

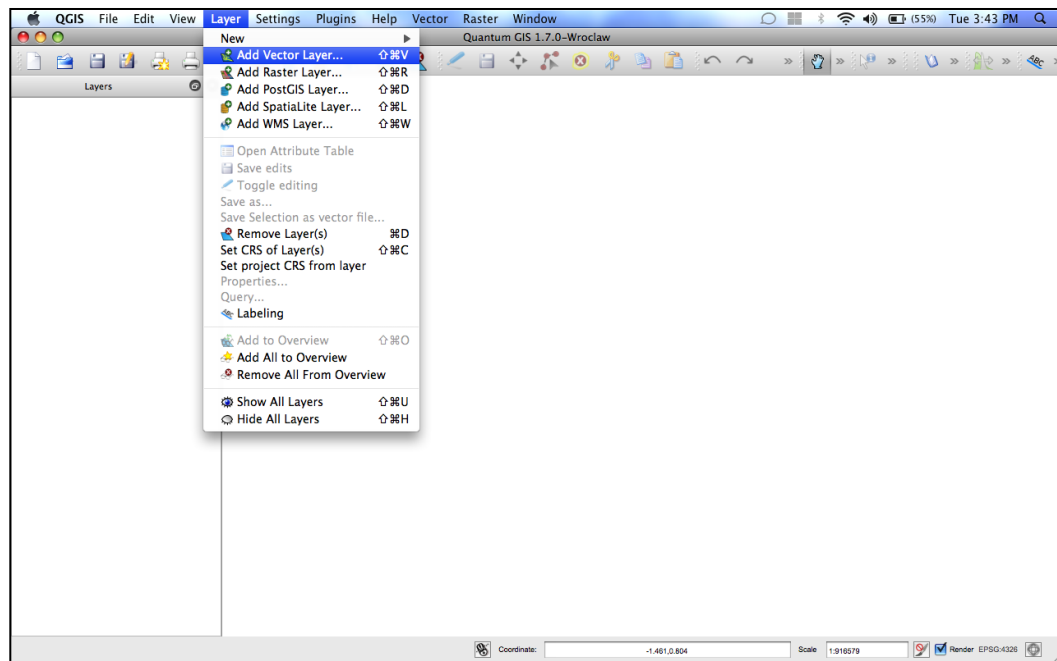
Getting Started with QGIS on a Mac

Overview

This tutorial provides a basic overview of how to manipulate attributes, queries, layers, and more in Quantum GIS.

Getting Started with Attributes and Queries

1. Launch QGIS, then add your data by clicking on the menu item **Layer > Add Vector Layer**.



2. Browse to locate the shapefile data that you wish to add. This tutorial provides examples of how to process a California cities shapefile and a U.S. states shapefile.

Tip:

If you wish to add more than one shapefile at a time, simply hold down the command (⌘) key as you select multiple files, then click “Open.” You can also click the “Add vector layer” icon on the top bar. Hold the cursor over an icon and the name and function of the icon will appear.

3. Your data will appear in the Layer panel on the left. Right click on the layer name to open a menu and select “Open attribute table.”
4. Now you can explore the values of your various attributes.

5. If you wish to focus on a particular attribute, click the attribute tab to sort the values in ascending or descending order.

Attribute table - US_States_ta83 :: 0 / 51 feature(s) selected

	OBJECTID_1 ▼	OBJECTID	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	POP2000
0	1	1	Hawaii	15	Pacific	HI	121153
1	2	2	Washington	53	Pacific	WA	589412
2	3	3	Montana	30	Mountain	MT	90219
3	4	4	Maine	23	New England	ME	127492
4	5	5	North Dakota	38	West North ...	ND	64220
5	6	6	South Dakota	46	West North ...	SD	75484
6	7	7	Wyoming	56	Mountain	WY	49378
7	8	8	Wisconsin	55	East North ...	WI	536367
8	9	9	Idaho	16	Mountain	ID	129395
9	10	10	Vermont	50	New England	VT	60882
10	11	11	Minnesota	27	West North ...	MN	491947
11	12	12	Oregon	41	Pacific	OR	342139
12	13	13	New Hamps...	33	New England	NH	123578
13	14	14	Iowa	19	West North ...	IA	292632
14	15	15	Massachuse...	25	New England	MA	634909
15	16	16	Nebraska	31	West North ...	NE	171126
16	17	17	New York	36	Middle Atla...	NY	1897645
17	18	18	Pennsylvania	42	Middle Atla...	PA	1228105
18	19	19	Connecticut	09	New England	CT	340556
19	20	20	Rhode Island	44	New England	RI	104831

Look for in OBJECTID_1 Search

☐ Show selected only ☐ Search selected only ☒ Case sensitive Advanced search ?

6. Let's try an example using queries within the attribute table. If you have one particular attribute to search for, you can type it in the 'Look For' box and search within the attribute.

Attribute table - US_States_ta83 (1 matching features)

	OBJECTID_1 ▼	OBJECTID	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	POP2000
16	17	17	New York	36	Middle Atla...	NY	1897645
17	18	18	Pennsylvania	42	Middle Atla...	PA	1228105
18	19	19	Connecticut	09	New England	CT	340556
19	20	20	Rhode Island	44	New England	RI	104831
20	21	21	New Jersey	34	Middle Atla...	NJ	841435
21	22	22	Indiana	18	East North ...	IN	608048
22	23	23	Nevada	32	Mountain	NV	199825
23	24	24	Utah	49	Mountain	UT	223316
24	25	25	California	06	Pacific	CA	3387164
25	26	26	Ohio	39	East North ...	OH	1135314
26	27	27	Illinois	17	East North ...	IL	1241929
27	28	28	District of C...	11	South Atlantic	DC	57205
28	29	29	Delaware	10	South Atlantic	DE	78360
29	30	30	West Virginia	54	South Atlantic	WV	180834
30	31	31	Maryland	24	South Atlantic	MD	529648
31	32	32	Colorado	08	Mountain	CO	430126
32	33	33	Kentucky	21	East South ...	KY	404176
33	34	34	Kansas	20	West North ...	KS	268841
34	35	35	Virginia	51	South Atlantic	VA	707851
35	36	36	Missouri	29	West North ...	MO	559521

Look for Ohio in STATE_NAME Search

☐ Show selected only ☐ Search selected only ☒ Case sensitive Advanced search ?

7. For more advanced queries, select “Advanced search” at the bottom of the attribute table. Using the more advanced search, you can find and select specific attributes.
8. In the **SQL where clause box**, type in your desired query. For example, to find the states with the largest size, type ‘SQMI>= 100000’ then click “OK.” This will select all states with square mileage greater than or equal to 100,000.

Tip:

You may find it easier to click on the field value and select various operators to form your query. After forming your query, click ‘Test’ to see if it is valid.

9. Now you will see highlighted rows within the attribute table. Check the ‘Show selected only’ box to see only those attributes that fit within the query.


Attribute table – US_States_ta83 :: 8 / 51 feature(s) selected

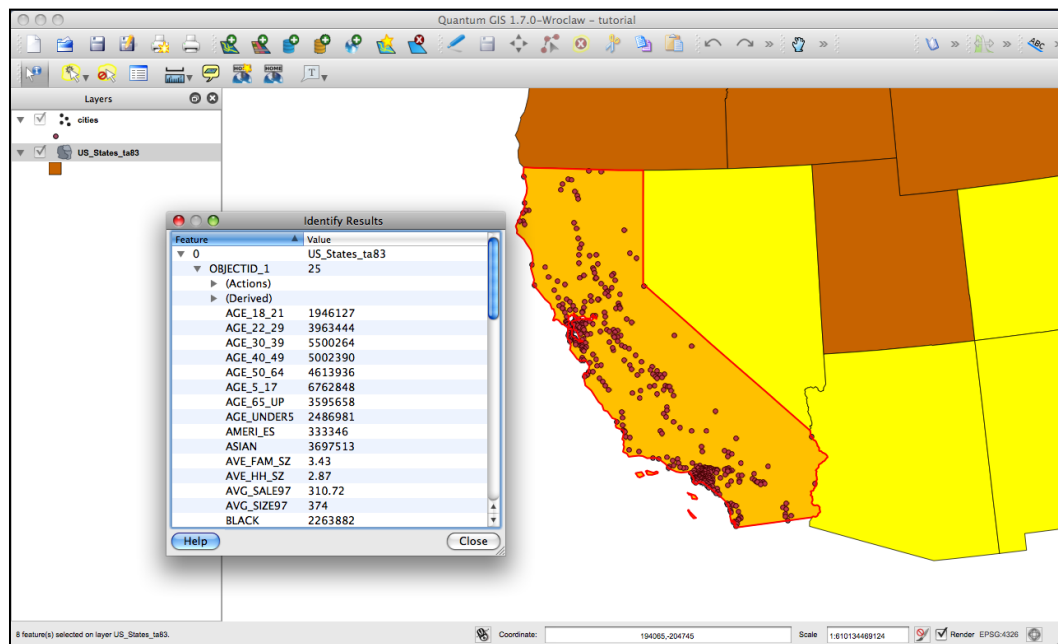
OBJECTID_1	OBJECTID	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	POP2000
0	51	Alaska	02	Pacific	AK	626932
1	41	Texas	48	West South ...	TX	20851820
2	25	California	06	Pacific	CA	33871648
3	3	Montana	30	Mountain	MT	902195
4	42	New Mexico	35	Mountain	NM	1819046
5	37	Arizona	04	Mountain	AZ	5130632
6	23	Nevada	32	Mountain	NV	1998257
7	32	Colorado	08	Mountain	CO	4301261

Look for Ohio in STATE_NAME Search

☒ Show selected only ☐ Search selected only ☒ Case sensitive Advanced search ?

10. Minimize the attribute table to view the data. You will notice that data points selected within the attribute table are now selected in yellow on the map.

11. Using the Identify tool  located within the toolbar, you can click on individual points to view specific attributes without having to go back into the attribute table.

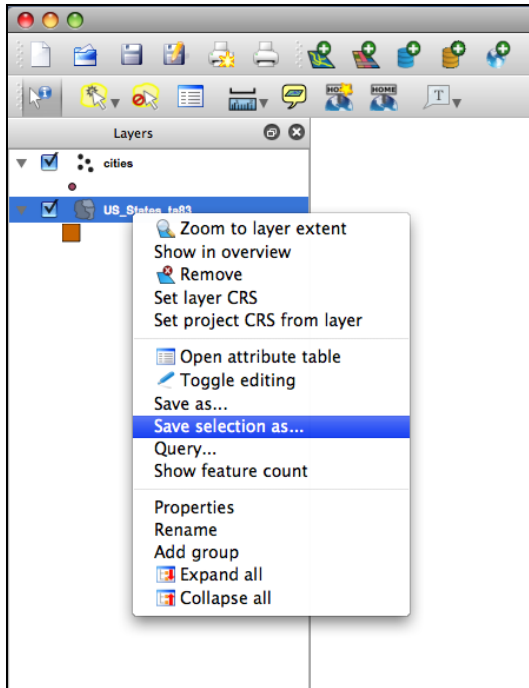


12. You can also run a query within a query. To do this, search within the initial query by checking the ‘Search selected only’ box and enter a second query.
13. Let’s find the states with the largest areas and densest populations. We’ve already run the first query in Step 8 to find the states with the largest areas. Check the ‘Search selected only box’ and type ‘POP00_SQMI>= 25’. Click OK. Now only states larger than 100,000 square miles and population densities over 25 are selected.

Attribute table – US_States_ta83 :: 4 / 51 feature(s) selected

	OBJECTID_1	OBJECTID	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	POP2000
1	41	41	Texas	48	West South ...	TX	20851820
2	25	25	California	06	Pacific	CA	33871648
5	37	37	Arizona	04	Mountain	AZ	5130632
7	32	32	Colorado	08	Mountain	CO	4301261

14. The query tool can be useful for refining data attributes depending on your particular needs. You can also create new layers based on your selections. Right click on the layer where the selections have been made and select ‘Save selection as...’



15. Browse to the appropriate folder and save your layer with a name of your choice. Once the export to vector file process is complete, load the layer using **Layer > Add Vector Layer**.
16. Now you have a new layer with your previous selections! This can be done with any query. New maps can be created from these layers.

Tip:

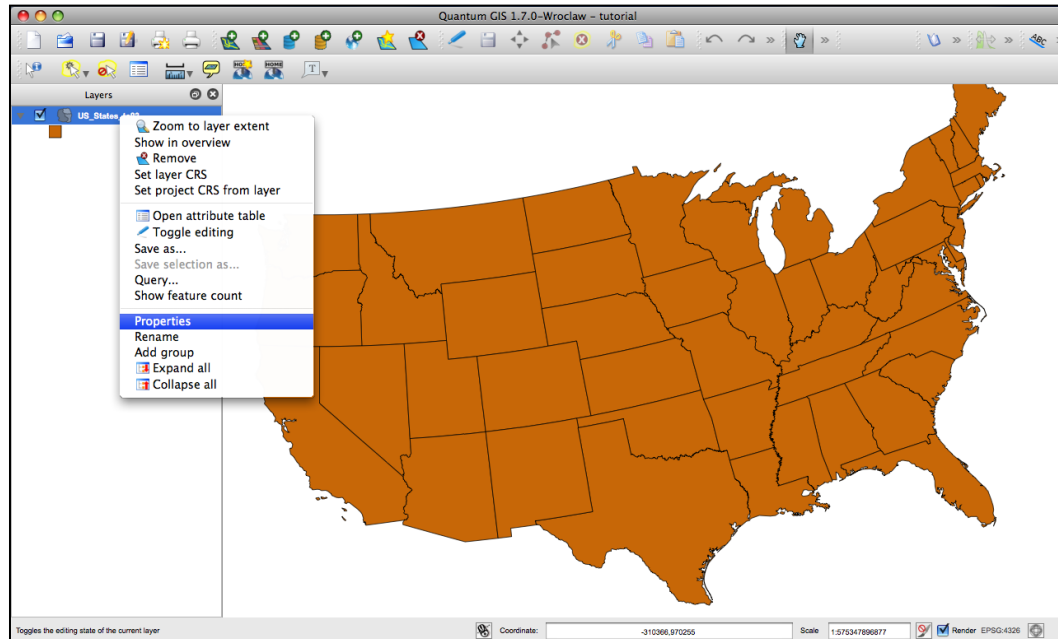
Use the other tool icons within the attribute table to invert selections, deselect, zoom to map and more! Hovering over the icon will reveal a pop-up message that explains its function.



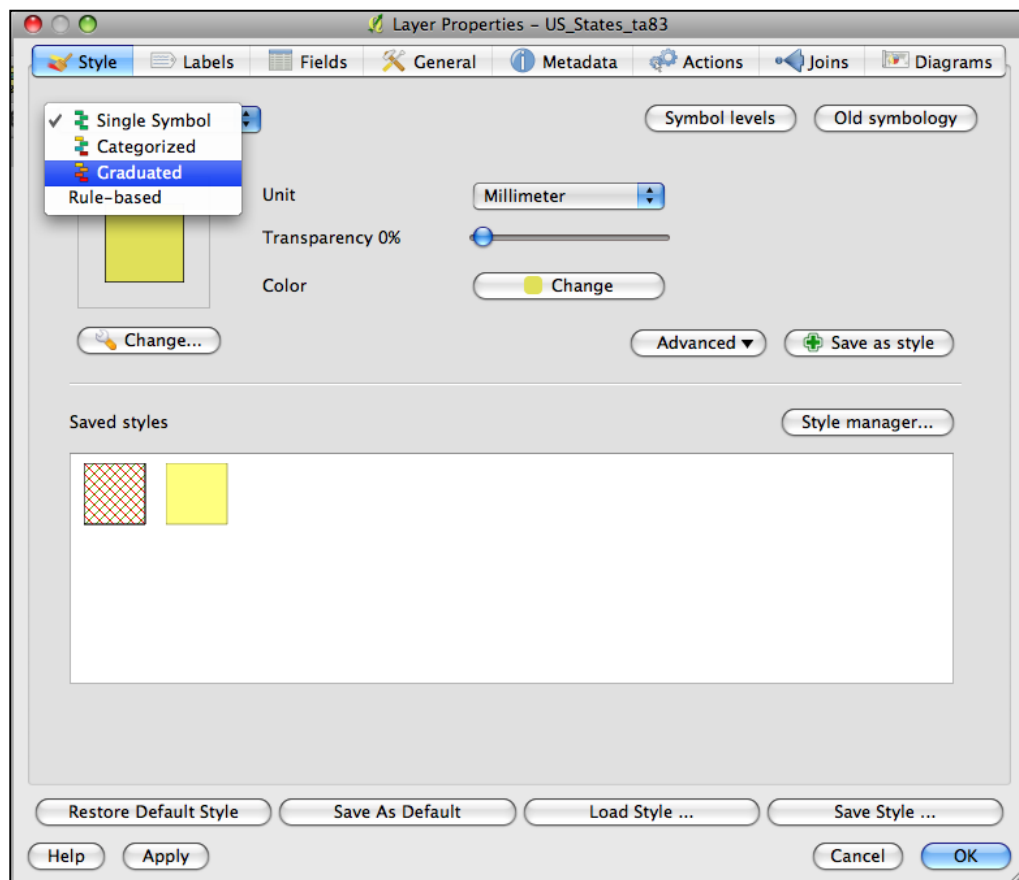
Styling Vector Data

1. There are multiple ways to display data when creating a map. This is done by changing the symbology of certain attributes within the data layer. As demonstrated in the following U.S. states layer, we can create a map that shows different attributes in different ways.
2. Let's create a map that shows the states' populations from lowest to highest.

3. Right click on the layer and select 'Properties' or double click on the layer name.



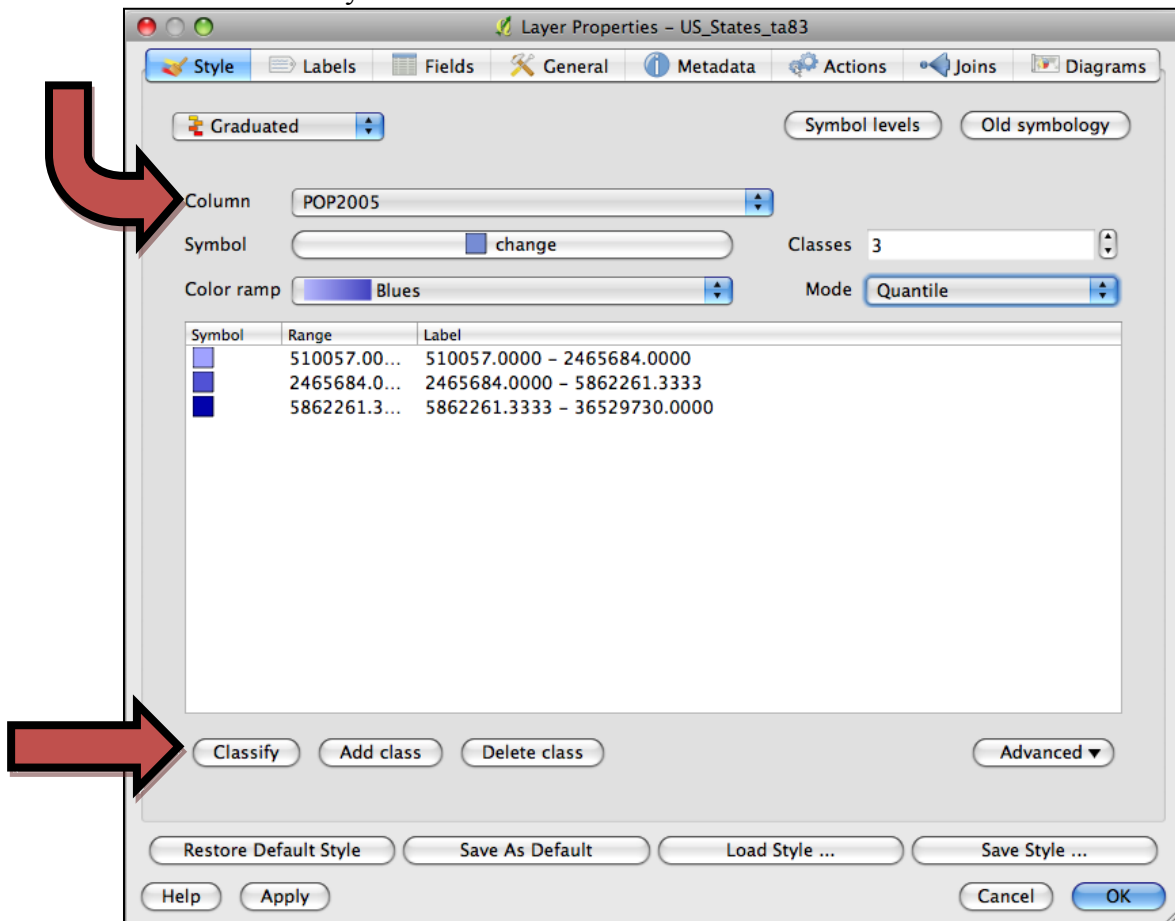
4. Under the 'Style' tab, there are various options for changing the appearance of different attributes.
5. The drop-down button shows four different options to style the data: single symbol, categorized, graduated and rule based (see definitions below). For our purposes, we will use the 'Graduated' symbology.



Definitions:

- Single symbol means all the features in the layer will be styled the same way.
- Categorized means the features in the layer will be shown in different shades of a color based on unique values in an attribute field.
- Graduated allows you to break down the data in a column in unique 'classes' and choose a different style for each of the classes.
- Rule based symbology ignores symbol levels in place of rules provided by the user.

6. We would like to show the state population so select 'POP2005' as the Column and click 'Classify' at the bottom.

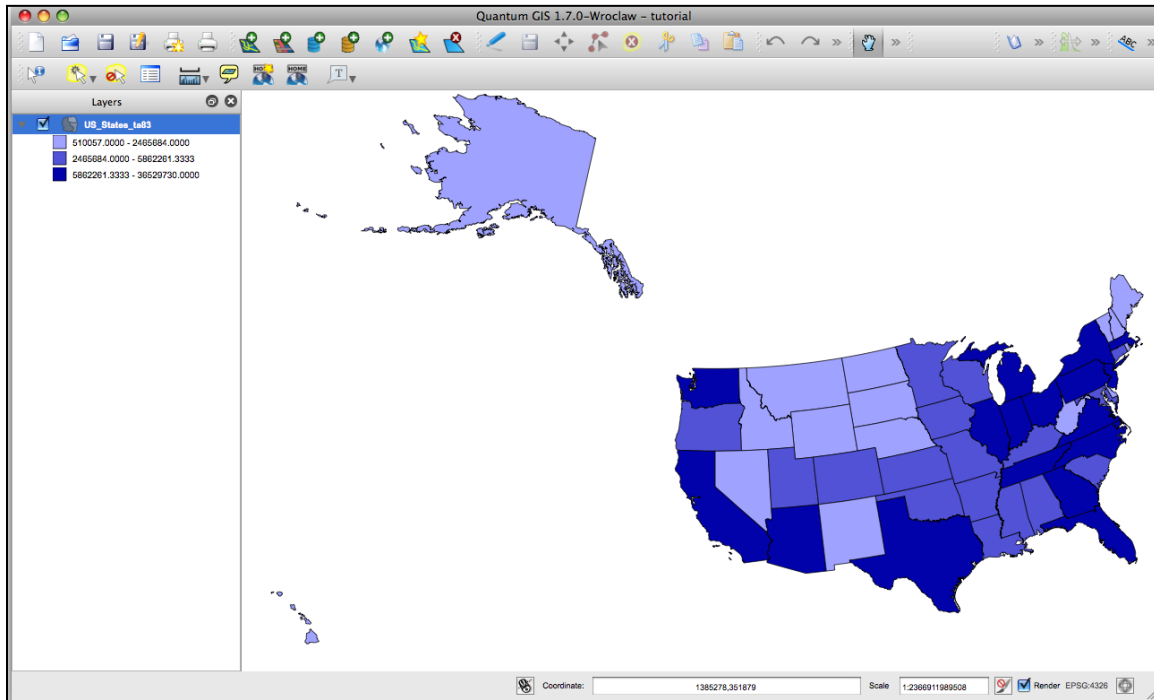


7. Since graduated symbology breaks down the data in a column in unique 'classes' we can think of classifying our population data into three classes, 'low,' 'medium' and 'high'. Change the classes to 3 and the mode to 'Quantile.' Click "Color ramp" to select an appropriate palette for your representative data. Click 'Classify' again to see the change in your data.

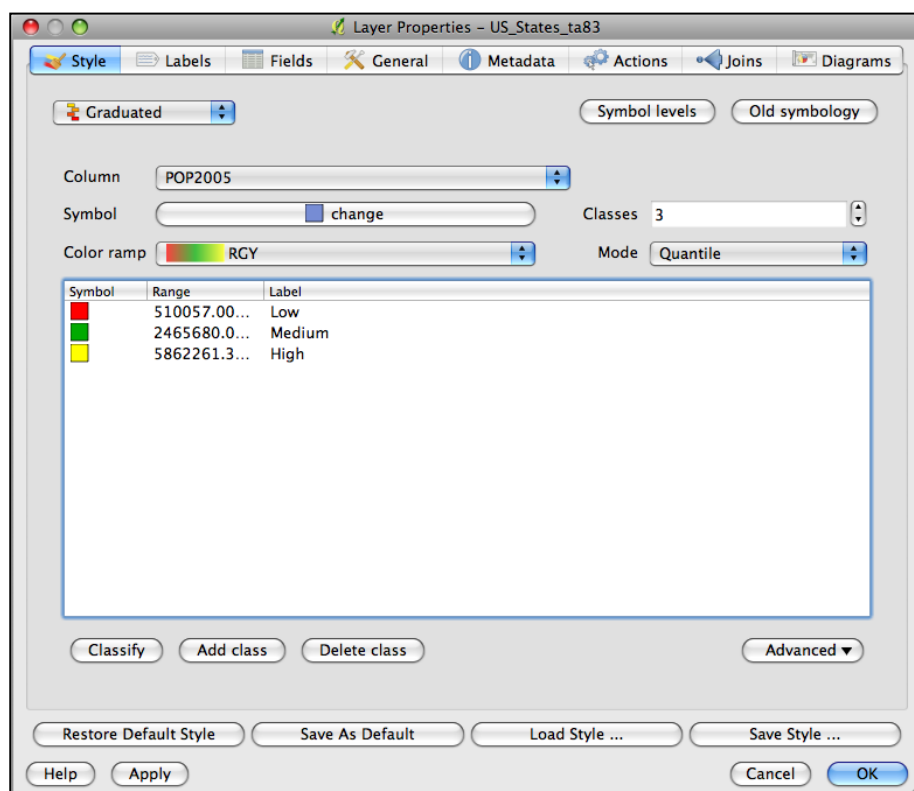
Tip:

There are 5 modes available: equal interval, quantile, natural breaks (jenks), standard deviation and pretty breaks. These modes use different statistical algorithms to break down the data into separate classes. Explore each of these modes with your data to find the best possible mode for your needs.

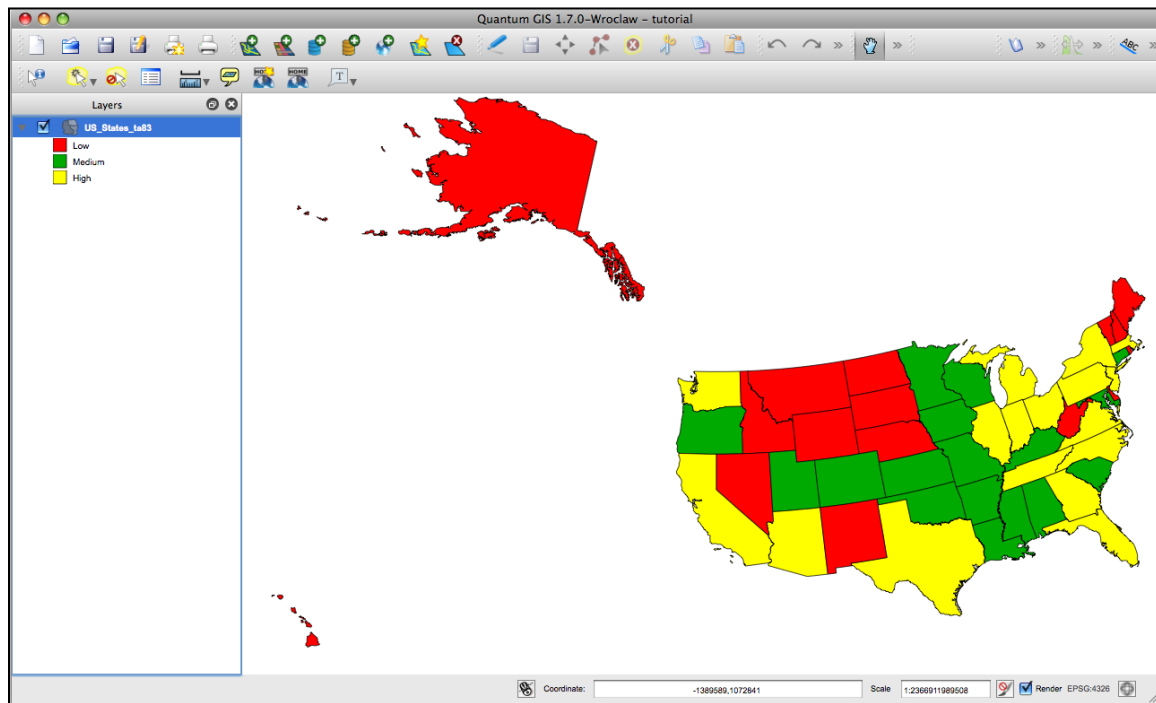
8. Press OK to see the results in the map window. You will see a map showing each state in 1 of 3 colors representing their populations. The lightest blue corresponds to states with the lowest populations, and the darkest blue corresponds to states with the highest.



9. It is also possible to change the colors and choose other styling options within the 'Style' dialog box. For example, we can change the colors to red, green, and yellow to indicate low, medium, and high populations. When selecting colors, consider whether they match cultural conventions. We can also change the Label values to give the each value a label that users can understand.



10. Click OK to see the changes. Now this map has clearly defined categories.



This tutorial showed you how to process two simple shapefiles. There are many other ways to style your data to create a map that fits your needs. Explore them with QGIS tutorials at <http://qgis.spatialthoughts.com/>