WORKING WITH QGIS

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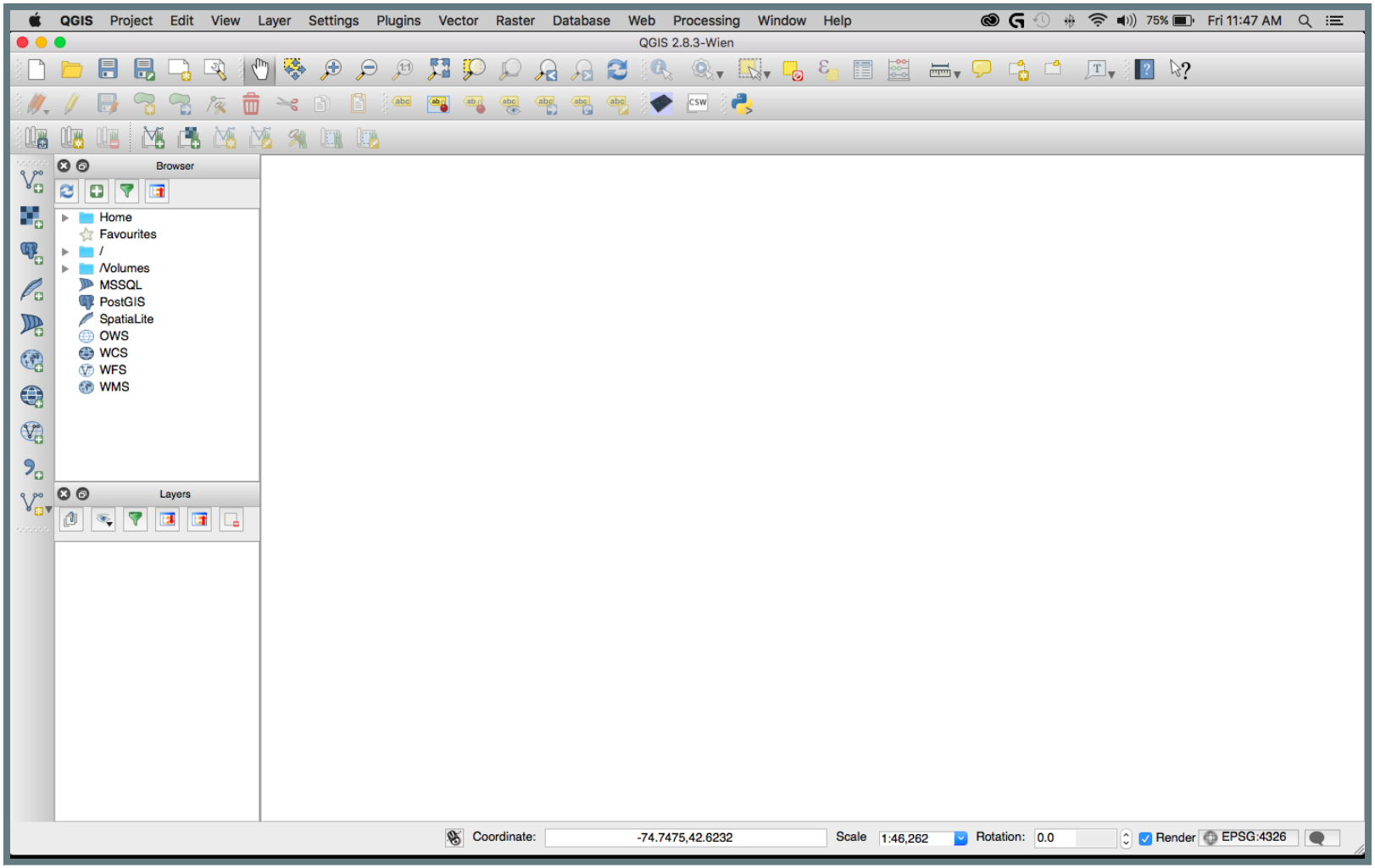
A QUICK TOUR OF QGIS

A BLANK MAP


QGIS Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Window Help
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Browser
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OWS
WCS
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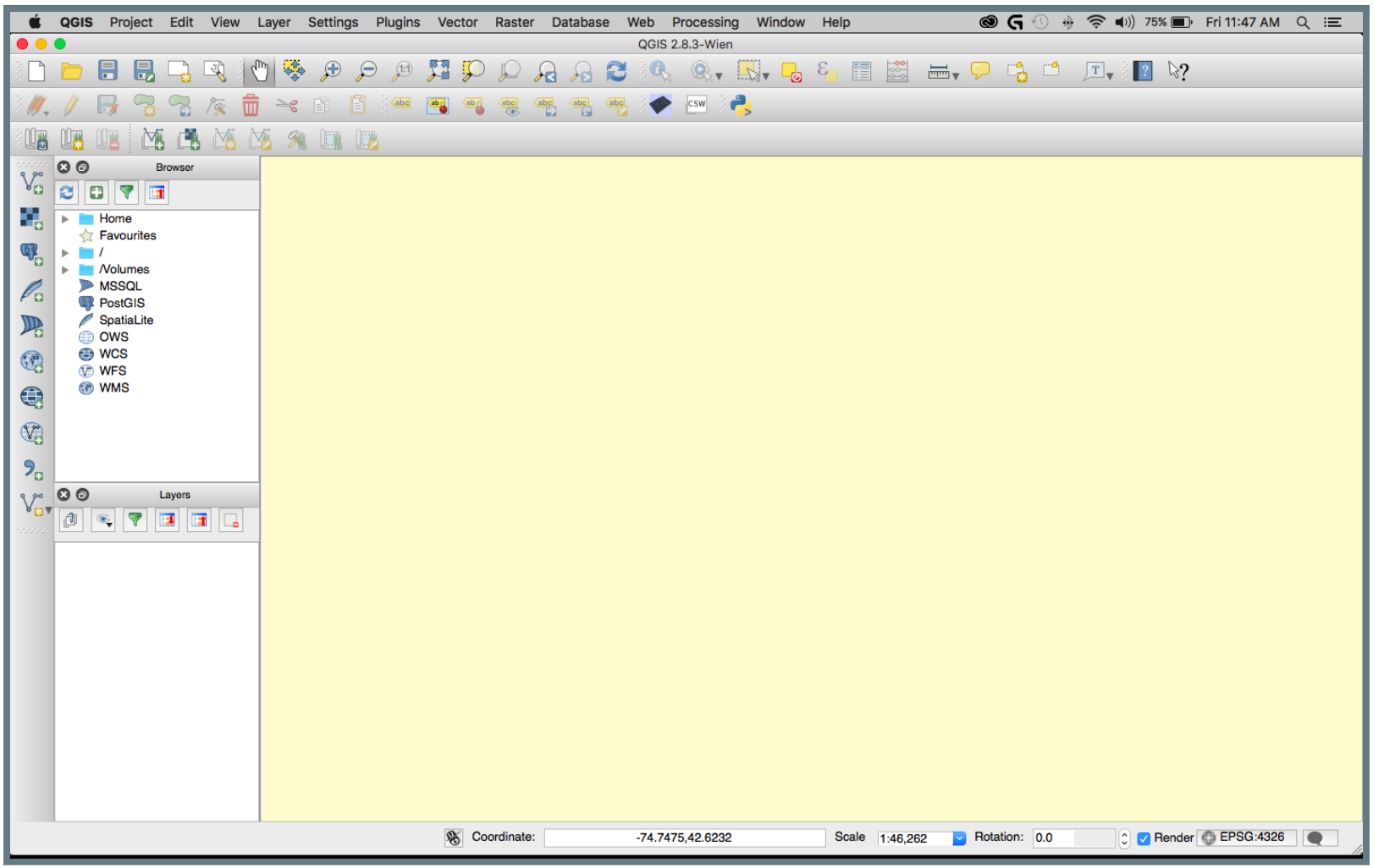
Layers
Coordinate:
-74.7475,42.6232
Scale
1:46,262
Rotation:
0.0
Render
EPSG:4326

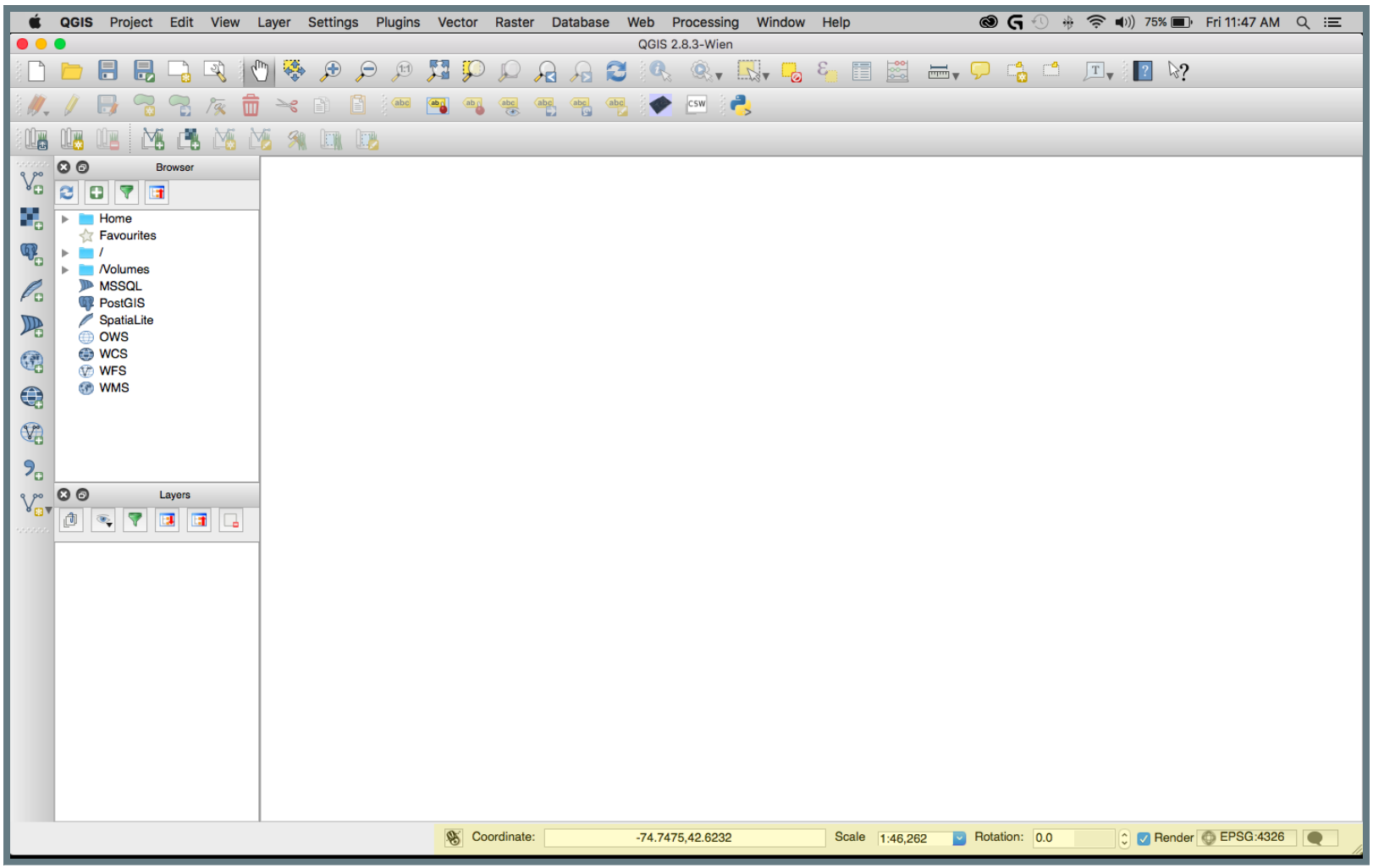
THE MAP PANE

This is where your map will be displayed



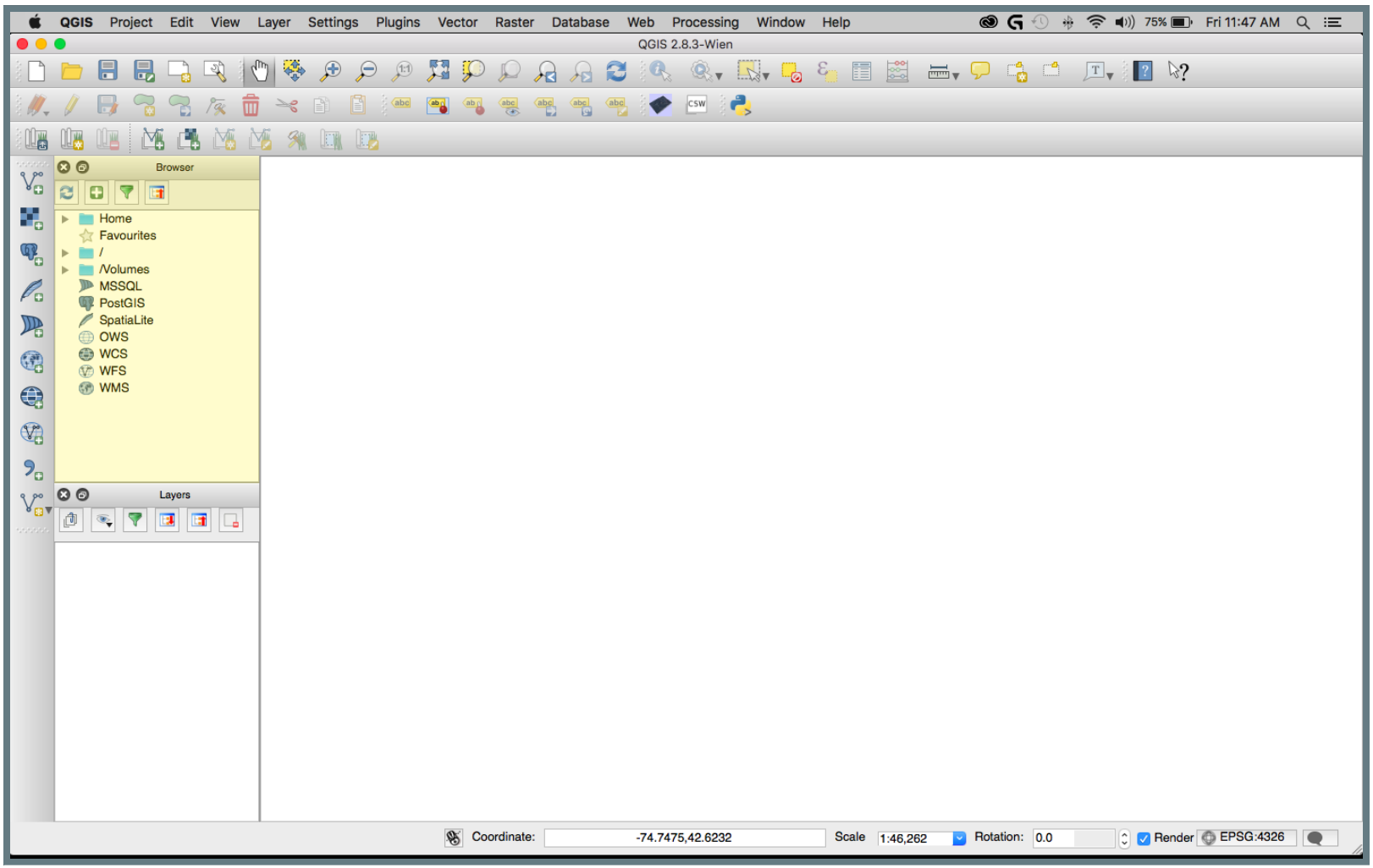
MAP INFORMATION

Projection and scale along with other info



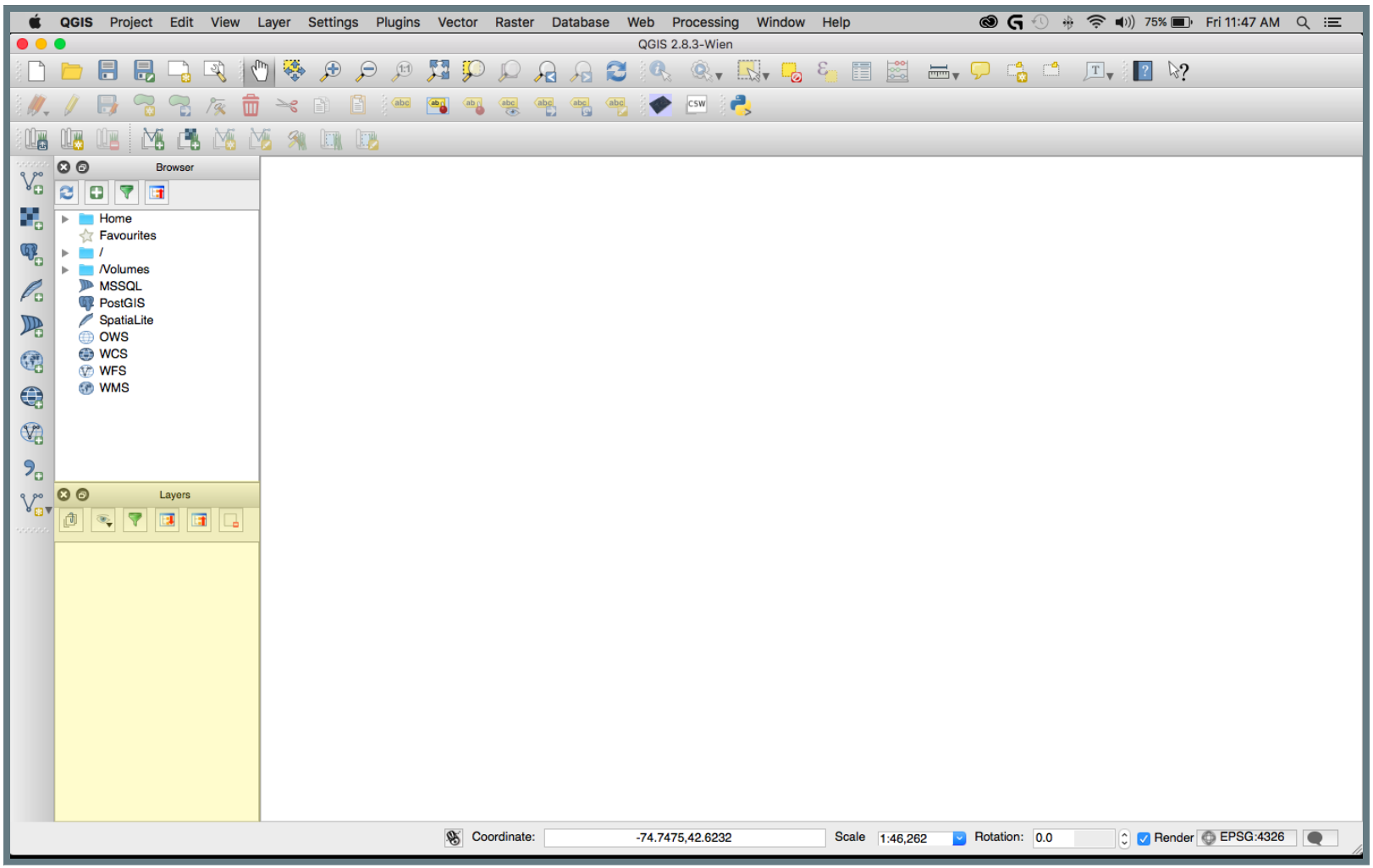
THE BROWSER PANE

Here you can navigate to your data



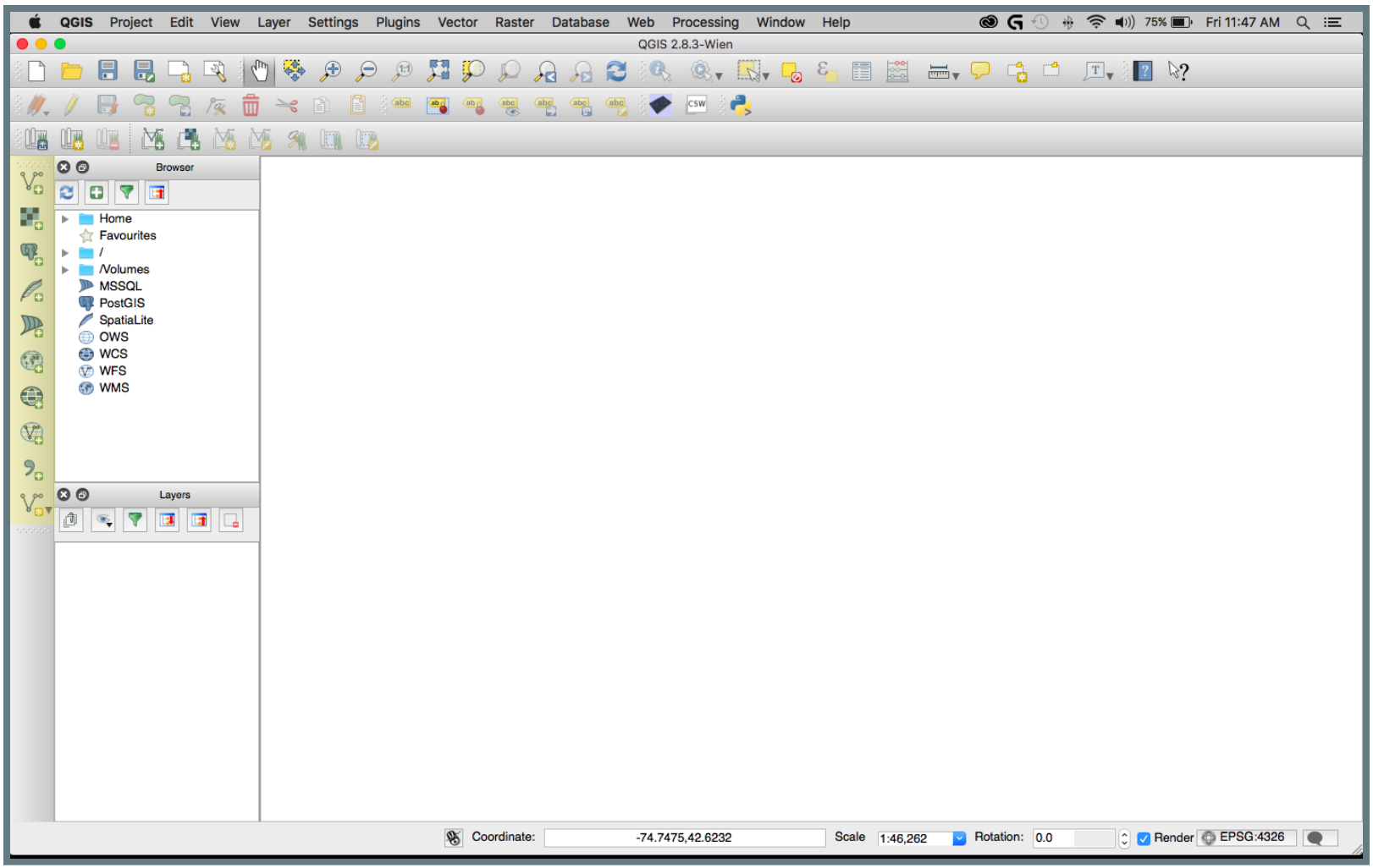
THE LAYERS PANE

Here is where QGIS displays what layers you have on your map



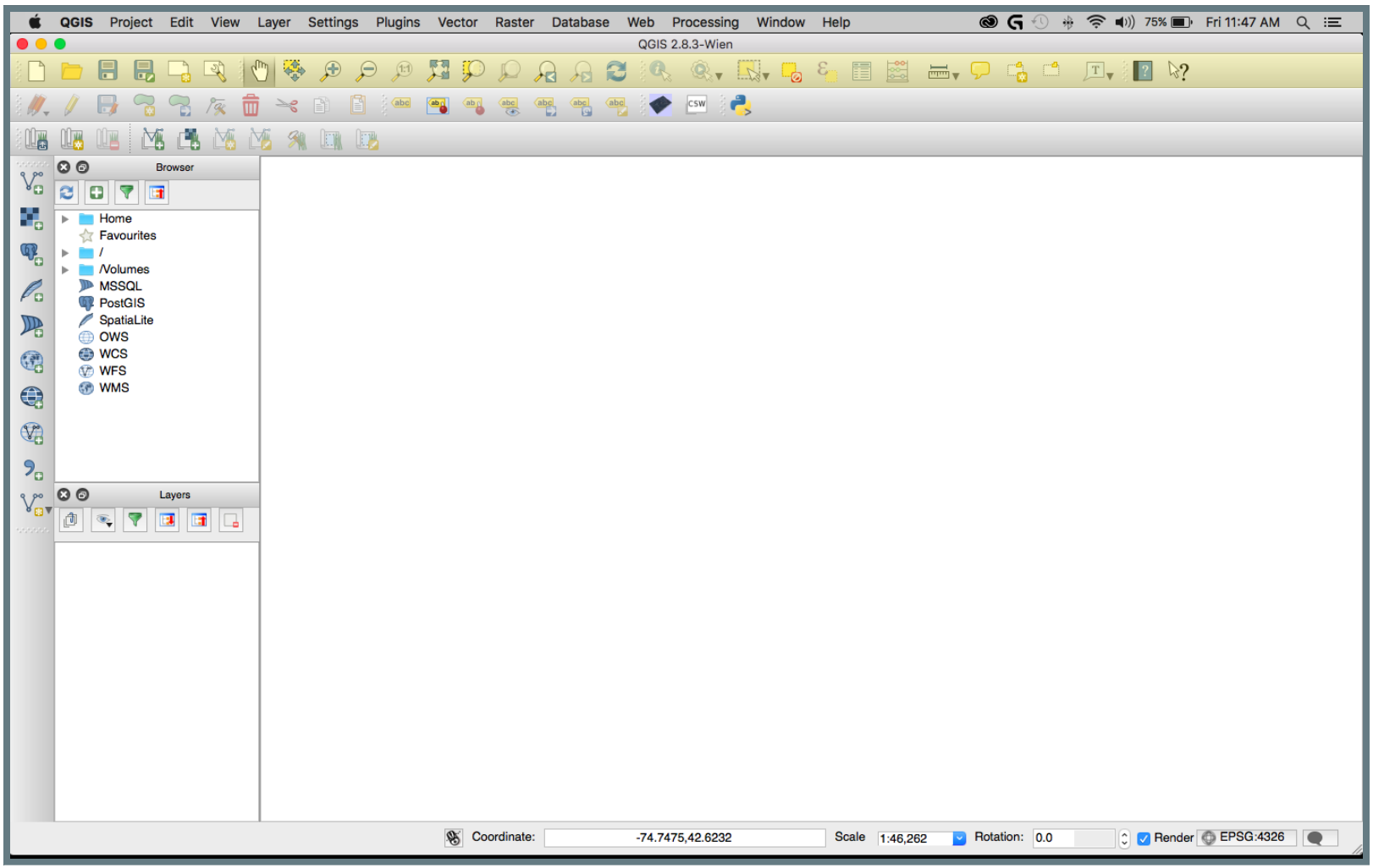
THE ADD LAYERS TOOLBAR

Here is where you add new layers



OTHER TOOLS

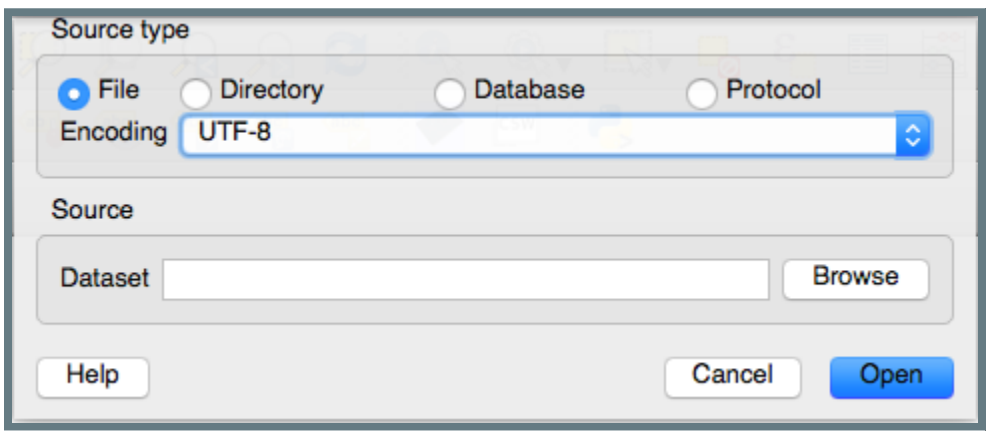
Select, pan and zoom, among others



BUILDING A MAP

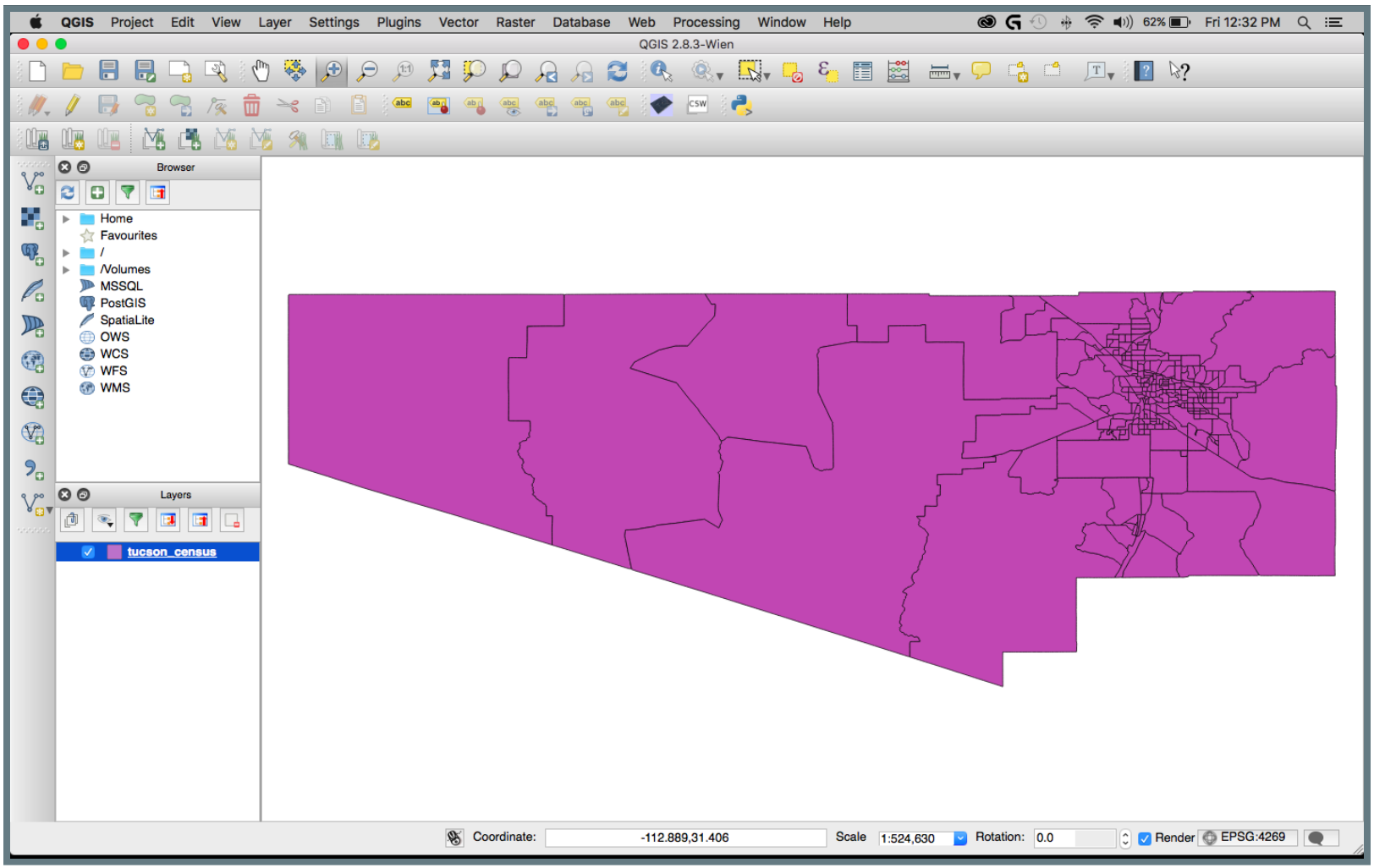
ADDING A LAYER

1. Click on the  button to add a shapefile
2. This pops up a dialog



3. Click browse and navigate to the tucson_census.shp file
3. Click open twice to add the shapefile as a layer to the map

AND WE HAVE A MAP

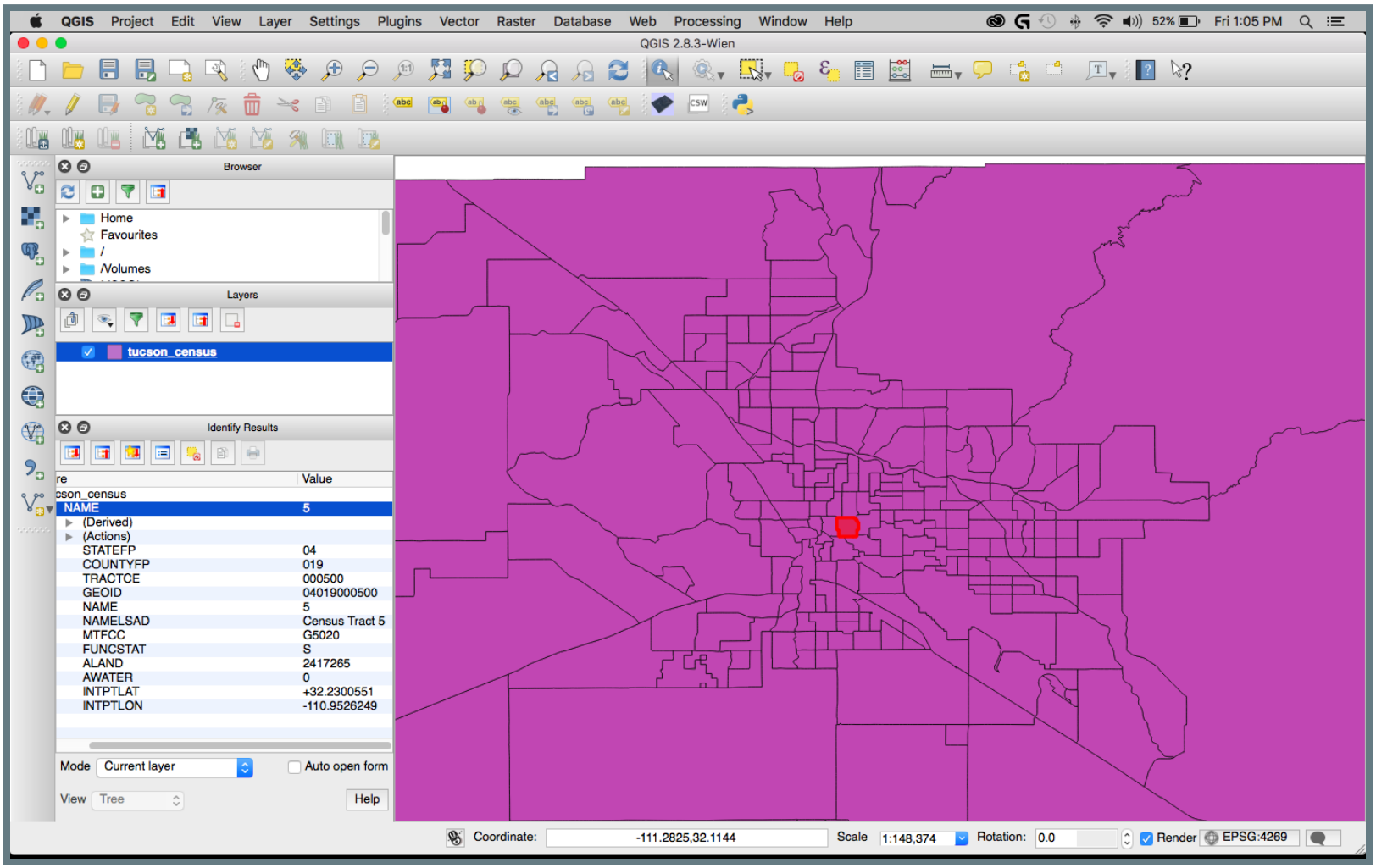


EXPLORING WHAT WE HAVE SO FAR

This layer is basically a feature collection. Each individual polygon within it is known as a feature. Let's explore a feature.

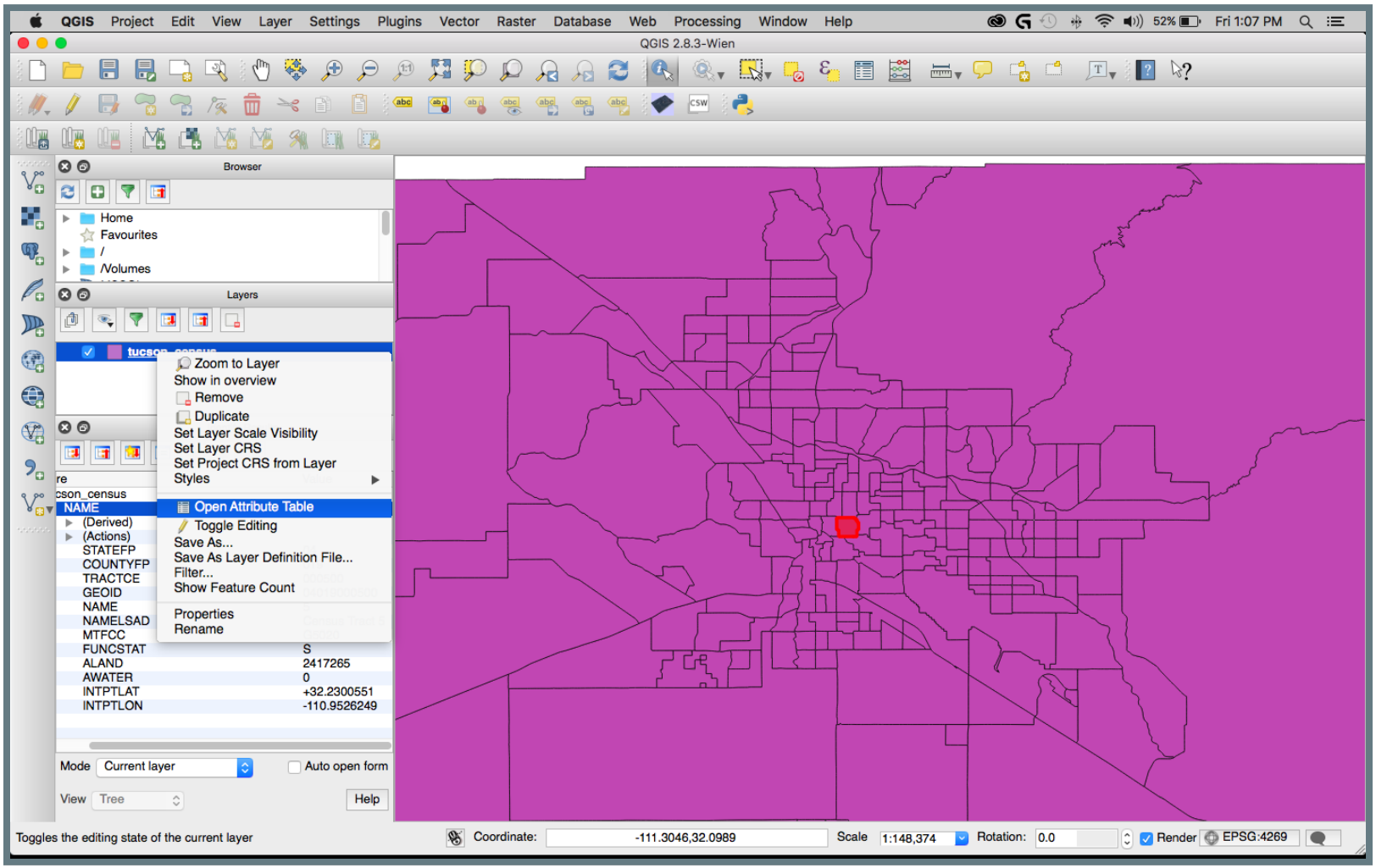
1. Click on the  icon in the top toolbar. Then click in the map to zoom in to an area.
2. Click on the  in the top toolbar to bring up the Identify Features Tool. Click on a feature within the map.

This brings up a new box below the Layers pane containing information about the feature you clicked on. The clicked feature will also be highlighted.

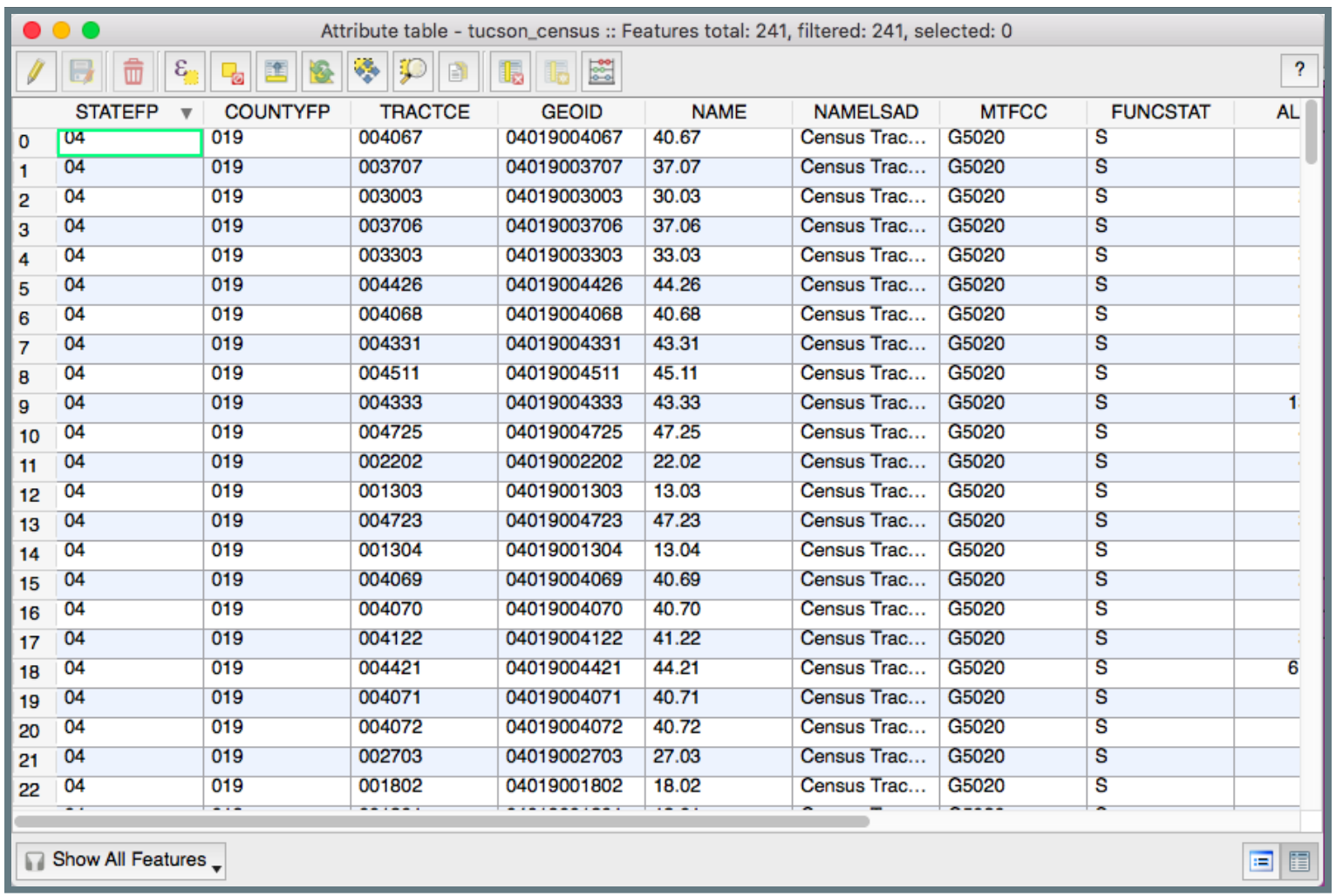


We can also bring up information about all features by accessing the data behind the shapefile.

Right click on the layer and select Open Attribute Table to bring up the data.



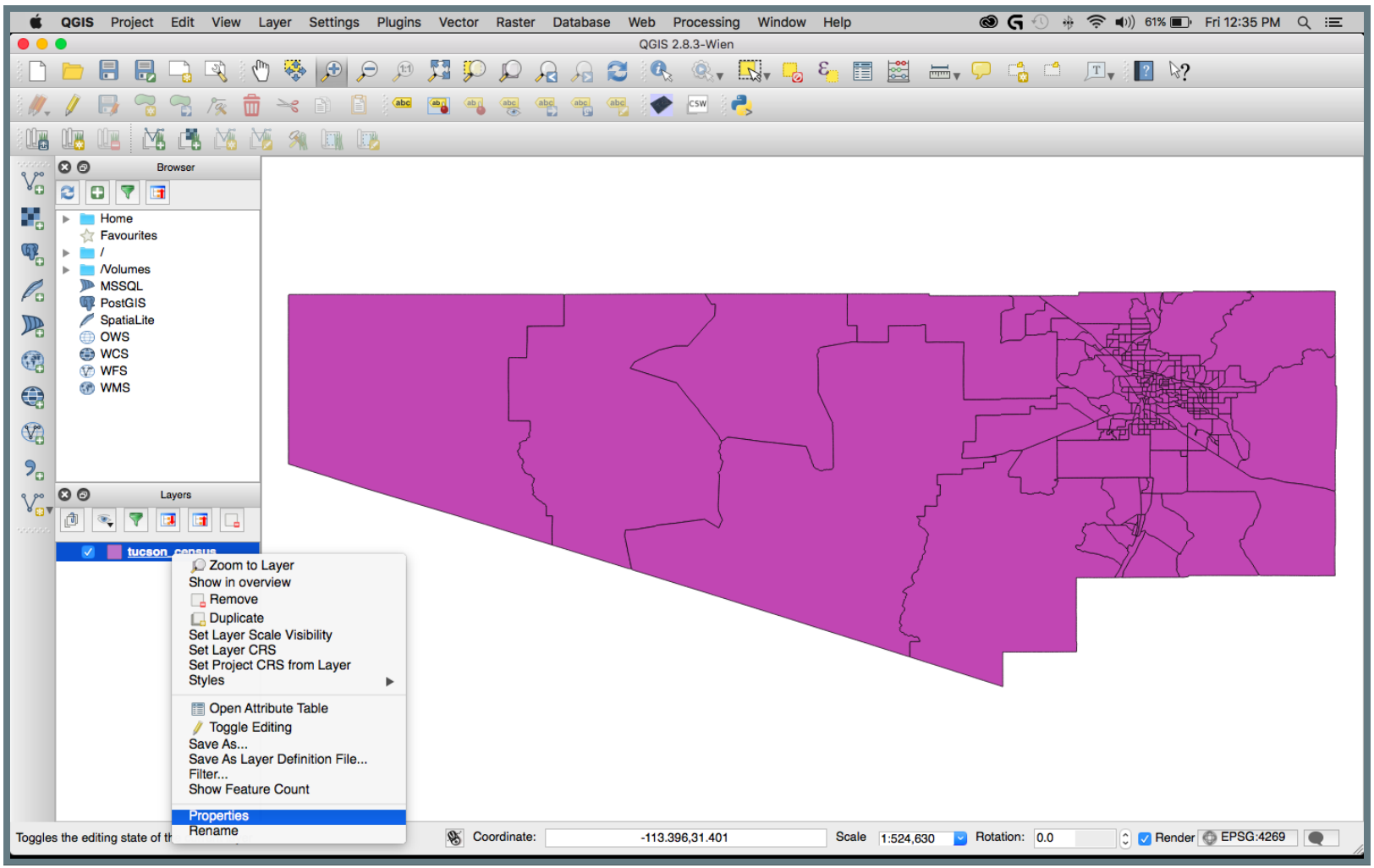
This opens a new window displaying the data in a spreadsheet format. The data can be selected, searched, sorted and filtered here. You can also perform calculations and add new columns here.



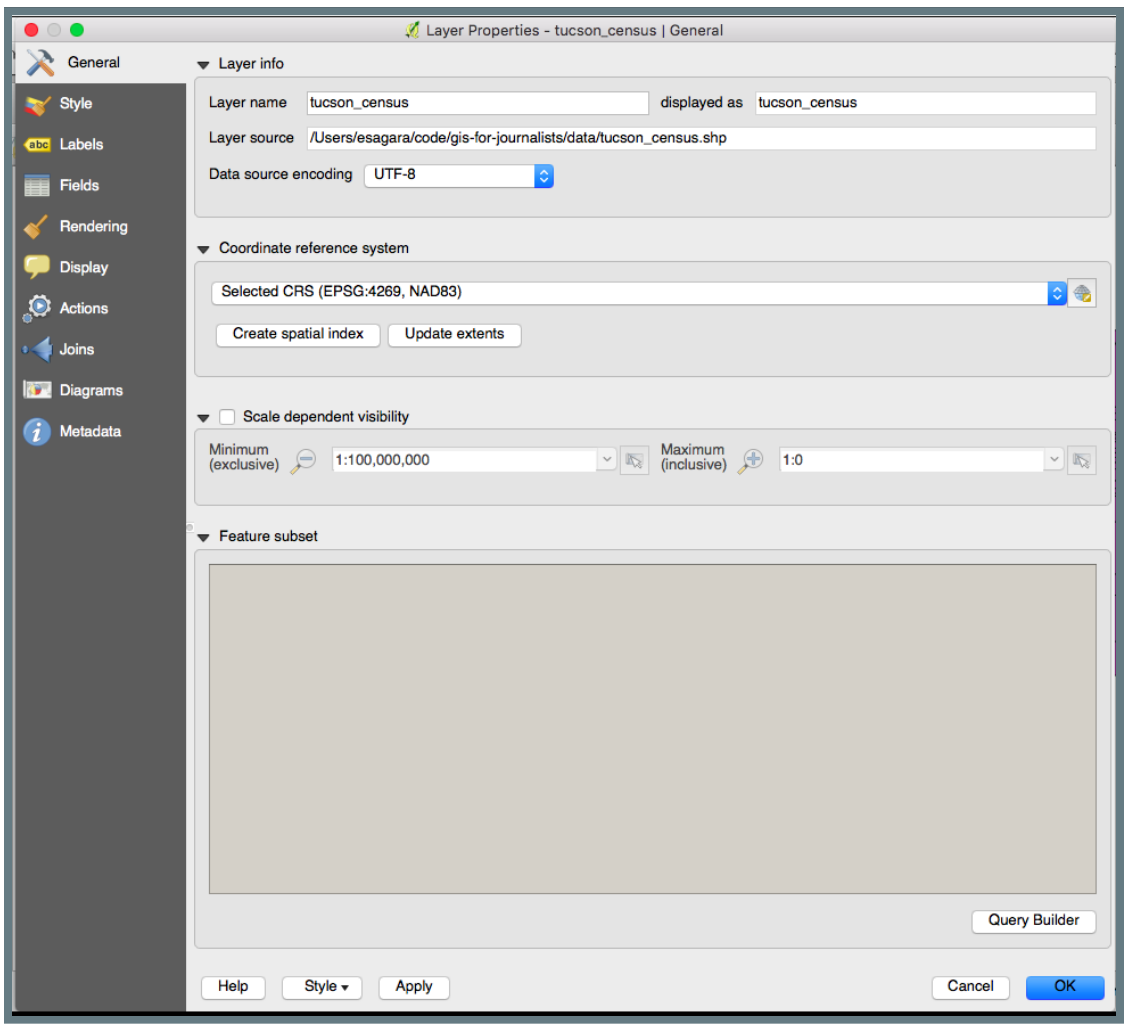
	STATEFP	COUNTYFP	TRACTCE	GEOID	NAME	NAMELSAD	MTFCC	FUNCSTAT	AL
0	04	019	004067	04019004067	40.67	Census Trac...	G5020	S	
1	04	019	003707	04019003707	37.07	Census Trac...	G5020	S	
2	04	019	003003	04019003003	30.03	Census Trac...	G5020	S	
3	04	019	003706	04019003706	37.06	Census Trac...	G5020	S	
4	04	019	003303	04019003303	33.03	Census Trac...	G5020	S	
5	04	019	004426	04019004426	44.26	Census Trac...	G5020	S	
6	04	019	004068	04019004068	40.68	Census Trac...	G5020	S	
7	04	019	004331	04019004331	43.31	Census Trac...	G5020	S	
8	04	019	004511	04019004511	45.11	Census Trac...	G5020	S	
9	04	019	004333	04019004333	43.33	Census Trac...	G5020	S	1
10	04	019	004725	04019004725	47.25	Census Trac...	G5020	S	
11	04	019	002202	04019002202	22.02	Census Trac...	G5020	S	
12	04	019	001303	04019001303	13.03	Census Trac...	G5020	S	
13	04	019	004723	04019004723	47.23	Census Trac...	G5020	S	
14	04	019	001304	04019001304	13.04	Census Trac...	G5020	S	
15	04	019	004069	04019004069	40.69	Census Trac...	G5020	S	
16	04	019	004070	04019004070	40.70	Census Trac...	G5020	S	
17	04	019	004122	04019004122	41.22	Census Trac...	G5020	S	
18	04	019	004421	04019004421	44.21	Census Trac...	G5020	S	6
19	04	019	004071	04019004071	40.71	Census Trac...	G5020	S	
20	04	019	004072	04019004072	40.72	Census Trac...	G5020	S	
21	04	019	002703	04019002703	27.03	Census Trac...	G5020	S	
22	04	019	001802	04019001802	18.02	Census Trac...	G5020	S	

STYLING THE LAYER

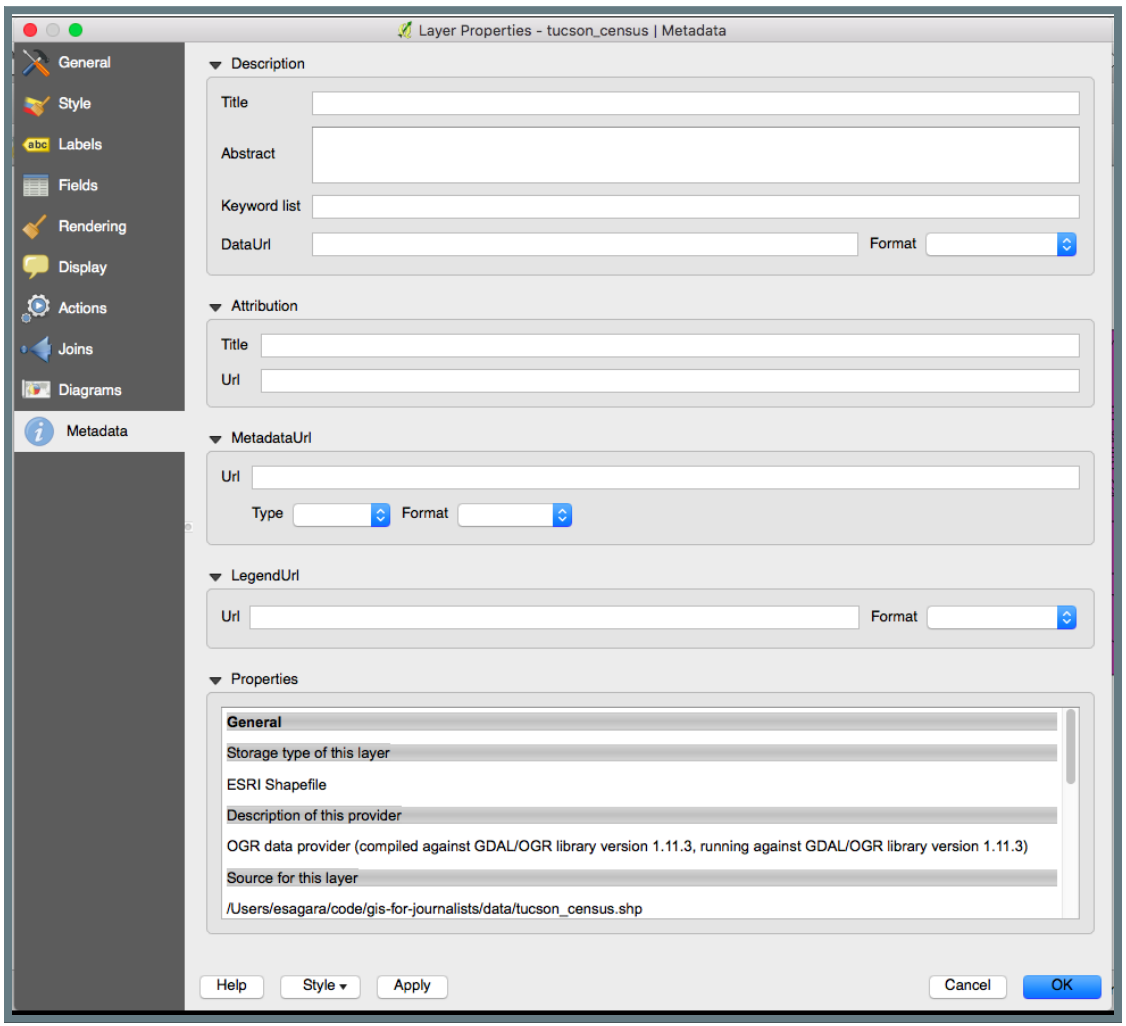
In the layers pane, right click on the tucson_census layer and select "Properties" to bring up information about the layer.



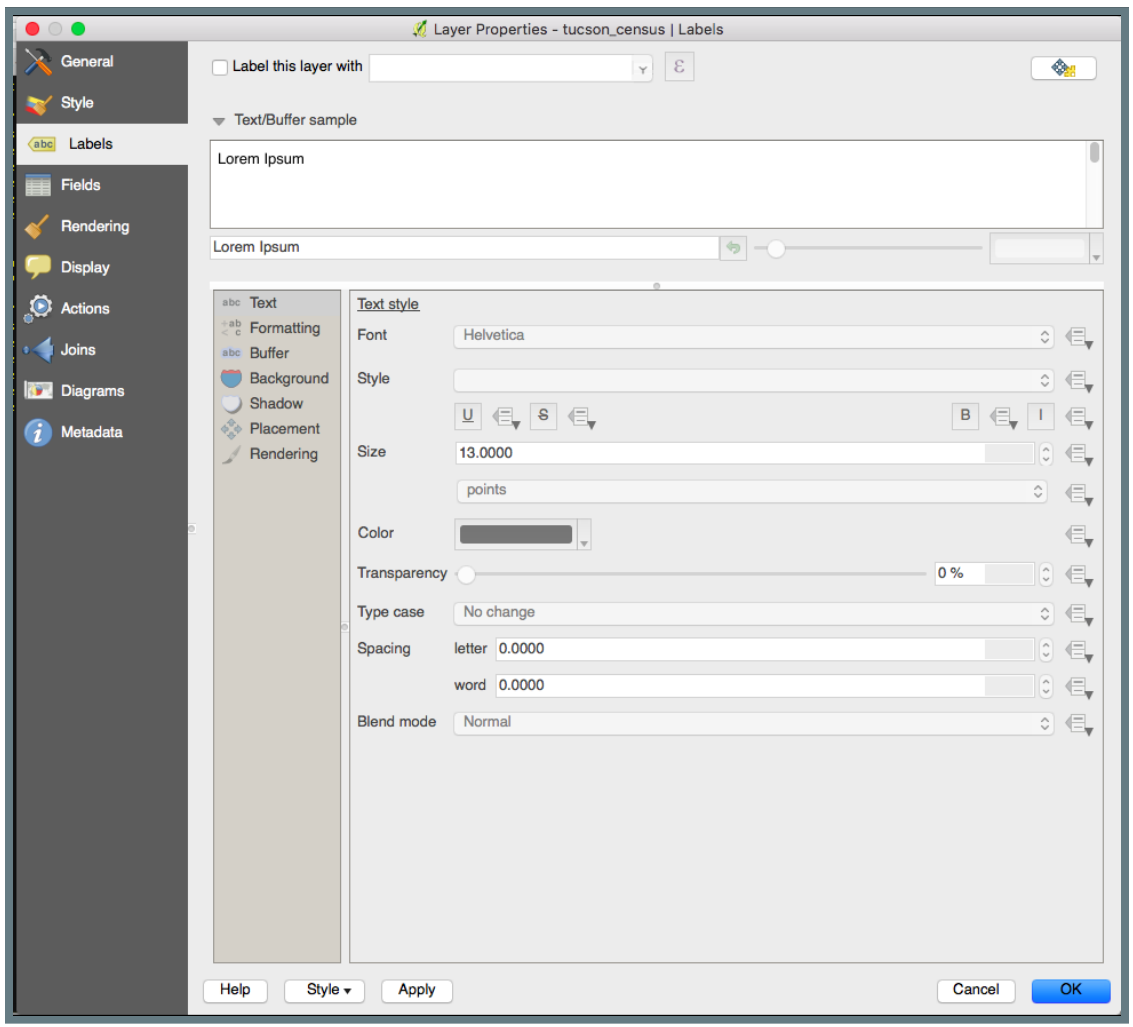
Clicking on the General tab brings up information about the layer, including its Coordinate Reference System (more about that later).



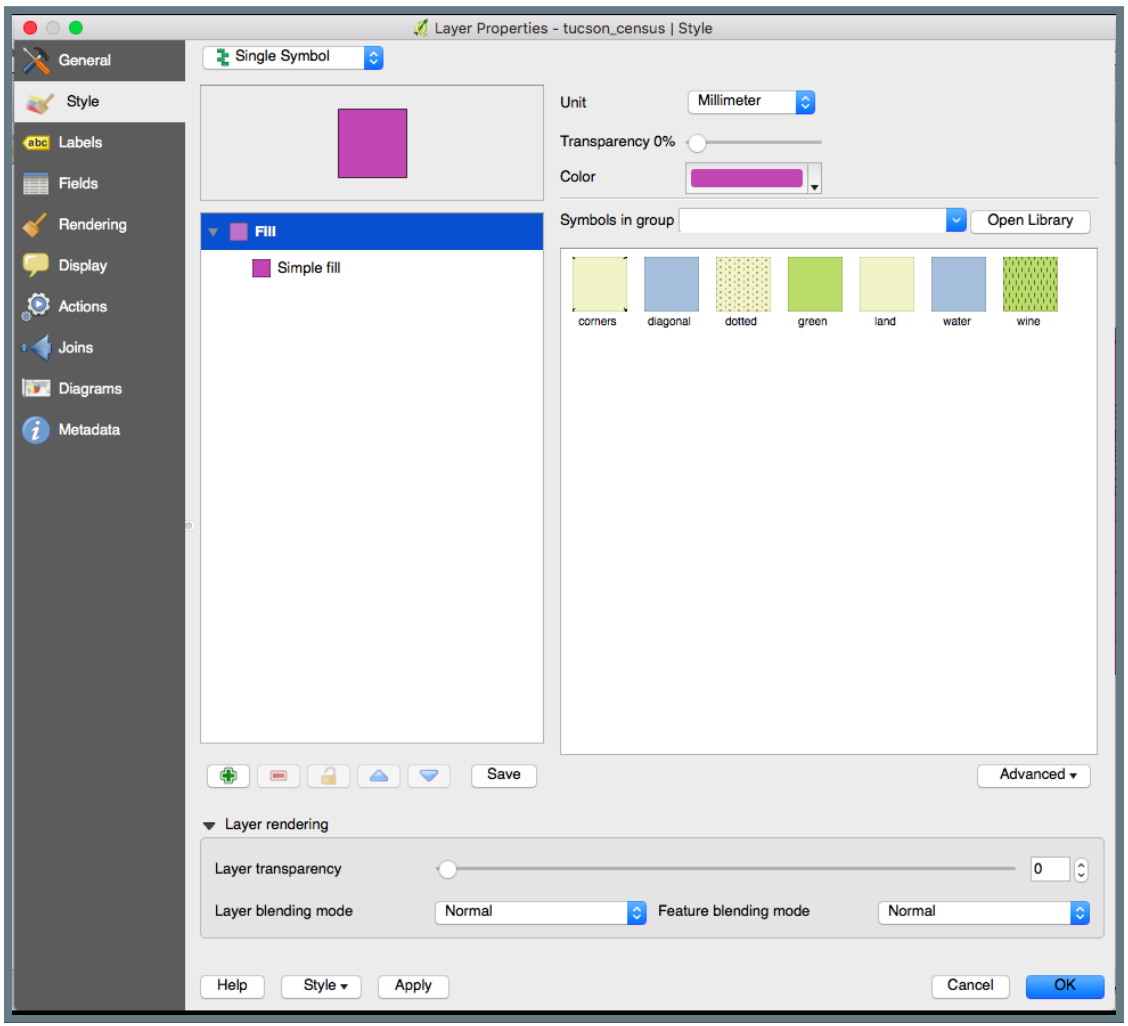
The Metadata tab contains more detailed information about the dataset, including some more geographic information.



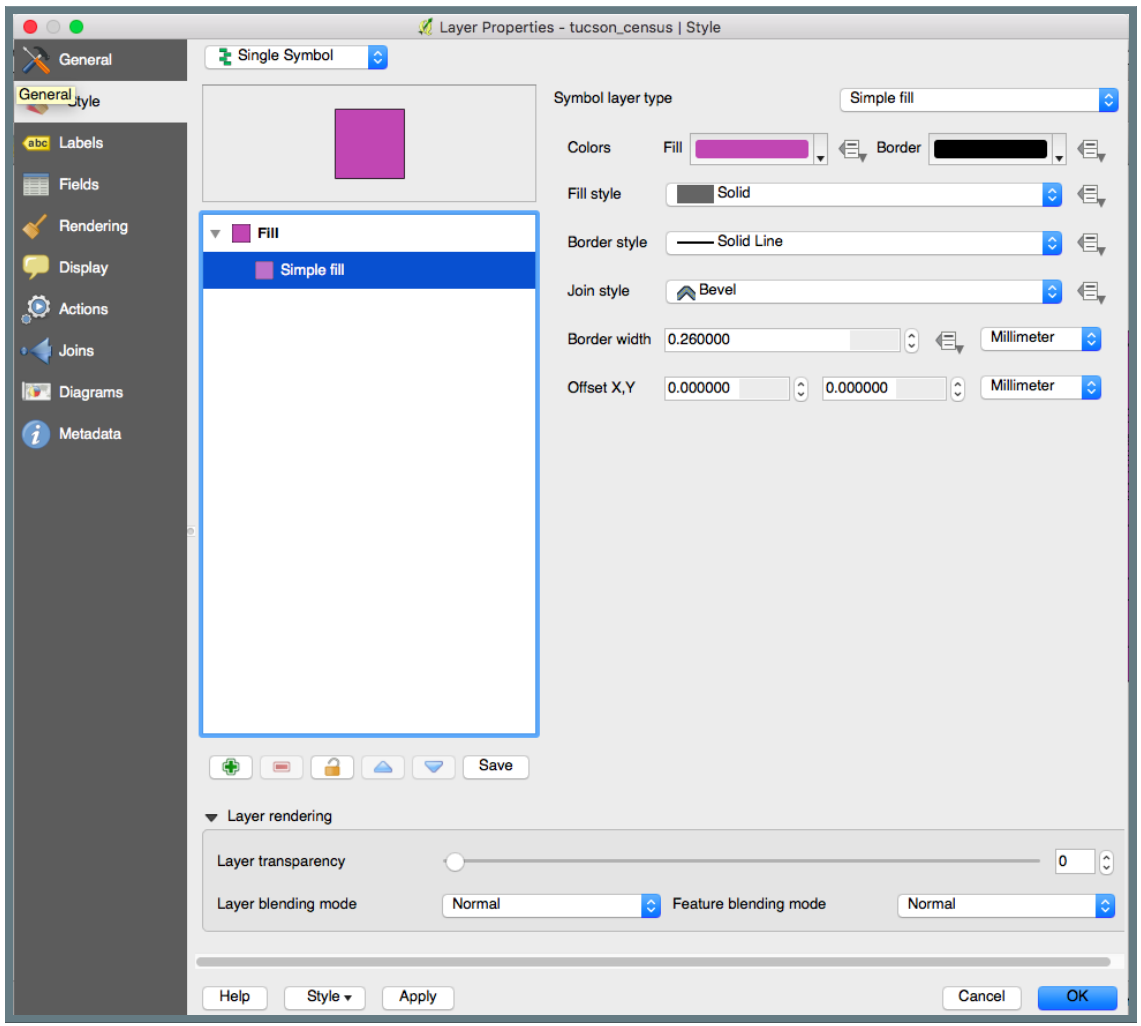
The labels tab allows us to set how the individual features in the layer are labeled. We often handle labeling outside of QGIS, so we are going to skip this.



The style tab allows us to color and set borders on the features within the layer.



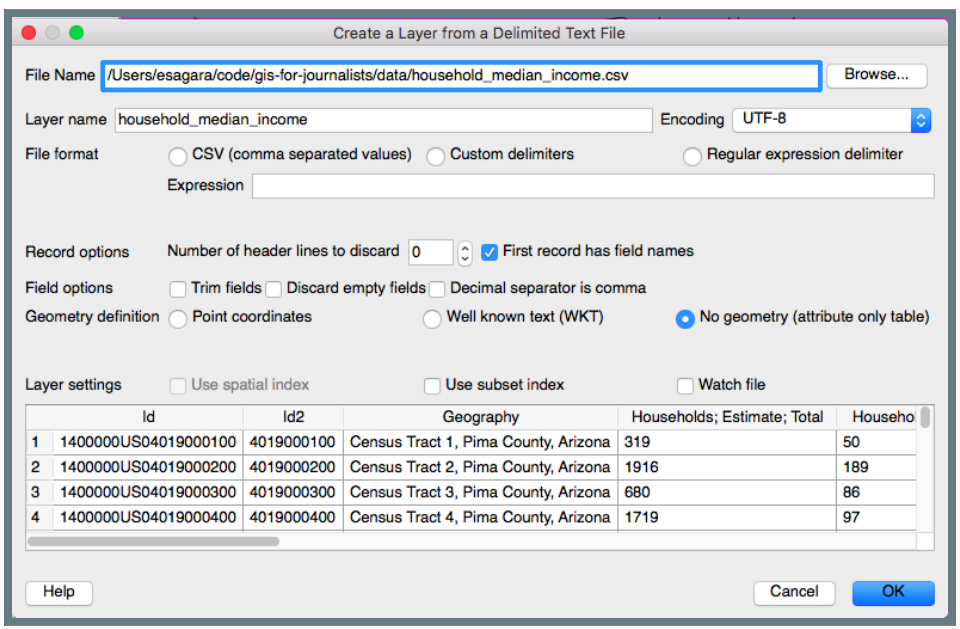
Clicking the Simple Fill button brings up a dialog box allowing us to set the color and border of the features.



JOINING DATA TO THE LAYER

ADDING A CSV FILE

1. Start by clicking on the  in the toolbar to the left of your screen.
2. This brings up a dialog box. Click Browse, navigate to the household_median_income.csv and open it. Make sure the No Geometry option is clicked before hitting OK.



AN IMPORTANT NOTE:

QGIS automatically interpets all numbers as integers when it imports a CSV file. This can be problematic when you have a number with a leading zero that you need to preserve because integers strip those out.

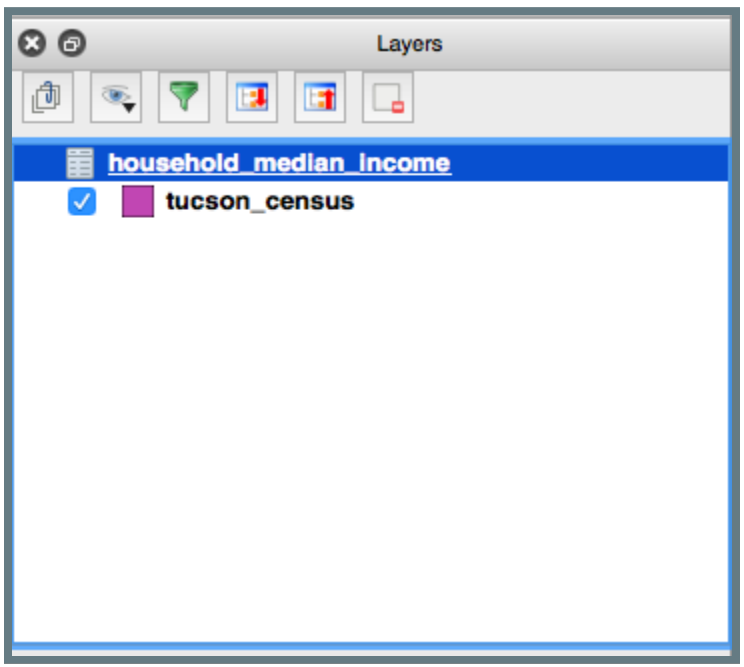
THE SOLUTION

The solution is to create a separate file similar to a CSV but with only one row. This file is saved as a .csvt file with the same name as your CSV file. In this case it would be household_median_income.csvt.

The single row contains a comma-separated list of the data types (encapsulated in quotes) for each column.

```
"String","String","String","Integer","Integer","Integer","Integer"
```

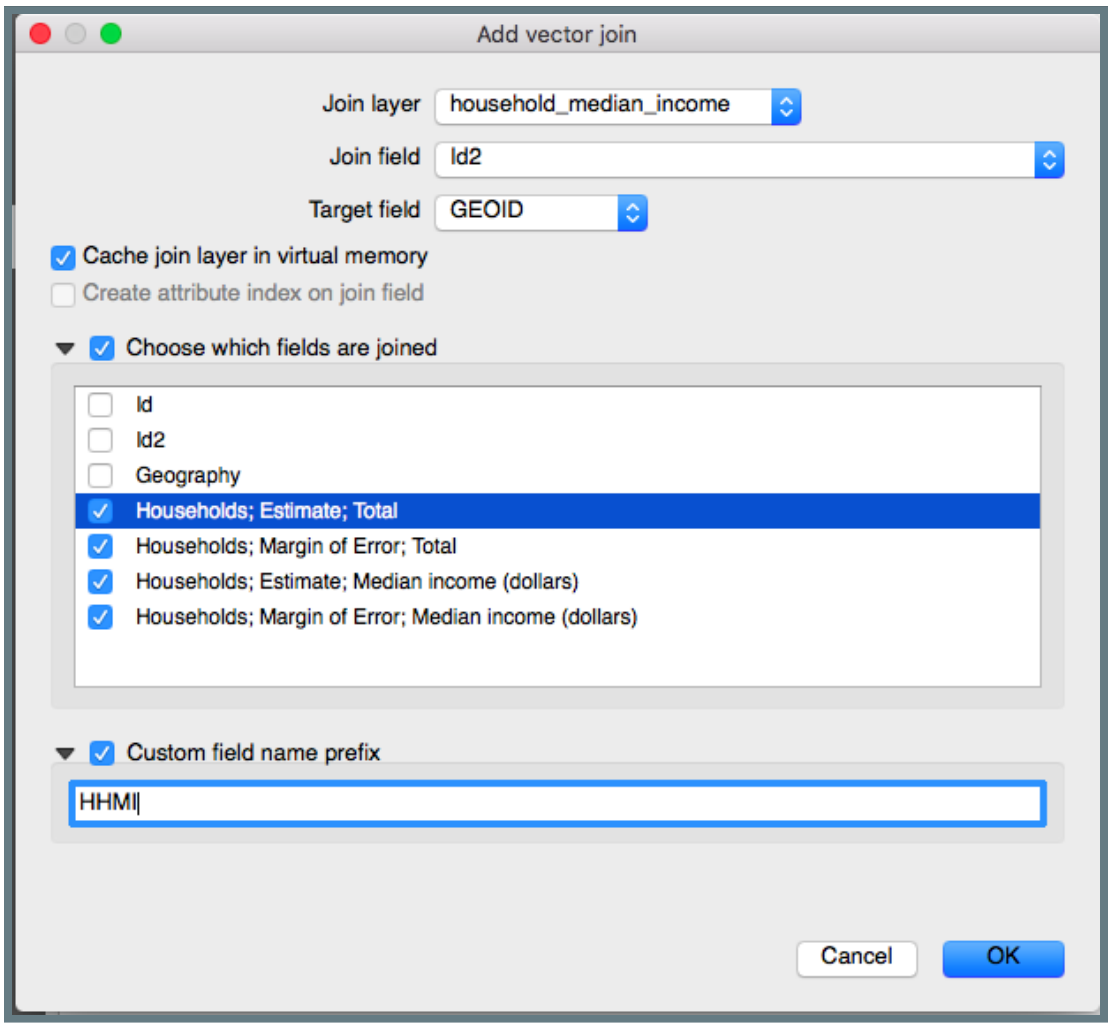
By now the file should appear in your layers as a new item.



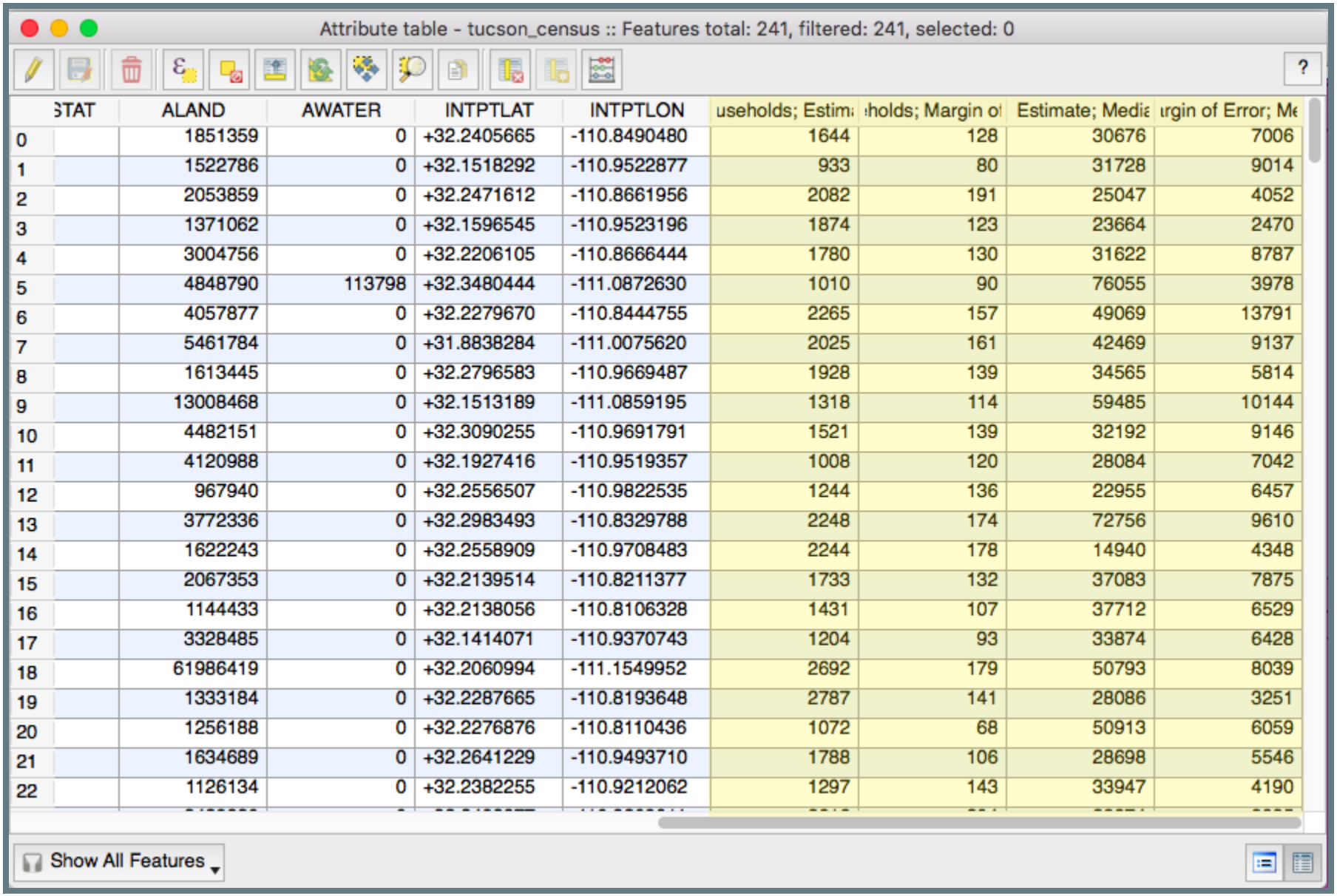
JOINING THE TWO LAYERS

1. Open up the properties for the tucson_census layer.
2. Click the  button at the bottom.
3. In the dialog box make sure the Join Layer is household_median_income. Set the Join Field to "Id2" and the Target Field to "GEOID."
4. Click on "Choose which fields are joined" and select the last four options.
5. Click on "Custom field prefix" and change it to HHMI.
6. Click OK to close the dialog and then OK to close the layer properties.

The dialog box filled out:

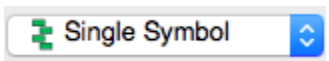


You should now have four new columns at the end of the tucson_census attribute table.

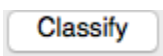


	STAT	ALAND	AWATER	INTPTLAT	INTPTLON	useholds; Estim	holds; Margin of	Estimate; Media	rgin of Error; Me
0		1851359	0	+32.2405665	-110.8490480	1644	128	30676	7006
1		1522786	0	+32.1518292	-110.9522877	933	80	31728	9014
2		2053859	0	+32.2471612	-110.8661956	2082	191	25047	4052
3		1371062	0	+32.1596545	-110.9523196	1874	123	23664	2470
4		3004756	0	+32.2206105	-110.8666444	1780	130	31622	8787
5		4848790	113798	+32.3480444	-111.0872630	1010	90	76055	3978
6		4057877	0	+32.2279670	-110.8444755	2265	157	49069	13791
7		5461784	0	+31.8838284	-111.0075620	2025	161	42469	9137
8		1613445	0	+32.2796583	-110.9669487	1928	139	34565	5814
9		13008468	0	+32.1513189	-111.0859195	1318	114	59485	10144
10		4482151	0	+32.3090255	-110.9691791	1521	139	32192	9146
11		4120988	0	+32.1927416	-110.9519357	1008	120	28084	7042
12		967940	0	+32.2556507	-110.9822535	1244	136	22955	6457
13		3772336	0	+32.2983493	-110.8329788	2248	174	72756	9610
14		1622243	0	+32.2558909	-110.9708483	2244	178	14940	4348
15		2067353	0	+32.2139514	-110.8211377	1733	132	37083	7875
16		1144433	0	+32.2138056	-110.8106328	1431	107	37712	6529
17		3328485	0	+32.1414071	-110.9370743	1204	93	33874	6428
18		61986419	0	+32.2060994	-111.1549952	2692	179	50793	8039
19		1333184	0	+32.2287665	-110.8193648	2787	141	28086	3251
20		1256188	0	+32.2276876	-110.8110436	1072	68	50913	6059
21		1634689	0	+32.2641229	-110.9493710	1788	106	28698	5546
22		1126134	0	+32.2382255	-110.9212062	1297	143	33947	4190

COLORING OUR NEW MAP

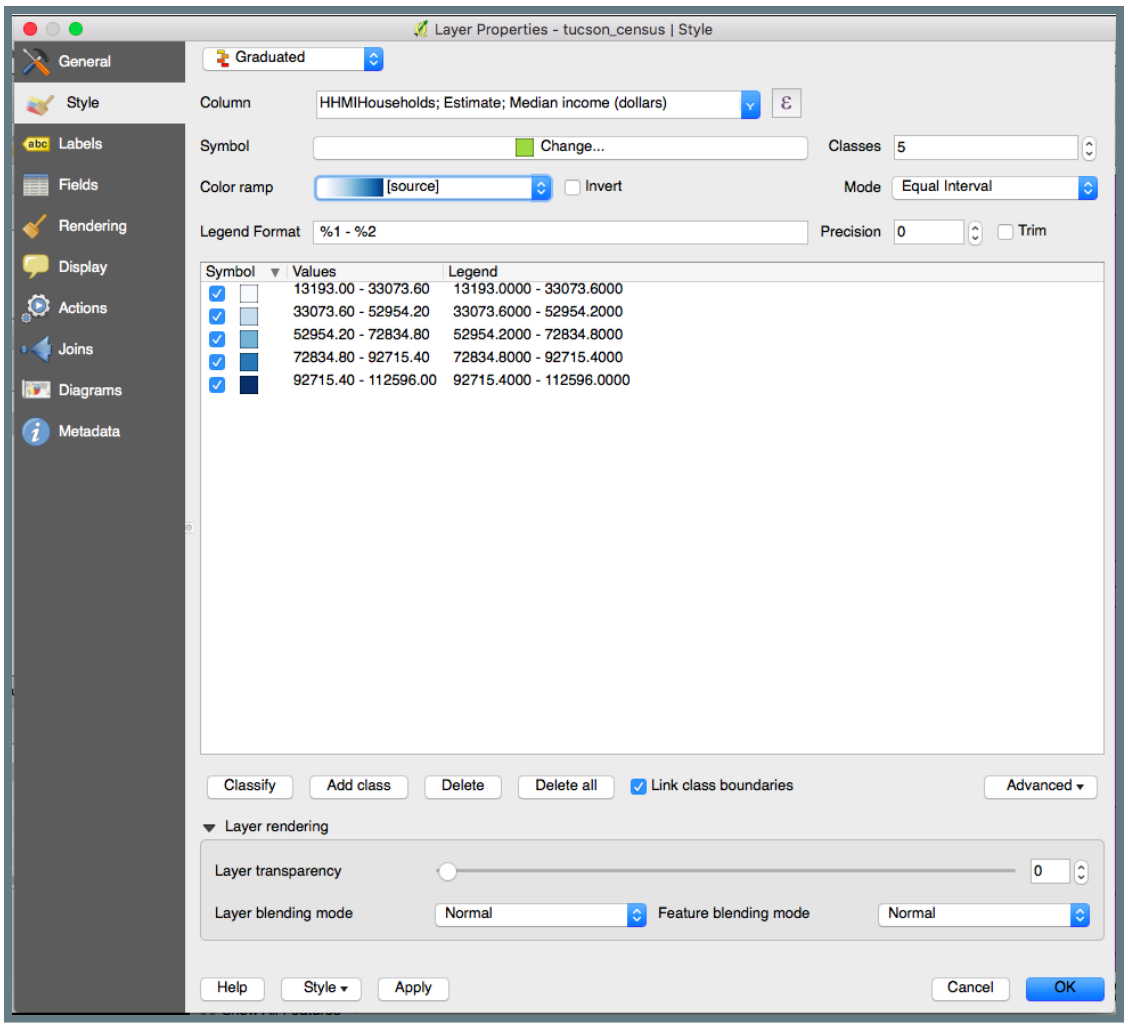
1. To begin open up the properties for tucson_census.
2. Change 

to 

.
3. Select the next to last option under "Column."
4. Select a color ramp of your choice.
5. Hit the 

button.

This is what your dialog should look like.

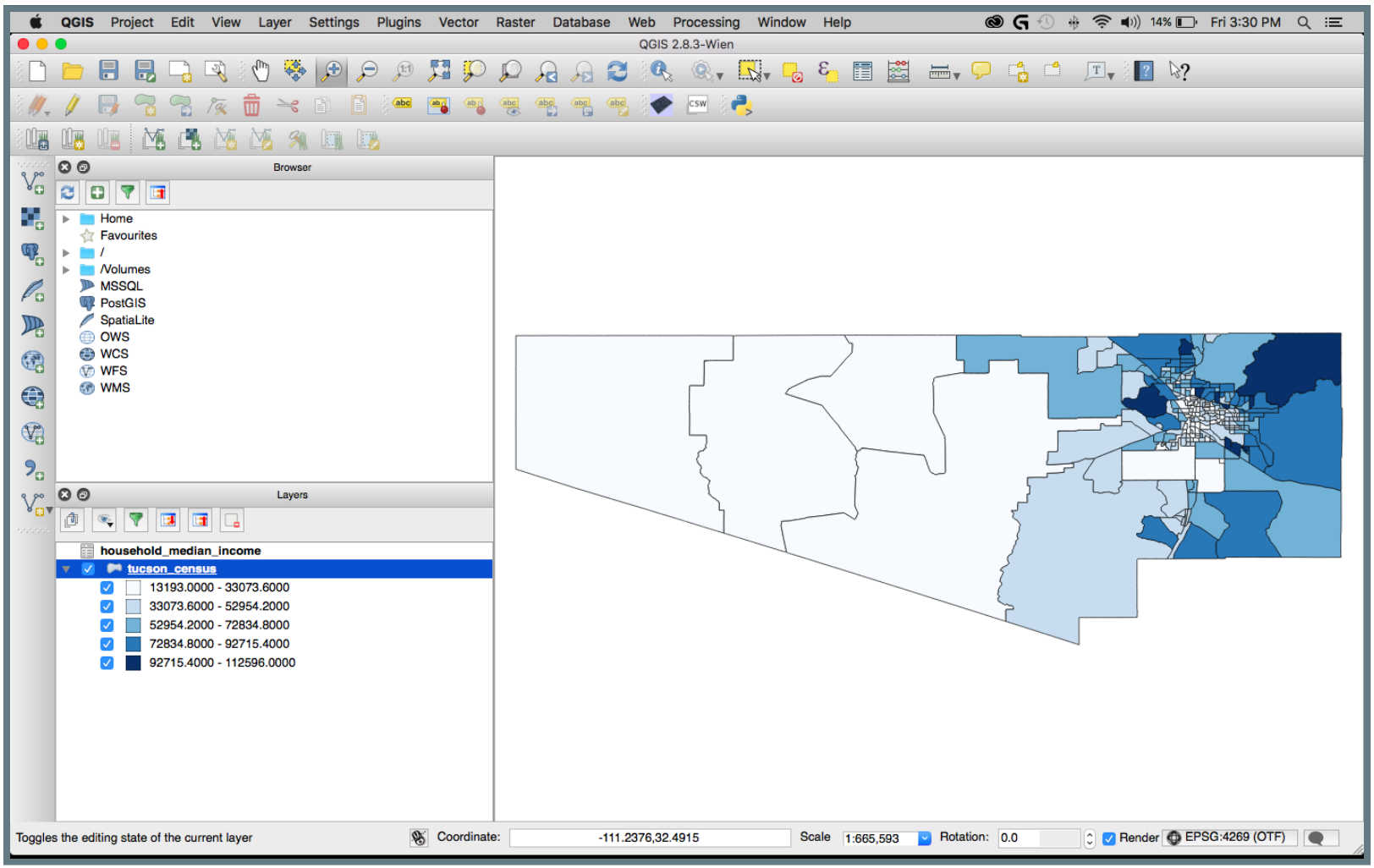


A FEW QUICK NOTES

You can change the number of categories you want to display by changing "Classes" to the prefered number. However large amounts of classes tend to dilute the analysis while smaller amounts obscure results.

You can also change how QGIS calculates where to split up the categories under the "Mode" option. There is a lot of math behind some of these choices and they have specific use cases. Research these options before using them.

THE FINISHED MAP



SAVING YOUR WORK

Aside from saving the entire project, you can also export your tucson_census to a new file containing the joined data.

TO SAVE TO SHAPEFILE

1. Right click on tucson_census in the Layers panel and select "Save As..."
2. Make sure 'ESRI Shapefile' is selected at the top.
3. On the next line, click Browse to navigate to the folder where you want to save your data. Name your file and click "Save."
4. Change your projection if needed.
5. Click OK. A layer with the new shapefile should be added to your map.

SAVING TO KML

Save your map to this format if you plan to use it online with Google Fusion Tables, Google Earth or most other online programs.

1. Right click on tucson_census in the Layers panel and select "Save As..."
2. Make sure "Keyhole Markup Language [KML]" is selected at the top.
3. On the next line, click Browse to navigate to the folder where you want to save your data. Name your file and click "Save."

4. On the line labeled CRS click the  icon.
5. Select or search for the option that says 'EPSG:4326.' This is the projection used by all KML files.
6. Under Datasource Options change DescriptionField to 'HHMIMedian Income' and NameField to "NAMELSAD."
7. Hit OK and your new KML file should be added to the map.

CONGRATULATIONS!

YOU'VE CREATED YOUR FIRST MAP

This presentation and other handouts can be found online at
https://github.com/newshackaz/gis-for-journalists