

Introduction to QGIS (version 3.10) and Geoprocessing using COVID-19 data

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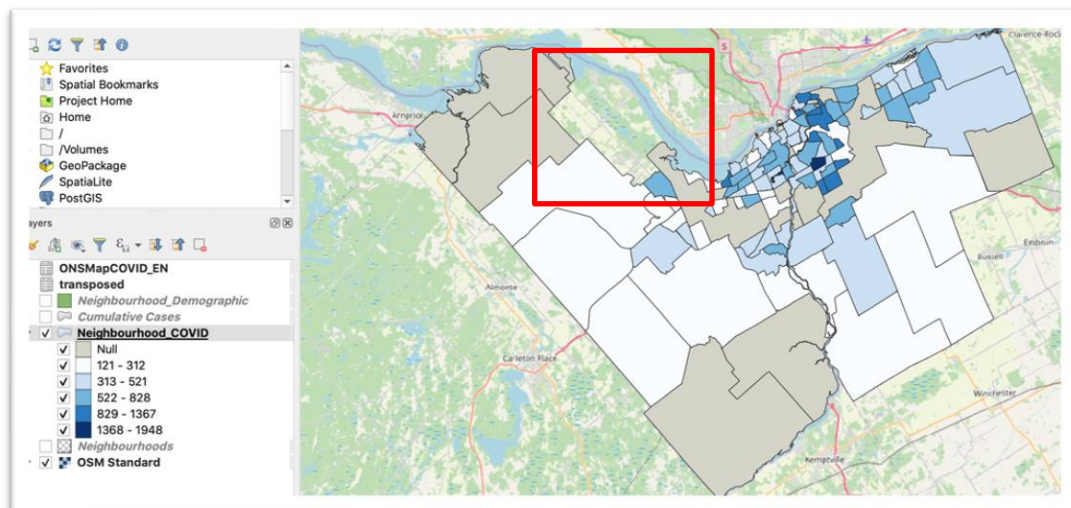
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1. Dealing with NULL values in symbology

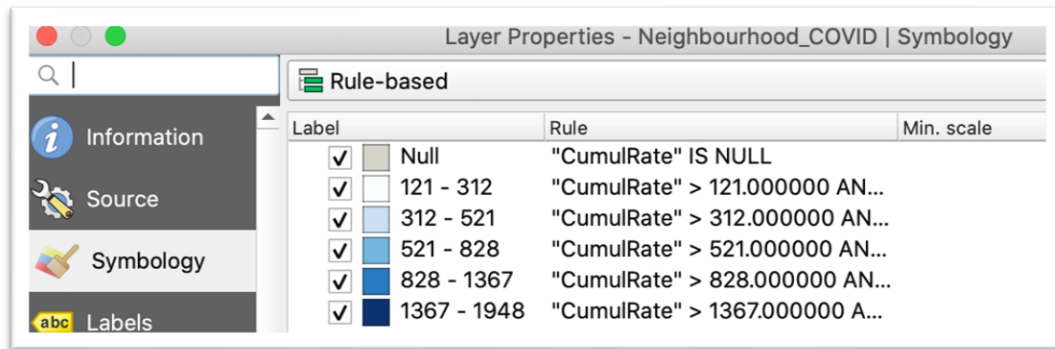
When we created the rule-based classification in Week 2 of the course's mapping session, there was an issue with the value ranges: the bottom number in the range (e.g. the first value, in this example case 121) is omitted based on how the rule-based classification functions. This is how to fix it.

- 1) In this example, we worked with the Cumulative Rate of COVID-19 in Ottawa neighbourhoods, created a Graduated symbology, and then added rule-based symbology to accommodate the dataset's NULL values. Following those steps, produces this result

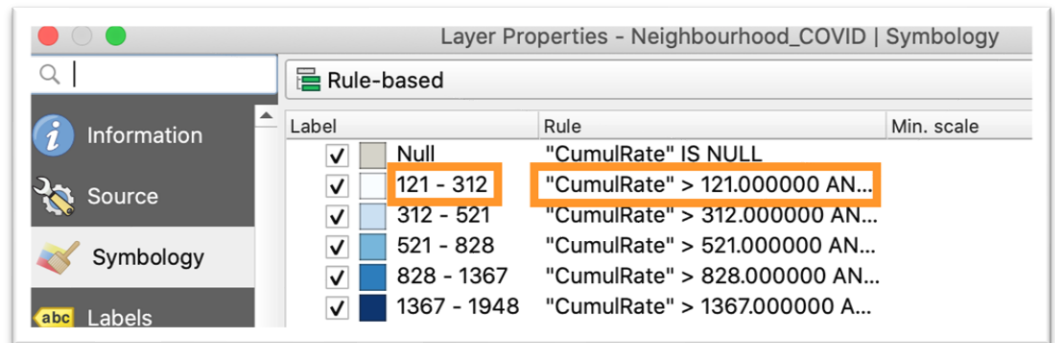


- 2) Obviously, at least one entire neighbourhood (Dunrobin, near the top left) is missing. Why?

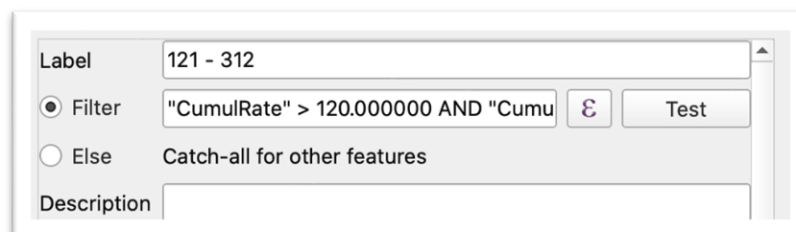
- 3) Right-click on the Neighbourhood_COVID file, select Properties, and go to Symbology



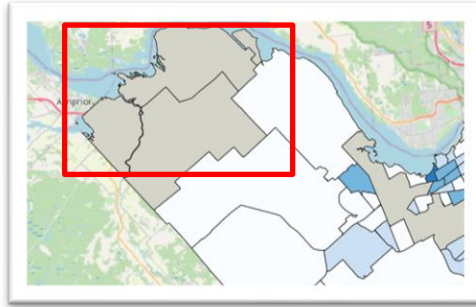
- 4) If we look closely at the Label and Rule columns, we notice a couple of discrepancies:
- The Label says '121-312' but the Rule says "CumulRate" > 121
 - This is a problem for two reasons:
 - The Label is inaccurate if the range is, in fact, >121
 - Dunrobin isn't showing up because its CumulRate = 121



- 5) Let's fix it!
- Double-click on the "CumulRate" > 121.000000... rule
 - In the pop-up, click in the Filter text box, scroll over to the left, and change > 121.000 to > 120



- -
 - c. Click OK
 - e. Click Apply (in the main Symbology window)
- 6) If you move the Layer Properties window over, you should now be able to see Dunrobin. Hooray!



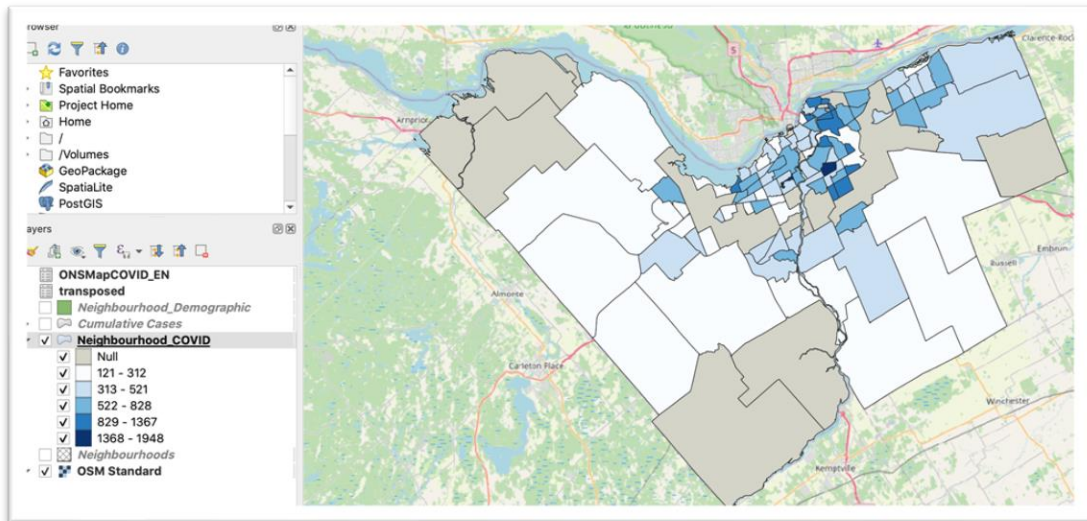
- a.
- 7) However, there's still an issue with the labels: **if you look at the associated rules, the same thing happens with all the categories** (e.g. the Label says 312-521, but the Rule indicates > 312).
- 8) Fixing the labels will solve this issue:
 - a. Click each Label entry to see a cursor
 - b. Change the bottom value to reflect what the Rule says. In this case, we'll add 1 to the bottom value to make it 313 instead of 312.

Layer Properties - Neighbourhood_COVID | Symbology

Rule-based

Label	Rule	Min. scale
<input checked="" type="checkbox"/> Null	"CumulRate" IS NULL	
<input checked="" type="checkbox"/> 121 - 312	"CumulRate" > 120.000000 AN...	
<input checked="" type="checkbox"/> 313 - 521	"CumulRate" > 312.000000 AN...	
<input checked="" type="checkbox"/> 521 - 828	"CumulRate" > 521.000000 AN...	
<input checked="" type="checkbox"/> 828 - 1367	"CumulRate" > 828.000000 AN...	
<input checked="" type="checkbox"/> 1367 - 1948	"CumulRate" > 1367.000000 A...	

- i.
 - c. Do the same for the remaining labels.
- | Label | Rule | Min. scale |
|---|--------------------------------|------------|
| <input checked="" type="checkbox"/> Null | "CumulRate" IS NULL | |
| <input checked="" type="checkbox"/> 121 - 312 | "CumulRate" > 120.000000 AN... | |
| <input checked="" type="checkbox"/> 313 - 521 | "CumulRate" > 312.000000 AN... | |
| <input checked="" type="checkbox"/> 522 - 828 | "CumulRate" > 521.000000 AN... | |
| <input checked="" type="checkbox"/> 829 - 1367 | "CumulRate" > 828.000000 AN... | |
| <input checked="" type="checkbox"/> 1368 - 1948 | "CumulRate" > 1367.000000 A... | |
- i.
 - ii. This also solves the problem of label overlap: **you should never have labels with the same bottom value as the previous top value because values should only ever fall in one category, not multiple categories.**
 - d. Click Apply.
 - 9) Save your QGIS project!!

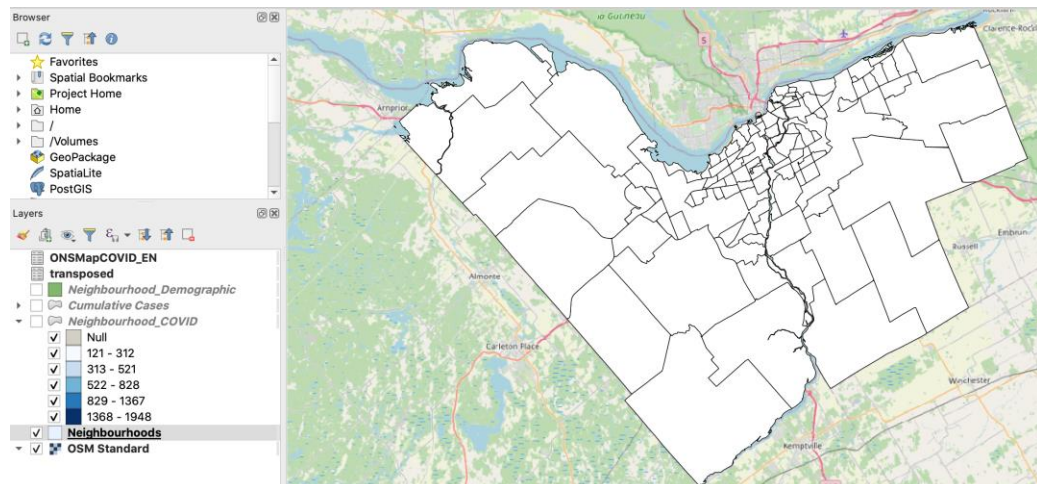


10)

2. Making a non-solid fill in polygon layers

Sometimes you want to make it obvious that there is a NULL value for a particular neighbourhood – for yourself getting familiarized with the data, or later on for readers. You can effectively do this by giving a non-solid fill (e.g. hashmarks, lines) so it doesn't get confused with low/0 values. You can do this by importing a neighbourhood shapefile layer and symbolizing it using the following steps.

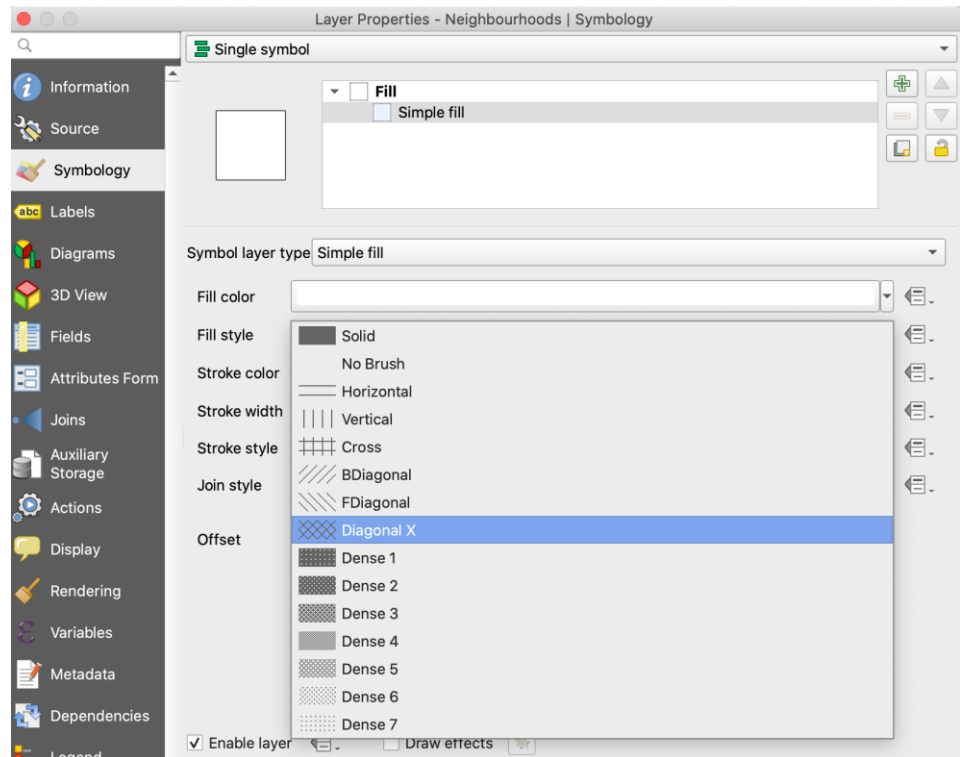
- 11) Right-click on the original Neighbourhoods shapefile and go to Properties > Symbology. Right now, mine is symbolized a plain white.



a.

- 12) In the Symbology tab, it should currently be set as Single Symbol with a Simple Fill style. We're going to change it up slightly:

- a. Click on Simple Fill so that you have a new range of options
- b. Click the Fill style drop-down and select a fill style, such as Diagonal X

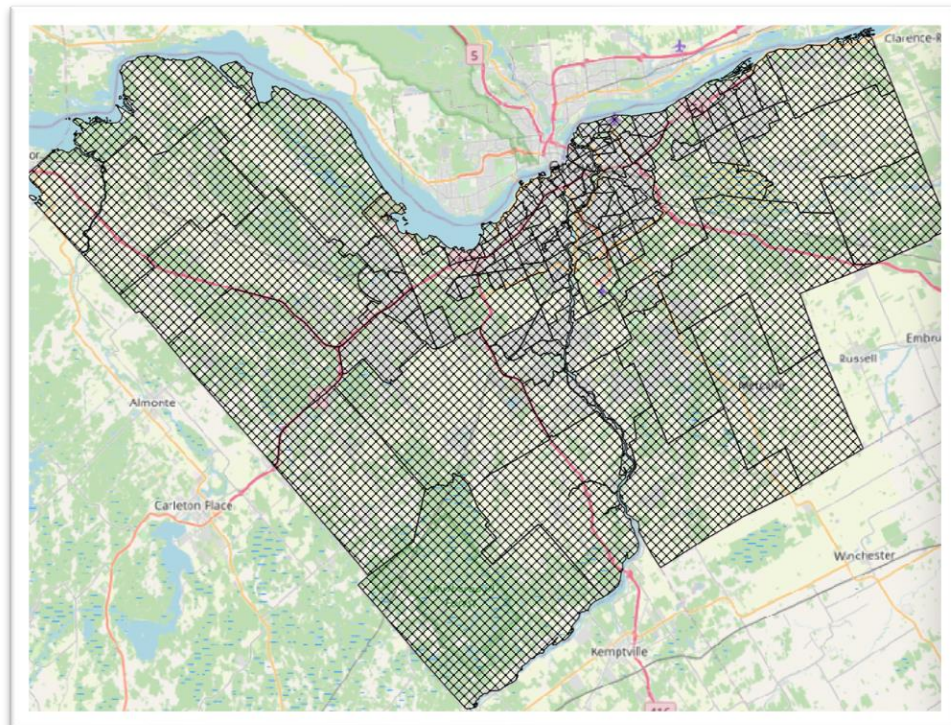


i.

c. Once you've selected the fill style, **change the Fill colour** to black

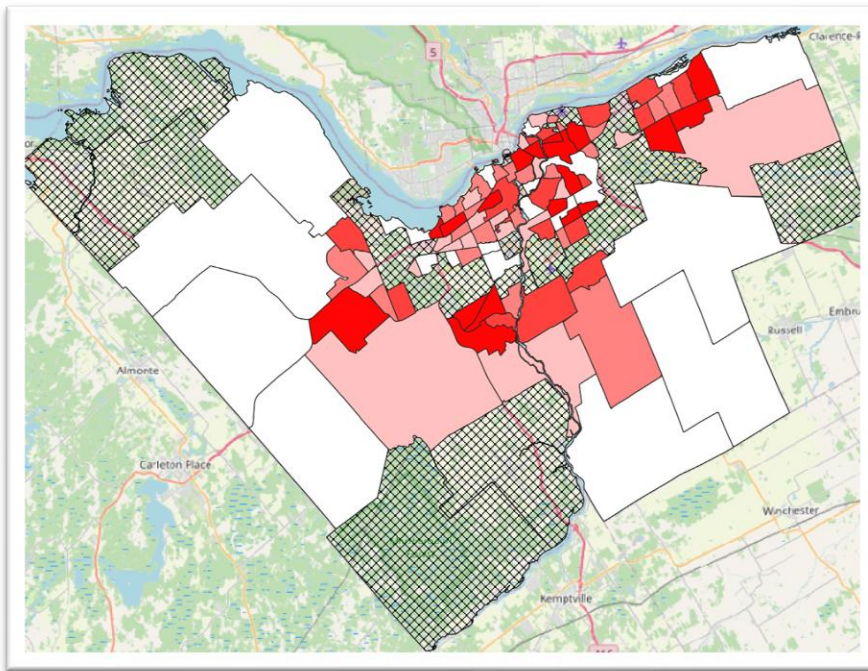
d. Click Apply

13) Your Neighbourhoods shapefile should now look like this:



a.

- 14) If you display this additional neighbourhoods layer with the one you have already symbolized, you can see which neighbourhoods have Null values.

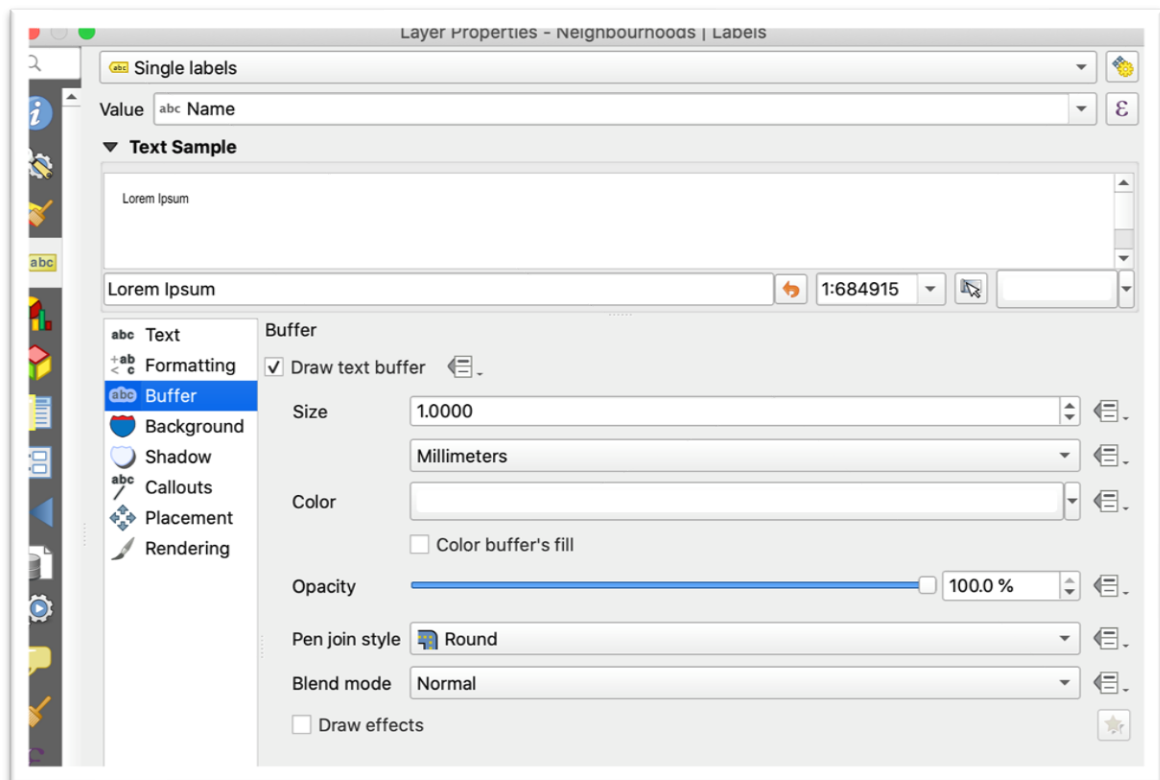


3. Adding labels

We're going to add a label to the new Neighbourhoods layer that we just symbolized in steps 12 and 13.

- 15) Right-click on the Neighbourhoods file and go to Properties > Labels
- 16) Select **Single Labels** from the drop-down menu
- 17) In the Value drop-down, select Name
- 18) Click **Buffer** in the option list down on the left
 - a. There are tons of options for the font and placement of the labels, but the Buffer will add a helpful edge of white to the words which makes it more visible (especially on the hashed background)
 - i. If you want to change the font (size, font style, etc.), it's under Text
 - b. Check Draw text buffer
 - c. The rest of the defaults should be fine (size: 1mm, color: white, etc.)

19) Your Label window should look like this:



20) Click Apply

