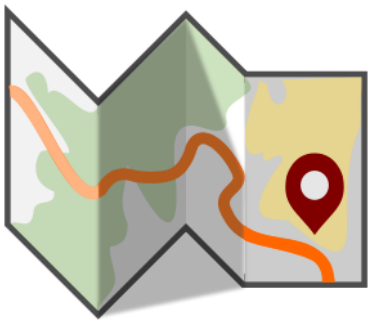
Performing Table Joins

QGIS Tutorials and Tips



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Performing Table Joins

Not every dataset you want to use comes as a shapefile, or in a spatial format. Often the data would come as a table or a spreadsheet and you would need to link it with your existing spatial data for use in your analysis. This operation is known as a *Table Join* and this tutorial will cover how to carry out table joins in QGIS.

Overview of the task

We will use a shapefile of census tracts for California and population data table from US Census Bureau to create a population map for california.

Other skills you will learn

- Creating *.csvt* files to indicate column data types in a CSV file.
- Loading CSV files that do not contain any geometry in QGIS.

Get the data

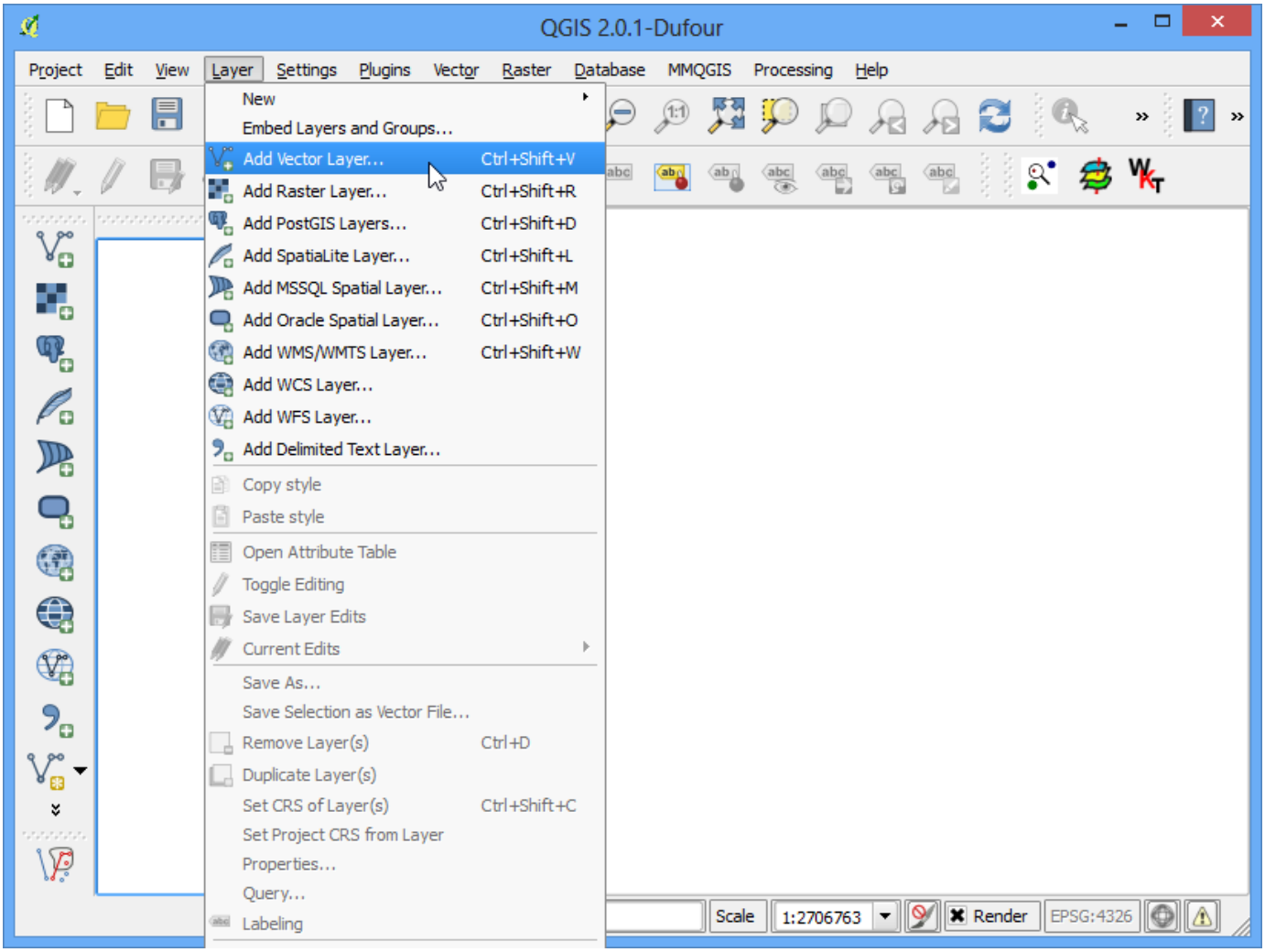
US Census Bureau has various spatial extracts from the MAF/TIGER database. You can query and download census tracts shapefile for California.

Americal FactFinder is a repository of all census data for the US. You can use *Advanced Search* and query for the *Topic - Total Population* and *Geographies - All Census Tracts in California* to create a custom CSV and download it. This tutorial uses *Total Population 2010 Census Summary File 1* data.

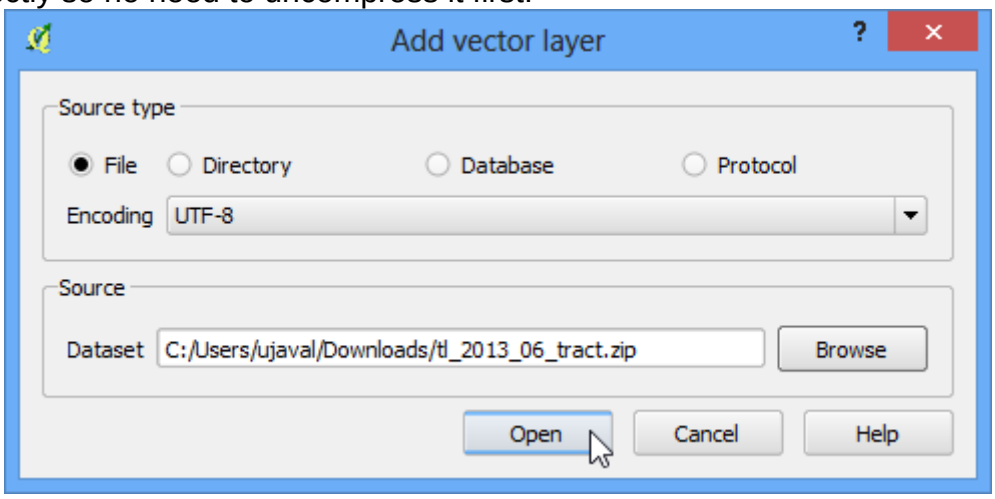
Data Source [TIGER] [USCENSUS]

Procedure

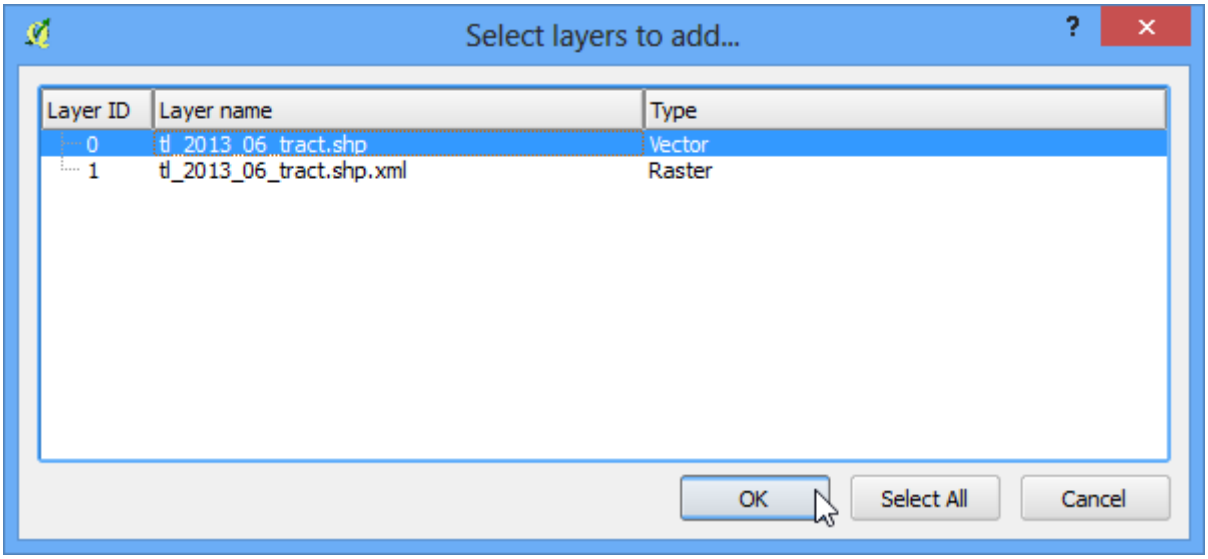
1. We will first load the census tracts shapefile. Go to *Layer* ■ *Add Vector Layer*.



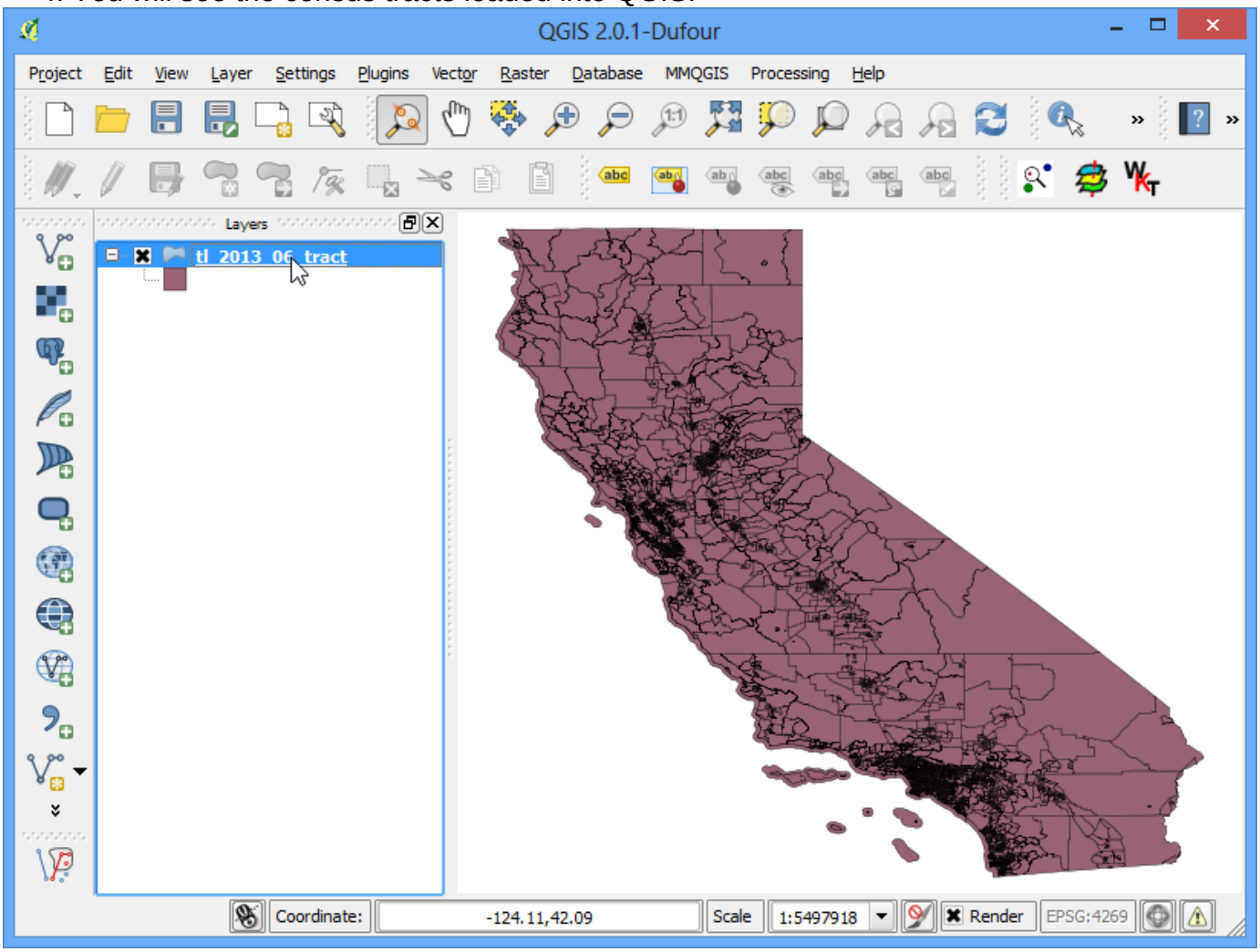
2. Browse to the downloaded zip file *tl_2013_06_tract.zip* and select it. QGIS can open zip files directly so no need to uncompress it first.



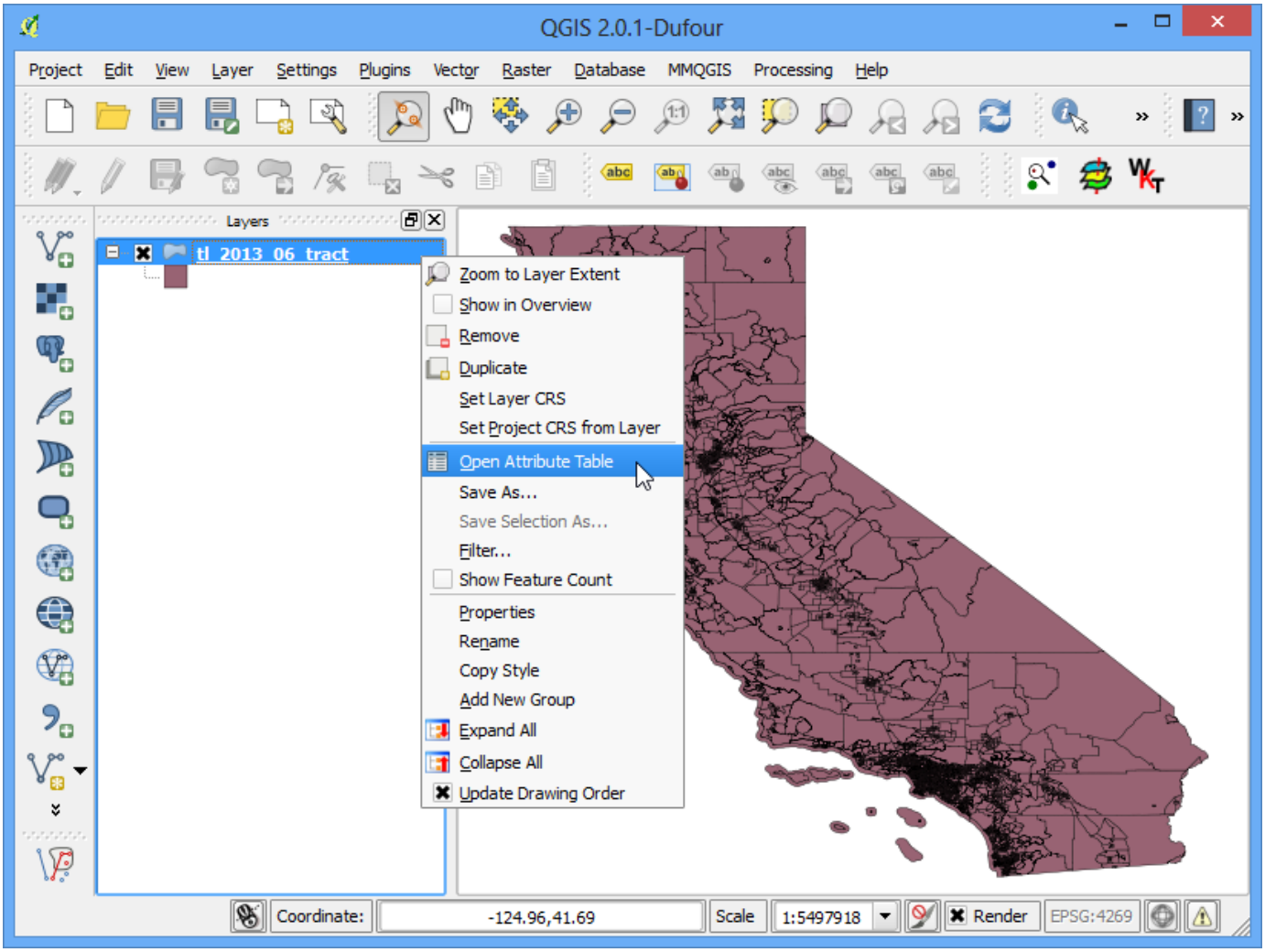
3. Select the *tl_2013_06_tract.shp* layer and click *OK*.



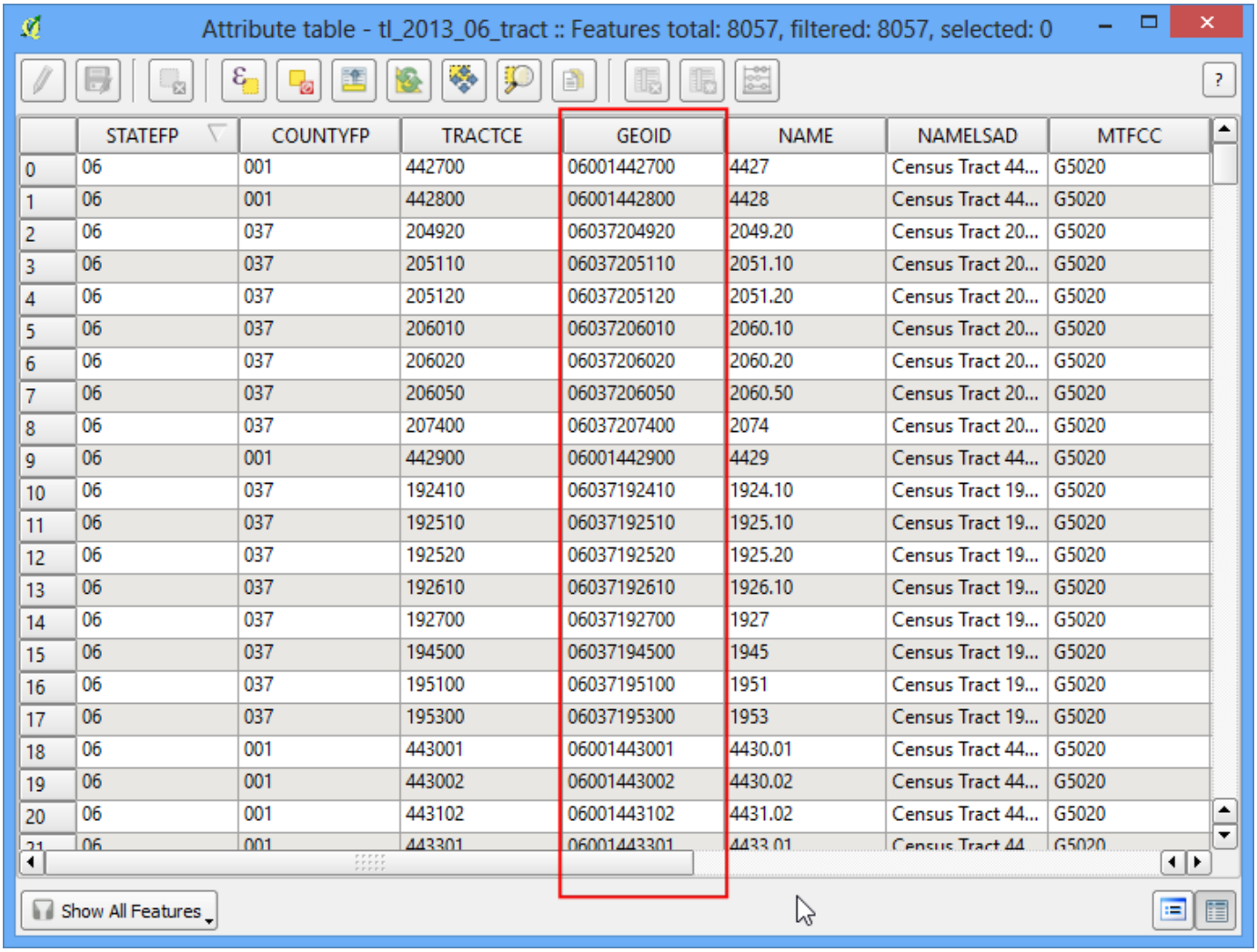
4. You will see the census tracts loaded into QGIS.



5. Right-click on the layer and select *Open Attribute Table*.

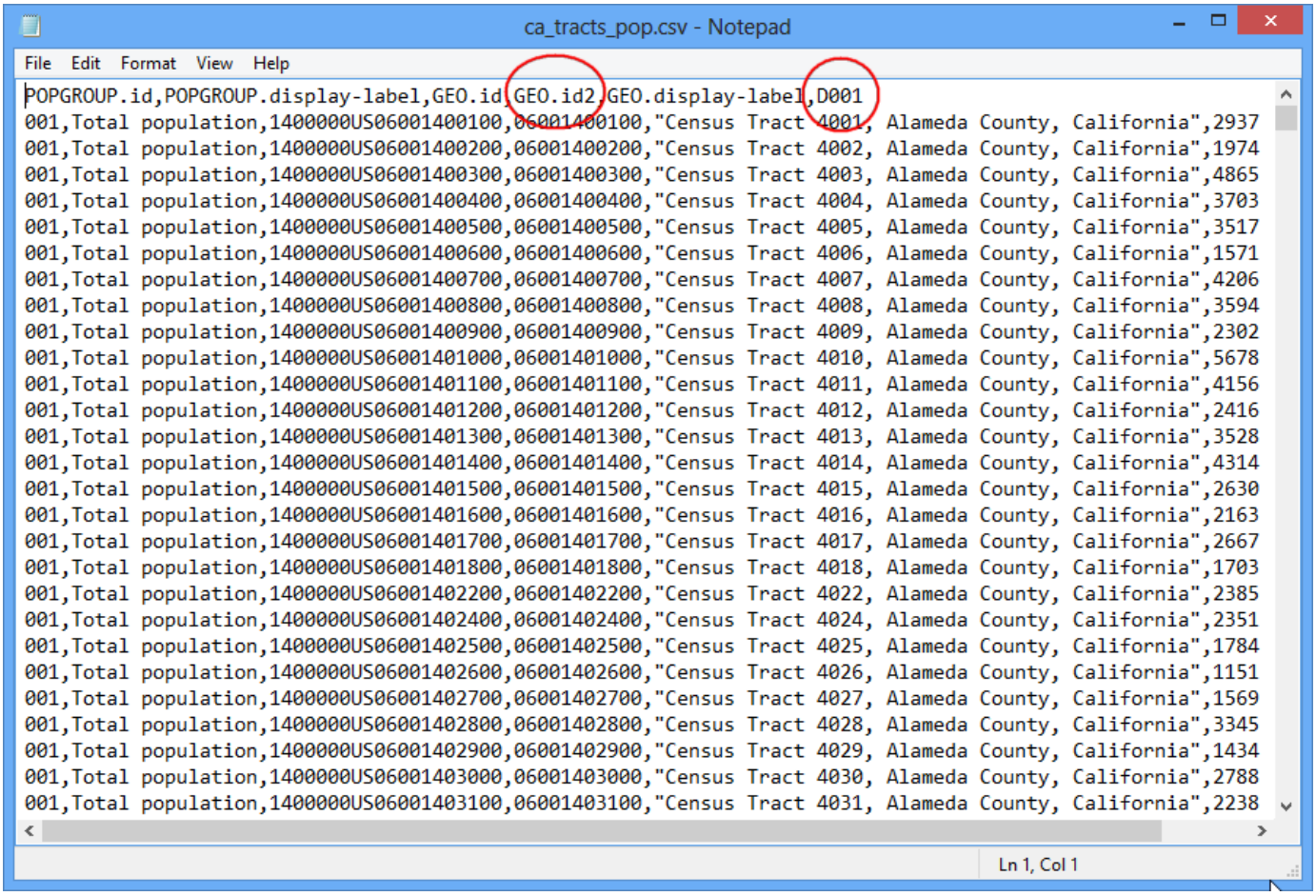


6. Examine the attributes of the tracts shapefile. To join a table with this shapefile, we need a unique and common attribute for each feature. In this case, the **GEOID** field is a unique identifier for each tract and can be used to *link* this shapefile with any other table containing the same ID.

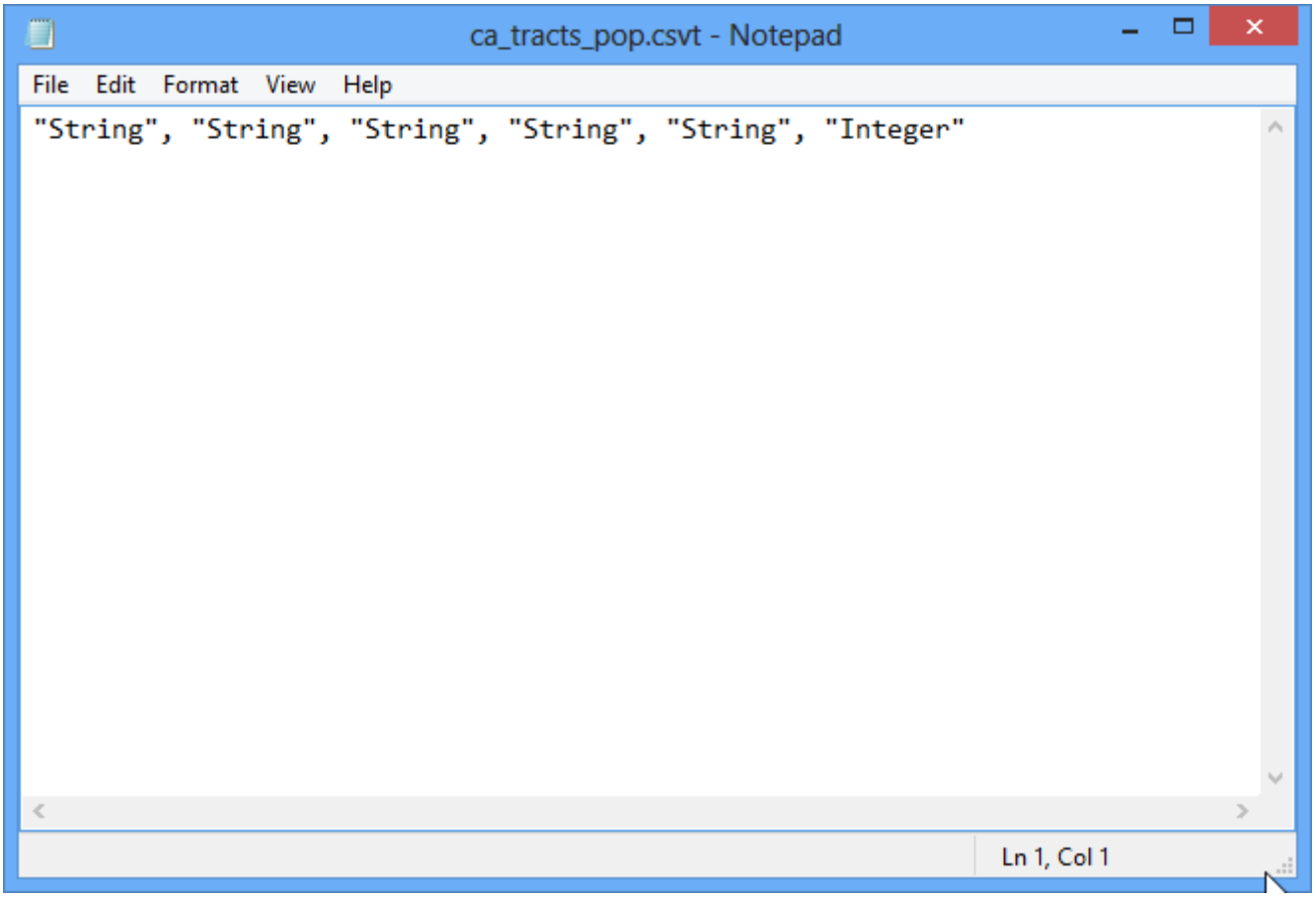


	STATEFP	COUNTYFP	TRACTCE	GEOID	NAME	NAMELSAD	MTFCC
0	06	001	442700	06001442700	4427	Census Tract 44...	G5020
1	06	001	442800	06001442800	4428	Census Tract 44...	G5020
2	06	037	204920	06037204920	2049.20	Census Tract 20...	G5020
3	06	037	205110	06037205110	2051.10	Census Tract 20...	G5020
4	06	037	205120	06037205120	2051.20	Census Tract 20...	G5020
5	06	037	206010	06037206010	2060.10	Census Tract 20...	G5020
6	06	037	206020	06037206020	2060.20	Census Tract 20...	G5020
7	06	037	206050	06037206050	2060.50	Census Tract 20...	G5020
8	06	037	207400	06037207400	2074	Census Tract 20...	G5020
9	06	001	442900	06001442900	4429	Census Tract 44...	G5020
10	06	037	192410	06037192410	1924.10	Census Tract 19...	G5020
11	06	037	192510	06037192510	1925.10	Census Tract 19...	G5020
12	06	037	192520	06037192520	1925.20	Census Tract 19...	G5020
13	06	037	192610	06037192610	1926.10	Census Tract 19...	G5020
14	06	037	192700	06037192700	1927	Census Tract 19...	G5020
15	06	037	194500	06037194500	1945	Census Tract 19...	G5020
16	06	037	195100	06037195100	1951	Census Tract 19...	G5020
17	06	037	195300	06037195300	1953	Census Tract 19...	G5020
18	06	001	443001	06001443001	4430.01	Census Tract 44...	G5020
19	06	001	443002	06001443002	4430.02	Census Tract 44...	G5020
20	06	001	443102	06001443102	4431.02	Census Tract 44...	G5020
21	06	001	443301	06001443301	4433.01	Census Tract 44	G5020

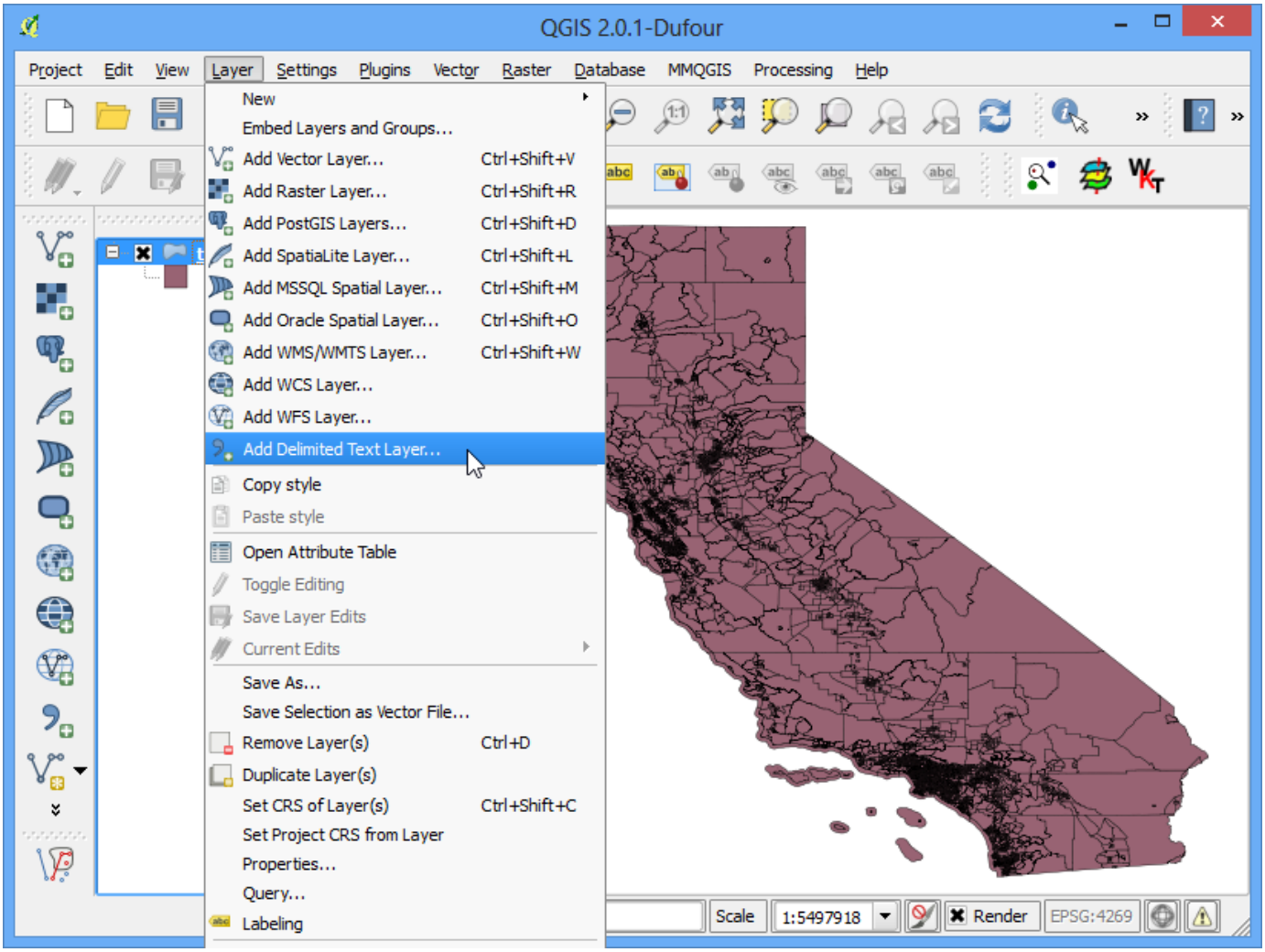
7. Open the CSV file *ca_tracts_pop.csv* in a text editor. You will notice that each row of the file contains information about a tract along with the unique identifier we saw in the previous step. Note that this field is called **GEO.id2** in the CSV. You will also note that the **D001** column has population value for each of the census tract.



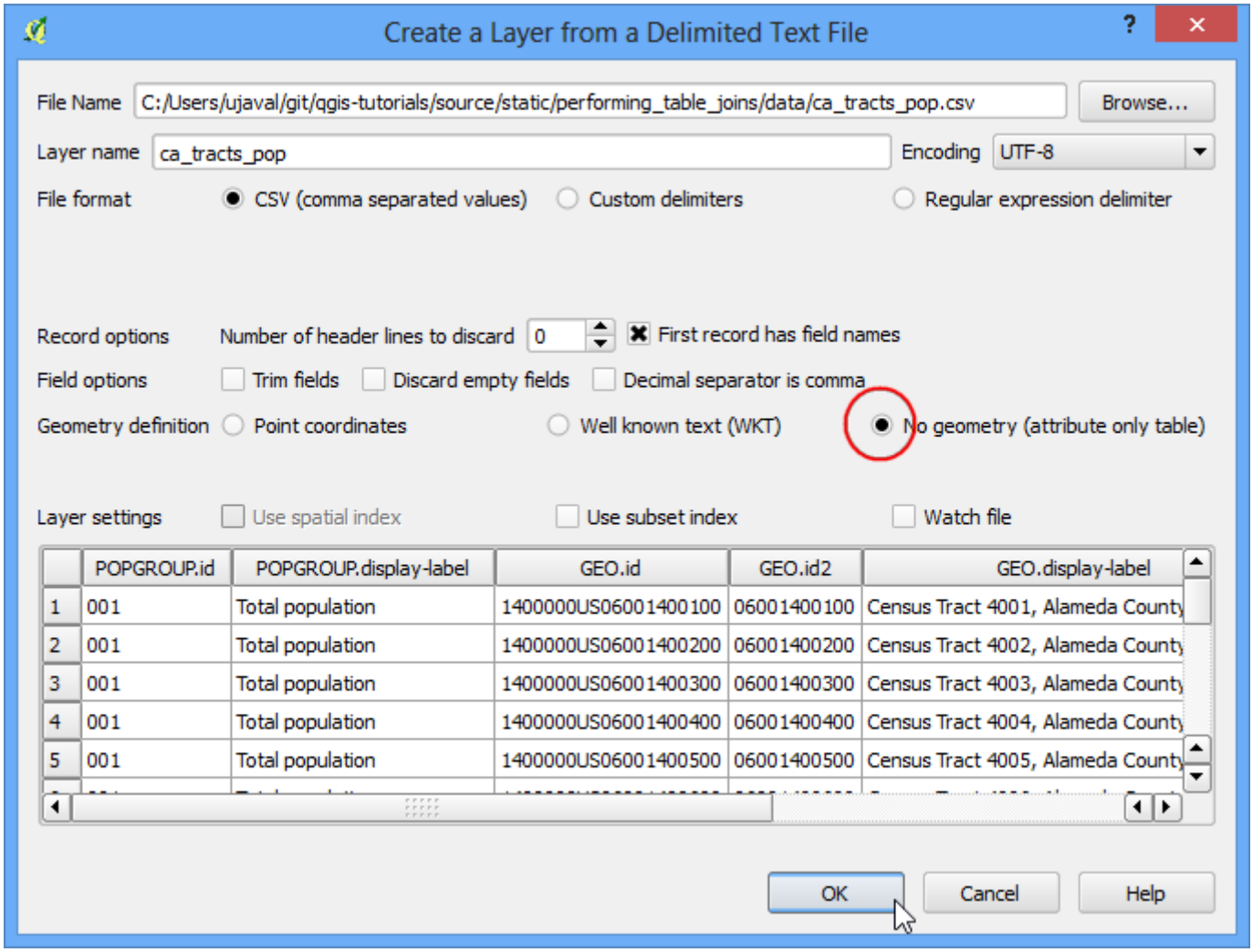
8. We could import this csv file without any further action and it would be imported. But, the default type of each column would be a *String* (text). That is ok except for the *D001* field which contains numbers for the population. Having those imported as text would not allow us to run any mathematical operations on this column. To tell QGIS to import the field as a number, we need to create a *sidecar* file with a *.csvt* extension. This file will have only 1 row specifying data types for each column. Save this file as *ca_tracts_pop.csvt* in the same directory as the original *.csv* file. You can also **download the csvt file from here.**



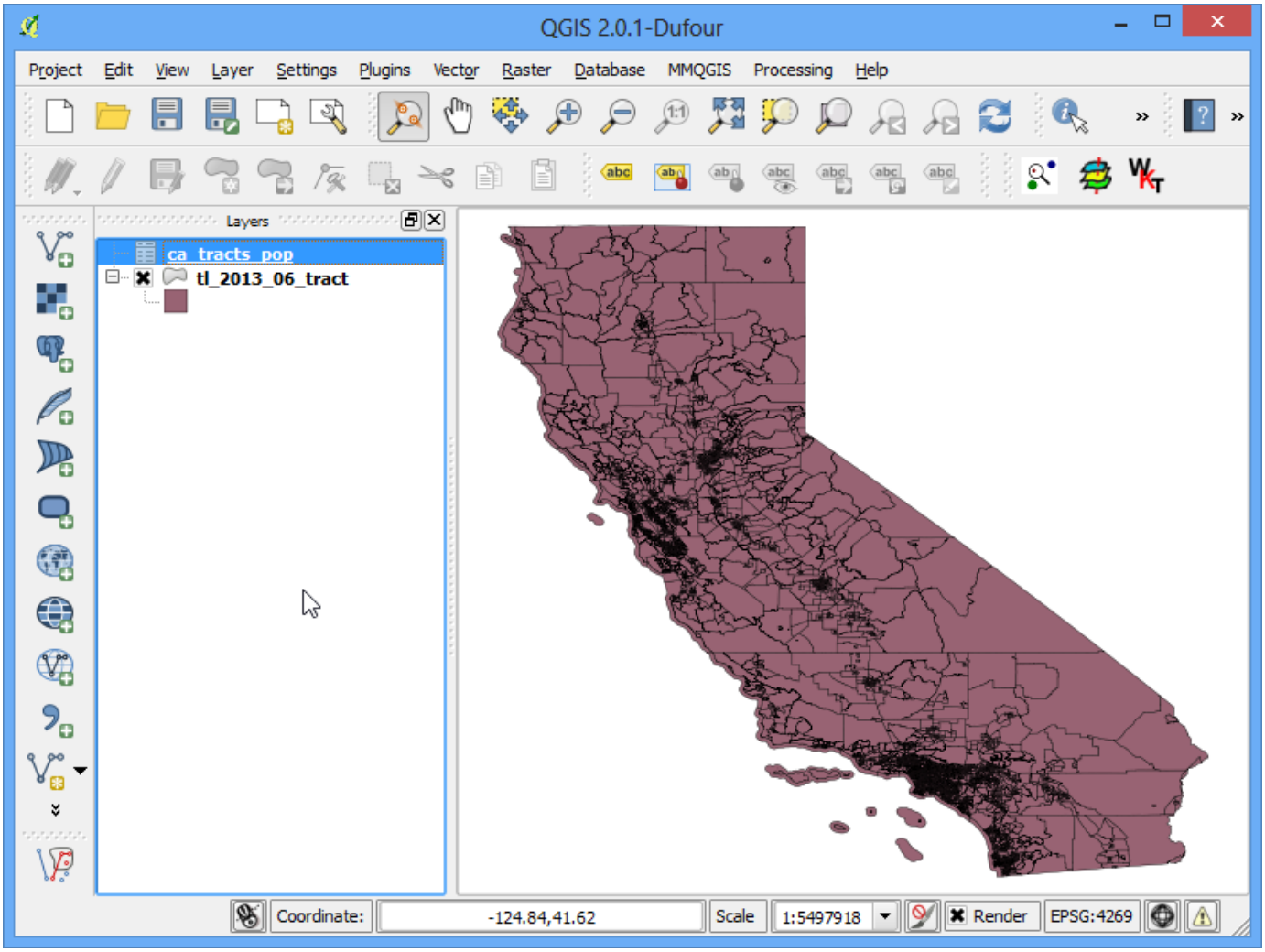
9. Now we are ready to import the CSV file to QGIS. Go to *Layer* ■ *Add Delimited Text Layer*.



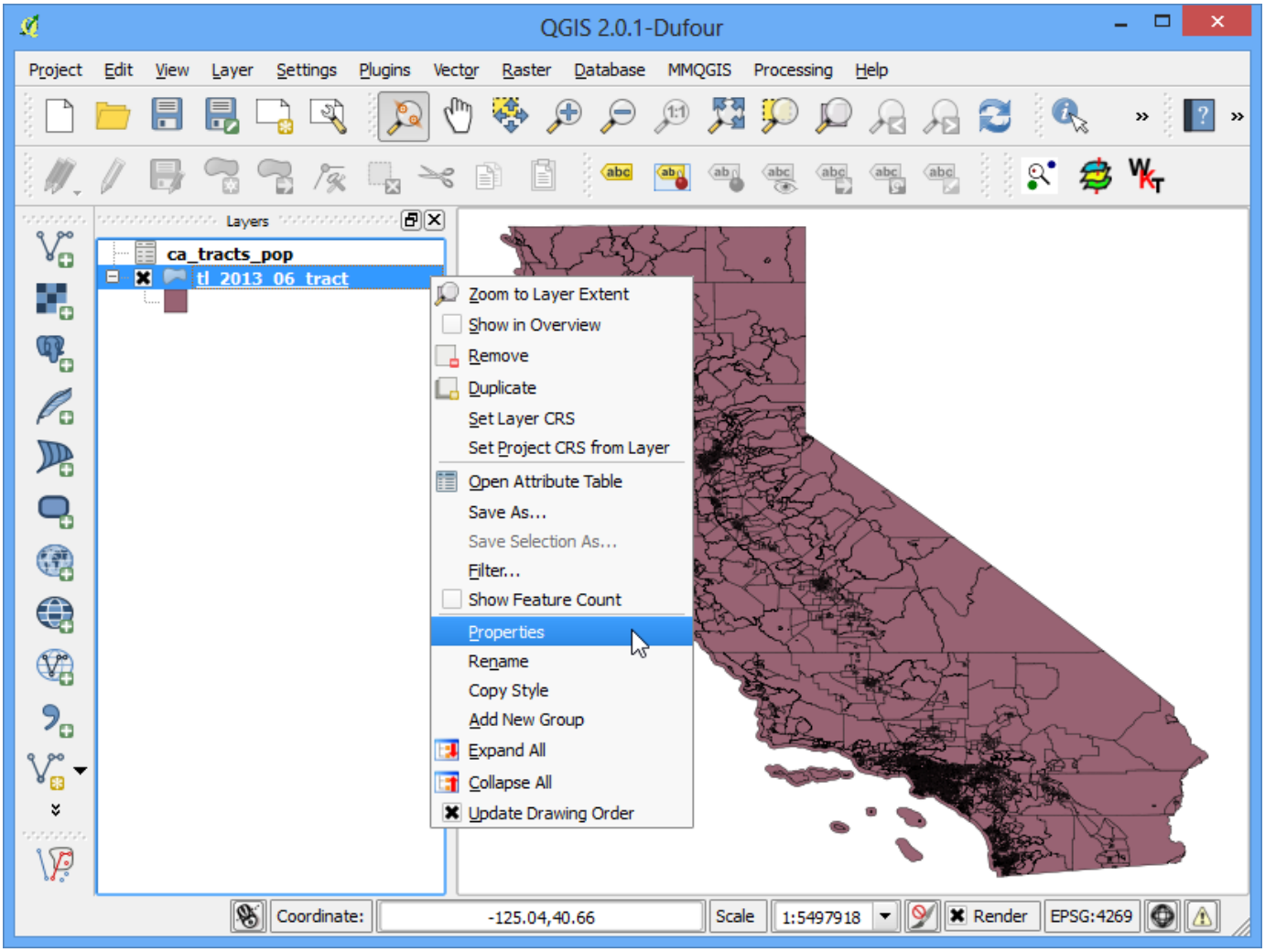
10. Browse to the folder containing the CSV file and select it. Make sure you have selected *File format* as *CSV (comma separated values)*. Since we are importing this as a table, we must specify that our file contains no geometry. Select the *No geometry (attribute only table)* option. Click *OK*.



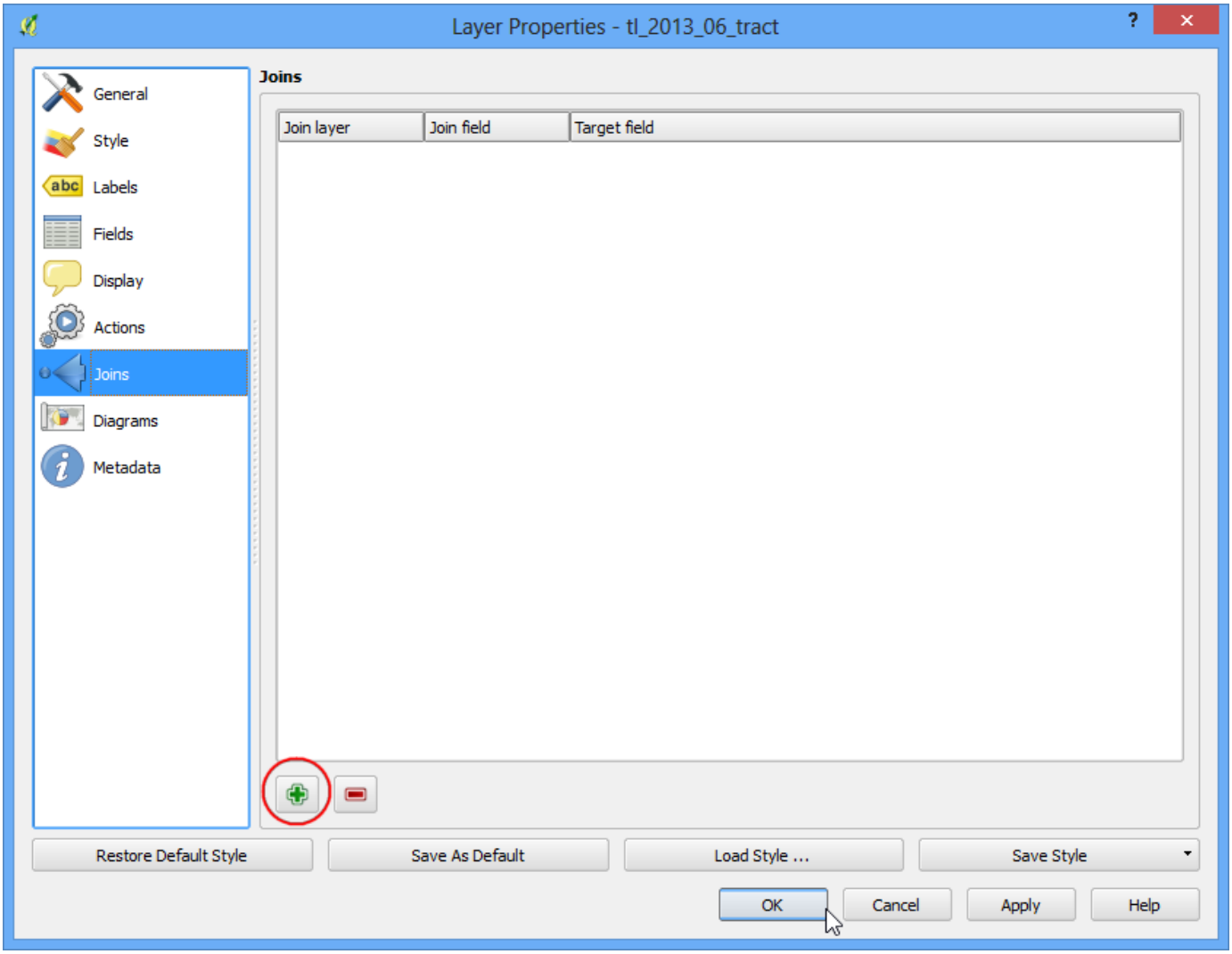
11. The CSV will now be imported as a table to QGIS.



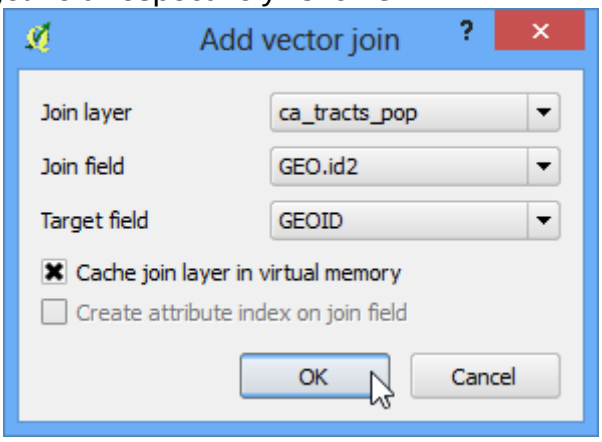
12. Select the *tl_2013_06_tract* layer. Right-click on it and select *Properties*.



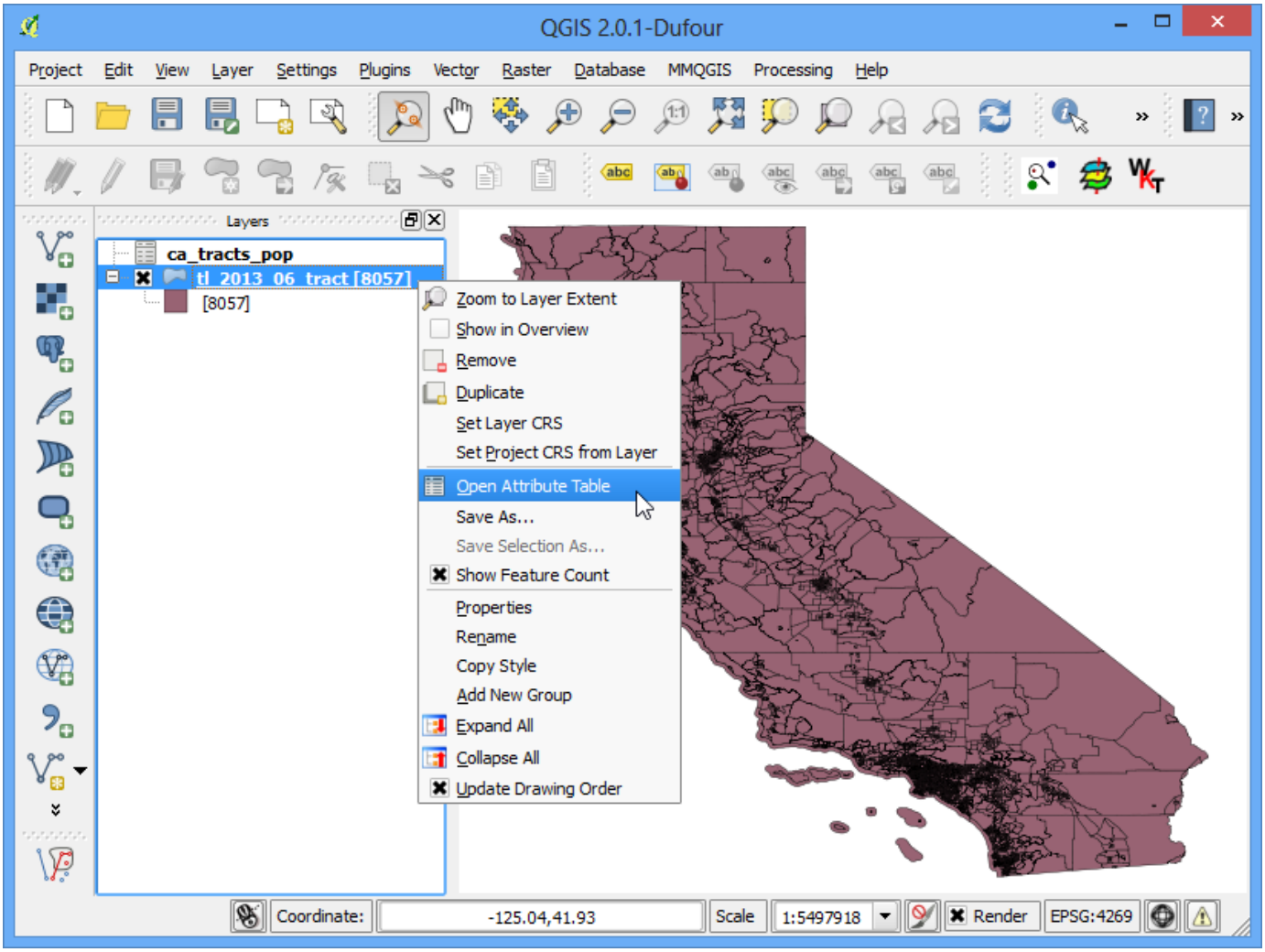
13. In the *Layer Properties* dialog, select the *Joins* tab. Click on the + button at the bottom to create a new table join.



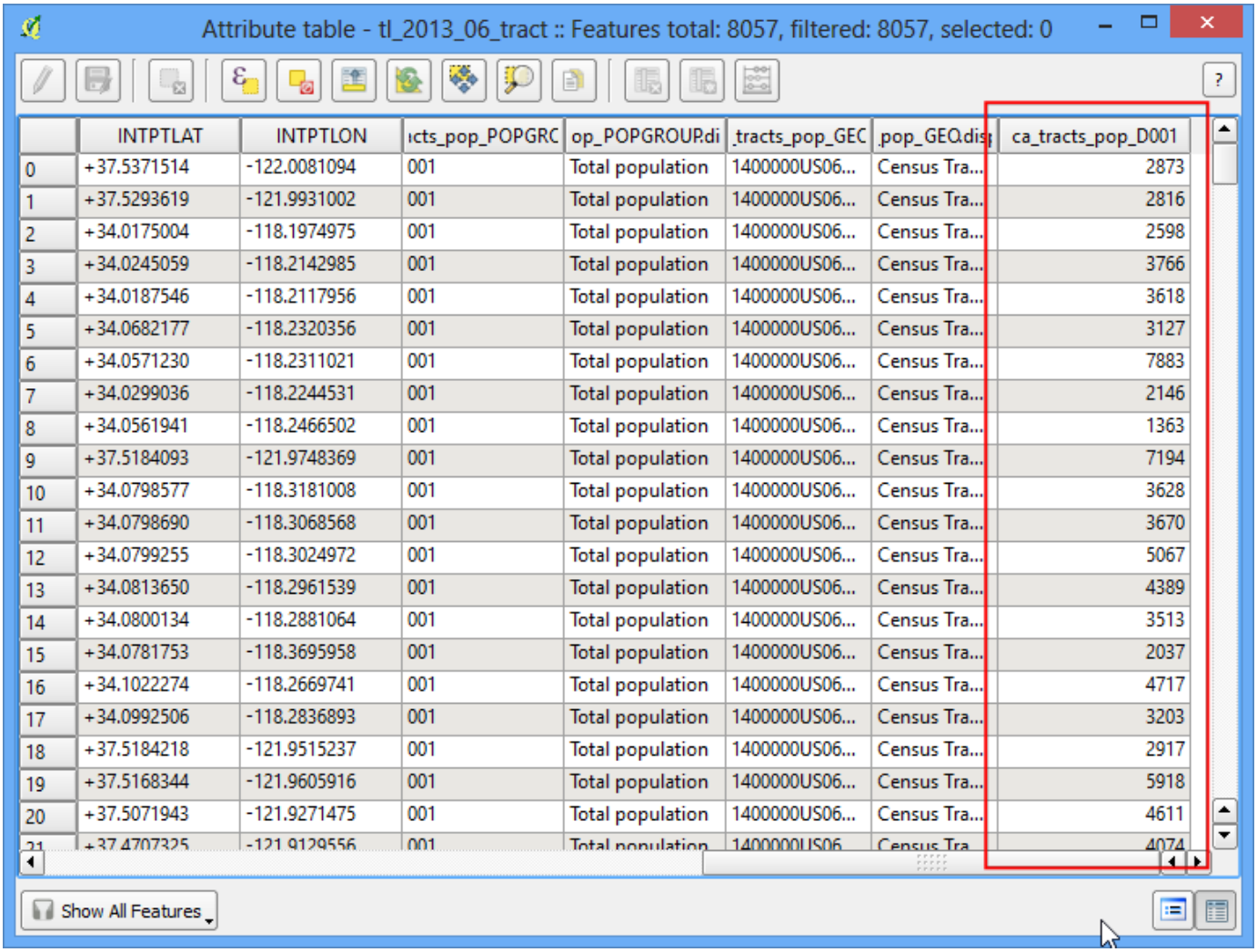
14. In the *Add vector join* dialog, select *ca_tracts_pop* as the *Join layer*. Next we have to select the field with unique ids in both the shapefile and the CSV. Select *GEO.id2* and *GEOID* as the *Join field* and *Target field* respectively. Click *OK*.



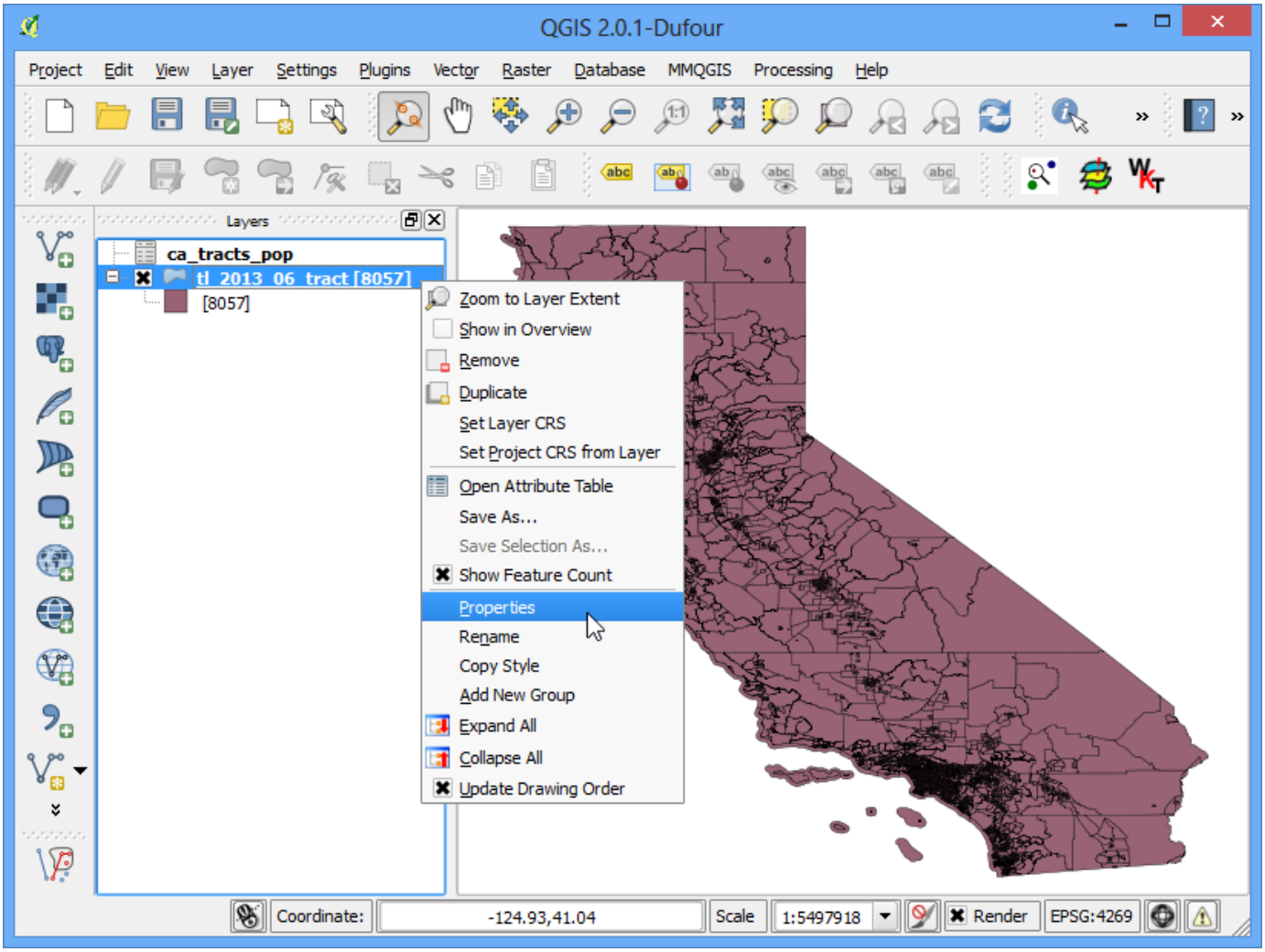
15. Close the *Layer Properties* dialog and return to the main QGIS window. At this point, the fields from the CSV file are joined with the shapefile. Right-click on the *tl_2013_06_tract* layer and select *Open Attribute Table*.



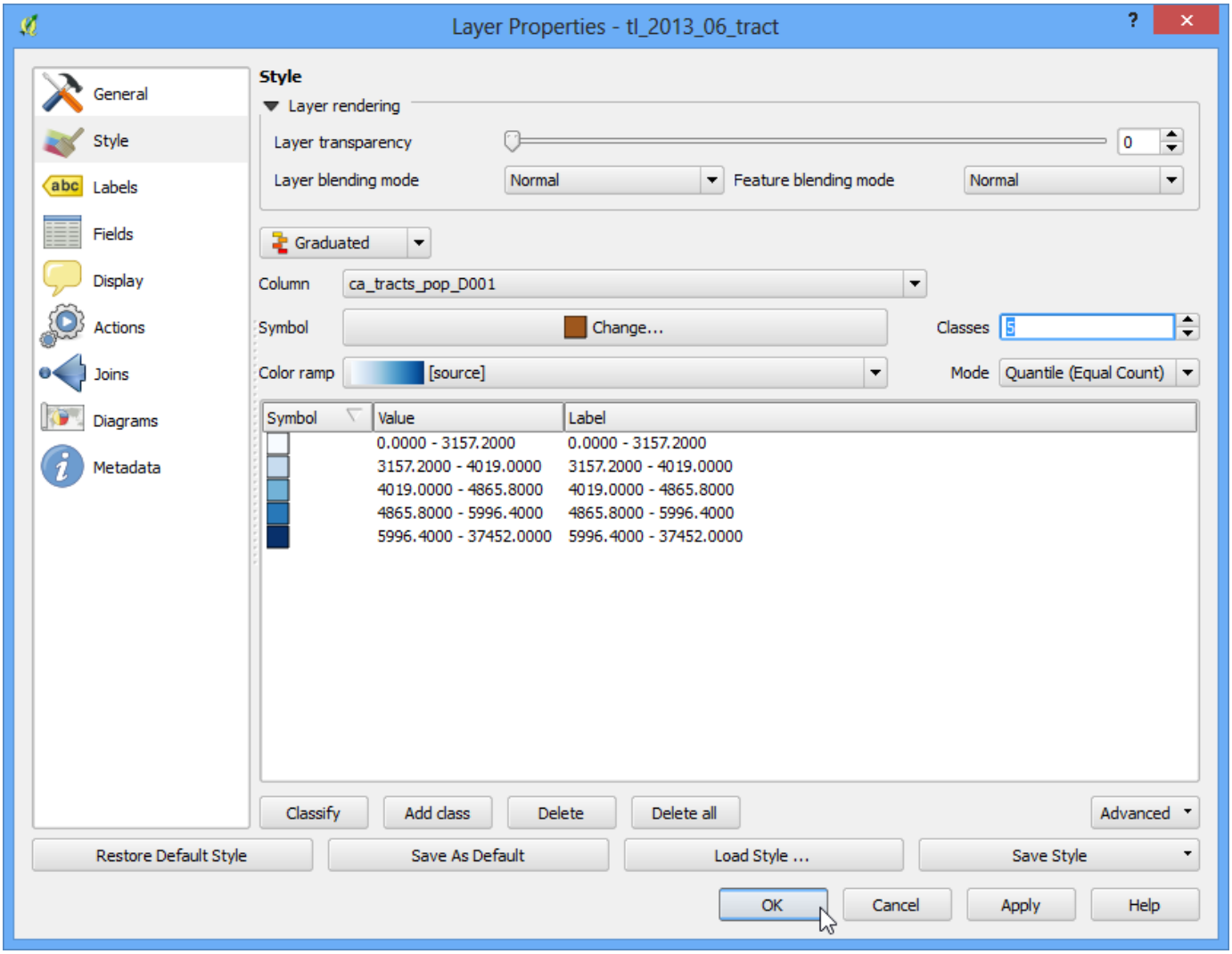
16. You can now see a new set of fields, including *ca_tracts_pop_D001* field added to each feature. Now you have access to the population value of each tract from the CSV file. Close the attribute table and return to the main QGIS window.



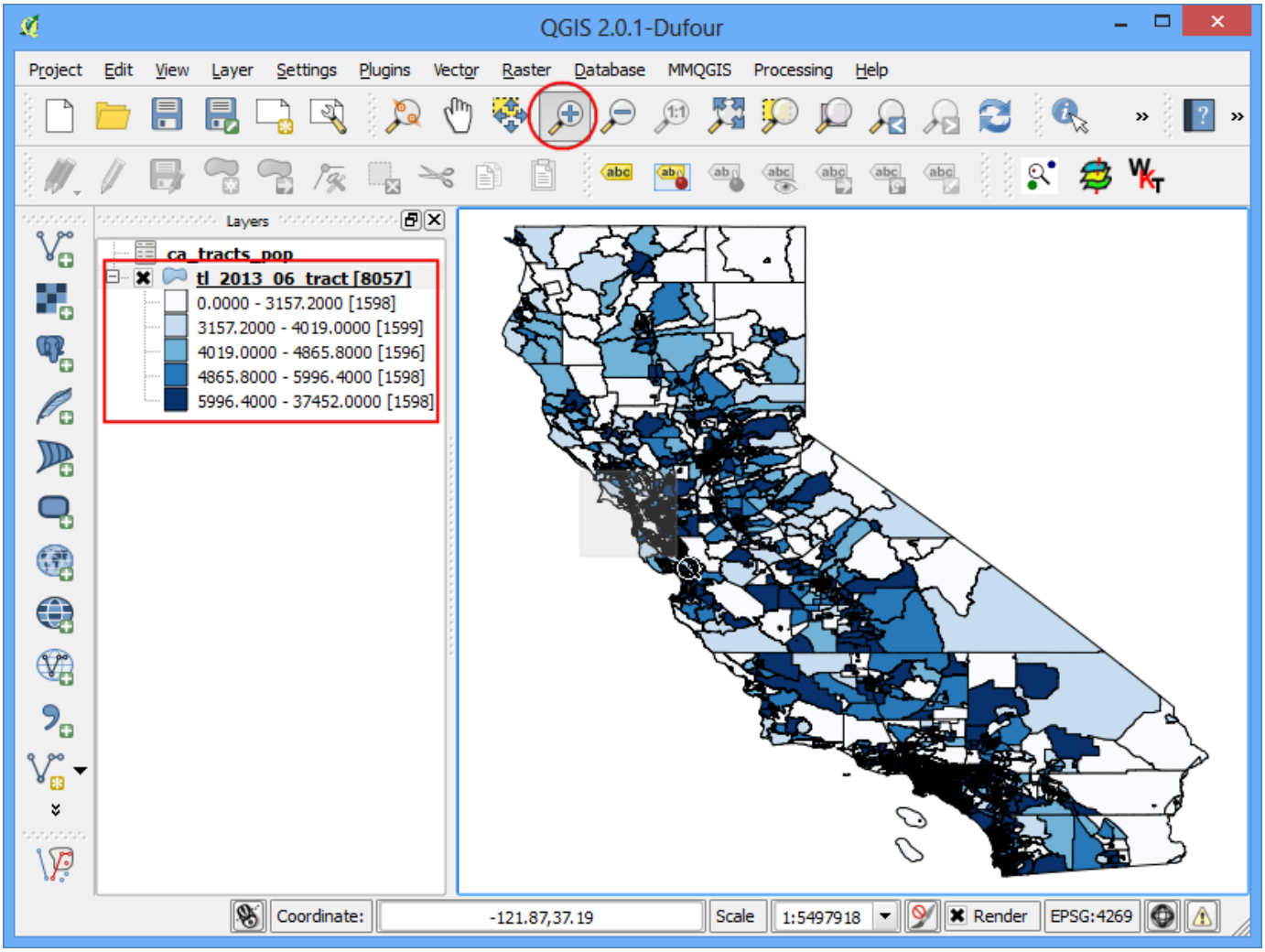
17. Right-click the *tl_2013_06_tract* layer and select *Properties*.



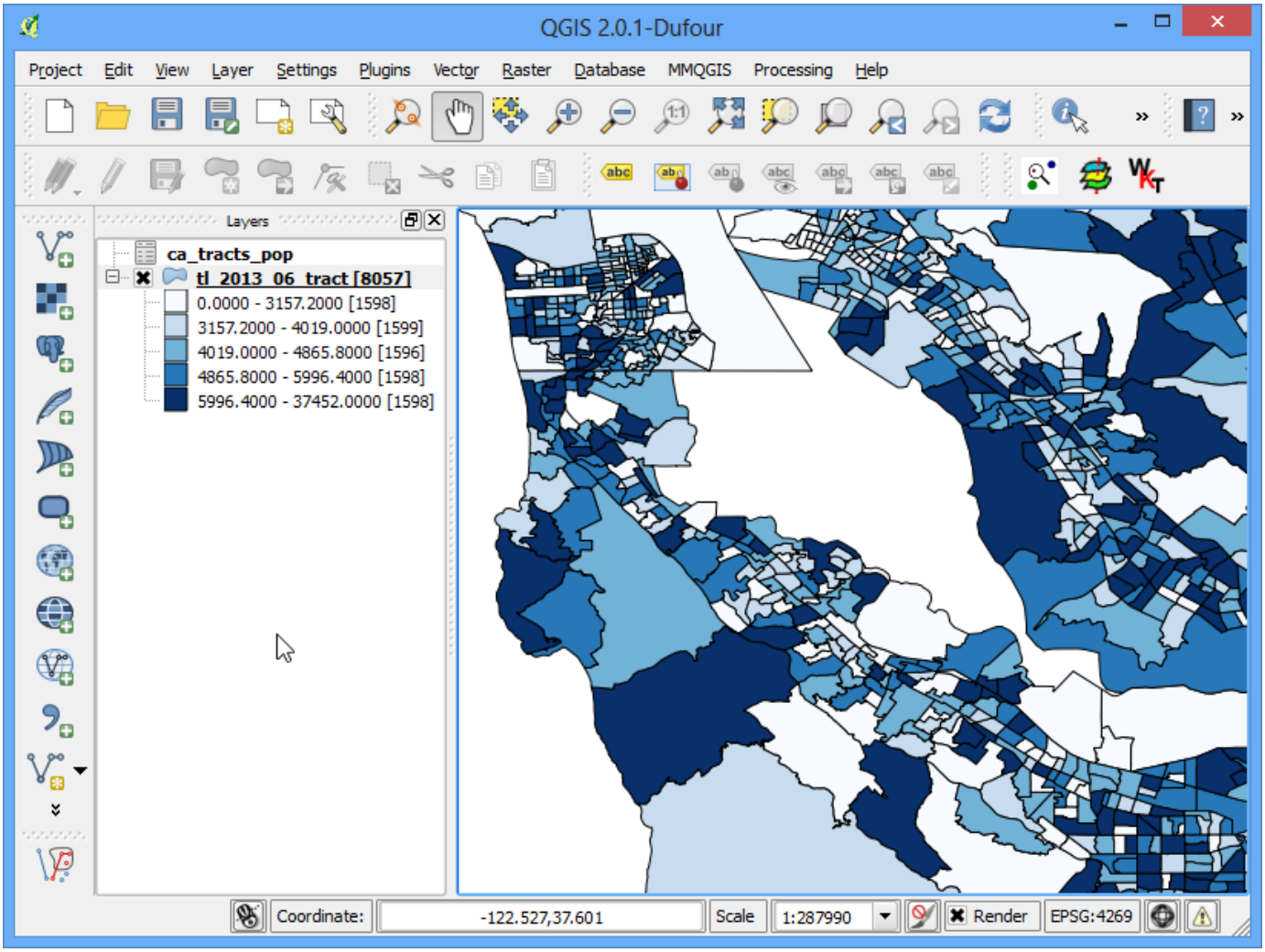
18. Select the *Style* tab. Select the *Graduated* from the drop-down menu. As we are looking to create a population map, we want to assign different color to each census tract feature based on the population count. Select *ca_tracts_pop_D001* as the *Column*. Select a color ramp of your liking from the *Color ramp* drop-down. In the *Mode*, select *Quantile (Equal Count)*. Next click *Classify*. You will see a different color assigned to certain population ranges. Click *OK*.



19. You will now see a nice visualization of the census tracts as styled using population values. Use the *Zoom in* tool to select a smaller area from the layer.



20. You have a detailed and accurate population map of California. You can use the same technique to create maps based on variety of census data.


QGIS 2.0.1-Dufour
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