Working with Attributes

QGIS Tutorials and Tips

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Working with Attributes

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 QGIS.

Overview of the task

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 10,00,000.

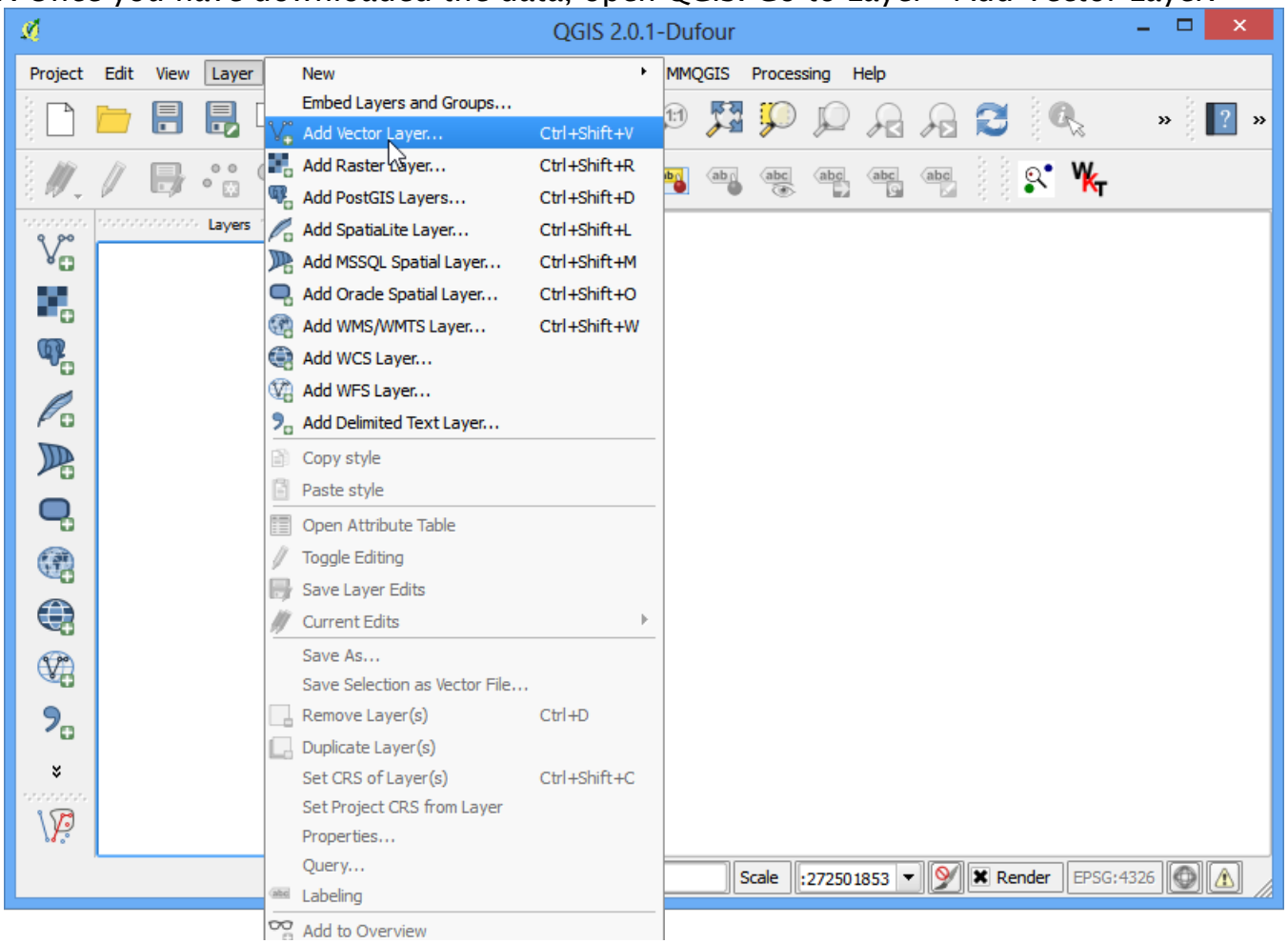
Get the data

We will use the Populated Places dataset from Natural Earth.

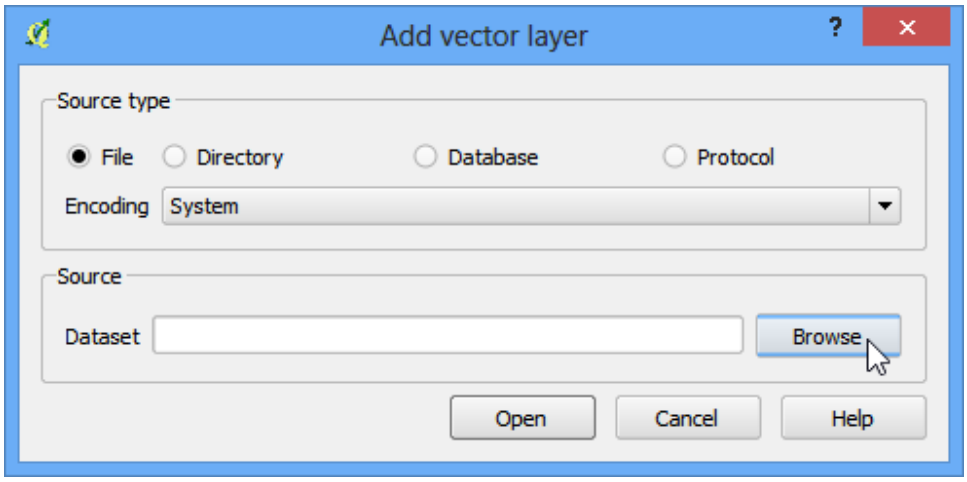
Download the Natural Earth Populated Places shapefile..

Procedure

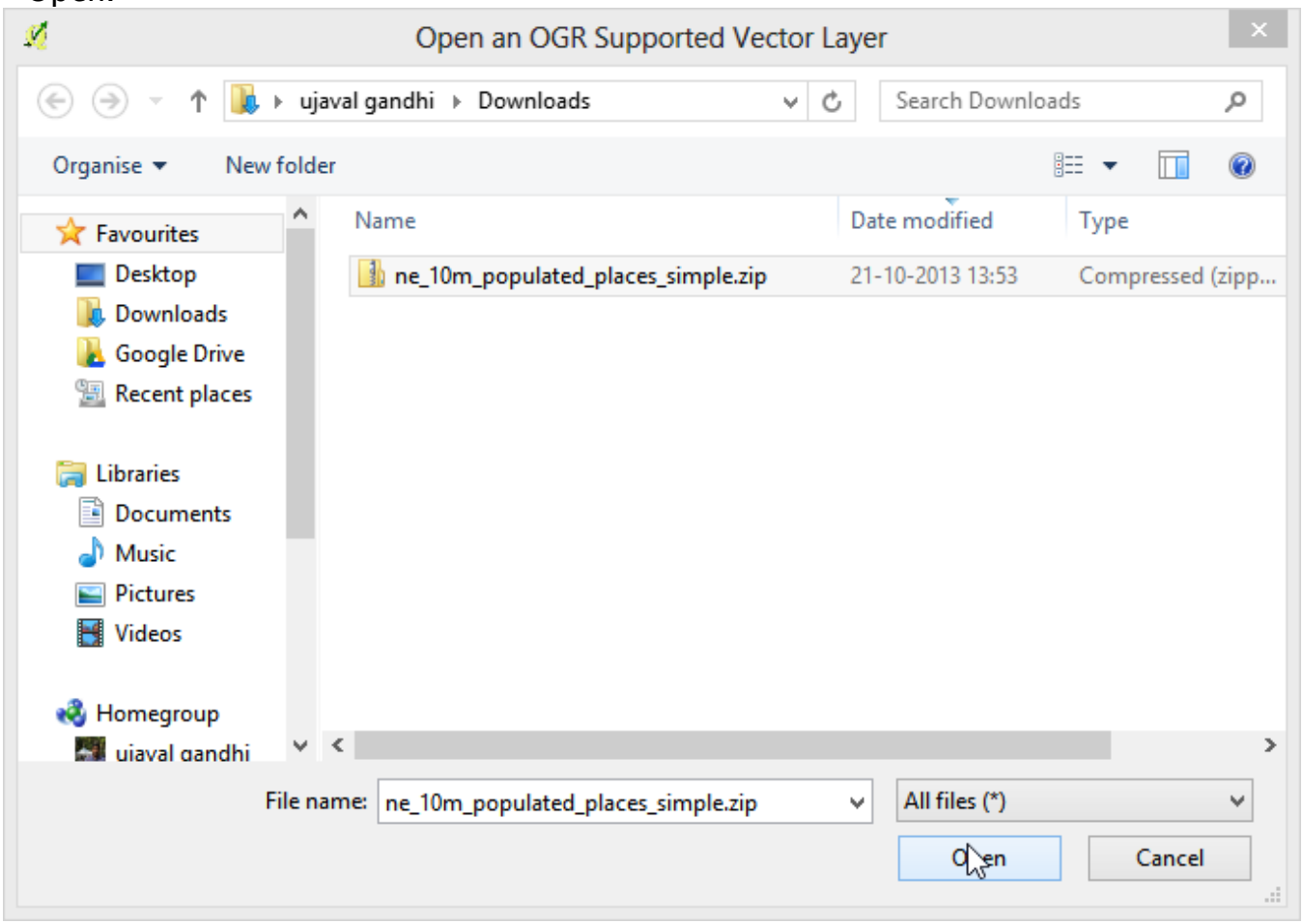
1. Once you have downloaded the data, open QGIS. Go to Layer ‣ Add Vector Layer.



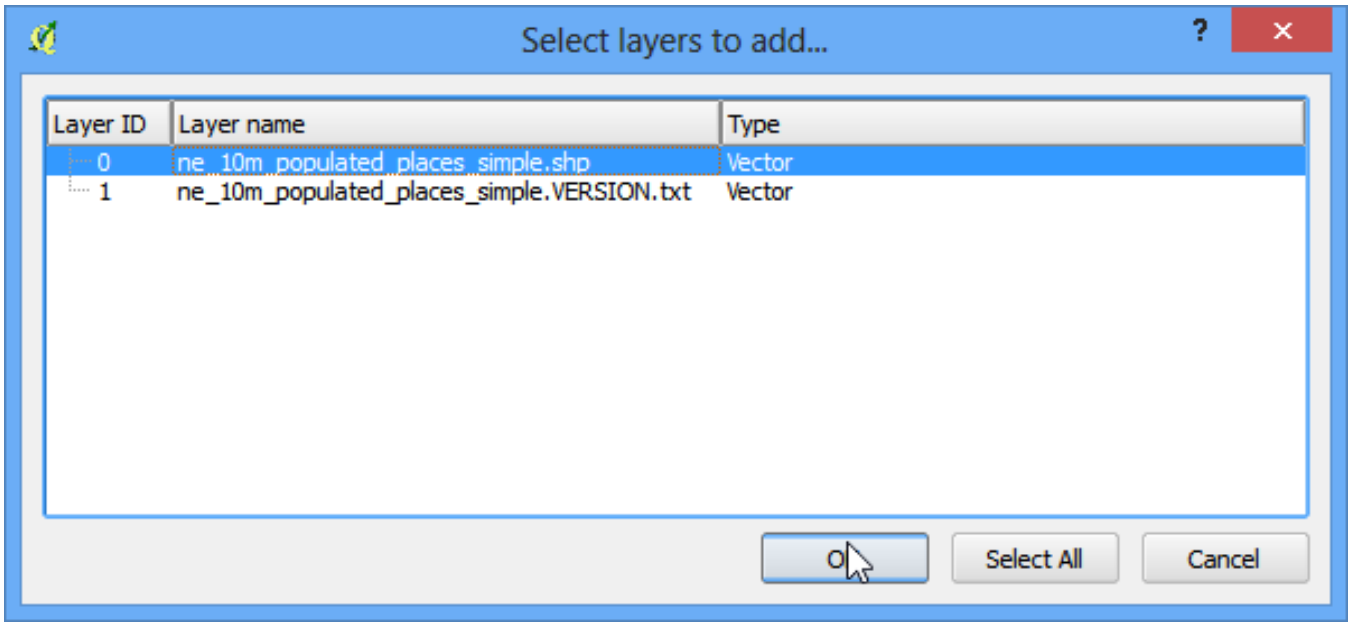
2. Click on Browse and navigate to the folder where you downloaded the data.



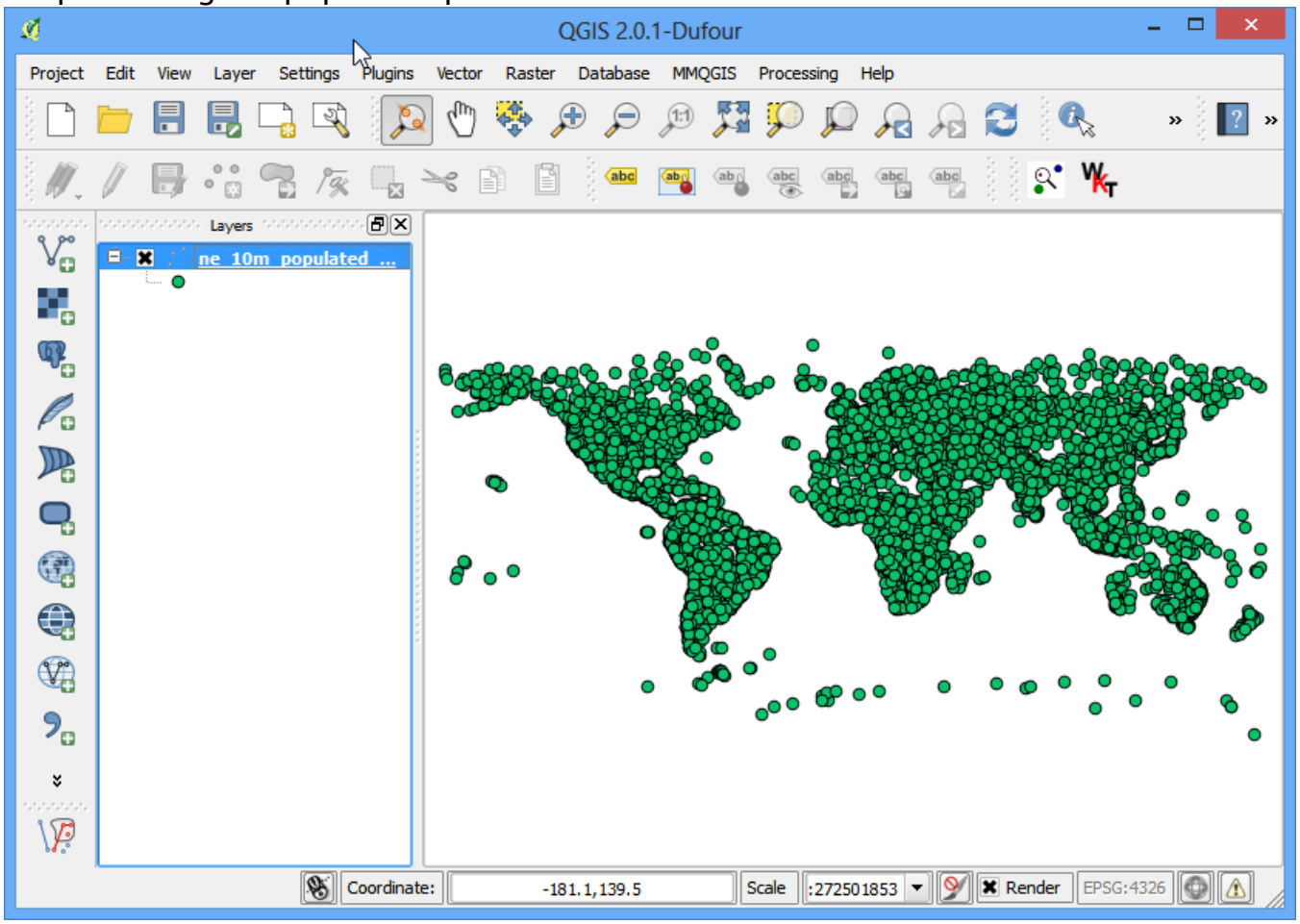
3. Locate the downloaded zip file ***ne_10m_populated_places_simple.zip***. You do not need to unzip the file. QGIS has the ability to read zip files directly. Select the file and click Open.



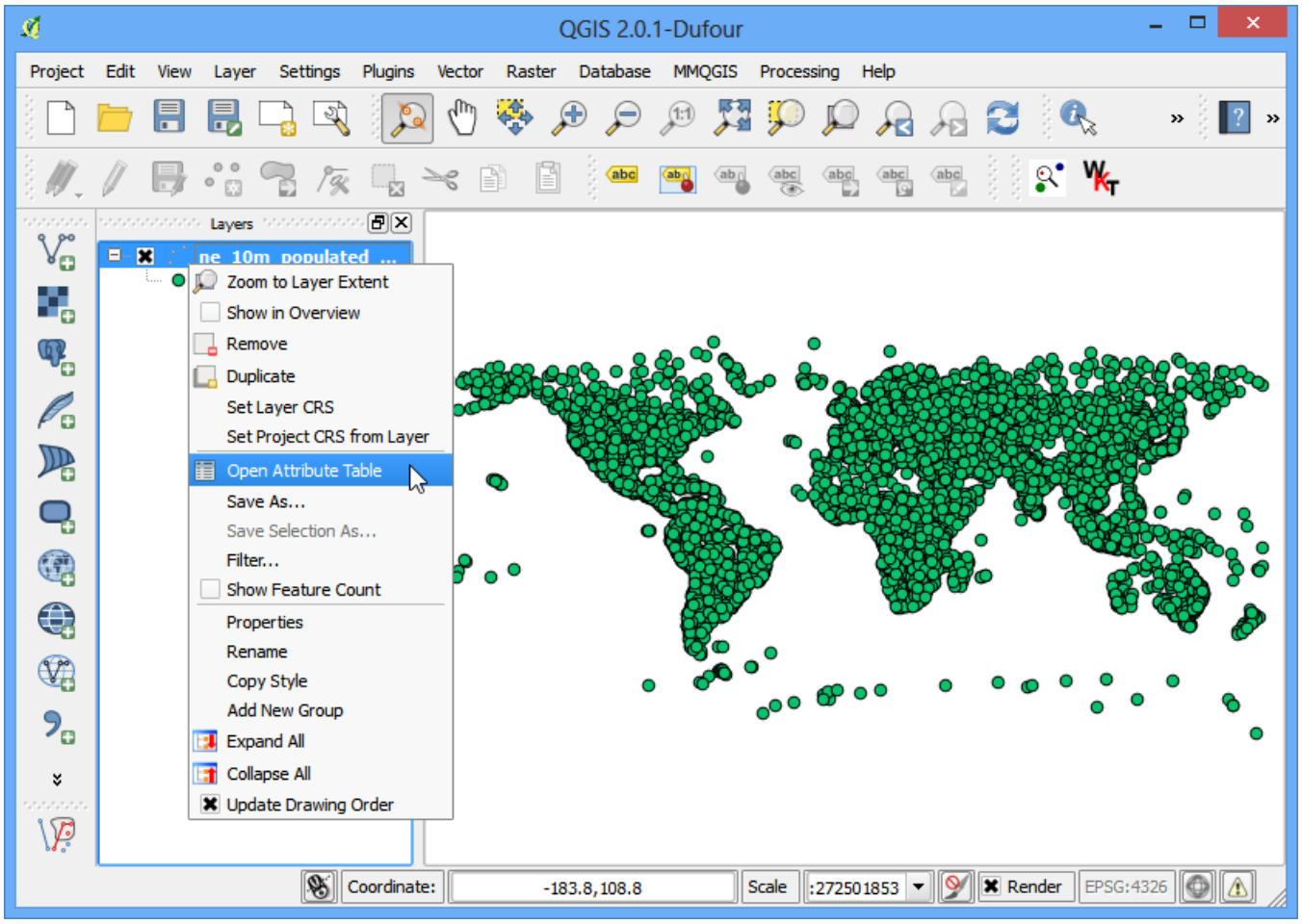
4. You will get a dialog asking you to select the layer to open. Select ***ne_10m_populated_places_simple.shp*** and click OK.



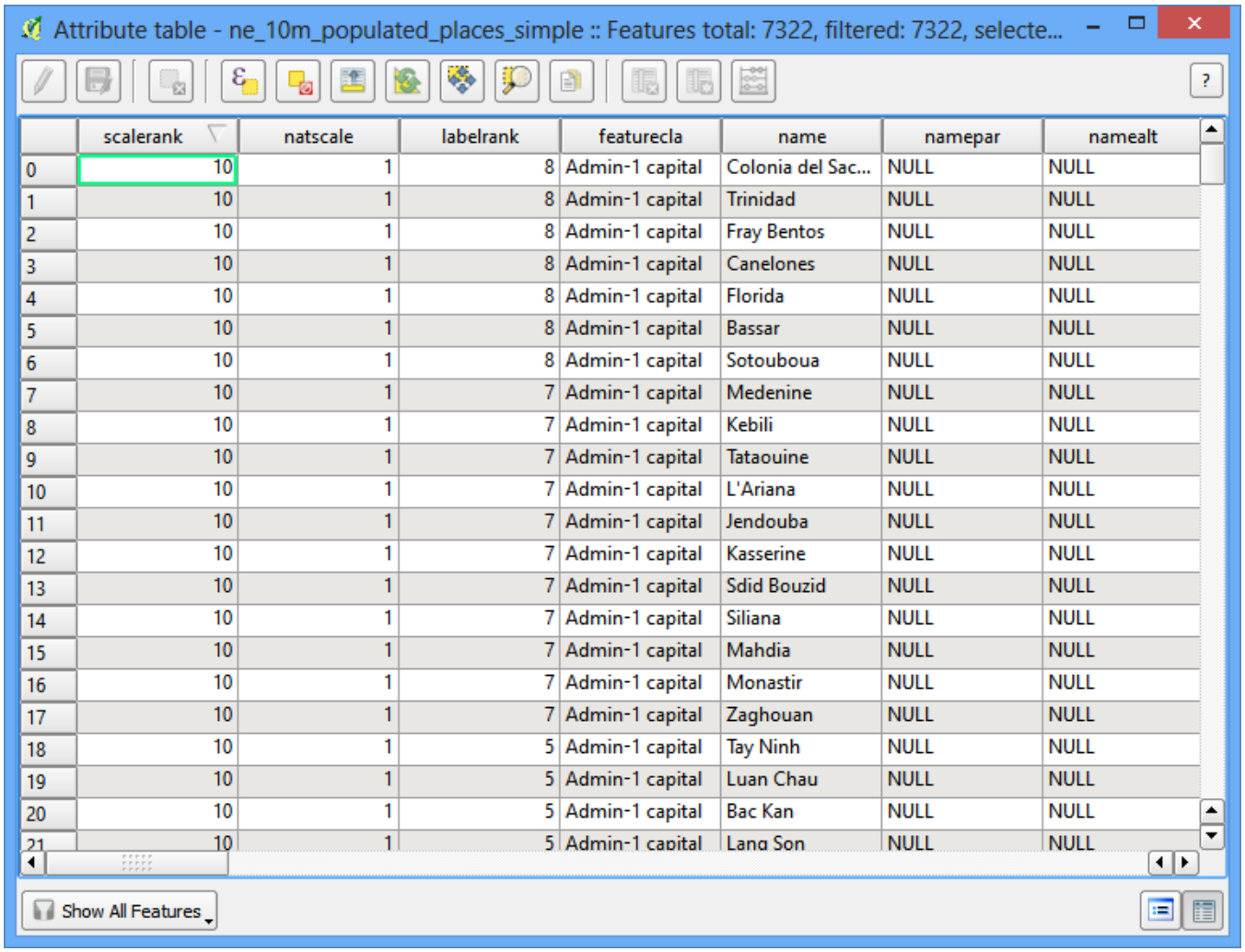
5. The selected layer will now be loaded in QGIS and you will see many points representing the populated places of the world.



6. To see the attributes of right-click the layer and select Open Attribute Table.

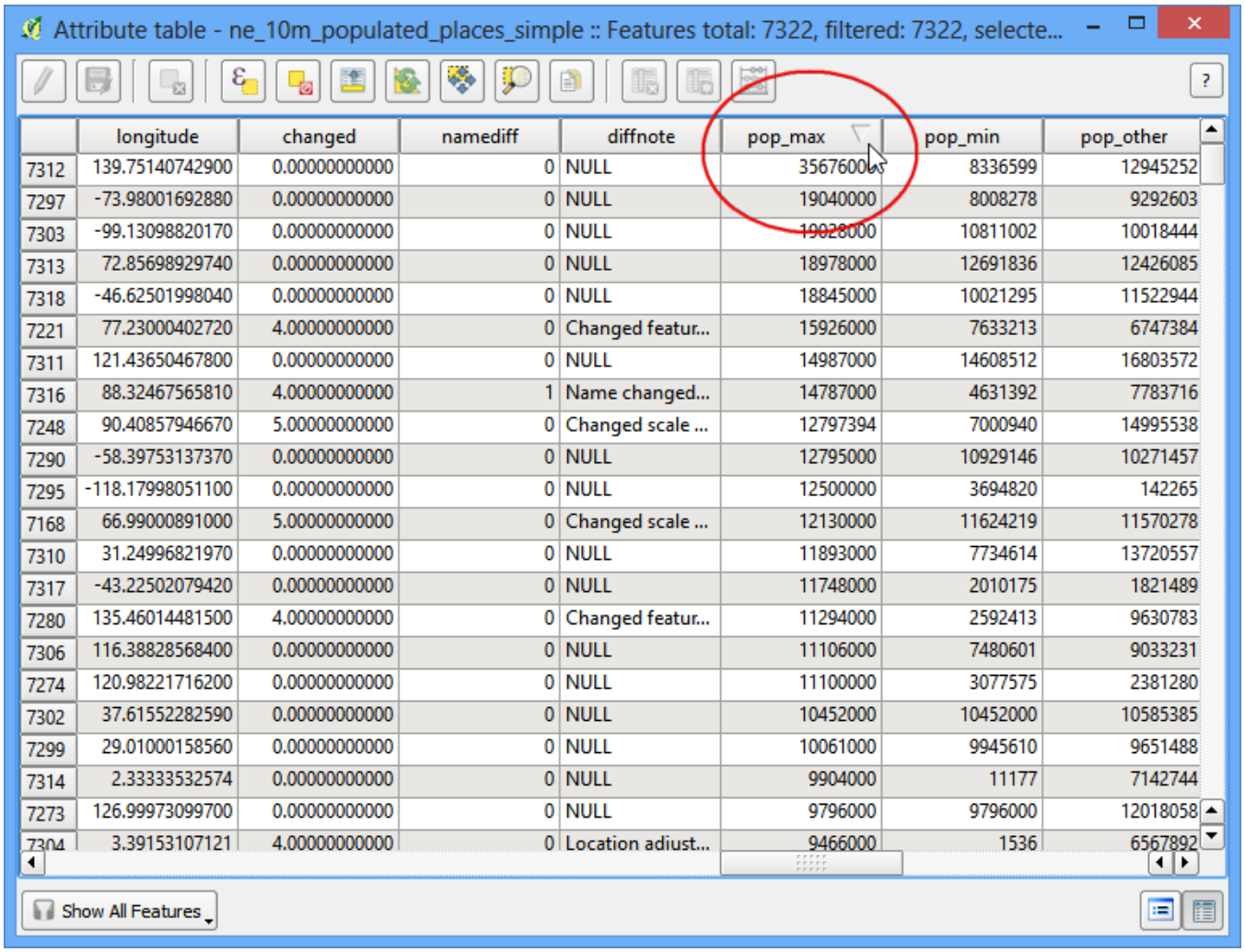


7. Explore the various attributes and their values.



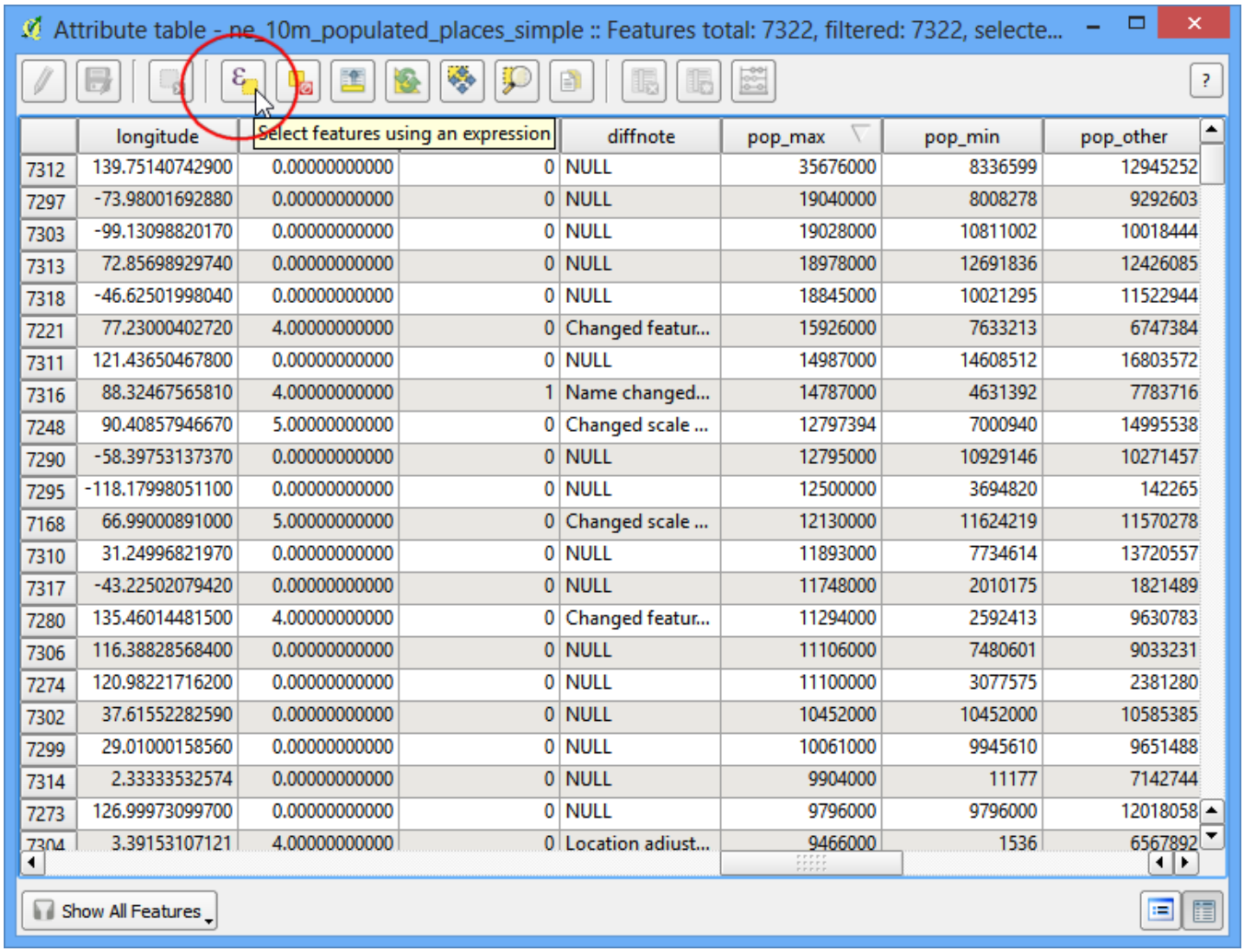
	scalerank	natscale	labelrank	featurecla	name	namepar	namealt
0	10	1	8	Admin-1 capital	Colonia del Sac...	NULL	NULL
1	10	1	8	Admin-1 capital	Trinidad	NULL	NULL
2	10	1	8	Admin-1 capital	Fray Bentos	NULL	NULL
3	10	1	8	Admin-1 capital	Canelones	NULL	NULL
4	10	1	8	Admin-1 capital	Florida	NULL	NULL
5	10	1	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
19	10	1	5	Admin-1 capital	Luan Chau	NULL	NULL
20	10	1	5	Admin-1 capital	Bac Kan	NULL	NULL
21	10	1	5	Admin-1 capital	Lang Son	NULL	NULL

8. 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.



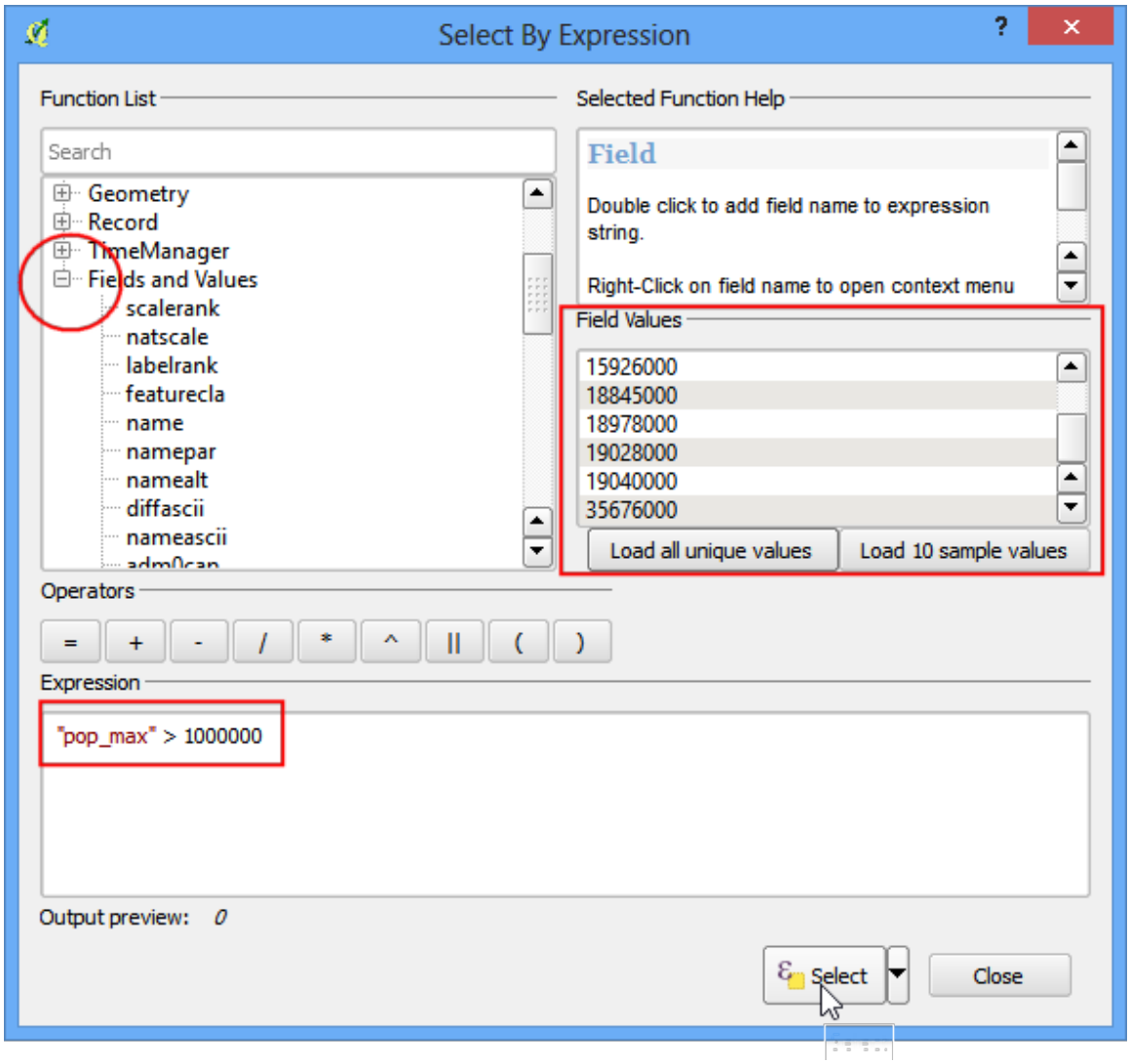
	longitude	changed	namediff	diffnote	pop_max	pop_min	pop_other
7312	139.75140742900	0.00000000000	0	NULL	35676000	8336599	12945252
7297	-73.98001692880	0.00000000000	0	NULL	19040000	8008278	9292603
7303	-99.13098820170	0.00000000000	0	NULL	19028000	10811002	10018444
7313	72.85698929740	0.00000000000	0	NULL	18978000	12691836	12426085
7318	-46.62501998040	0.00000000000	0	NULL	18845000	10021295	11522944
7221	77.23000402720	4.00000000000	0	Changed featur...	15926000	7633213	6747384
7311	121.43650467800	0.00000000000	0	NULL	14987000	14608512	16803572
7316	88.32467565810	4.00000000000	1	Name changed...	14787000	4631392	7783716
7248	90.40857946670	5.00000000000	0	Changed scale ...	12797394	7000940	14995538
7290	-58.39753137370	0.00000000000	0	NULL	12795000	10929146	10271457
7295	-118.17998051100	0.00000000000	0	NULL	12500000	3694820	142265
7168	66.99000891000	5.00000000000	0	Changed scale ...	12130000	11624219	11570278
7310	31.24996821970	0.00000000000	0	NULL	11893000	7734614	13720557
7317	-43.22502079420	0.00000000000	0	NULL	11748000	2010175	1821489
7280	135.46014481500	4.00000000000	0	Changed featur...	11294000	2592413	9630783
7306	116.38828568400	0.00000000000	0	NULL	11106000	7480601	9033231
7274	120.98221716200	0.00000000000	0	NULL	11100000	3077575	2381280
7302	37.61552282590	0.00000000000	0	NULL	10452000	10452000	10585385
7299	29.01000158560	0.00000000000	0	NULL	10061000	9945610	9651488
7314	2.33333532574	0.00000000000	0	NULL	9904000	11177	7142744
7273	126.99973099700	0.00000000000	0	NULL	9796000	9796000	12018058
7304	3.39153107121	4.00000000000	0	Location adiust...	9466000	1536	6567892

9. Now we are ready to perform our query on these attributes. Select features using an expression.

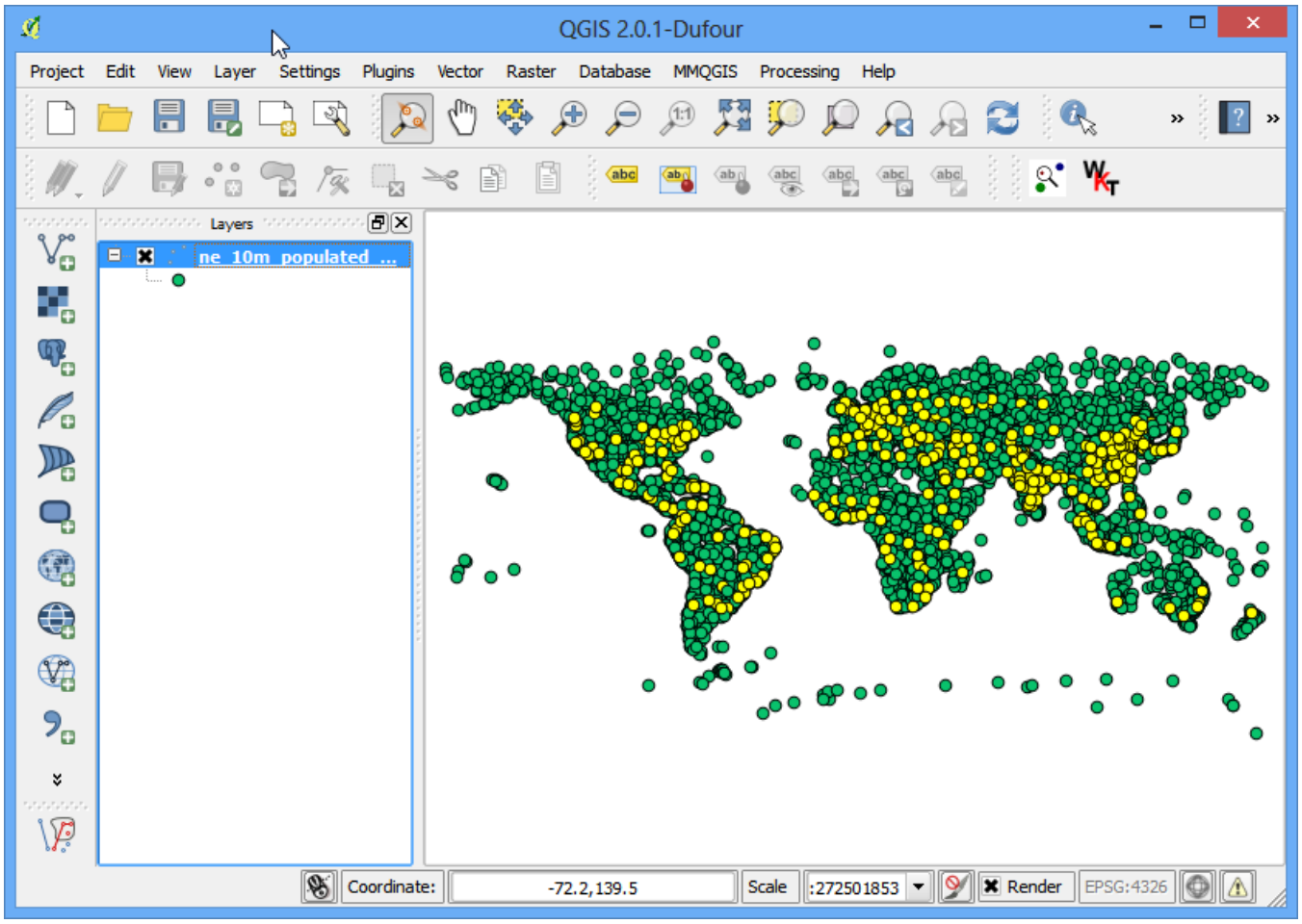


	longitude			diffnote	pop_max	pop_min	pop_other
7312	139.75140742900	0.00000000000	0	NULL	35676000	8336599	12945252
7297	-73.98001692880	0.00000000000	0	NULL	19040000	8008278	9292603
7303	-99.13098820170	0.00000000000	0	NULL	19028000	10811002	10018444
7313	72.85698929740	0.00000000000	0	NULL	18978000	12691836	12426085
7318	-46.62501998040	0.00000000000	0	NULL	18845000	10021295	11522944
7221	77.23000402720	4.00000000000	0	Changed featur...	15926000	7633213	6747384
7311	121.43650467800	0.00000000000	0	NULL	14987000	14608512	16803572
7316	88.32467565810	4.00000000000	1	Name changed...	14787000	4631392	7783716
7248	90.40857946670	5.00000000000	0	Changed scale ...	12797394	7000940	14995538
7290	-58.39753137370	0.00000000000	0	NULL	12795000	10929146	10271457
7295	-118.17998051100	0.00000000000	0	NULL	12500000	3694820	142265
7168	66.99000891000	5.00000000000	0	Changed scale ...	12130000	11624219	11570278
7310	31.24996821970	0.00000000000	0	NULL	11893000	7734614	13720557
7317	-43.22502079420	0.00000000000	0	NULL	11748000	2010175	1821489
7280	135.46014481500	4.00000000000	0	Changed featur...	11294000	2592413	9630783
7306	116.38828568400	0.00000000000	0	NULL	11106000	7480601	9033231
7274	120.98221716200	0.00000000000	0	NULL	11100000	3077575	2381280
7302	37.61552282590	0.00000000000	0	NULL	10452000	10452000	10585385
7299	29.01000158560	0.00000000000	0	NULL	10061000	9945610	9651488
7314	2.33333532574	0.00000000000	0	NULL	9904000	11177	7142744
7273	126.99973099700	0.00000000000	0	NULL	9796000	9796000	12018058
7304	3.39153107121	4.00000000000	0	Location adiust...	9466000	1536	6567892

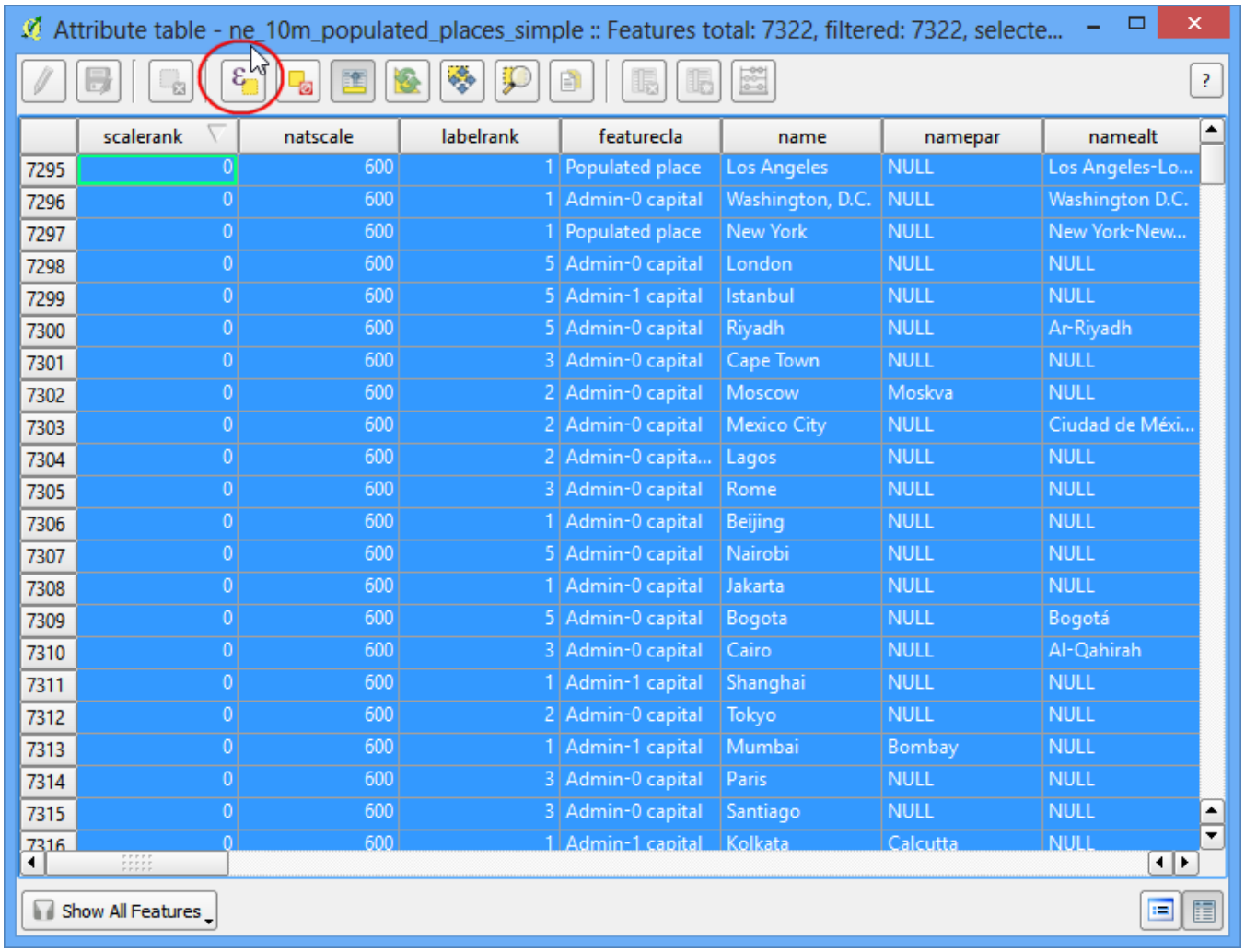
10. In the Select By Expression window, expand the Fields and Values section and double-click the ***pop_max*** label. You will notice that it is added to the expression section at the bottom. If you aren't sure about the field values, you can click the Load all unique values to see what the attribute values are present in the dataset. For this exercise, we are looking to find all features that have a population greater than 10,00,000. So complete the expression as ***"pop_max" > 1000000*** and click Select.



1. 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 10,00,000.

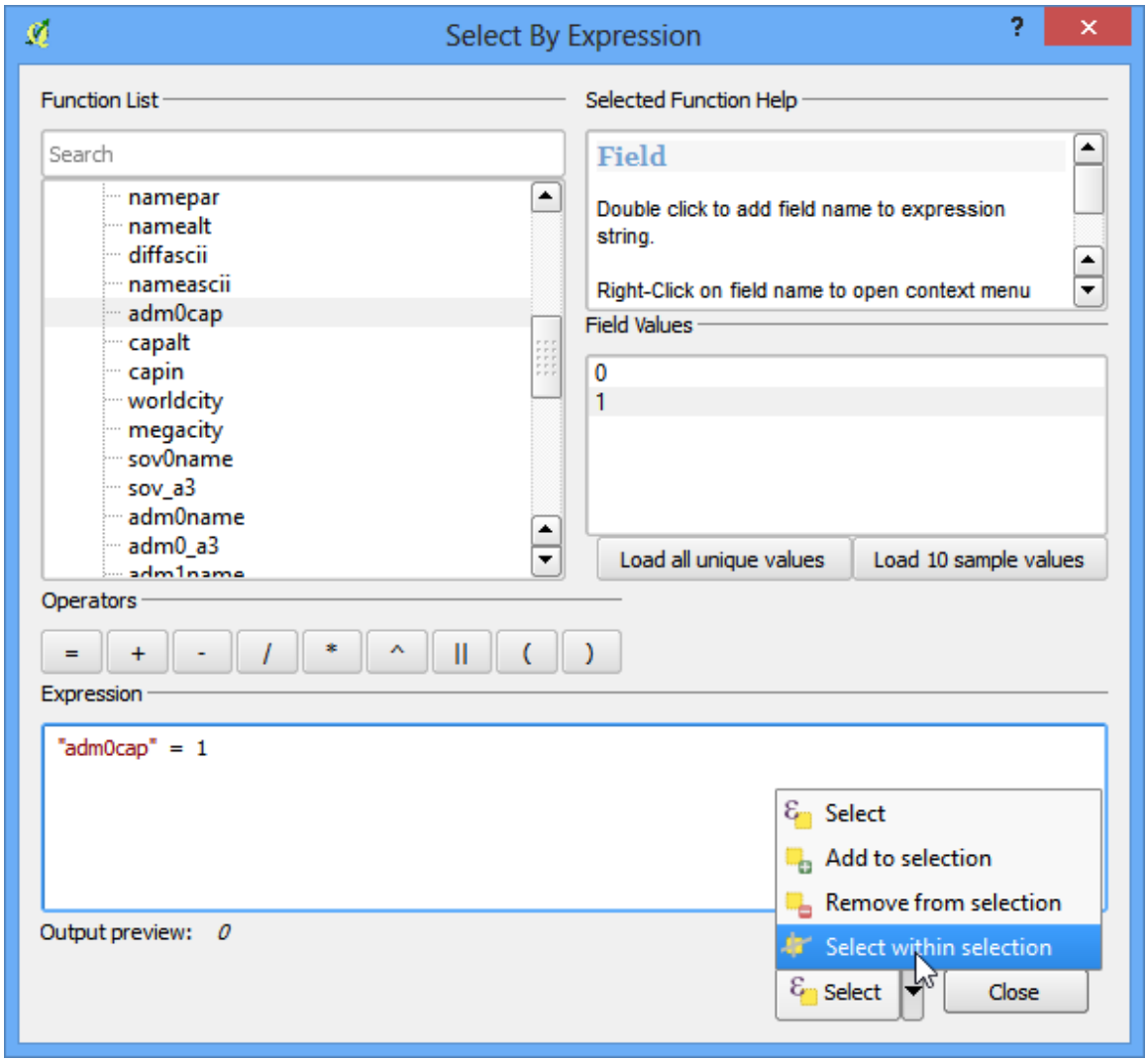


1 The goal for this exercise is to find the places that are country capitals. Let's refine our
2. query to select only those places which are capitals. Click on the Select feature using an expression button in the attribute table.

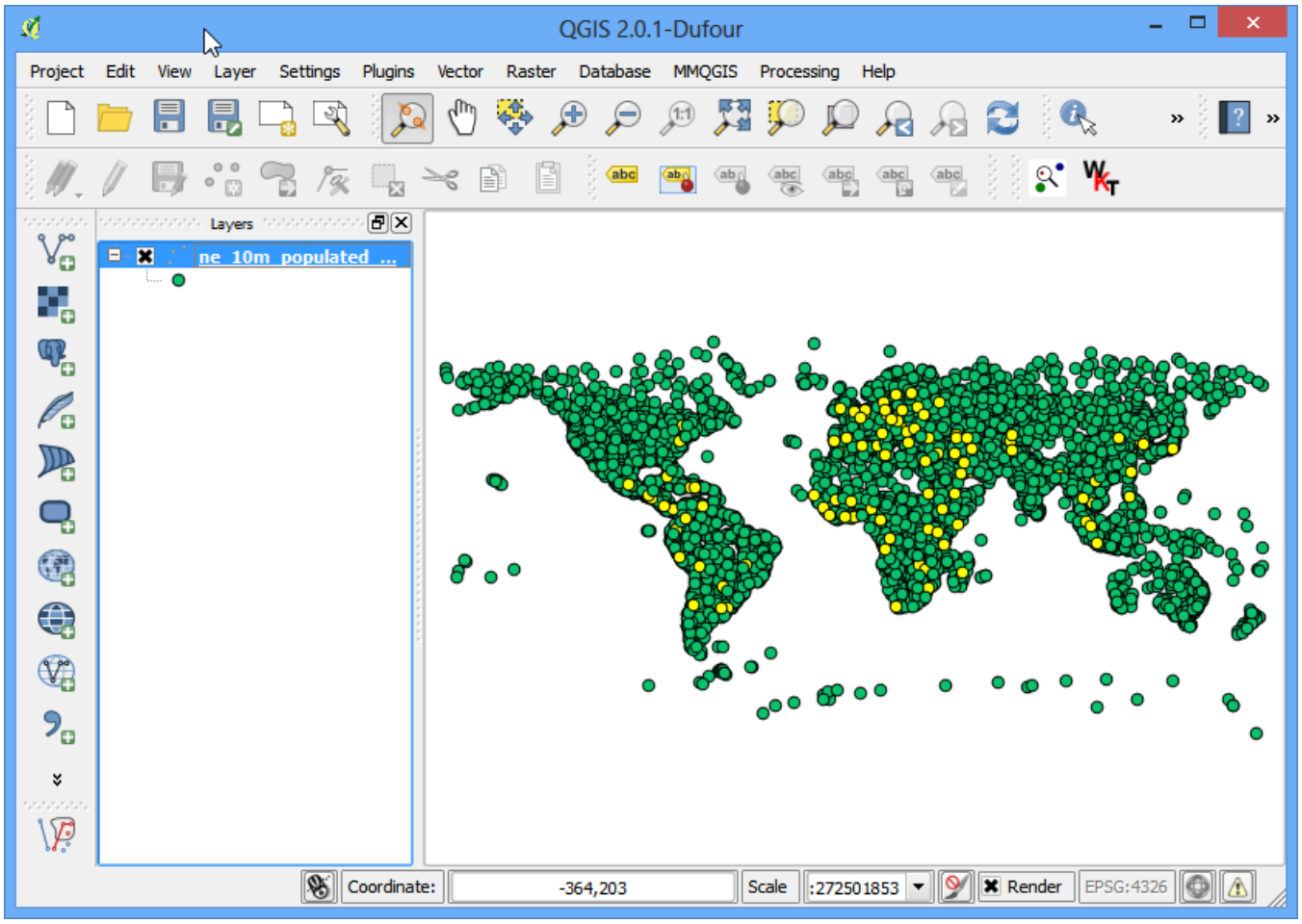


	scalerank	natscale	labelrank	featurecla	name	namepar	namealt
7295	0	600	1	Populated place	Los Angeles	NULL	Los Angeles-Lo...
7296	0	600	1	Admin-0 capital	Washington, D.C.	NULL	Washington D.C.
7297	0	600	1	Populated place	New York	NULL	New York-New...
7298	0	600	5	Admin-0 capital	London	NULL	NULL
7299	0	600	5	Admin-1 capital	Istanbul	NULL	NULL
7300	0	600	5	Admin-0 capital	Riyadh	NULL	Ar-Riyadh
7301	0	600	3	Admin-0 capital	Cape Town	NULL	NULL
7302	0	600	2	Admin-0 capital	Moscow	Moskva	NULL
7303	0	600	2	Admin-0 capital	Mexico City	NULL	Ciudad de Méxi...
7304	0	600	2	Admin-0 capita...	Lagos	NULL	NULL
7305	0	600	3	Admin-0 capital	Rome	NULL	NULL
7306	0	600	1	Admin-0 capital	Beijing	NULL	NULL
7307	0	600	5	Admin-0 capital	Nairobi	NULL	NULL
7308	0	600	1	Admin-0 capital	Jakarta	NULL	NULL
7309	0	600	5	Admin-0 capital	Bogota	NULL	Bogotá
7310	0	600	3	Admin-0 capital	Cairo	NULL	Al-Qahirah
7311	0	600	1	Admin-1 capital	Shanghai	NULL	NULL
7312	0	600	2	Admin-0 capital	Tokyo	NULL	NULL
7313	0	600	1	Admin-1 capital	Mumbai	Bombay	NULL
7314	0	600	3	Admin-0 capital	Paris	NULL	NULL
7315	0	600	3	Admin-0 capital	Santiago	NULL	NULL
7316	0	600	1	Admin-1 capital	Kolkata	Calcutta	NULL

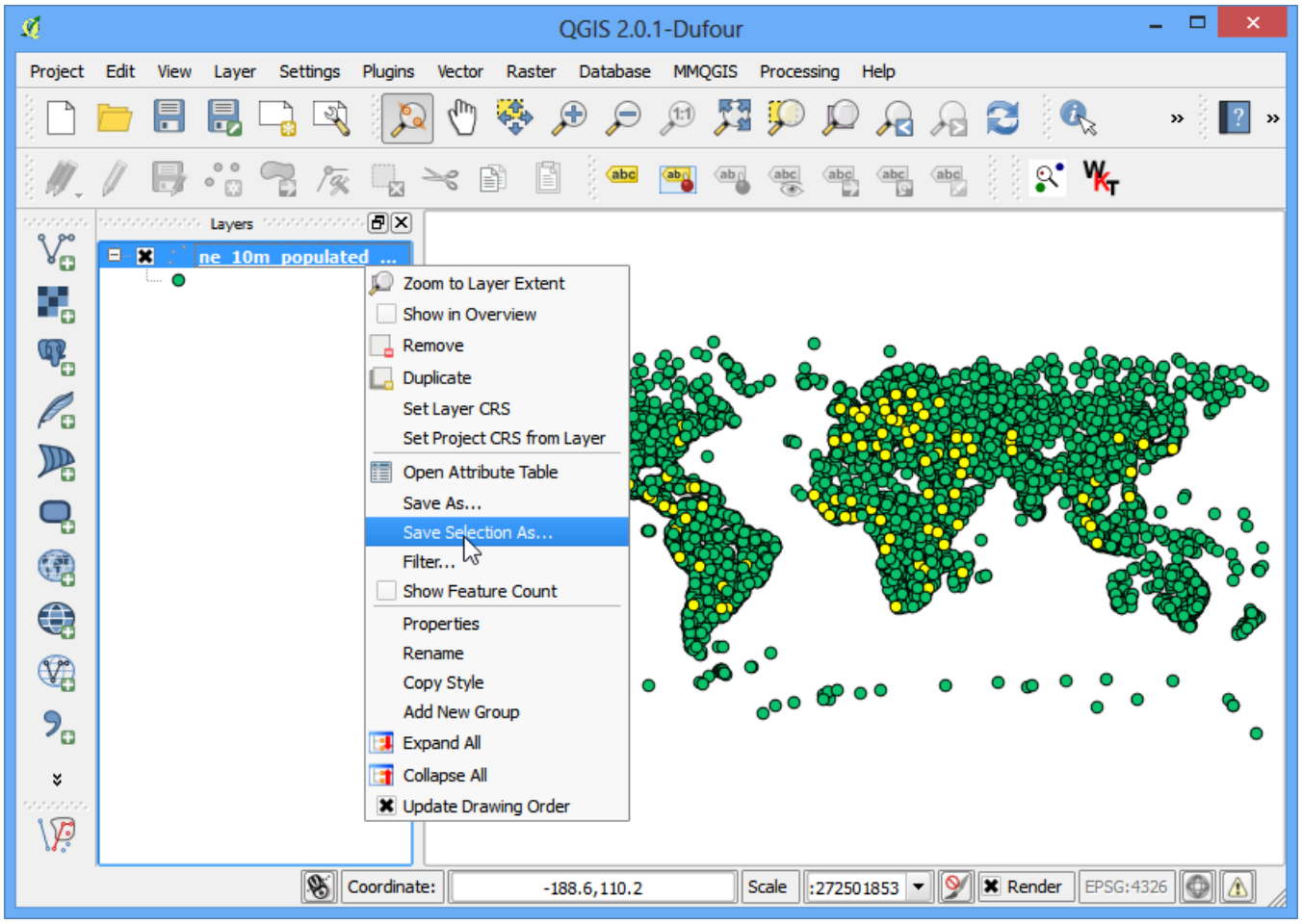
13. The field containing this data is ***adm0cap***. The value ***1*** indicates that the place is a capital. Enter the expression as ***"adm0cap" = 1***. Since we want to search only within our previous query results, select Select within selection.



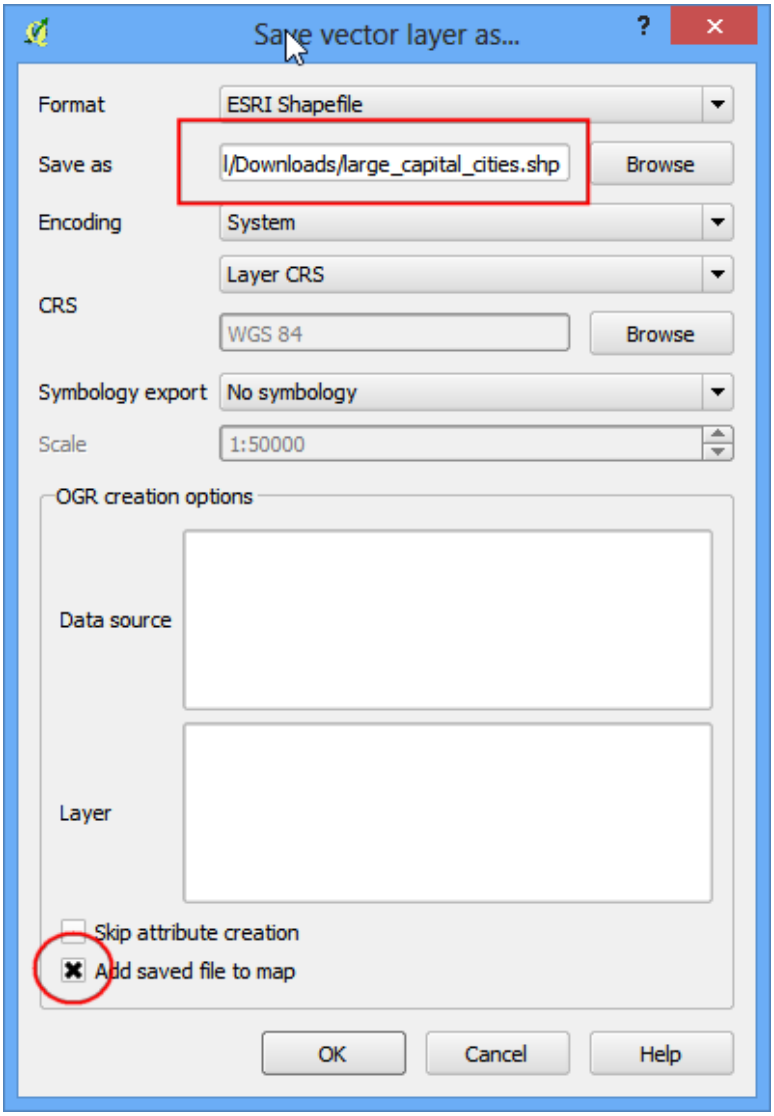
1 Click on Close and return to the main QGIS window. Now you will see a smaller subset
4. of the points selected. This is the result of the second query and shows all places from the dataset that are country capitals as well as have population greater than 10,00,000.



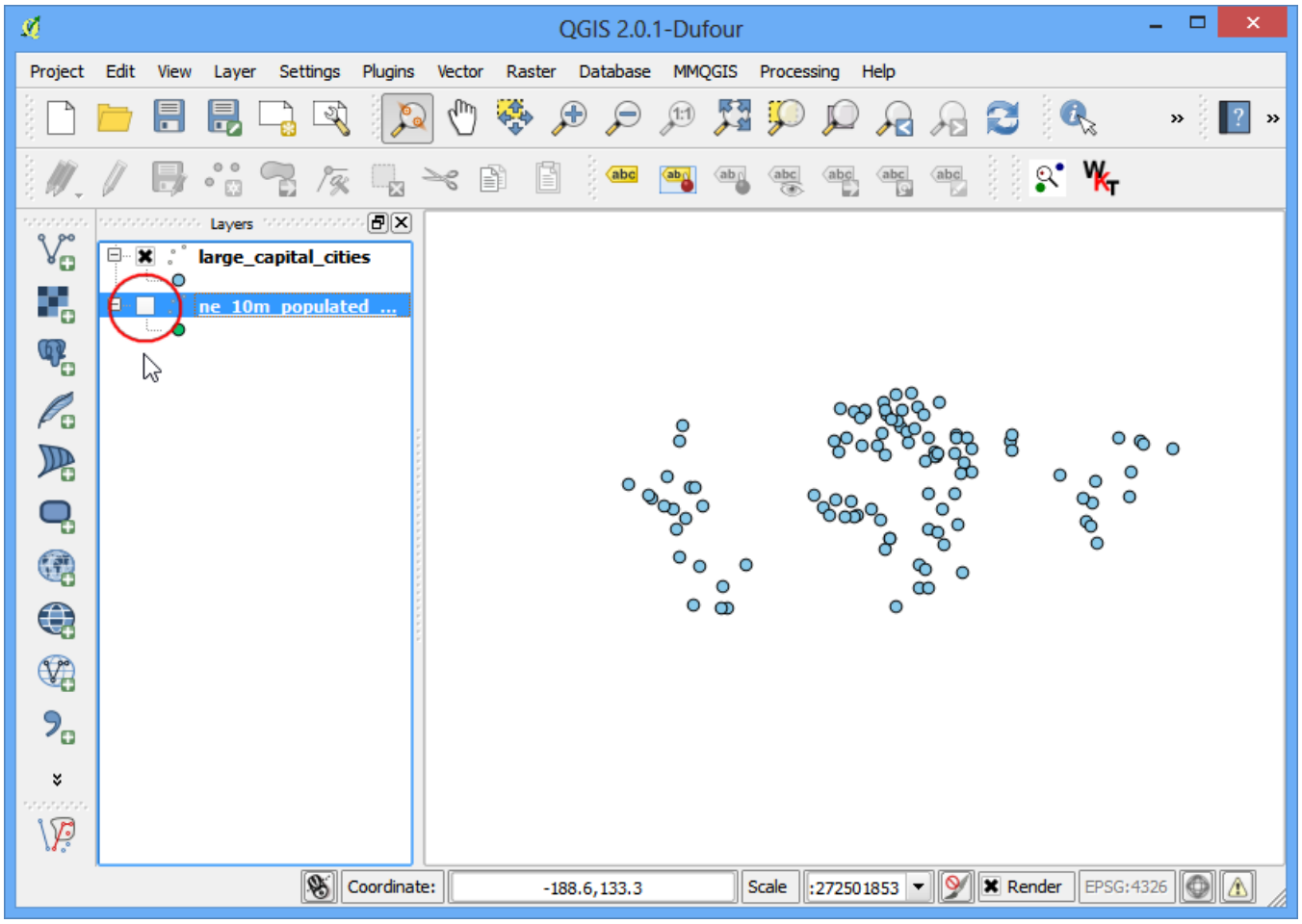
1 Let's save these results to a separate layer. Right-click on the layer and select Save
5. Selection As.



6. Keep the format selection as ***ESRI Shapefile*** and enter the output name as ***large_capital_cities.shp***. Check the box next to Add saved file to map and click OK.



17. The newly created shapefile will be automaticlally loaded into QGIS. Turn off the populated places layer by un-checking the box next to it. Now, you will see only the features from the newly created layer containing capital cities of the world that have population greater than 10,00,000.


QGIS 2.0.1-Dufour
Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
MMQGIS
Processing
Help
Layers
large_capital_cities
ne_10m_populated ...
Coordinate:
-188.6,133.3
Scale
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Render
EPSG:4326