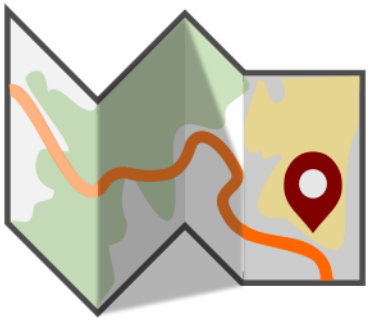
# Working with Attributes

## QGIS Tutorials and Tips



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Translations by

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# Làm vi□c v□i thu□c tính

GIS data has two parts – features and attributes. Attributes are structured data about each feature. This tutorial shows how to view the attributes and do basic queries on them in QGIS.

## T□ng quan v□ nhi□m v□

The dataset for this tutorial contains information about populated places of the world. The task is to query and find all the capital cities in the world that have a population greater than 1,000,000.

### *Các k■ n■ng b■n s■ h■c ■■■c*

- Select features from a layer using expressions.
- Deselect features from a layer using the Attributes toolbar.
- Using Query Builder to show a subset of features from a layer.

## Nh□n d□ li□u

Natural Earth has a nice Populated Places dataset. Download the simple (less columns) dataset

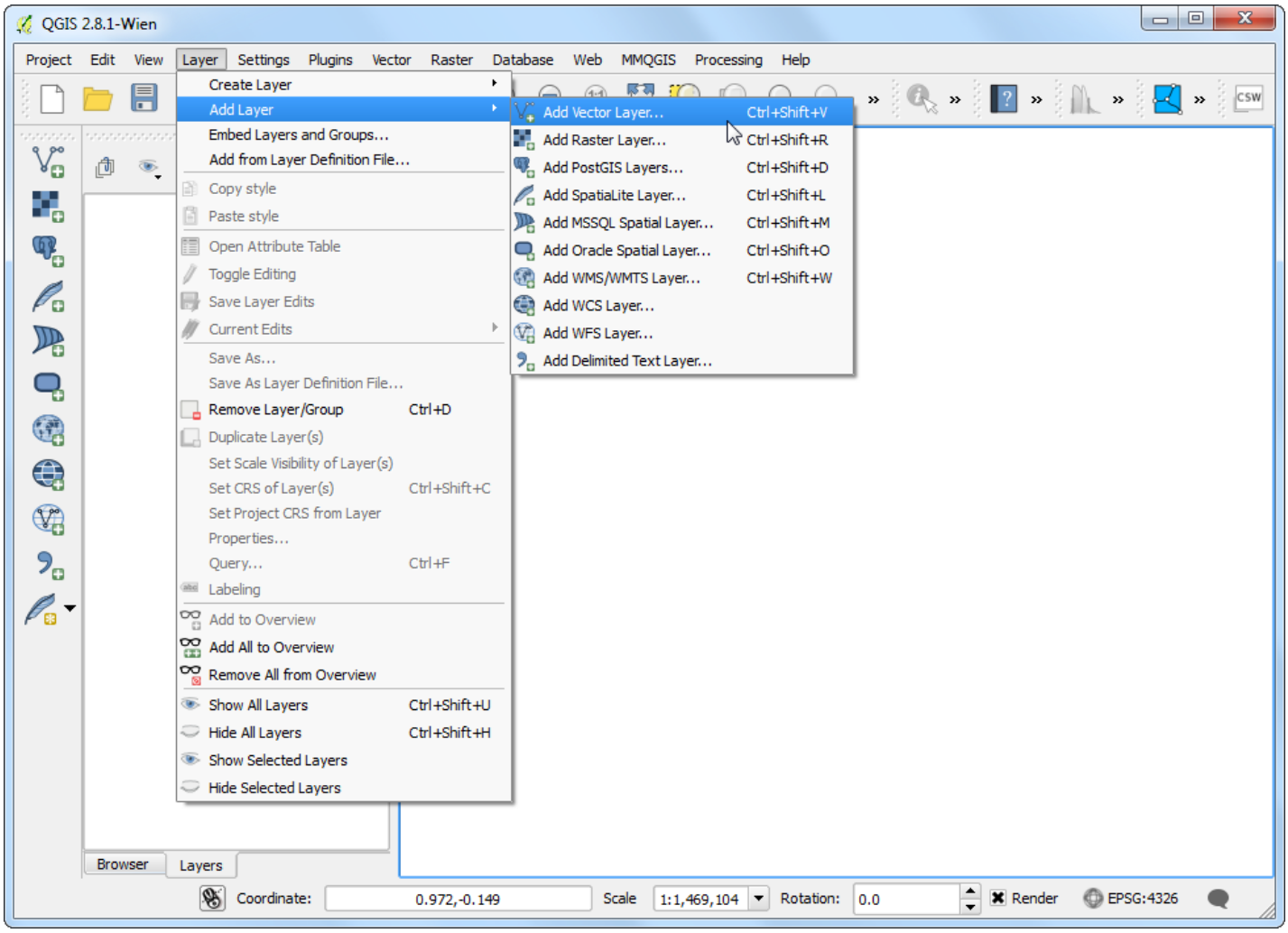
For convenience, you may directly download a copy of datasets from the link below:

ne_10m_populated_places_simple.zip

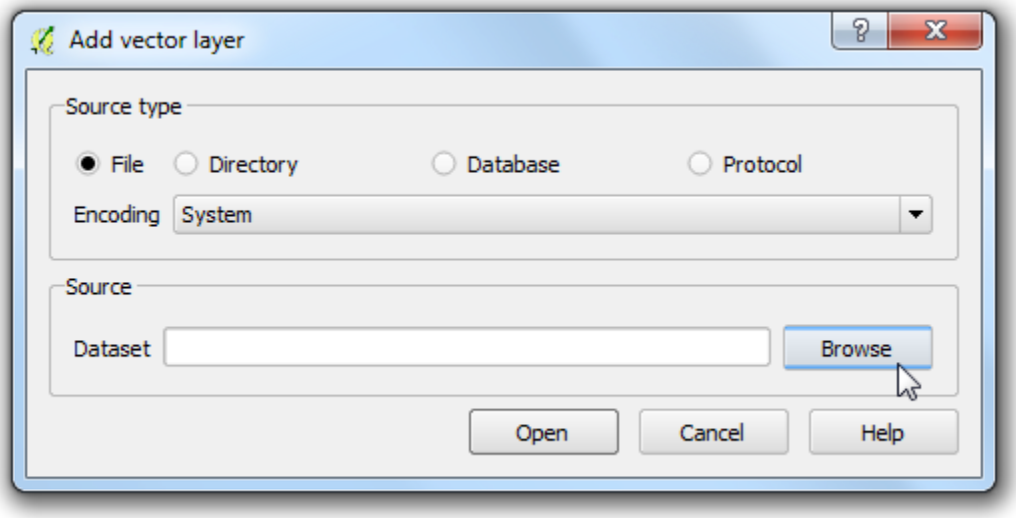
Ngu□n d□ li□u [NATURALEARTH]

## Các bư□c th□c hi□n

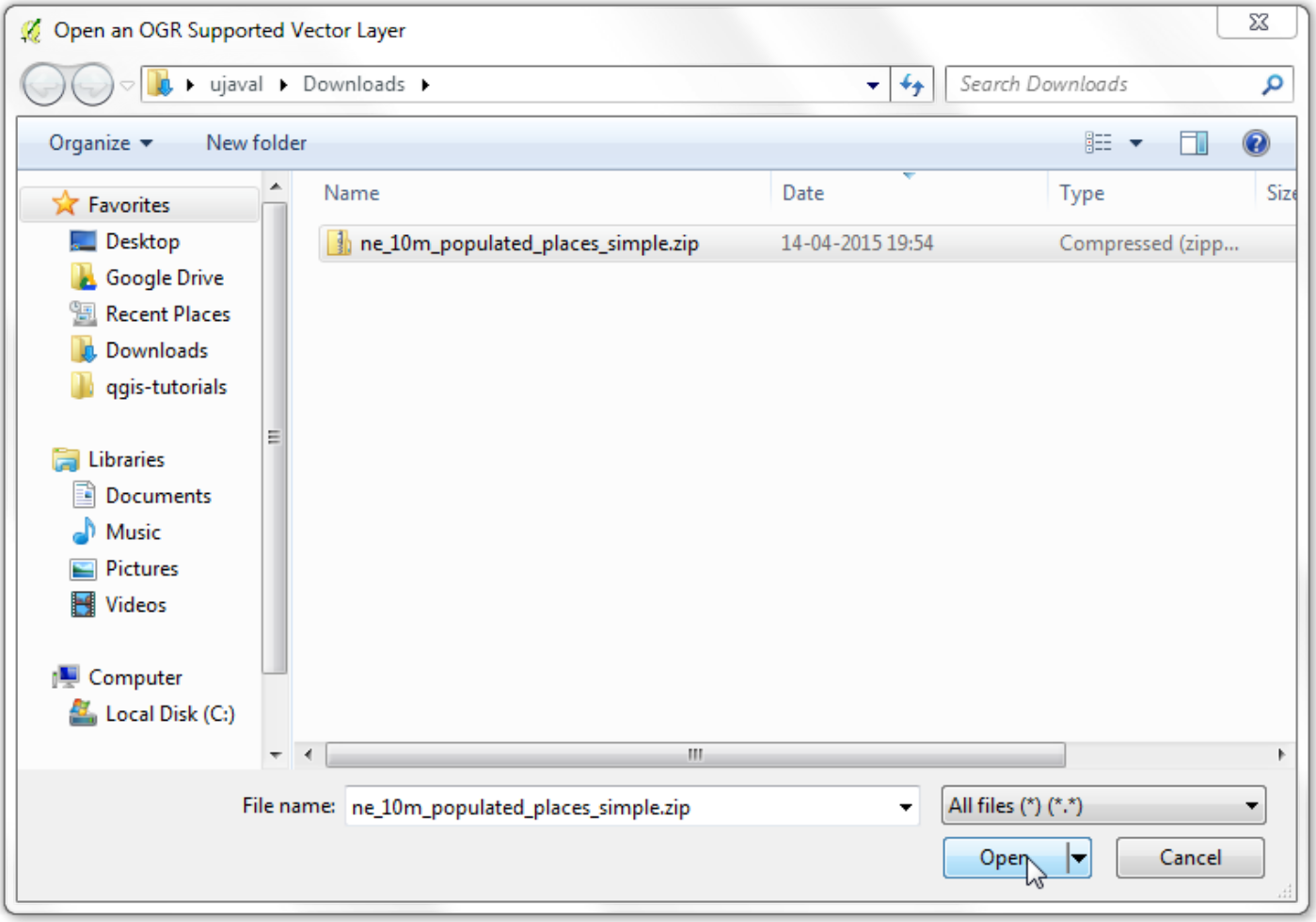
1. Once you have downloaded the data, open QGIS. Go to Layer ▸ Add Layer ▸ Add Vector Layer.



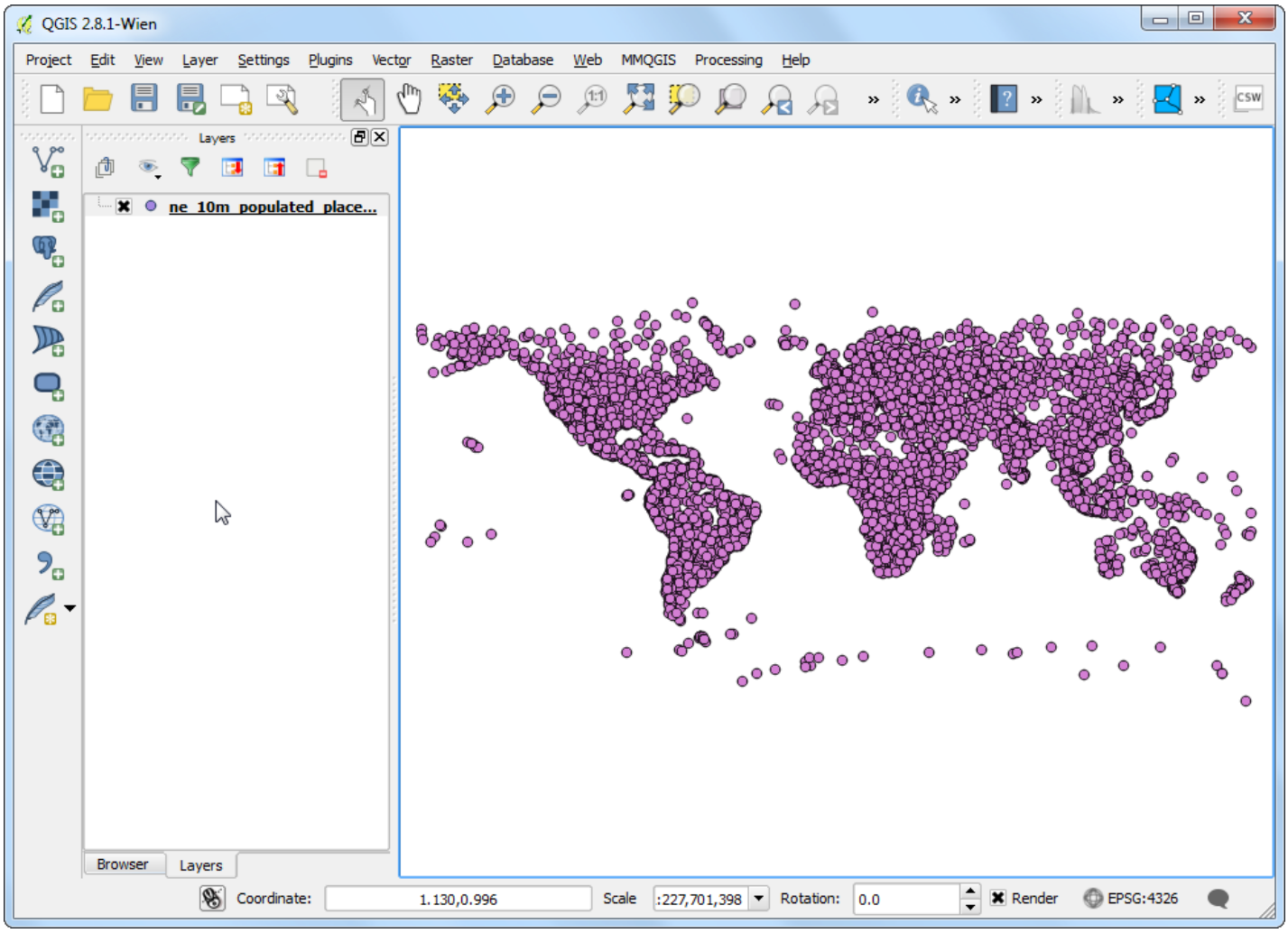

2. Click on Browse and navigate to the folder where you downloaded the data.



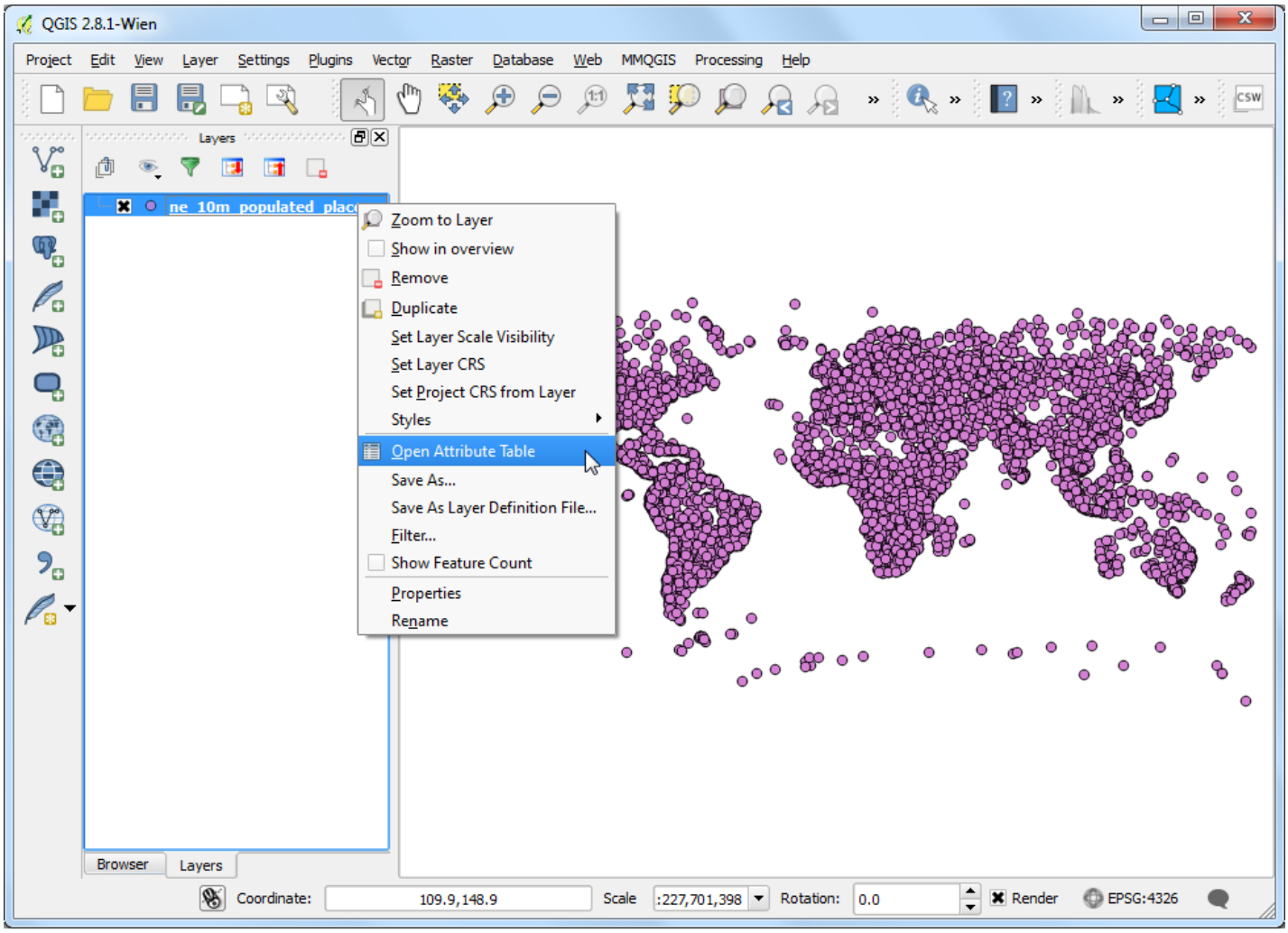

3. Locate the downloaded zip file ***ne_10m_populated_places_simple.zip***. You do not need to unzip the file. QGIS has the ability to read zip files directly. Select the file and click Open.



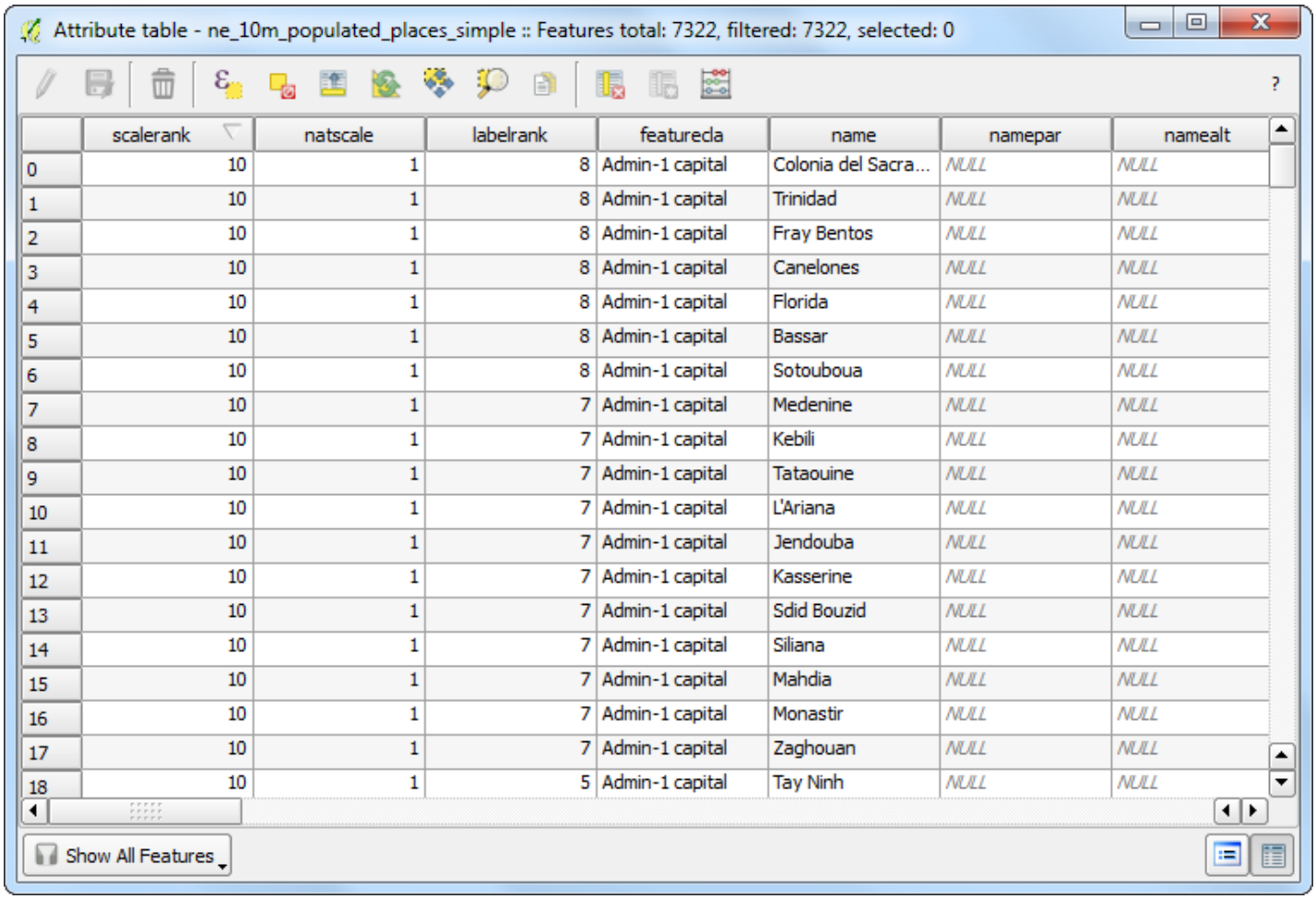

4. The selected layer will now be loaded in QGIS and you will see many points representing the populated places of the world.




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

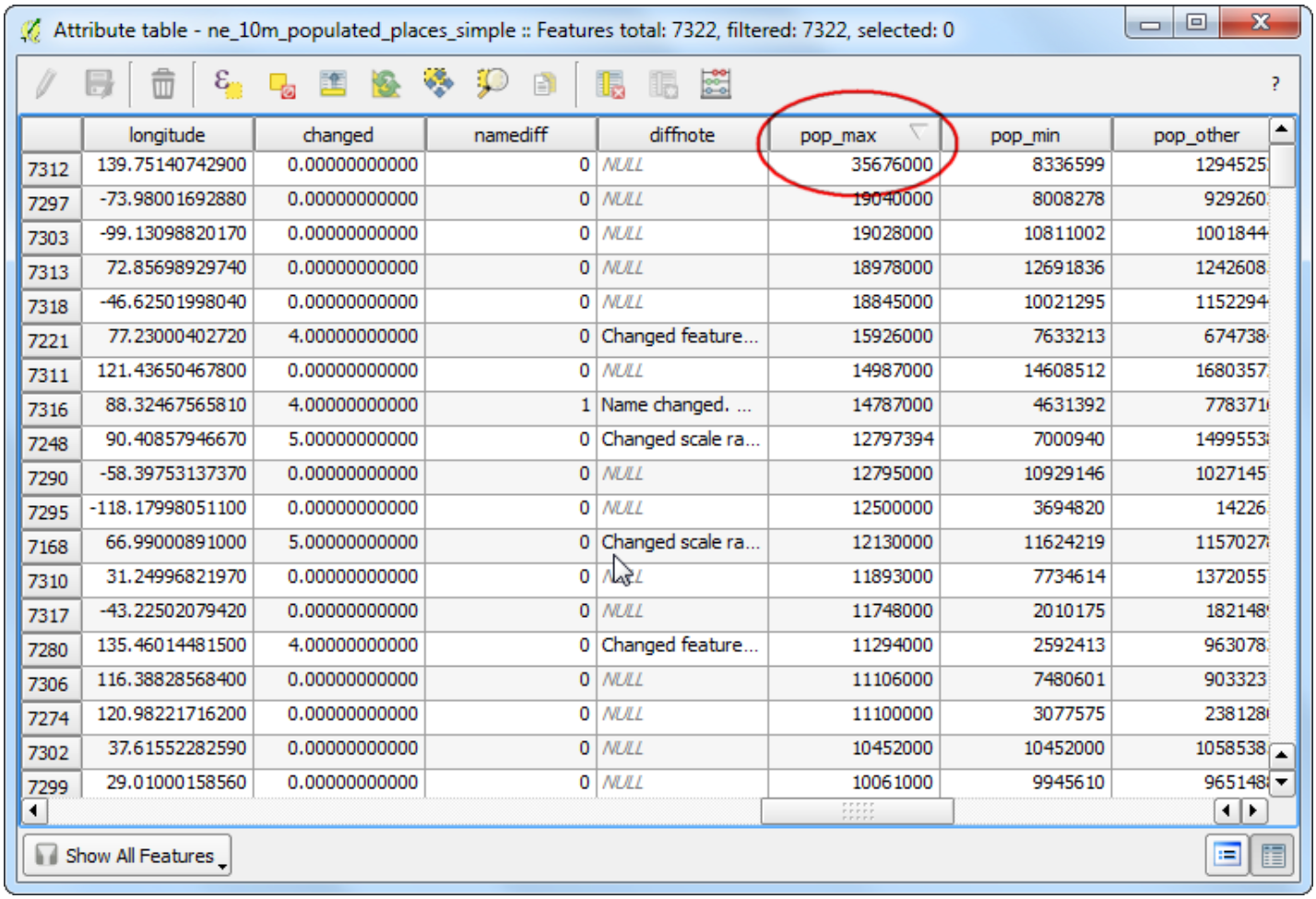



6. Explore the various attributes and their values.



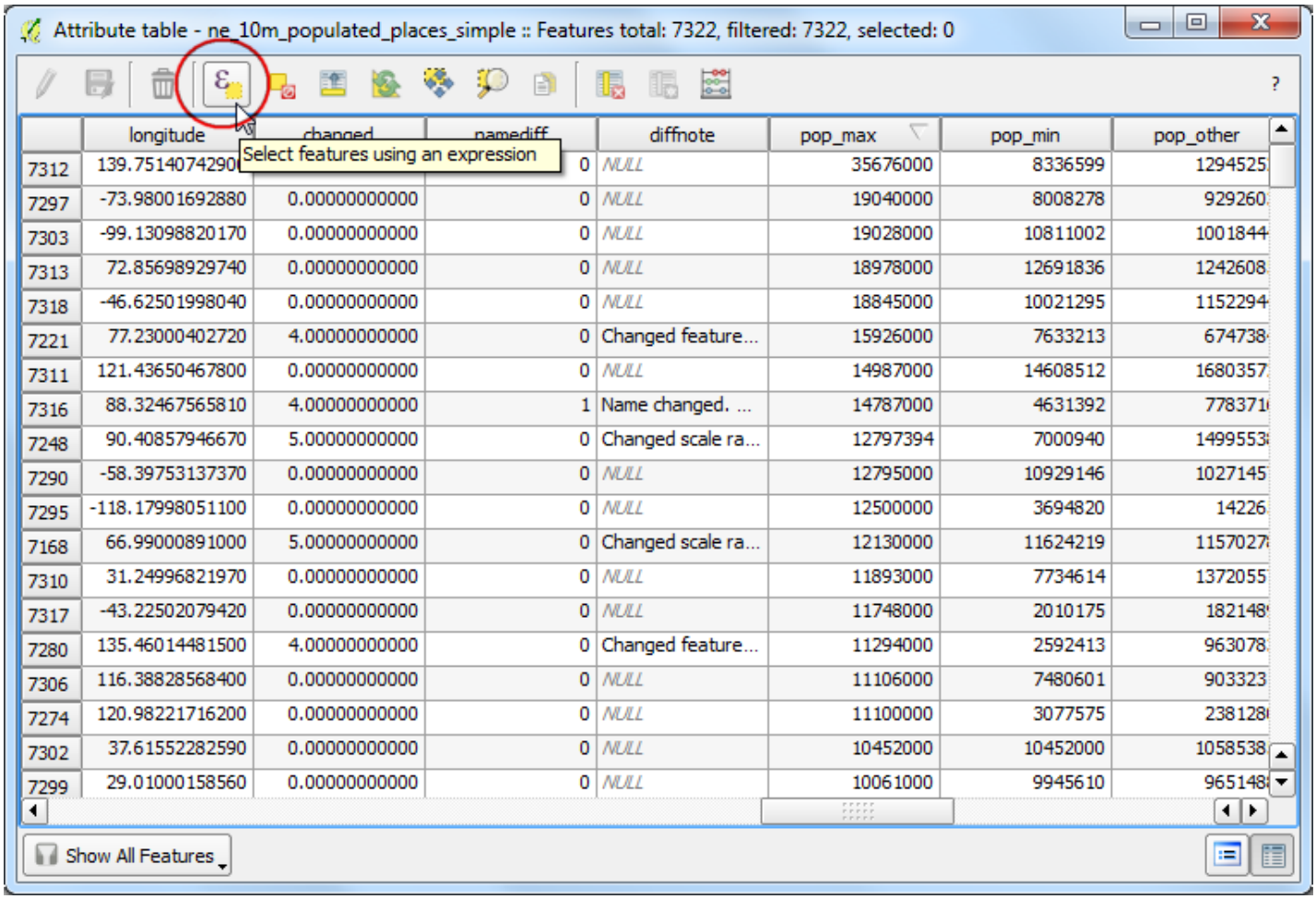

| | scalerank | natscale | labelrank | featurecla | name | namepar | namealt |
|---|---|---|---|---|---|---|---|
| 0 | 10 | 1 | 8 | Admin-1 capital | Colonia del Sacra... | NULL | NULL |
| 1 | 10 | 1 | 8 | Admin-1 capital | Trinidad | NULL | NULL |
| 2 | 10 | 1 | 8 | Admin-1 capital | Fray Bentos | NULL | NULL |
| 3 | 10 | 1 | 8 | Admin-1 capital | Canelones | NULL | NULL |
| 4 | 10 | 1 | 8 | Admin-1 capital | Florida | NULL | NULL |
| 5 | 10 | 1 | 8 | Admin-1 capital | Bassar | NULL | NULL |
| 6 | 10 | 1 | 8 | Admin-1 capital | Sotouboua | NULL | NULL |
| 7 | 10 | 1 | 7 | Admin-1 capital | Medenine | NULL | NULL |
| 8 | 10 | 1 | 7 | Admin-1 capital | Kebili | NULL | NULL |
| 9 | 10 | 1 | 7 | Admin-1 capital | Tataouine | NULL | NULL |
| 10 | 10 | 1 | 7 | Admin-1 capital | L'Ariana | NULL | NULL |
| 11 | 10 | 1 | 7 | Admin-1 capital | Jendouba | NULL | NULL |
| 12 | 10 | 1 | 7 | Admin-1 capital | Kasserine | NULL | NULL |
| 13 | 10 | 1 | 7 | Admin-1 capital | Sdid Bouzid | NULL | NULL |
| 14 | 10 | 1 | 7 | Admin-1 capital | Siliana | NULL | NULL |
| 15 | 10 | 1 | 7 | Admin-1 capital | Mahdia | NULL | NULL |
| 16 | 10 | 1 | 7 | Admin-1 capital | Monastir | NULL | NULL |
| 17 | 10 | 1 | 7 | Admin-1 capital | Zaghouan | NULL | NULL |
| 18 | 10 | 1 | 5 | Admin-1 capital | Tay Ninh | NULL | NULL |

7. We are interested in the population of each feature, so ***pop_max*** is the field we are looking for. You can click twice on the field header to sort the column in descending order.




| | longitude | changed | namediff | diffnote | pop_max | pop_min | pop_other |
|---|---|---|---|---|---|---|---|
| 7312 | 139.75140742900 | 0.00000000000 | 0 | NULL | 35676000 | 8336599 | 1294525 |
| 7297 | -73.98001692880 | 0.00000000000 | 0 | NULL | 19040000 | 8008278 | 929260 |
| 7303 | -99.13098820170 | 0.00000000000 | 0 | NULL | 19028000 | 10811002 | 1001844 |
| 7313 | 72.85698929740 | 0.00000000000 | 0 | NULL | 18978000 | 12691836 | 1242608 |
| 7318 | -46.62501998040 | 0.00000000000 | 0 | NULL | 18845000 | 10021295 | 1152294 |
| 7221 | 77.23000402720 | 4.00000000000 | 0 | Changed feature... | 15926000 | 7633213 | 674738 |
| 7311 | 121.43650467800 | 0.00000000000 | 0 | NULL | 14987000 | 14608512 | 1680357 |
| 7316 | 88.32467565810 | 4.00000000000 | 1 | Name changed. ... | 14787000 | 4631392 | 778371 |
| 7248 | 90.40857946670 | 5.00000000000 | 0 | Changed scale ra... | 12797394 | 7000940 | 1499553 |
| 7290 | -58.39753137370 | 0.00000000000 | 0 | NULL | 12795000 | 10929146 | 1027145 |
| 7295 | -118.17998051100 | 0.00000000000 | 0 | NULL | 12500000 | 3694820 | 14226 |
| 7168 | 66.99000891000 | 5.00000000000 | 0 | Changed scale ra... | 12130000 | 11624219 | 1157027 |
| 7310 | 31.24996821970 | 0.00000000000 | 0 | NULL | 11893000 | 7734614 | 1372055 |
| 7317 | -43.22502079420 | 0.00000000000 | 0 | NULL | 11748000 | 2010175 | 182148 |
| 7280 | 135.46014481500 | 4.00000000000 | 0 | Changed feature... | 11294000 | 2592413 | 963078 |
| 7306 | 116.38828568400 | 0.00000000000 | 0 | NULL | 11106000 | 7480601 | 903323 |
| 7274 | 120.98221716200 | 0.00000000000 | 0 | NULL | 11100000 | 3077575 | 238128 |
| 7302 | 37.61552282590 | 0.00000000000 | 0 | NULL | 10452000 | 10452000 | 1058538 |
| 7299 | 29.01000158560 | 0.00000000000 | 0 | NULL | 10061000 | 9945610 | 965148 |

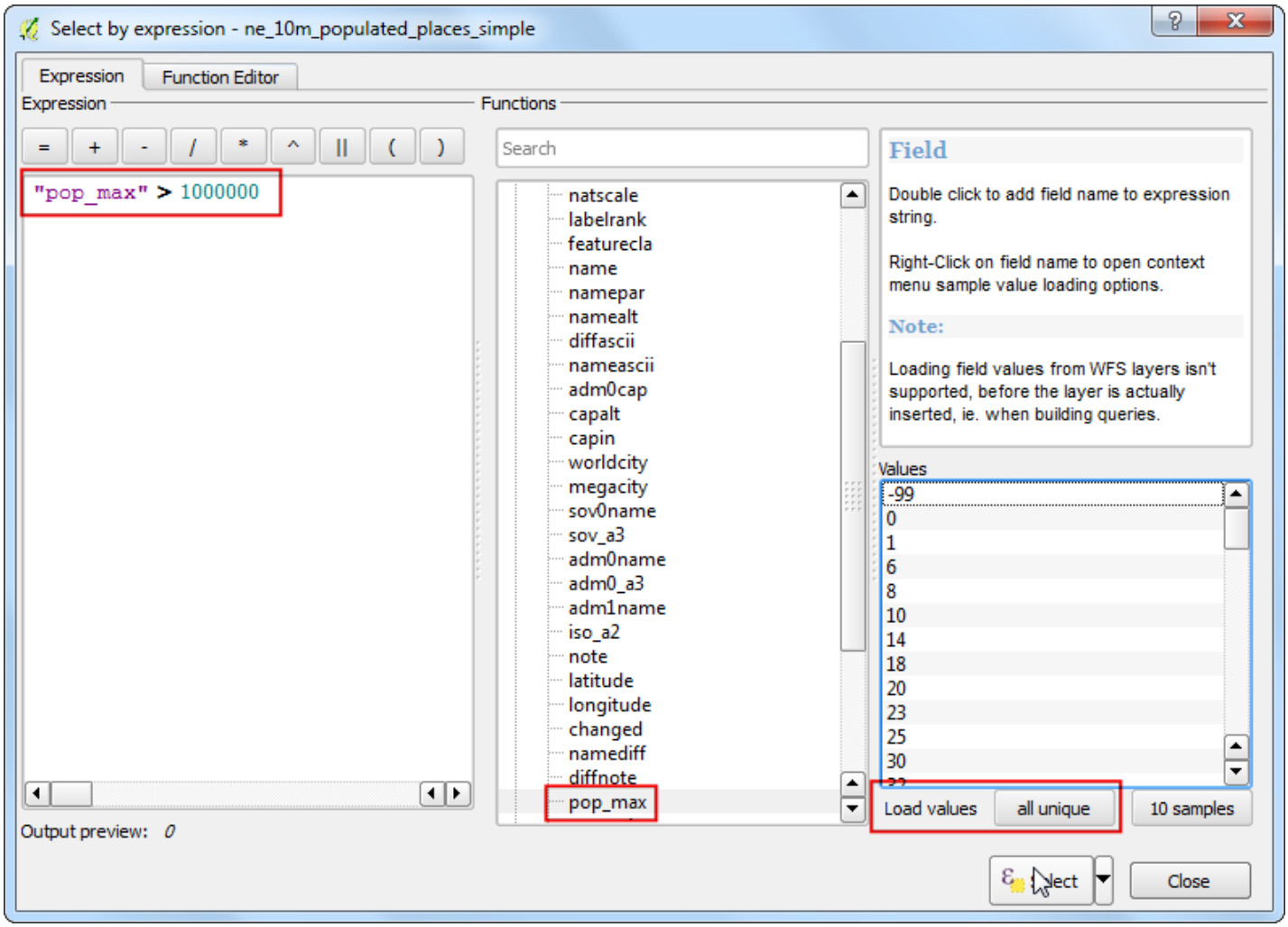
8. Now we are ready to perform our query on these attributes. QGIS uses SQL-like expressions to perform queries. Click Select features using an expression.



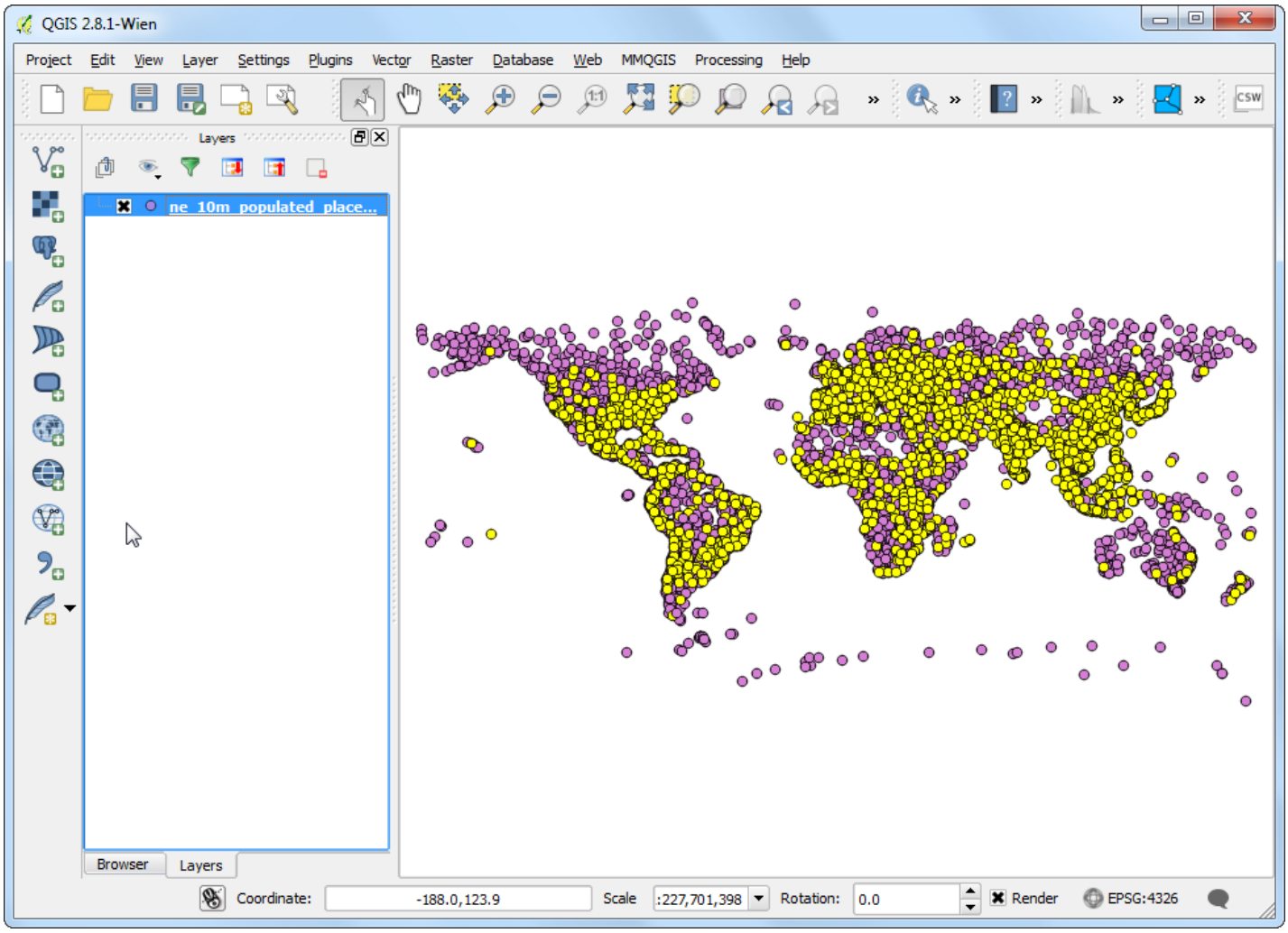

| | longitude | changed | namediff | diffnote | pop_max | pop_min | pop_other |
|---|---|---|---|---|---|---|---|
| 7312 | 139.7514074290 | | 0 | NULL | 35676000 | 8336599 | 1294525 |
| 7297 | -73.98001692880 | 0.00000000000 | 0 | NULL | 19040000 | 8008278 | 929260 |
| 7303 | -99.13098820170 | 0.00000000000 | 0 | NULL | 19028000 | 10811002 | 1001844 |
| 7313 | 72.85698929740 | 0.00000000000 | 0 | NULL | 18978000 | 12691836 | 1242608 |
| 7318 | -46.62501998040 | 0.00000000000 | 0 | NULL | 18845000 | 10021295 | 1152294 |
| 7221 | 77.23000402720 | 4.00000000000 | 0 | Changed feature... | 15926000 | 7633213 | 674738 |
| 7311 | 121.43650467800 | 0.00000000000 | 0 | NULL | 14987000 | 14608512 | 1680357 |
| 7316 | 88.32467565810 | 4.00000000000 | 1 | Name changed. ... | 14787000 | 4631392 | 778371 |
| 7248 | 90.40857946670 | 5.00000000000 | 0 | Changed scale ra... | 12797394 | 7000940 | 1499553 |
| 7290 | -58.39753137370 | 0.00000000000 | 0 | NULL | 12795000 | 10929146 | 1027145 |
| 7295 | -118.17998051100 | 0.00000000000 | 0 | NULL | 12500000 | 3694820 | 14226 |
| 7168 | 66.99000891000 | 5.00000000000 | 0 | Changed scale ra... | 12130000 | 11624219 | 1157027 |
| 7310 | 31.24996821970 | 0.00000000000 | 0 | NULL | 11893000 | 7734614 | 1372055 |
| 7317 | -43.22502079420 | 0.00000000000 | 0 | NULL | 11748000 | 2010175 | 182148 |
| 7280 | 135.46014481500 | 4.00000000000 | 0 | Changed feature... | 11294000 | 2592413 | 963078 |
| 7306 | 116.38828568400 | 0.00000000000 | 0 | NULL | 11106000 | 7480601 | 903323 |
| 7274 | 120.98221716200 | 0.00000000000 | 0 | NULL | 11100000 | 3077575 | 238128 |
| 7302 | 37.61552282590 | 0.00000000000 | 0 | NULL | 10452000 | 10452000 | 1058538 |
| 7299 | 29.01000158560 | 0.00000000000 | 0 | NULL | 10061000 | 9945610 | 965148 |

9. In the Select By Expression window, expand the Fields and Values section and double-click the ***pop_max*** label. You will notice that it is added to the expression section at the bottom. If you aren't sure about the field values, you can click the Load all unique values to see what the attribute values are present in the dataset. For this exercise, we are looking to find all features that have a population greater than ***1,000,000***. So complete the expression as below and click Select.

```
"pop_max" > 1000000
```

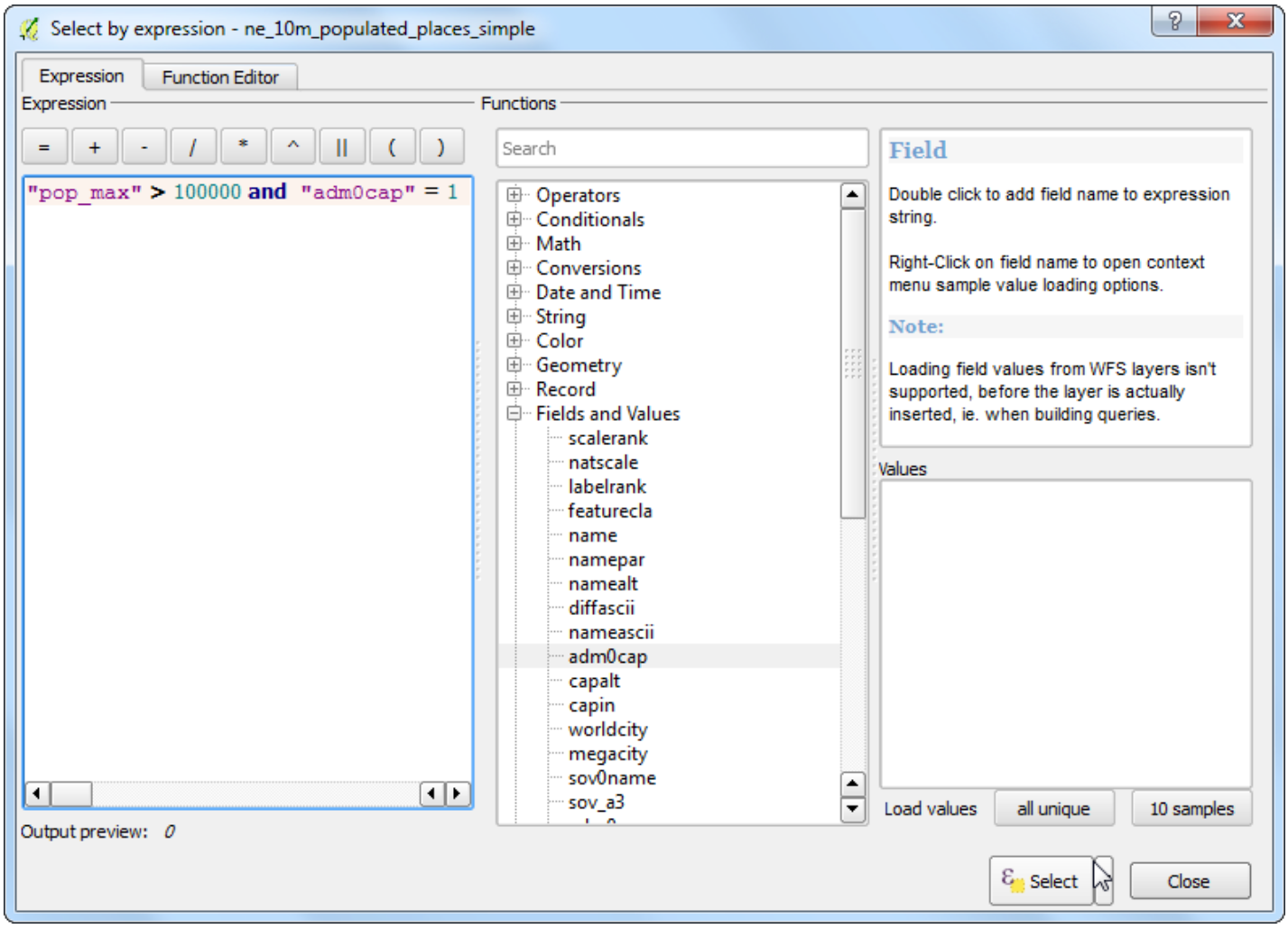



10. Click on Close and return to the main QGIS window. You will notice that a subset of points is now rendered in yellow. This is the result of our query and you are seeing all places from the dataset that have the ***pop_max*** attribute value greater than ***1,000,000***.

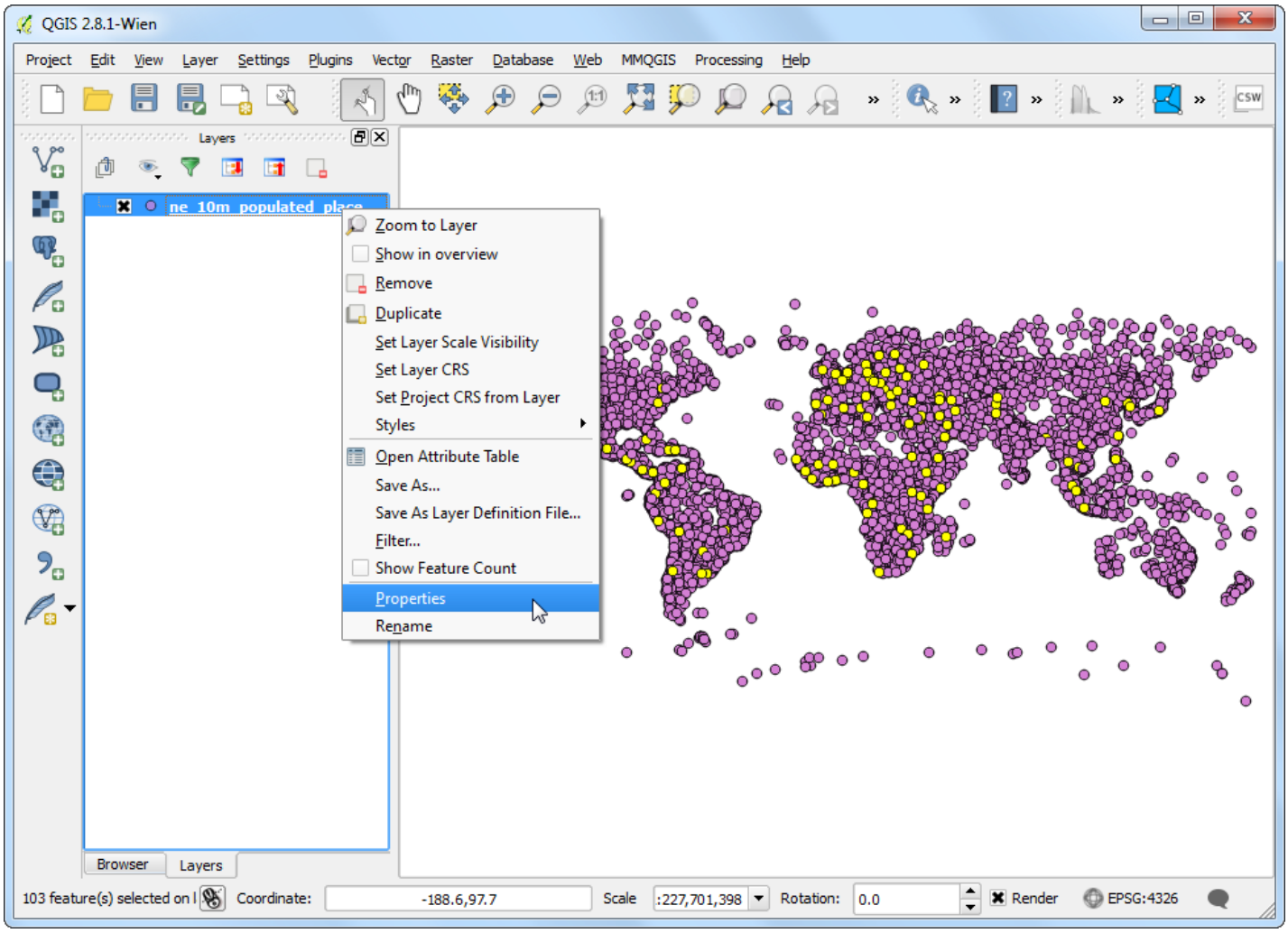



11. The goal for this exercise is to find the places that are country capitals. The field containing this data is ***adm0cap***. The value ***1*** indicates that the place is a capital. We can add this criteria to our previous expression using the ***and*** operator. Let's refine our query to select only those places which are capitals. Click on the Select feature using an expression button in the attribute table and enter the expression as below and click Select and then Close.

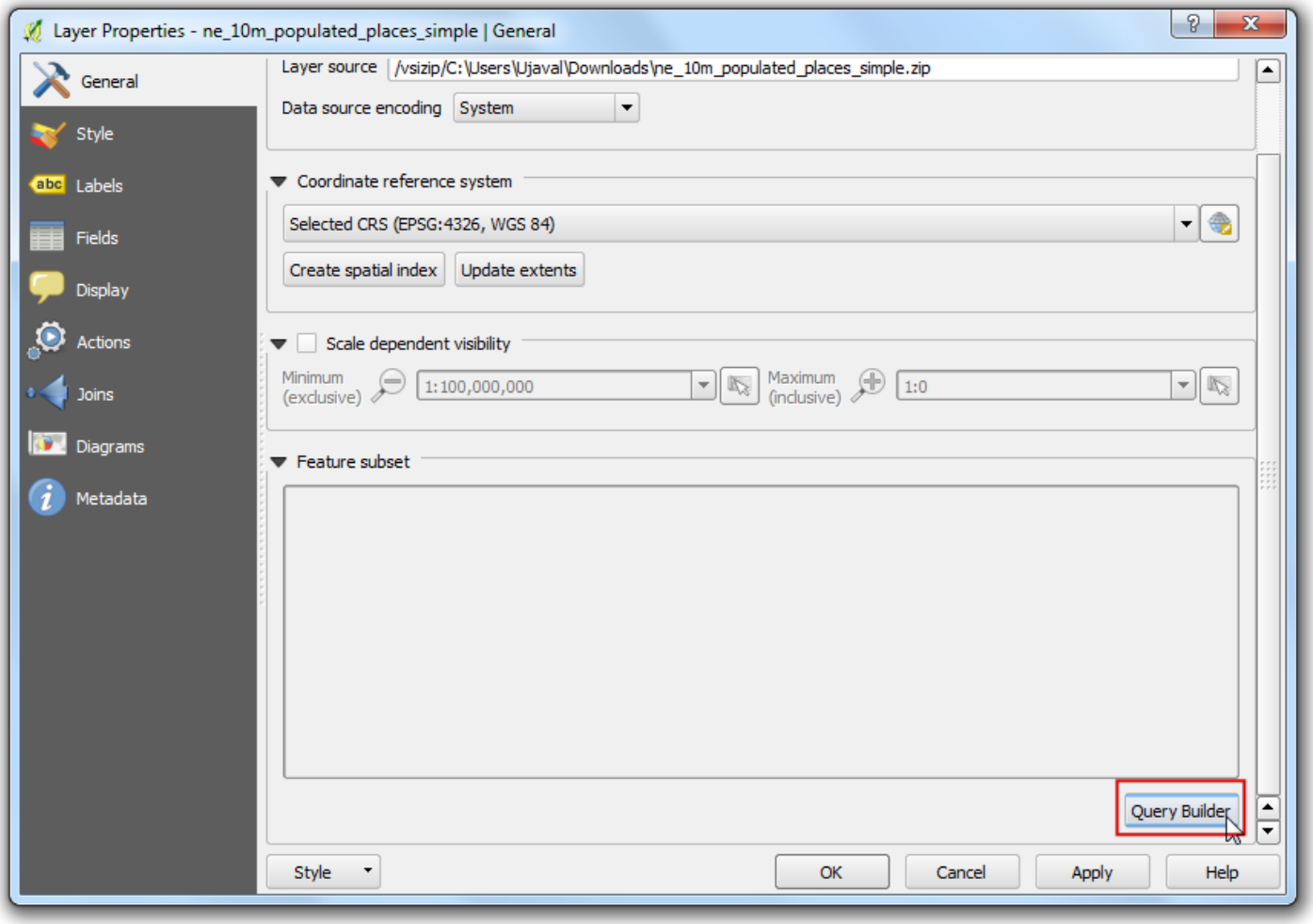
```
"pop_max" > 1000000 and "adm0cap" = 1
```




12. Return to the main QGIS window. Now you will see a smaller subset of the points selected. This is the result of the second query and shows all places from the dataset that are country capitals as well as have population greater than 1,000,000. If we wanted to do some further analysis on this subset of data, we can make this selection persistent. Right-click the ***ne_10m_populated_places_simple*** layer and select Properties.

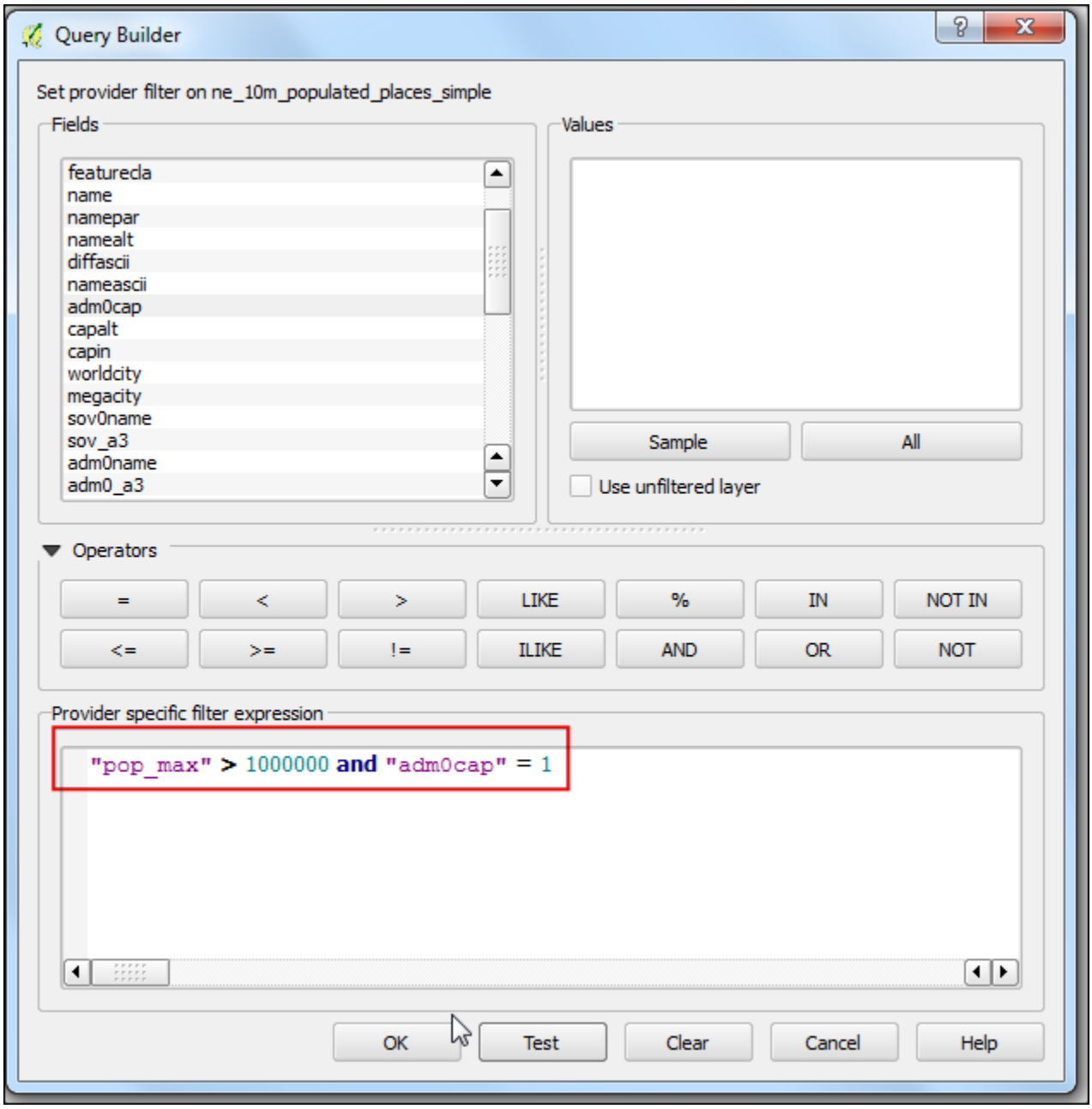



13. In the General tab, scroll down to the Feature subset section. Click Query Builder.

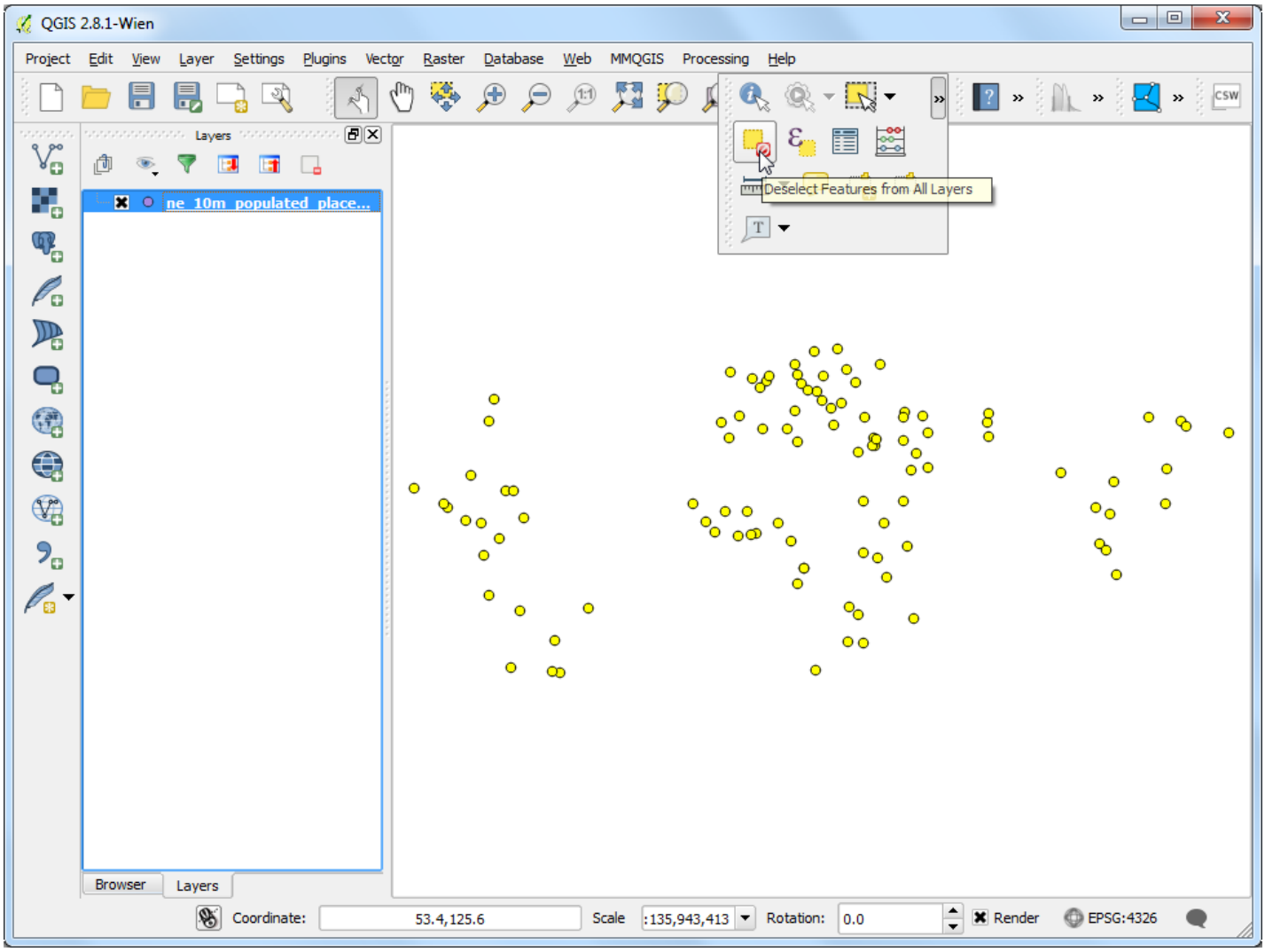



14. Enter the same expression you had entered earlier and click OK.

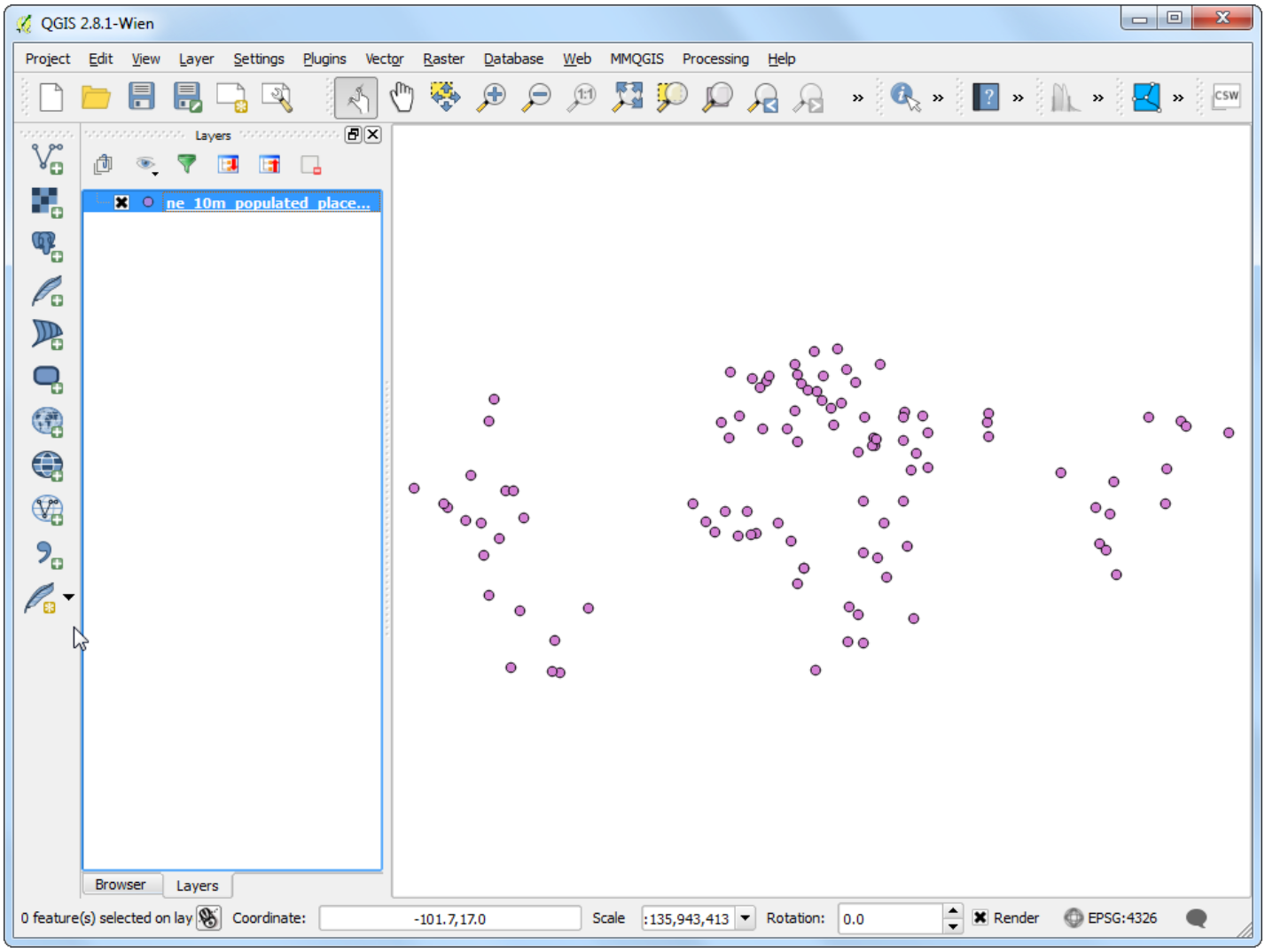
```
"pop_max" > 1000000 and "adm0cap" = 1
```




15. Back in the main QGIS window, you will see rest of the points disappear. You may now perform any other analysis on this layer and only the features that match our expression will be used. You will notice that the points still appear in yellow. This is because they are still selected. Find the Deselect Features from All Layers button under the Attributes toolbar and click on it.




16. You will see that the points are now de-selected and rendered in their original color.


QGIS 2.8.1-Wien
Project Edit View Layer Settings Plugins Vector Raster Database Web MMQGIS Processing Help
Layers
ne_10m_populated_place...
Browser
Layers
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Coordinate:
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Scale
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Rotation:
0.0
Render
EPSG:4326