

## Vector Analysis using QGIS 3.10

### Objective:

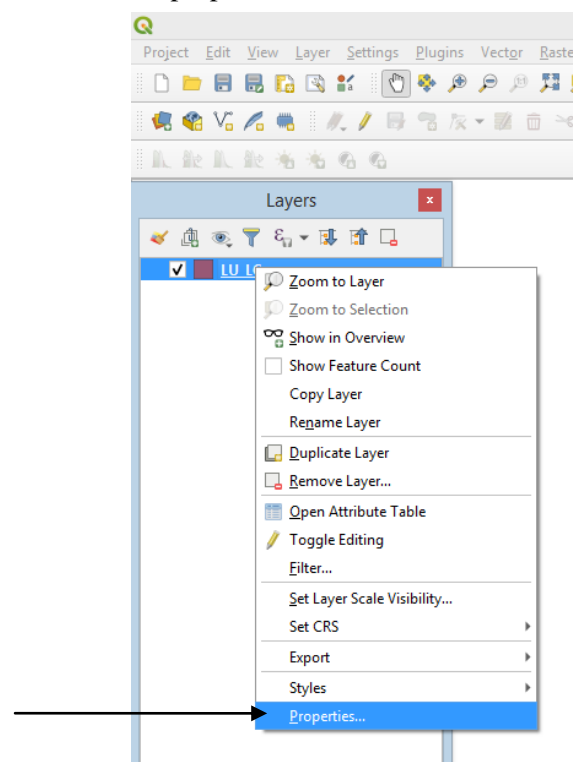
To perform vector analysis on shapefiles (vector data).

### Step1. Load your datasets.

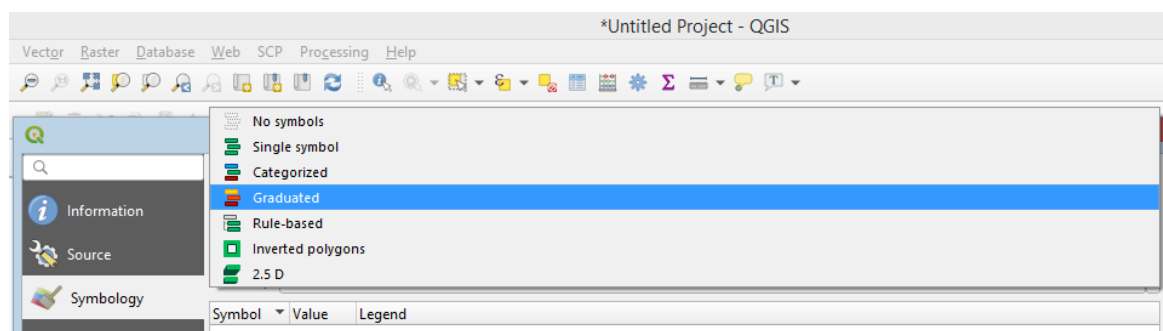
Load the shapefiles needed for carrying out the vector analysis.

LU\_LC shapefile from the designated folder.

**Step2.** Open attribute information to know what data they contain. You can use the knowledge of the data in setting up the symbology for the data. From the layers panel window right click on the data to access the context menu and click properties .



The symbology option helps in visualizing the attribute data with different colour coding and other customizable options to generate a layer that is representative of the data it contains for display and visualization. Use Categorized option if the layer contains textual information and graduated if it contains numerical data.



You can experiment symbology option for other shapefiles.

### Step3. Carrying out Vector analysis.

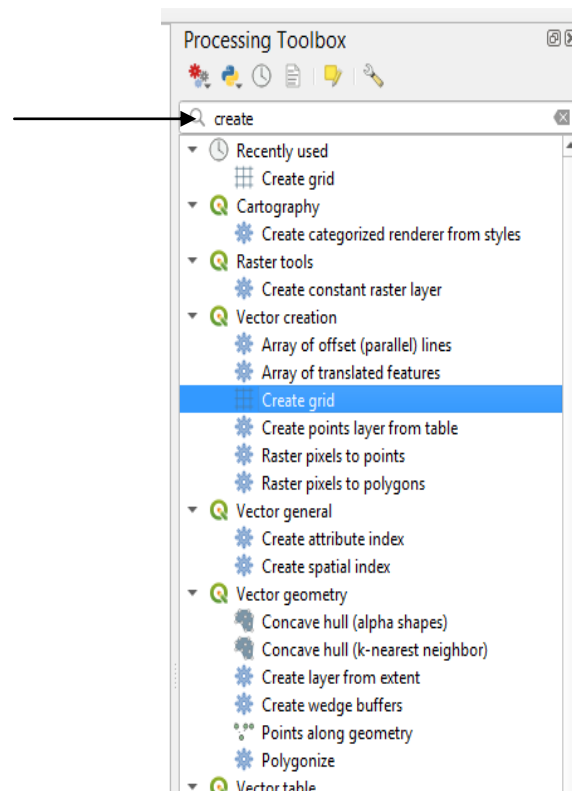
Vector Analysis/ Geoprocessing is the generic name people refer with when they want to extract /delineate data from a set of vector layers. The Analysis varies with scale and size of the project you are handling. In this tutorial...

> extract the area statistics of each category of LU\_LC shapefile based on rectangular grid\_id

> organize the resultant attribute data using Groupstats plugin.

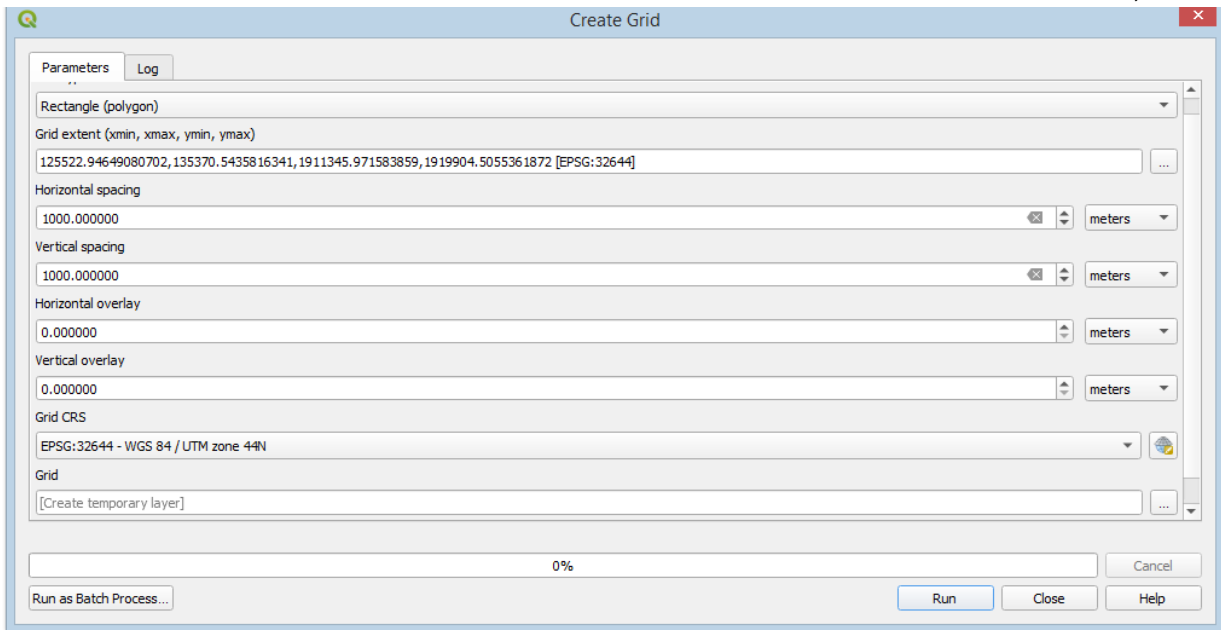
### Step4. Create a Grid Polygon Shapefile.

>In Processing Toolbox in the search bar type create to display algorithms bearing similar names. Click on create grid option.

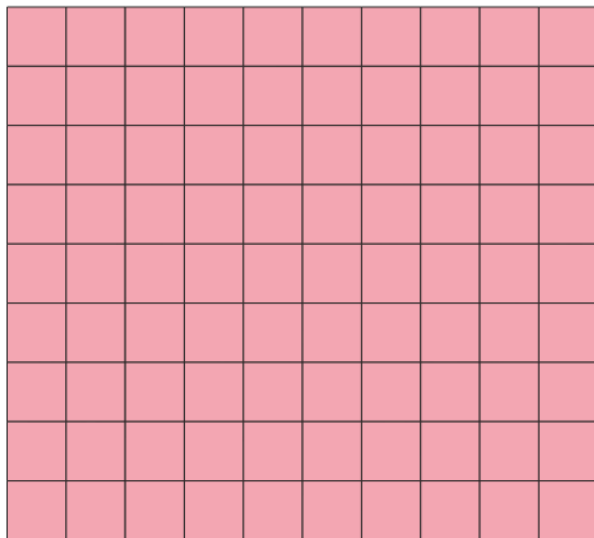


>The create grid option generated grid of different spacing and overlays. In Grid type select **Rectangle (polygon)**. Under Grid Extent use **select extent on canvas** and draw the ribbon close to the boundaries of the LU\_LC layer. Enter the vertical and horizontal spacing as 1000 units. The units in this case is meters as defined in the coordinate reference system in **Source** tab under **layer properties**.

>For horizontal and vertical overlay leave the default values. The Grid CRS is maintained as **EPSG:32644-WGS 84/ UTM zone 44N**. Save the grid file as temporary or save to a folder.



>The output of the tool resembles like the grid shown below and the attribute table is shown adjacent to it. Notice the id column and the four corners columns top, bottom, left and right of each rectangle polygon.

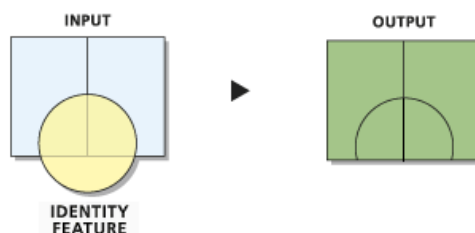


	left	top	right	bottom	id
1	125522.9464908...	1919904.505536...	126522.9464908...	1918904.505536...	1
2	125522.9464908...	1918904.505536...	126522.9464908...	1917904.505536...	2
3	125522.9464908...	1917904.505536...	126522.9464908...	1916904.505536...	3
4	125522.9464908...	1916904.505536...	126522.9464908...	1915904.505536...	4
5	125522.9464908...	1915904.505536...	126522.9464908...	1914904.505536...	5
6	125522.9464908...	1914904.505536...	126522.9464908...	1913904.505536...	6
7	125522.9464908...	1913904.505536...	126522.9464908...	1912904.505536...	7
8	125522.9464908...	1912904.505536...	126522.9464908...	1911904.505536...	8
9	125522.9464908...	1911904.505536...	126522.9464908...	1910904.505536...	9
10	126522.9464908...	1919904.505536...	127522.9464908...	1918904.505536...	10
11	126522.9464908...	1918904.505536...	127522.9464908...	1917904.505536...	11
12	126522.9464908...	1917904.505536...	127522.9464908...	1916904.505536...	12
13	126522.9464908...	1916904.505536...	127522.9464908...	1915904.505536...	13
14	126522.9464908...	1915904.505536...	127522.9464908...	1914904.505536...	14
15	126522.9464908...	1914904.505536...	127522.9464908...	1913904.505536...	15
16	126522.9464908...	1913904.505536...	127522.9464908...	1912904.505536...	16

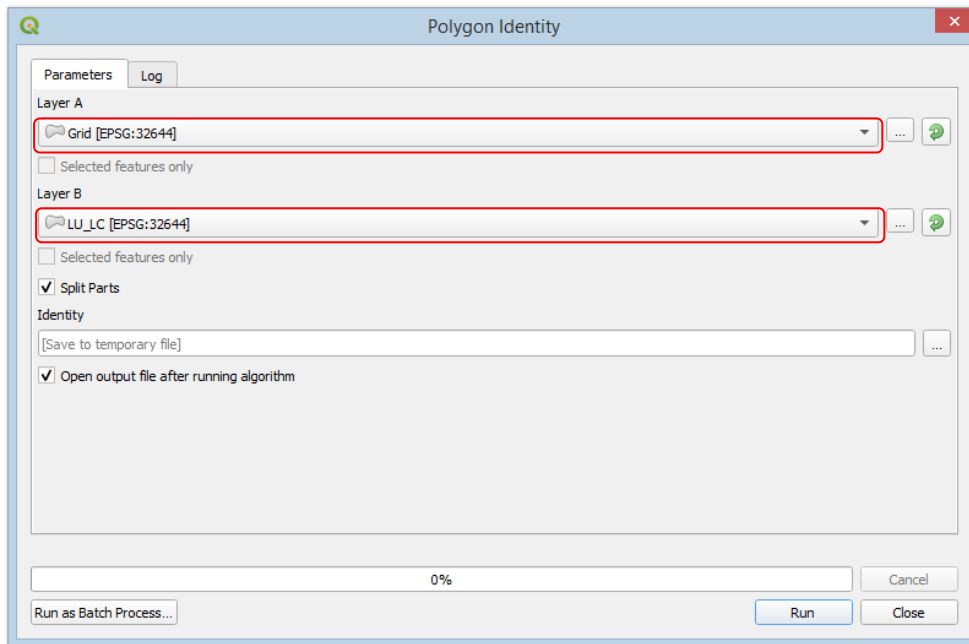
**Step 5: Extracting the features**

> The Polygon Identity tool found in processing toolbox extracts features in the manner illustrated below.

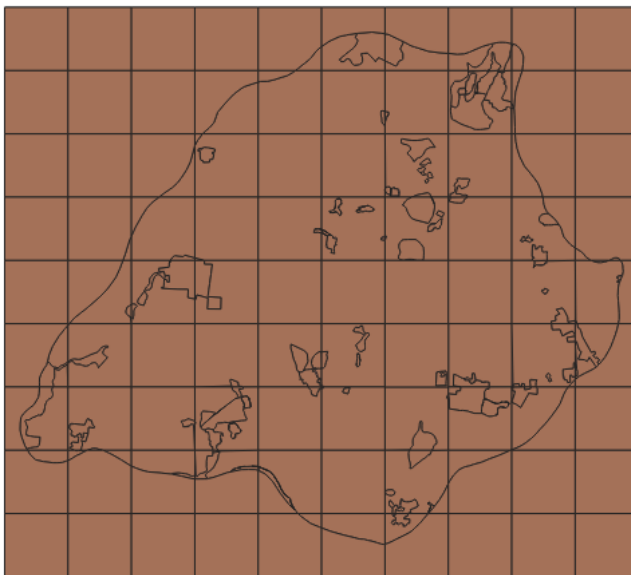
Computes a geometric intersection of the Input Features and Identity Features. The Input Features or portions thereof that overlap Identity Features will get the attributes of those Identity Features.



> Invoke the polygon identity tool and given the inputs. Check split parts and give the output file name.

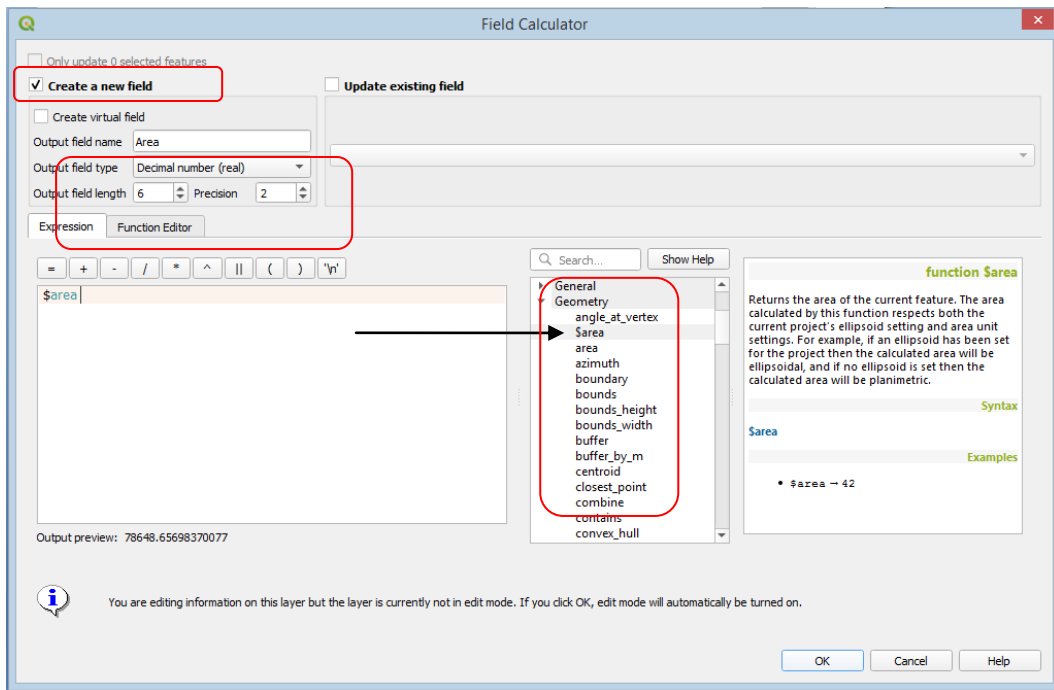


> The result of the computation yields the following geometry and attribute table.



	left	top	right	bottom	id	DESCRPTIO	V_NAME
19	126522.9464900...	1916904.505500...	127522.9464900...	1915904.505500...	13	Agricultural La...	
20	126522.9464900...	1916904.505500...	127522.9464900...	1915904.505500...	13		
21	126522.9464900...	1915904.505500...	127522.9464900...	1914904.505500...	14	Wastelands-Scr...	
22	126522.9464900...	1915904.505500...	127522.9464900...	1914904.505500...	14	Agricultural La...	
23	126522.9464900...	1915904.505500...	127522.9464900...	1914904.505500...	14		
24	126522.9464900...	1914904.505500...	127522.9464900...	1913904.505500...	15	Wastelands-Scr...	
25	126522.9464900...	1914904.505500...	127522.9464900...	1913904.505500...	15	Agricultural La...	
26	126522.9464900...	1914904.505500...	127522.9464900...	1913904.505500...	15		
27	126522.9464900...	1913904.505500...	127522.9464900...	1912904.505500...	16	Built Up-Built U...	CHANDRAWA...
28	126522.9464900...	1913904.505500...	127522.9464900...	1912904.505500...	16	Agricultural La...	
29	126522.9464900...	1913904.505500...	127522.9464900...	1912904.505500...	16	Wastelands-Scr...	
30	126522.9464900...	1913904.505500...	127522.9464900...	1912904.505500...	16		
31	126522.9464900...	1912904.505500...	127522.9464900...	1911904.505500...	17	Agricultural La...	
32	126522.9464900...	1912904.505500...	127522.9464900...	1911904.505500...	17	Wastelands-Scr...	
33	126522.9464900...	1912904.505500...	127522.9464900...	1911904.505500...	17	Agricultural La...	
34	126522.9464900...	1911904.505500...	127522.9464900...	1911904.505500...	17		
35	126522.9464900...	1911904.505500...	127522.9464900...	1910904.505500...	18		
36	127522.9464900...	1919904.505500...	128522.9464900...	1918904.505500...	19		
37	127522.9464900...	1918904.505500...	128522.9464900...	1917904.505500...	20		
38	127522.9464900...	1917904.505500...	128522.9464900...	1916904.505500...	21	Agricultural La...	

>To add the area for each of the polygon in the identity layer use Field calculator and select create new field option with the following parameters. Select \$area and click ok to fill the column with values

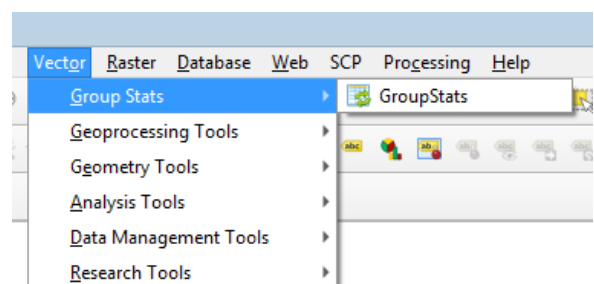


Identity :: Features Total: 354, Filtered: 354, Selected: 0

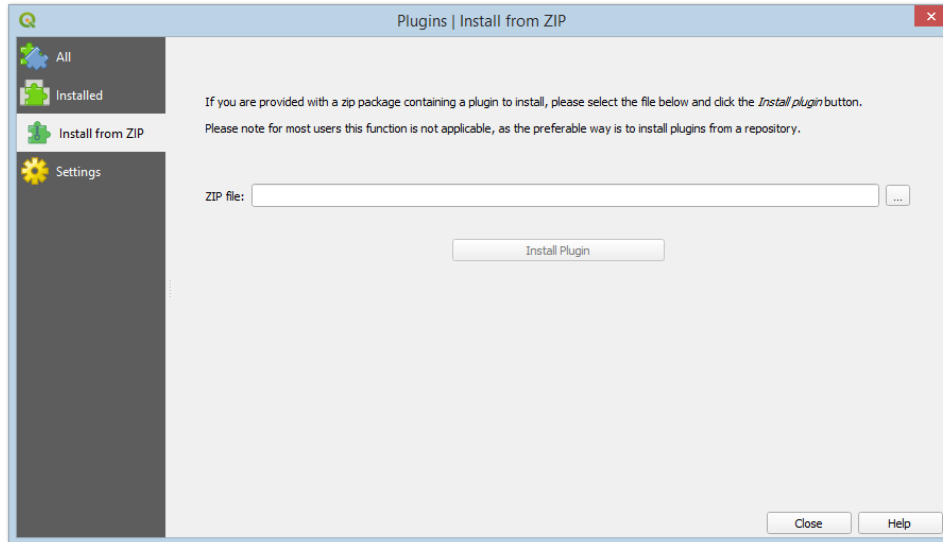
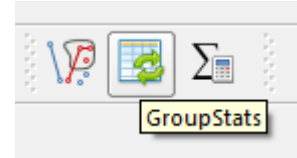
	top	right	bottom	id	DESCRPTIO	V_NAME	Area
1	1911904.505500...	135522.9464900...	1910904.505500...	90			997509.91
2	1919904.505500...	135522.9464900...	1918904.505500...	82			997509.91
3	1917904.505500...	135522.9464900...	1916904.505500...	84			997509.82
4	1913904.505500...	135522.9464900...	1912904.505500...	88			997509.71
5	1918904.505500...	135522.9464900...	1917904.505500...	83			997509.70
6	1912904.505500...	135522.9464900...	1911904.505500...	89			997509.65
7	1911904.505500...	134522.9464900...	1910904.505500...	81			997491.99
8	1912904.505500...	134522.9464900...	1911904.505500...	80			997491.74
9	1915904.505500...	133522.9464900...	1914904.505500...	68	Agricultural La...		997473.71
10	1911904.505500...	133522.9464900...	1910904.505500...	72			997473.71
11	1915904.505500...	132522.9464900...	1914904.505500...	59	Agricultural La...		997455.34
12	1914904.505500...	132522.9464900...	1913904.505500...	60	Agricultural La...		997455.17
13	1912904.505500...	131522.9464900...	1911904.505500...	53	Agricultural La...		997437.66
14	1915904.505500...	131522.9464900...	1914904.505500...	50	Agricultural La...		997437.43
15	1915904.505500...	130522.9464900...	1914904.505500...	41	Agricultural La...		997419.13
16	1917904.505500...	130522.9464900...	1916904.505500...	39	Agricultural La...		997418.90
17	1919904.505500...	129522.9464900...	1918904.505500...	28			997401.24
18	1911904.505500...	129522.9464900...	1910904.505500...	36			997400.28
19	1911904.505500...	128522.9464900...	1910904.505500...	27			997382.68

**Step6:** Organizing the data

> The results of the attribute table could be organized using the Groupstats Plugin under the vector menu.

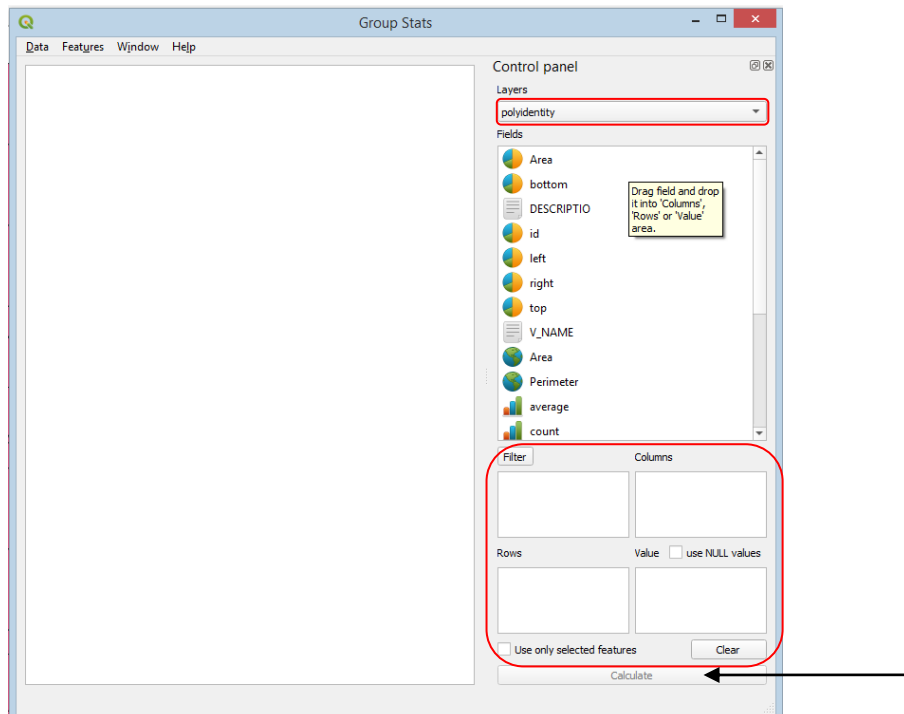


>Group Stats is a plugin for QGIS which makes it easy to calculate statistics for feature groups in a vector layer. Install the Groupstats plugin from the Plugin repository or install it from the zip file option.

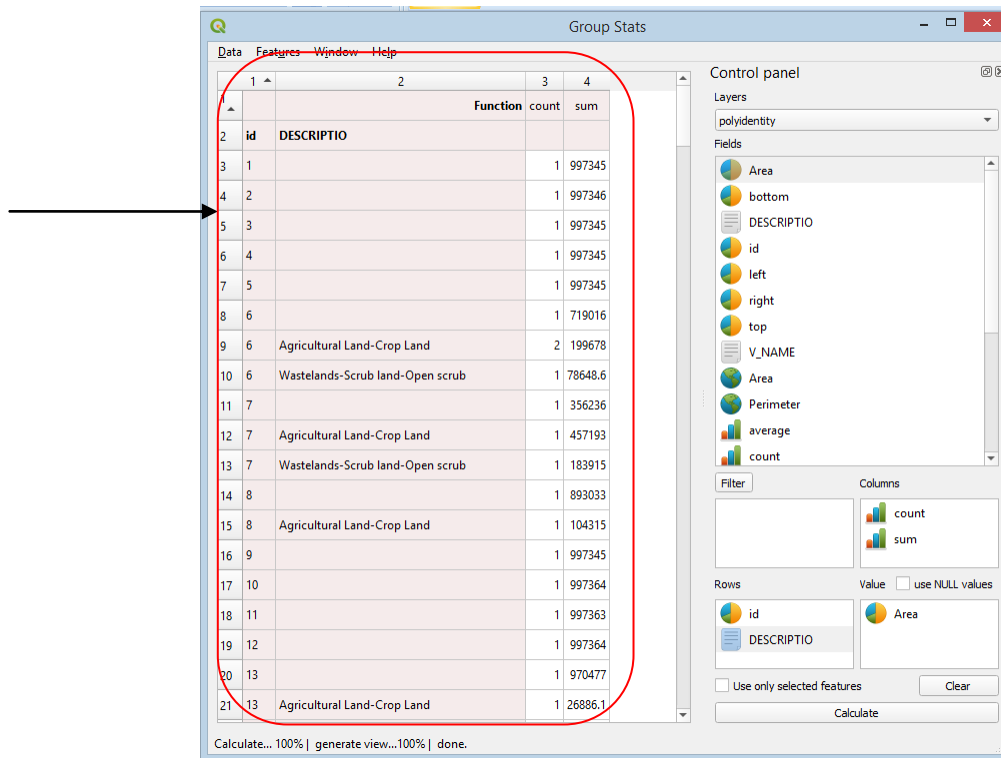


> The plugin button is added to the vector toolbar and of course you can access it via vector menu

>Select the layer attribute data to be organized from Layers options in the GroupStats plugin window and drag and drop the fields in the rows, columns and value section and enter calculate.



> on execution you find the attribute information is arranged in the left space of the plugin.



> Export the attribute table as csv file

