

Targeted skills

By the end of this module, you will know how to:

- create a choropleth map
- visualize density instead of absolute values (which might be misleading)
- create a proportional circles map

Data

Data to be used in this module can be found in the following folder:

```
data/bluetongue_2014_2015  
data/grc_adm3
```

Exercise outline & memos

In this series of exercises we will create a thematic maps showing the spatial distribution of diseases cases by administrative boundaries (here Greece administrative boundaries level 3 decentralized administrations).

1. Creating a choropleth map

In a new project, open first “bluetongue_2014_2015.shp” recently created including only cases in Italy:

```
data/bluetongue_2014_2015/bluetongue_2014_2015.shp
```

then open the administrative level 3 boundaries shapefile for Greece:

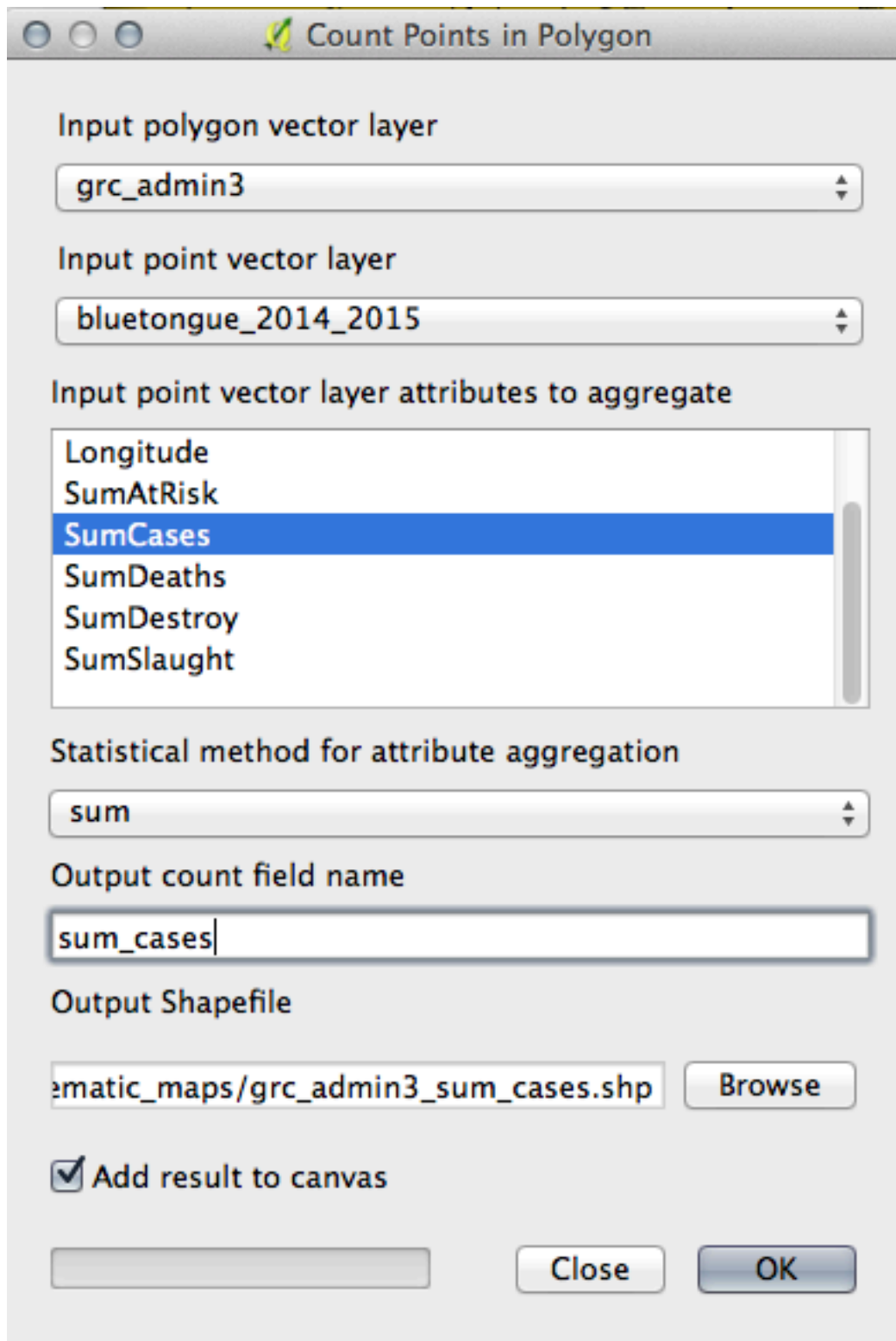
```
data/grc_admin3/grc_admin3.shp
```

Now we will sum the number of cases by admin. level 3 (following the same step as in previous module)

[In QGIS top menu]

Vector Analysis Tools Points in Polygon...

Reproduce settings below and click "OK" (save new file as "grc_admin3_sum_cases.shp")



Count Points in Polygon

Input polygon vector layer

grc_admin3

Input point vector layer

bluetongue_2014_2015

Input point vector layer attributes to aggregate

- Longitude
- SumAtRisk
- SumCases
- SumDeaths
- SumDestroy
- SumSlaught

Statistical method for attribute aggregation

sum

Output count field name

sum_cases

Output Shapefile

ematic_maps/grc_admin3_sum_cases.shp

☒ Add result to canvas

[In QGIS Layers Panel]

Hide both grc_admin3 and bluetongue_2014_2015, keeping only grc_admin3_sum_cases visible

Now to create the choropleth map:

[In QGIS Panel Layers]

Click right on newly created "grid_nb_cases.shp" to open its property panel.
 Reproduce the settings shown below (settings will be further commented during live session)

The screenshot shows the QGIS Graduated symbology panel for the layer 'grid_nb_cases.shp'. The 'Column' is set to 'sum_cases'. The 'Method' is 'Color'. The 'Color ramp' is 'Reds6'. The 'Legend Format' is '%1 - %2'. The 'Precision' is 0. The 'Classes' tab is active, showing 6 classes. The 'Mode' is 'Natural Breaks (Jenks)'. The 'Classify' button is visible. The legend table is as follows:

Symbol	Values	Legend
<input checked="" type="checkbox"/>	0.00 - 9.00	0 - 9
<input checked="" type="checkbox"/>	9.00 - 24.00	9 - 24
<input checked="" type="checkbox"/>	24.00 - 44.00	24 - 44
<input checked="" type="checkbox"/>	44.00 - 66.00	44 - 66
<input checked="" type="checkbox"/>	66.00 - 93.00	66 - 93
<input checked="" type="checkbox"/>	93.00 - 298.00	93 - 298

Buttons at the bottom: Add class, Delete, Delete all, Link class boundaries (checked).

Warning: Now, one important issue with that kind of map is that bigger administrative regions area likely to include more points, so more cases. As a result, most often, that kind of maps just shows that the bigger is the region the more case we get (which is not so much informative).

Instead, we would prefer to map density, i.e normalize the number of cases by the area. This is what we will do next.

2. Visualizing density instead of absolute values

First make a copy of "grc_admin3_sum_cases.shp" by saving it as "grc_admin3_sum_cases_density.shp"
 Reproduce the settings shown below (settings will be further commented during live session)
 Note that instead of using simply "sum_cases" as column we use instead "sum_cases / \$area"

The screenshot shows the QGIS Graduated symbology panel for the layer 'grc_admin3_sum_cases_density.shp'. The 'Column' is set to 'sum_cases / \$area'. The 'Method' is 'Color'. The 'Color ramp' is '[source]'. The 'Legend Format' is '%1 - %2'. The 'Precision' is 0. The 'Classes' tab is active, showing 6 classes. The 'Mode' is 'Natural Breaks (Jenks)'. The 'Classify' button is visible. The legend table is as follows:

Symbol	Values	Legend
<input checked="" type="checkbox"/>	0.00 - 103.55	0 - 104
<input checked="" type="checkbox"/>	103.55 - 253.90	104 - 254
<input checked="" type="checkbox"/>	253.90 - 484.84	254 - 485
<input checked="" type="checkbox"/>	484.84 - 776.16	485 - 776
<input checked="" type="checkbox"/>	776.16 - 1364.57	776 - 1365
<input checked="" type="checkbox"/>	1364.57 - 1990.36	1365 - 1990

Buttons at the bottom: Add class, Delete, Delete all, Link class boundaries (checked).

Now you should have both thematic maps (absolute values and density) in our layers panel, switch it on and of to notice how different is the spatial pattern.

3. Creating a proportional circles map

Another expressive mapping technique in that case it to use proporional circle, i.e circles whose area is proportional to the number of cases.

First make a copy of "grc_admin3_sum_cases.shp" by saving it as "grc_admin3_sum_cases_bubbles.shp"

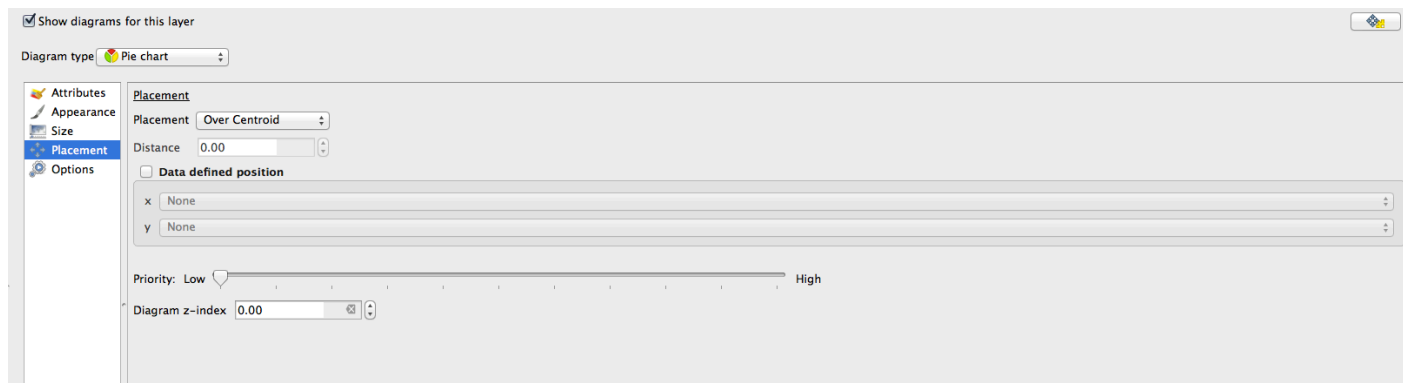
Open the properties dialog for the new layer created and select the "Diagrams" tab, then reproduce the 4 following settings

The first screenshot shows the 'Diagrams' tab in the Properties dialog. The 'Show diagrams for this layer' checkbox is checked. The 'Diagram type' is set to 'Pie chart'. The 'Attributes' tab is selected, showing a list of available attributes. The 'Assigned attributes' table shows the attribute 'sum_cases' assigned to the 'Color' property, with the legend entry 'sum_cases'.

Attribute	Color	Legend
"sum_cases"		sum_cases

The second screenshot shows the 'Appearance' tab in the Properties dialog. The 'Show diagrams for this layer' checkbox is checked. The 'Diagram type' is set to 'Pie chart'. The 'Format' section shows 'Transparency' set to 27%. The 'Line color' is set to a default color. The 'Line width' is set to 0.00000. The 'Start angle' is set to 'Top'. The 'Visibility' section shows 'Show all diagrams' checked and 'Scale dependent visibility' unchecked.

The third screenshot shows the 'Size' tab in the Properties dialog. The 'Show diagrams for this layer' checkbox is checked. The 'Diagram type' is set to 'Pie chart'. The 'Size' section shows 'Size units' set to 'mm'. The 'Fixed size' is set to 15.00000. The 'Scaled size' is selected. The 'Scale linearly between 0 and the following attribute value / diagram size:' section shows the attribute 'sum_cases' selected. The 'Maximum value' is set to 298.000000. The 'Size' is set to 35. The 'Increase size of small diagrams' checkbox is unchecked. The 'Minimum size' is set to 0.000000. The 'Scale' is set to 'Area'.



As a result, you should obtain a map as shown below (don't forget to change the styles of the polygon layer - admin. bound. to grey tones):

