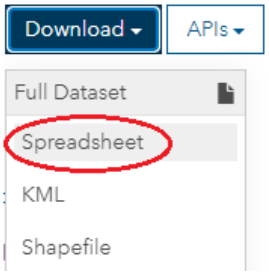
Mapping COVID-19 Cases Across Hamilton

This exercise will look at the COVID-19 situation within Hamilton, through a map of cases by Census Tract.

The data for this exercise is available through the City of Hamilton's open data portal.

Download COVID-19 data for the City of Hamilton

- Go to https://open.hamilton.ca/
- Click the **Health & Safety** category
- Select the **COVID-19 Case Counts by Census Tracts** dataset
- **Download** the full dataset as a spreadsheet



Download Census Tracts from Scholars GeoPortal

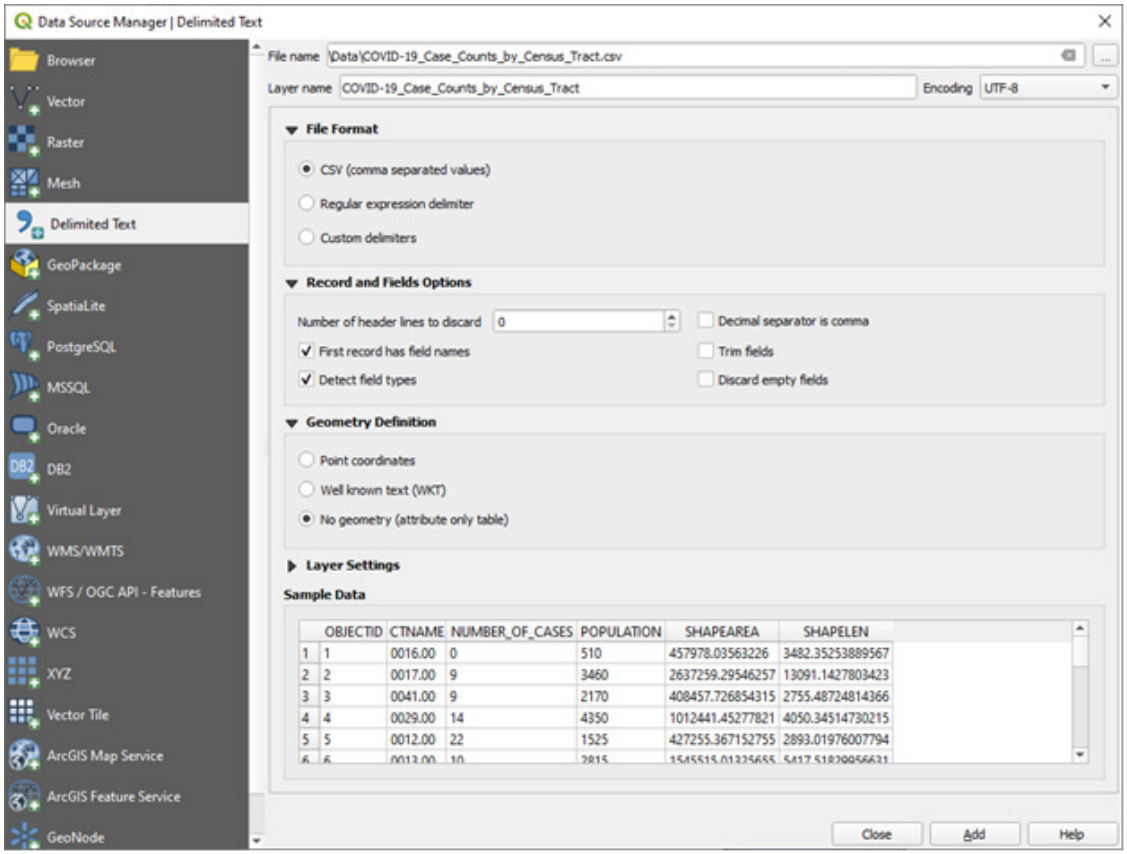
- Go to geo.scholarsportal.info
- **Login** using your McMaster credentials (MacID and password)
- Search for "**Census 2016**"
- Click the **Add** button on the **Cartographic Boundary File (CBF), 2016 Census** result
- **Add** the **Census Tracts** to the map
- Navigate to the **Download** tab and choose to download the data by **area of interest**
- Choose the option to **Select a pre-defined area**
- Select **Census Subdivision** and click on the map anywhere within Hamilton
- Click the **Download** button
- Click the link to download the .zip file (NOT the *Download all* button)
- **Extract** the data from the compressed file to a folder on your computer

Add shapefile data to map

- **Open QGIS** Desktop
- Go to the **Layer** menu **> Add Layer > Add Vector Layer…**
- Navigate to the **Census Tract** shapefile dataset (*DLI_2016_Census_CBF_Eng_Nat_ct.shp*) and click **Add**, followed by **Close**

Add tabular data to map

- Go to the **Layer** menu **> Add Layer > Add Delimited Text Layer…** and navigate to the Hamilton COVID-19 dataset
- For inputs:
    - *File format* – CSV (comma separated values)
    - *Record and Fields Options* – First record has field names (column headings); detect field types (i.e. numeric vs text)
    - *Geometry definition* – No geometry (attribute only table)
- Preview the data under **Sample Data** (should resemble the image below)

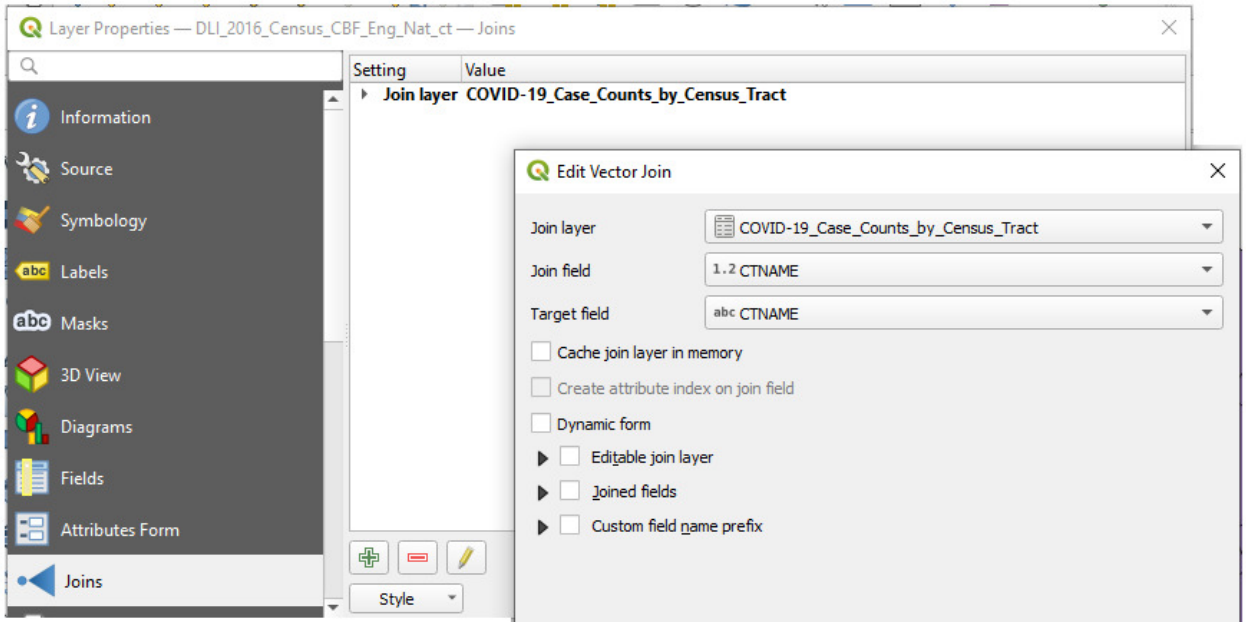


- Click **Add**, followed by **Close**

Join data to Census Tracts

- **Right-click** the census tract layer in the layer list and choose **Properties**
- Click the **Joins** tab
- To create a **new join**, click the  icon
    - For inputs:
        - *Join layer* – CSV file (COVID-19_Case_Counts_by_Census_Tract)

- *Join field* – CTNAME
- *Target field* – CTNAME
- All other options - unchecked
- Click *Apply* and *OK*



- To verify the join has been successful, open the attribute table of the census tract layer and view the additional columns at the end of the row (column headings starting with *"Counts_"*)

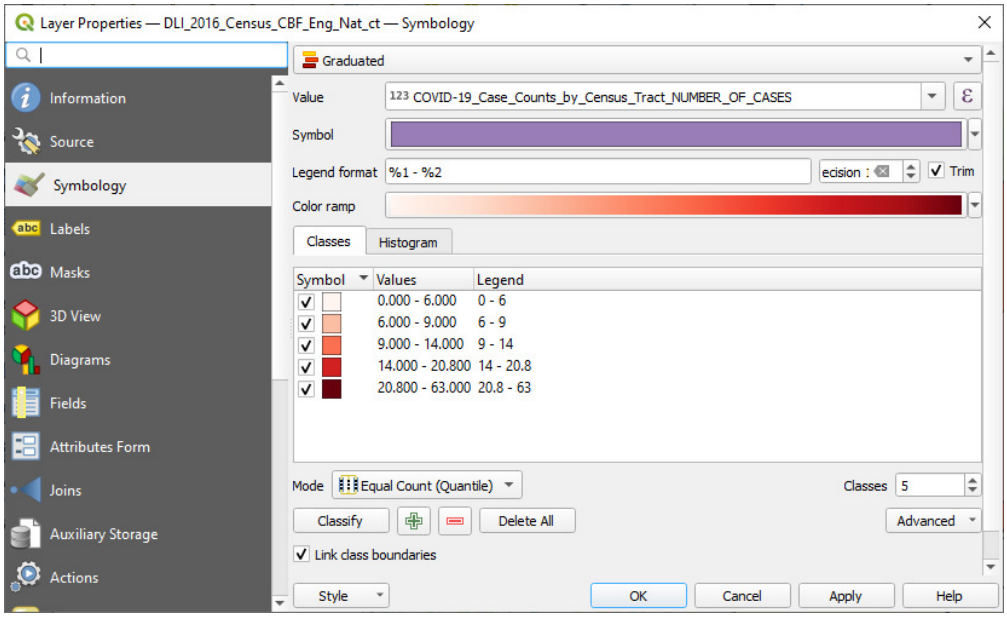
Add basemap

- Go to **Plugins > Manage and Install Plugins…**
- Search for "**QuickMapServices**"
- **Install** plugin and **close** the plugins dialog box
- In the **Web** menu, go to **QuickMapServices** and choose a basemap (try *OSM > OSM Standard*)
- A background, or basemap, will be added to your map view

Symbolize data

- **Double-click** the census tract layer, or right-click and select **Properties**
- Click the **Symbology** tab
- In the top dropdown menu, change Single Symbol to Graduated
- In the **Value** dropdown, select the column containing the number of cases (from the previous step)

- Select a **colour ramp** from the dropdown menu (or right-click) - be thoughtful with your colour selection
- Click **Classify** and observe that 5 classes are created
- Edit the **opacity** of this layer so that the webmap beneath shows (under **Layer Rendering**)
- Click **OK** to exit the layer properties dialog box



Compose Map

- **Zoom** the map to the approximate desired extent
- Click on the **New Print Layout** button  to open the print layout window (or **Project** menu **> New Print Layout…**)
- Give your map a **name** when the dialog box comes up (this is the layout name, not the title)
- Click **Add new map**  and then draw a box to specify your map's extent on the page
- At this point, the content in the map view should appear in your layout window
- Use the **Move Item Content**  button to change the extent and zoom

Annotate Map

- Use **Add New Labels** tool  to add a title with your name and the date (use **Item Properties**
- tab to control font size, colour, background)
- Use **Add picture** tool  to add a north arrow
- In the **Item Properties** window select an appropriate symbol for the north arrow

- Use the **Add new legend** button  to insert a legend
- With the legend selected, click the **Item Properties** tab, rearrange the legend items, and rename the layers by double-clicking on the text
- Use the **Add New Scalebar** tool  to insert a scale bar
- Drag the bar to the desired location and size
- Set **units** to **Kilometres**, and label to *"***km***"*
- Select desired number of segments
- Change the bar height and font size

Export the map

- Use **Export as image**  or **Export as PDF**  to export the map to the desired directory
- **Save** your layout
- Open the new map to see the final product

Topics Covered

- Adding data in different formats to the map (shapefiles, comma-separated values (.csv) file, basemap)
- Joining tabular data to a shapefile
- How to style layers (symbology)
- Map layouts for printing or including in reports or presentations

Data Sources

City of Hamilton Open Data
COVID-19 Case Counts by Census Tract

Scholars GeoPortal
Statistics Canada Census Tracts