# Image georeferencing and feature extraction

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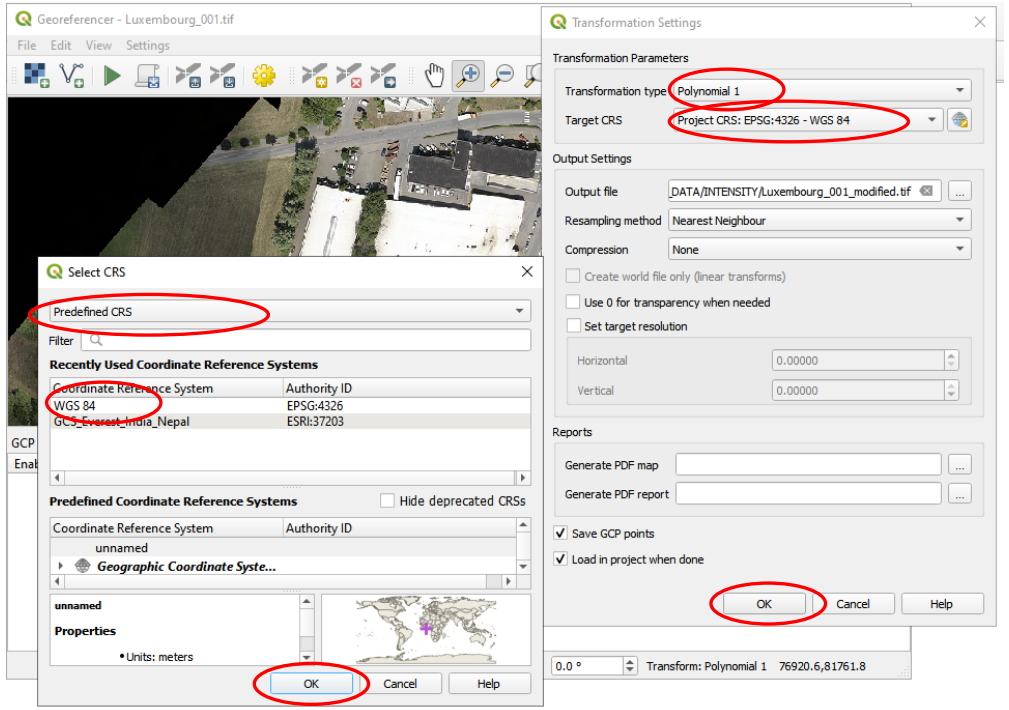
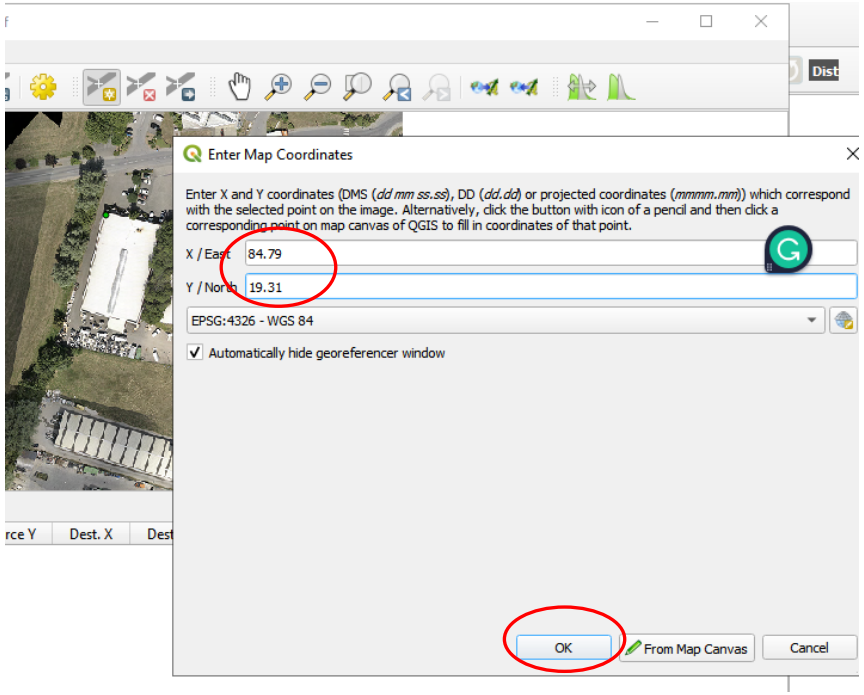
# ***Outline***

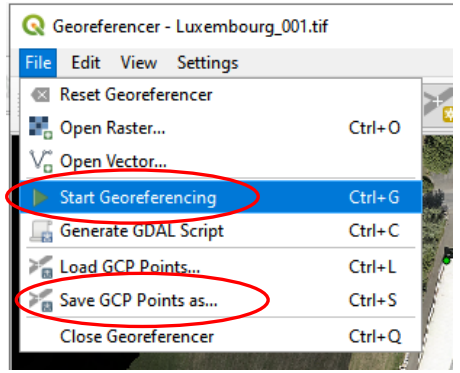
- ➢ Image/ Toposheet georeferencing
- ➢ Satellite data visualization
- ➢ Subset based on AOI
- ➢ Vector shape file creation
- Data Clipping
- Shape file creation (Point, Line, and Polygon)
- Adding fields to attribute table
- Attribute data editing
- Vector data editing
- Export to KML

# Toposheet/ Image georeferencing

- Open QGIS → go to Layer → Georeferencer →Georeferencer window will open→go to file →open raster →browse our unreferenced image/ toposheet.
- Go to settings →Transformation Settings → Transformation type: select **polynomial1**→ Target CRS : click on it → custom CRS : select predefined CRS →select WGS84 → output file: give output location and file name→ resampling method : Nearest Neighbour → save GCP points→ ok
- Click on add point → place point on toposheet/ image → enter lat and long values → ok → take 4 points
- Click on save GPC points as→ give path and name → Now Go to the file and click on start geoferencing.



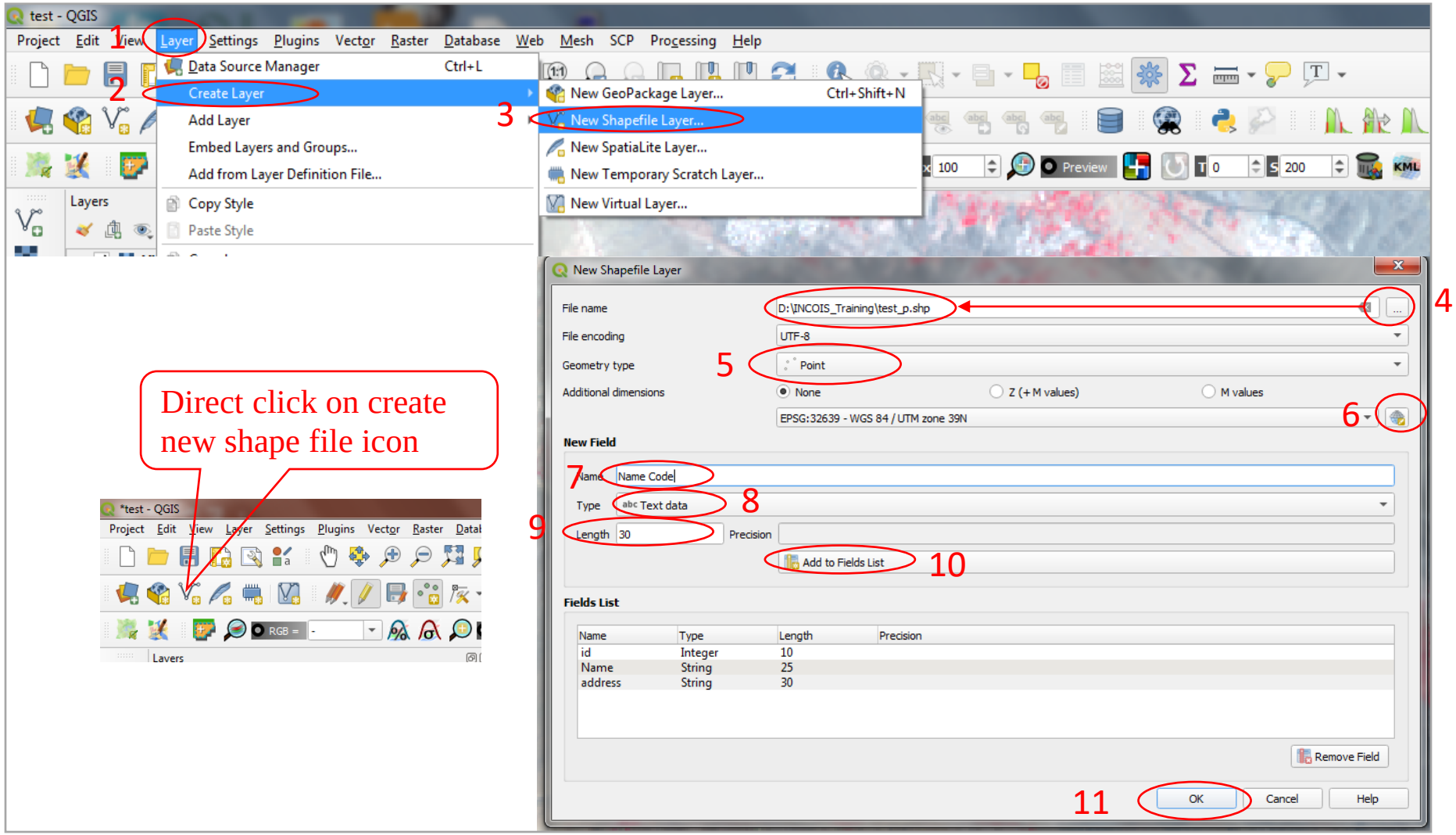

CRS polynomial order: https://docs.qgis.org/3.28/en/docs/user_manual/working_with_raster/georeferencer.html

# Shape file creation:

**Shape files are three types** :

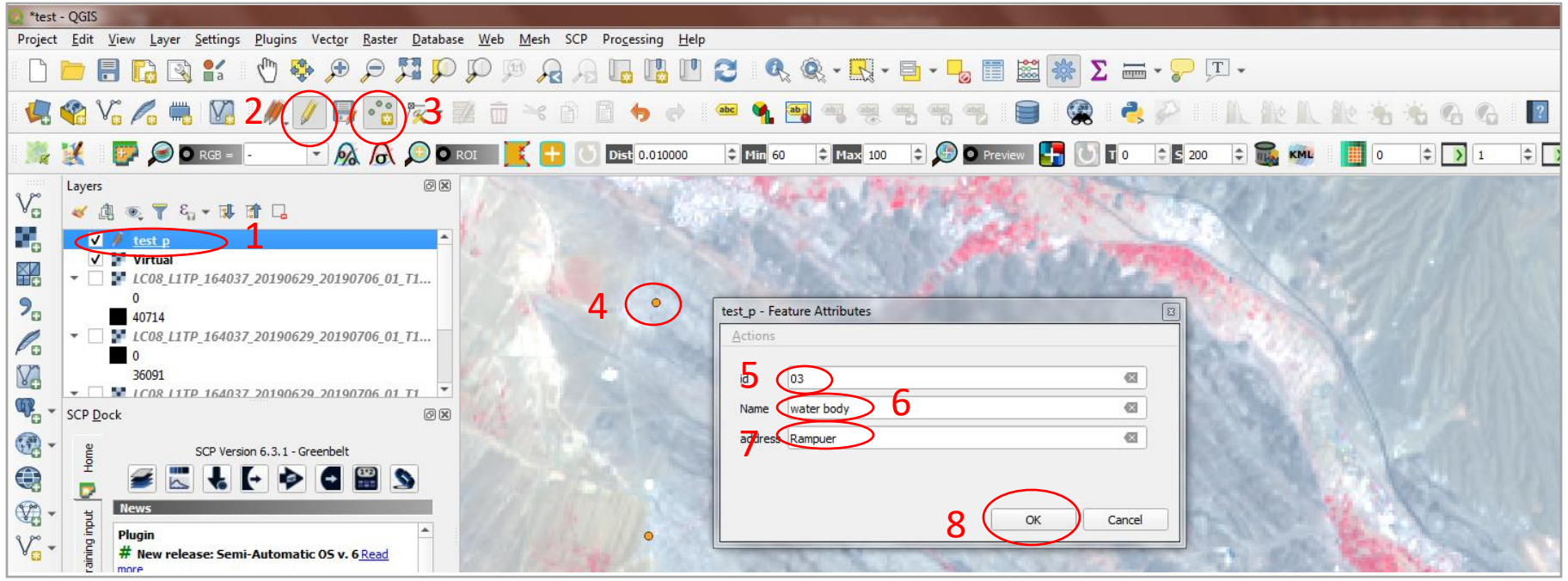
1. Point shape file
2. Line shape file
3. Polygon shape file

## Point Shape file creation :

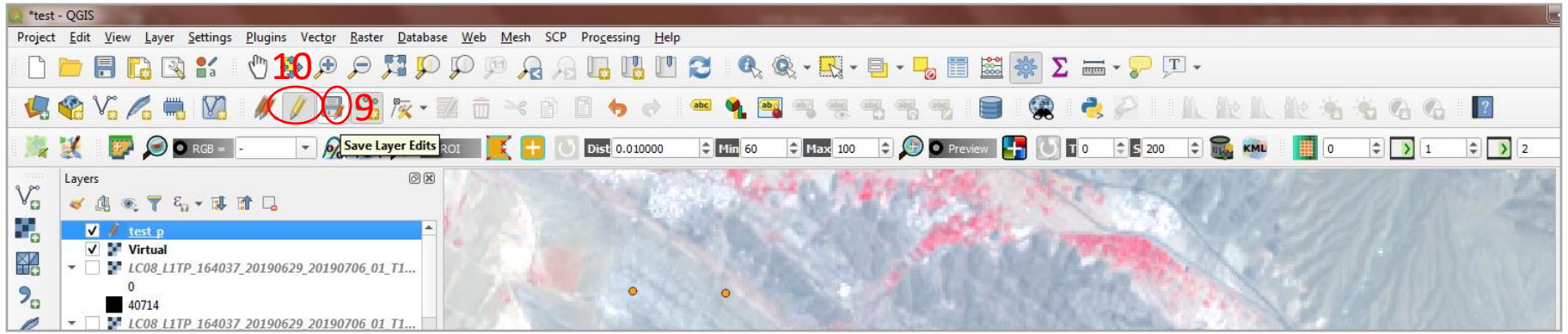


# Point Shape file Editing :

- Select point shape file
- Click on Toggle editing ⟶ add point feature ⟶ put points on image

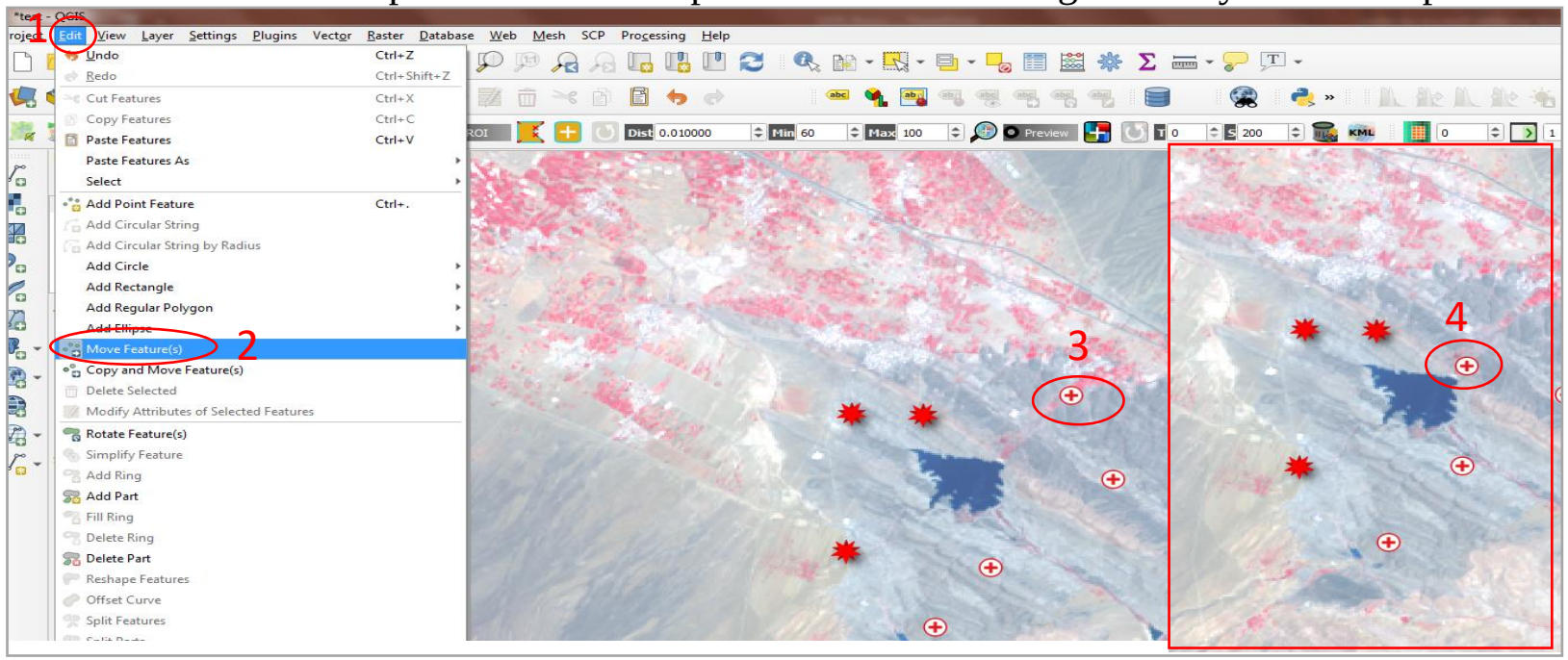



- To save edited data click on save layer edits.
- To stop editing click on Toggle editing

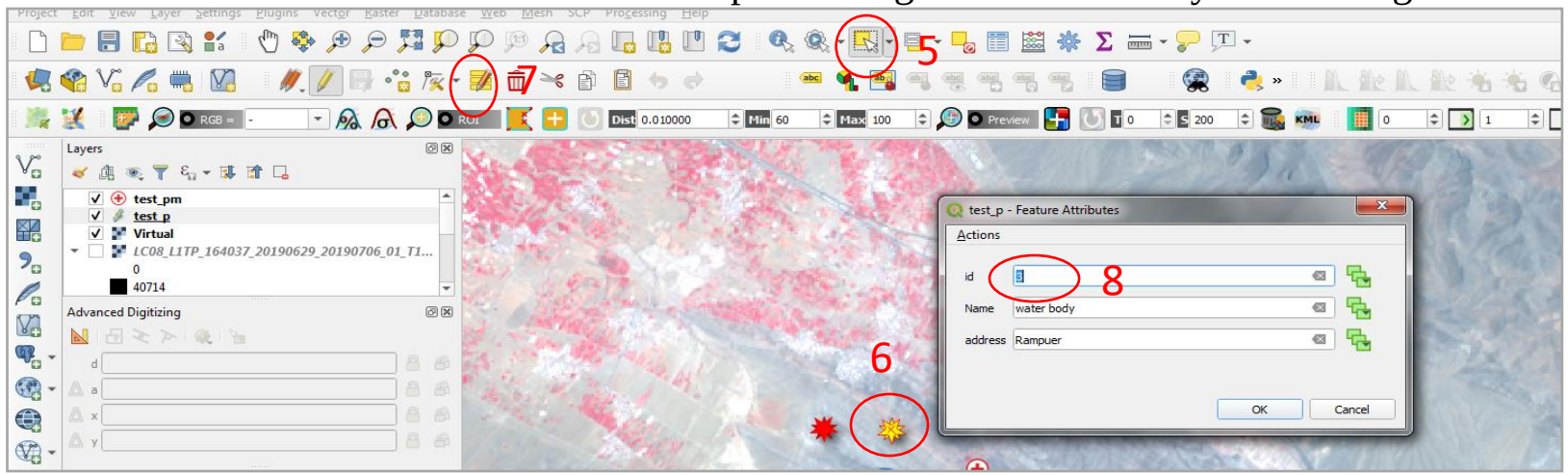


# Contin…….

- Moving point from one location to another location .Go to Edit ⟶ Move feature
- Now click on point to select the point and click on image where you want to place that point

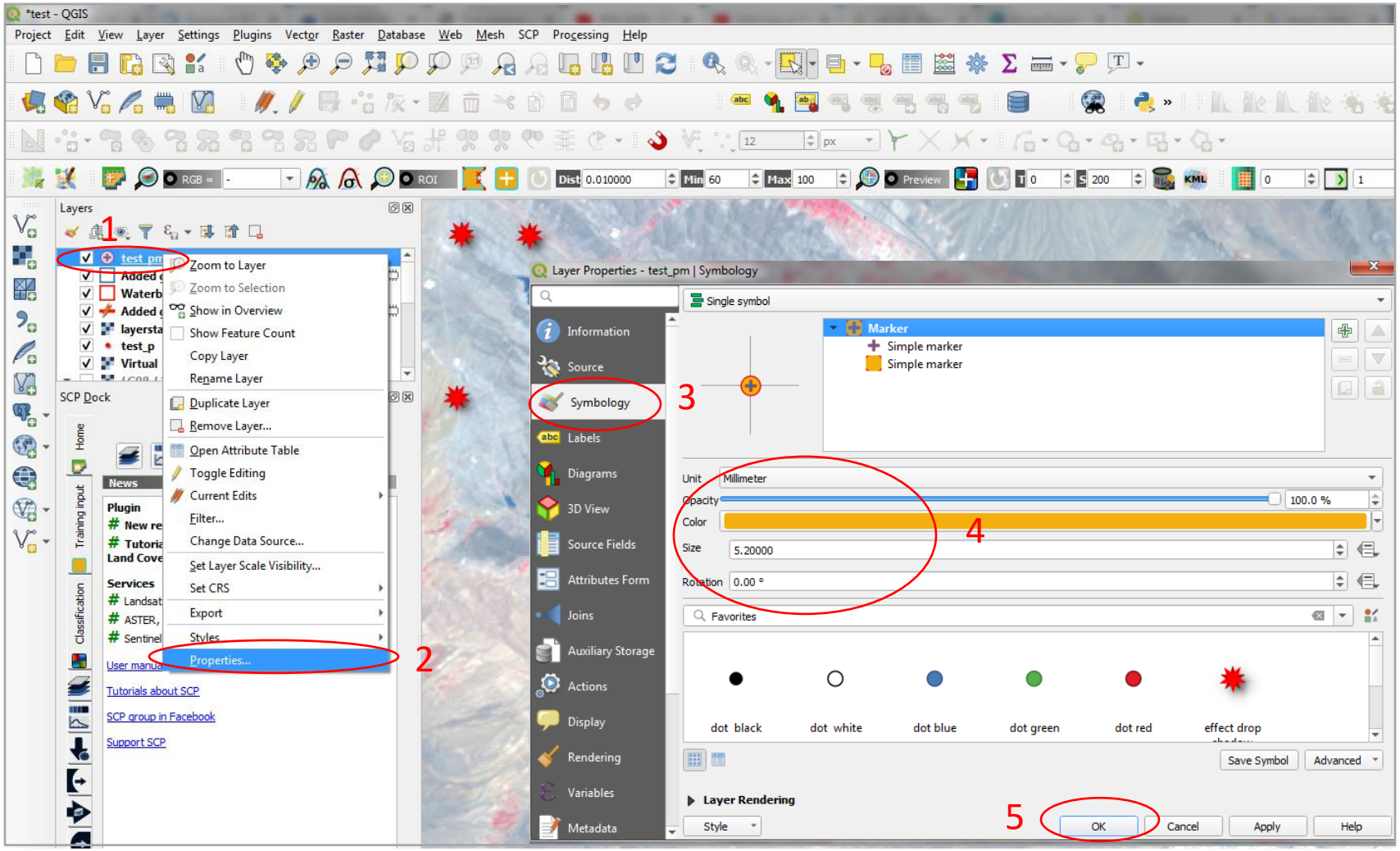



- To edit the attribute data select that point using select features by area or single click



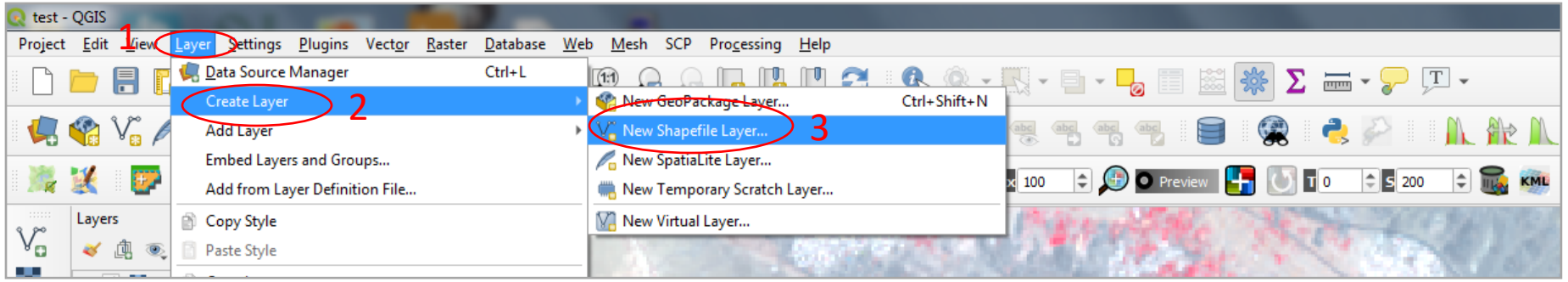
# Symbology :

- To change symbol Select layer(Point or Line or Polygon) right click ⟶ Properties
- In layer properties window ➞ Click on Symbology Now change the symbol style, colour, size ➞ ok

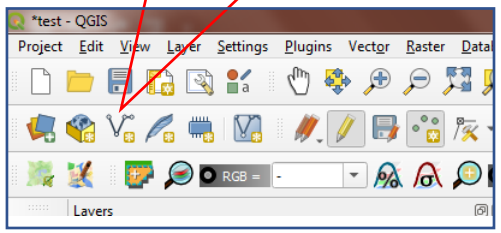


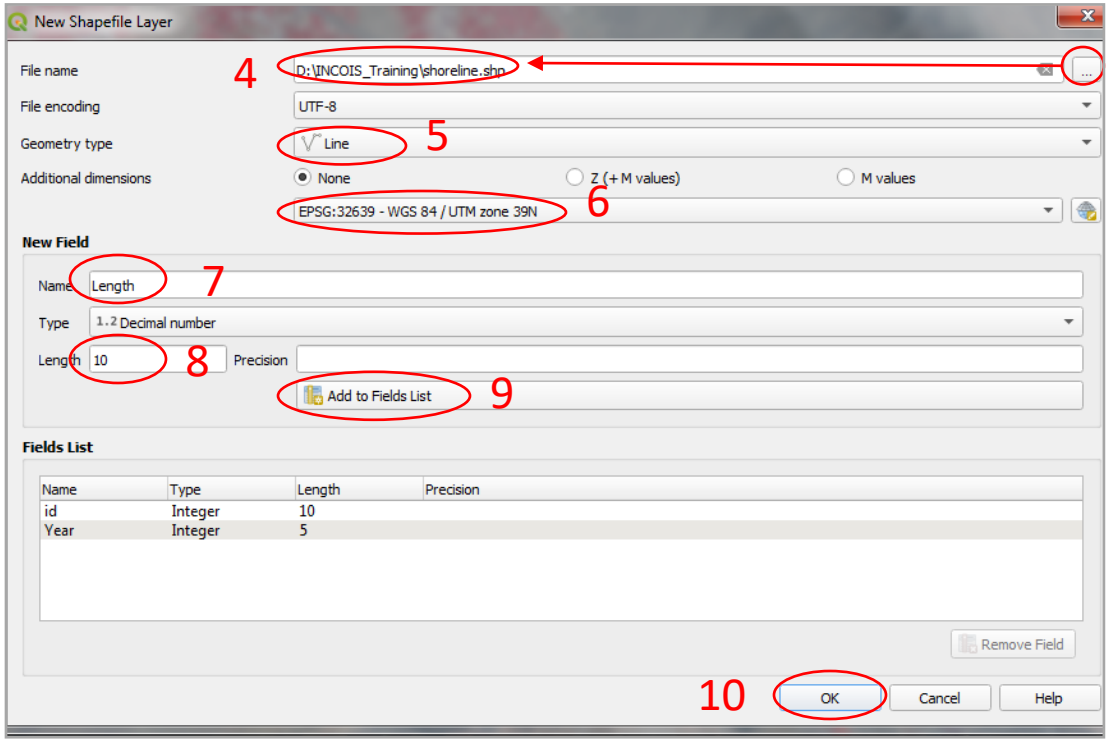
# Line Shape file creation:

- Go to layer → Create Layer → New shapefile Layer



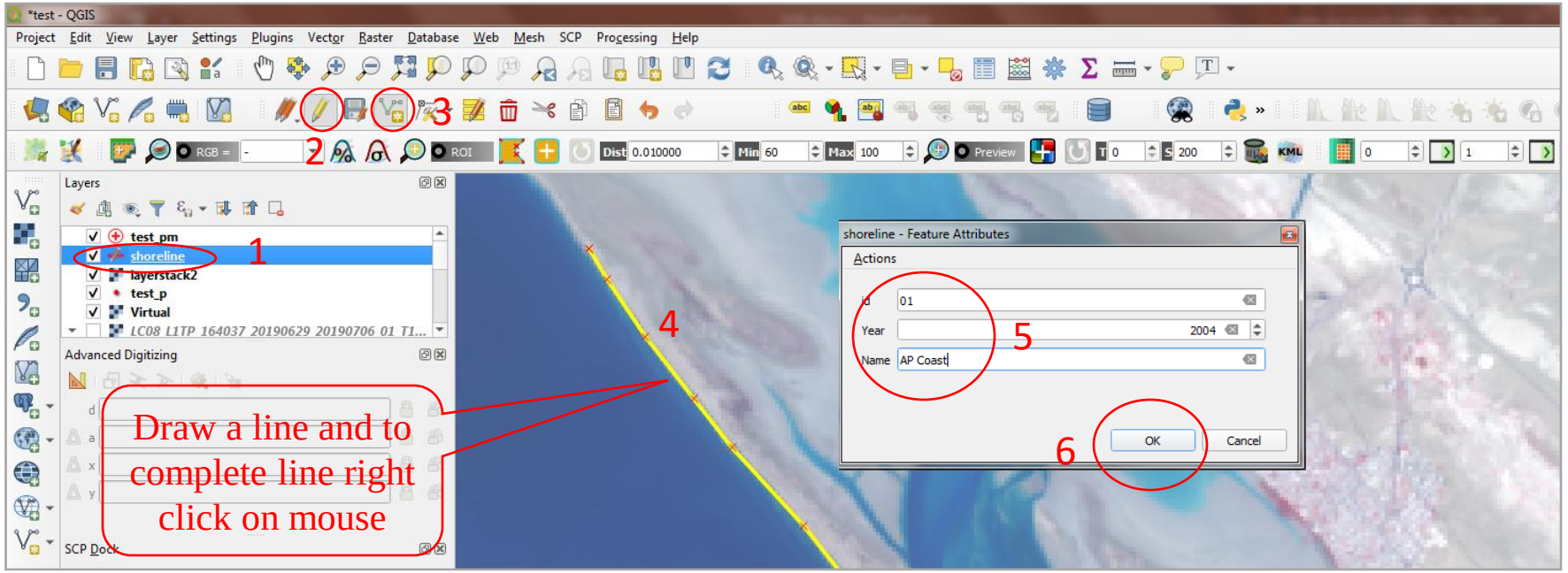

Direct click on create new shape file icon



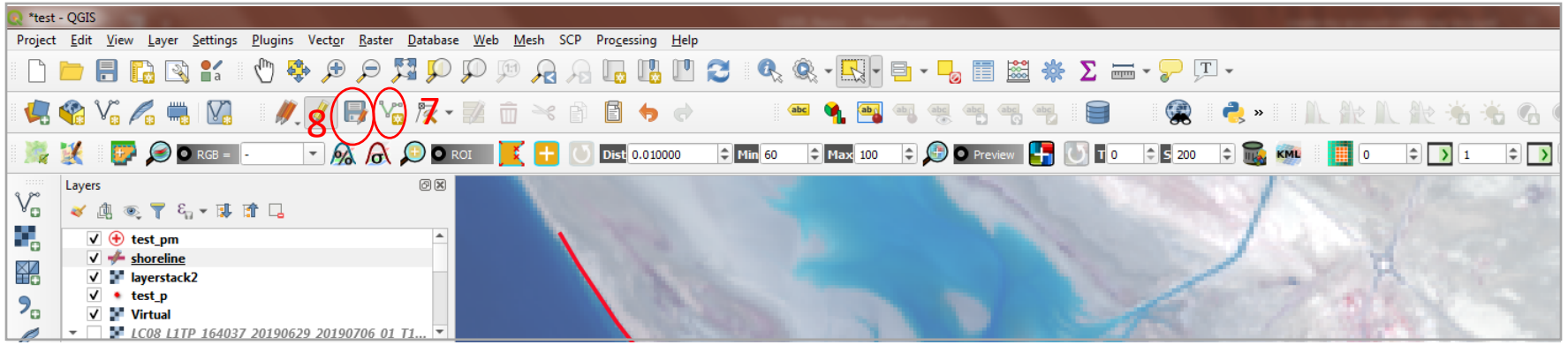



# Line Shape file Editing :

- Select line shape file
- Click on Toggle editing ⟶ add line feature ⟶ draw a line on image




- To save edited data click on save layer edits.
- To stop editing click on Toggle editing



# Contin…….

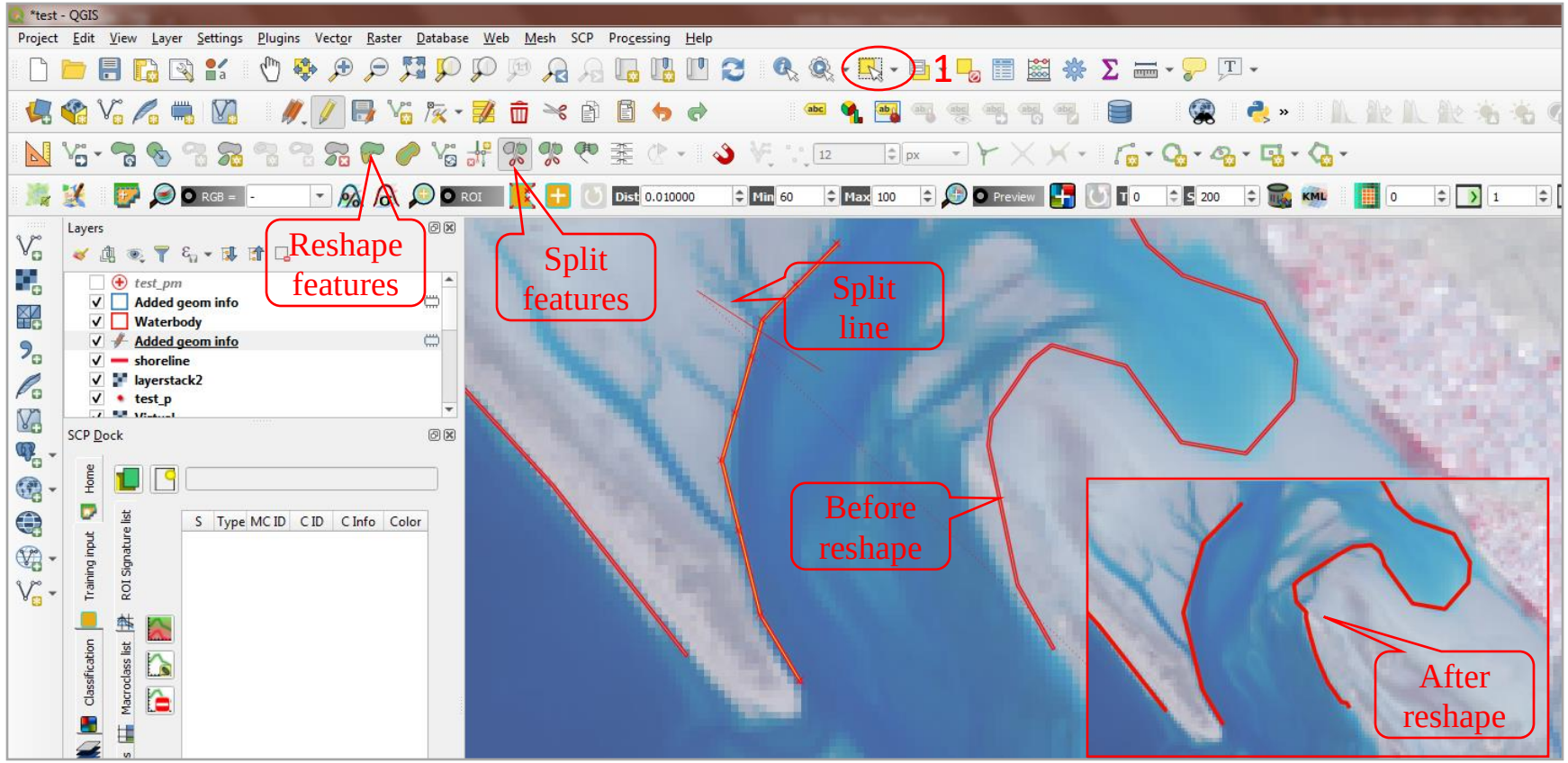
**Split line feature :**

- Select line which you want to split using select features by area or single click
- Click on split features ➞ draw a line where you want to split and right click to complete line

**Reshape Line feature:**

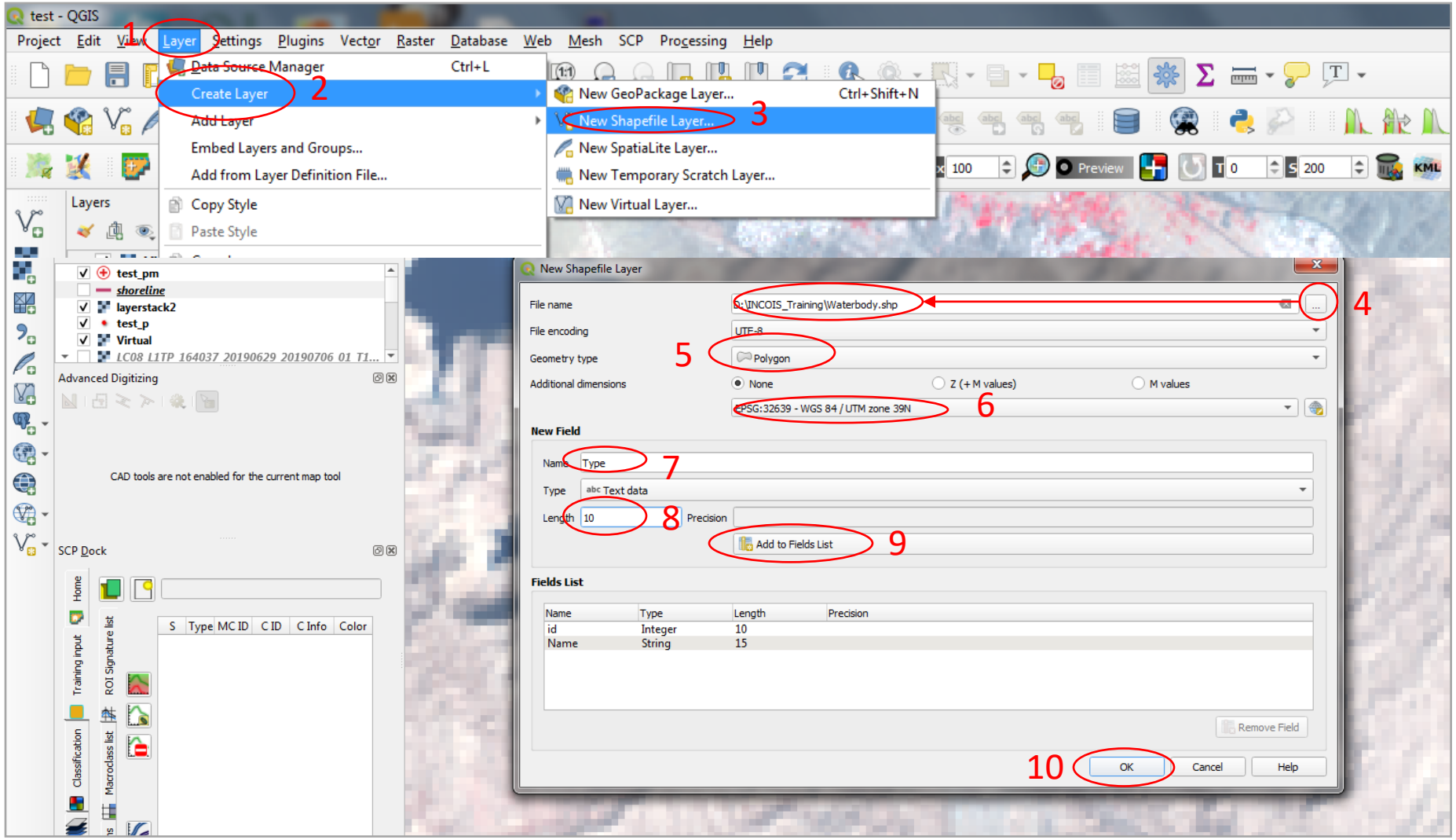
- Select line which you want to split using select features by area or single click
- Click on reshape feature ➞ draw a line where you want to split and right click to complete line

Note: Drawing line in reshape feature line first point and last point should touch line feature



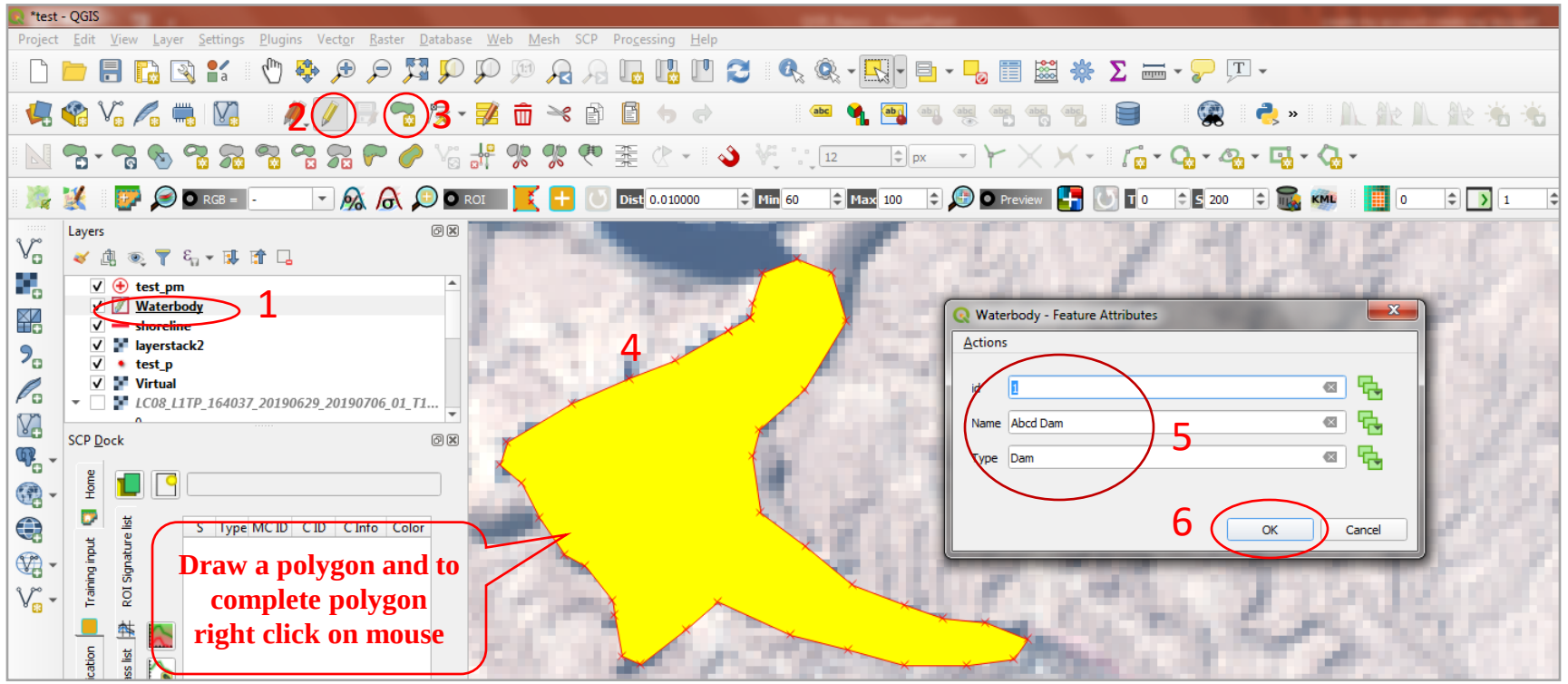
# Polygon Shape file creation:

- Go to layer → Create Layer → New shapefile Layer



# Polygon Shape file Editing:

- Select polygon shape file
- Click on Toggle editing ⟶ add polygon feature ⟶ draw a polygon on image



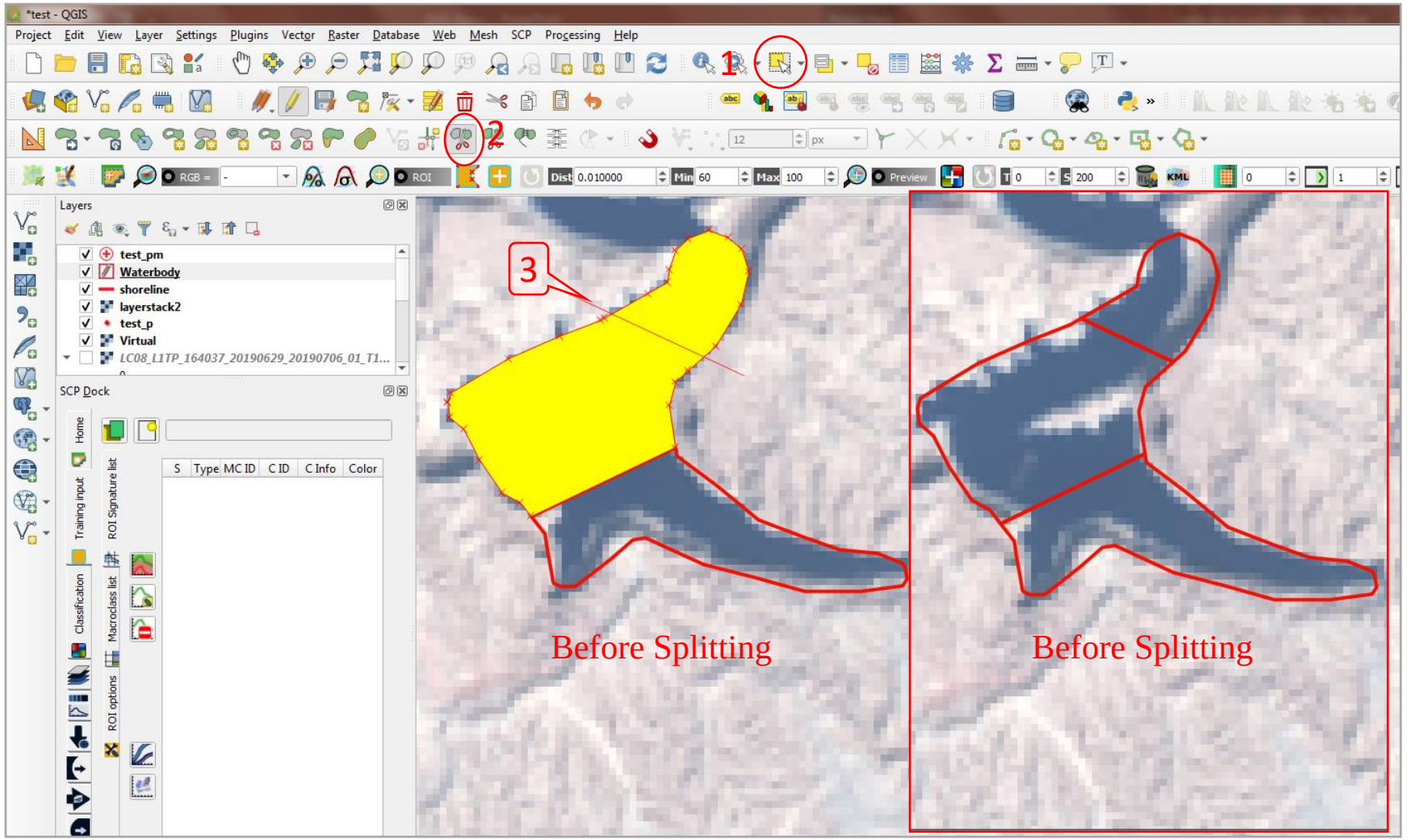

- To save edited data click on save layer edits.
- To stop editing click on Toggle editing

# Splitting polygon

**One to many polygons(Splitting polygon):**

- Select the polygon using select features by area or single click
- Now click on Split features ⟶ Draw a line where to split polygon and right click

Note: Starting point and ending should touch the polygon line



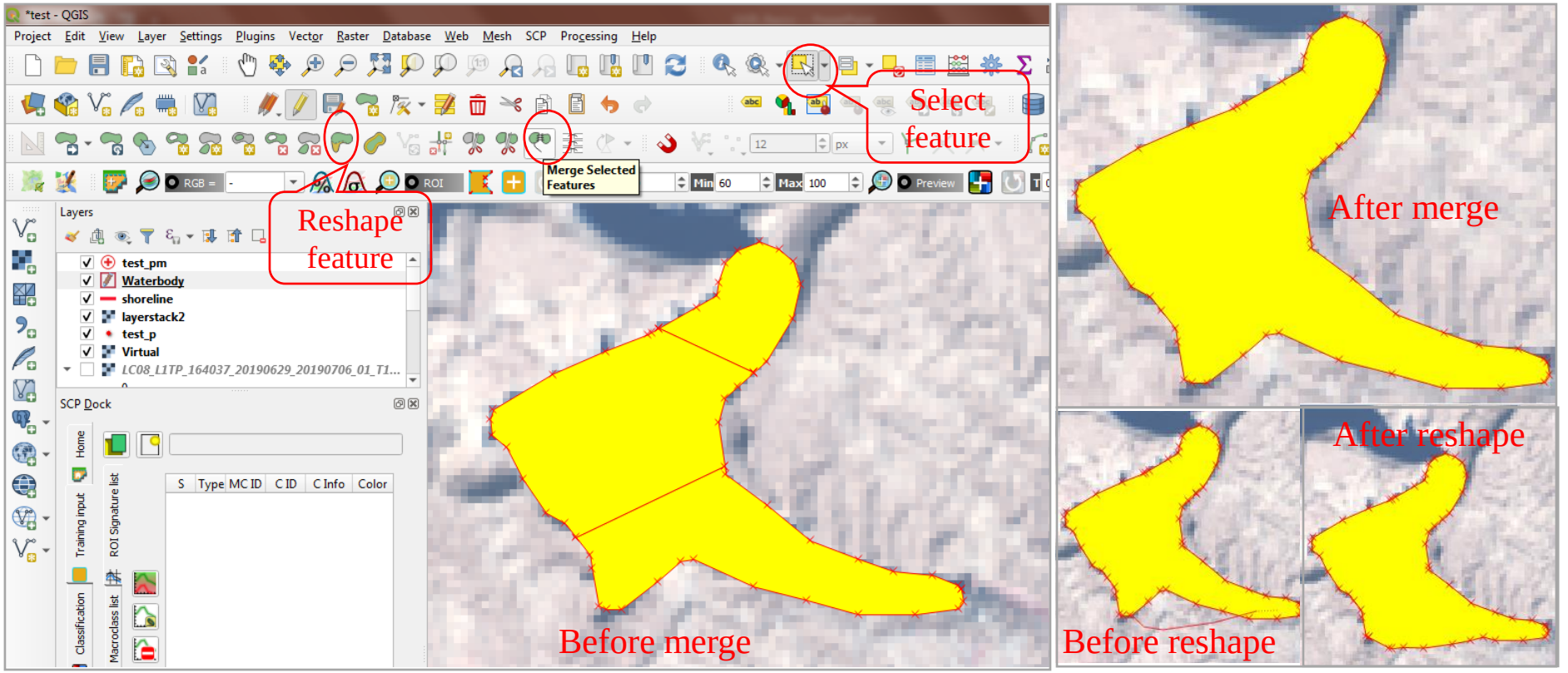
# Merging and Reshaping Polygons

**Many to one polygons (Merging Polygons):**

- Select the polygon using select features by area or single click
- Now Select the polygons which you want to merge press shift key in keyboard and click on multiple polygons ⟶ click on Merge selected features.

**Reshape polygon:**

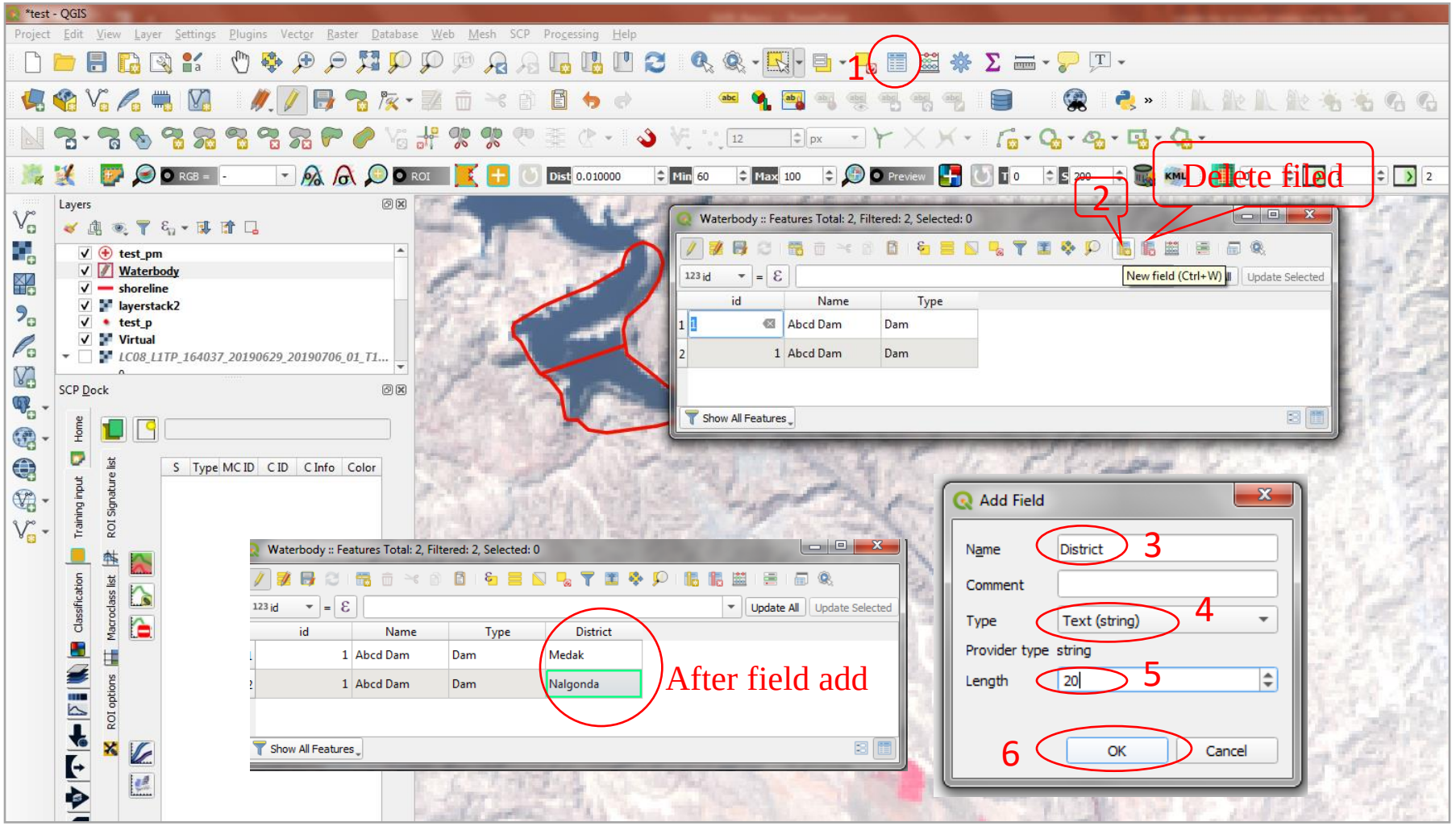
- Select the polygon using select features by area or single click
- Click on reshape features ⟶ Now draw a line the way you want to reshape feature and right click to complete. That line staring point and ending point should touch the polygon



# Adding fields to attribute table

**Adding fields to attribute table:**

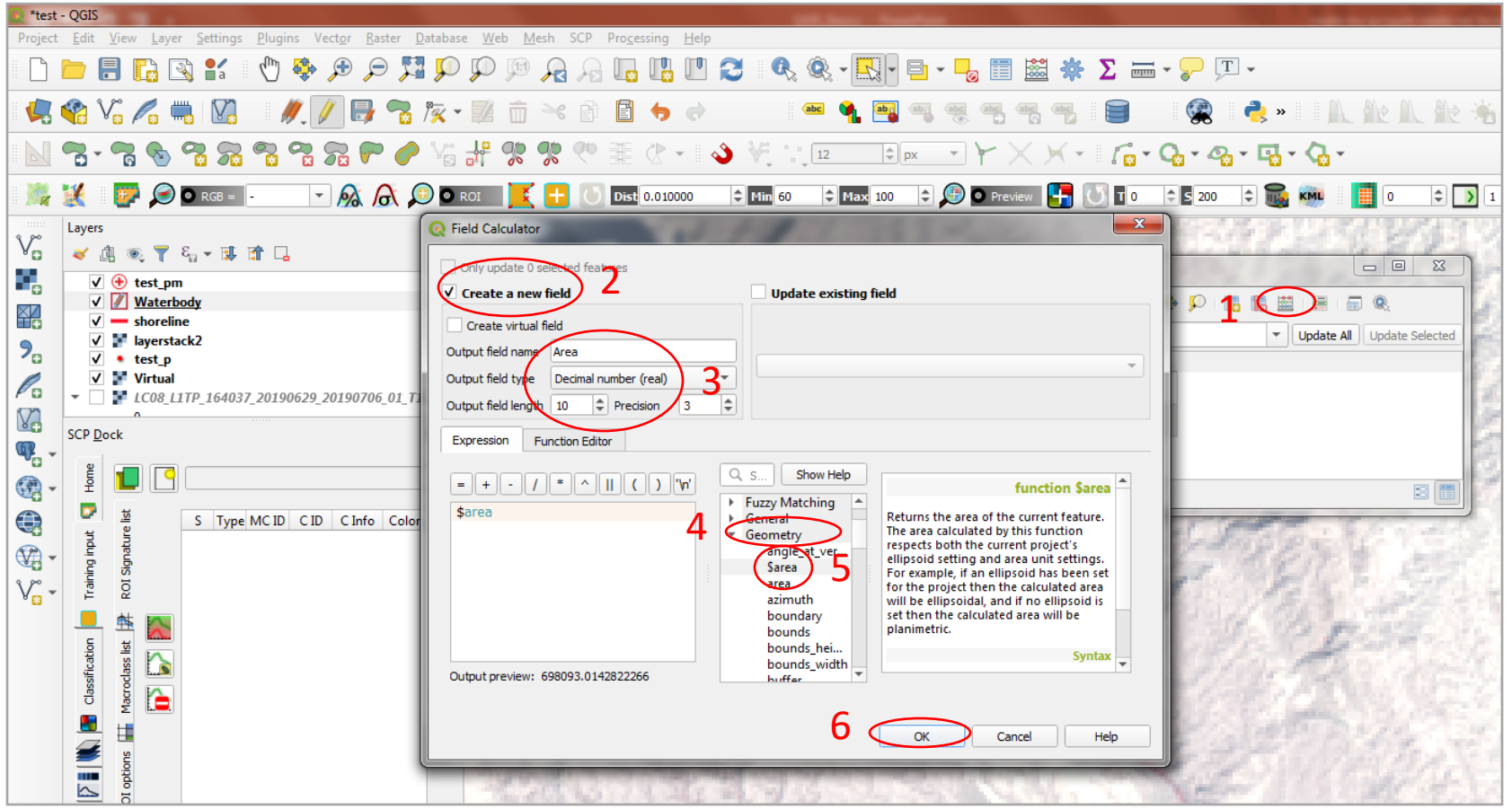
- Click on open attribute table → Attribute table window opens → Click on New field
- Add field window opens → Give the field name, type, length → Ok
- To Delete filed → click on Delete field → Select filed from delete field window → OK



# Area calculation

**Area calculation:**

- Click on open Field calculator in attribute table window
- In filed calculator → check create a new field → Give name, type, length
  Geometry → double click on $area → ok

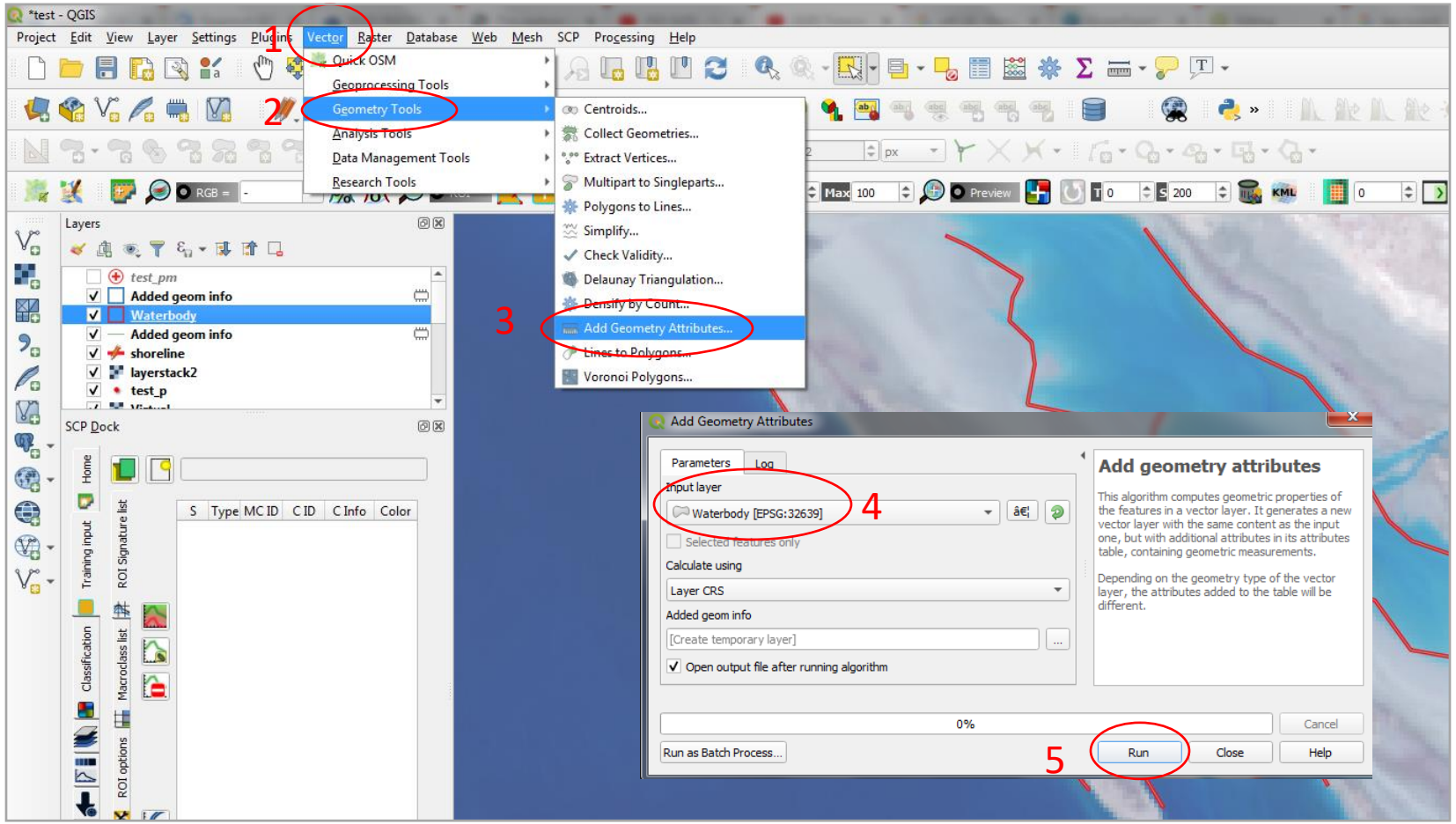


# Contin…….

**Area and perimeter or length of line feature calculation:**

- Click on vector ⟶ Geometry tools ⟶ Add Geometry attributes
- In input layer select polygon feature ⟶ Run (Calculates area and Perimeter)
- In input layer select line feature ⟶ Run (Calculates length of line)

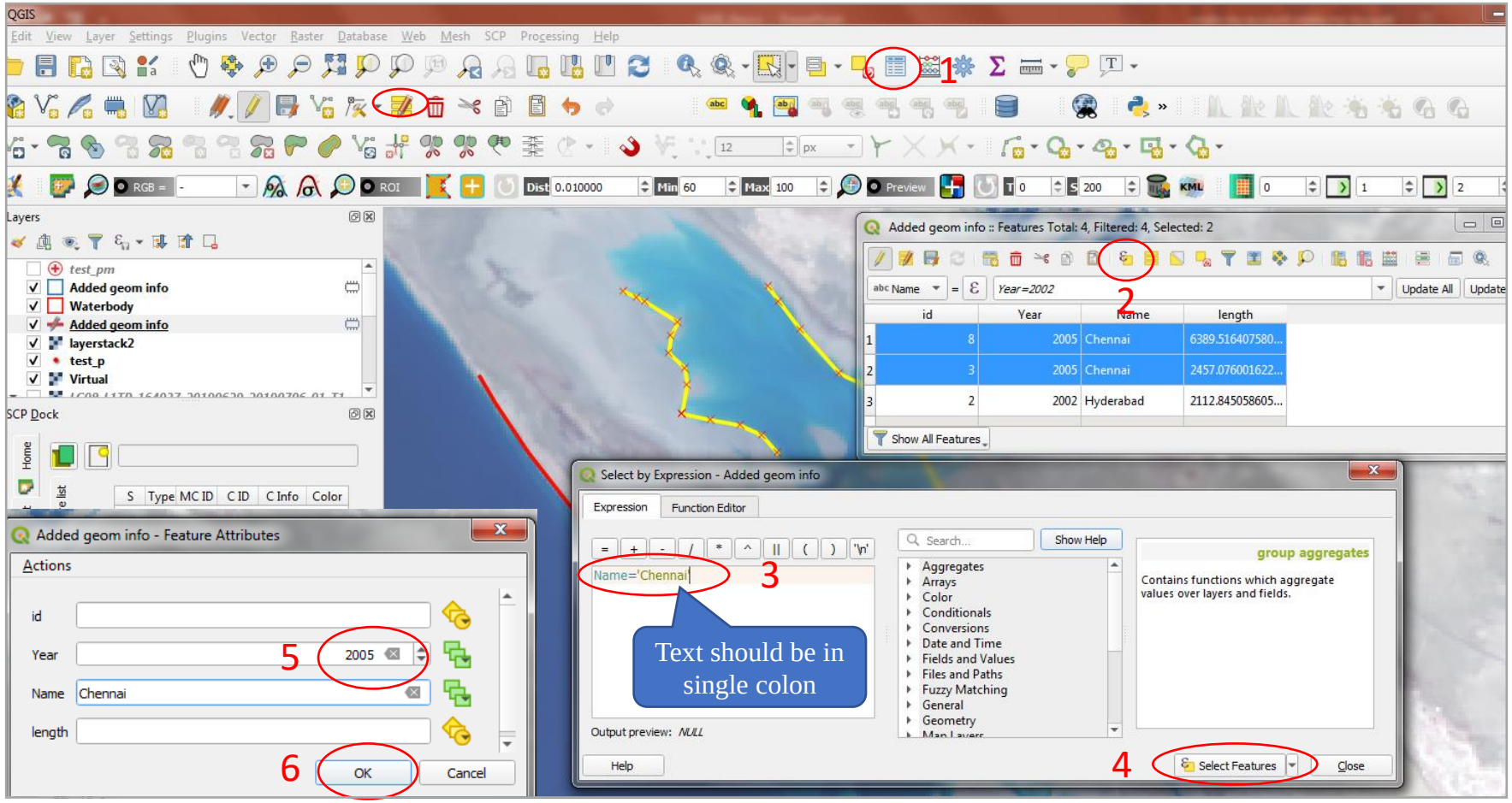
Note: after calculating area and perimeter or length of line it will generate new shape file



# Attribute data editing

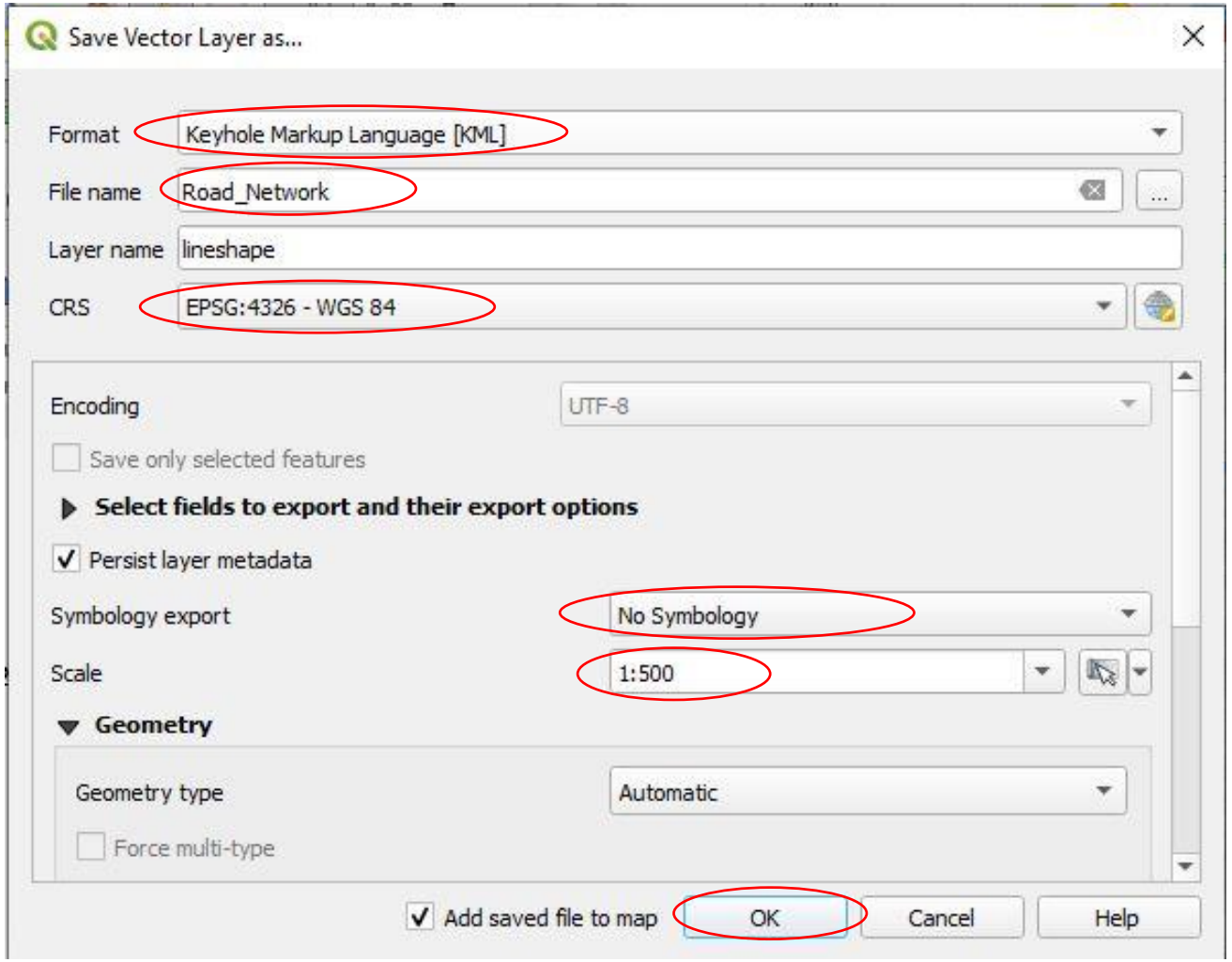
If we want give the name to all same class fields at a time:

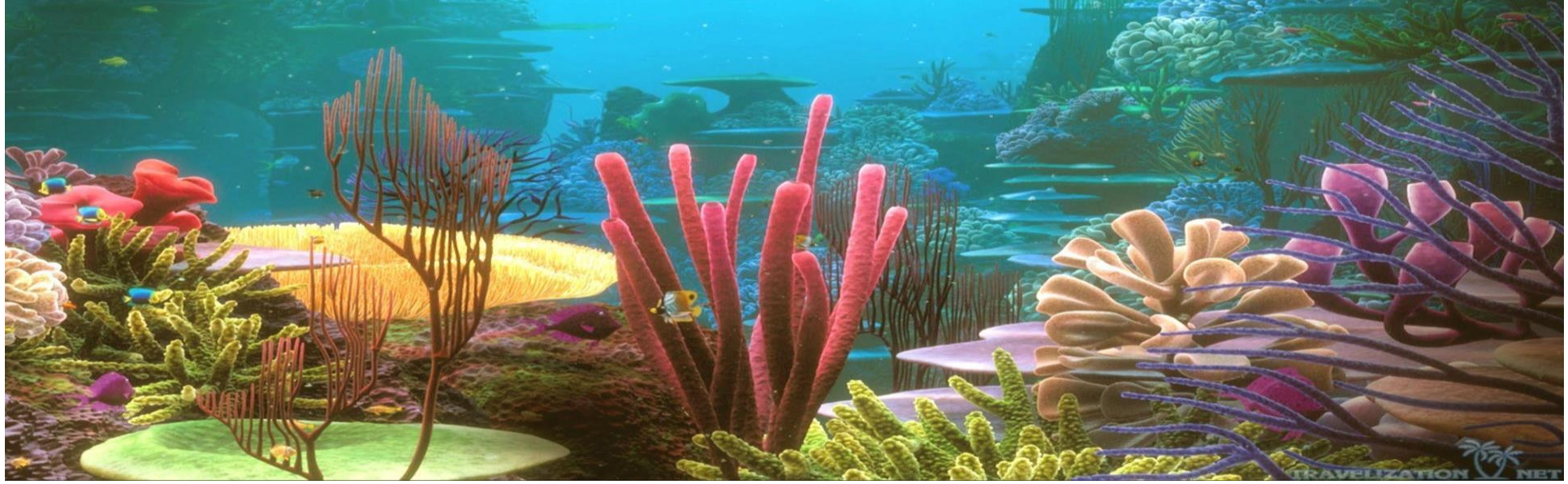
- Click on open attribute table
- Click on select by expression → type the expression → Click on Select feature
- Click on modify attributes of all selected features simultaneously → enter the name ok



# Export shape to KML

➢Select our shape file → go to Layers → Save as → Select Format:KML→ file name: give File name
CRS: if you want to change you can → symbology and Scale : select as per our requirement → OK
It will save in default folder → click on add → select layer from layer panel → export→ save feature as → give path and name.






# *Thank you*