WORKING WITH QGIS

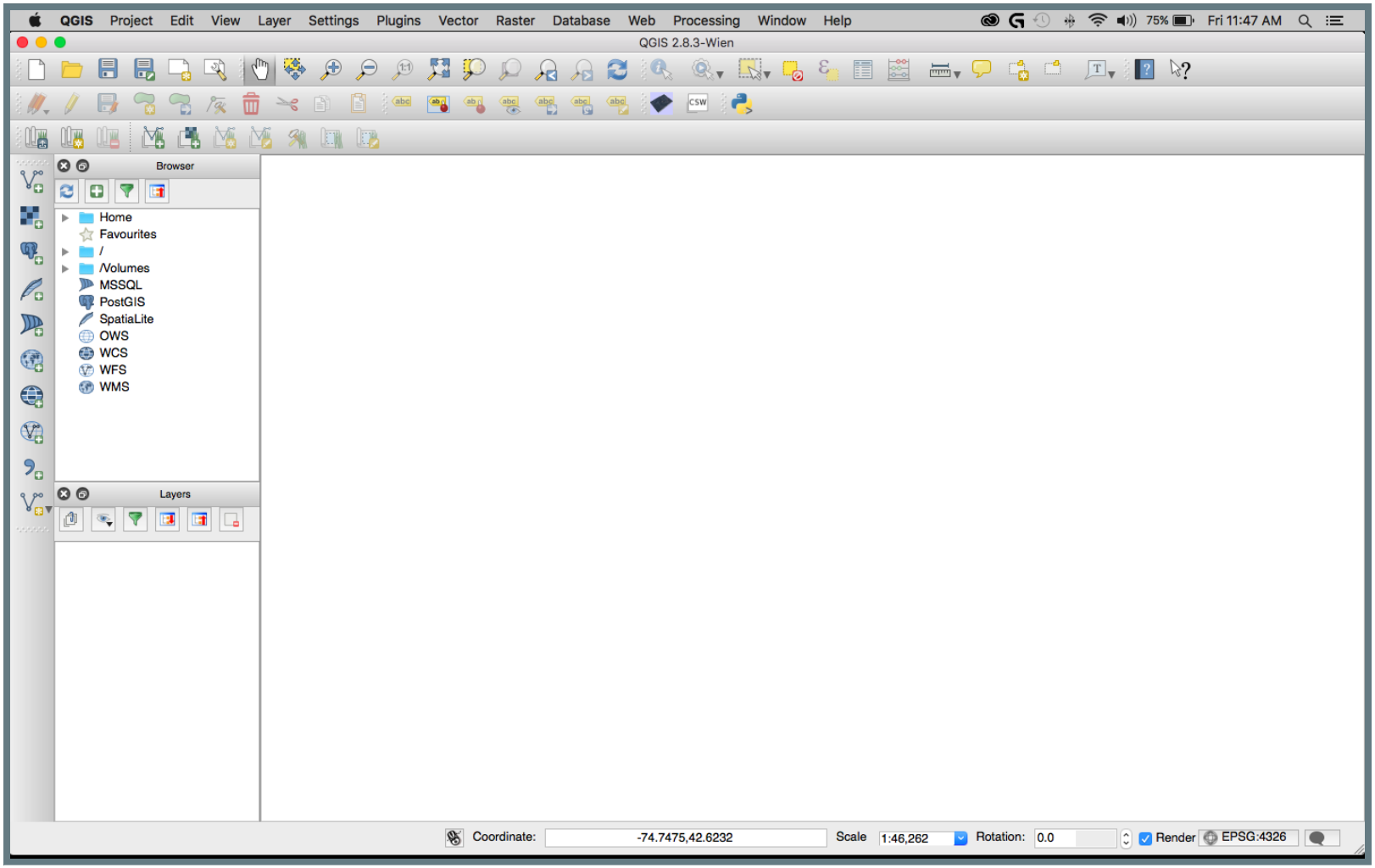
ERIC SAGARA

Reveal / Center for Investigative Reporting

esagara@cironline.org | @esagara

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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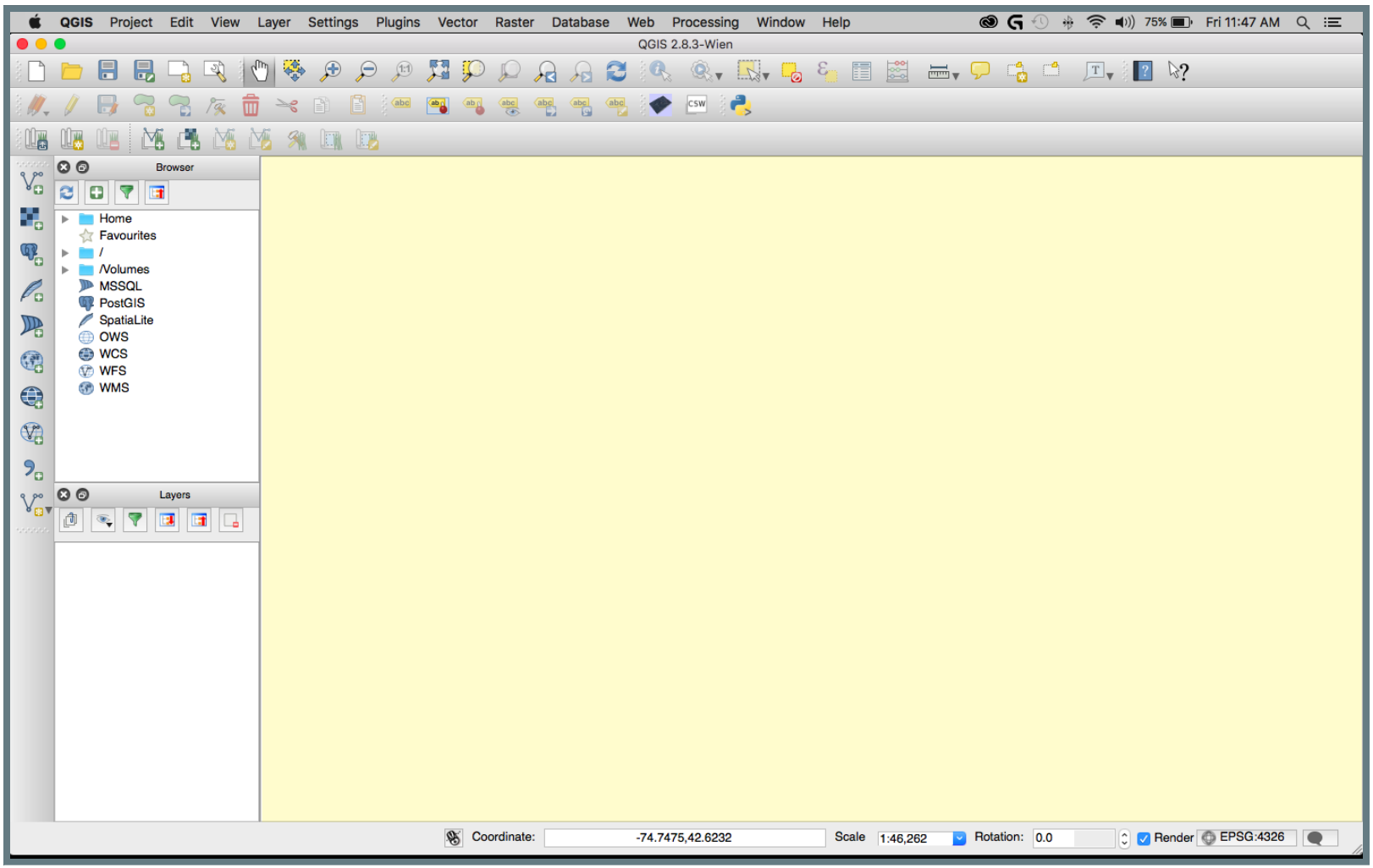
MSSQL
PostGIS
SpatiaLite
OWS
WCS
WFS
WMS
Layers
Coordinate:
-74.7475,42.6232
Scale
1:46,262
Rotation:
0.0
Render
EPSG:4326

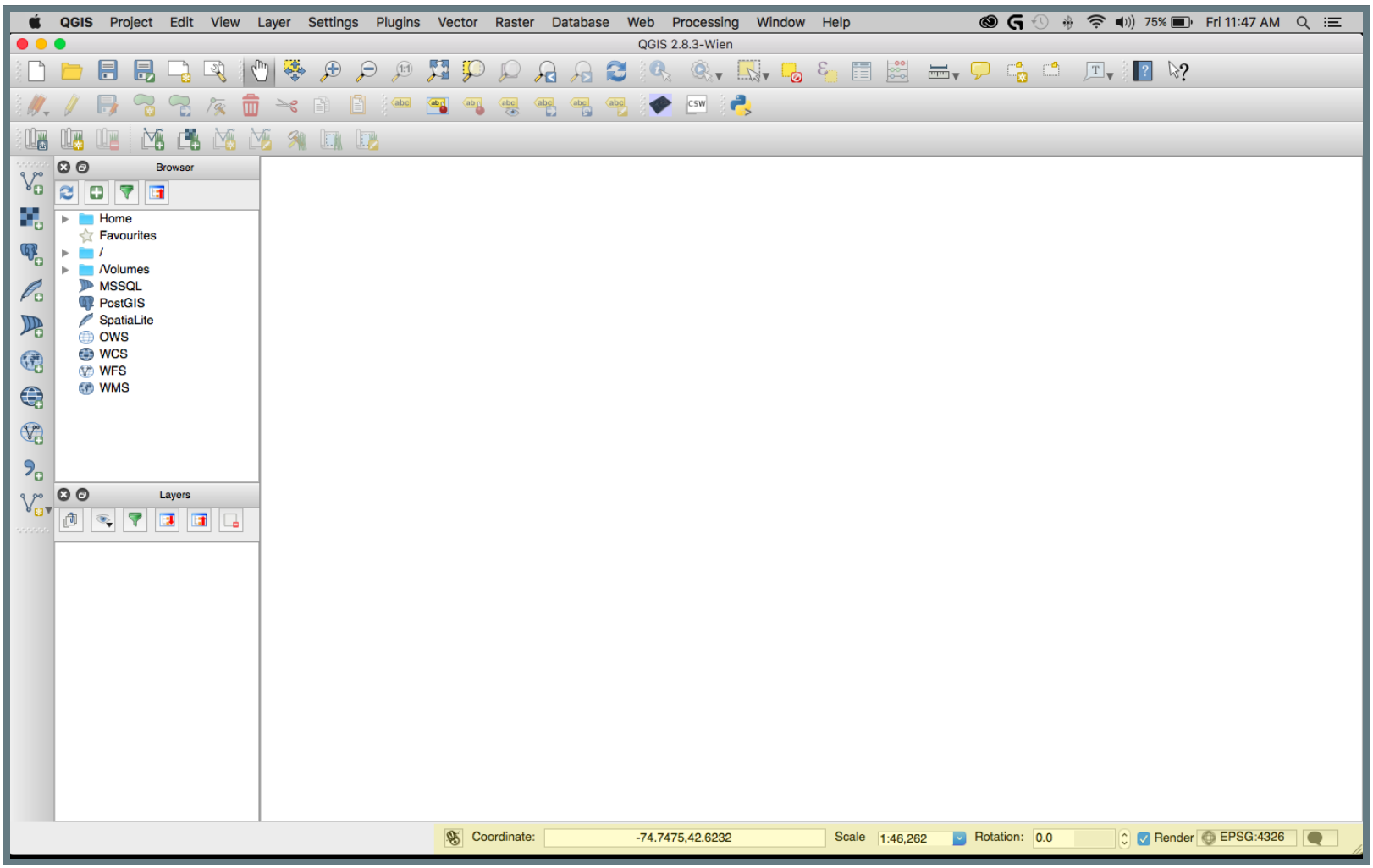
THE MAP PANE

This is where your map will be displayed



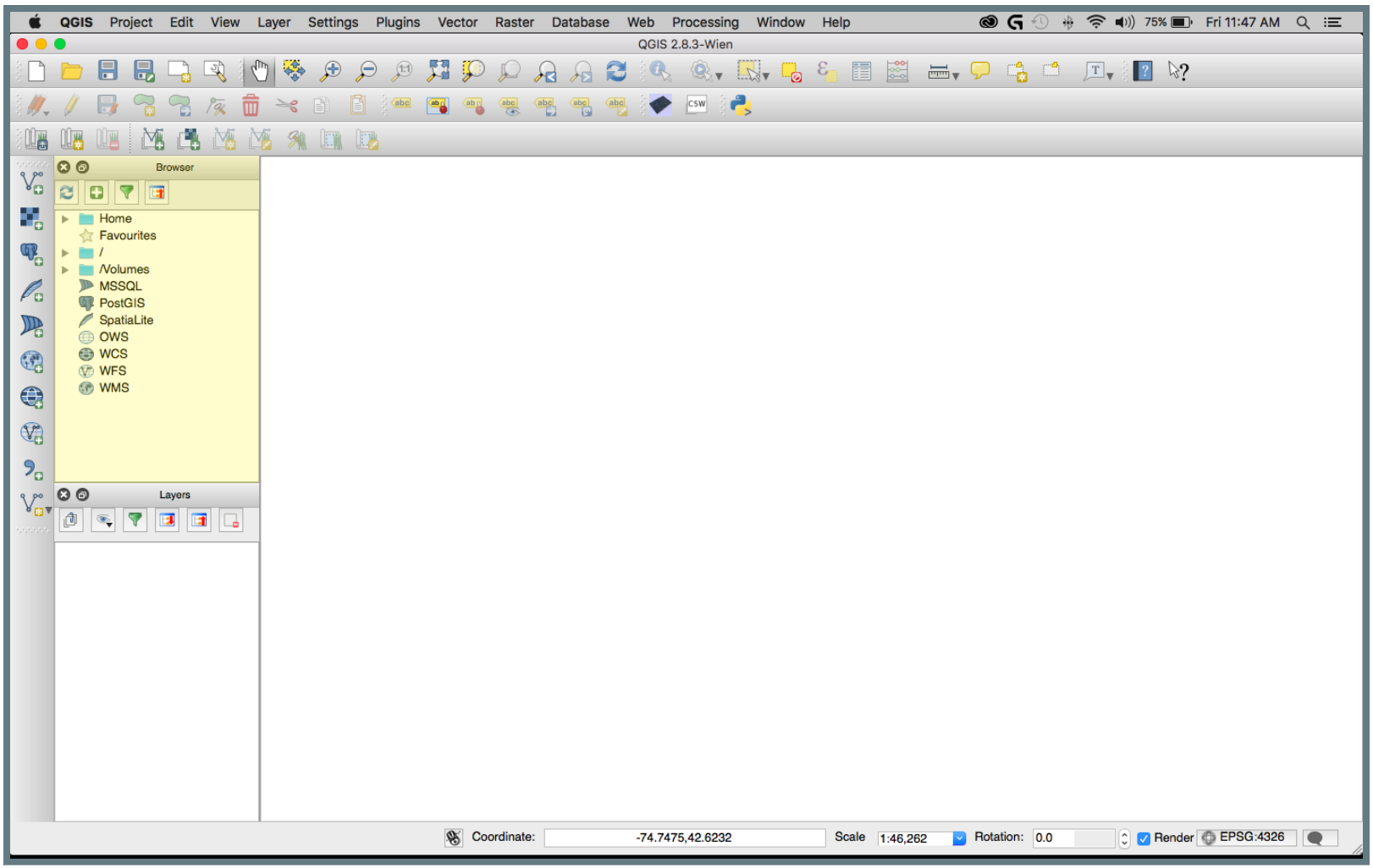
MAP INFORMATION

Projection and scale along with other info



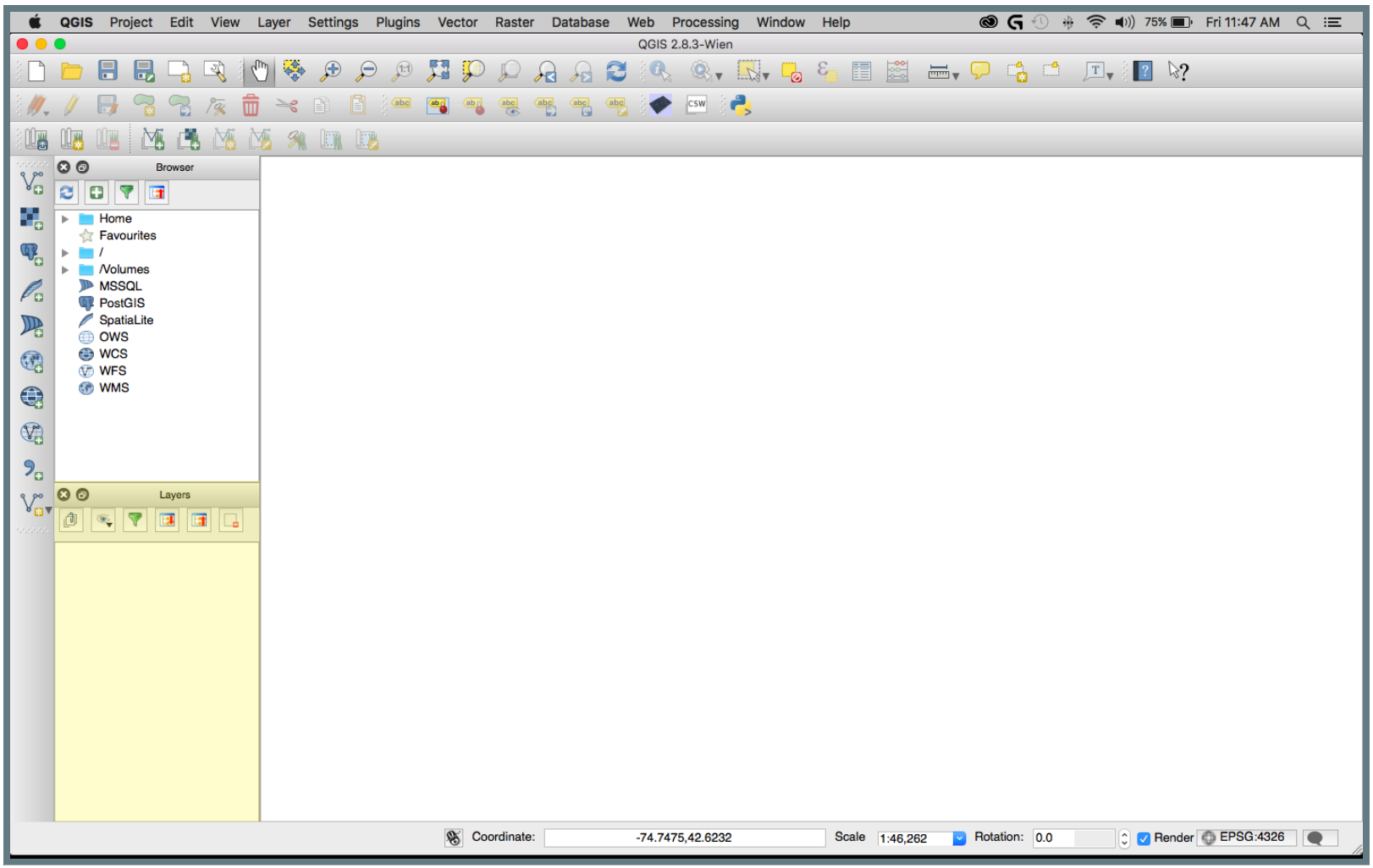
THE BROWSER PANE

Here you can navigate to your data



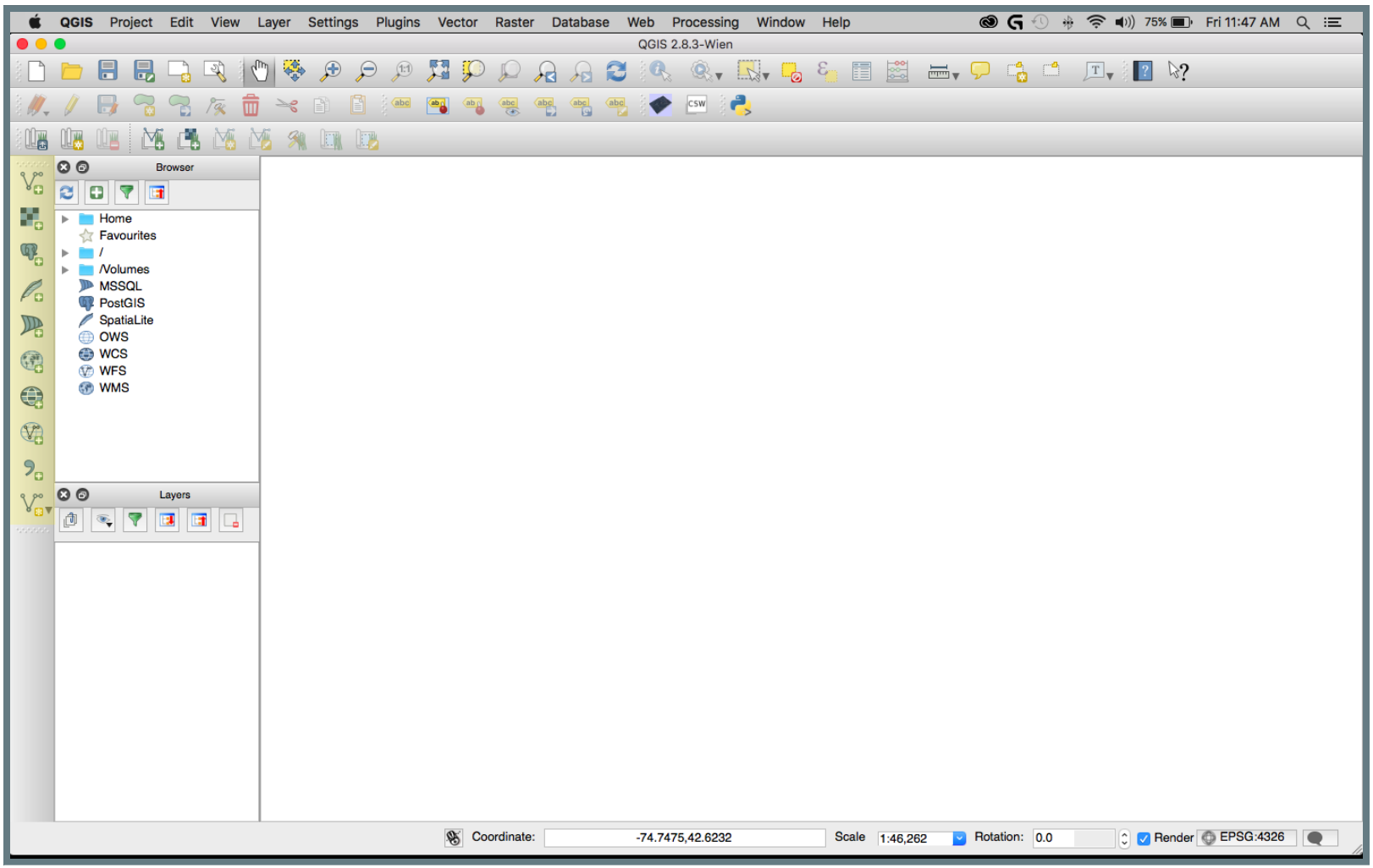
THE LAYERS PANE

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



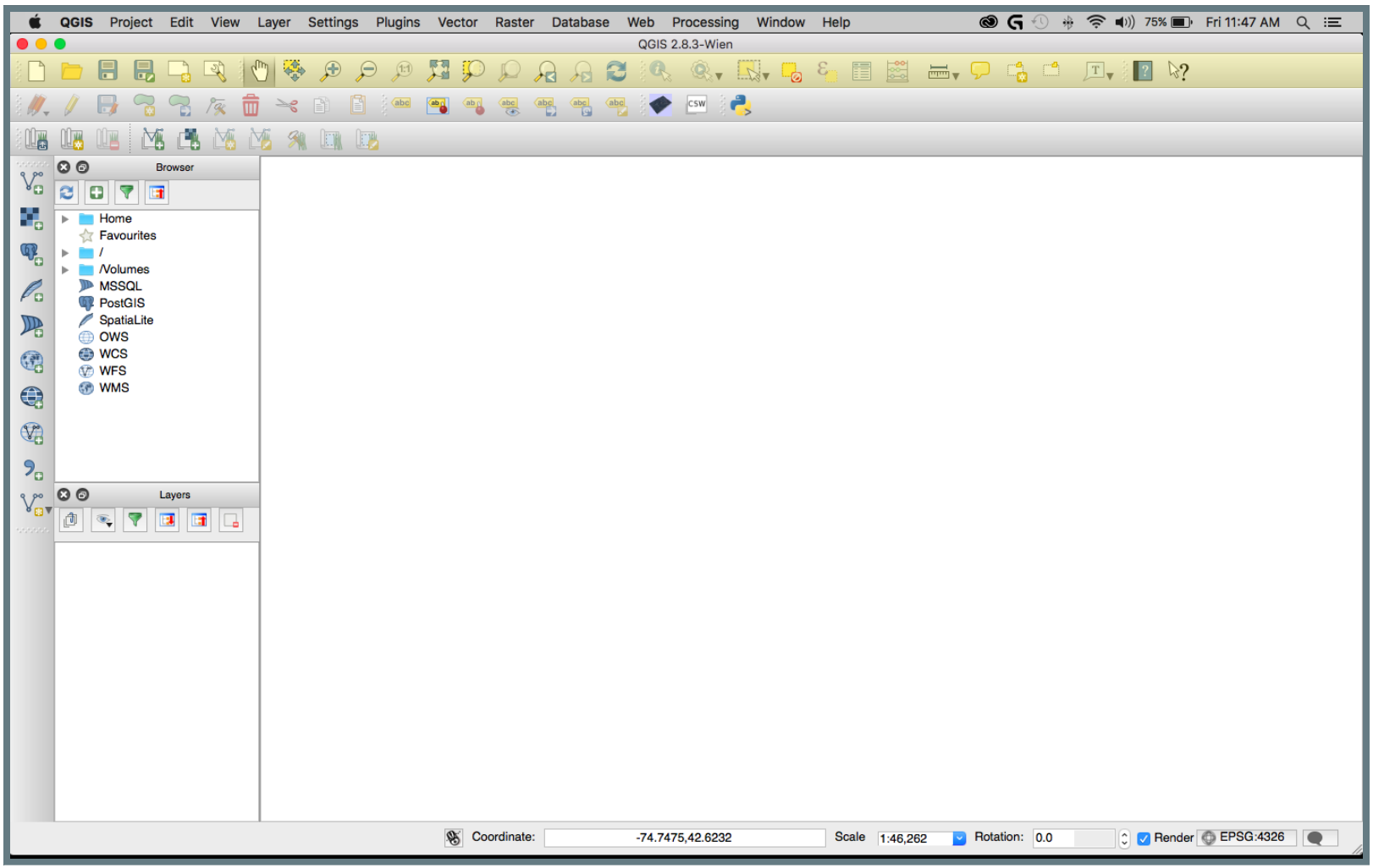
THE ADD LAYERS TOOLBAR

Here is where you add new layers



OTHER TOOLS

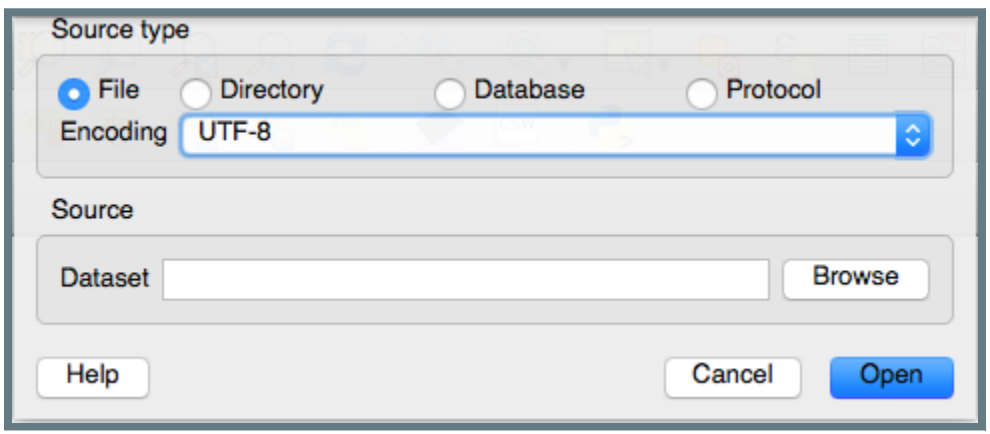
Select, pan and zoom, among others



BUILDING A MAP

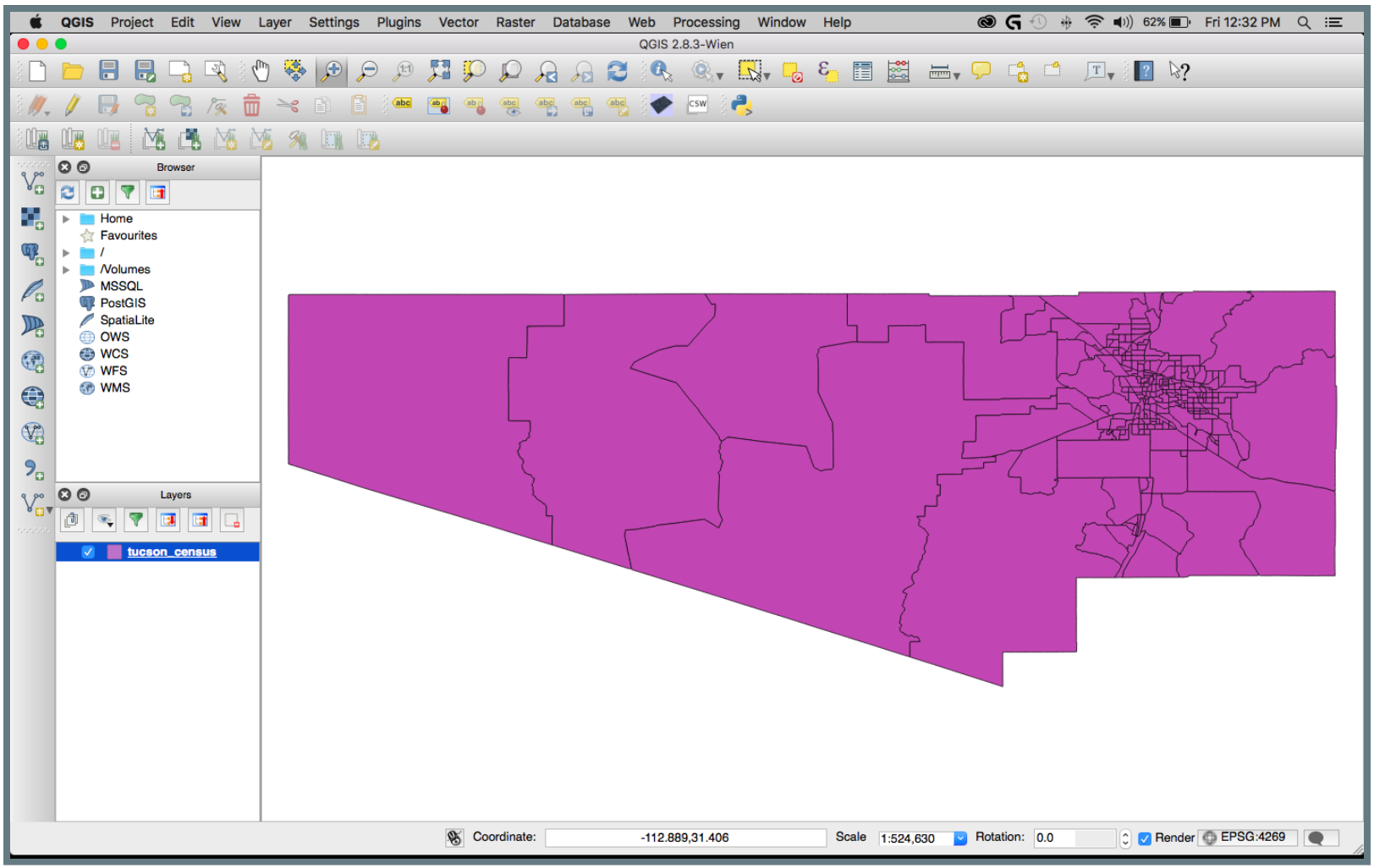
ADDING A LAYER

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

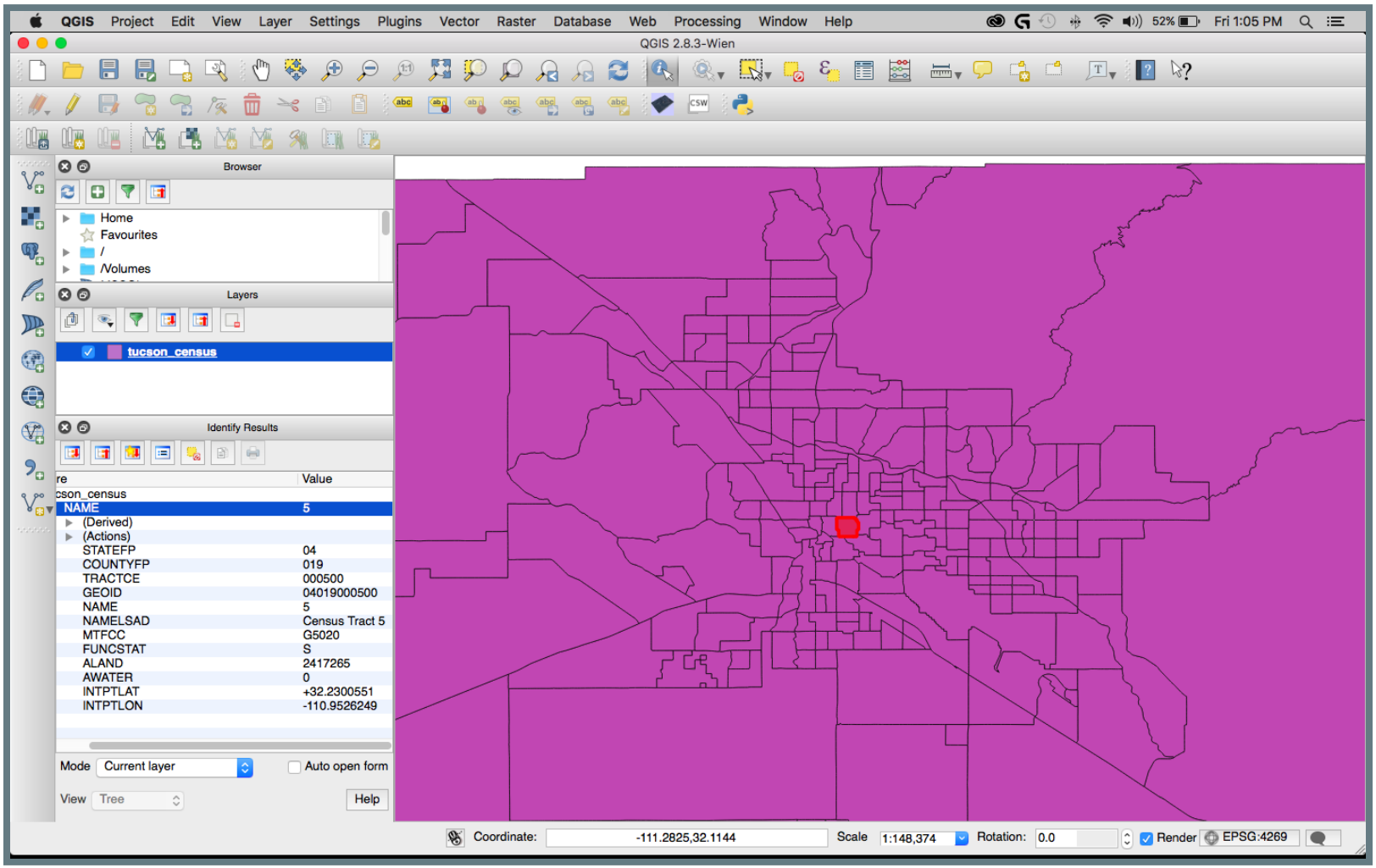


EXPLORING WHAT WE HAVE SO FAR

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

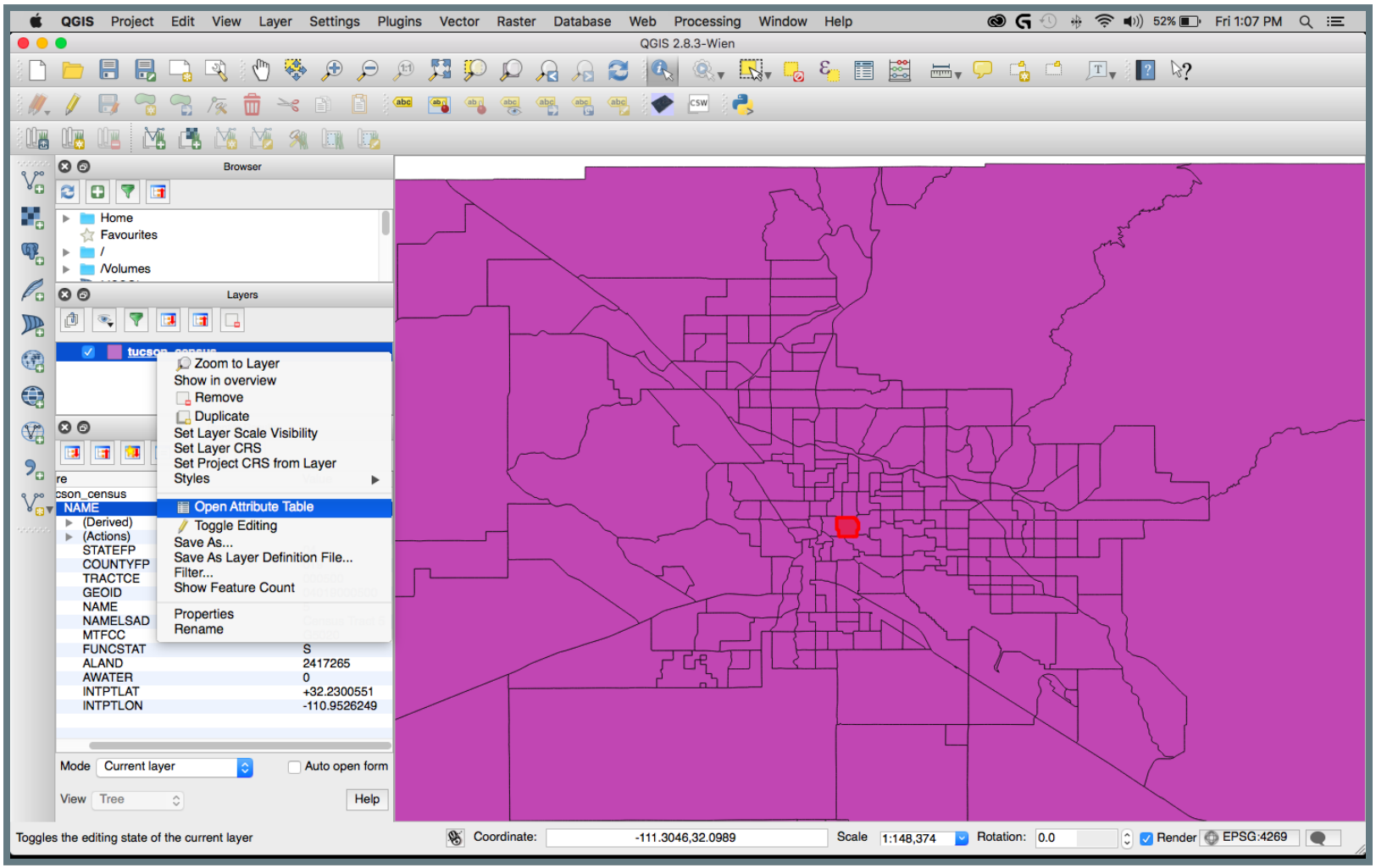
1. Click on the  icon in the top toolbar. Then click in the map to zoom in to an area.
2. Click on the  in the top toolbar to bring up the Identify Features Tool. Click on a feature within the map.

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.

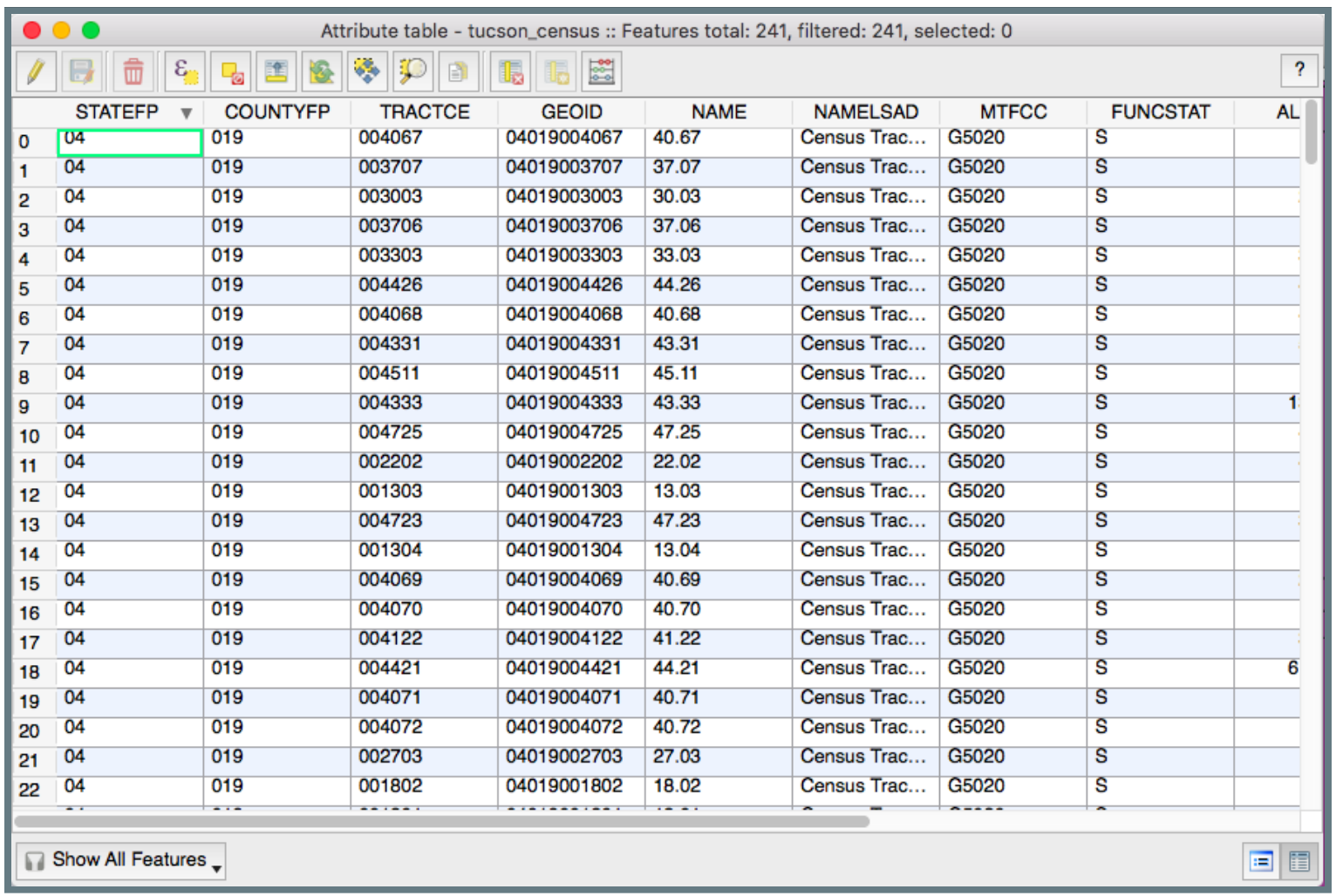


We can also bring up information about all features by accessing the data behind the shapefile.

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



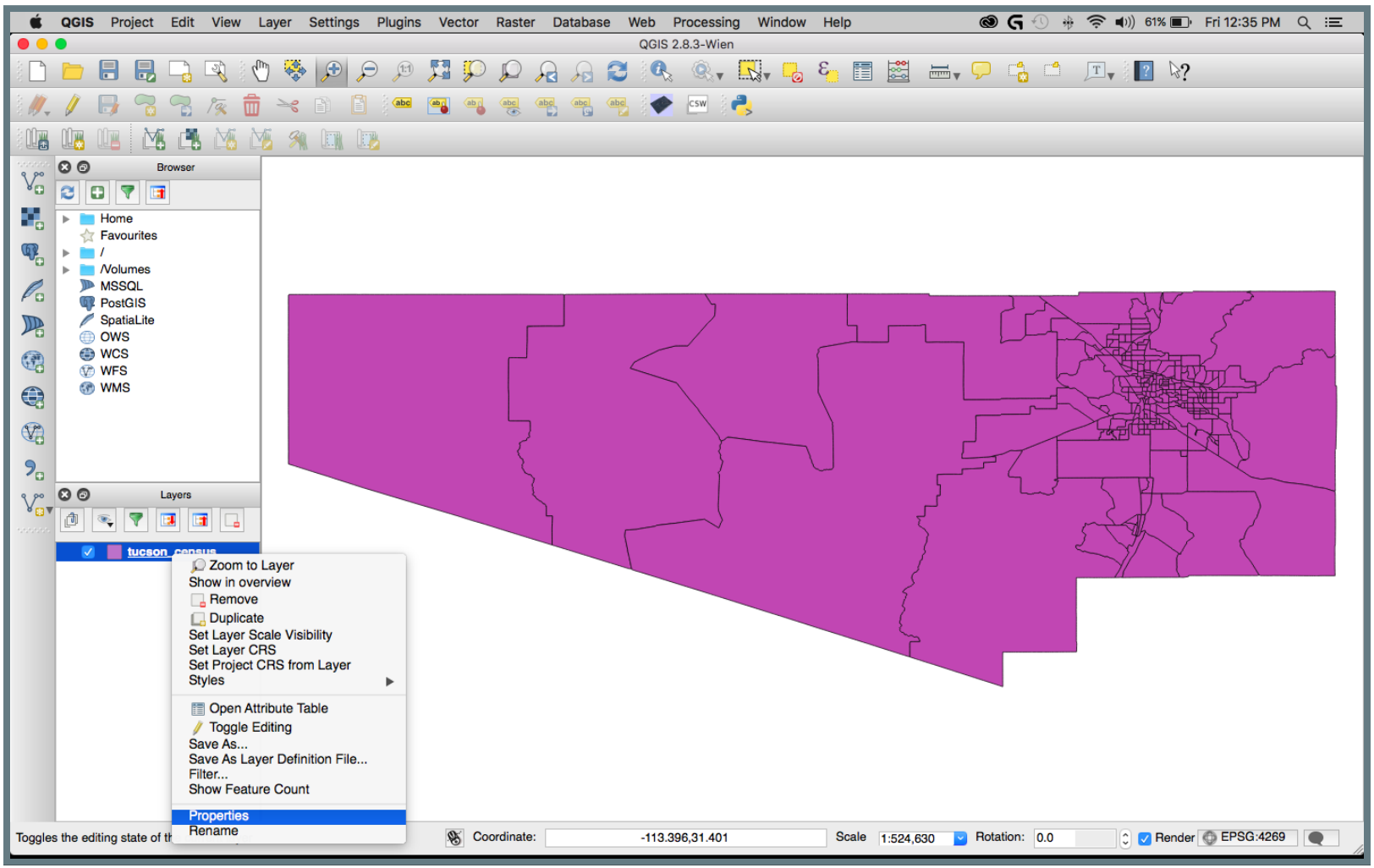
This opens a new window displaying the data in a spreadsheet format. The data can be selected, searched, sorted and filtered here. You can also perform calculations and add new columns here.



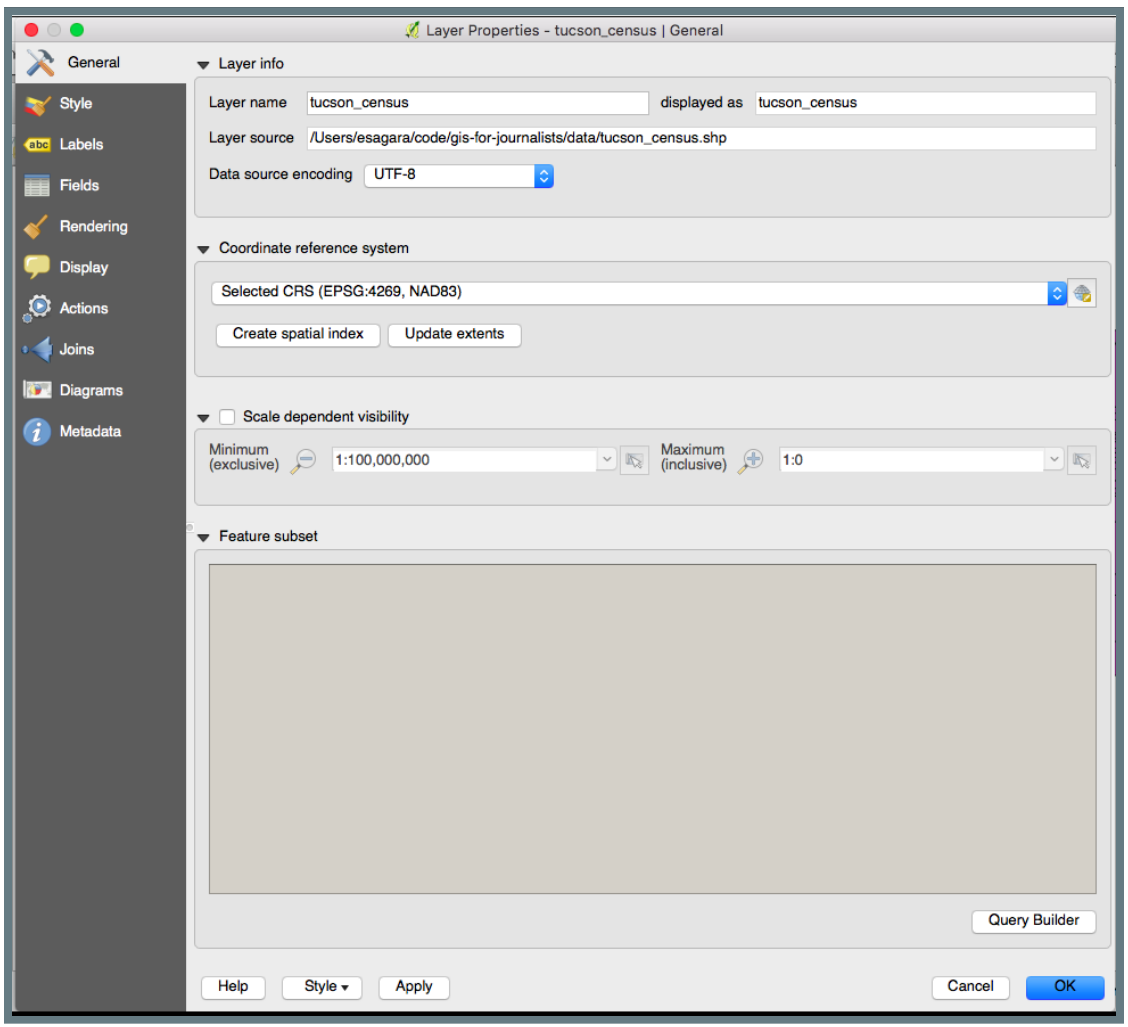
	STATEFP	COUNTYFP	TRACTCE	GEOID	NAME	NAMELSAD	MTFCC	FUNCSTAT	AL
0	04	019	004067	04019004067	40.67	Census Trac...	G5020	S	
1	04	019	003707	04019003707	37.07	Census Trac...	G5020	S	
2	04	019	003003	04019003003	30.03	Census Trac...	G5020	S	
3	04	019	003706	04019003706	37.06	Census Trac...	G5020	S	
4	04	019	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

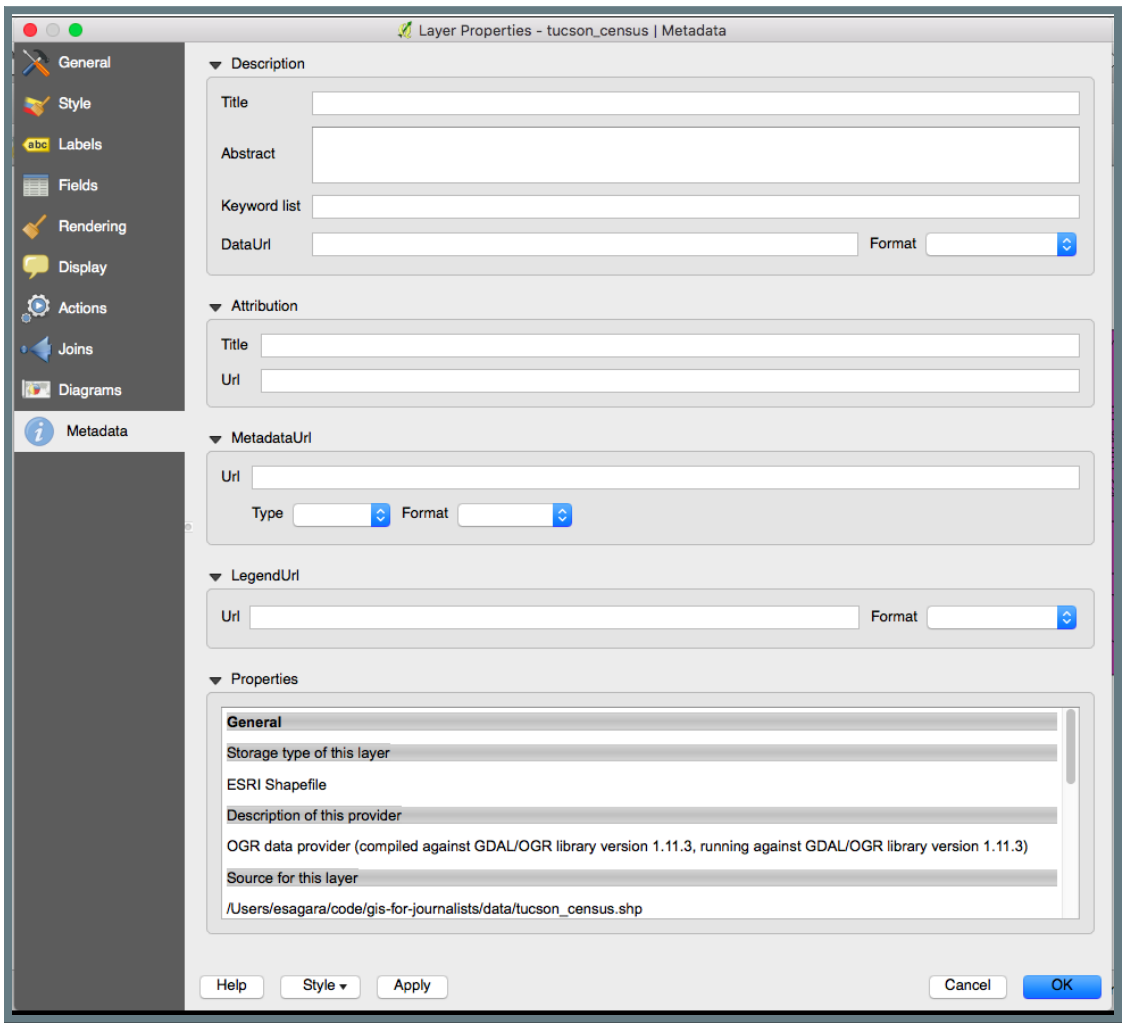
In the layers pane, right click on the tucson_census layer and select "Properties" to bring up information about the layer.



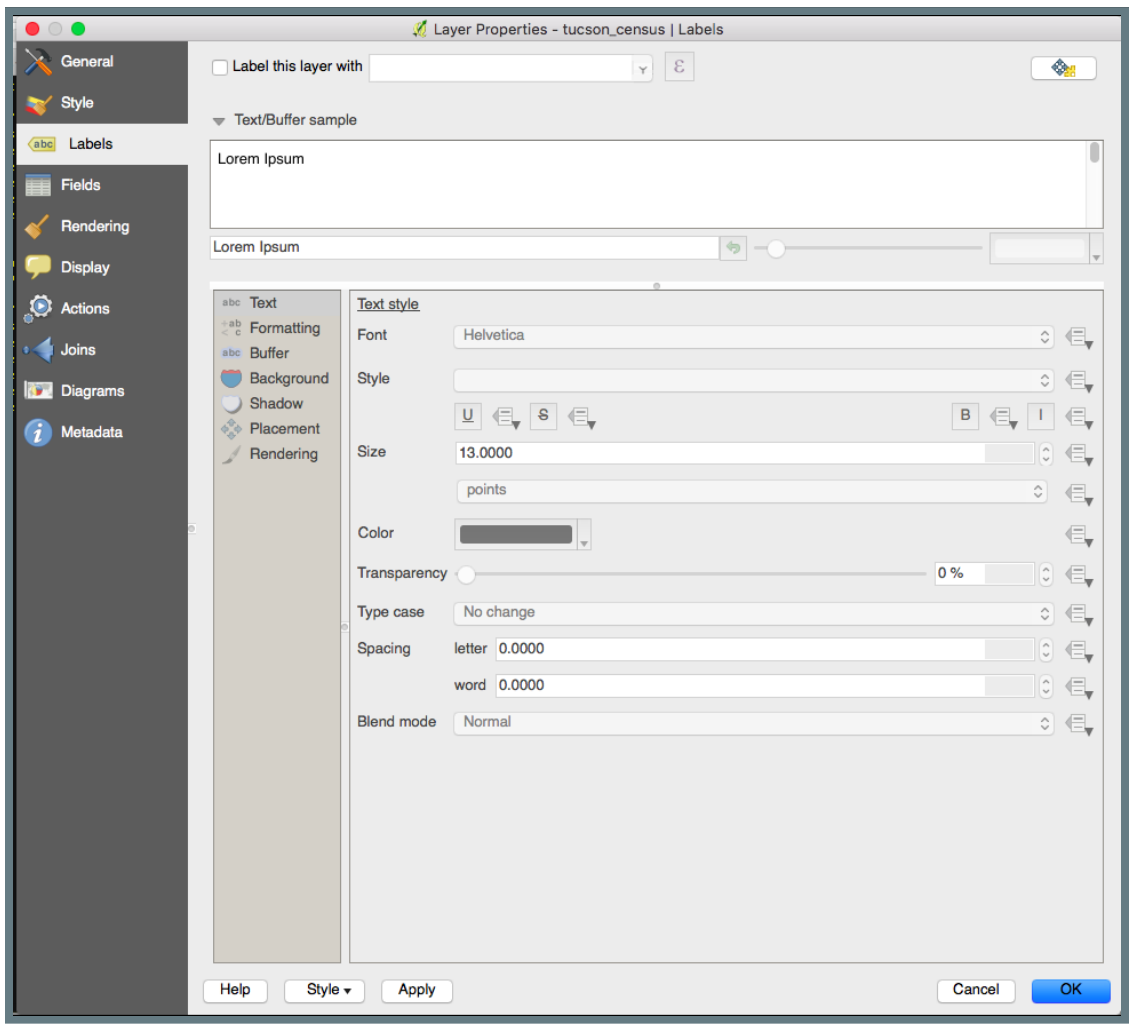
Clicking on the General tab brings up information about the layer, including its Coordinate Reference System (more about that later).



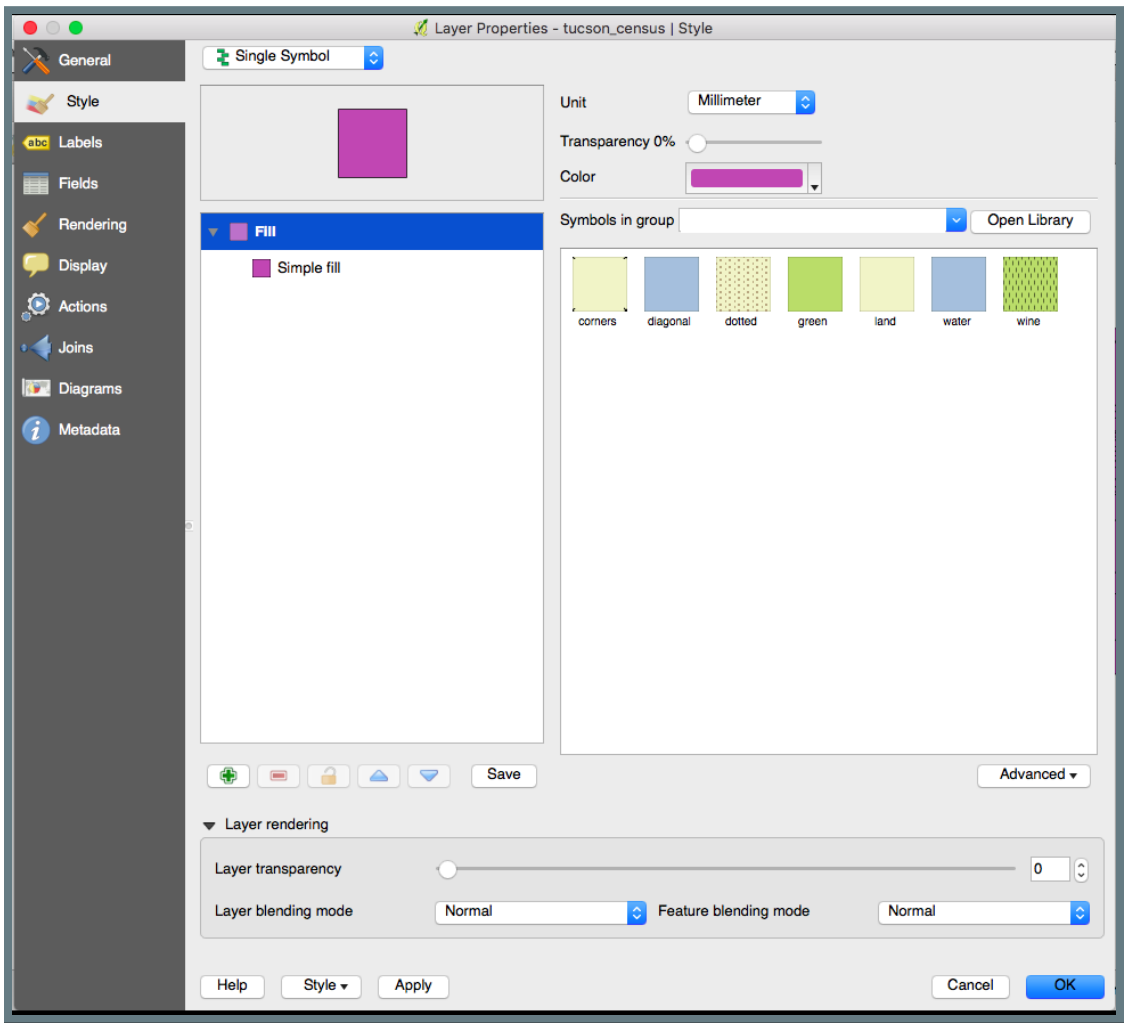
The Metadata tab contains more detailed information about the dataset, including some more geographic information.



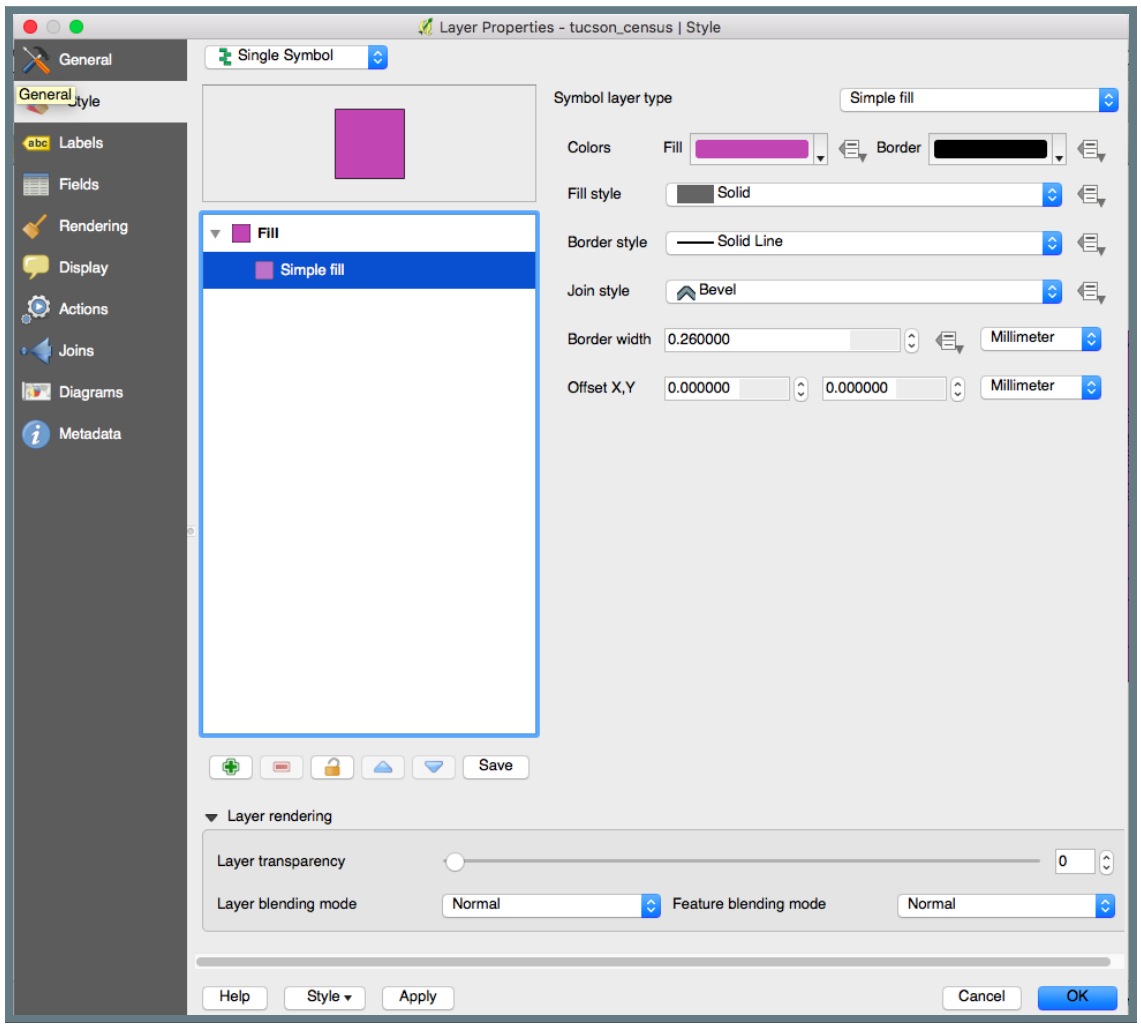
The labels tab allows us to set how the individual features in the layer are labeled. We often handle labeling outside of QGIS, so we are going to skip this.



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



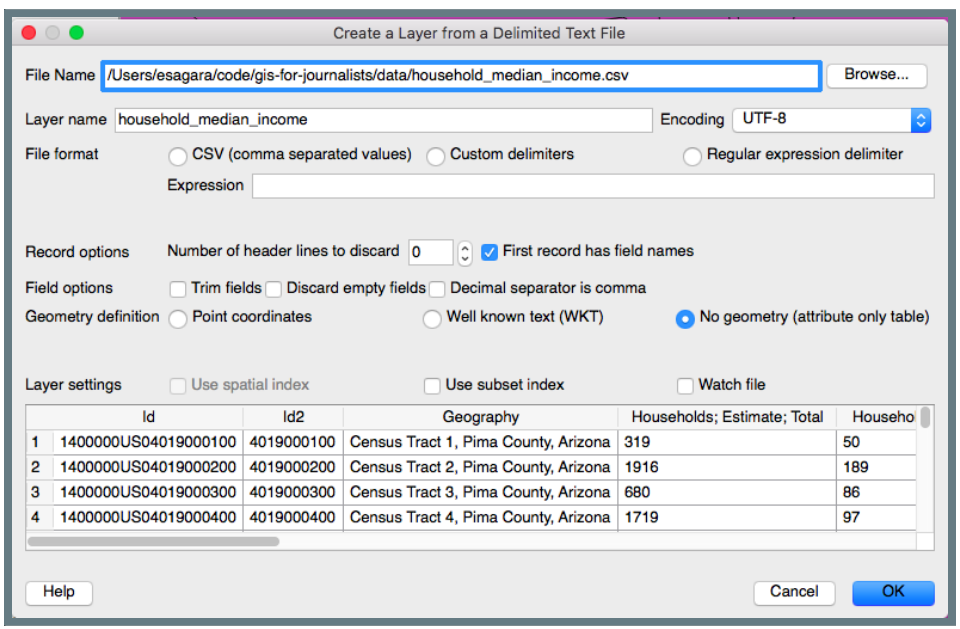
Clicking the Simple Fill button brings up a dialog box allowing us to set the color and border of the features.



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.

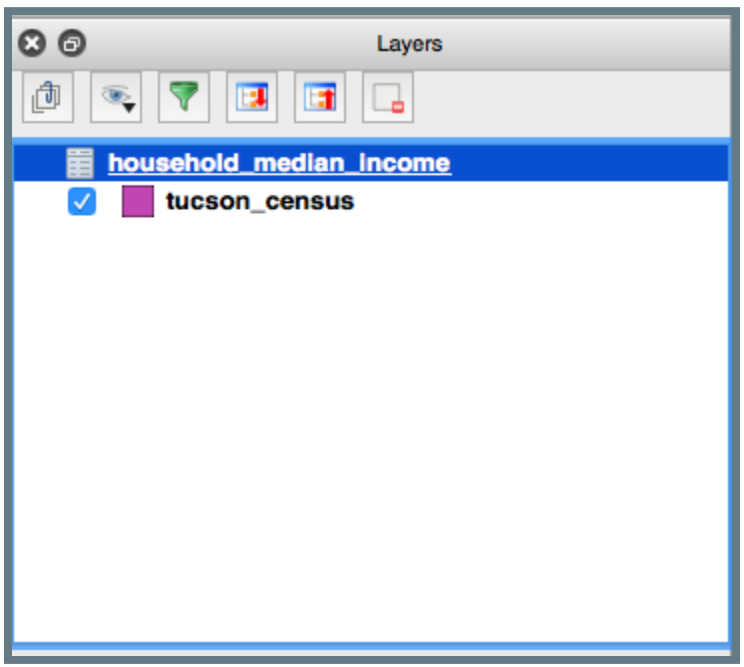
THE SOLUTION

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","Integer","Integer","Integer","Integer","Real","Real"
```

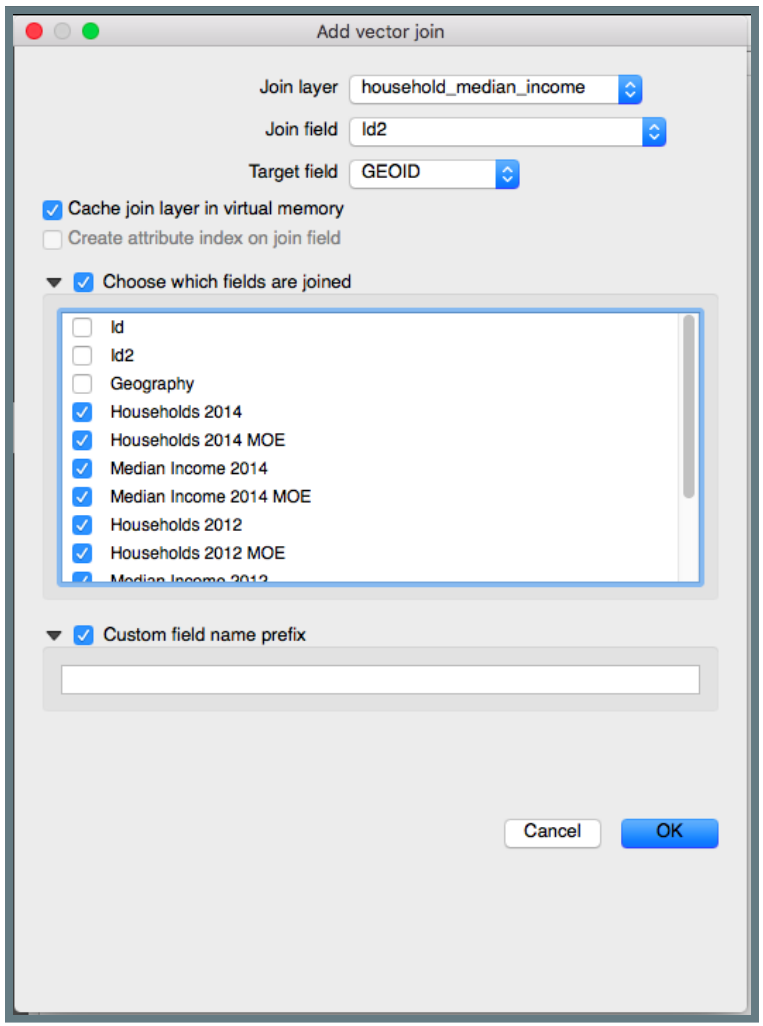
By now the file should appear in your layers as a new item.



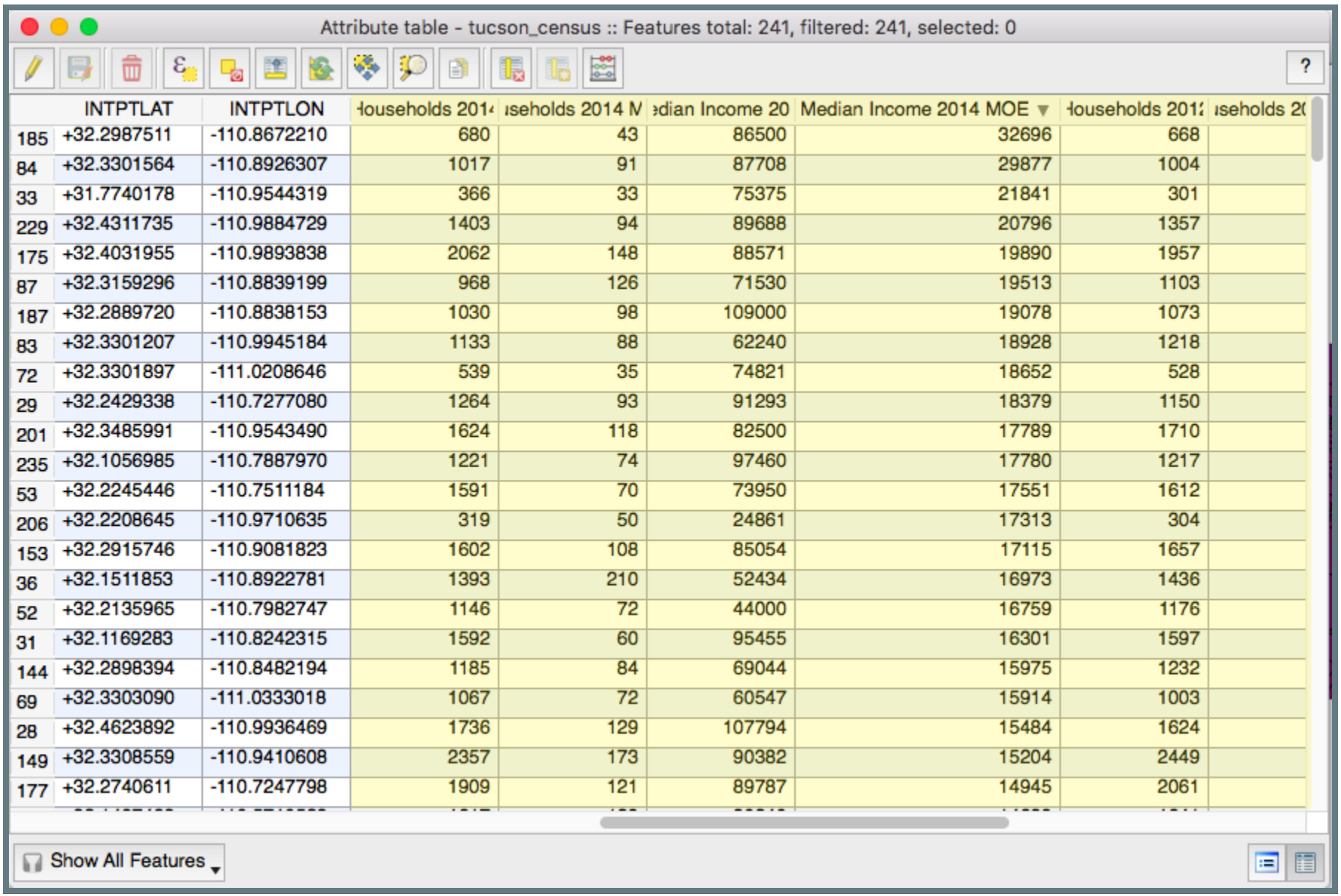
JOINING THE TWO LAYERS

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 everything but the first three options.
5. Click on "Custom field prefix" and delete the entry there.
6. Click OK to close the dialog and then OK to close the layer properties.

The dialog box filled out:

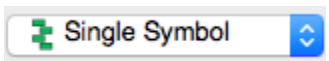


You should now have a ton of new columns at the end of the tucson_census attribute table.

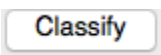


	INTPTLAT	INTPTLON	ɬouseholds 201⁴	ɹseholds 2014 M	ɘdian Income 20	Median Income 2014 MOE	ɬouseholds 201ɪ	ɹseholds 2(
185	+32.2987511	-110.8672210	680	43	86500	32696	668	
84	+32.3301564	-110.8926307	1017	91	87708	29877	1004	
33	+31.7740178	-110.9544319	366	33	75375	21841	301	
229	+32.4311735	-110.9884729	1403	94	89688	20796	1357	
175	+32.4031955	-110.9893838	2062	148	88571	19890	1957	
87	+32.3159296	-110.8839199	968	126	71530	19513	1103	
187	+32.2889720	-110.8838153	1030	98	109000	19078	1073	
83	+32.3301207	-110.9945184	1133	88	62240	18928	1218	
72	+32.3301897	-111.0208646	539	35	74821	18652	528	
29	+32.2429338	-110.7277080	1264	93	91293	18379	1150	
201	+32.3485991	-110.9543490	1624	118	82500	17789	1710	
235	+32.1056985	-110.7887970	1221	74	97460	17780	1217	
53	+32.2245446	-110.7511184	1591	70	73950	17551	1612	
206	+32.2208645	-110.9710635	319	50	24861	17313	304	
153	+32.2915746	-110.9081823	1602	108	85054	17115	1657	
36	+32.1511853	-110.8922781	1393	210	52434	16973	1436	
52	+32.2135965	-110.7982747	1146	72	44000	16759	1176	
31	+32.1169283	-110.8242315	1592	60	95455	16301	1597	
144	+32.2898394	-110.8482194	1185	84	69044	15975	1232	
69	+32.3303090	-111.0333018	1067	72	60547	15914	1003	
28	+32.4623892	-110.9936469	1736	129	107794	15484	1624	
149	+32.3308559	-110.9410608	2357	173	90382	15204	2449	
177	+32.2740611	-110.7247798	1909	121	89787	14945	2061	

COLORING OUR NEW MAP

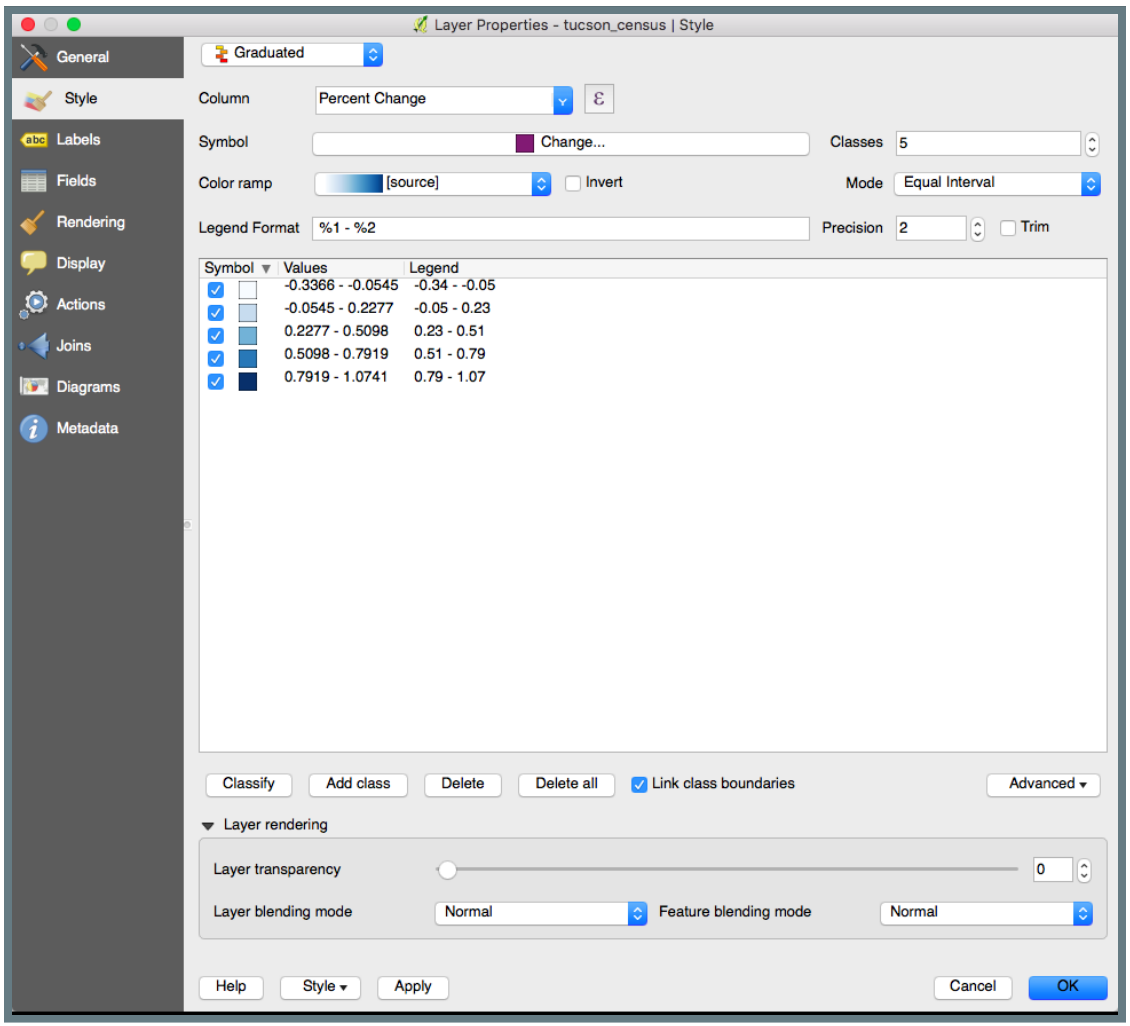
1. To begin open up the properties for tucson_census.
2. Change 

to 

.
3. Select "Percent Change" under "Column."
4. Select a color ramp of your choice.
5. Hit the 

button.

This is what your dialog should look like.

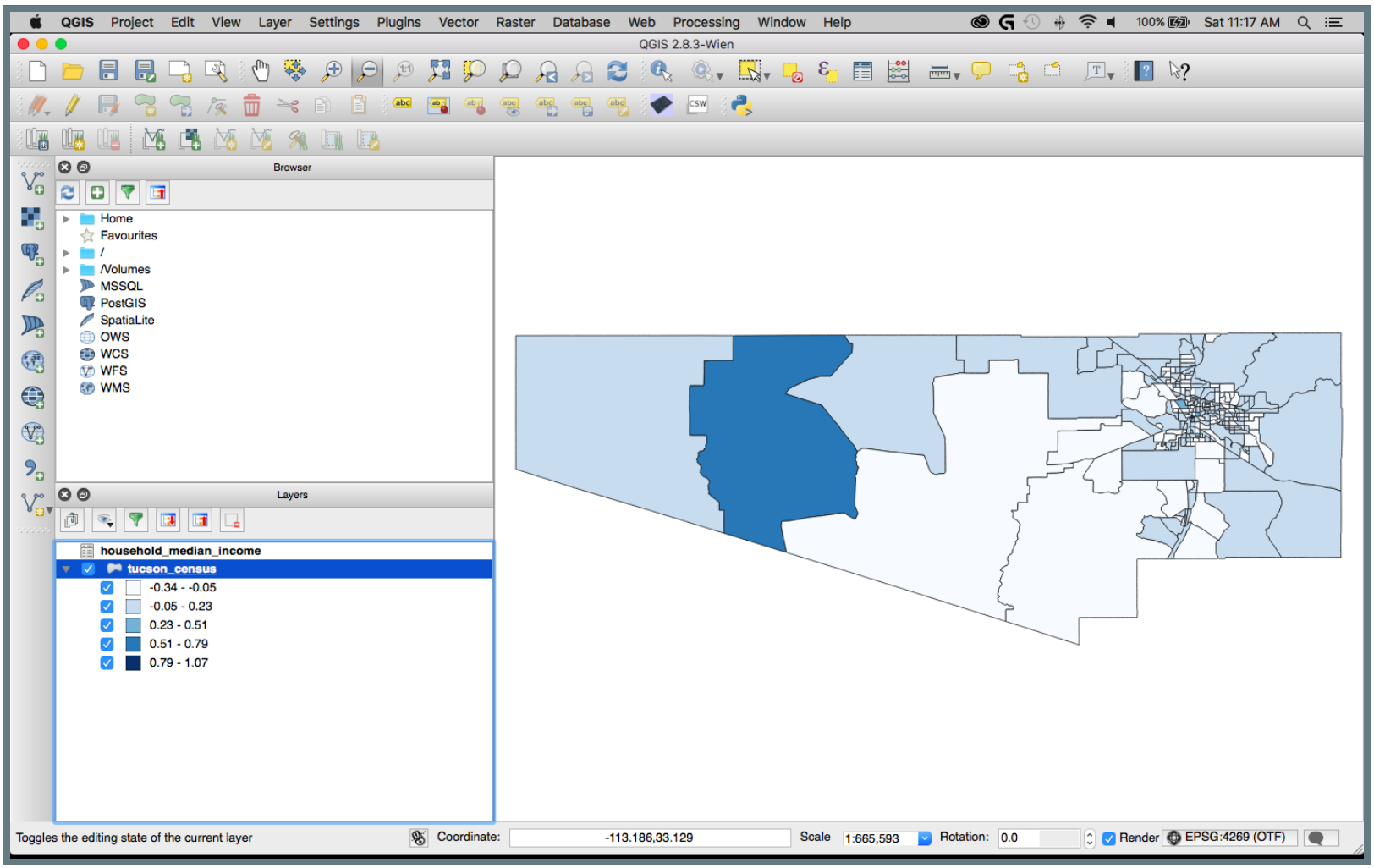


A FEW QUICK NOTES

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 "Percent Change" 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