

Mapping Data About Your Community

Do More with Digital Scholarship Series

Download data

Census Boundary Files

1. Navigate to <http://geo.scholarsportal.info>
2. Search for the *Cartographic Boundary Files (CBF) for 2016*
3. Download the *Dissemination Areas* for the *Hamilton Census Subdivision (CSD)*
4. *Extract all* data to your folder

Census Data Table

5. Navigate to the database listing on the library's website - <https://library.mcmaster.ca/databases>
 6. Search for Canadian Census Analyser and follow the link to the database
 7. Follow the prompts for the 2016 data for Dissemination Areas and download the median income for Hamilton
 8. Download the data to a file in Comma Separated Values (.csv) format and assign if an appropriate file name (*med_income_hamilton_2016.csv*, e.g.)
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Add data to the map

9. Add the Census Boundary File (*DLI_2016_Census_CBF_Eng_Nat_da.shp*) using the *Add Vector Layer*



button

10. Add the Census data table (income data) using the *Add Delimited Text Layer* button



- Confirm the dialog box is completed as follows (should populate automatically):
 - **Layer name** (how it will appear in the layer list): accept the default or provide a name of your own
 - **Encoding:** UTF-8
 - **File format:** CSV
 - **Geometry definition:** No geometry
 - Confirm sample data contains values
 - Click **Add** once confirmed

Perform table join

Appending data from a table to a shapefile is called a “join”. This allows you to add additional data to your shapefile from other sources. To join a table to a shapefile, they must share a common field containing unique values (e.g. ID number). Joins must be performed on the shapefile and not the data table in order to be displayed on the map.

11. Joins are created in the layer properties window. To view the properties for the Census Boundary File, right-click the dataset in the layer list and choose *Properties*

12. Select *Joins*



13. Add a join  and fill out the dialog box as follows:

- **Join layer** (the data table being appended to the shapefile):
med_income_hamilton_2016
- **Join field** (field name from data table):
geo_uid
- **Target field** (Field name in the shapefile):
DAUID

14. Click *OK* and confirm the join is complete by opening the attribute table to view the additional fields

Symbolize data

Data can be symbolized in a number of ways. Datasets containing a range of values can be classified and displayed using a range of colours, also called *graduated symbology*. Users specify the number of classes and the classification method.

Classification methods:

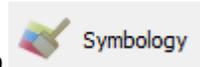
- **Equal interval** - class ranges of the same size
- **Quantile** - decides the class breaks so the number of values in each class are the same size
- **Natural breaks (Jenks)** - finds natural groupings of data in order to create classes
- **Standard deviation** - calculates the mean, and creates classes based on standard deviation from the mean
- **Pretty breaks** - based on R’s pretty algorithm (class boundaries with round numbers)

For more information on styling vector data -

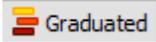
https://www.qgistutorials.com/en/docs/basic_vector_styling.html

15. Open the layer properties of the Dissemination Areas by right-clicking layer

16. Select the *Symbology* tab



17. Choose:

- Graduated**  Graduated
- Column:** *column containing income values (refer back to the data file in the Census Analyser)*
- Color ramp:** (right-click) *Greens*
- Mode:** *Equal Interval*
- Classes:** 5

18. Click *Classify*, followed by *OK*

Plugins

Plugins add functionality to the QGIS base. Plugins created within the QGIS community can be installed in QGIS through the “Plugins” menu.

We’ll be using the QuickMapServices plugin to add a basemap.

19. From the top menu, select **Plugins > Manage and Install Plugins...**

20. Search for and install the **QuickMapServices** plugin. If the plugin is already installed, make sure it is activated by checking the box

21. Once installed, use the QuickMapServices menu (in the top menu bar **Web > QuickMapServices**) to add a basemap layer

- Go to **Web > QuickMapServices > OSM > OSM Standard** to add the OpenStreetMap basemap
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Add complementary datasets

22. Go to the City of Hamilton’s open data website - open.hamilton.ca

23. Search for and select *Ward Boundaries*

24. Click the *Download* link and download the full dataset as a shapefile

25. Extract the data from the .zip files and save in your folder

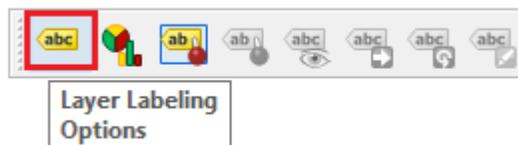
26. Add to QGIS using the *Add Vector Layer* option



27. Symbolize the ward boundaries as an outline only, allowing you to view the underlying income data

Label features

30. Select the ward boundaries in the layers list and click on the **Layer Labeling Options** button.



31. In the dropdown menu which reads “No Labels”, change it to **Single Labels**

32. In the “Label with” dropdown menu, select the field containing the ward number

33. Click **Apply**

34. Use the “Text” and “Formatting” tabs in the Layer labeling window to style and position your labels

Export map

Using print layouts, users can print maps with a title, north arrow, scale bar, and legend, and export it as an image, PDF, or scalable vector graphic (SVG). Using this tool, users can also create atlases. For a simple screen capture of the map with no additional elements, use Project > Import/Export and save the file as an image or PDF.

35. Zoom the main data frame to the approximate desired extents for your map.

36. Click on the **New Print Layout**  button to open the map creation window.

37. Give your map a **name** when the dialog box comes up.

38. Click **Add new map**  and then draw a box to specify your map’s extent on the page.

39. At this point, the content in the map view should appear in your map creation window.

40. Use the “Move Item Content” button  to change the extent and zoom.

41. 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).

42. Use **Add picture** tool  to add a **North arrow**
- In the Item Properties window expand “Search Directories” to select an appropriate symbol.

43. Use the **Add new legend** button  to insert a legend.

44. With the legend selected, click the “Item Properties” tab, rearrange the legend items, and rename the layers by double-clicking on the text.

45. Use the **Add New Scalebar**  tool to insert a scale bar
- Drag the bar to the desired location and size
 - Set units to “Meters”, and label to “m”
 - Select desired number of segments
 - Change the bar height and font size

46. Use “Export as **image**”  or “Export as **PDF**”  to export the map to the desired directory.

47. **Save** your project.

48. Open the new map to see the final product.