Introduction to QGIS Workshop

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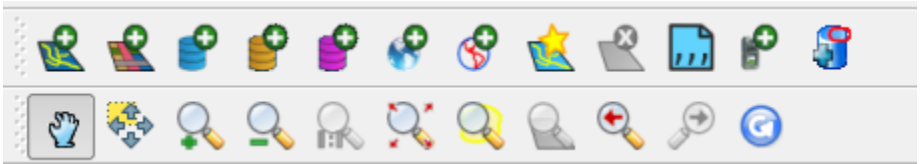
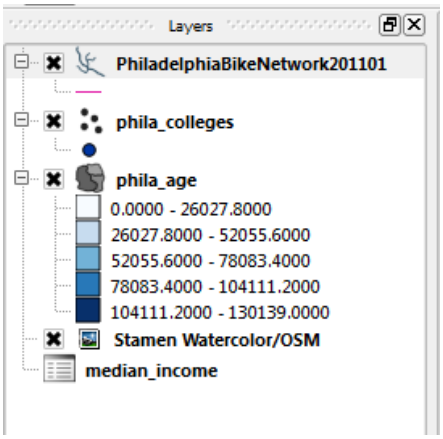
Navigating QGIS

Toolbars



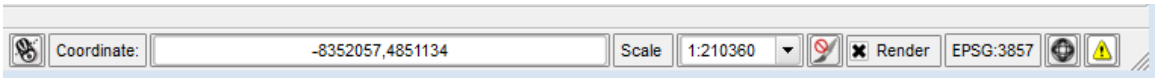
Tools you need for navigating and manipulating your data, at the top of the window. To choose which to display, right-click on the gray area or go to View > Toolbars.



Layer List

Shows you which data files have been added to your map and lets you control how the layers will be displayed.

Status Bar



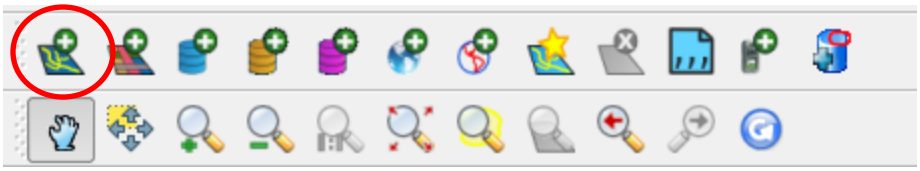
Displays scale and other current settings.

Tutorial: Making a Map

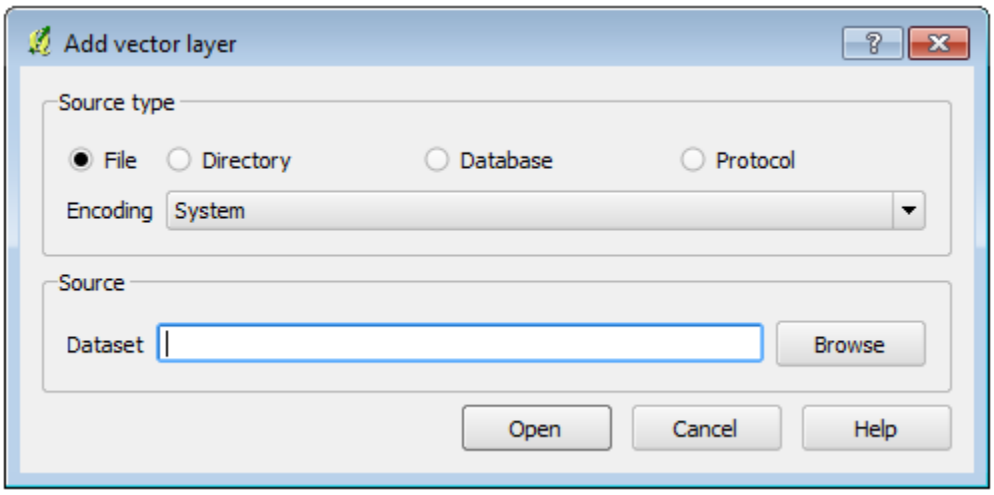
This tutorial will guide you through displaying data, changing symbologies, viewing attributes, and saving a map.

1. Unzip IntroArcData.zip to your Desktop.

2. From QGIS, click on the Add Vector Layer button.



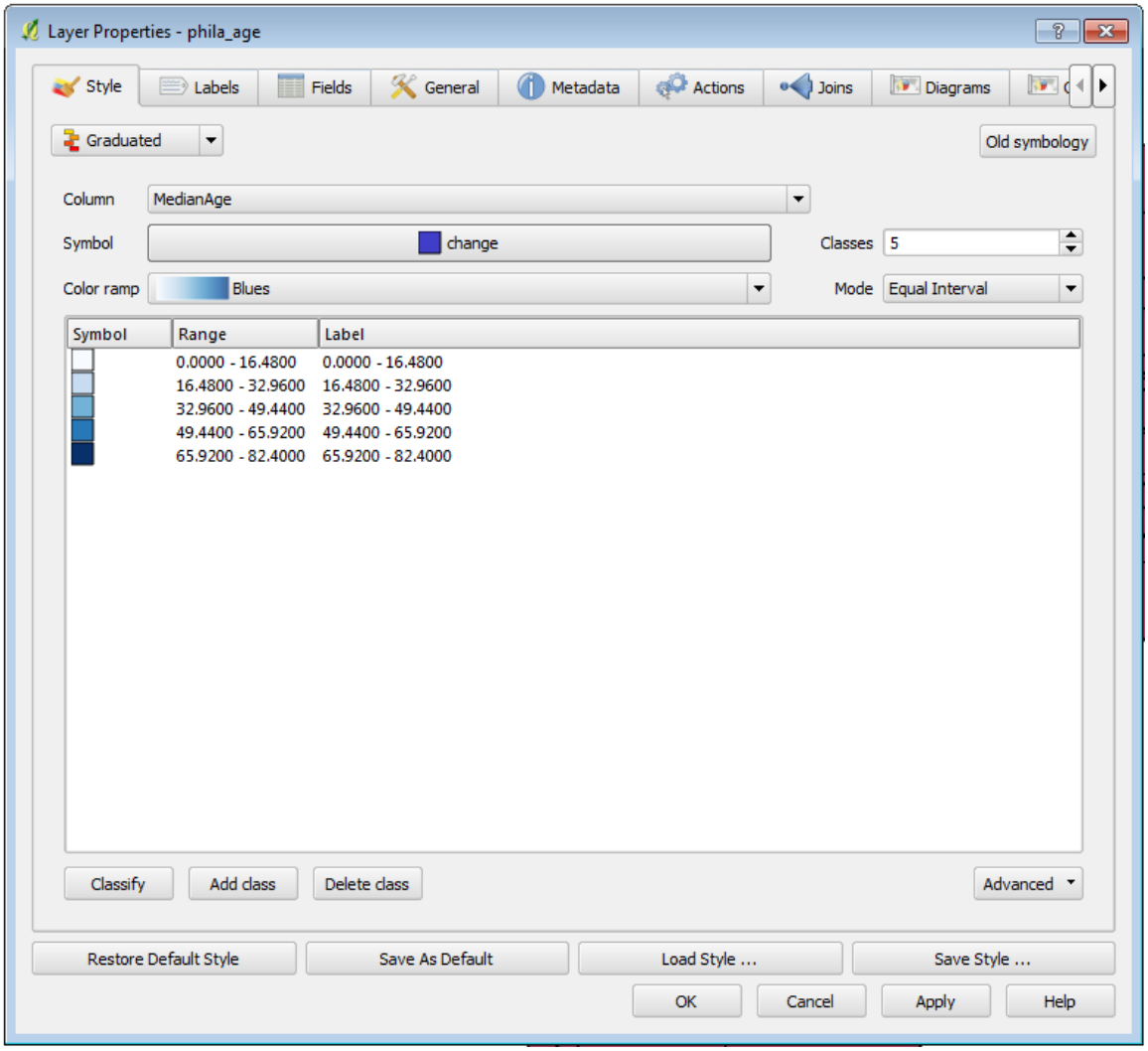
3. In the Add vector layer menu, click on Browse and navigate to the unzipped data.



Select the file phila_age.shp and click Open, then Open again. This will display Philadelphia census tracts along with median age data. This is an example of polygon data. The filename should also appear in the Layer List on the left.

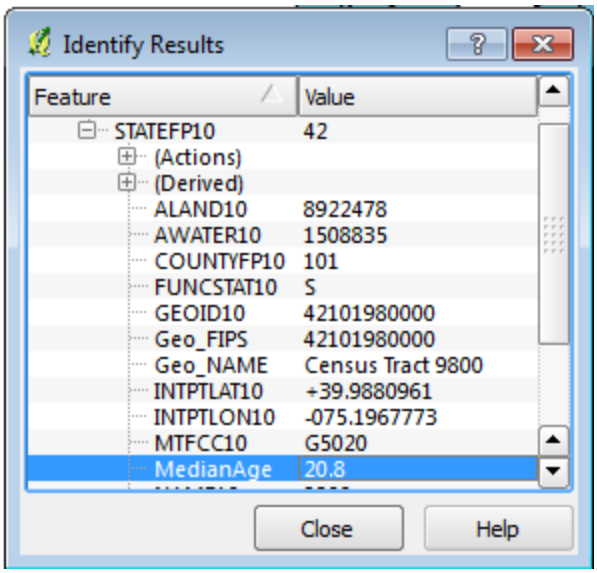
4. At first, the tracts will appear empty. In order to display the variations in the data, right-click on phila_age.shp in the Layer List and select Properties from the drop-down menu. Alternately, double-click on the name of the layer. Next select the Style tab in the Properties window. This will allow you to choose how to display the data.

5. In the Style tab, select Graduated from the drop-down menu at the top and select MedianAge for the column field, as shown below.

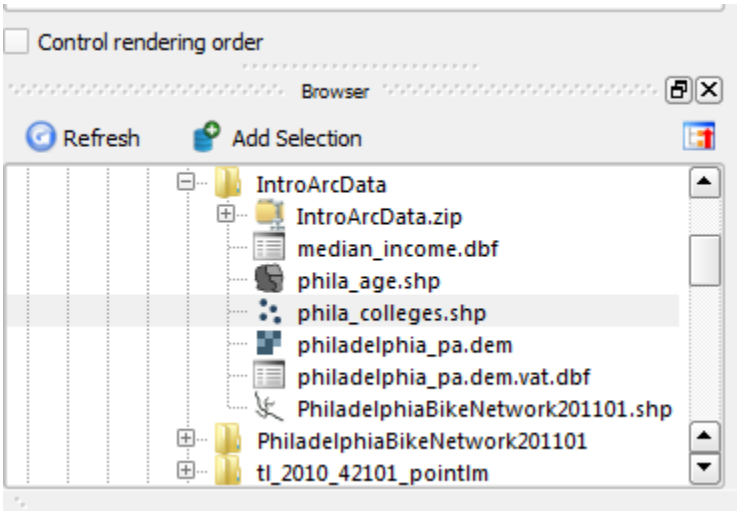


6. Now that you have some data and symbology for your map, be sure to save it. Select File > Save. This creates a .qgs file that records the location and appearance of your data. Note that this does not save the data itself. The data, in the form of shapefiles or tables, must be saved along with the .qgis file in order to recreate the map as you see it now.

7. To uncover the data behind individual census tracts, select the Identify Features tool from the toolbar and click on any tract. (If this tool is not visible, right-click on the gray area of the toolbar and select Attributes.) This will display the full record attached to that location. Most of the information simply identifies the tract, but the last line, MedianAge, gives data from the 2010 Census.

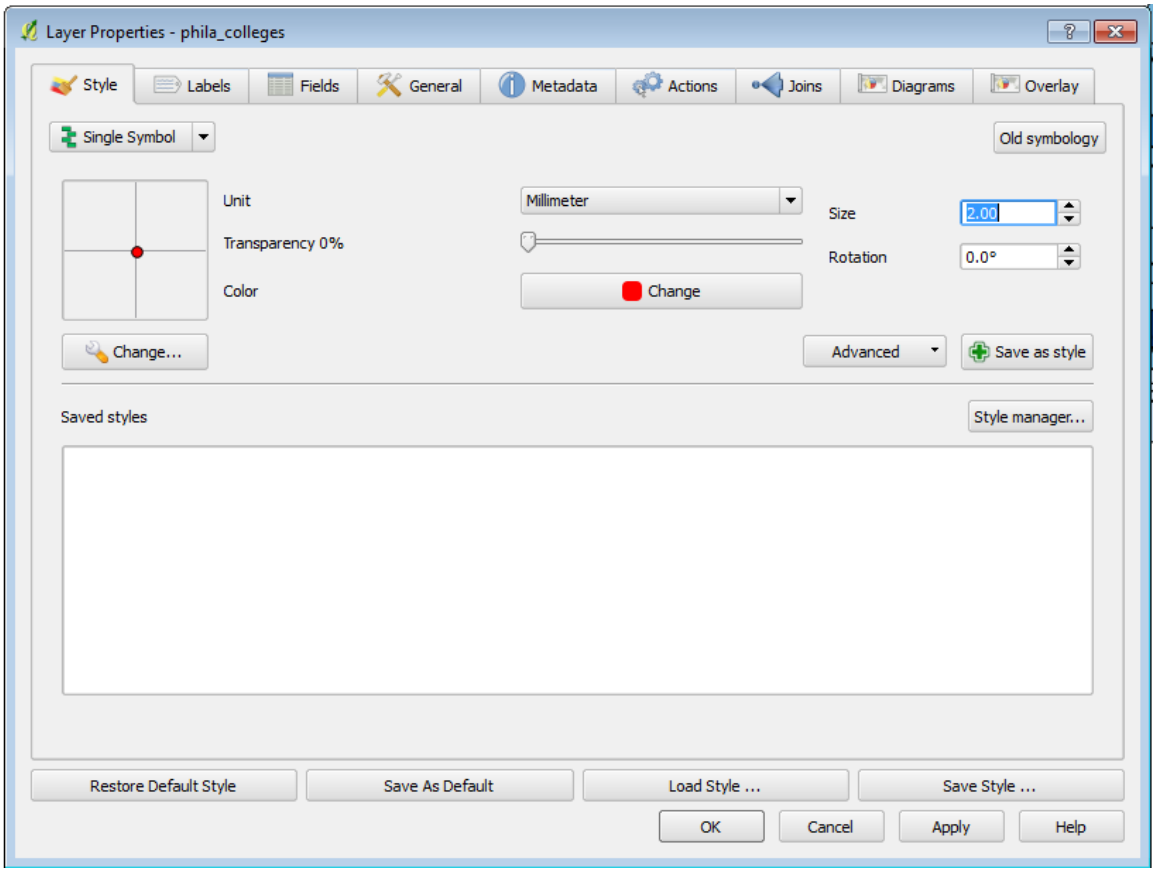


8. In addition to the Add Vector Layer button, you can also add data through the Browser Panel. If it's not visible, go to View > Panels, and check the box next to Browser. The Browser allows you to visually navigate to your files like you would through your computer directory. Find the folder of unzipped files in the Browser Panel, locate the phila_colleges.shp, and drag and drop it into the map. The locations of the postsecondary institutions of Philadelphia should appear overlaid on the census tracts. This is an example of point data.



9. You can use the Identify Features tool to look at the data one record at a time, or you can view the attribute table to look at all the records for postsecondary institutions at once. In the Layer List on the left, right-click on phila_colleges.shp and select Open Attribute Table. You should see the name of the school, the full-time enrollment, and the street address.

10. Access the Styles tab for phila_colleges in the same way as for phila_age.shp. Notice that you can change the size and color of the symbol. The “Change” button underneath the symbol offers further options for changing the shape of the symbol.



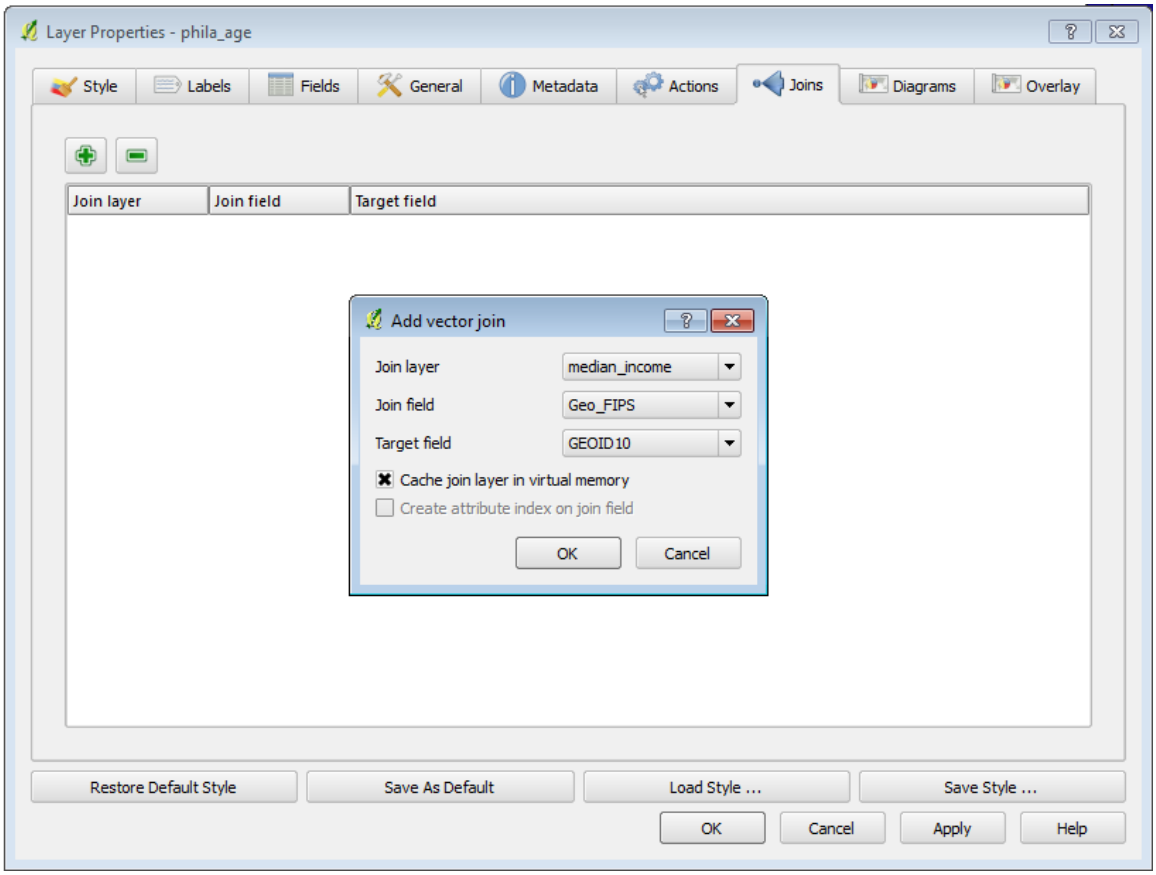
11. Using either the Add Vector Layer button or the Browser panel, add PhiladelphiaBikeNetwork201101.shp. This is an example of line data, showing bike routes in the city.

12. Access the Style tab as before. Change “Single Symbol” to “Categorized” in the drop-down menu. From the Column drop-down, choose TYPE, then click on Classify below. This allows you to distinguish the types of bike lanes from each other using different colors or kinds of lines. Double-click on the lines under Symbol to change their appearance, and click on OK when you are satisfied with the results.

13. Additional attributes can be combined to your shapefiles by joining them to data in spreadsheets or other tables. We can add median household income to the census tracts first by adding a table called median_income.dbf to our Table of Contents.

Use either the Add Vector Layer button or the Browser panel.

14. In order to perform the join, there must be a column in both the table and the spreadsheet that match exactly. In this case, that column is called Geo_FIPS in median_income.dbf and GEOID10 in phila_age.shp. Right-click on phila_age.shp in the Layer List and select Properties > Joins. Click on the green plus-sign to choose your file. In the Add Vector Join menu, choose "medium_income" as the join layer, and choose Geo_FIPS and GEOID10 as the join field and target field, respectively. Click OK, and then OK again.



15. The display won't look any different until you change the styles. You can do so in the same way as you did in steps 4 and 5. Repeat steps 4 and 5, but this time select SE_T057_00 in Value. This is the field for household median income.

You've now successfully loaded a variety of data files into QGIS and assigned varying styles to make a simple map. There are a number of things you can do from here, using this data alone. For example, you could:

- Select the census tracts near colleges and universities and compare them statistically to other tracts (using Vector > Research Tools > Select by Location).
- Select the colleges and universities with large enrollments and compare their neighborhoods to those of smaller institutions (use the “Look for” box in the attribute table window).
- Calculate the distance between institutions and the nearest bike paths (Use Vector > Analysis tools > Distance matrix)

You can also export the map as an image for use with other applications, like MS Word or PowerPoint. Use File > Save as Image.

Data Used:

U.S. Census Bureau. (2011) "Social Explorer Tables*:* ACS 2006 to 2010: Median Household Income in 2010 Inflation Adjusted Dollars." Prepared by Social Explorer. Available at http://www.socialexplorer.com/pub/reportdata/htmlresults.aspx?ReportId=R10193337.

U.S. Census Bureau, Geography Division. (2010) 2010 TIGER/Line Shapefiles: Census Tracts. Available at http://www.census.gov/cgi-bin/geo/shapefiles2010

U.S. Census Bureau. (2010) "P13: Median Age by Sex." 2010 Census Summary File 1 [Pennsylvania]. Prepared by Social Explorer. Available at http://www.socialexplorer.com/pub/reportdata/htmlresults.aspx?ReportId=R10193495

City of Philadelphia Street Department. (2012). Philadelphia Bike Network. Available at http://www.pasda.psu.edu/uci/MetadataDisplay.aspx?entry=PASDA&file=PhiladelphiaBikeNetwork201201.xml&dataset=1355

National Center for Education Statistics. (2011) Integrated Postsecondary Education Data System. "Institutional Characteristics." Available at http://nces.ed.gov/ipeds/datacenter.