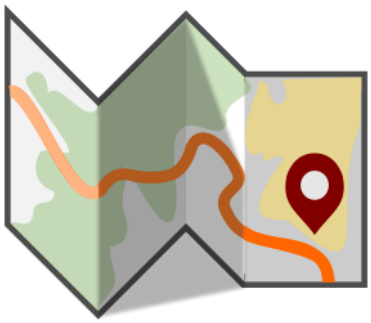
# Working with Attributes

## QGIS Tutorials and Tips



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Translations by

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# Mit Attributen arbeiten

GIS Daten bestehen aus zwei Teilen - Features und Attribute. Attribute sind strukturierte Inhalte über jedes Feature. Dieses Tutorial zeigt, wie Attribute angezeigt und einfache Abfragen auf diese in QGIS durchgeführt werden können.

## Übersicht der Aufgabe

Der Datensatz in dieser Anleitung beinhaltet Informationen über besiedelte Orte der Welt. Die Aufgabe besteht darin, in einer Abfrage alles Hauptstädte der Welt zu finden, die mehr als 1.000.000 Einwohner haben.

### *Other skills you will learn*

- 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.

## Daten besorgen

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

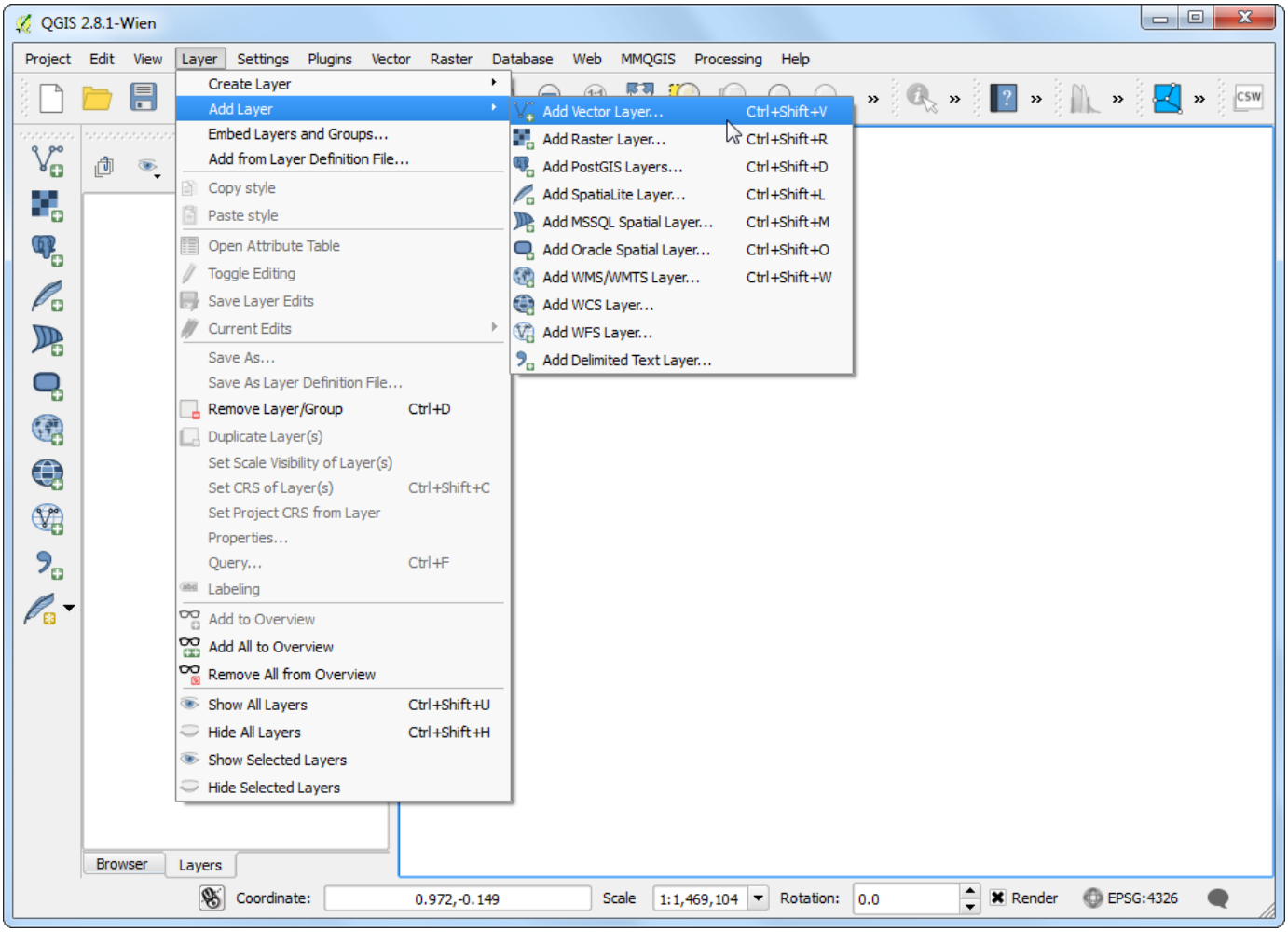
For convenience, you may directly download a copy of datasets from the link below:

ne_10m_populated_places_simple.zip

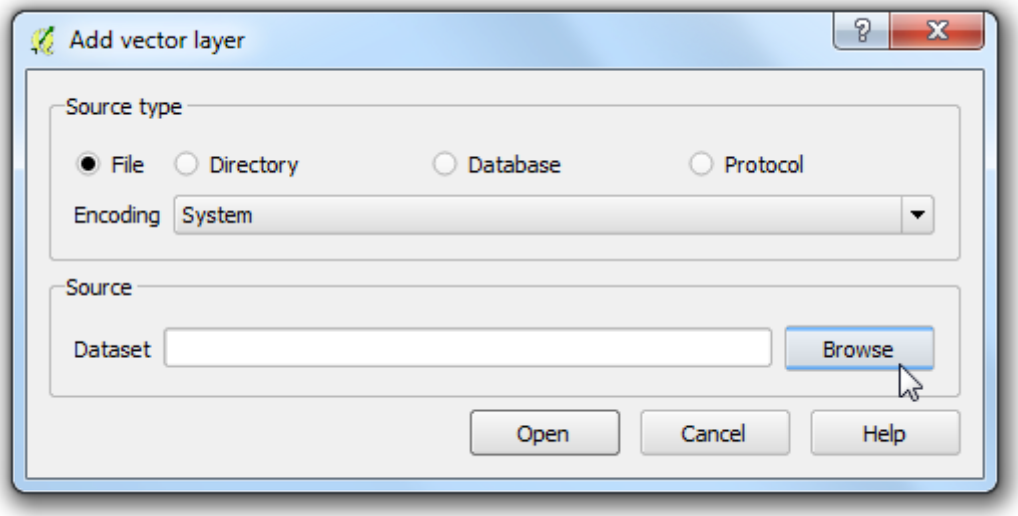
Datenquelle [NATURALEARTH]

## Arbeitsablauf

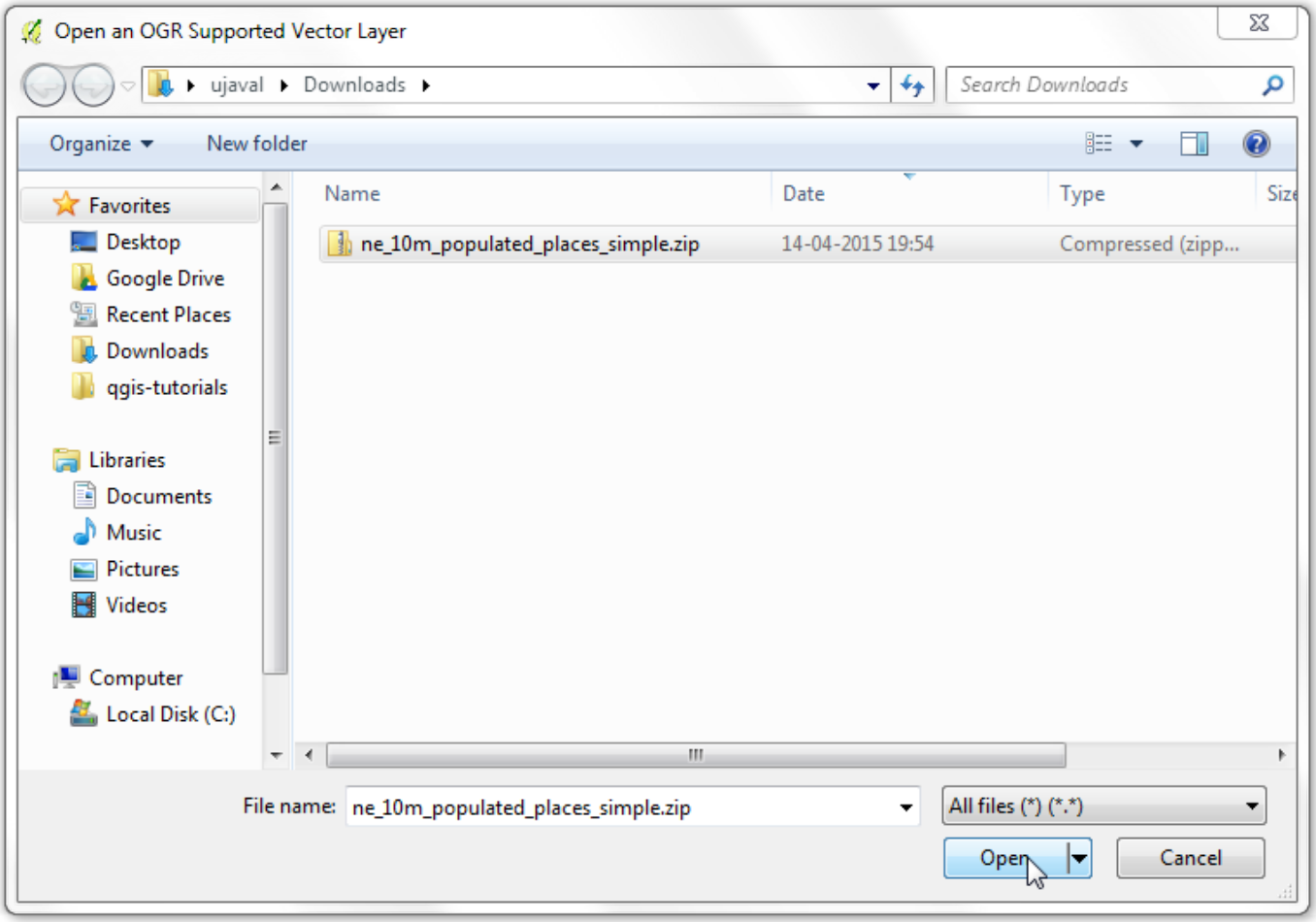
1. Once you have downloaded the data, open QGIS. Go to *Layer* ■ *Add Layer* ■ *Add Vector Layer*.



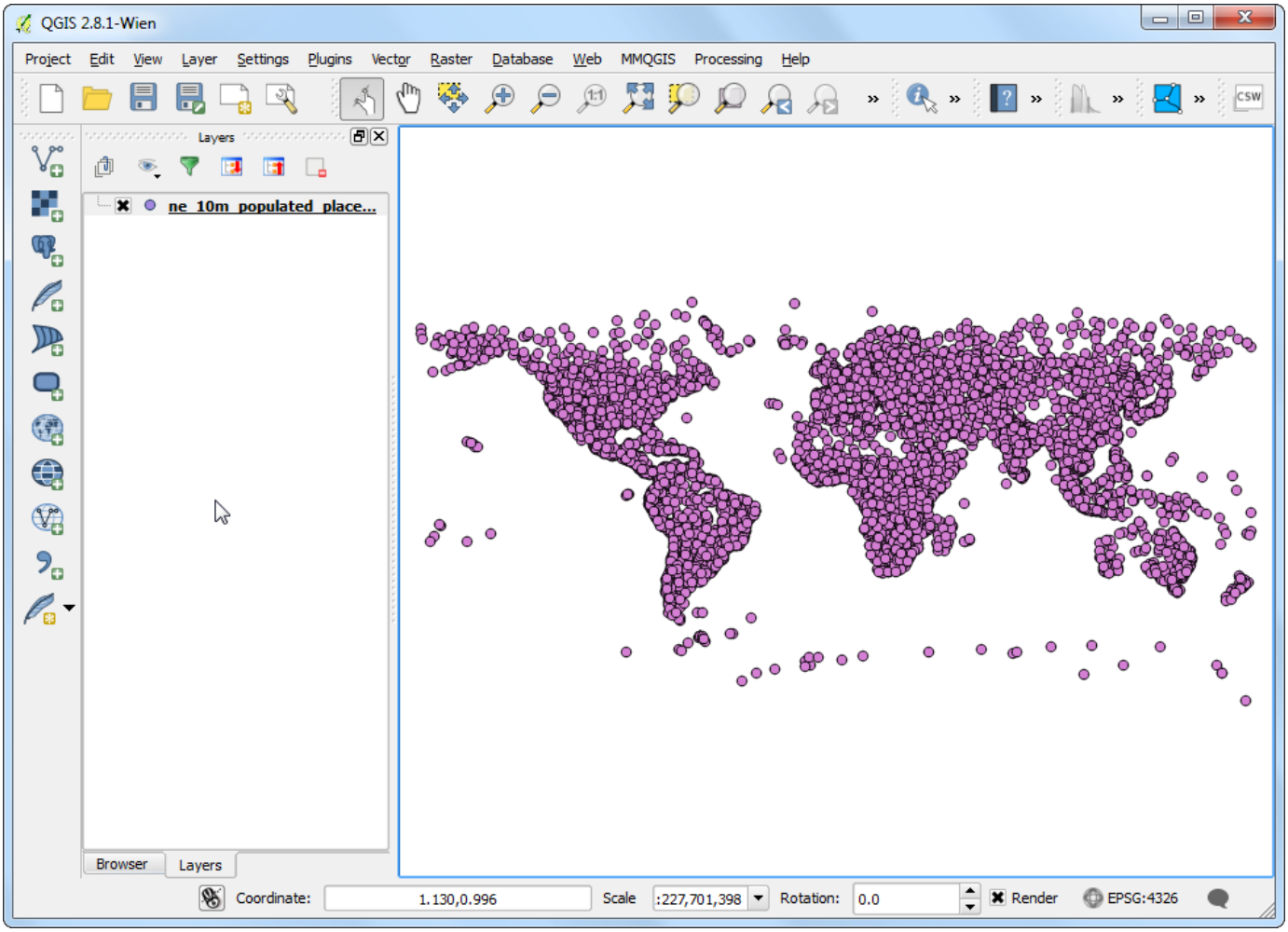

2. Klicken Sie auf *Durchsuchen* und gehen Sie zum Ordner, wo sich die geladenen Daten befinden.



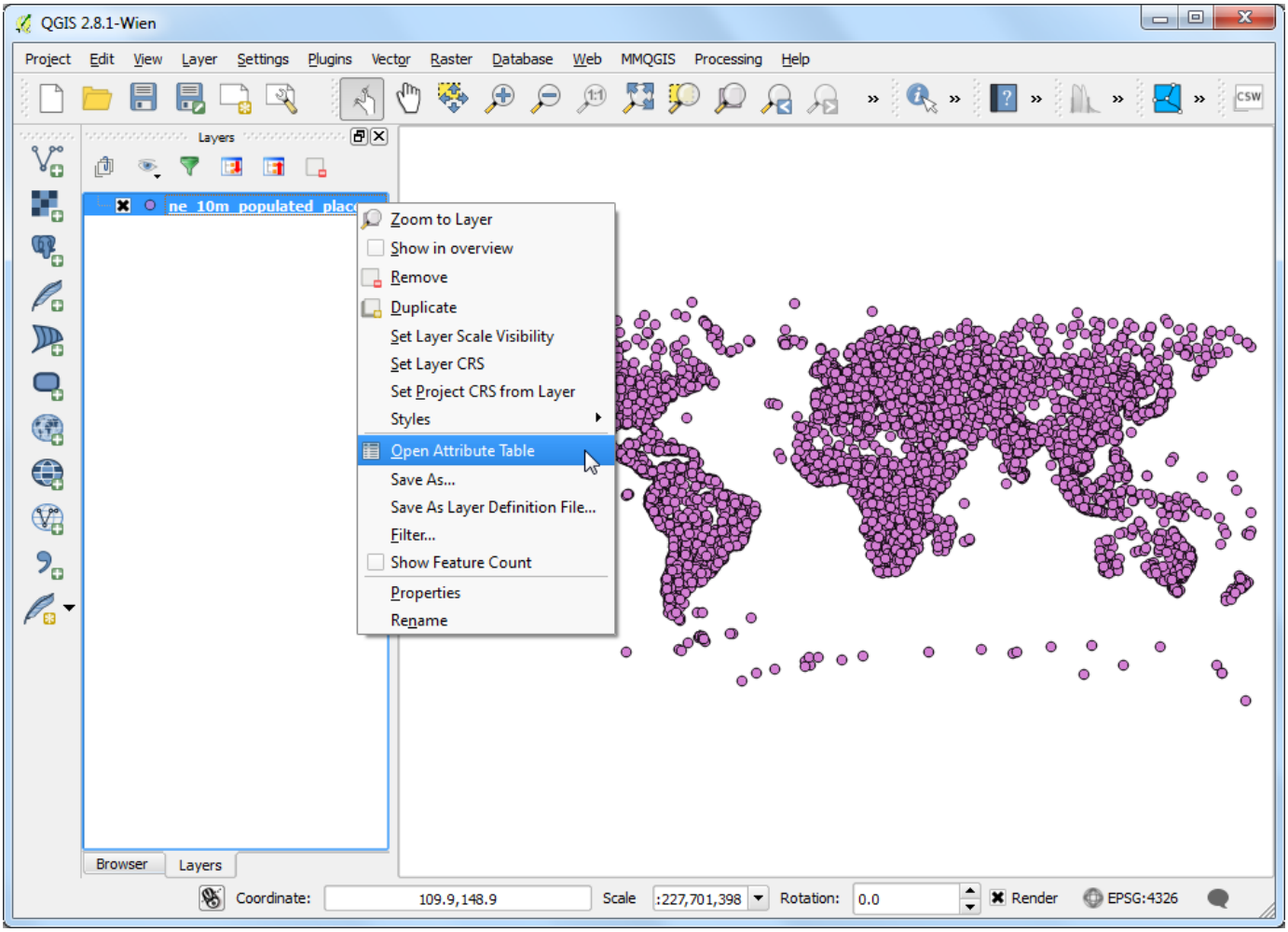

3. Finden Sie die ZIP-Datei *ne_10m_populated_places_simple.zip*. Sie brauchen diese nicht zu entpacken. QGIS kann direkt ZIP-Dateien lesen. Selektieren Sie die Datei und klicken *Öffnen*.



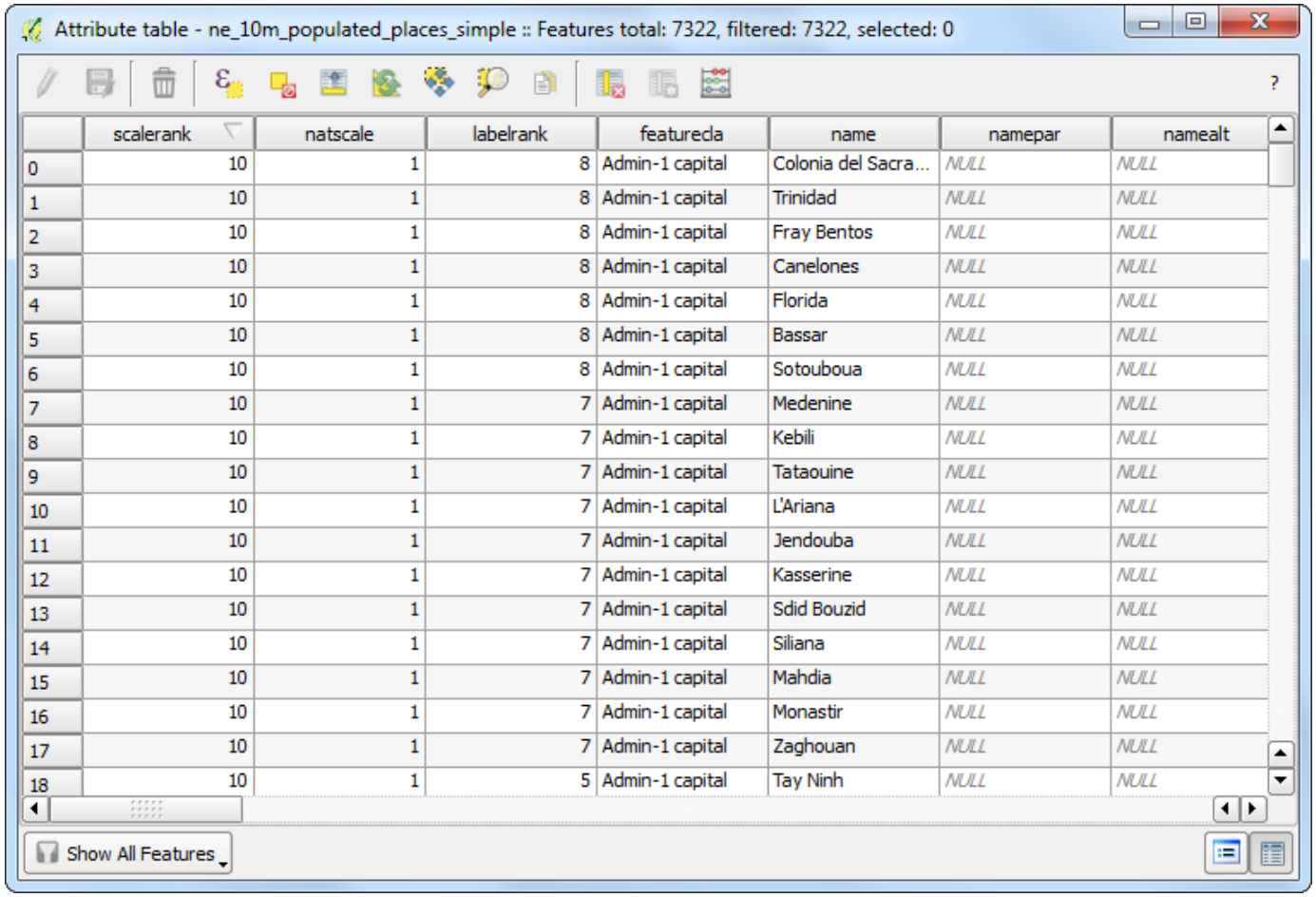

4. Die Auswahl wird nun in QGIS geladen und Sie sehen viele Punkte, die die besiedelten Orte der Welt repräsentieren.




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

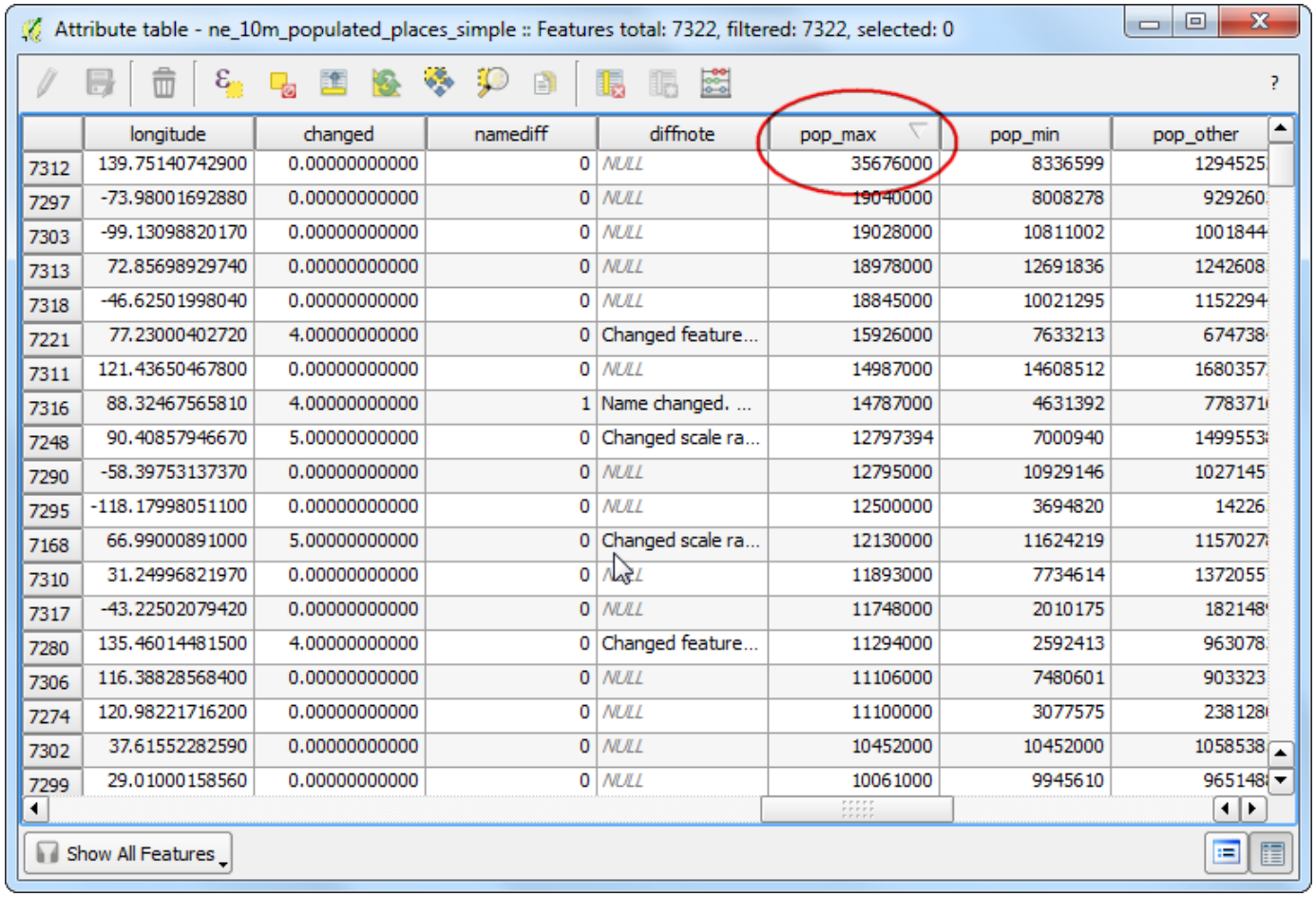



6. Erkunden Sie die unterschiedlichen Attribute und deren Werte.



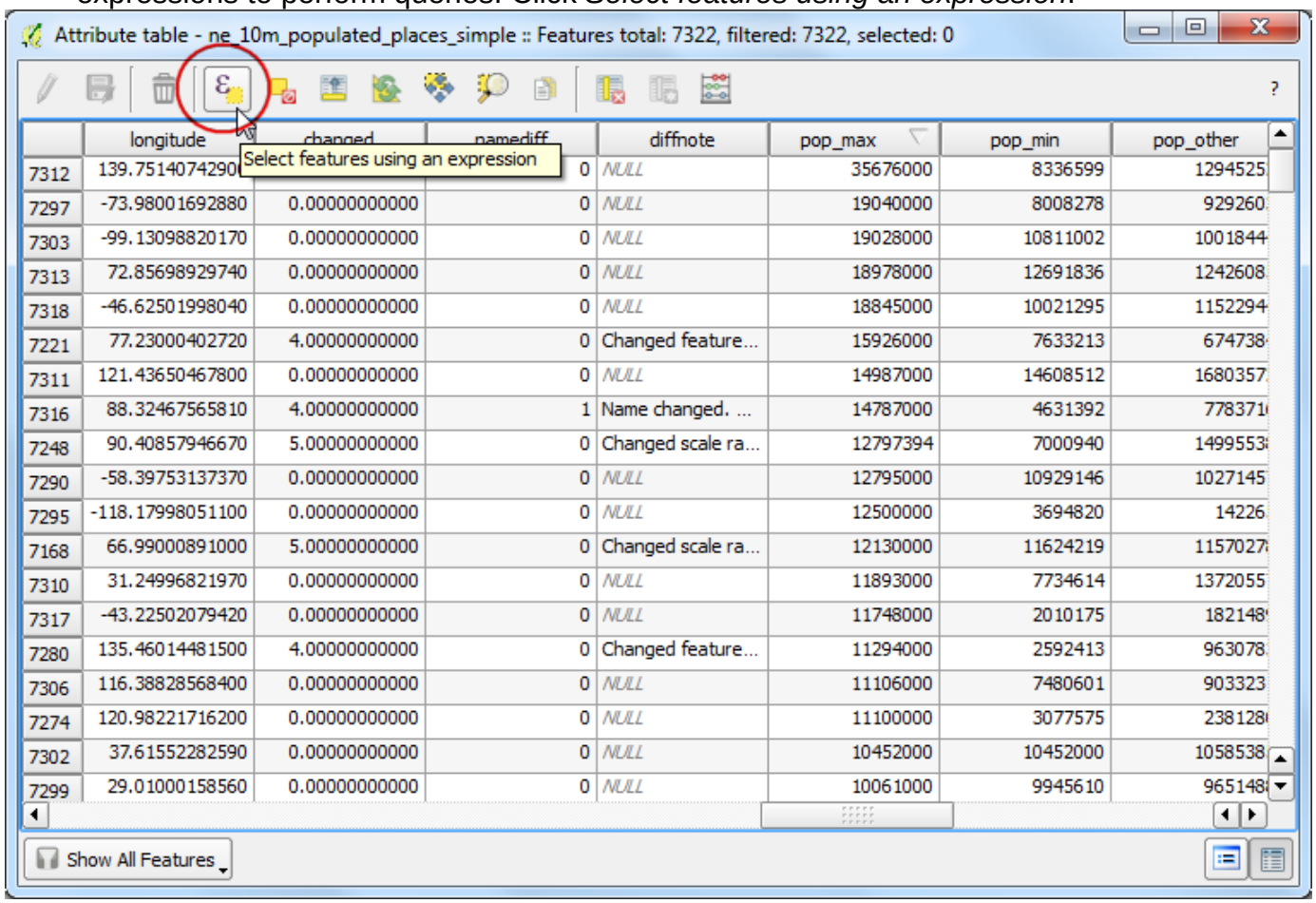

| | scalerank | natscale | labelrank | featurecla | name | namepar | namealt |
|---|---|---|---|---|---|---|---|
| 0 | 10 | 1 | 8 | Admin-1 capital | Colonia del Sacra... | NULL | NULL |
| 1 | 10 | 1 | 8 | Admin-1 capital | Trinidad | NULL | NULL |
| 2 | 10 | 1 | 8 | Admin-1 capital | Fray Bentos | NULL | 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. Uns interessiert die Population von jedem Feature, so dass wir uns auf das Feld *pop_max* konzentrieren. Sie können zweifach auf die Überschrift klicken, um die Tabelle in absteigender Reihenfolge zu sortieren.




| | 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 |

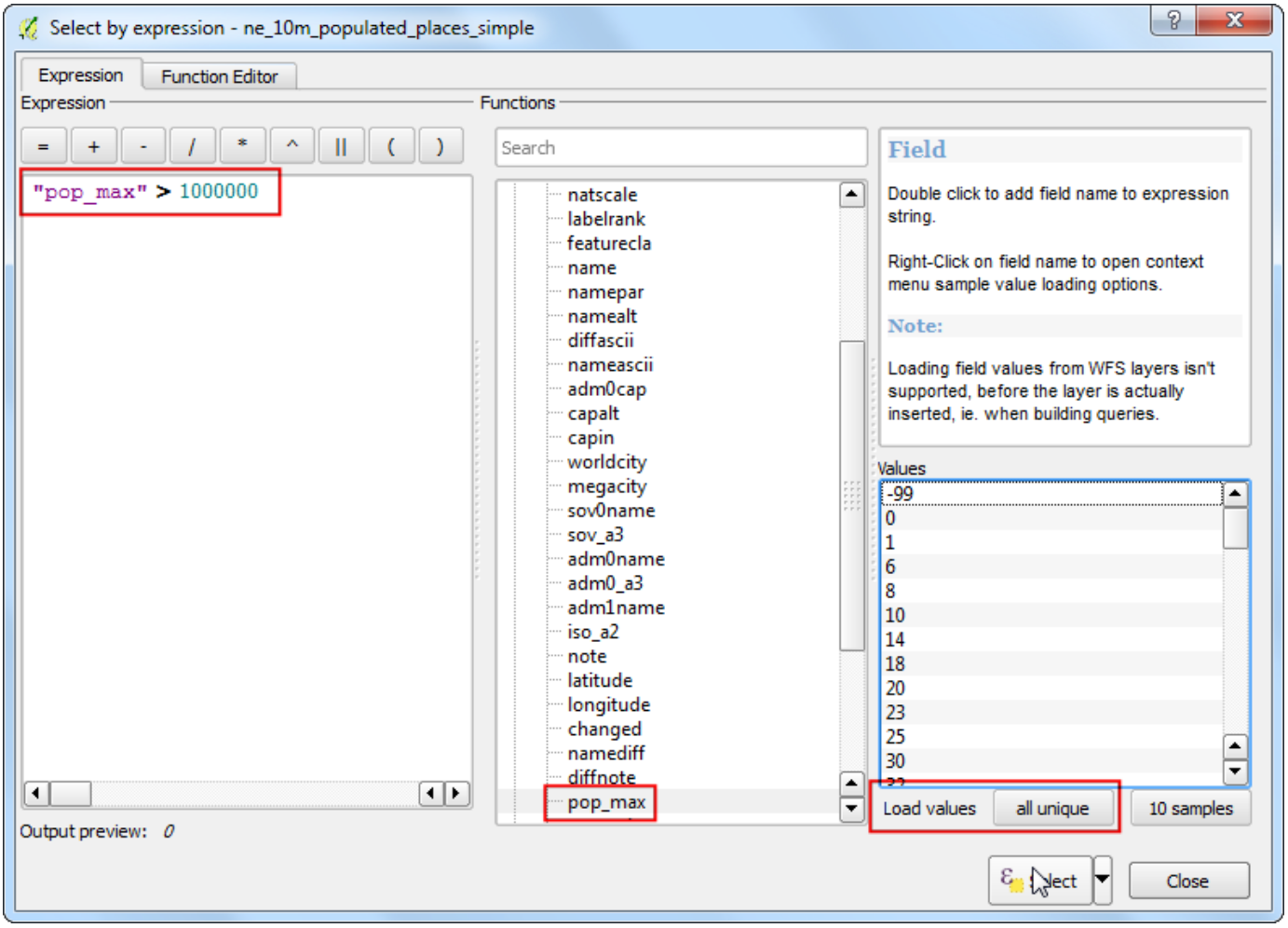
8. Now we are ready to perform our query on these attributes. QGIS uses SQL-like expressions to perform queries. Click *Select features using an expression*.



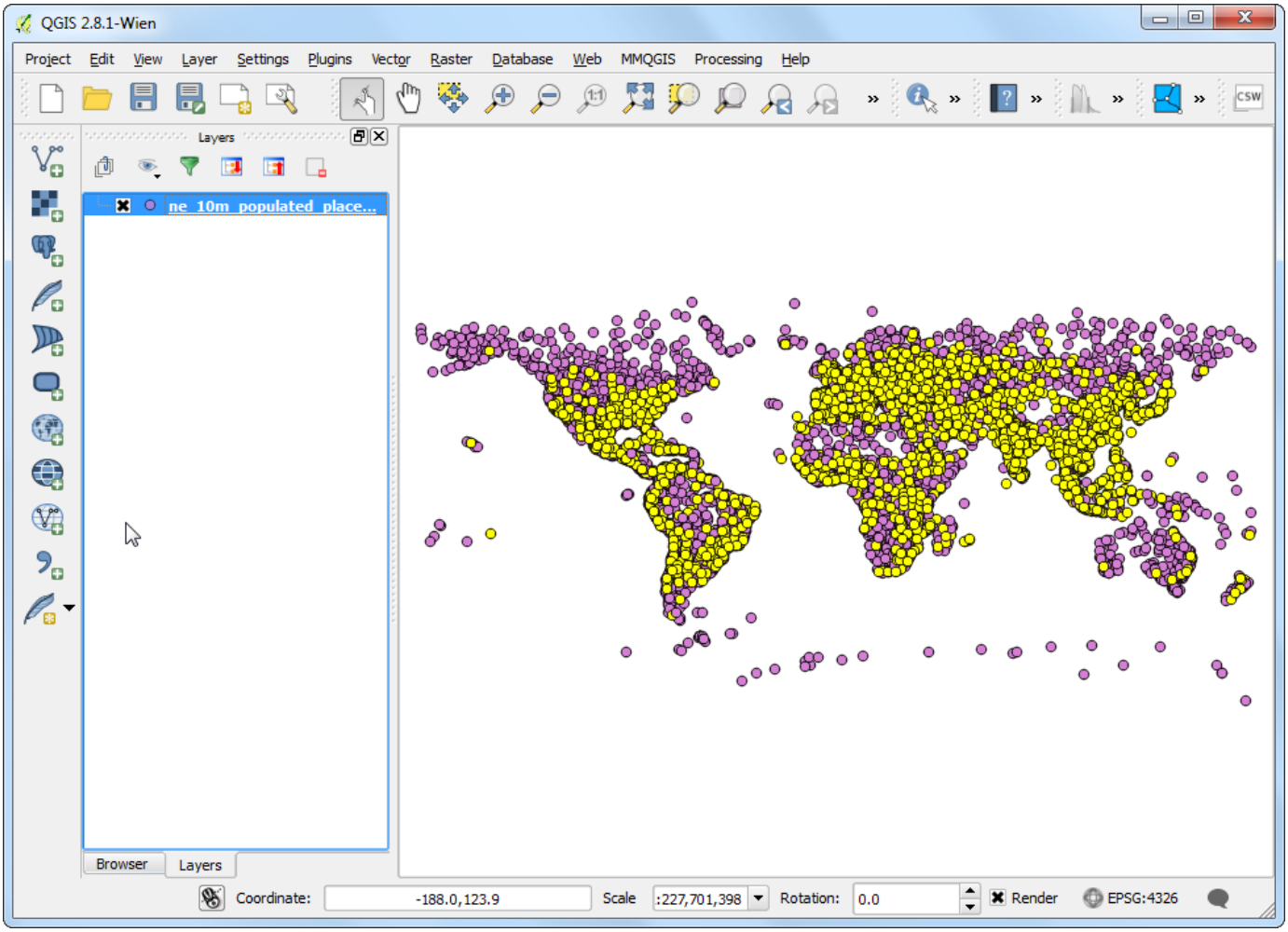

| | longitude | changed | namediff | diffnote | pop_max | pop_min | pop_other |
|---|---|---|---|---|---|---|---|
| 7312 | 139.75140742900 | 0.00000000000 | 0 | NULL | 35676000 | 8336599 | 1294525 |
| 7297 | -73.98001692880 | 0.00000000000 | 0 | NULL | 19040000 | 8008278 | 929260 |
| 7303 | -99.13098820170 | 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 |

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
```

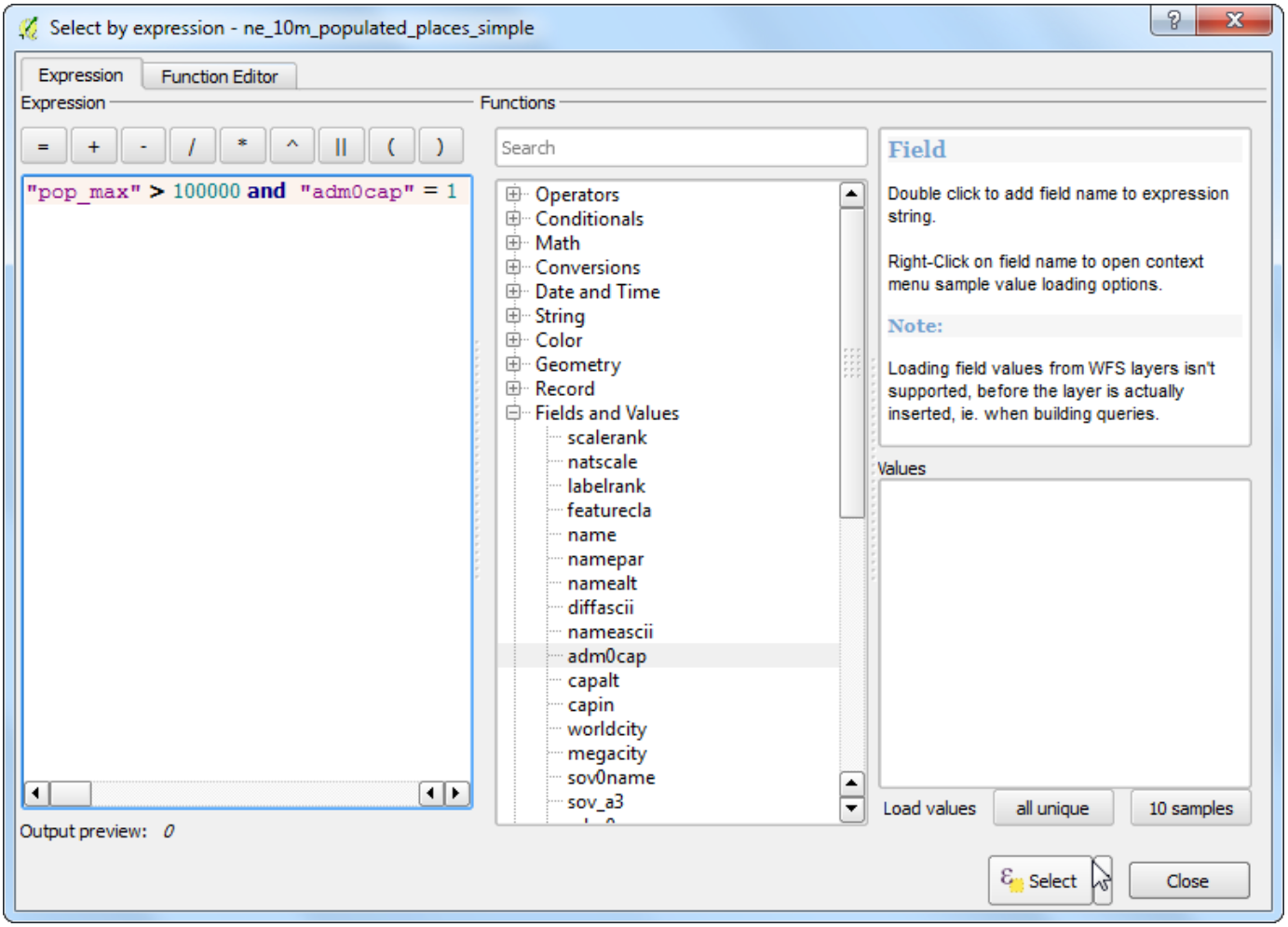



10. Click on *Close* and return to the main QGIS window. You will notice that a subset of points is now rendered in yellow. This is the result of our query and you are seeing all places from the dataset that have the `pop_max` attribute value greater than `1,000,000`.

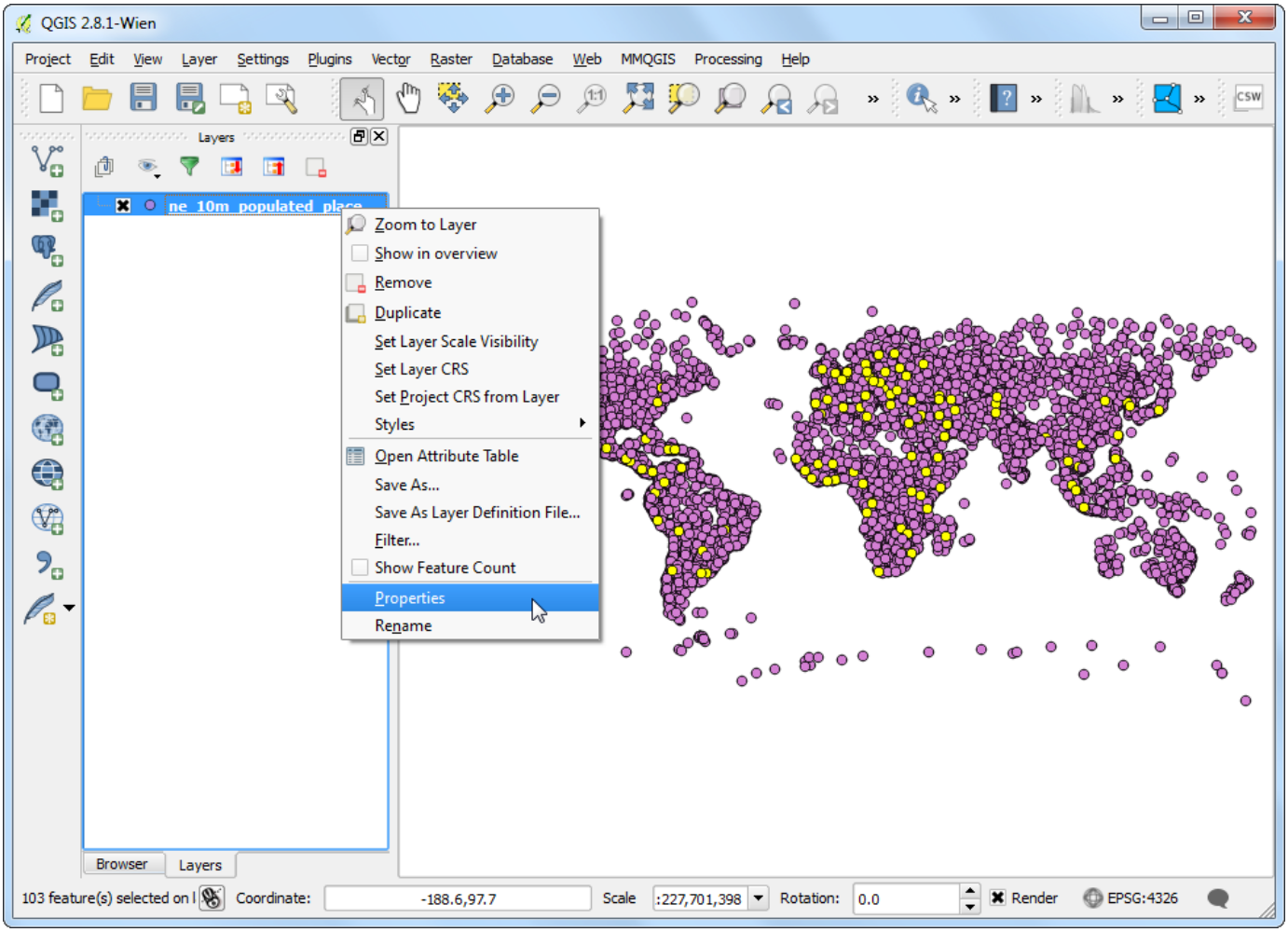



11. The goal for this exercise is to find the places that are country capitals. The field containing this data is *adm0cap*. The value 1 indicates that the place is a capital. We can add this criteria to our previous expression using the and operator. Let's refine our query to select only those places 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*.

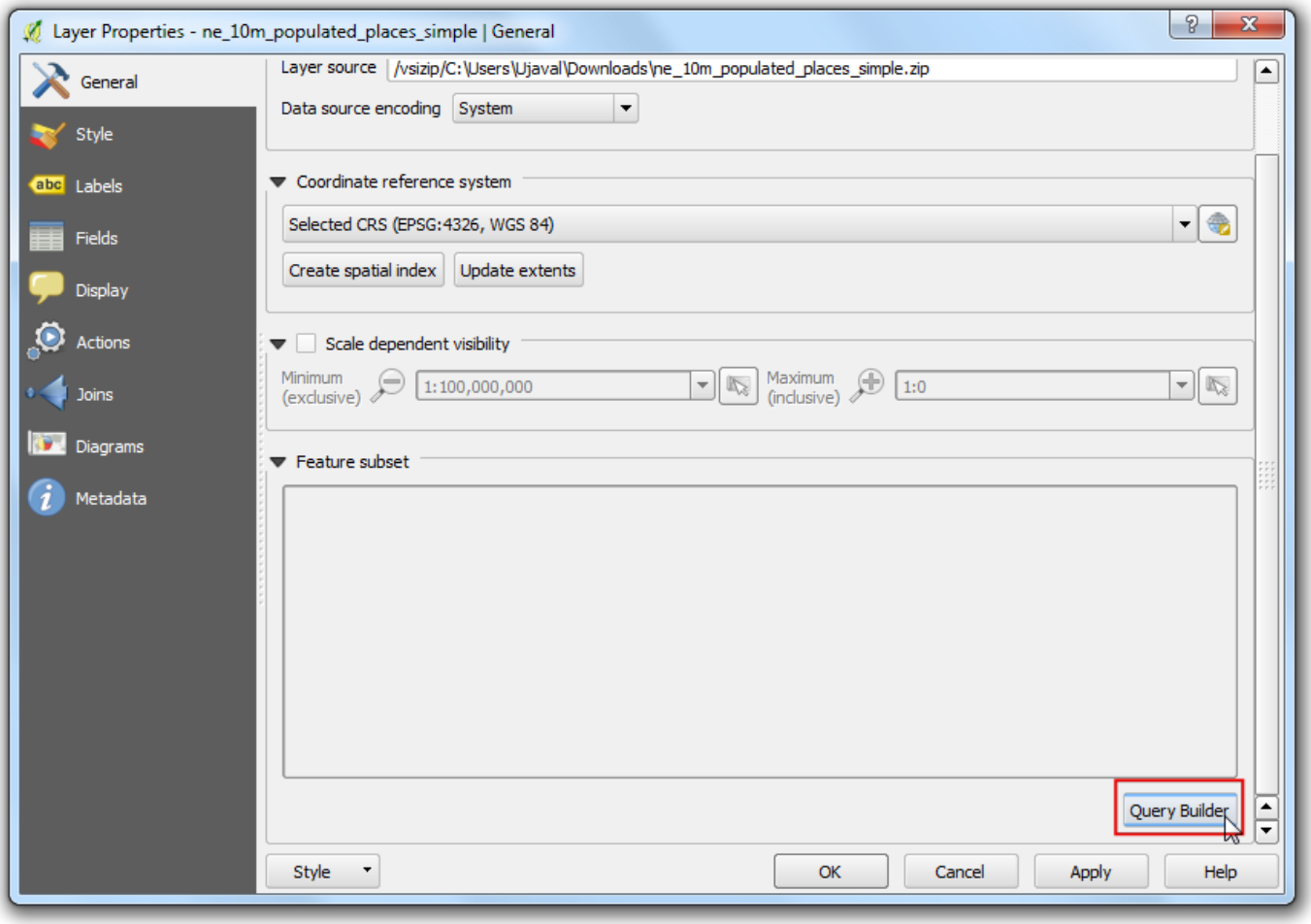
```
"pop_max" > 1000000 and "adm0cap" = 1
```




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*.

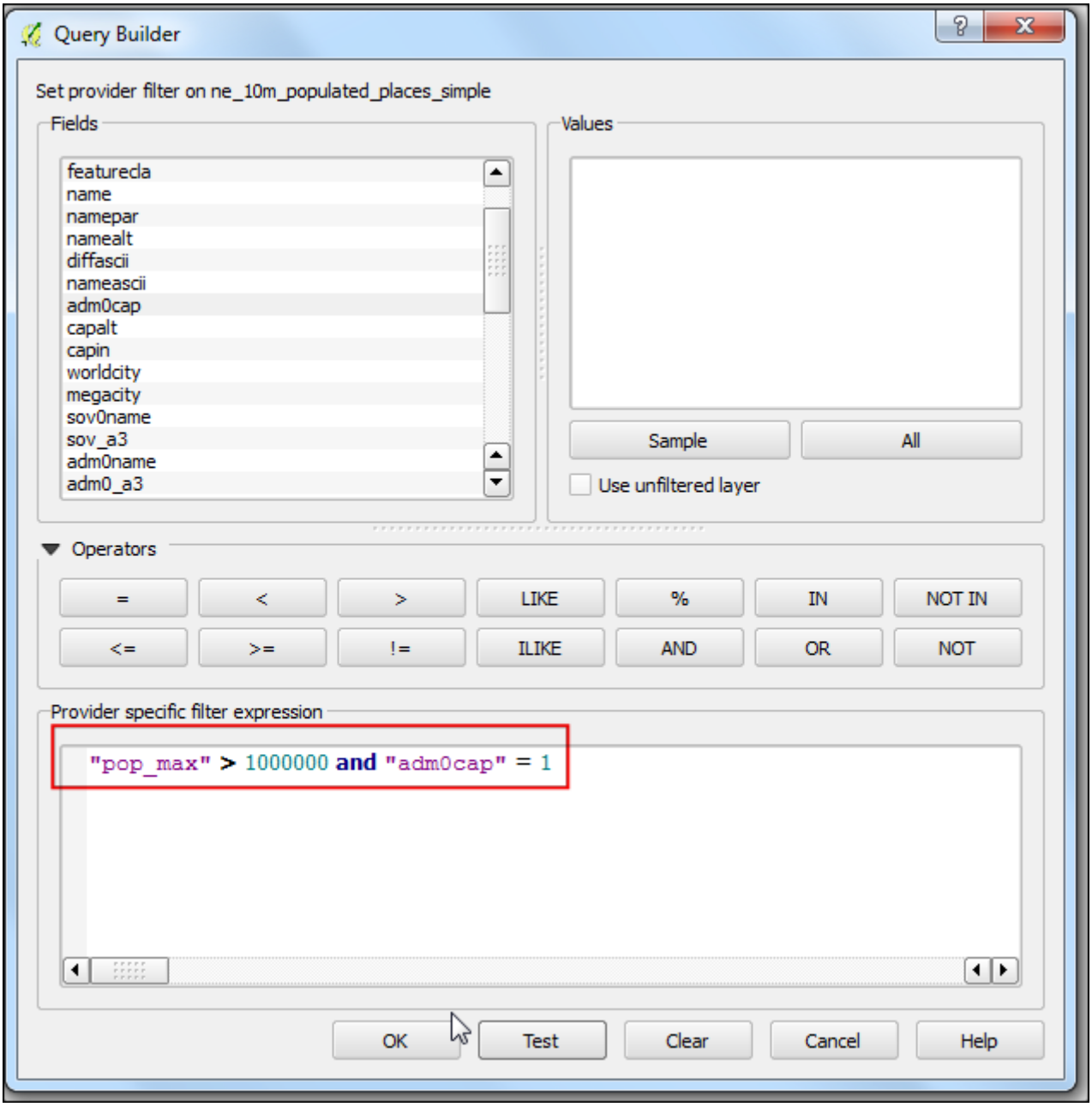



13. In the *General* tab, scroll down to the *Feature subset* section. Click *Query Builder*.

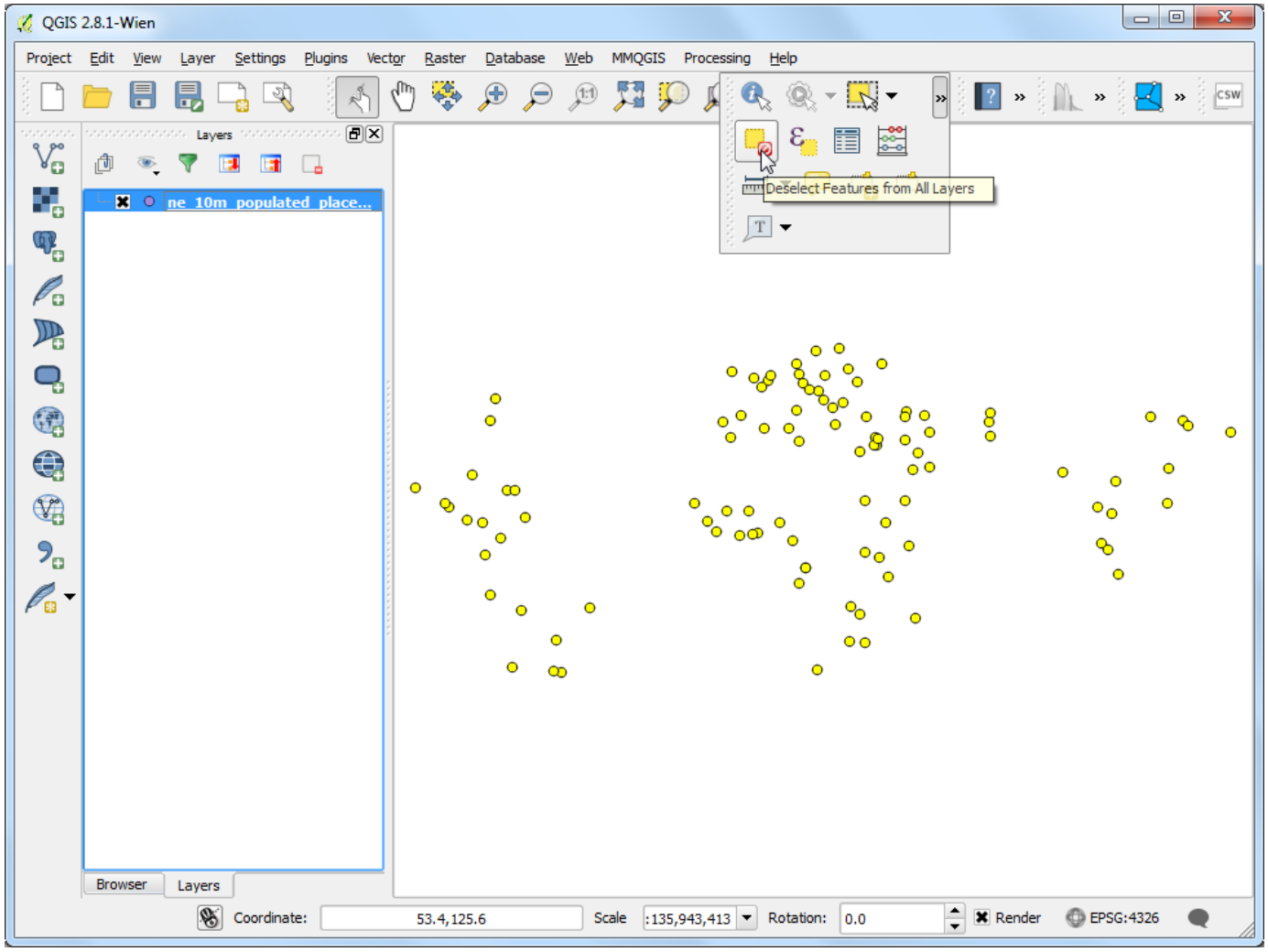



14. Enter the same expression you had entered earlier and click *OK*.

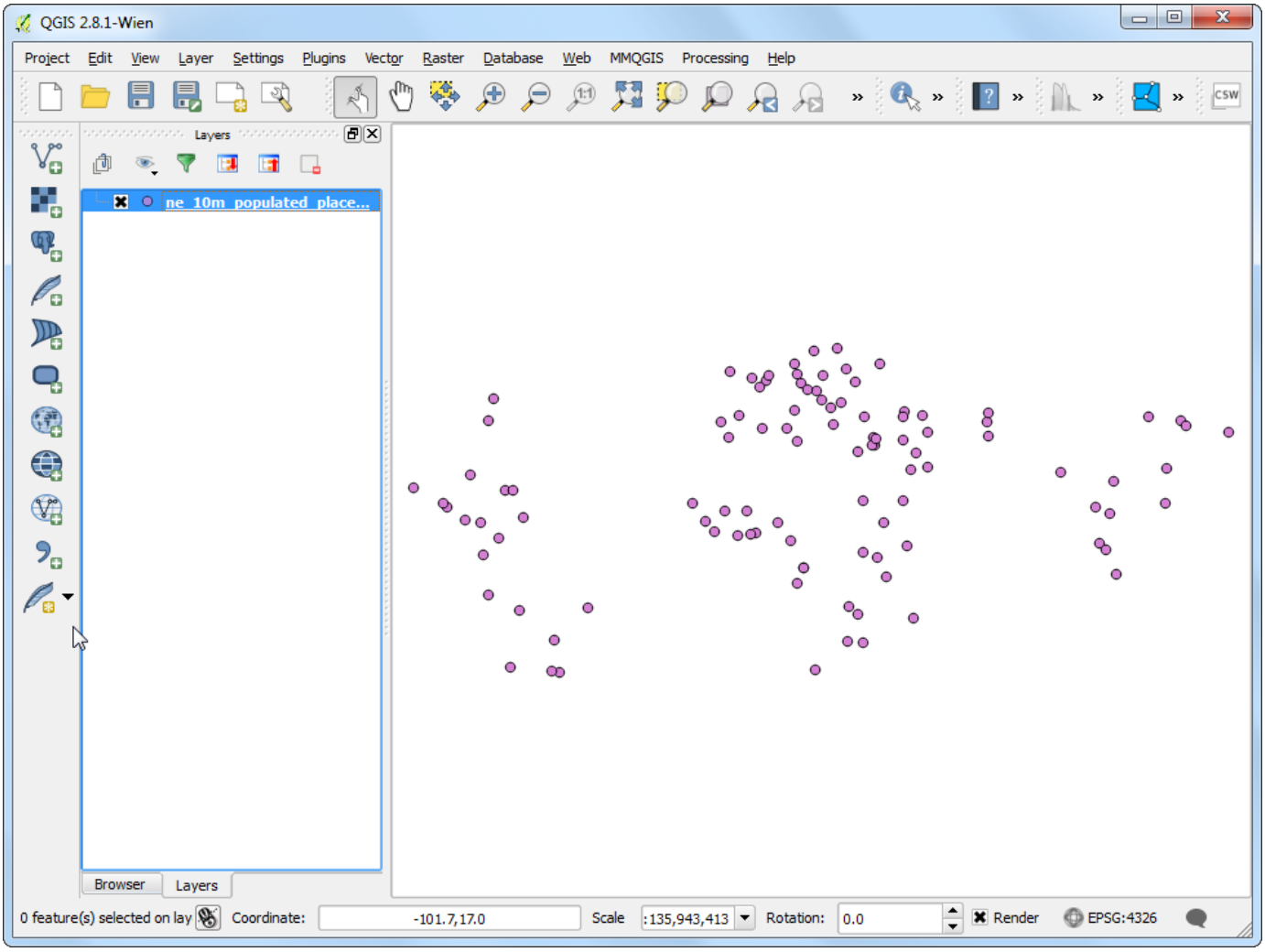
```
"pop_max" > 1000000 and "adm0cap" = 1
```




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
0 feature(s) selected on lay
Coordinate:
-101.7,17.0
Scale
:135,943,413
Rotation:
0.0
Render
EPSG:4326