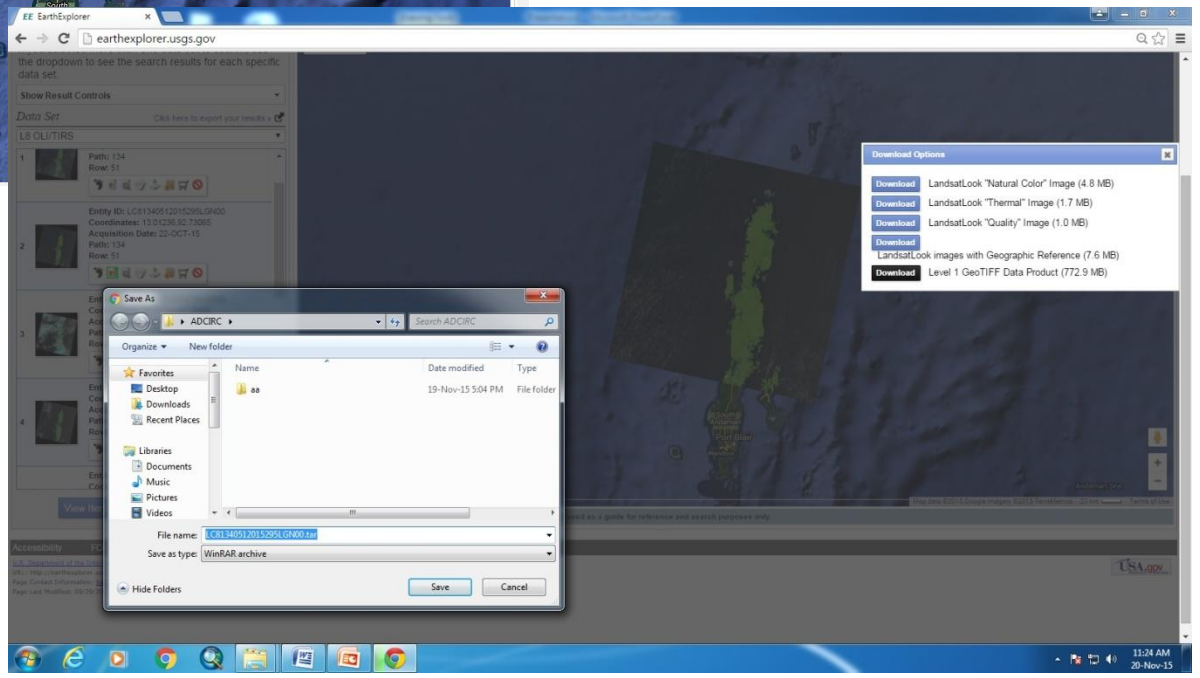
- Downloading satellite data from web
- Subset based on AOI
- Image Classification:
- Generation of Coral reef map

- Raster data opening in QGIS
- Raster Band Composition
- Change the band combination
- Adding data to band set
- Data Clipping
- Create the training input file
- Training sample extraction
- Image classification
- Data conversion from raster to vector
- Adding fields to attribute table
- Attribute data editing
- Vector data reclassification
- Vector data editing

Download Landsat data:

Go to http://earthexplorer.usgs.gov/ and create new user account → Landsat Archive → set search criteria based on user place and accusation time of Landsat data → Download tar file from Archive





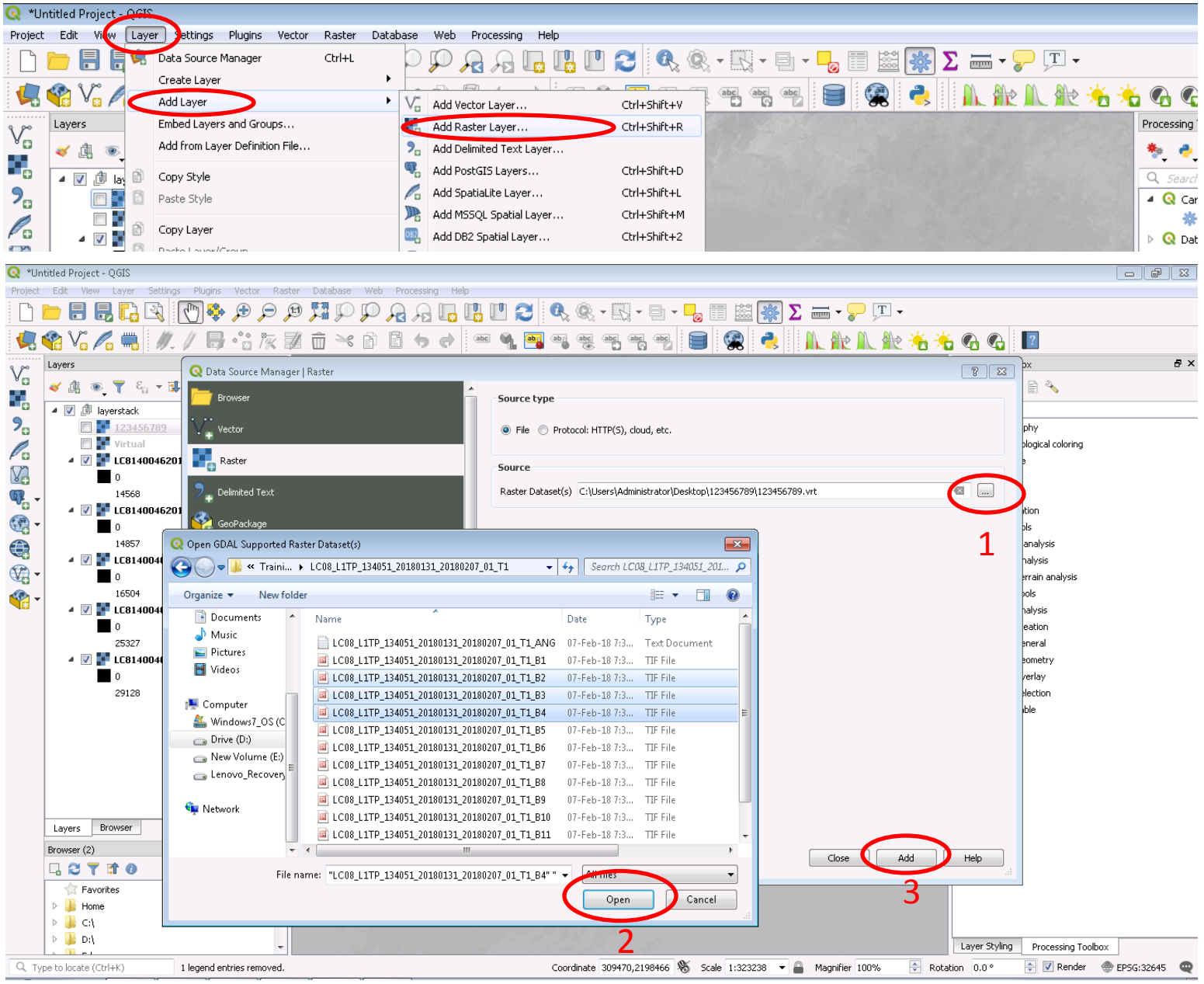
- Select clear and cloud free data
- Download Landsat 8 OLI Level-1 product data set
- After download unzip/uncompress the file

Landsat 8 OLI+ band configuration:

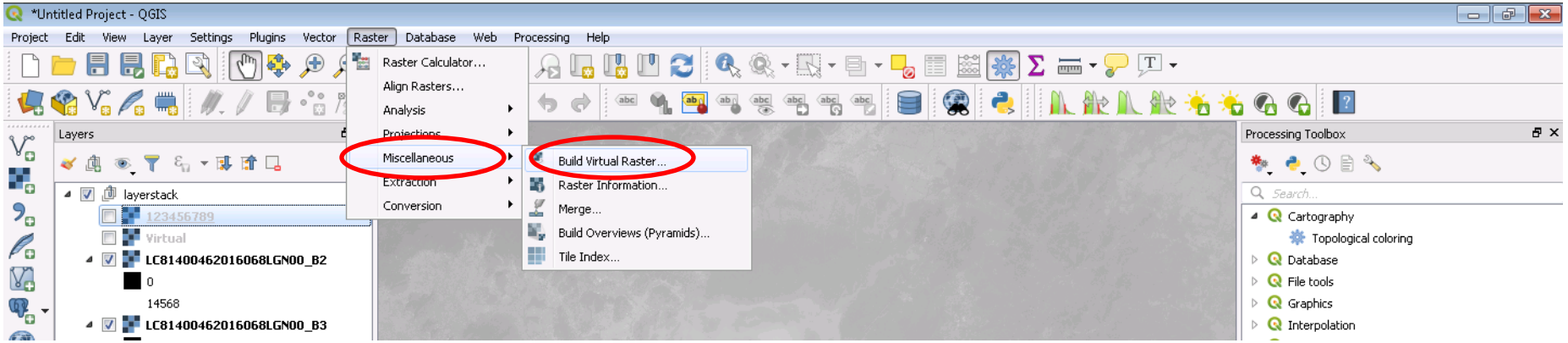
Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS)

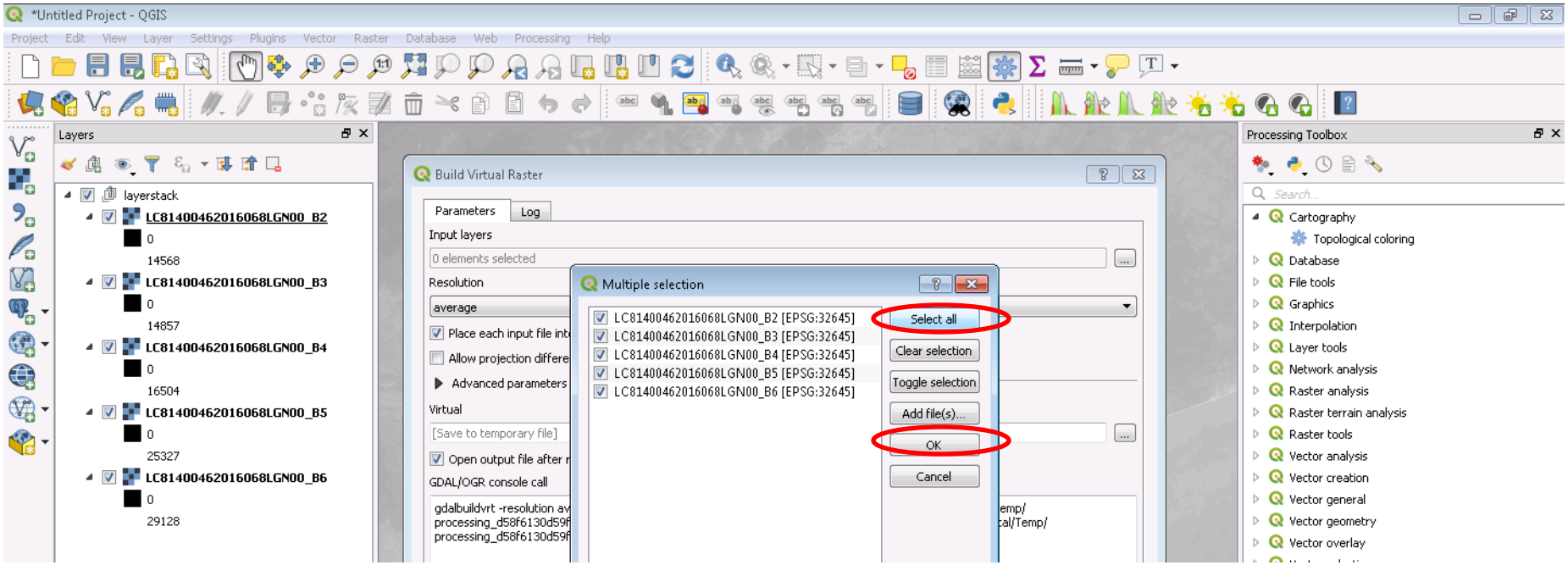
Band	Wavelength	Useful for mapping
Band 1 – Coastal Aerosol	0.435 - 0.451	Coastal and aerosol studies
Band 2 – Blue	0.452 - 0.512	Bathymetric mapping, distinguishing soil from vegetation, and deciduous from coniferous vegetation
Band 3 - Green	0.533 - 0.590	Emphasizes peak vegetation, which is useful for assessing plant vigor
Band 4 - Red	0.636 - 0.673	Discriminates vegetation slopes
Band 5 - Near Infrared (NIR)	0.851 - 0.879	Emphasizes biomass content and shorelines
Band 6 - Short-wave Infrared (SWIR) 1	1.566 - 1.651	Discriminates moisture content of soil and vegetation; penetrates thin clouds
Band 7 - Short-wave Infrared (SWIR) 2	2.107 - 2.294	Improved moisture content of soil and vegetation and thin cloud penetration
Band 8 - Panchromatic	0.503 - 0.676	15 meter resolution, sharper image definition
Band 9 – Cirrus	1.363 - 1.384	Improved detection of cirrus cloud contamination
Band 10 – TIRS 1	10.60 – 11.19	100 meter resolution, thermal mapping and estimated soil moisture
Band 11 – TIRS 2	11.50 - 12.51	100 meter resolution, Improved thermal mapping and estimated soil moisture

Raster data opening in QGIS:

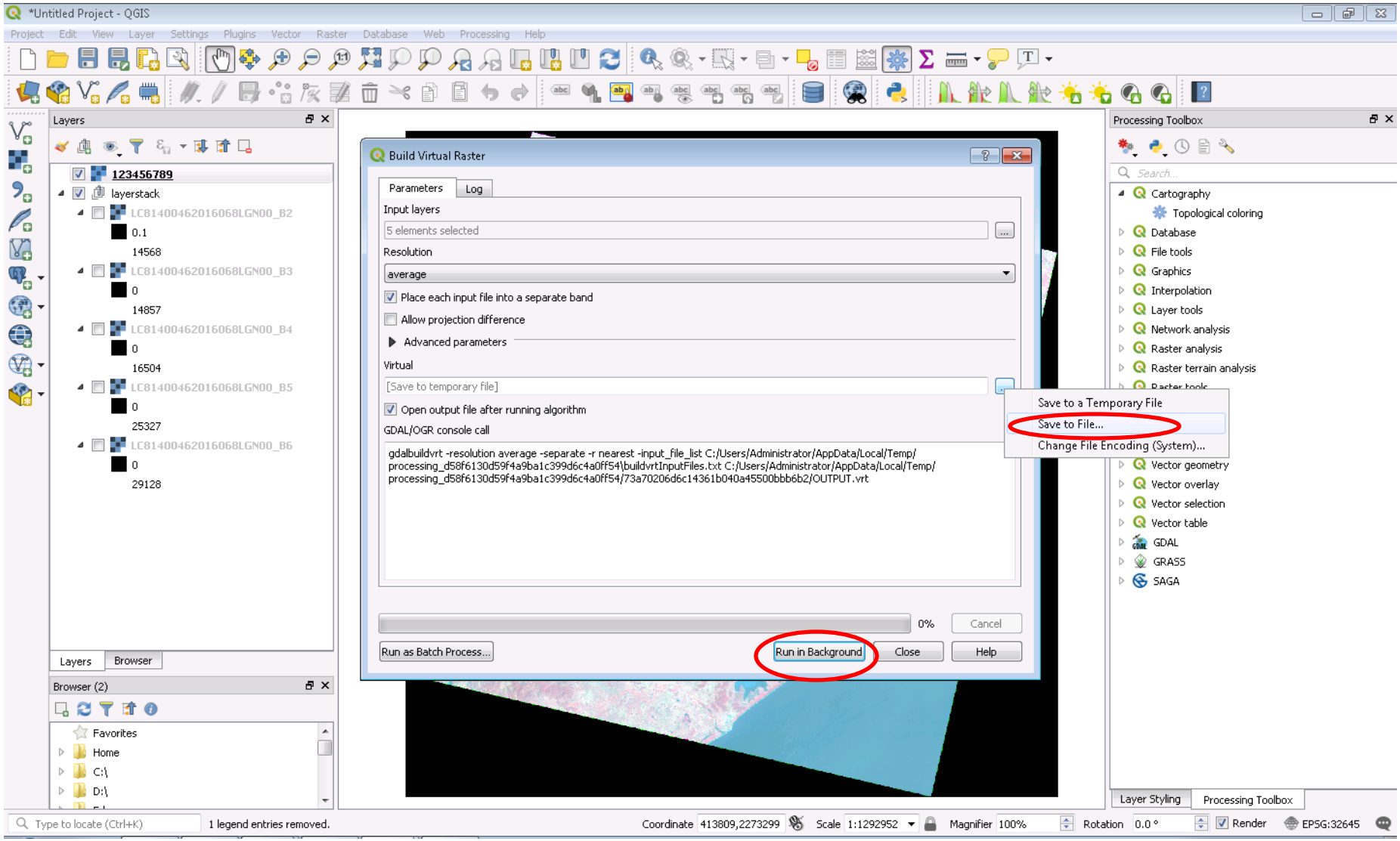


Raster Band Composition:





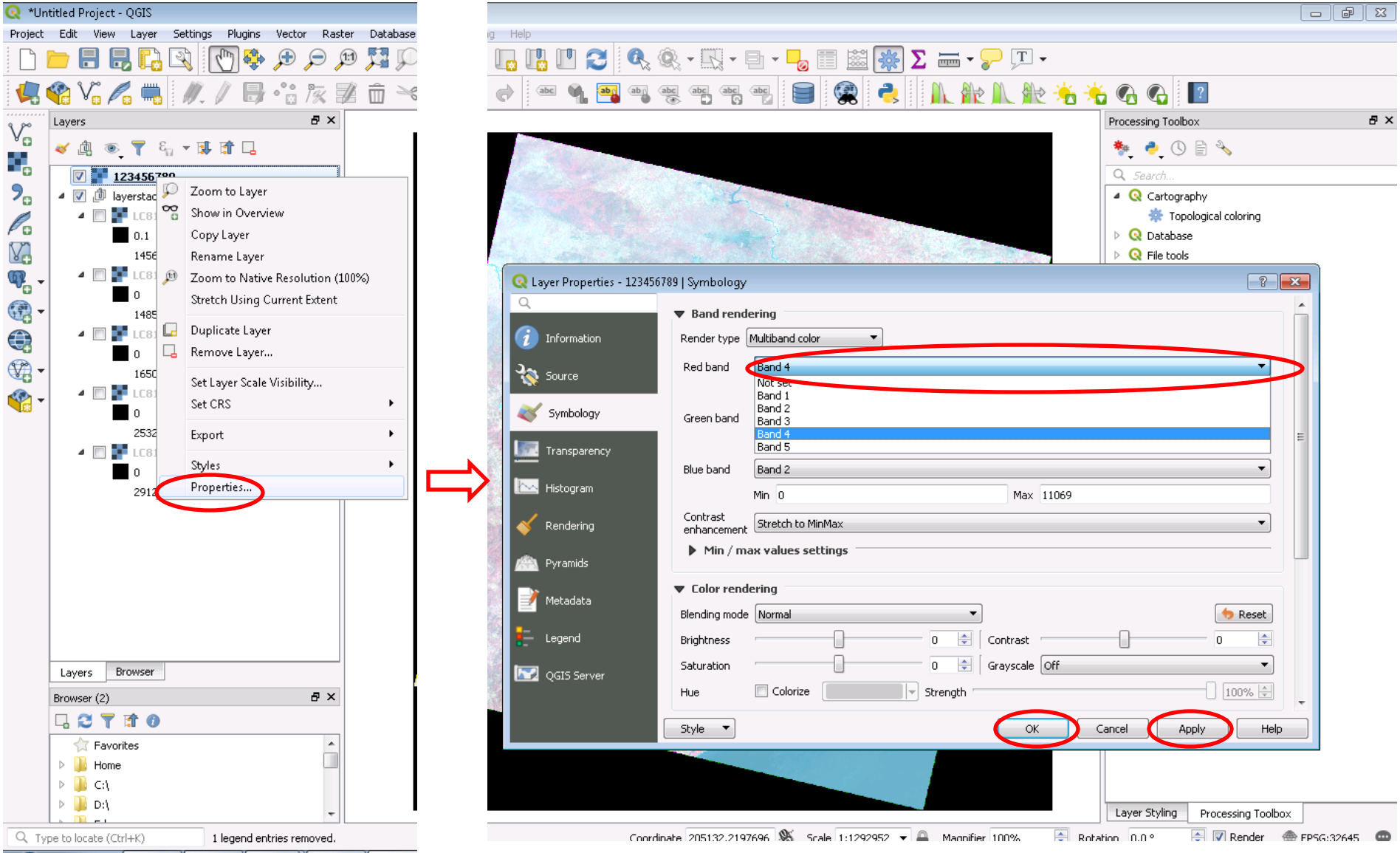
Raster Band Composition:



➢Open the FCC image

Change the band combination

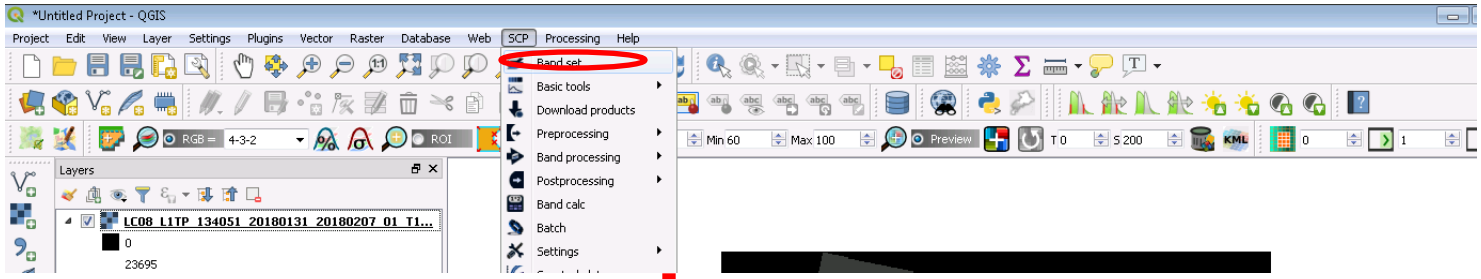
➢Select the FCC image → right click → properties

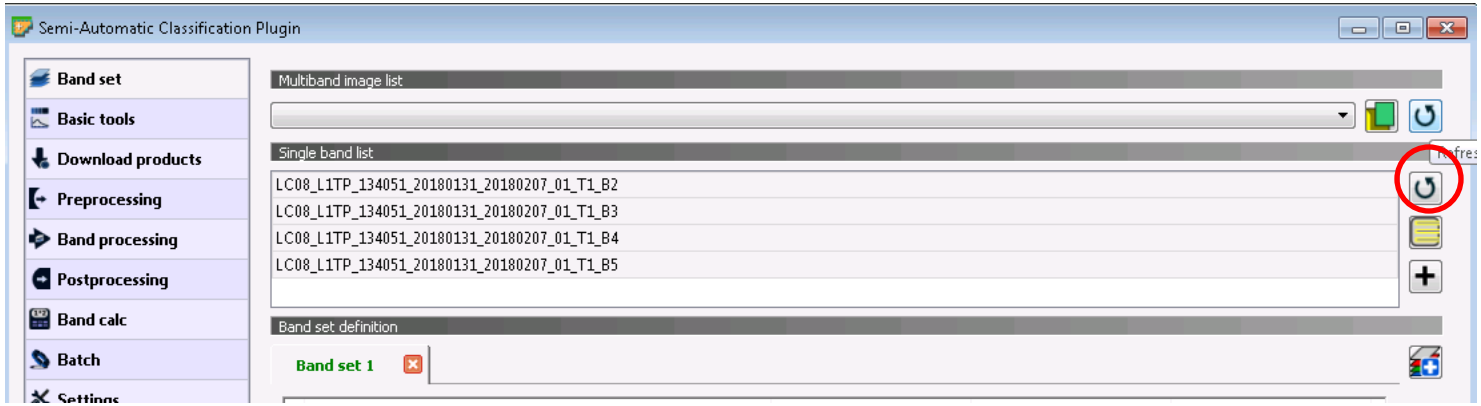


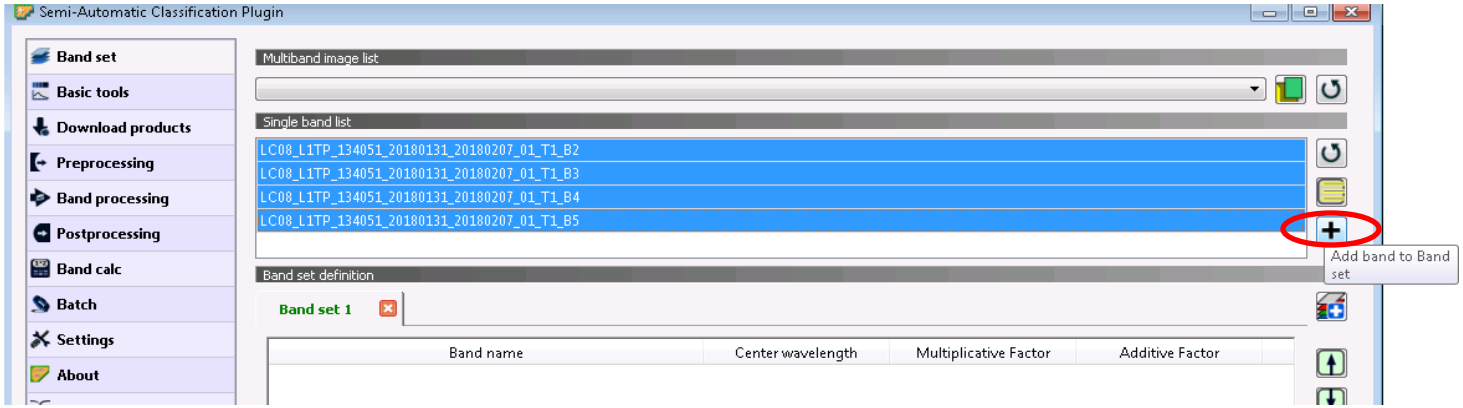
Adding data to band set:

➢Go to plugins ⟶ manage and install plugin ⟶ Select Semi automatic classification and install

➢Go to SCP click on band set⟶ SCP pugin window opens.

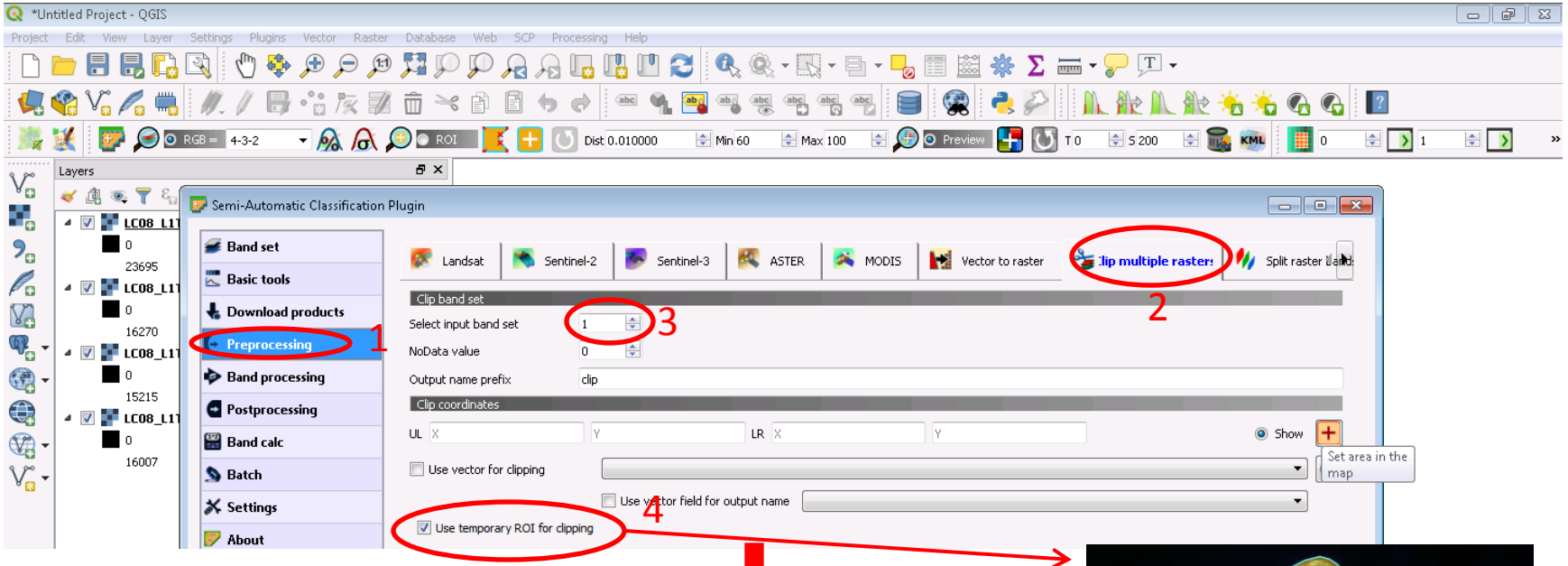




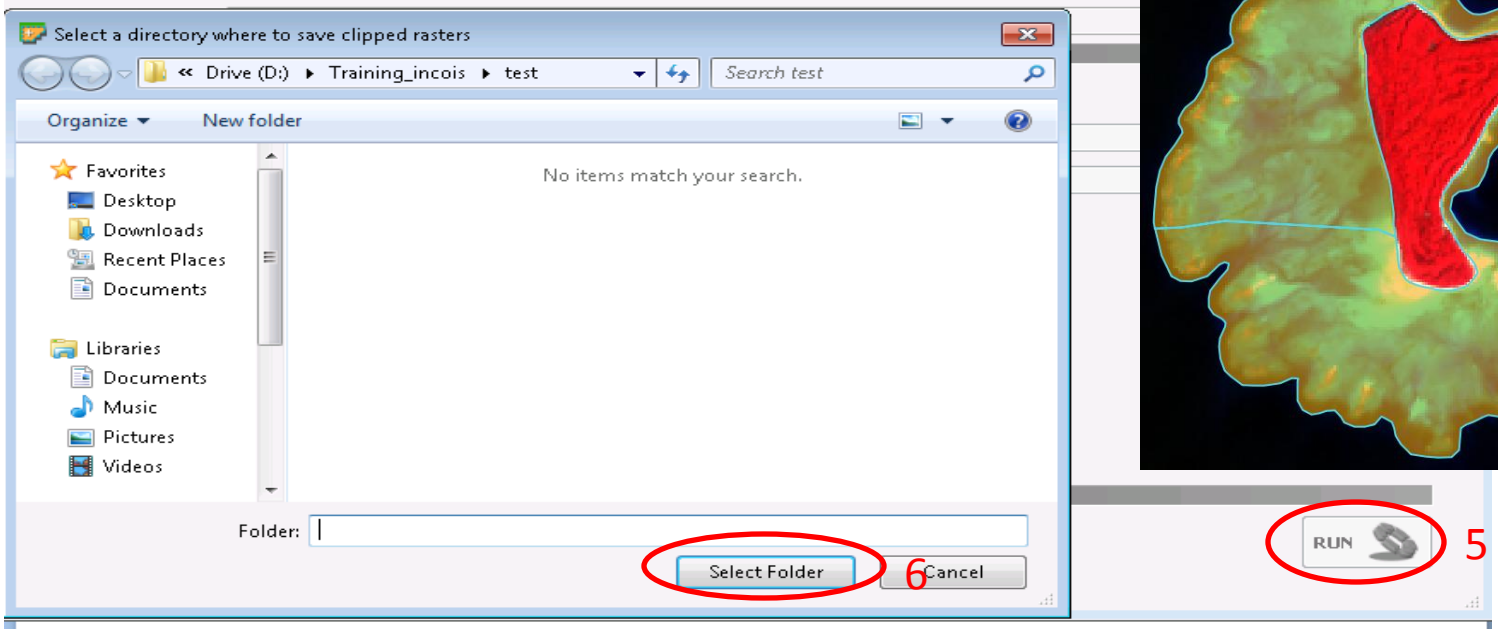


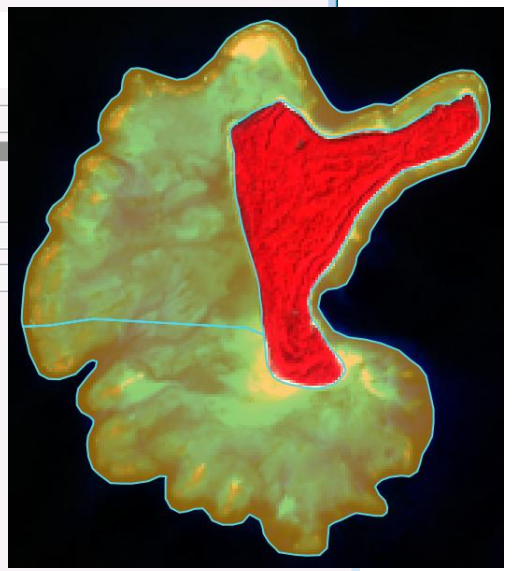
Data Clipping:

➢Go to SCP ⟶ processing ⟶ Landsat ⟶ Clip multiple raster



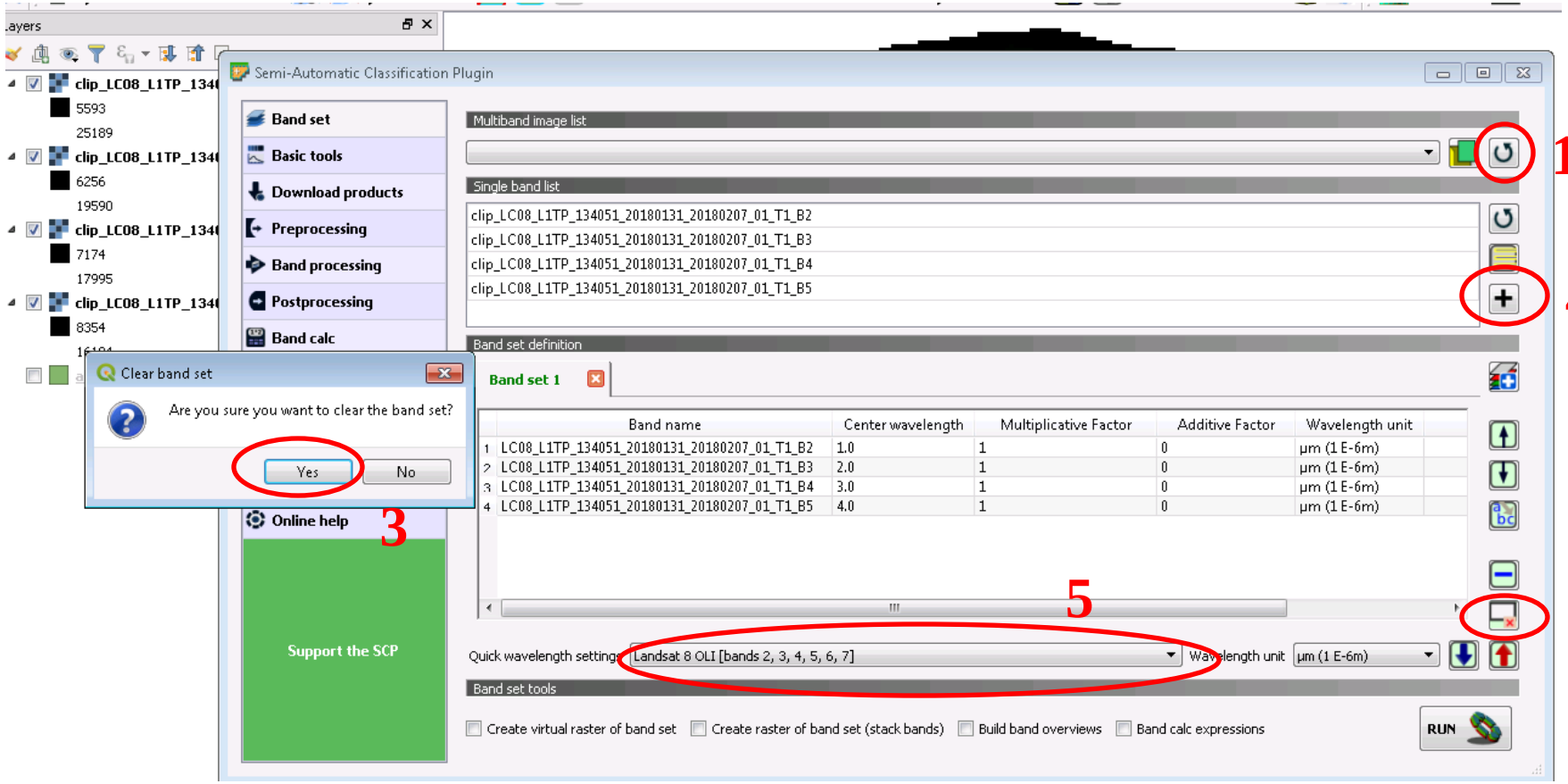
➢After 3 step draw ROI on raster image



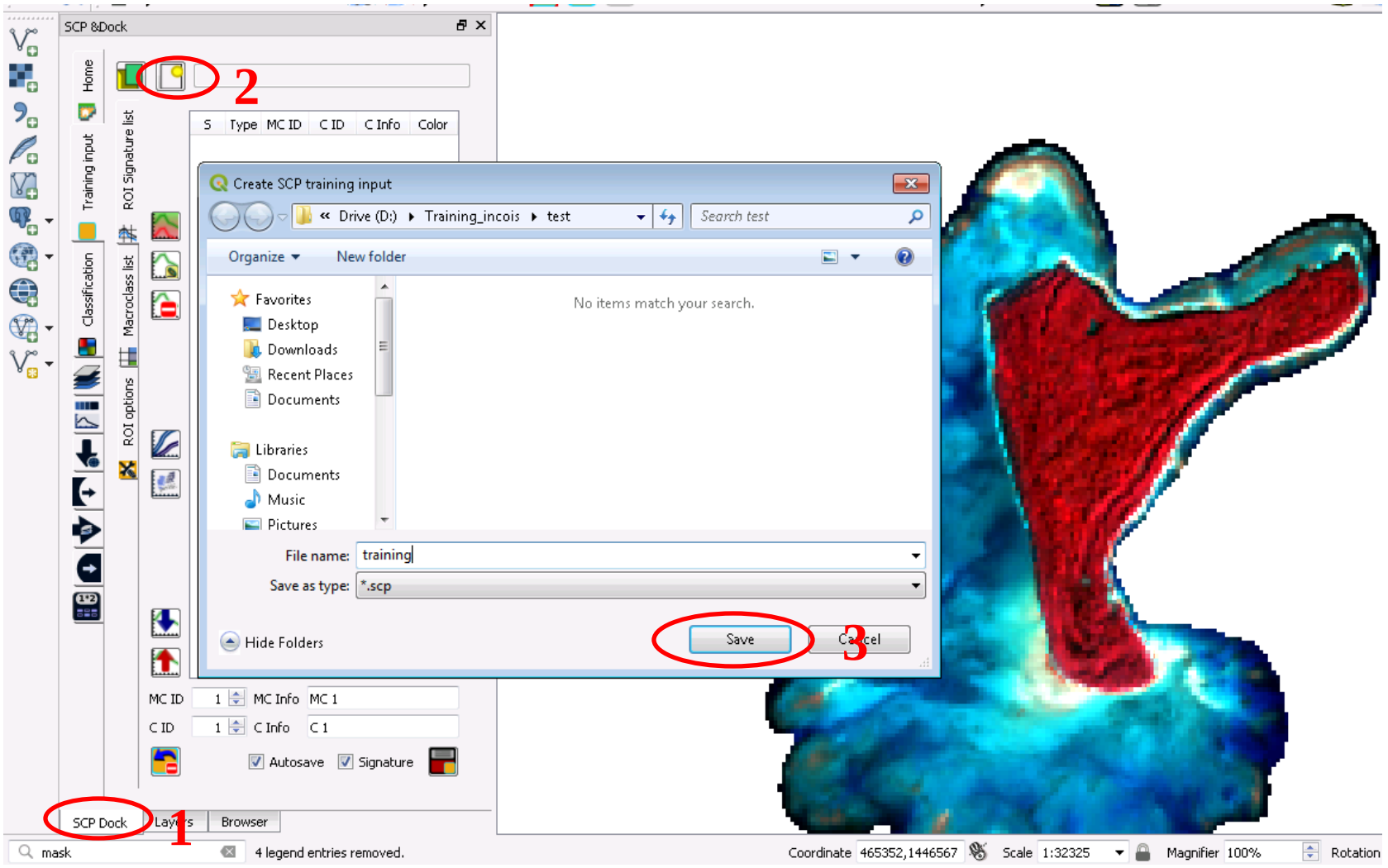


Define band set :

Go to SCP from main tool bar ⟶ Band set

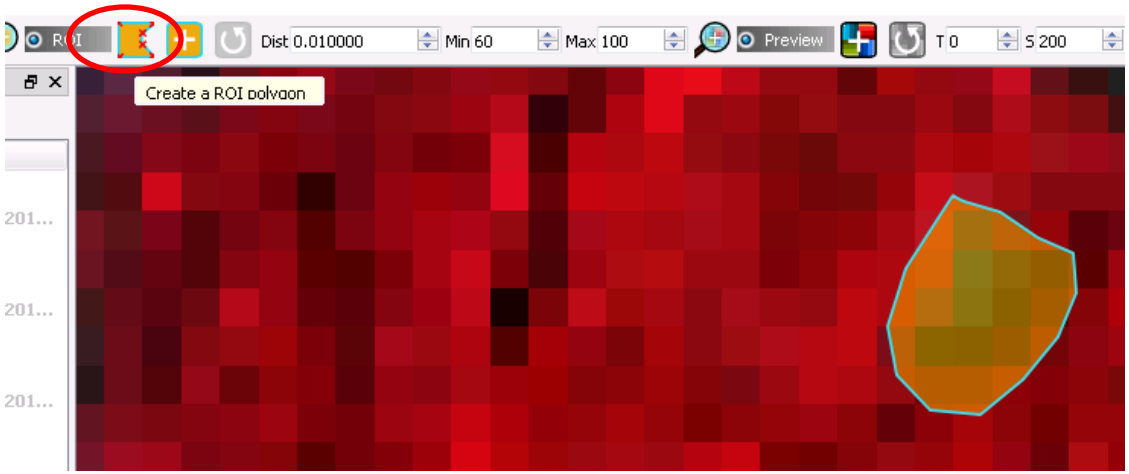


Create the training input file:



Training sample extraction:

- Now go to the create ROI polygon and draw a polygon



- Now click on save temporary ROI to training input
- Collect all training classes

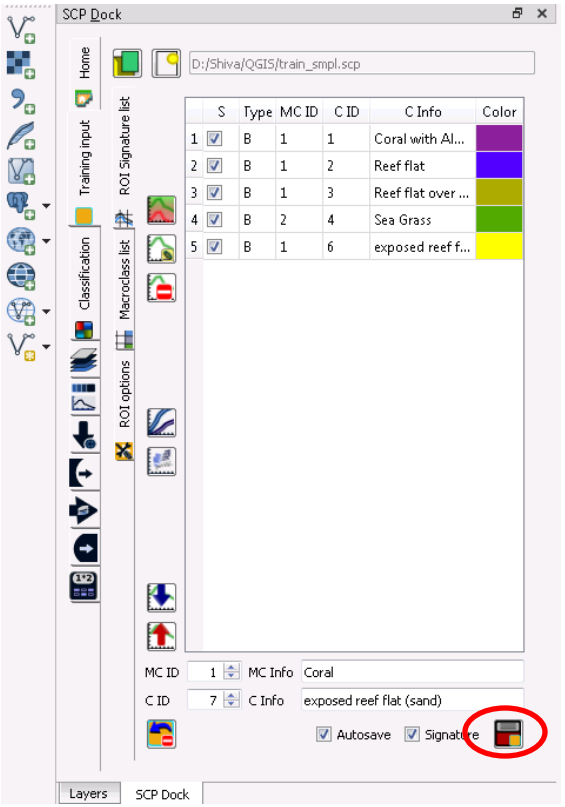
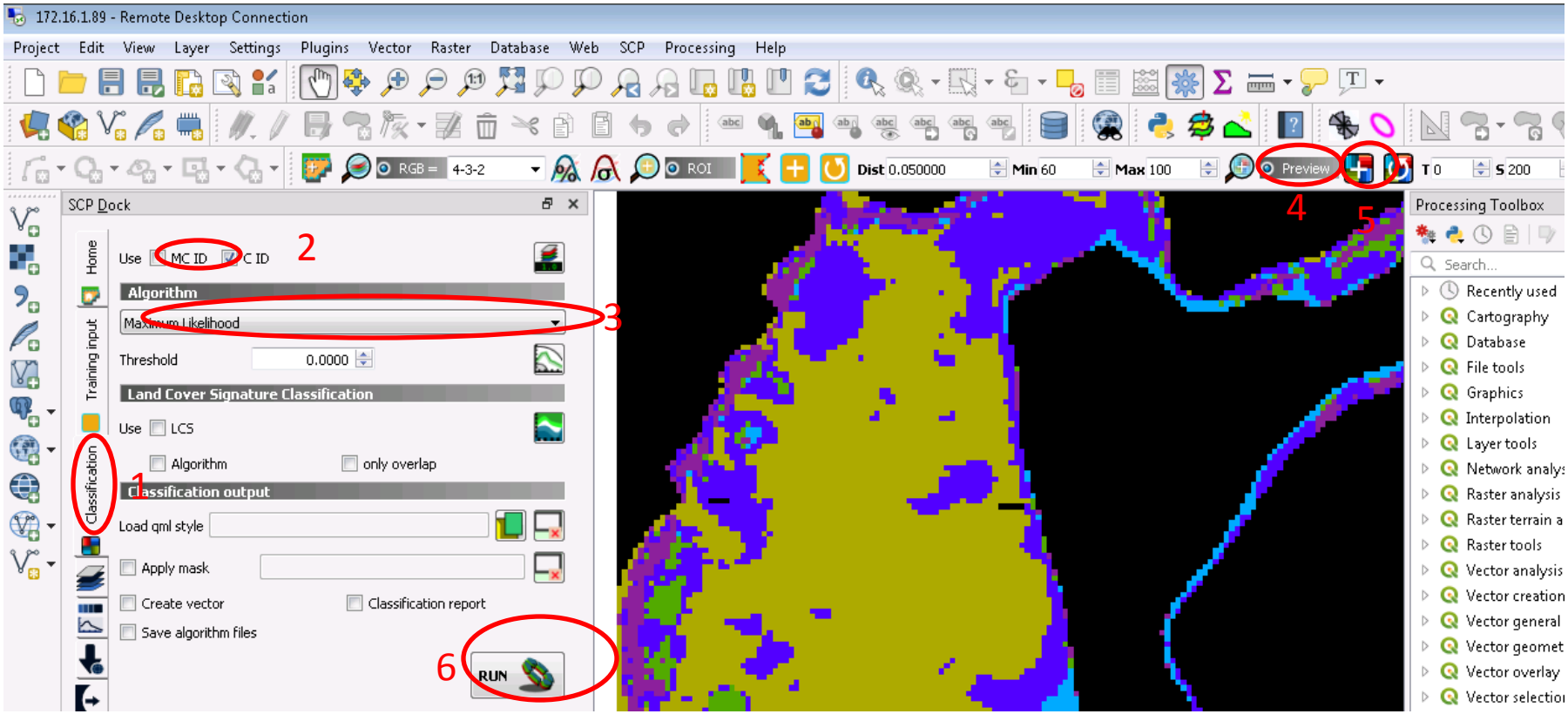
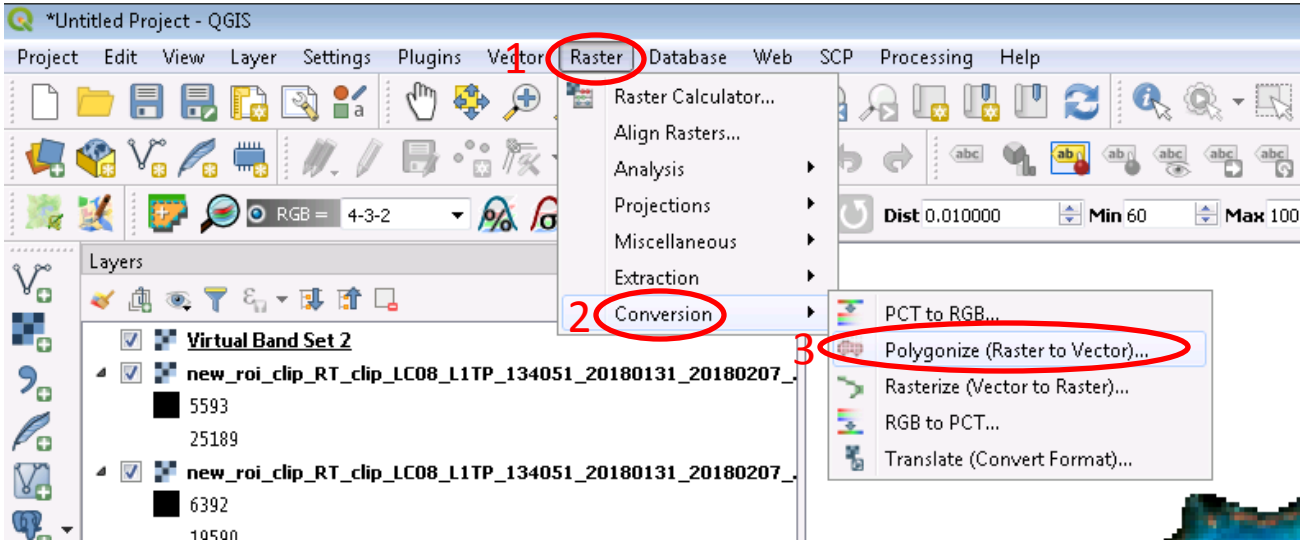


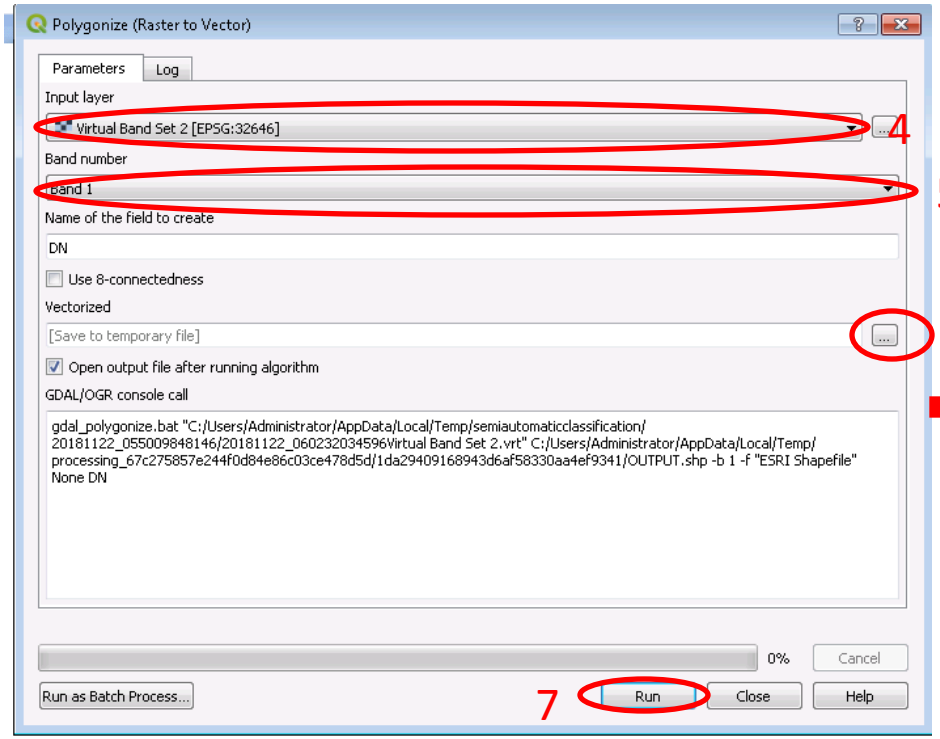
Image classification:

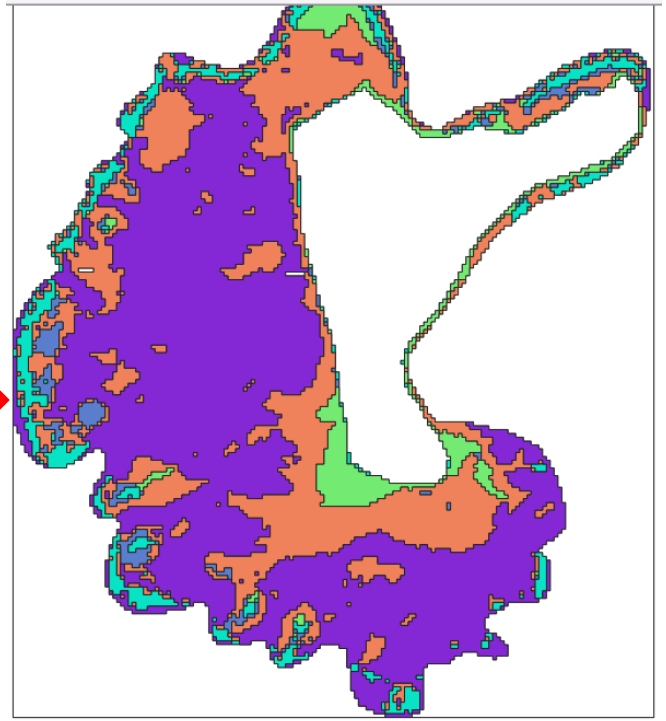


- Use Micro ID or class ID
- Select algorithm
- Check the preview and click on activate classification preview pointer for preview
- Clock on run ⟶ give the path to save classified image.

Data conversion from raster to vector:

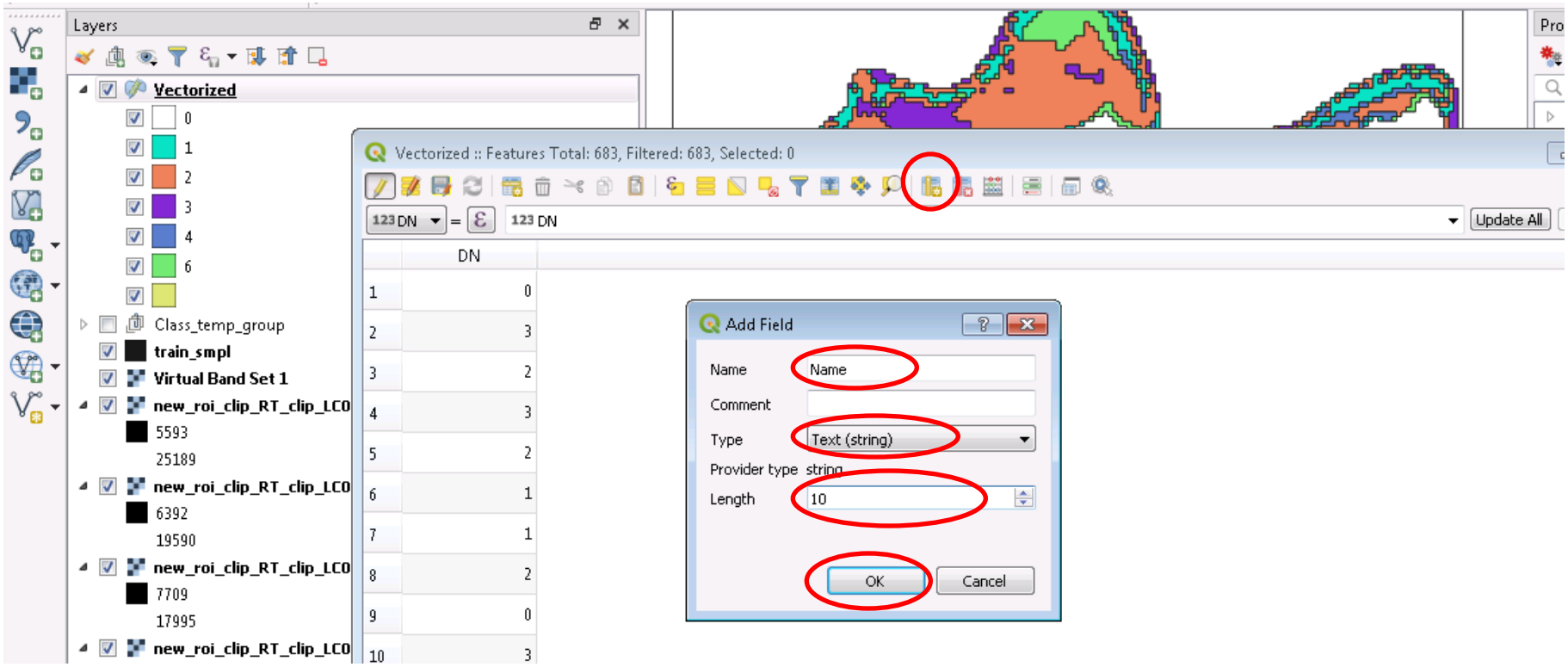






Adding fields to attribute table :

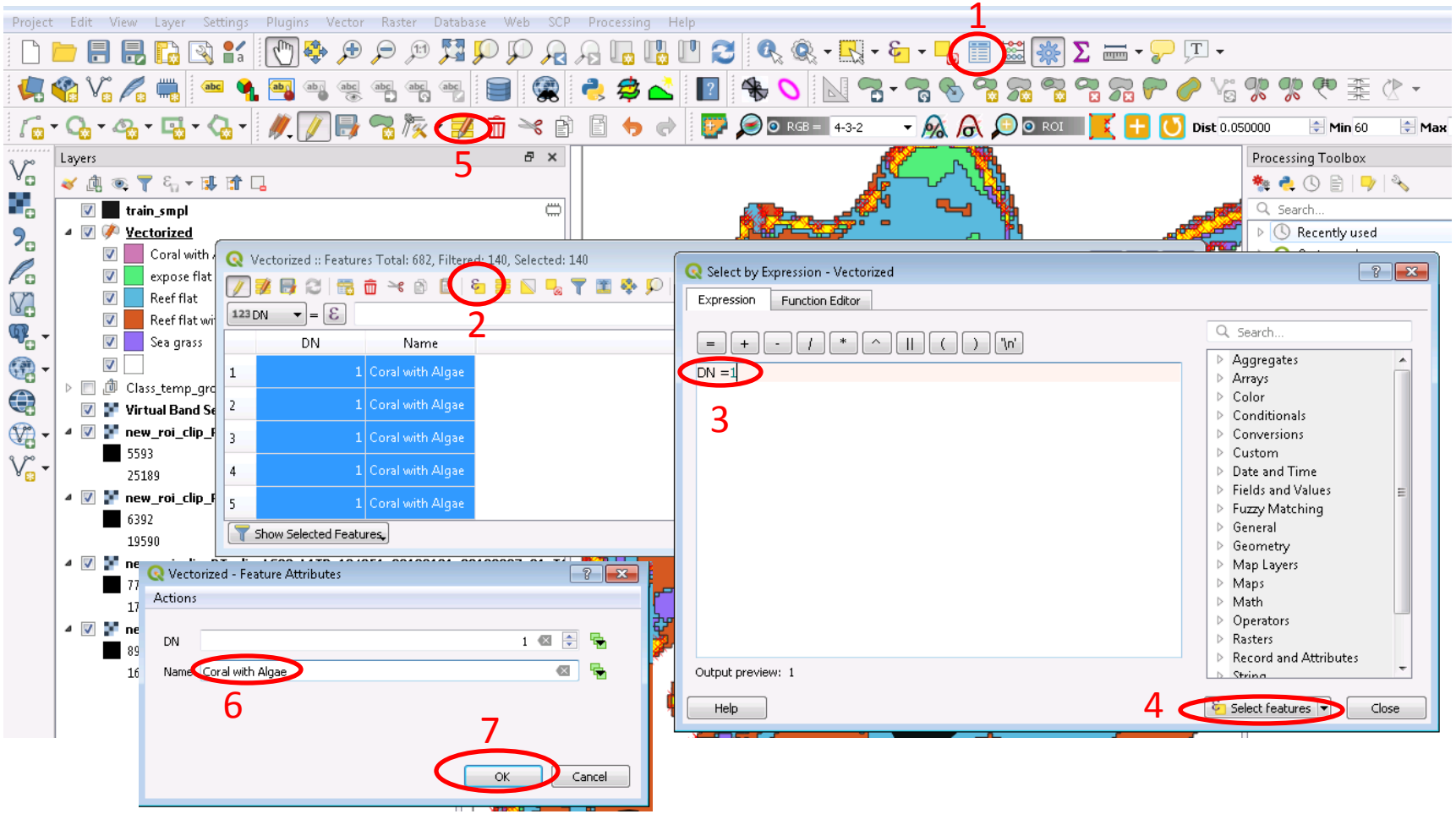
- Select Vector layer ⟶ right click ⟶ Open attribute table
- In attribute window click on add field
- Add field window opens → give the field name ⟶ Select the field type Length ⟶ ok



Attribute data editing

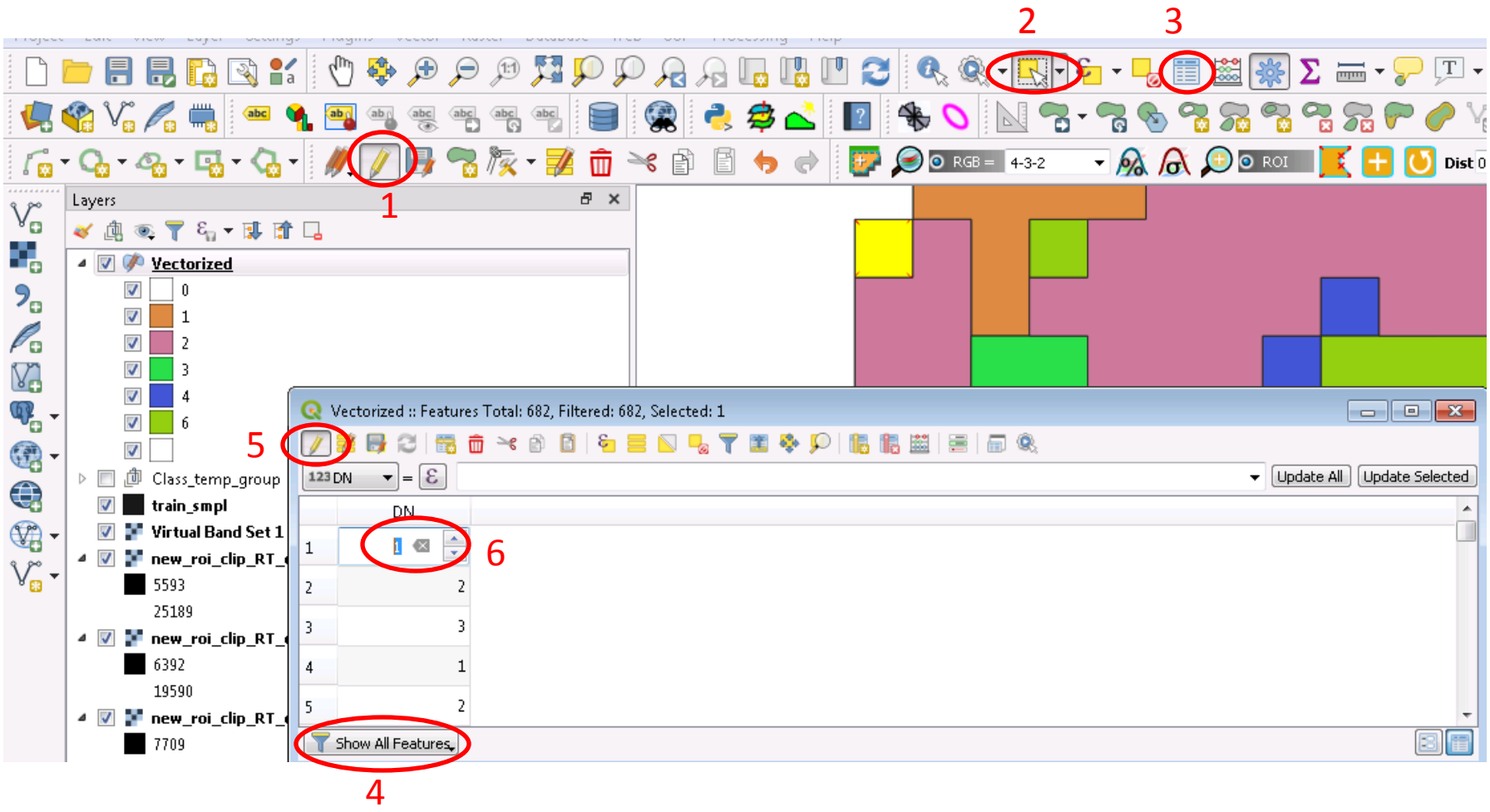
If we want give the name to all same class fields at a time:

- ➢Click on open attribute table
- ➢Click on select by expression ⟶ type the expression ⟶ Click on Select feature
- ➢Click on modify attributes of all selected features simultaneously ⟶ enter the name ok



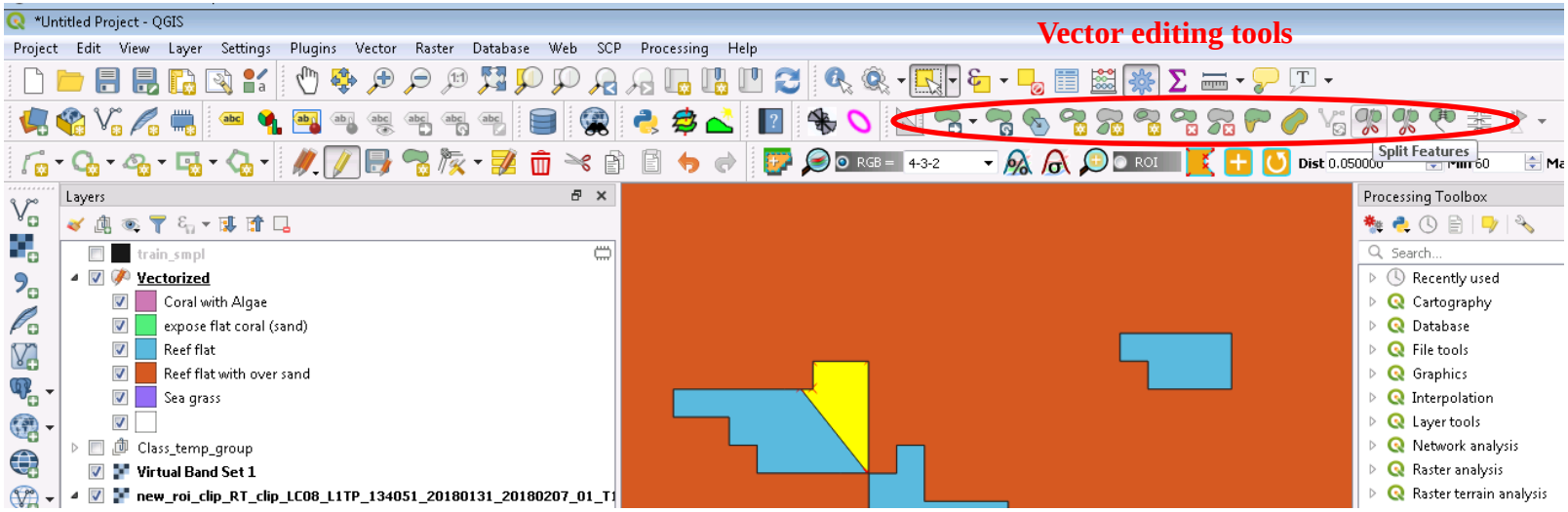
Vector data reclassification

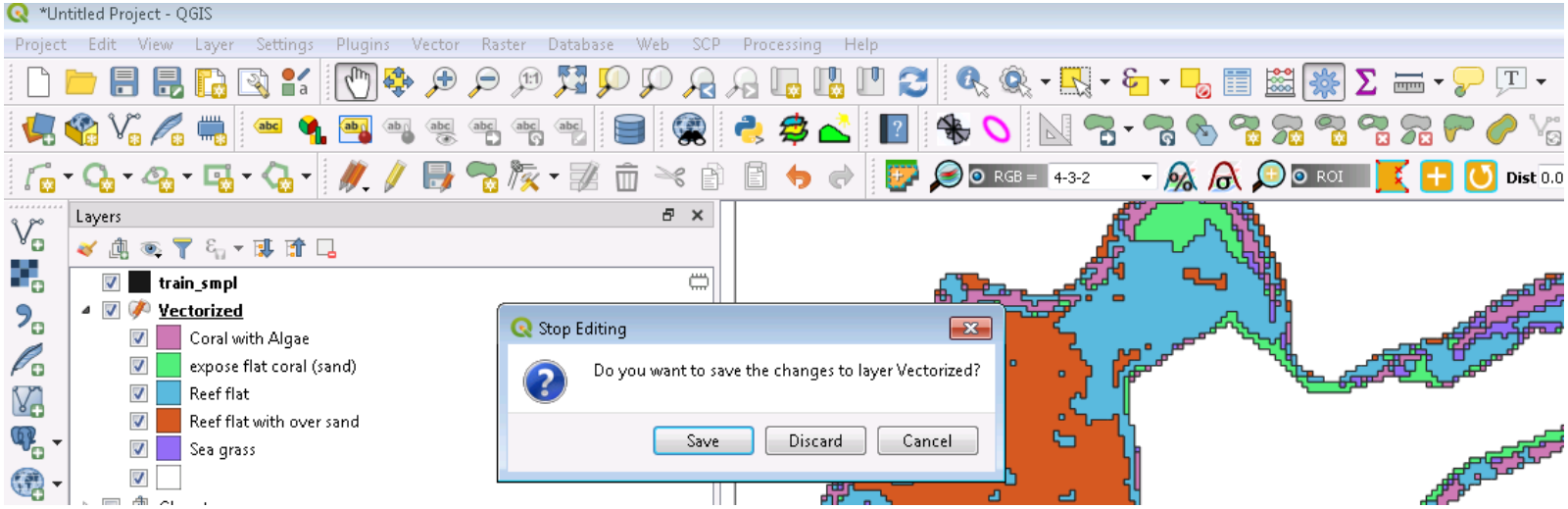
- Click on Toggle editing
- Click on select features by area or single click ⟶ Select miss classified feature
- Click on open attribute table ⟶ Select show selected features
- Click on toggle editing mode ⟶ move in to the right class with rename



Vector data editing

- If we found any miss classification and wrong shape of feature using vector editing Tools we can modify.
- After finishing all the edits click on toggle editing>stop editing window opens click on save





Thank you