THE UNIVERSITY OF NEW MEXICO

NMFMA Spring 2019 QGIS Workshop

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Part A. Introduction to QGIS

1. QGIS

- QGIS is a free and open source cross-platform (Windows, Mac OS, Linux, BSD, and Android) Desktop Geographic Information System (GIS)
- QGIS can help users create, edit, visualize, analyze, and publish geospatial data
- QGIS integrates with other open source GIS packages, including but not limited to PostGIS, GRASS GIS, and MapServer
- QGIS supports shapefiles, coverages, personal and file geodatabases (only feature class), many raster formats, and many other formats

2. QGIS vs. ArcGIS

- QGIS – free and open source software, more stable, less analysis tools, multi-platform
- ArcGIS – commercial software, less stable, more analysis tools, single-platform

3. Start to Learn QGIS

- Cutts, A., and Graser, A. 2018. *Learning QGIS*, 4th ed. Packt Publishing, Birmingham, UK.
- Menke, K., Smith, R. Jr., Pirelli, L., and Van Hoesen, J. 2016. *Mastering QGIS*, 2nd ed. Packt Publishing, Birmingham, UK.
- Graser, A., Mearns, B., Mandel, A., Ferrero, V. O., and Bruy A. 2017. *QGIS: Becoming a GIS Power User*. Packt Publishing, Birmingham, UK.
- Website
  - QGIS Workshop http://maps.cga.harvard.edu/qgis/
  - QGIS Tutorials and Tips http://qgistutorials.com
- Online Education
  - Udemy Introduction to GIS https://www.udemy.com/gis-for-everyone/
  - Udemy Learnt to use QGIS https://www.udemy.com/draft/149366/

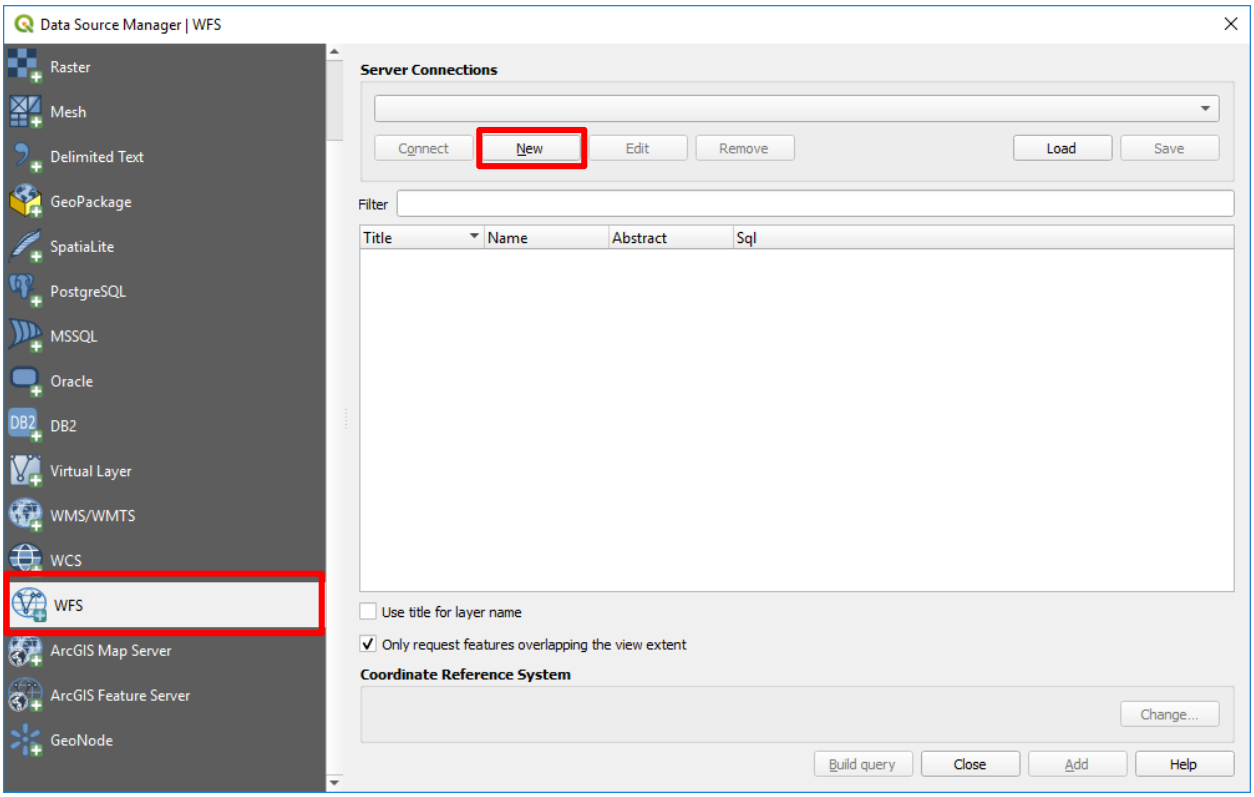
Part B. Loading Web Services

QGIS supports the loading of Open Geospatial Consortium (OGC) compliant web services such as Web Map Services, Web Map Tile Services (WMTS), Web Coverage Services (WCS), and Web Feature Services (WFS). Loading a web services is similar to loading a database service, in that you have to first set up the connection to the service, and then connect to the service to choose which layers to add.

1. Adding WFS

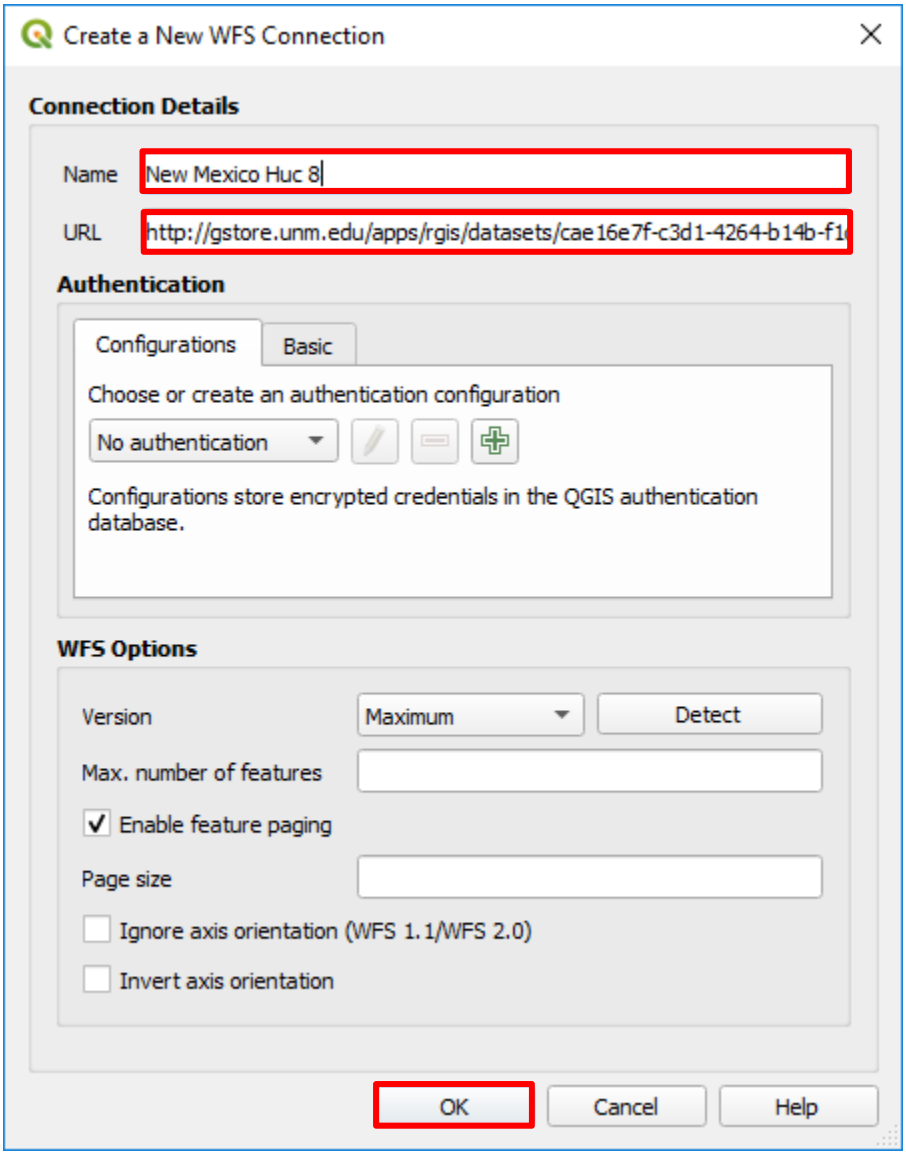
(1) Click on the "Open Data Source Manager"

(2) Click on WFS

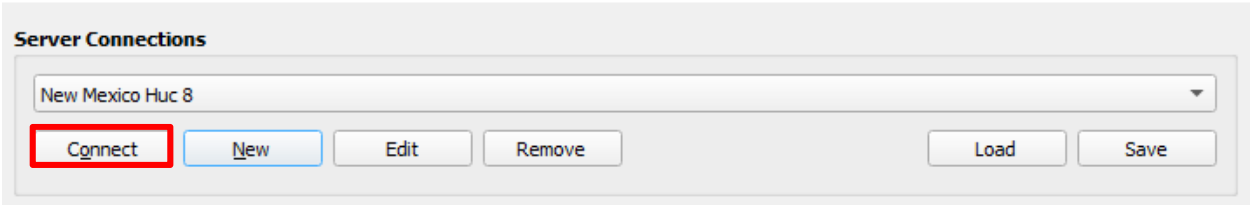


(3) Click on "New"

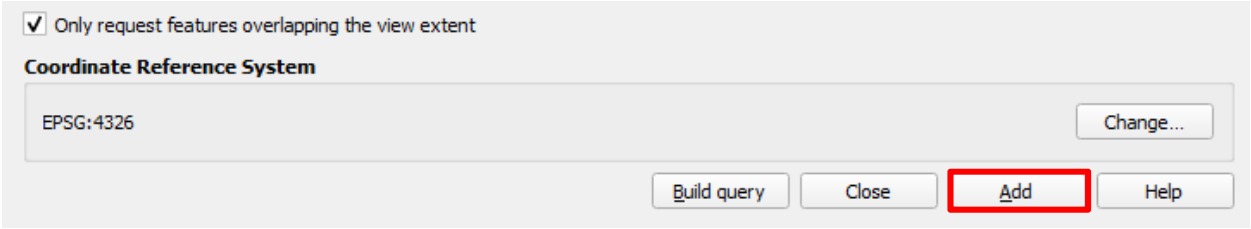
(4) In the “Create a New WFS Connection” dialog, type in the Name and URL for the intended WFS as below and then click on “OK”



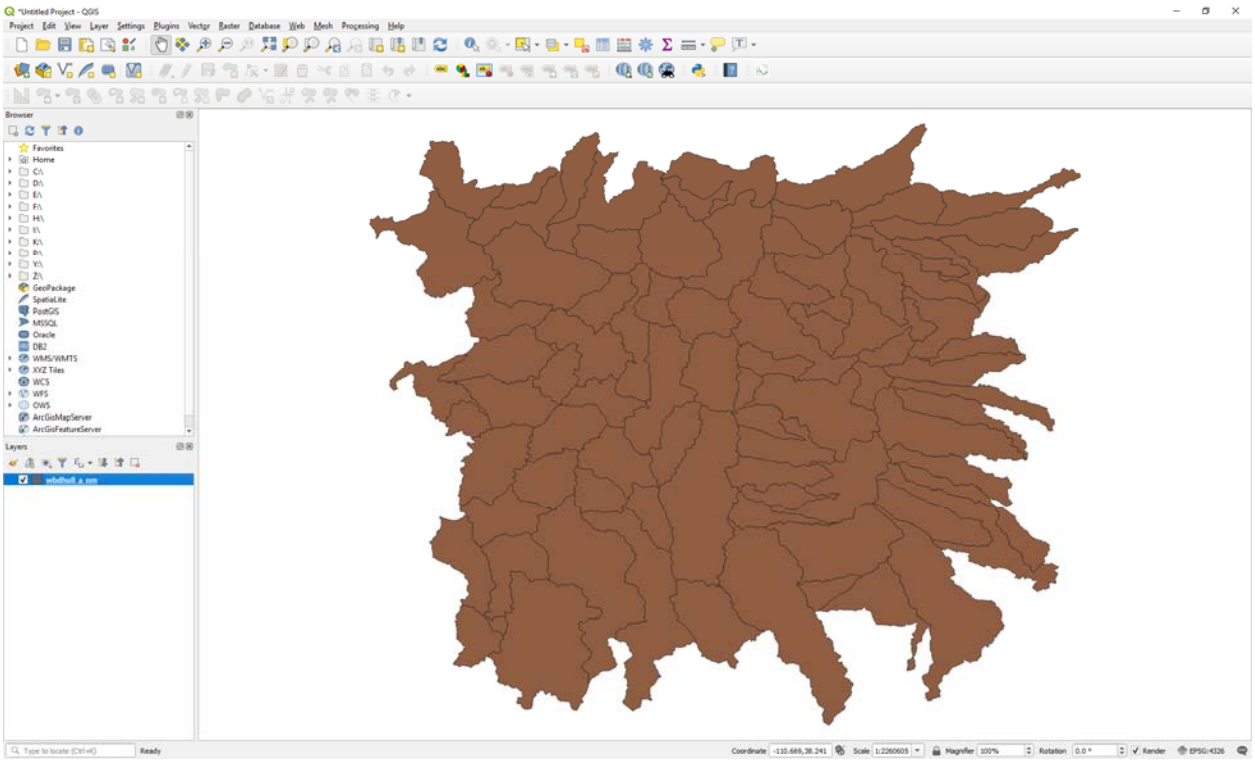
(5) Click on “Connect” in the Server Connections dialog



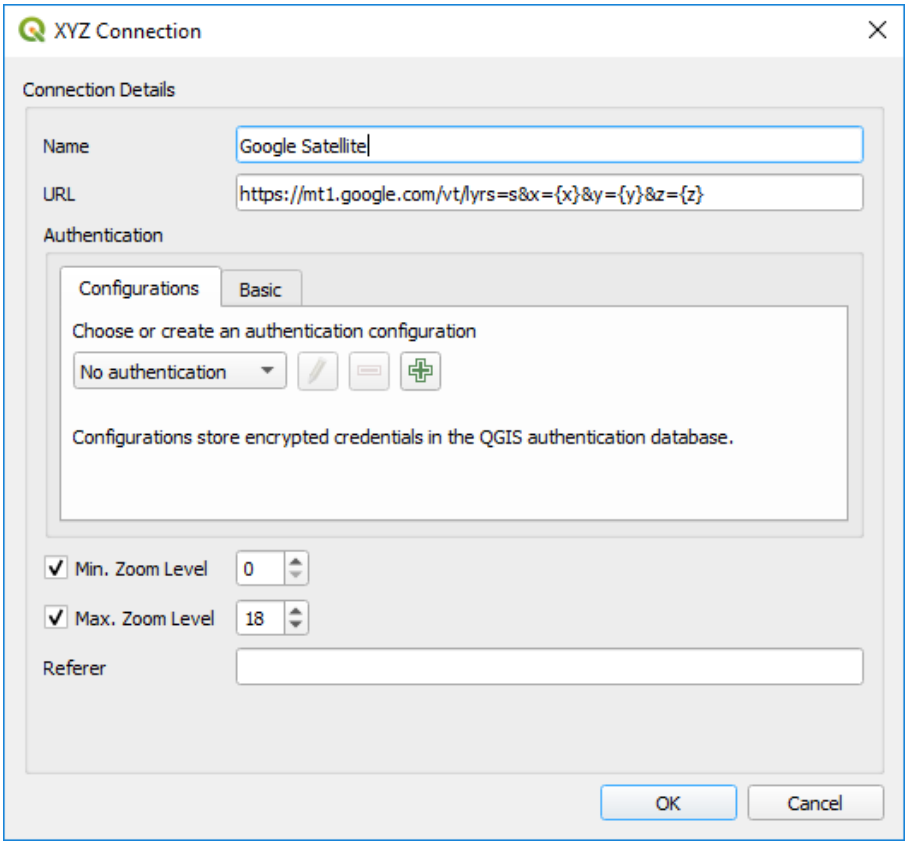
(6) Click on “Add” in the Server Connections dialog



(7) The WFS layer should be loaded as below; you may have a different color because QGIS will randomly choose a color when you add the layer



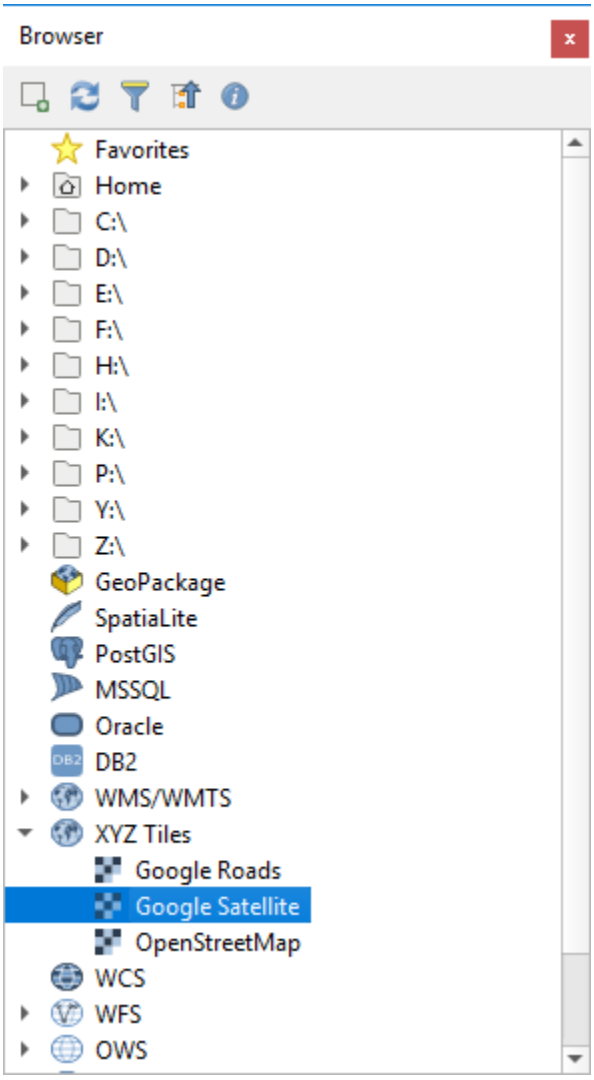
(8) In the Browser Panel, expand the XYZ Tiles, and then right-click on the XYZ Tiles, select New Connection, type in the name and URL for Google Satellite as below



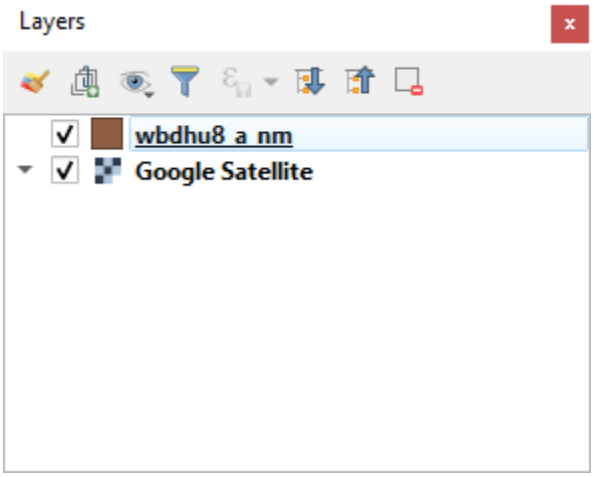
(9) https://mt1.google.com/vt/lyrs=s&x={x}&y={y}&z={z}

(10) Click on “OK”

(11) Google Satellite is added to the XYZ Tiles

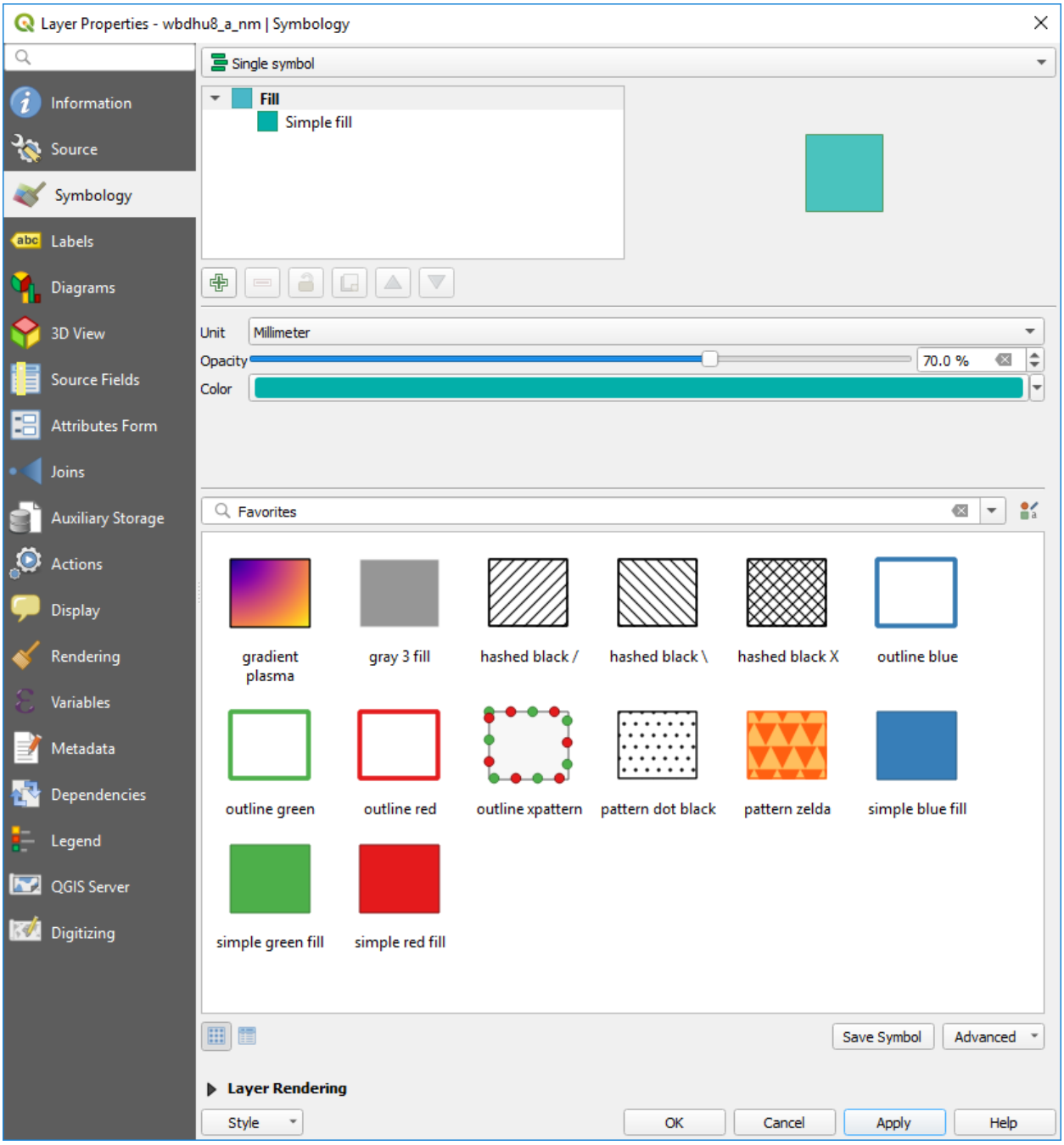


(12) Drag the Google Satellite layer under the New Mexico HUC 8 layer

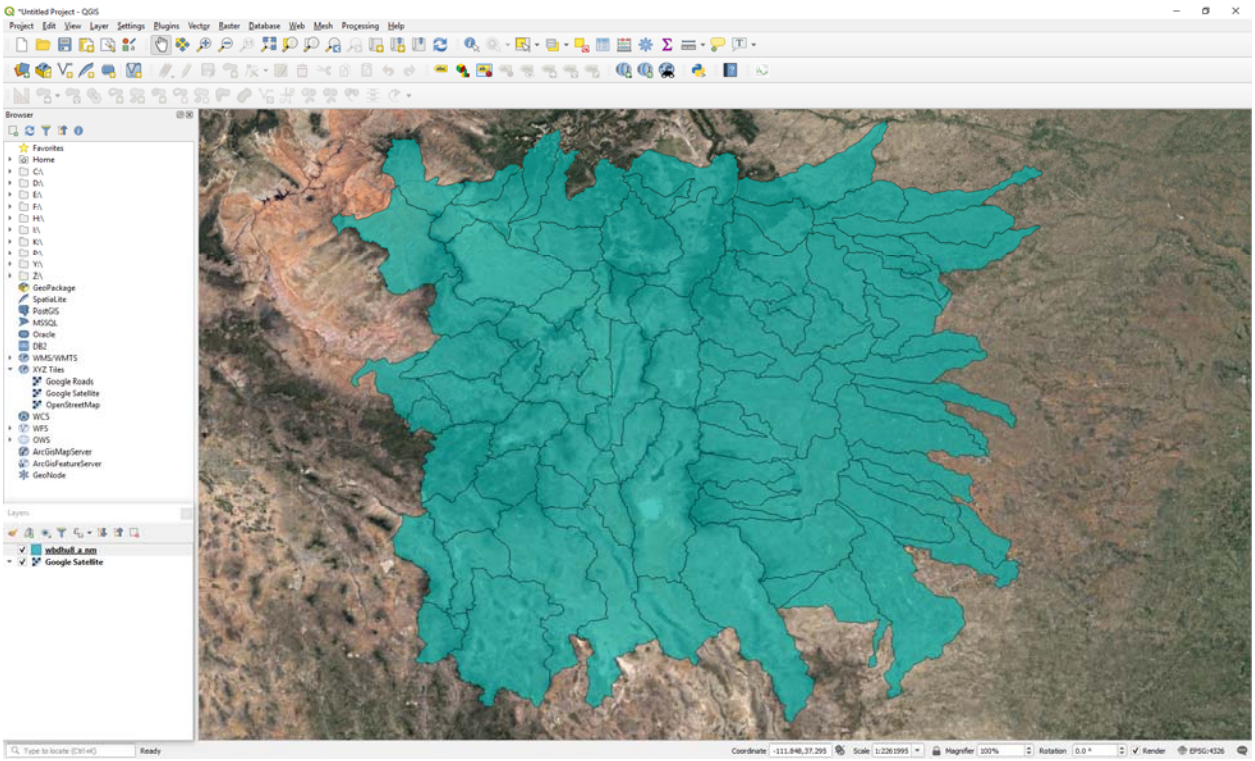


(13) Right-click on the New Mexico HUC 8 layer, and then select “Properties”

(14) In the Symbology Tab, click on the Opacity and change it to 70%; you can also change the color; if you decide to change the color, you need to change the color first and then assign the opacity to the new color

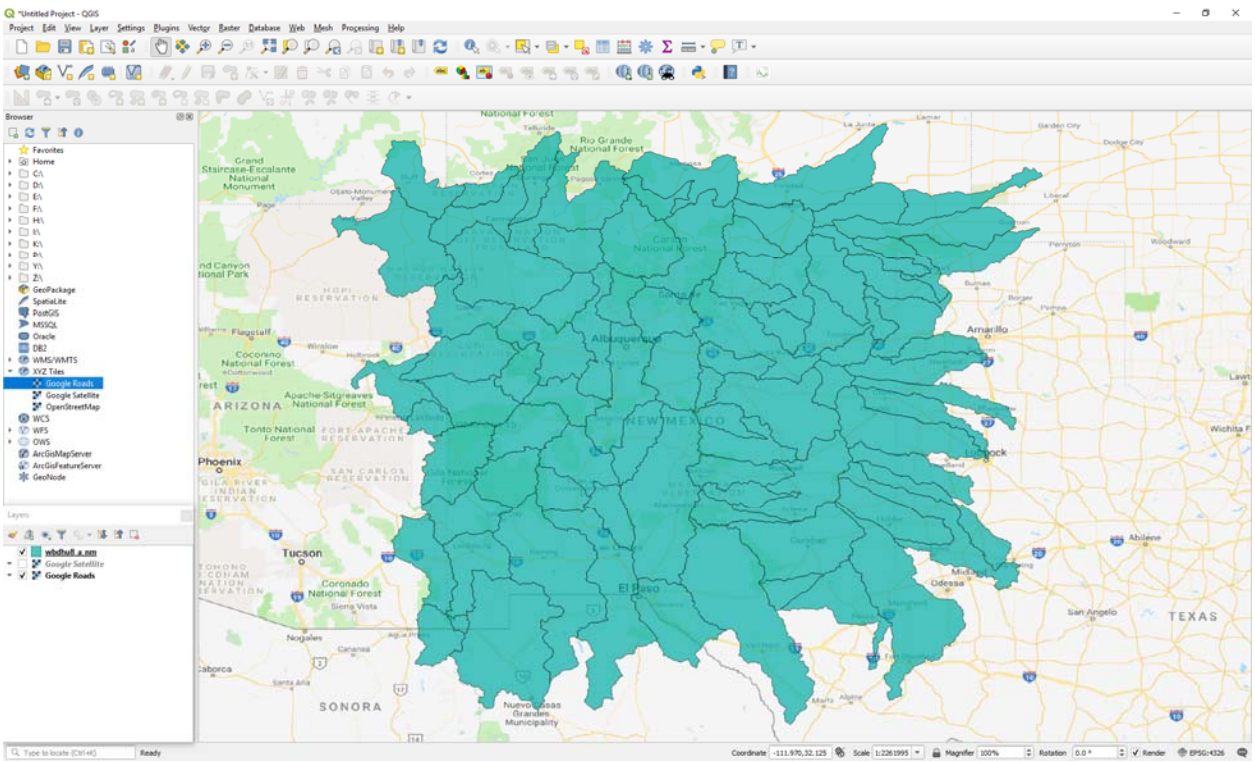


(15) A display as below will show up



(16) Add a Google Street layer to the XYZ Tile and then use it as the background layer

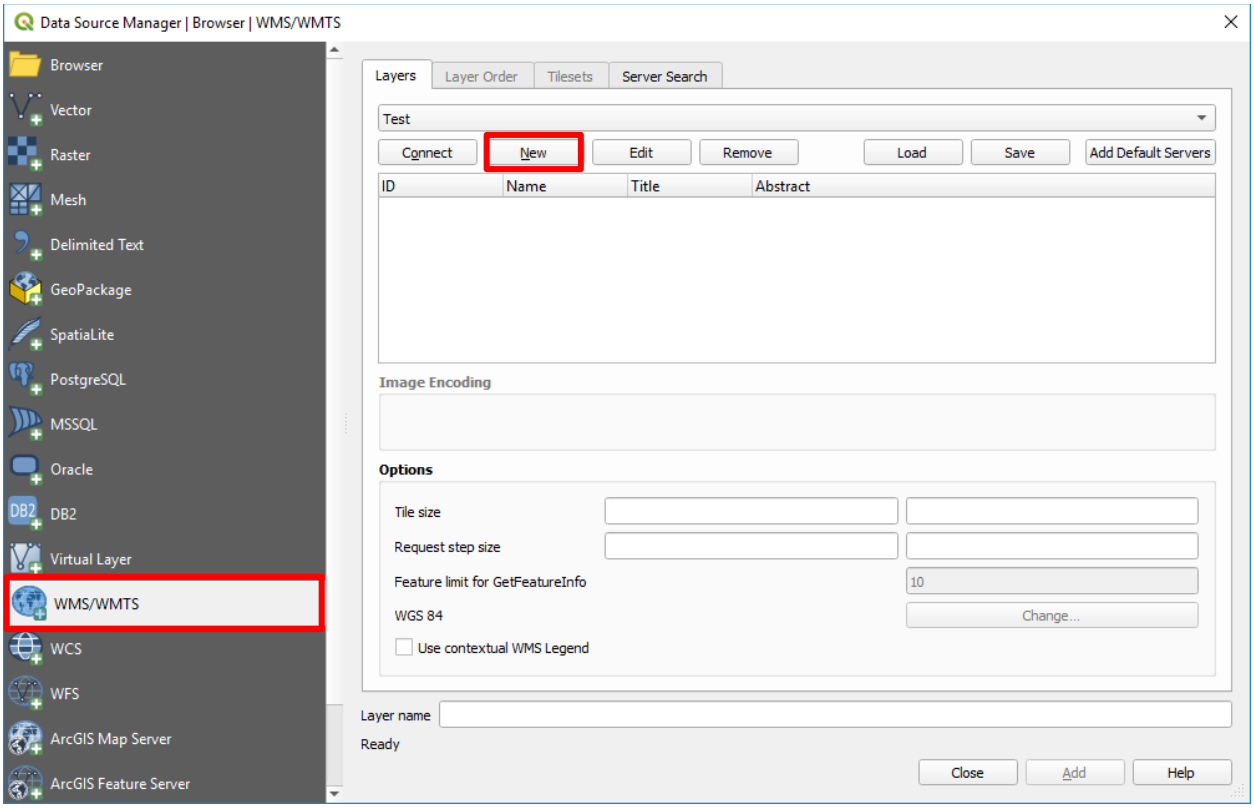
Note: the link for this is https://mt1.google.com/vt/lyrs=m&x={x}&y={y}&z={z}



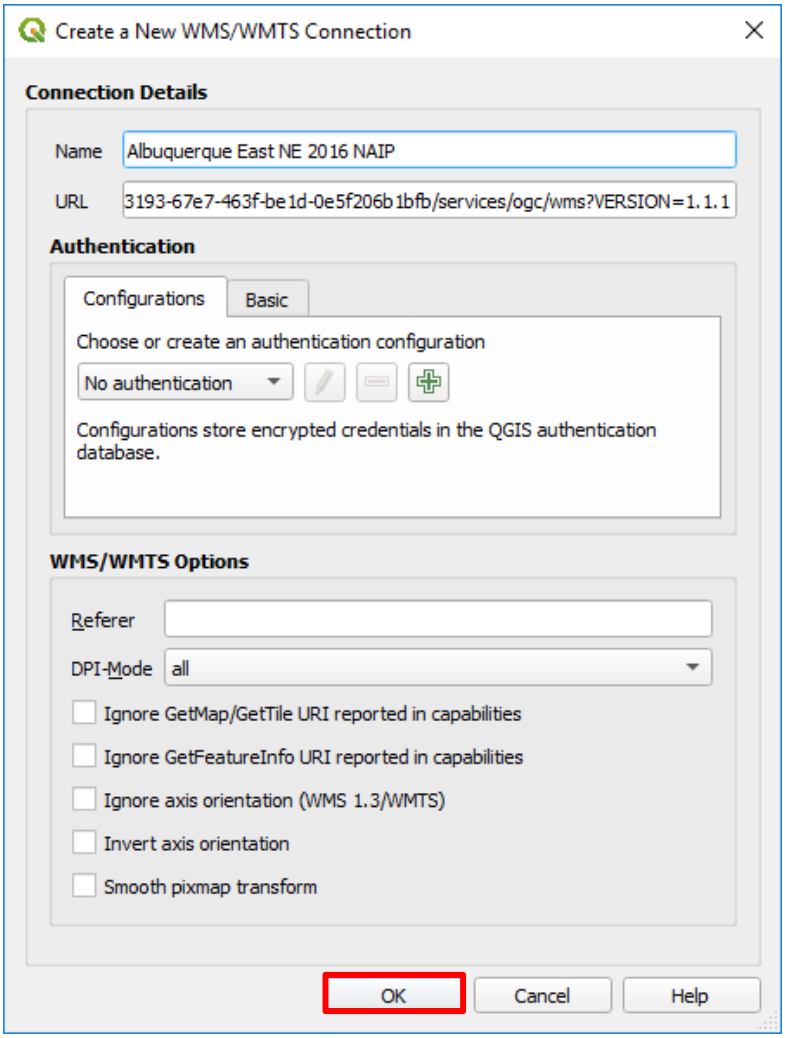
2. Adding WMS

(1) Click on the “Open Data Source Manager”

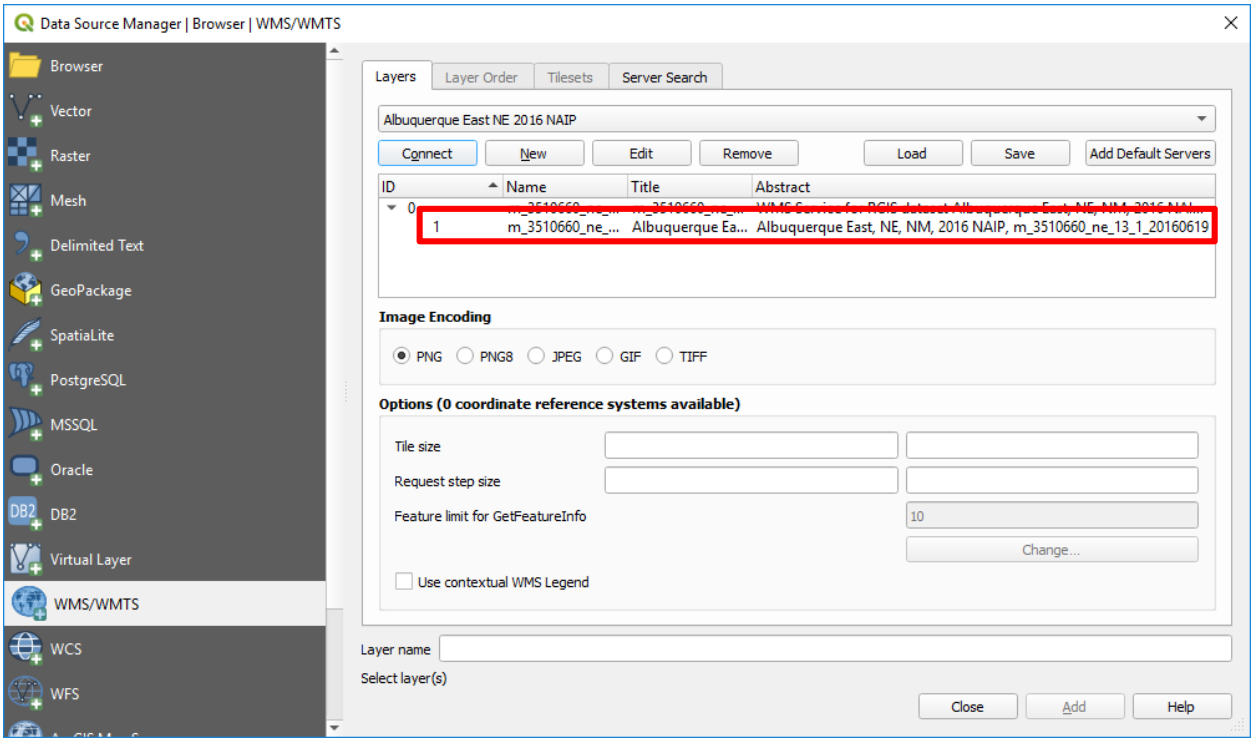
(2) Click on WMS/WMTS



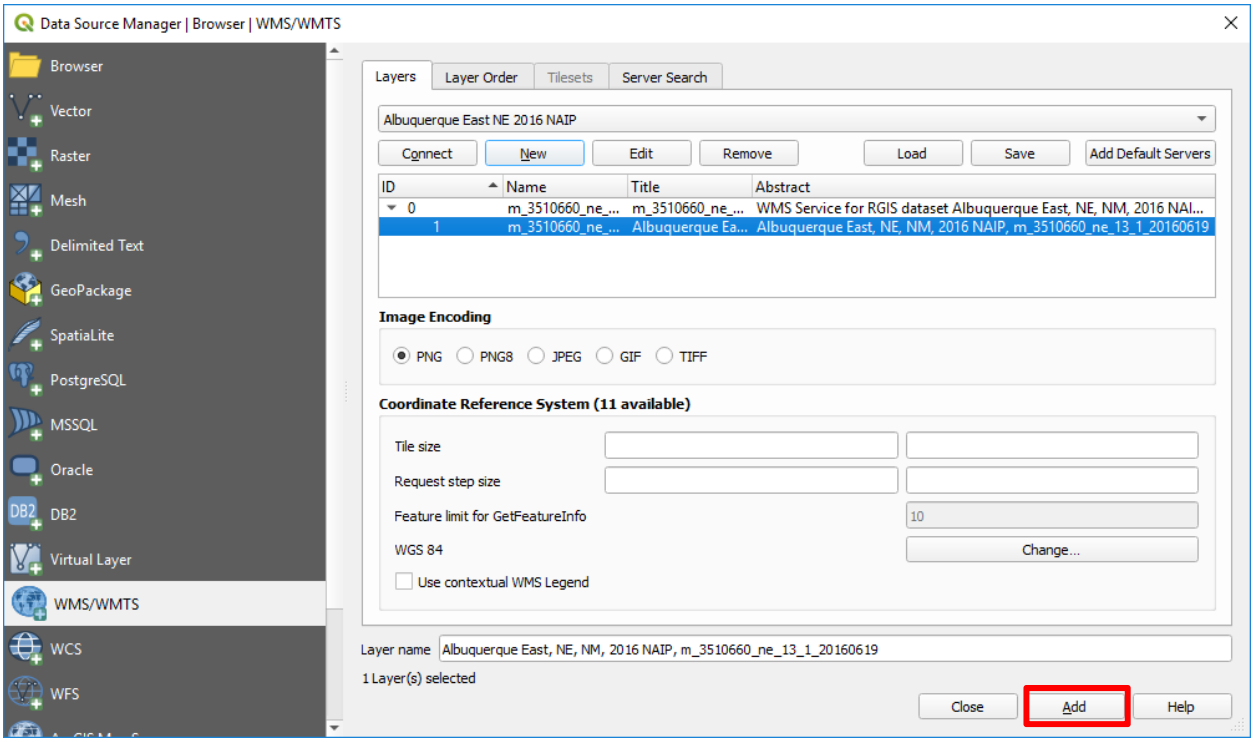
(3) Click on New and type in the Name and URL for the intended WMS layer as below and then click on OK



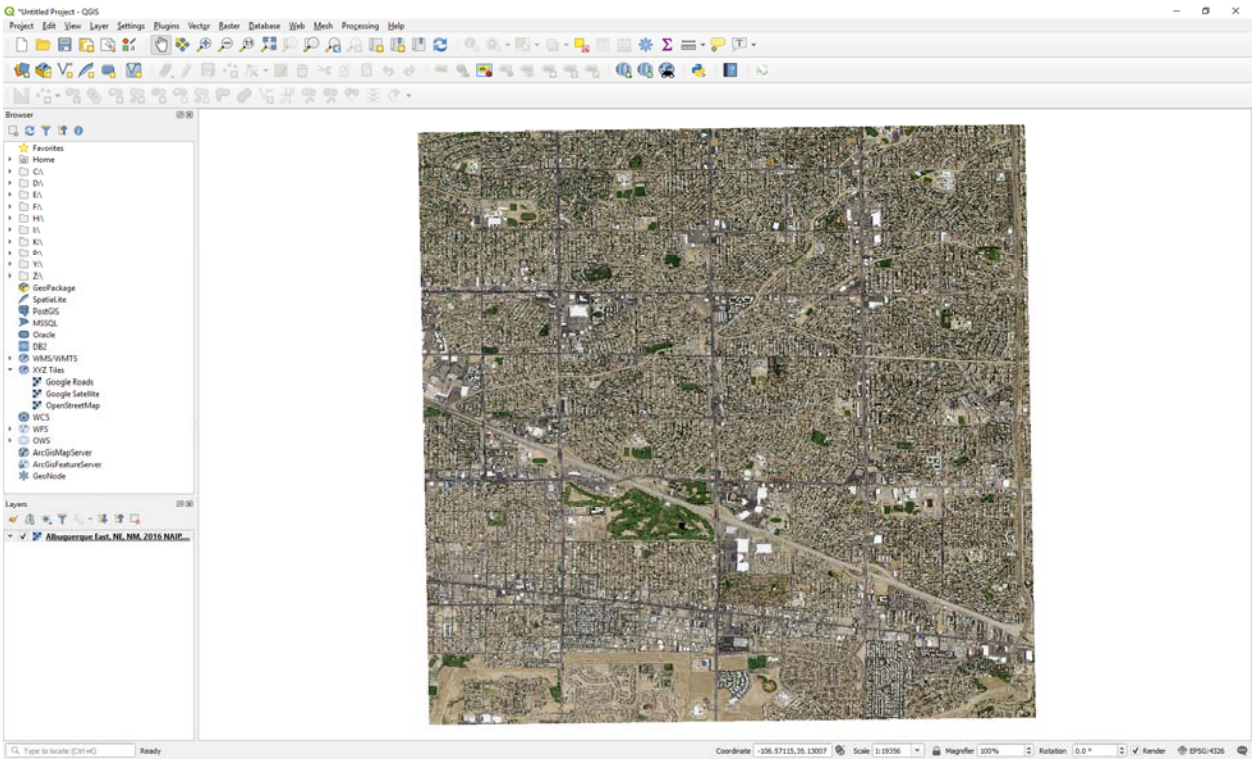
(4) Click on “Connect” and then click on the layer of “Albuquerque, East, NM, 2016 NAIP”



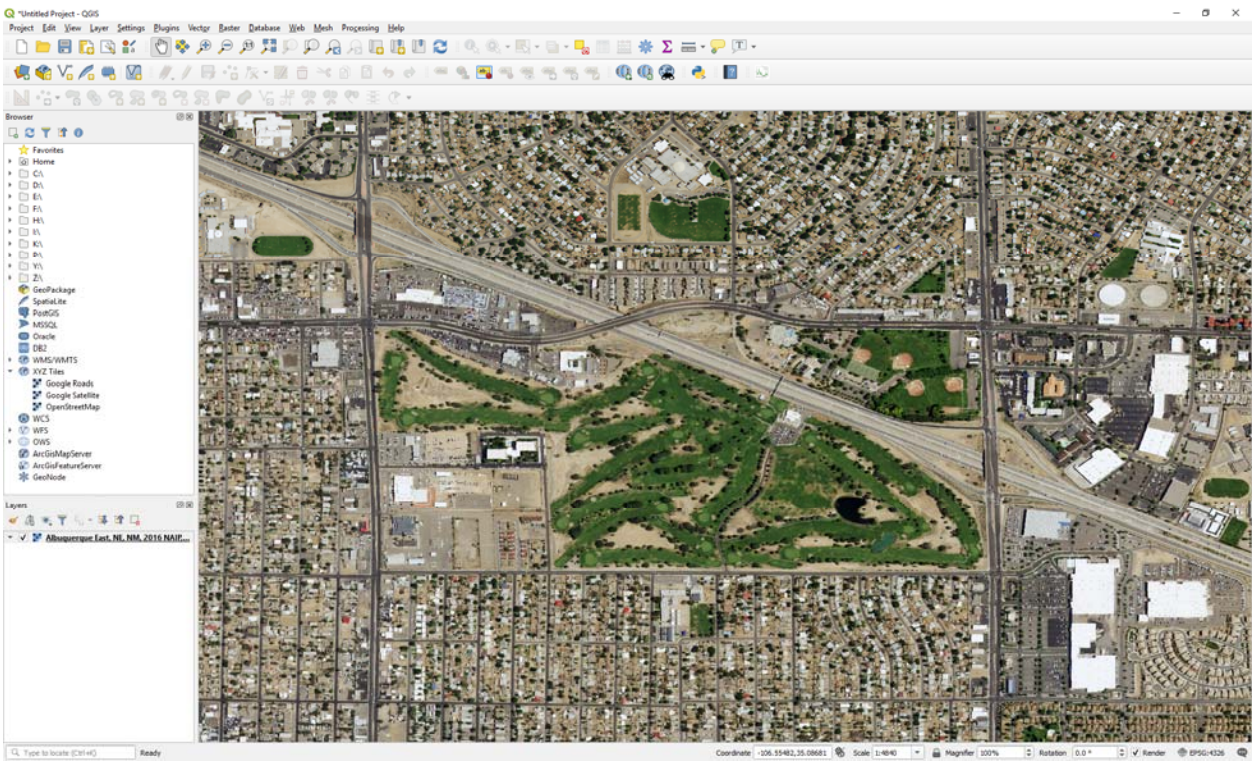
(5) Click on “Add” and then click on “Close”



(6) The Albuquerque East NE 2016 NAIP layer is added



(7) Zoom in to an area of interest



Practice:

https://hazards.fema.gov/gis/nfhl/services/public/NFHLWMS/MapServer/WMSServer?request=GetCapabilities&service=WMS

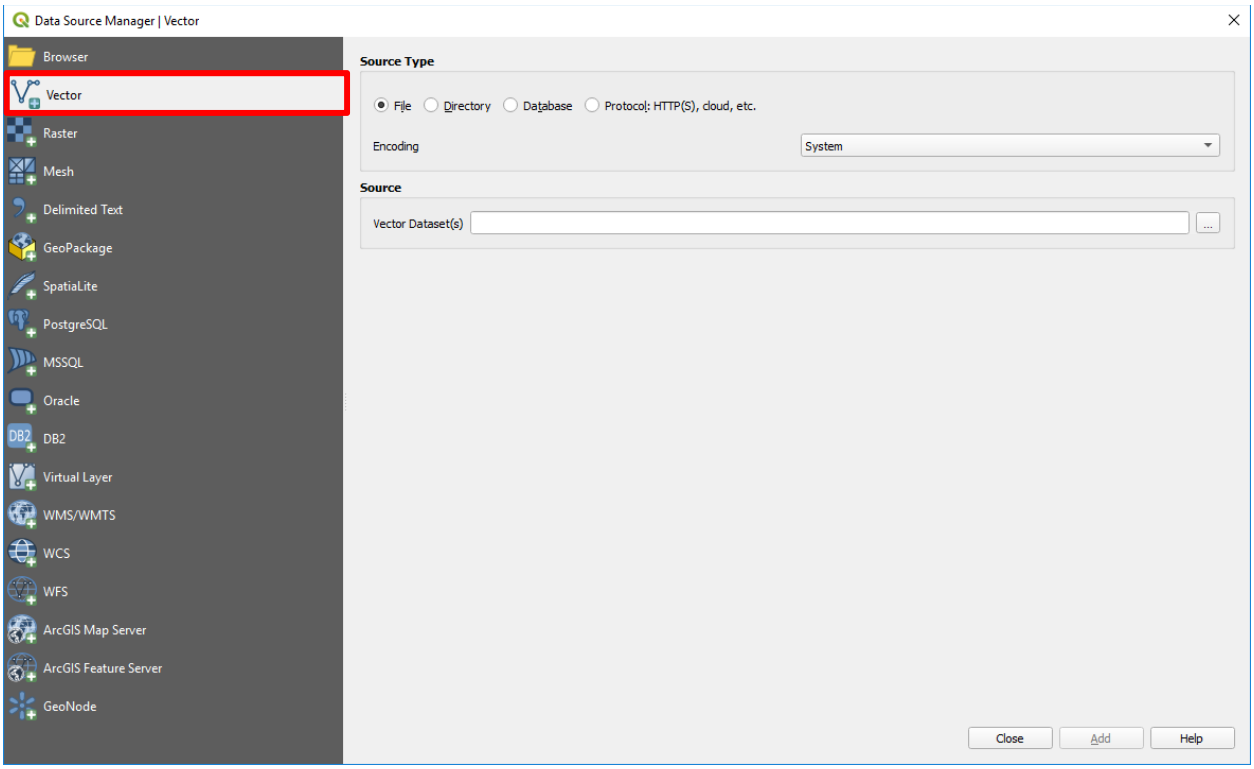
Part C. Styling Vector Data

1. Vector Styling

(1) Open QGIS Desktop application.

(2) Click on the Open Data Source Manger button

(4) Select the Vector option



(5) Navigate to the folder of QGIS_Workshop >>> Part_C >>> FEMA_NFHL

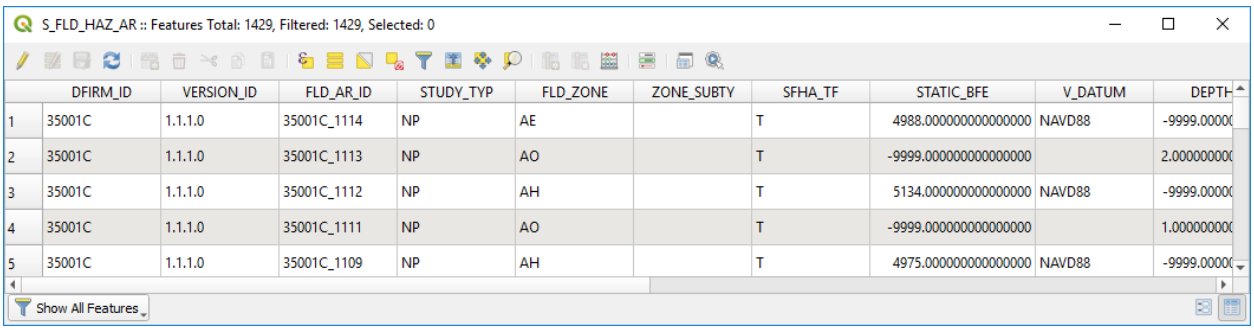
(6) Click on the S_FLD_HAZ_AR.shp to add it to the map area; you can also drag and drop it into your map area; another option is using the Browser Panel to add data

Note: To quickly locate .shp files, use the file type filter.

QGIS now has one Data Source Manager button; therefore, you do not need to add different types of data with different buttons.

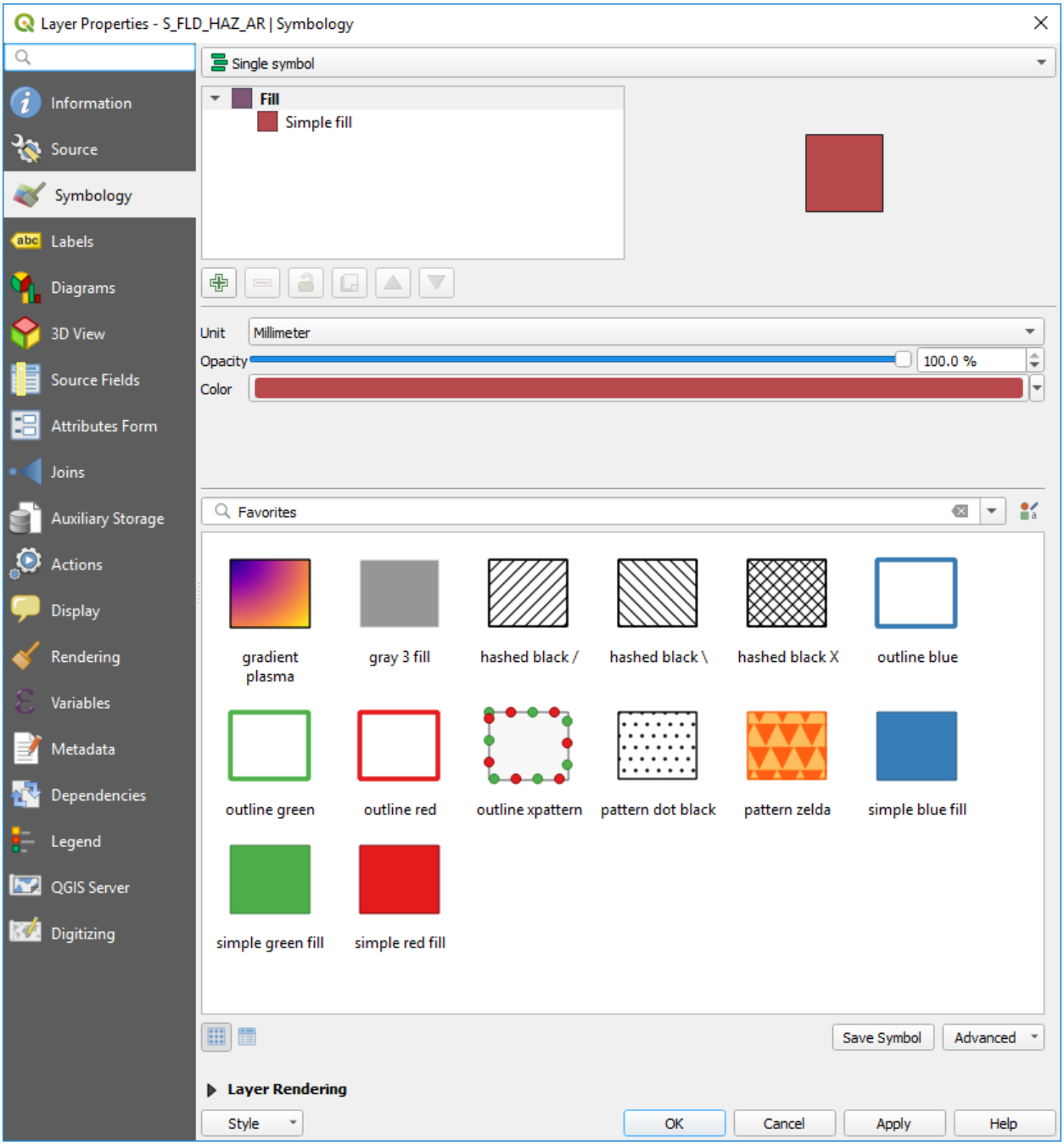
(7) Right-click on the S_FLD_HAZ_AR layer and select properties

(8) Open the layer and get yourself familiar with the attributes

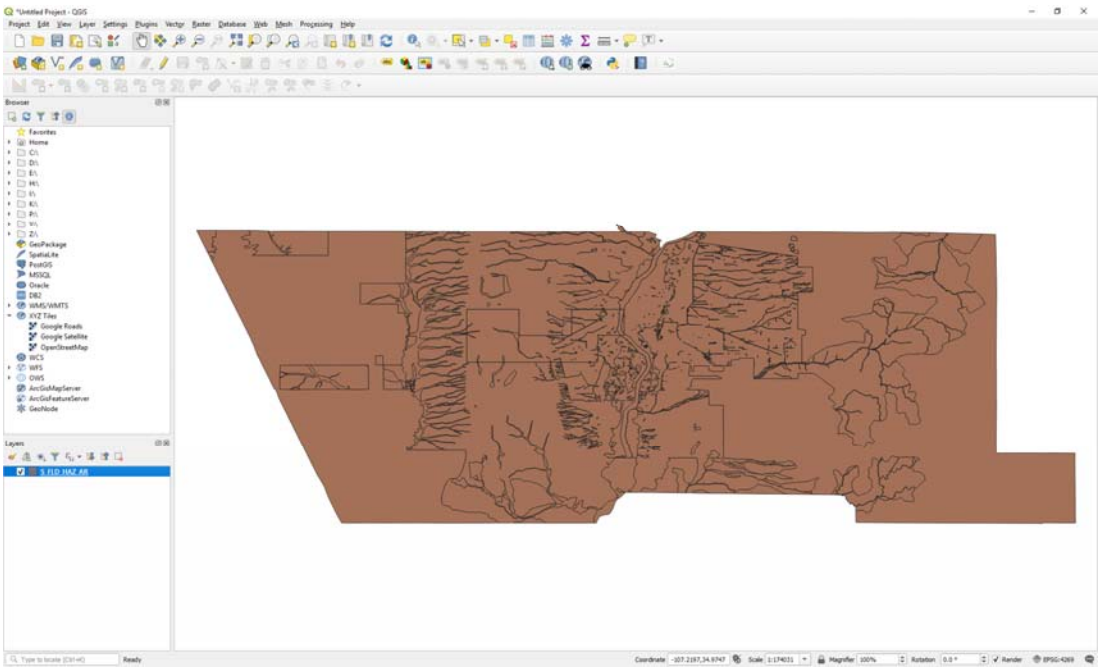


	DFIRM_ID	VERSION_ID	FLD_AR_ID	STUDY_TYP	FLD_ZONE	ZONE_SUBTY	SFHA_TF	STATIC_BFE	V_DATUM	DEPTH
1	35001C	1.1.1.0	35001C_1114	NP	AE		T	4988.000000000000000	NAVD88	-9999.00000
2	35001C	1.1.1.0	35001C_1113	NP	AO		T	-9999.000000000000000		2.00000000
3	35001C	1.1.1.0	35001C_1112	NP	AH		T	5134.000000000000000	NAVD88	-9999.00000
4	35001C	1.1.1.0	35001C_1111	NP	AO		T	-9999.000000000000000		1.00000000
5	35001C	1.1.1.0	35001C_1109	NP	AH		T	4975.000000000000000	NAVD88	-9999.00000

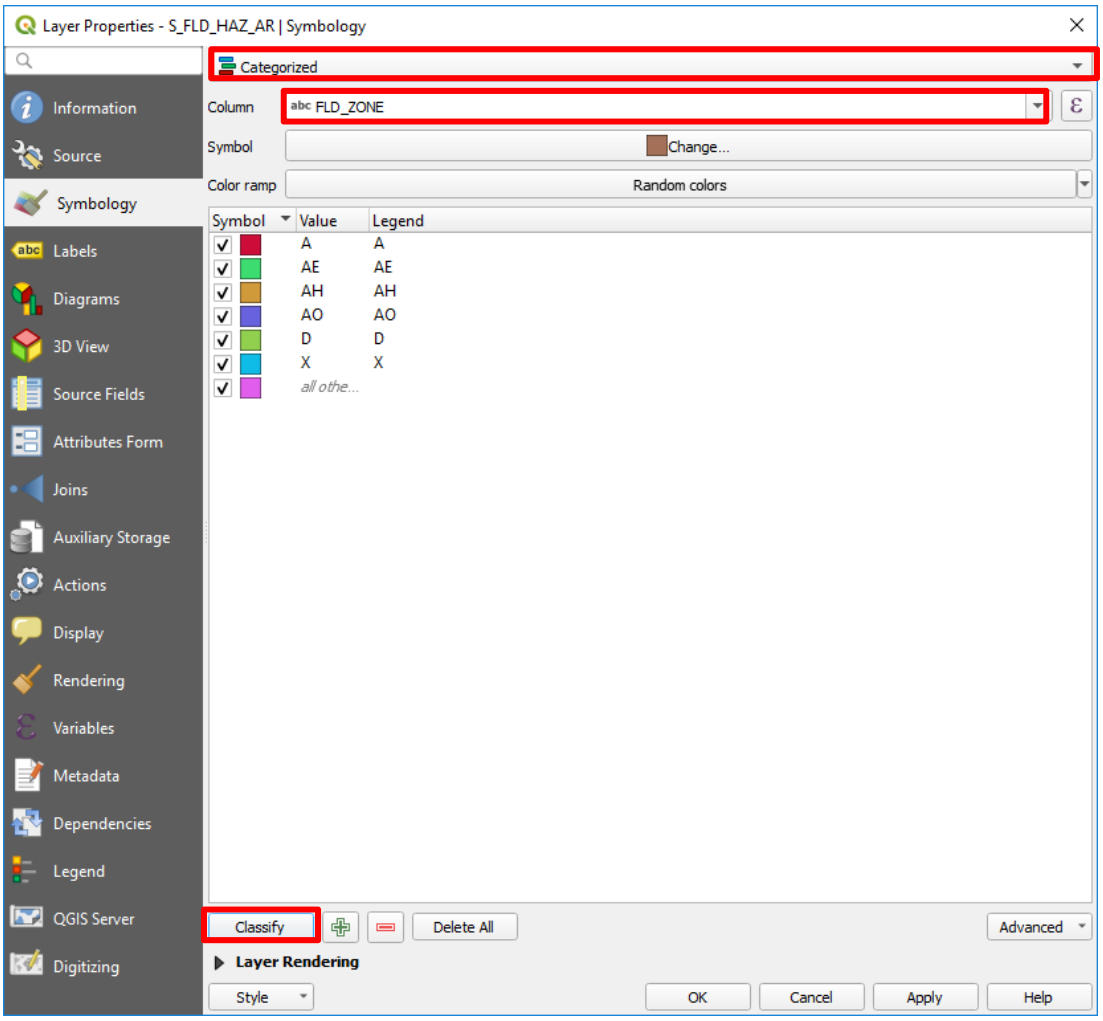
(9) Right-click on the layer again and select Symbology



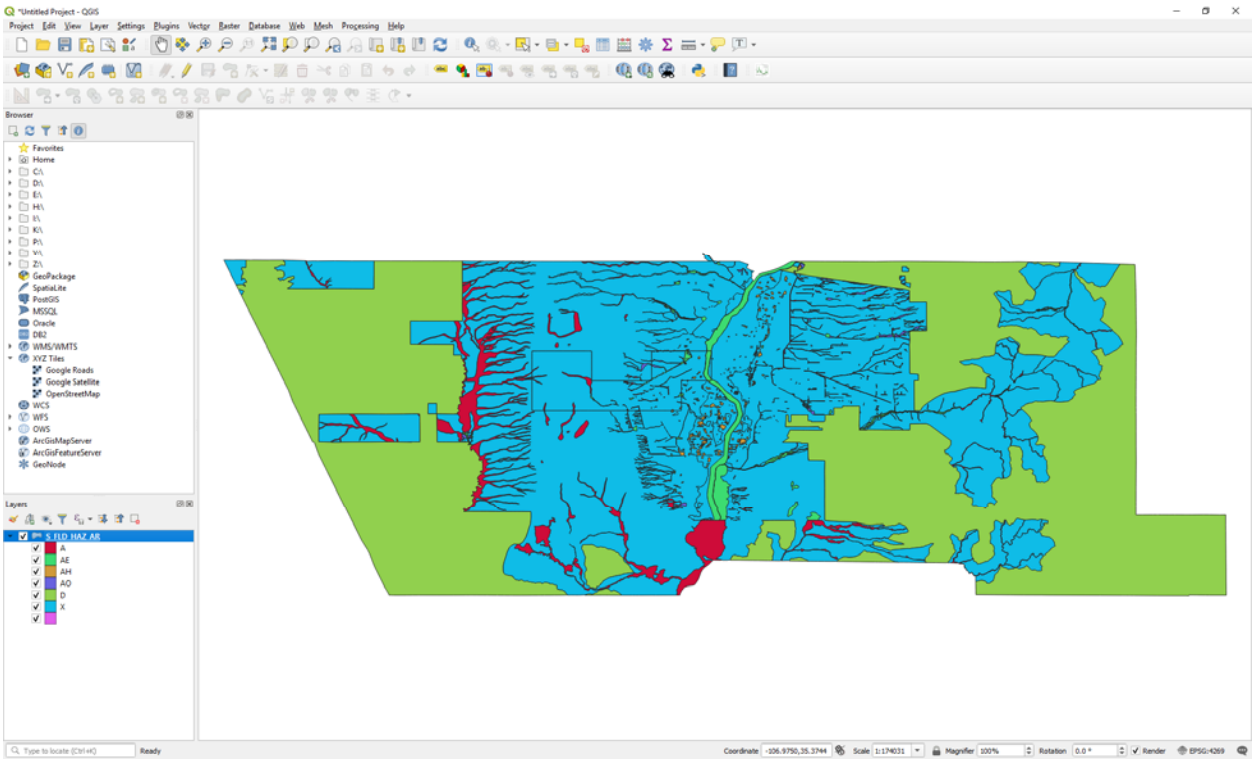
(10) Single symbol is the default display



(11) Change the type to Categorized and choose FLD_ZONE for the column and then click on Classify



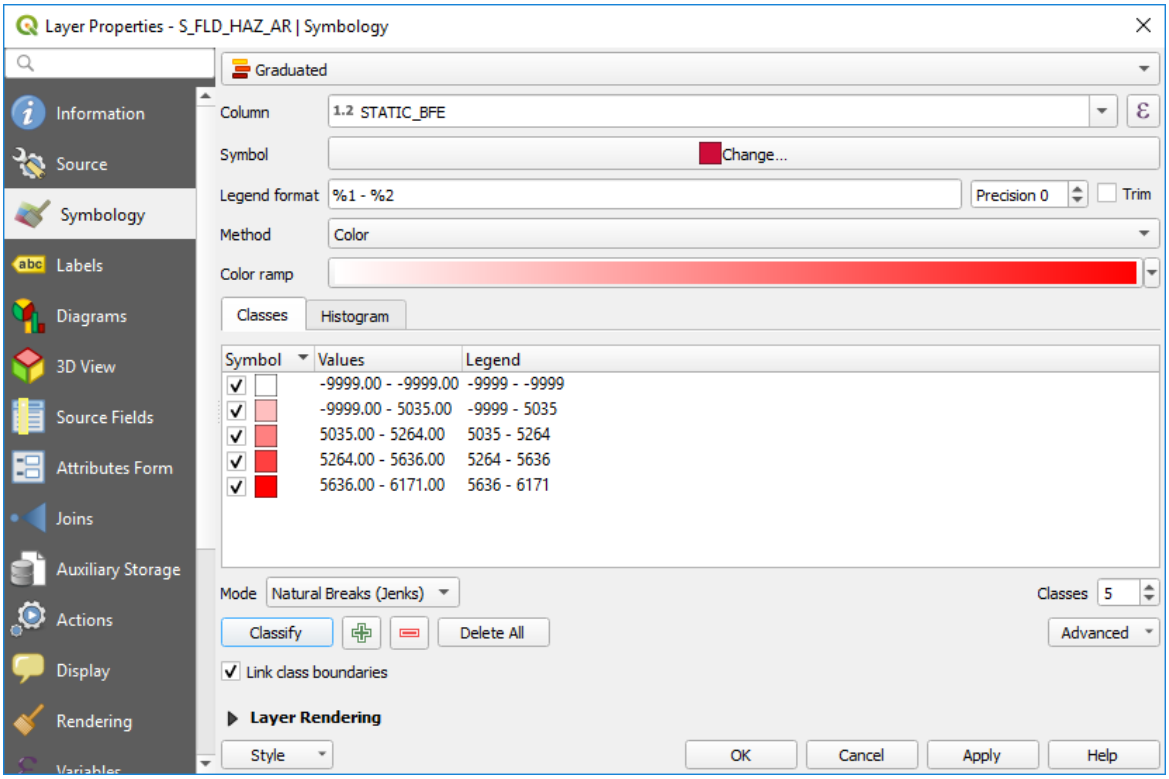
(12) Click on Apply and then Click on OK



(13) Now let us try the Graduated

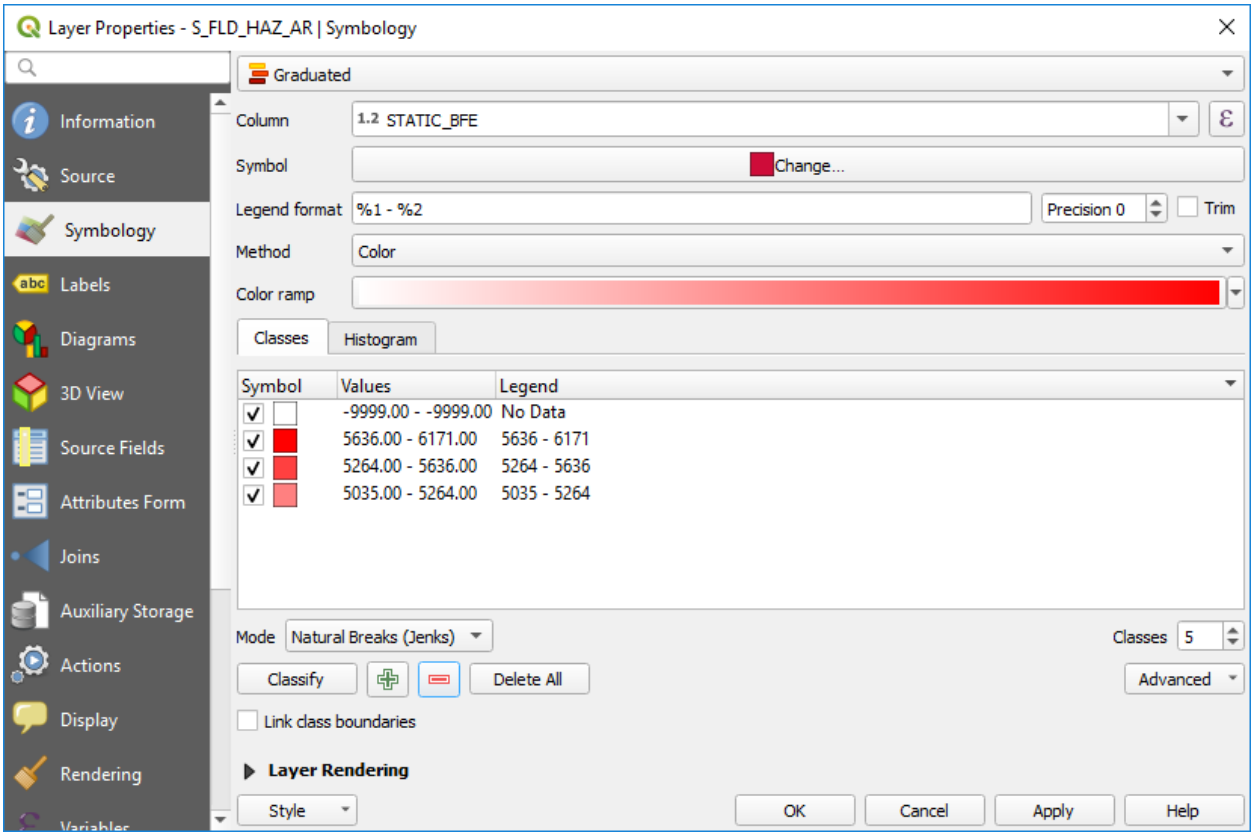
(14) Change the column to STATIC _BFE

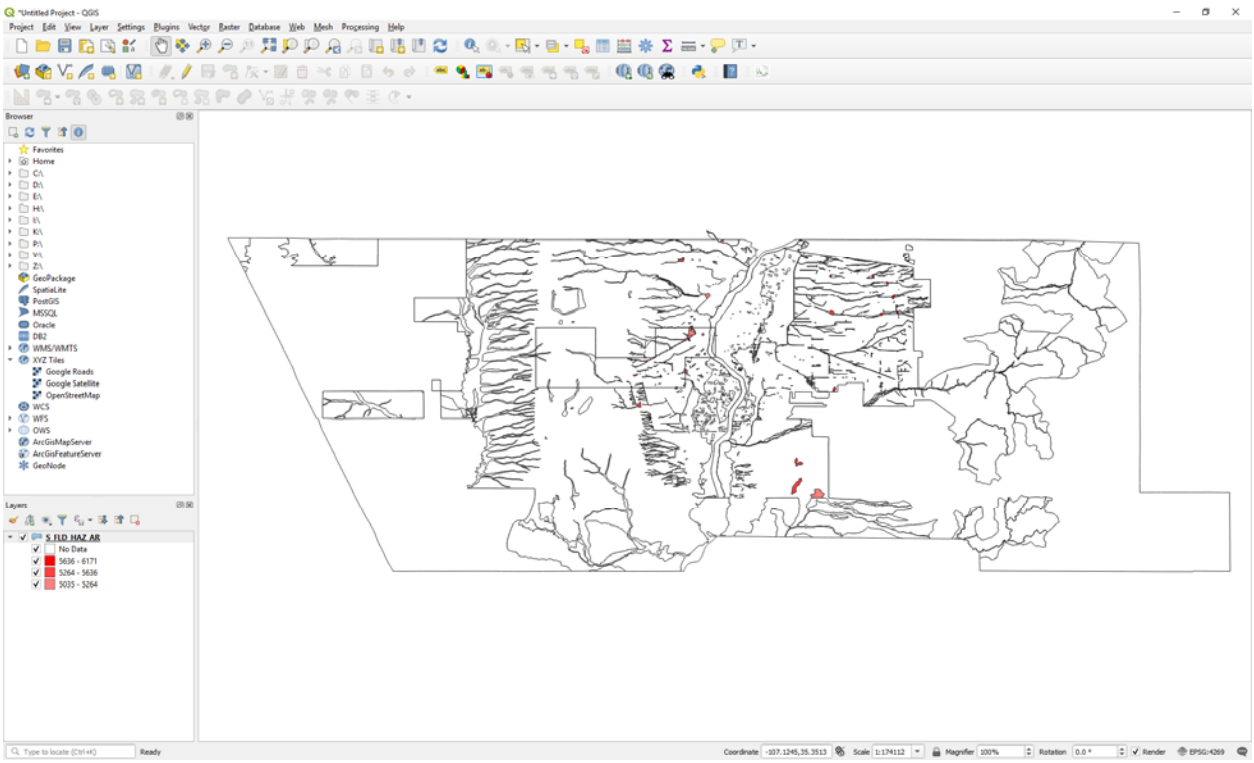
(15) Change Mode to Natural Breaks (Jenks) and then click on Classify



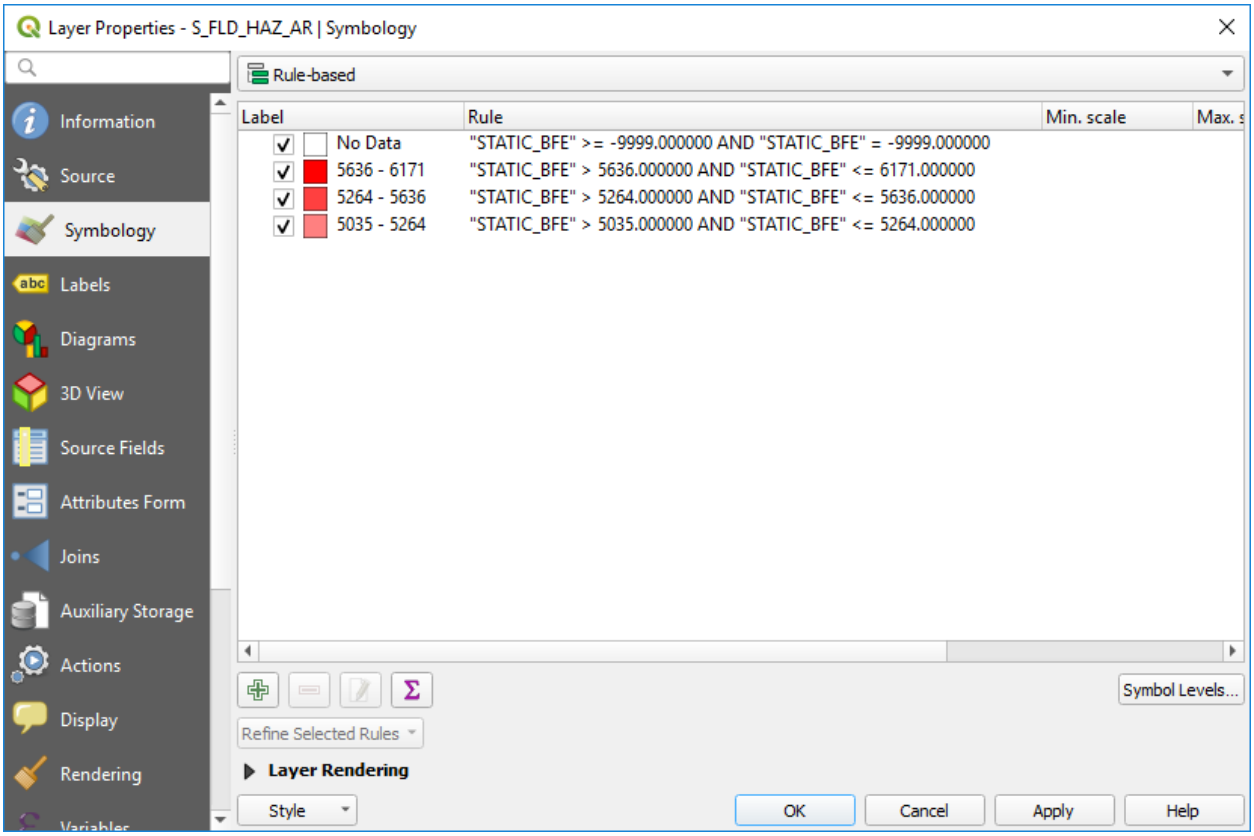
(16) Delete the -9999 – 5143 class

(17) Rename the -9999 – -9999 to No Data; click Apply and then OK

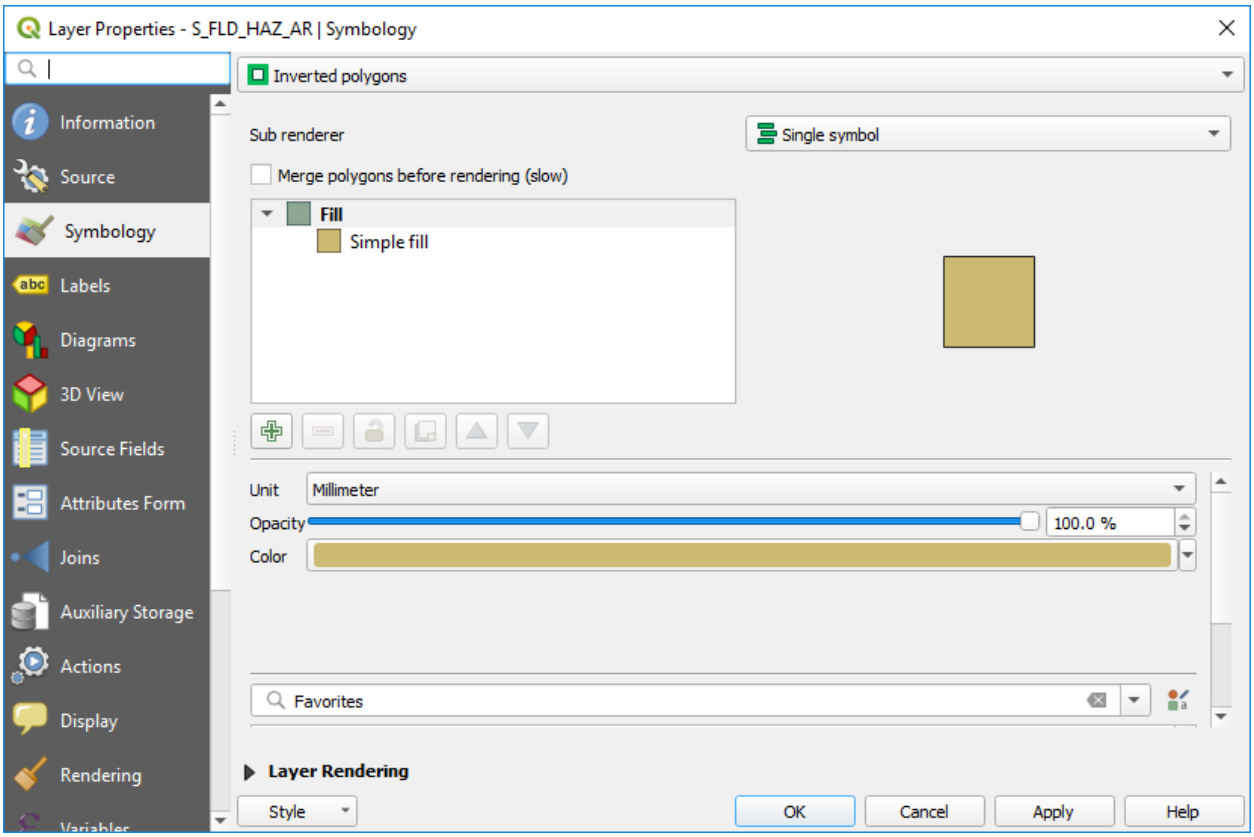




(18) Now try the Rule-based symbology



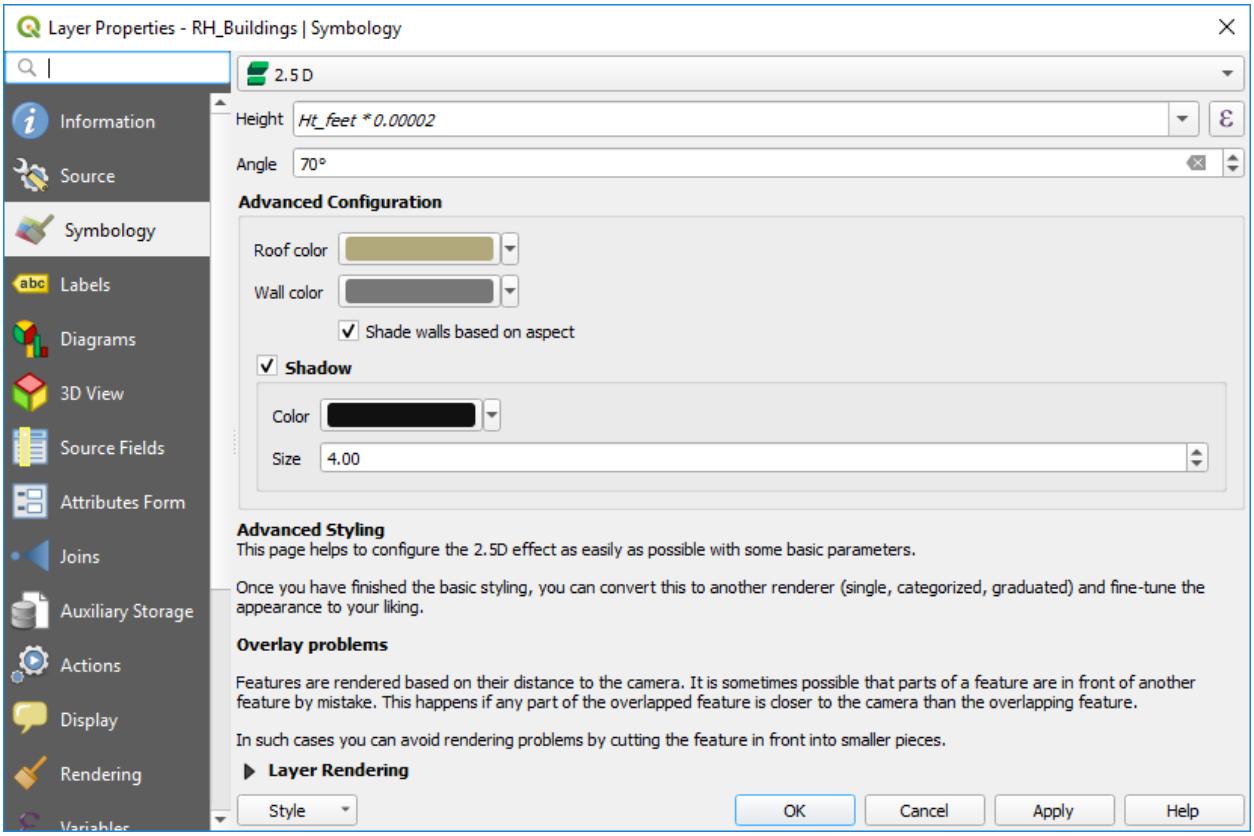
(19) Now try the Inverted polygons symbology

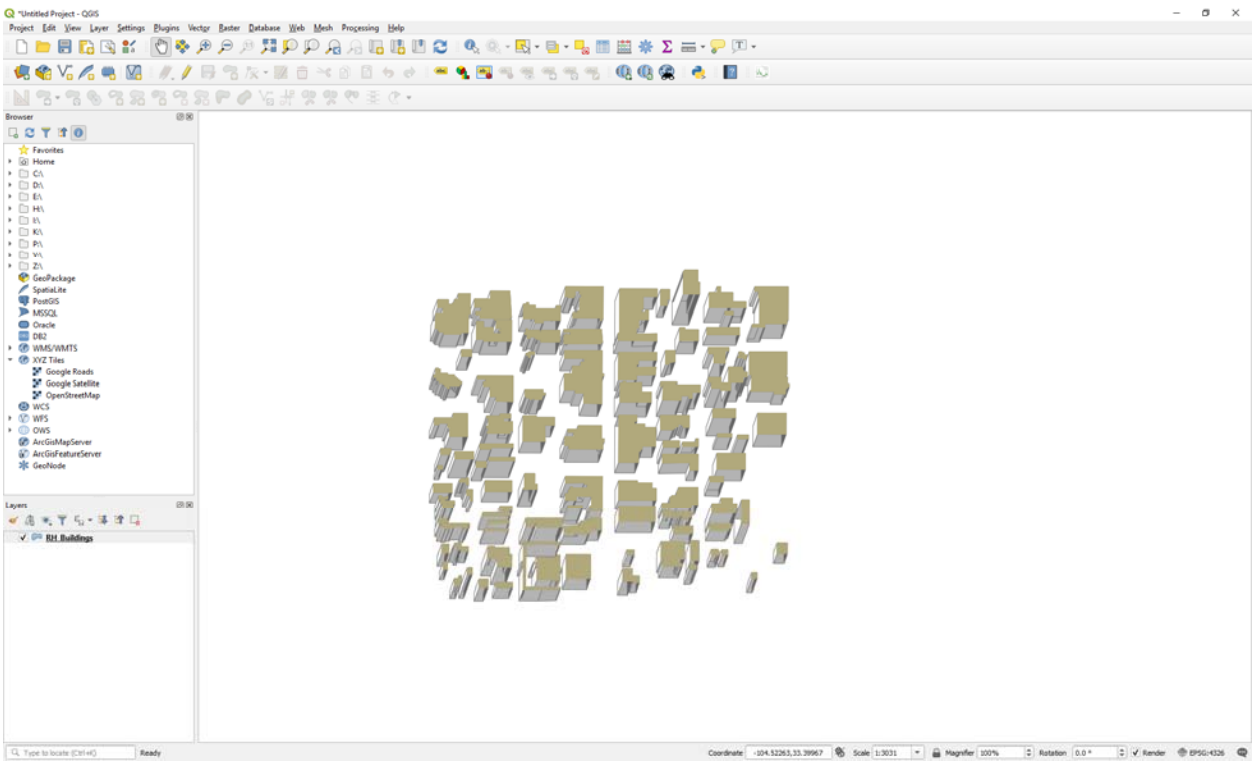


(20) Now try the 2.5 D symbology

(21) Add the RH_Buildings layer

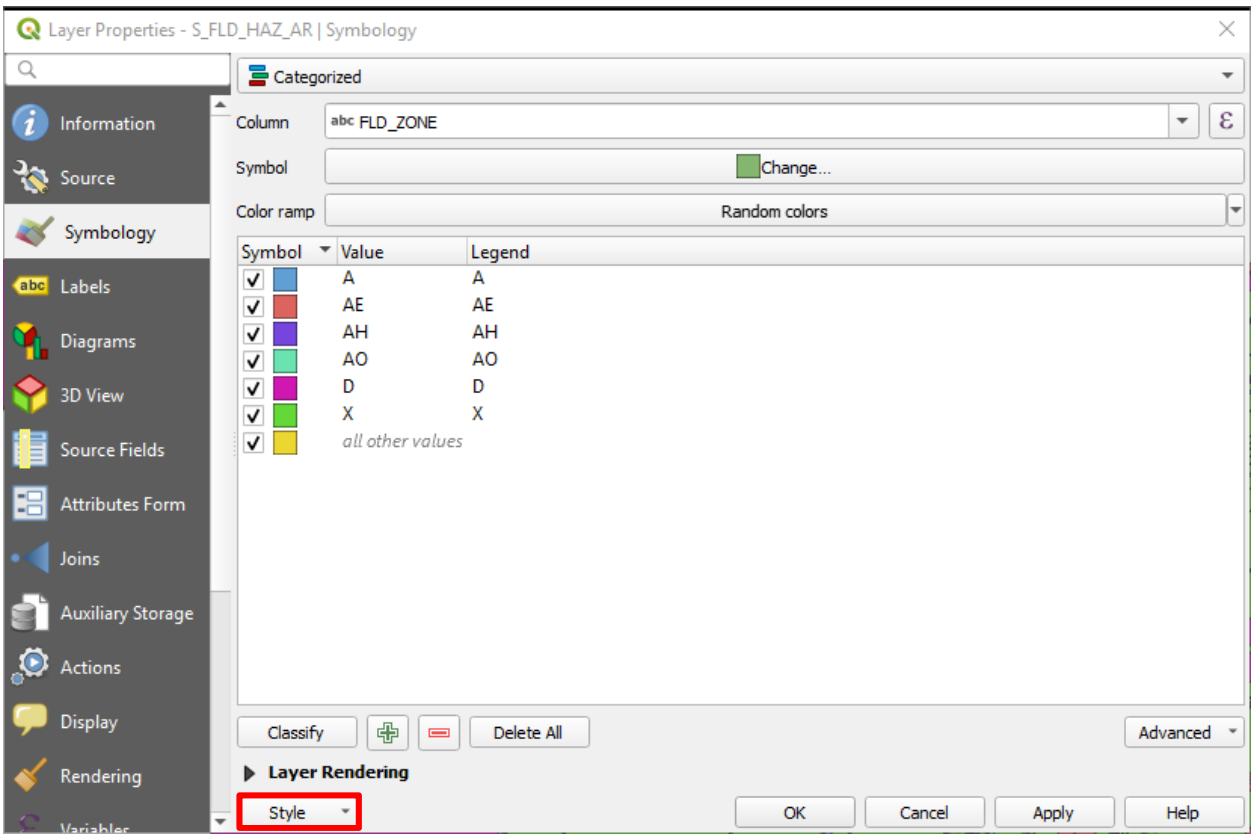
(22) Open the Properties dialog and select 2.5 D; use Ht_feet for height and times 0.00002

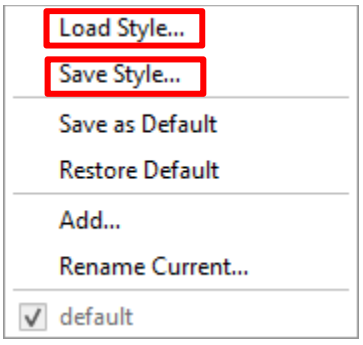




2. Save and Load Styles

QGIS can save styles in two file formats: QGIS Layer Style File (.qml) and SLD File (.sld). The .qml style file is specific to QGIS, while the .sld style file is useable by other programs to style files. In general, you should plan on saving styles using the .qml file type as it does the best job of saving your styles; however, if portability is a priority, then the .sld file is the better option. To save a style, open the Layer Properties dialog, set the style you want to save, and then to go to Style >>> Save Style, and save the style as either a .qml or a .sld file. The save style file can later be loaded and applied to other data layers.

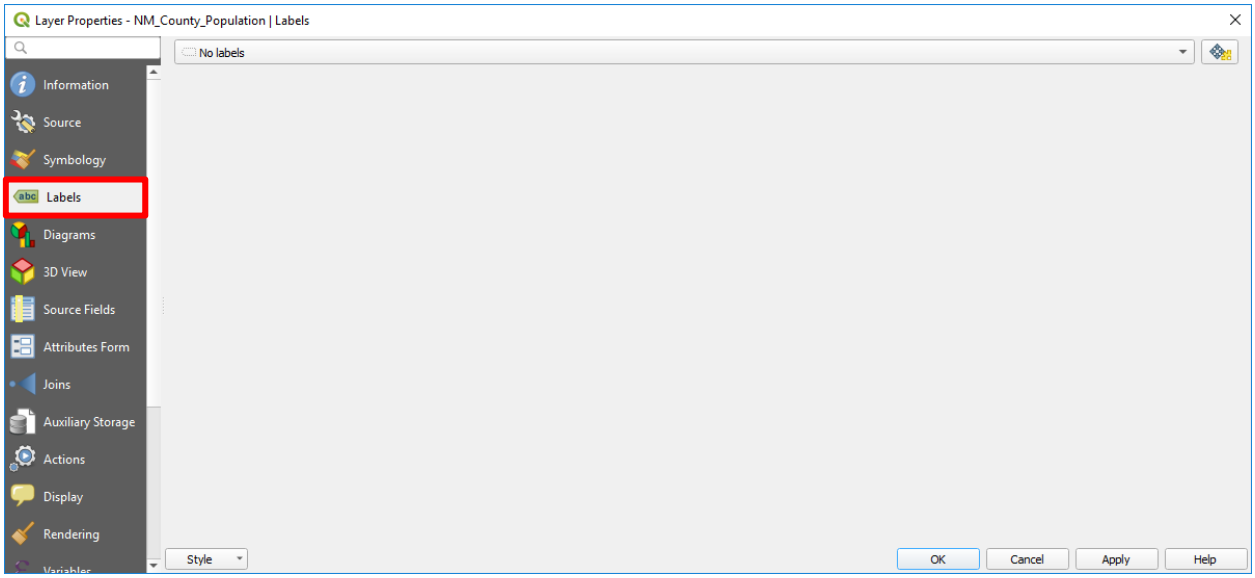




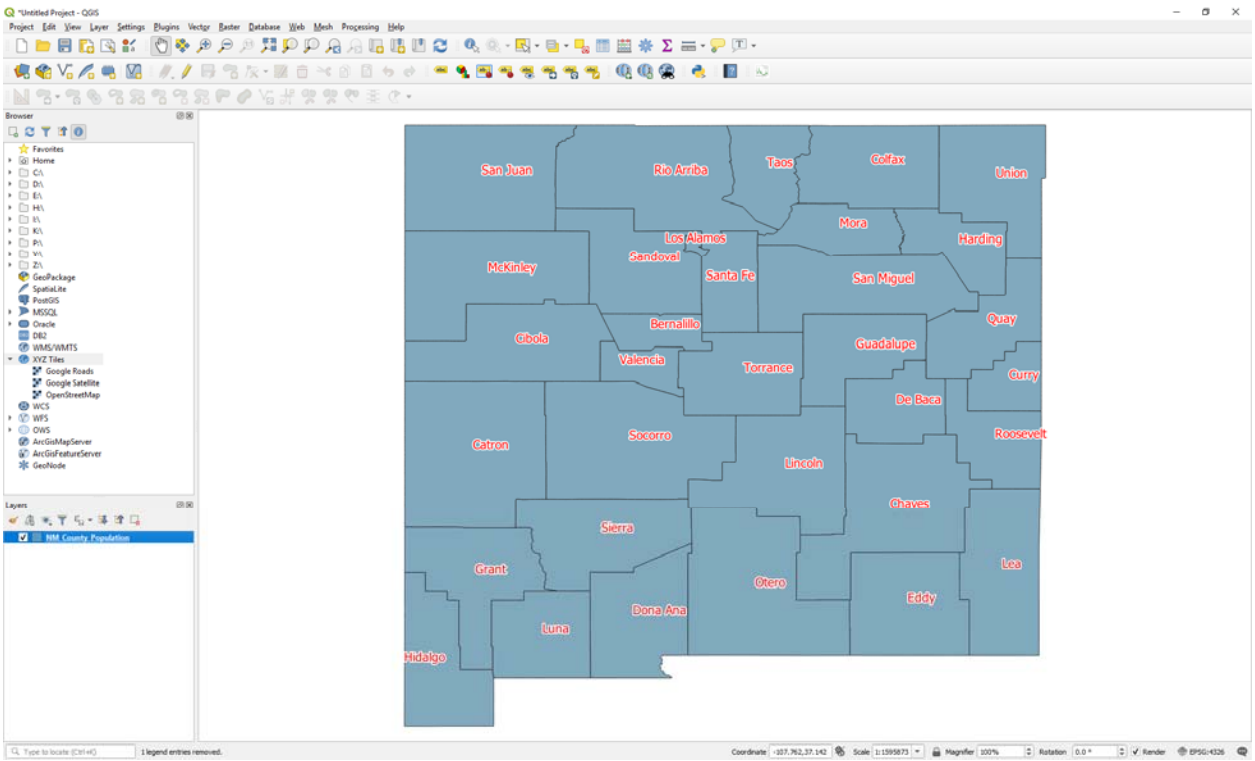
3. Labeling

(1) Start a new QGIS project, load the NM County Population layer

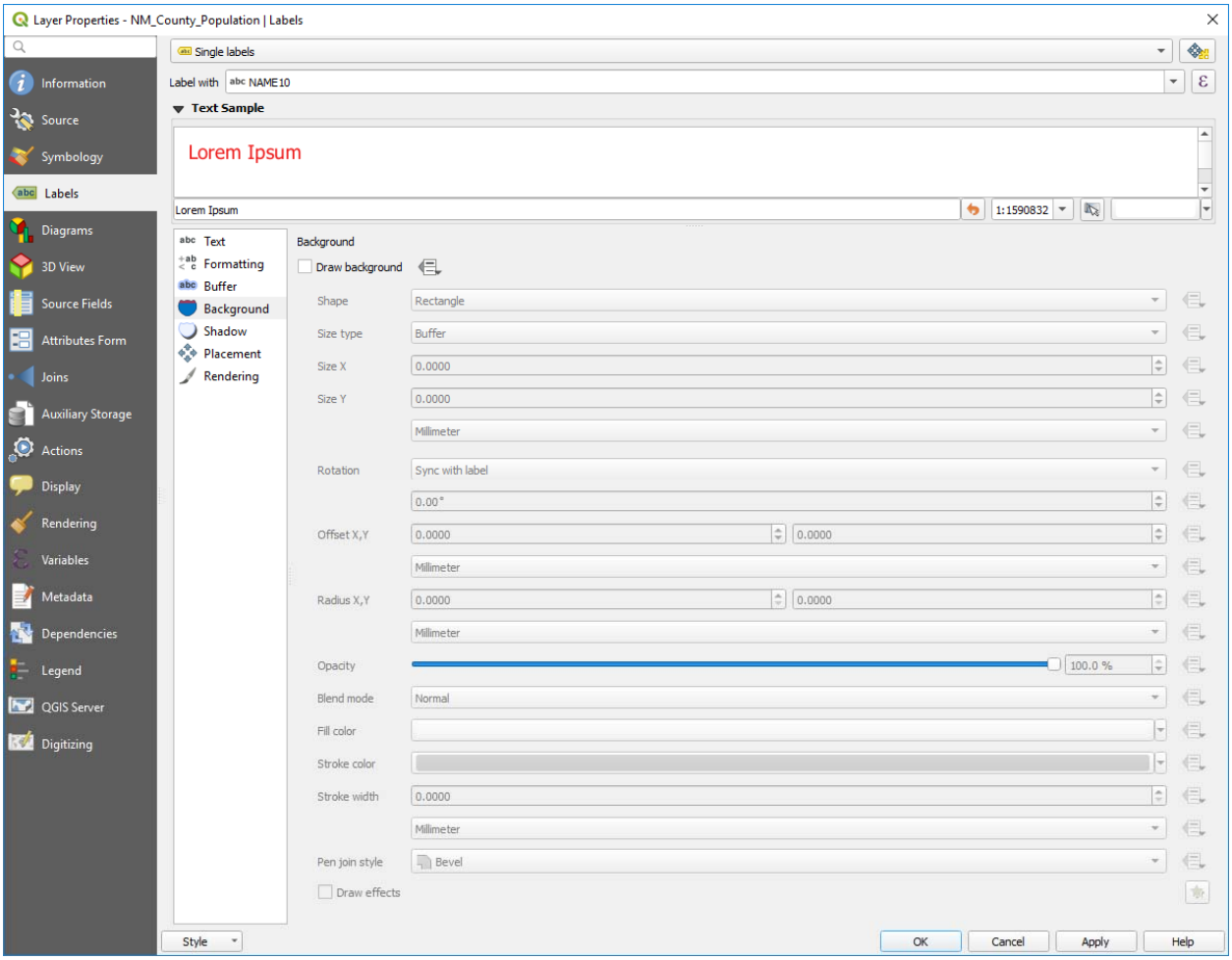
(2) Right-click on the added layer and then click on Labels



(3) Change No labels to Single labels, and then select Label with NAME10, Color Red, Size 14, Draw text buffer checked on



(4) Explore the Background, Shadow, and Placement Options

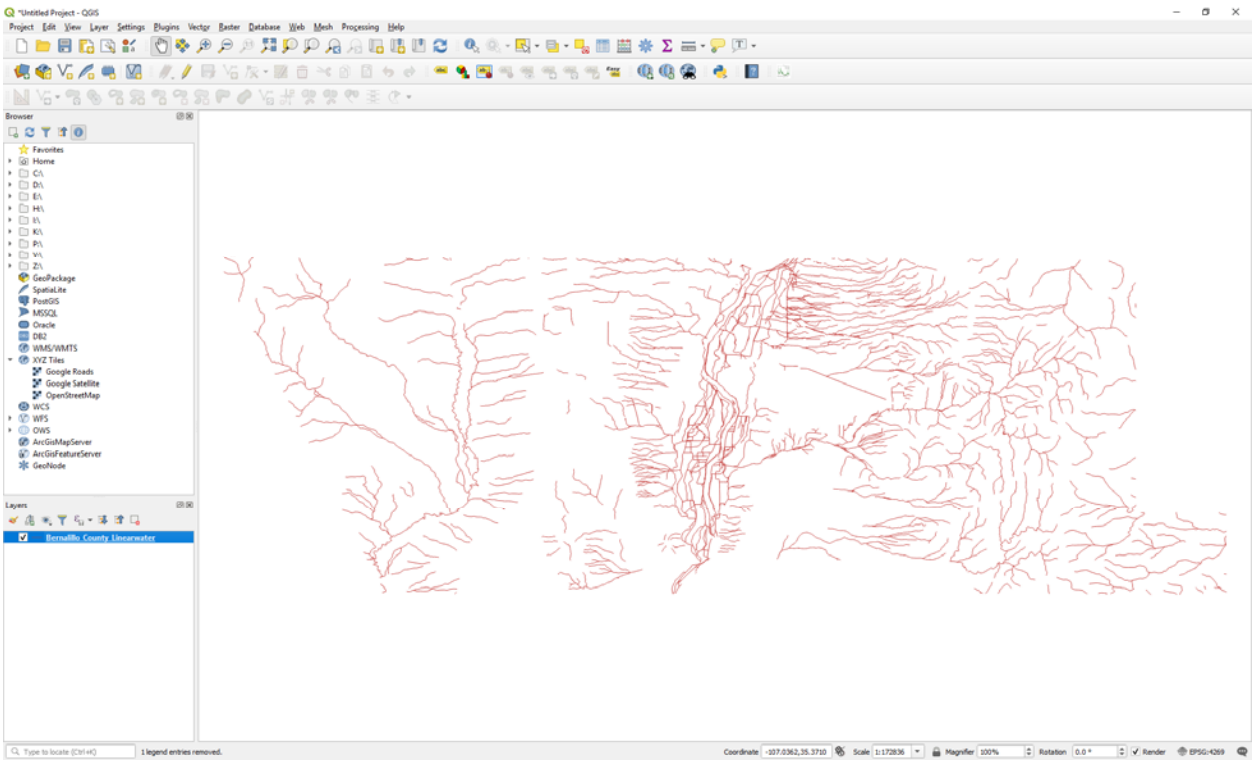


Part D. Processing Vector Data

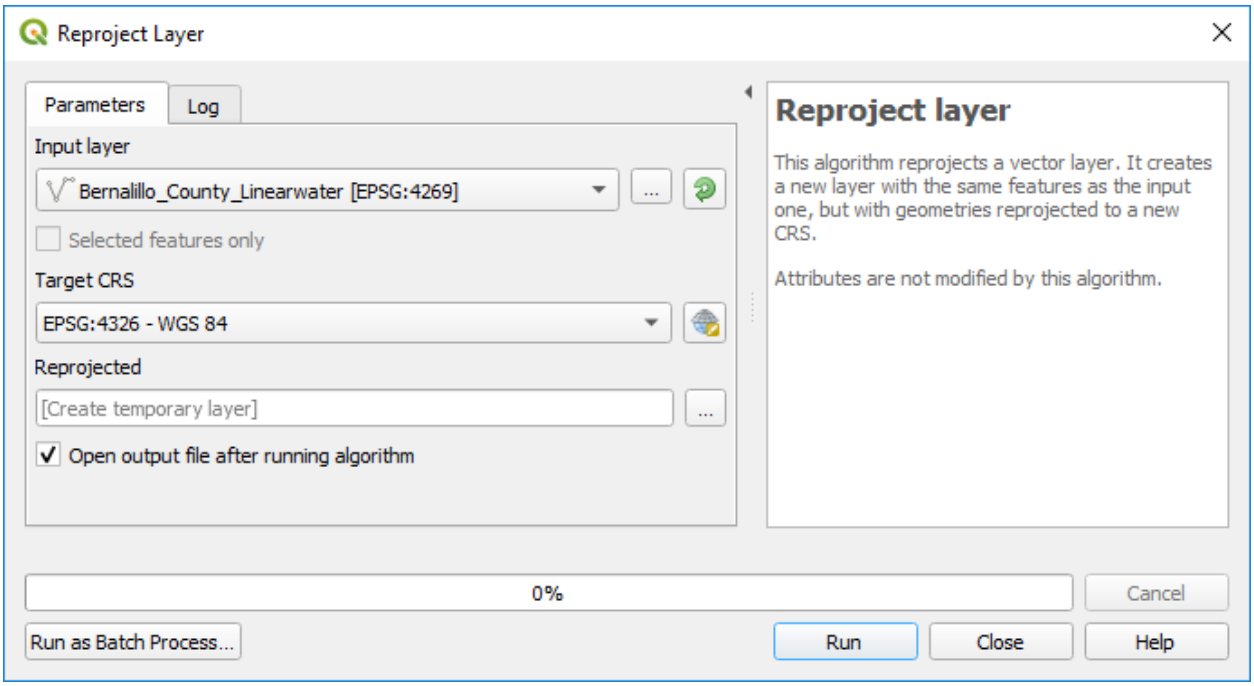
1. Re-project Layers

(1) Start a new QGIS project

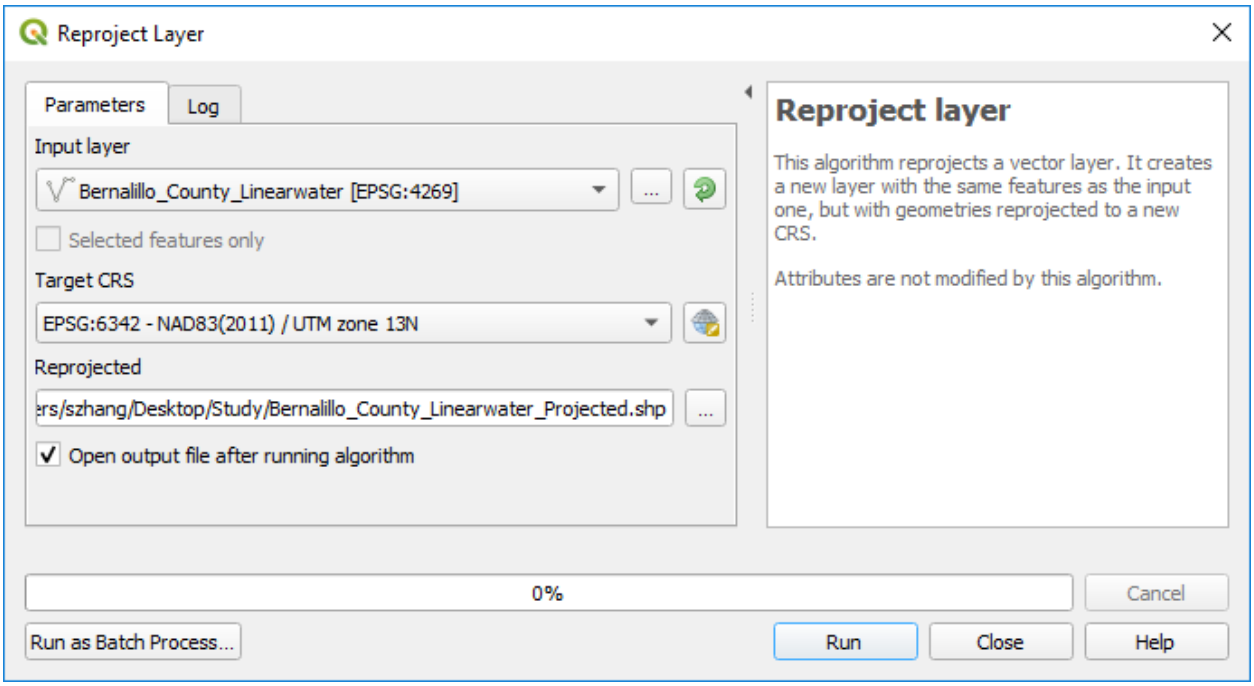
(2) Insert the Bernalillo County Linearwater layer



(3) Go to Vector >>> Data Management Tools >>> Reproject Layer



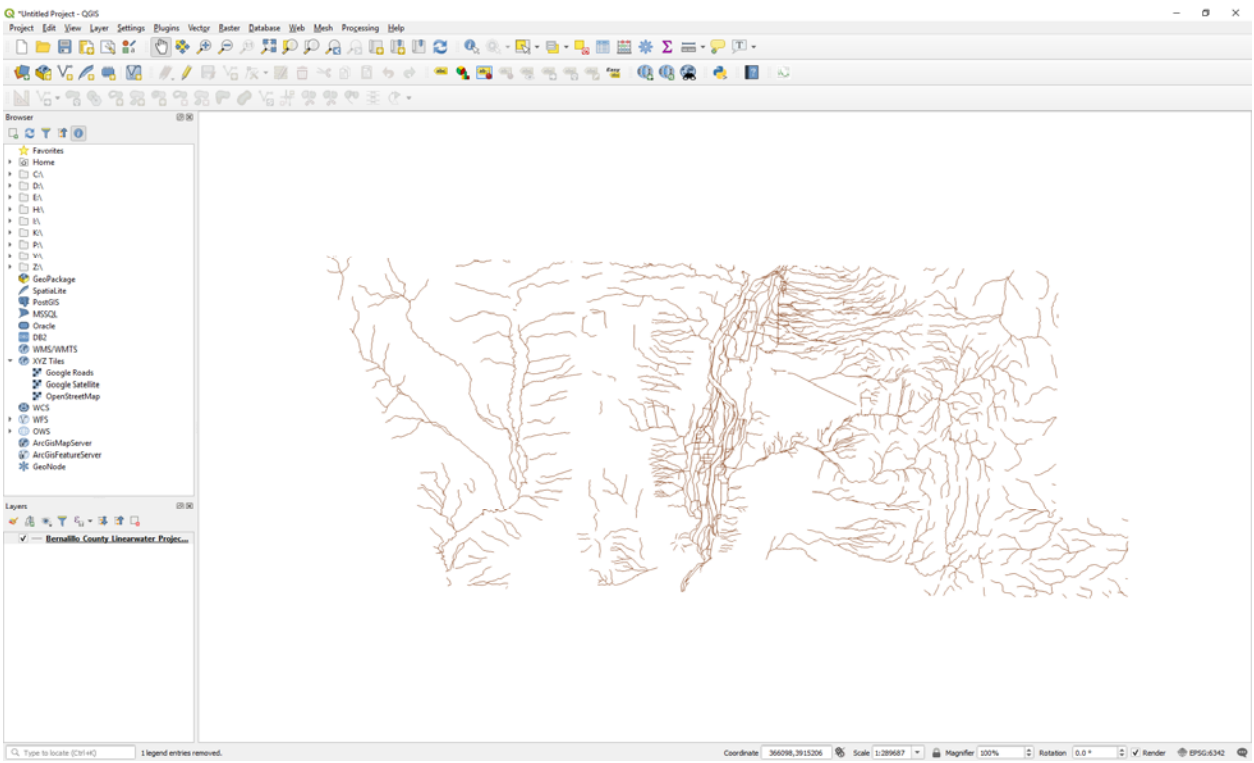
(4) Select NAD83 (2011) UTM Zone 13N as the Target CRS



(5) Click Run

(6) Start a new QGIS project

(7) Add the newly created re-projected layer



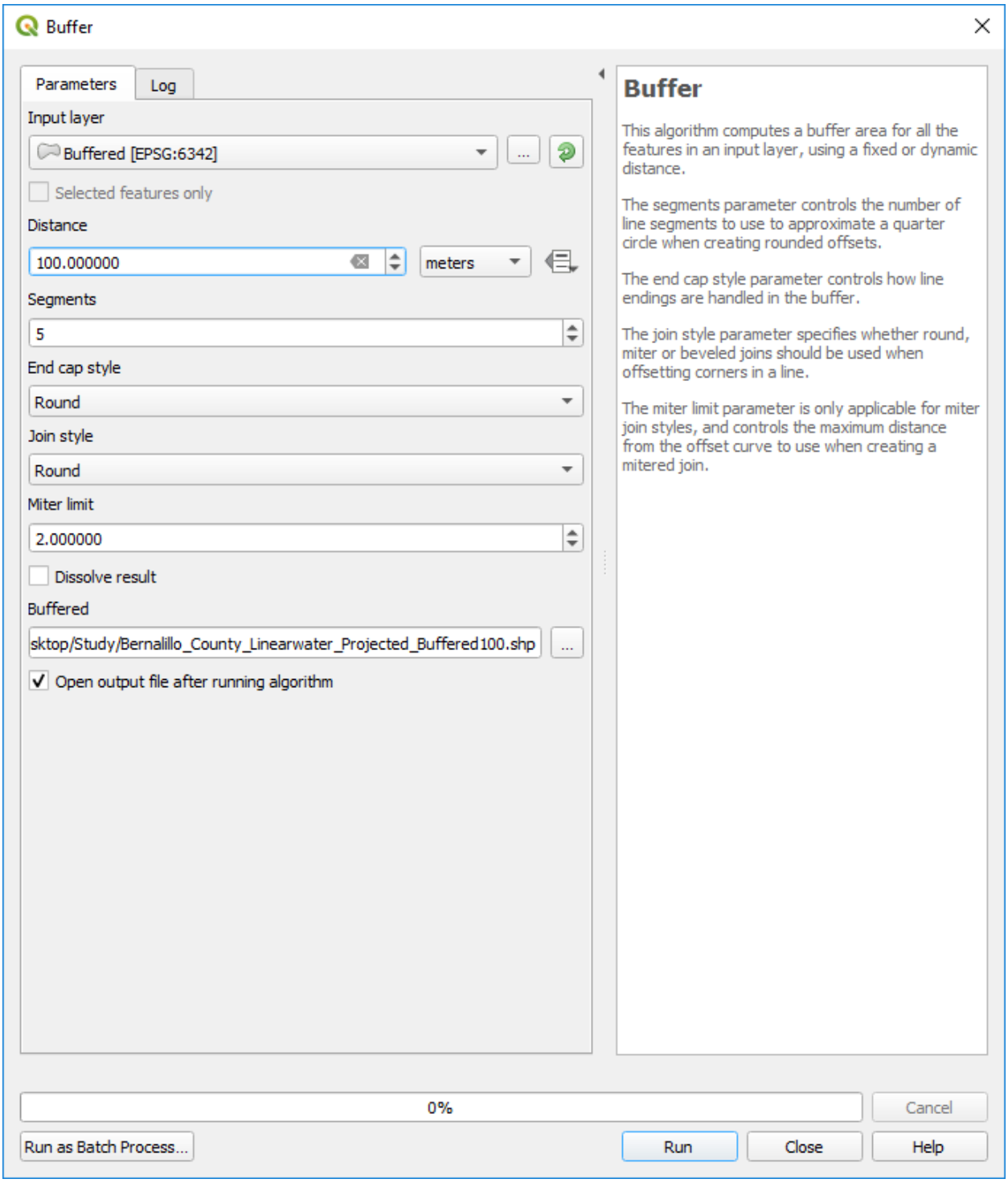
2. Buffer

(1) Start a new QGIS project

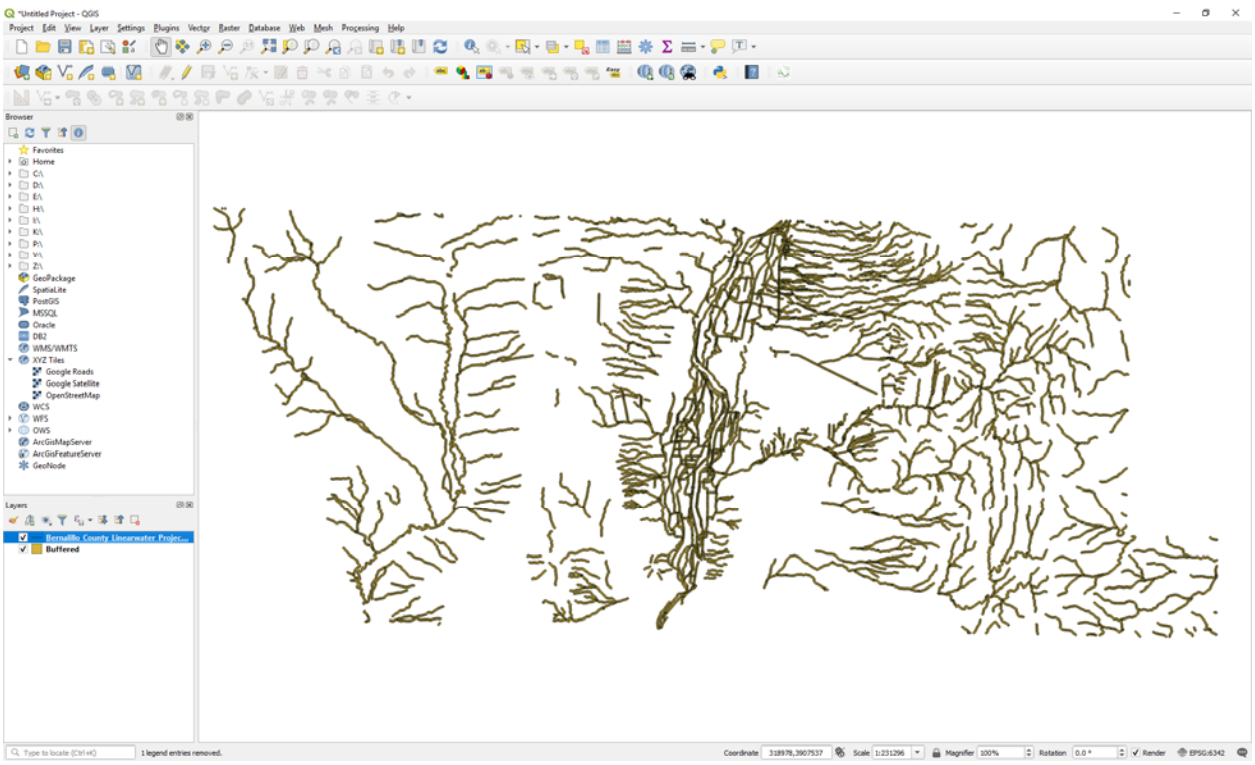
(2) Insert the Bernalillo County Linearwater Projected layer

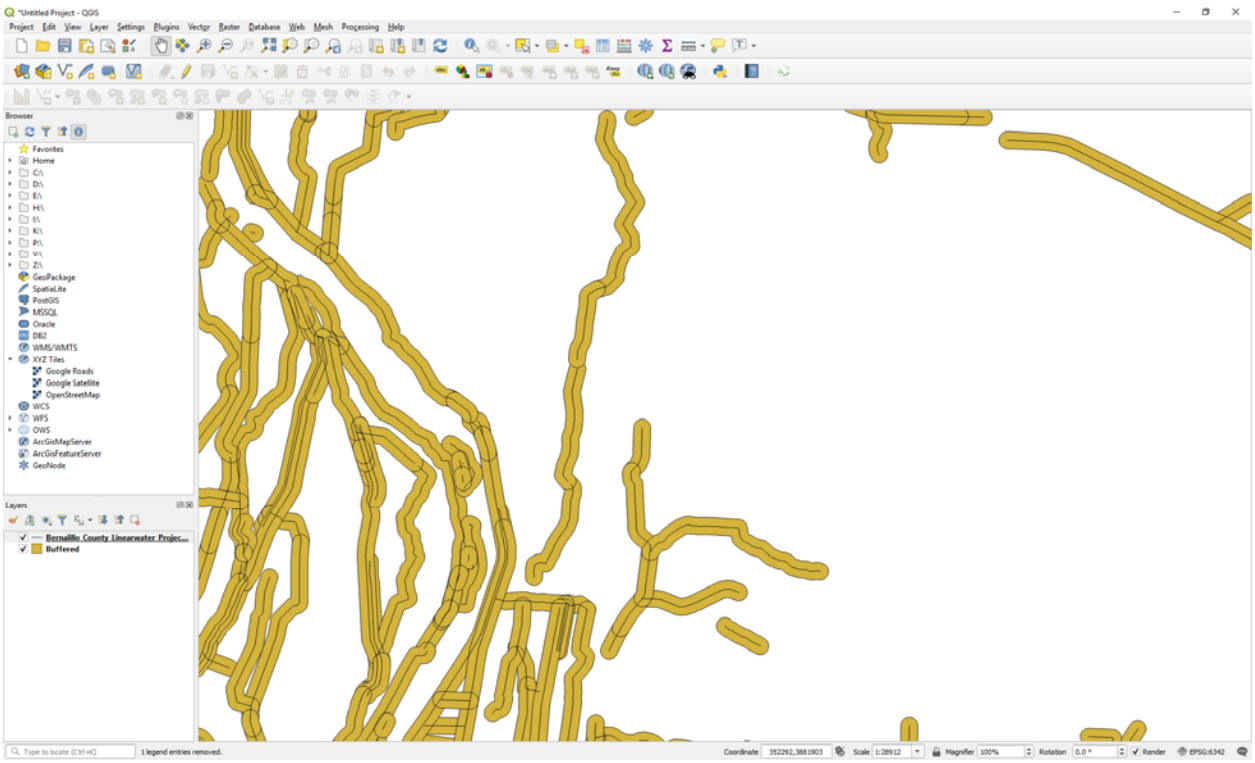
(3) Go to Vector >>> Geoprocessing Tools >>> Buffer

(4) Input the parameters as below

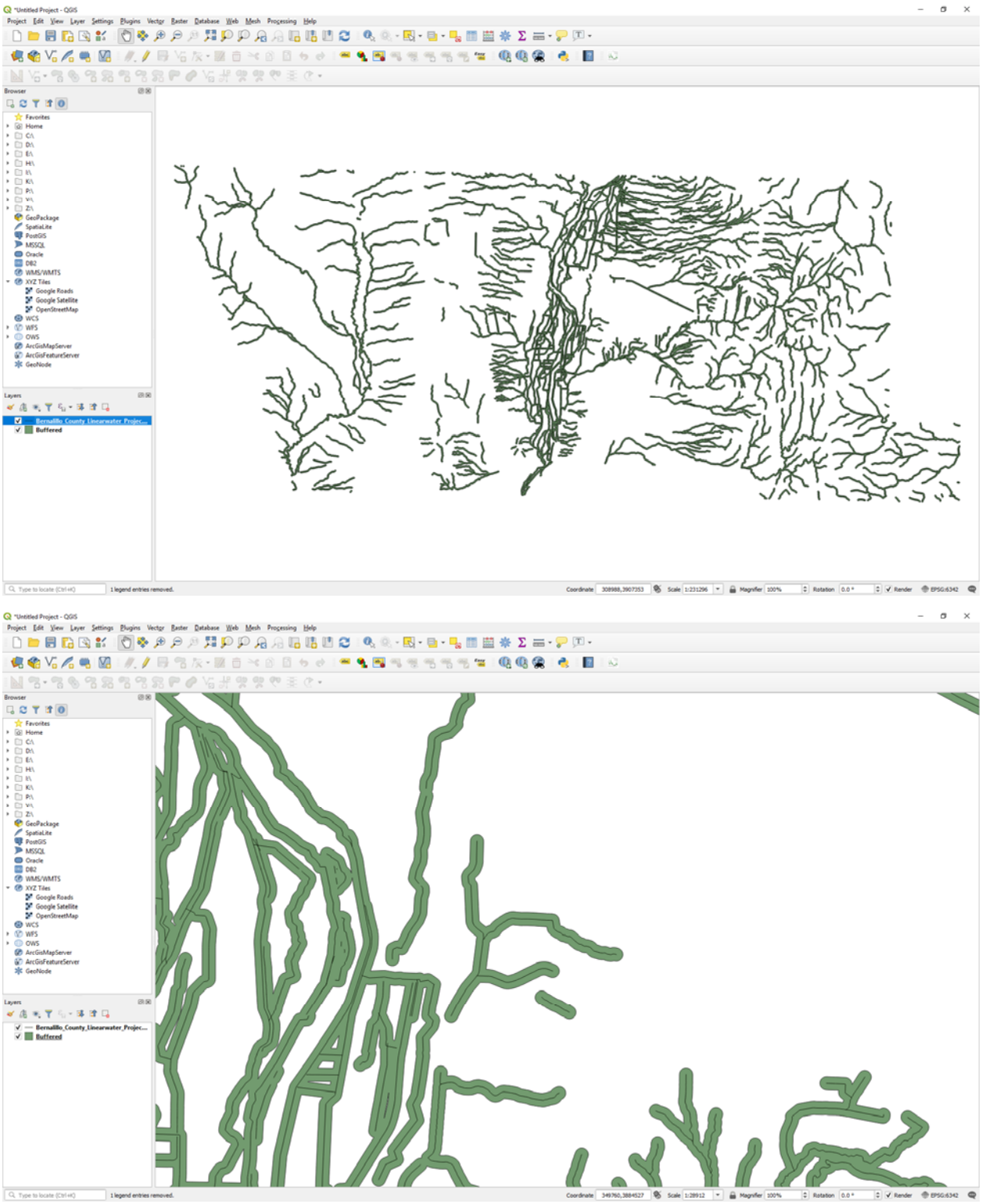


(5) Click on Run





(7) Try Dissolve result option



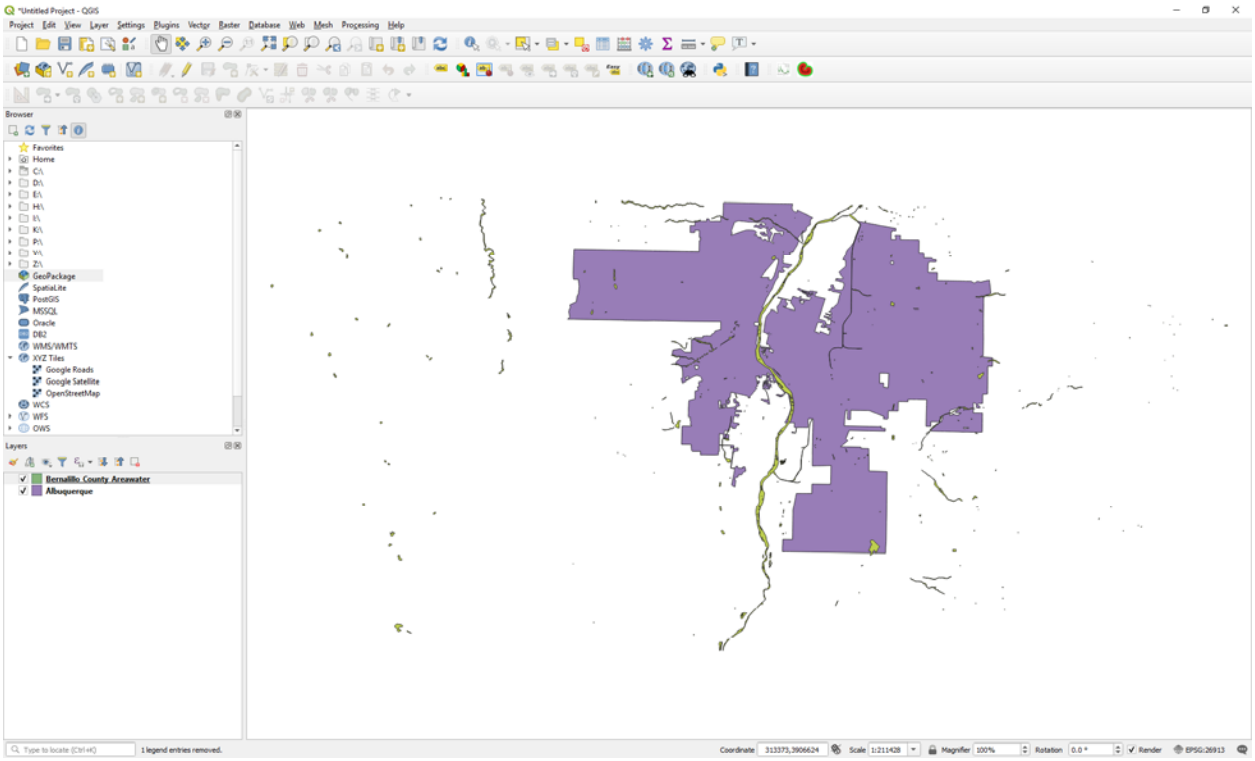
Exercise: In Plugins, find the Multi-distance buffer plugin and install it. Explore the tool.

3. Clip

(1) Start a new QGIS project

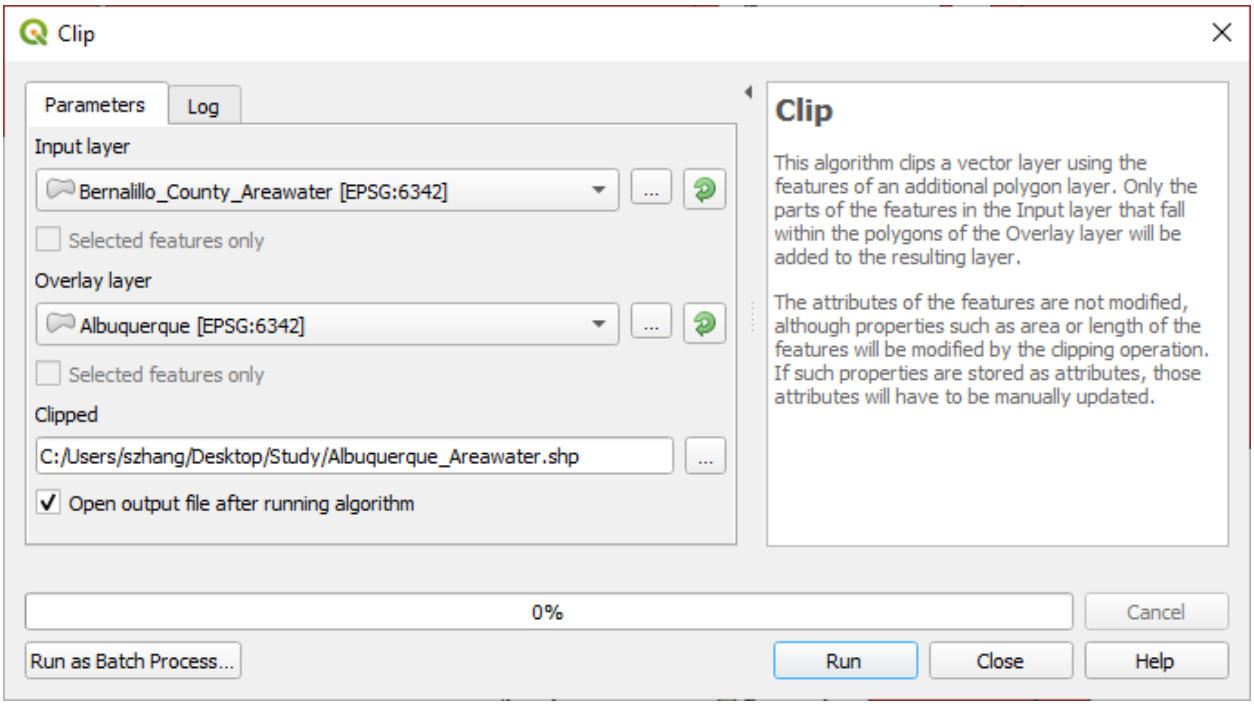
(2) Insert the Bernalillo County Areawater layer

(3) Insert the Albuquerque city boundary layer



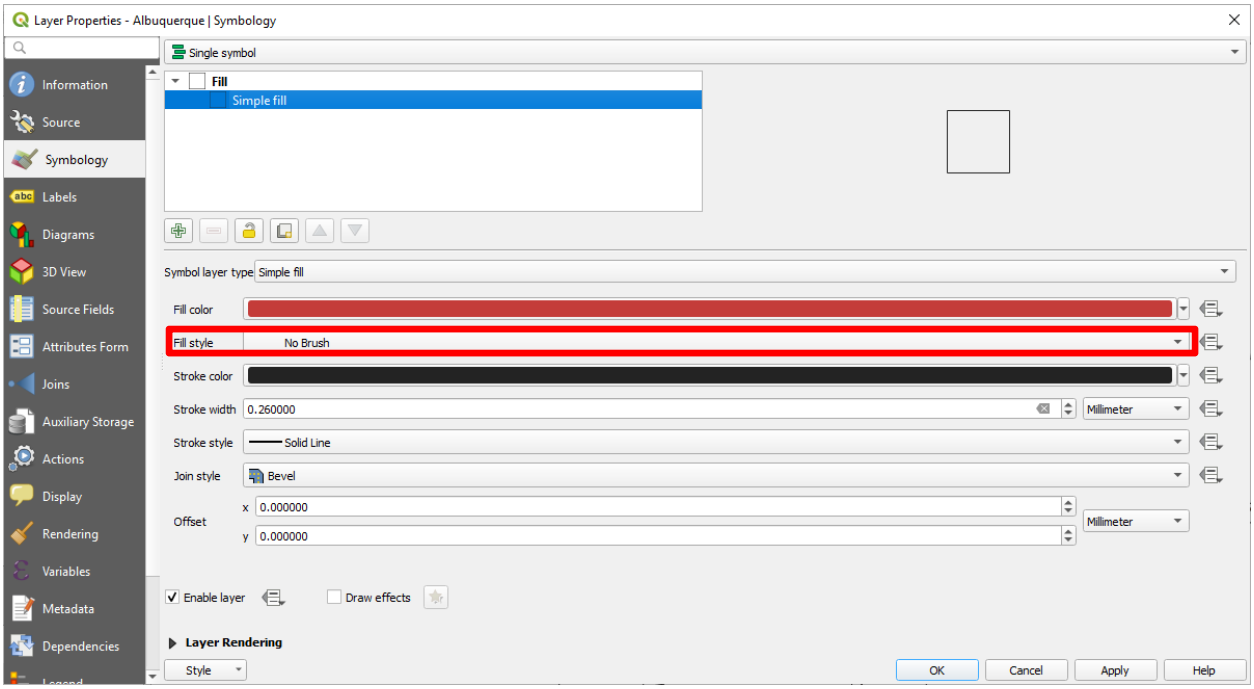
(4) Go to Vector >>> Geoprocessing Tools >>> Clip

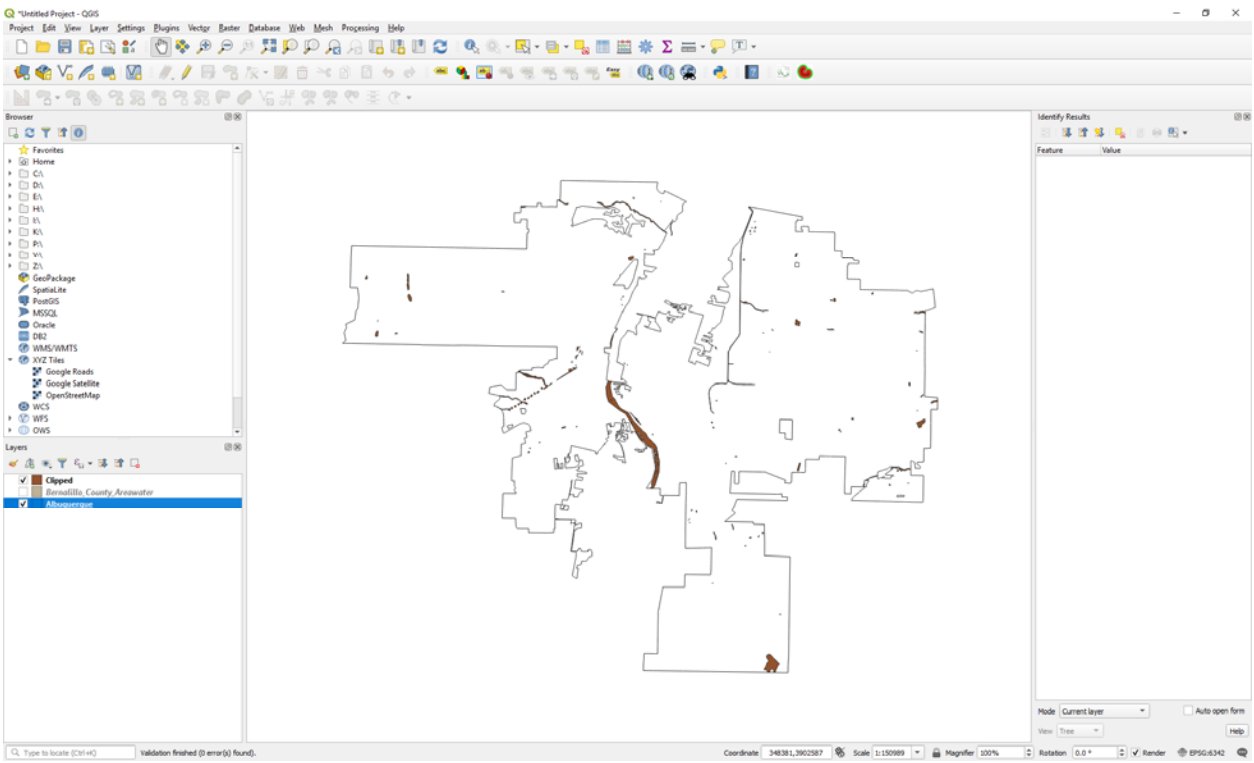
(5) Input the parameters as below



(6) Click Run

(7) Right-click on the Albuquerque boundary layer, and then select Symbology, change the Fill style to No Brush, and then click OK

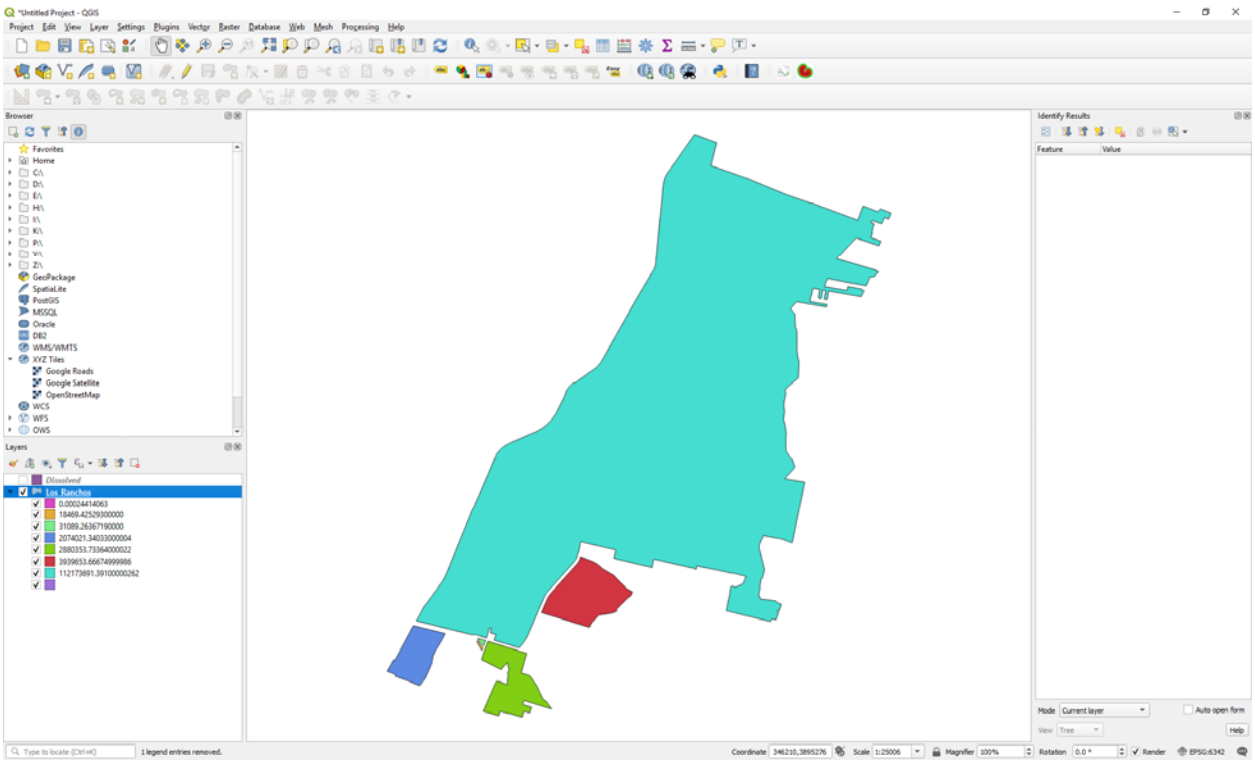




4. Dissolve

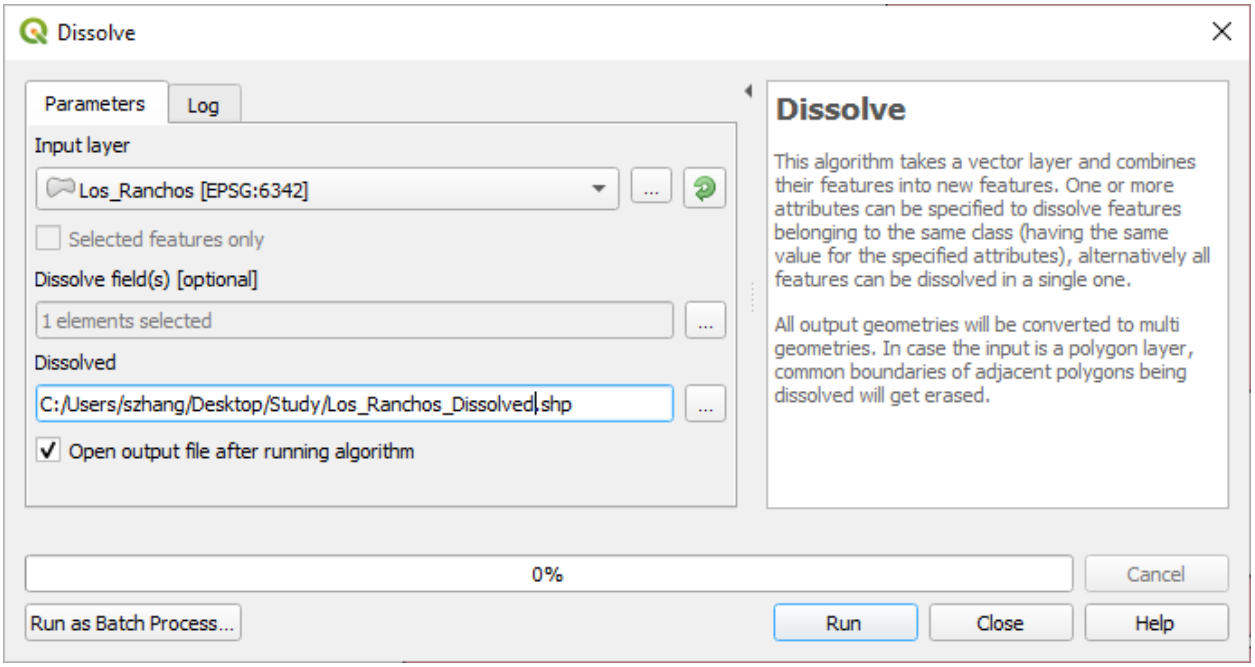
(1) Start a new QGIS project

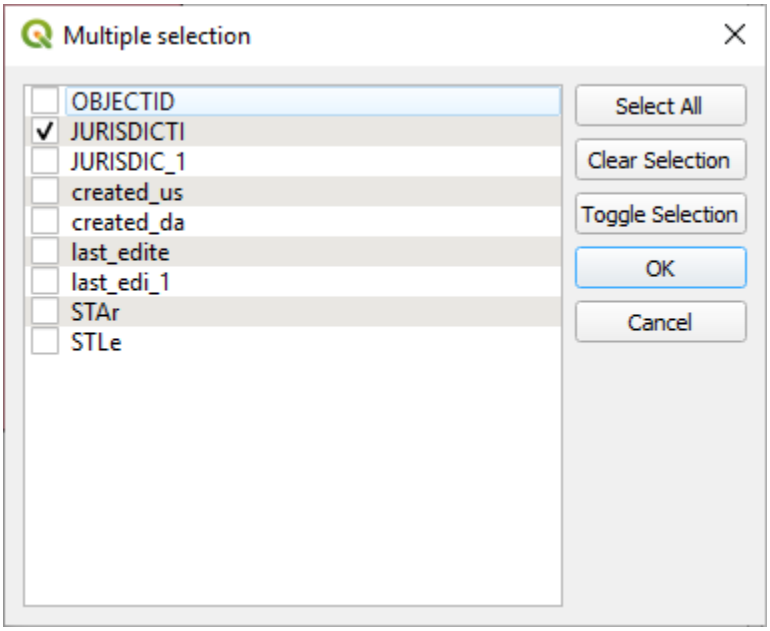
(2) Insert the Los Ranchos layer



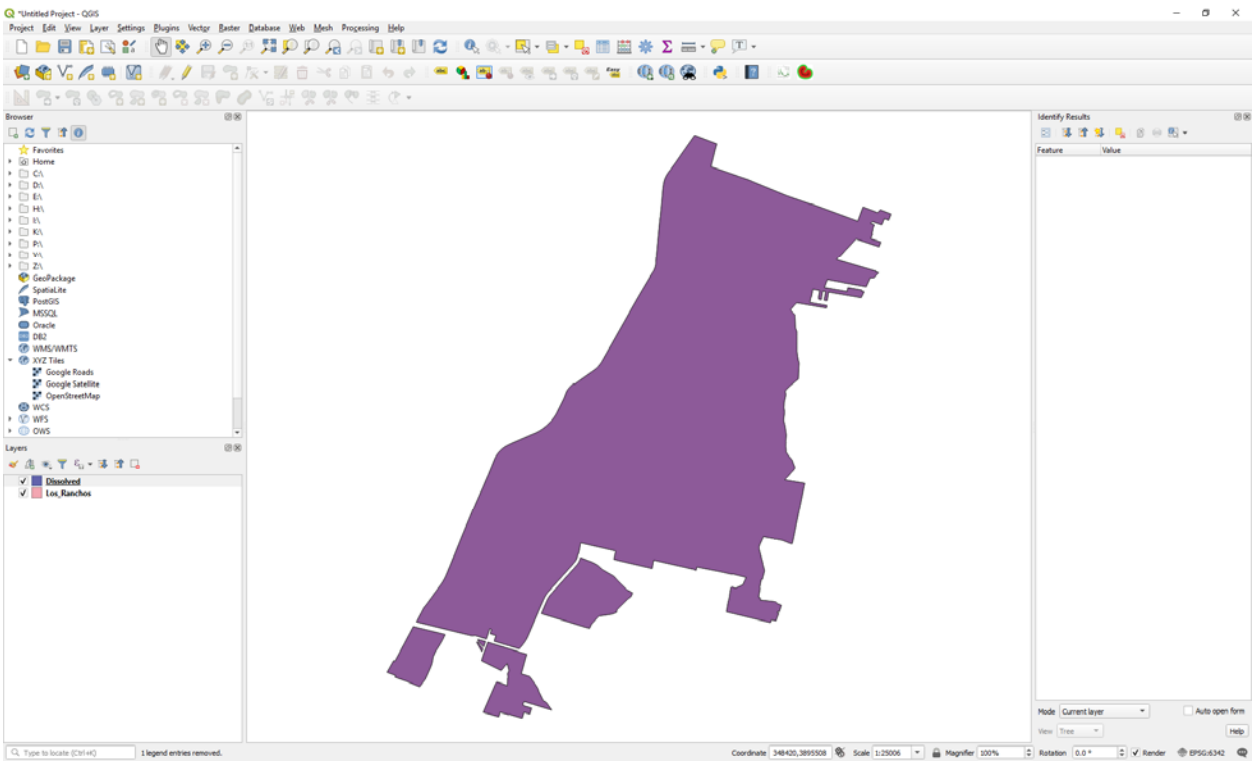
(3) Go to Vector >>> Geoprocessing Tools >>> Dissolve

(4) Input the parameters as below




Multiple selection
OBJECTID
JURISDICTI
JURISDIC_1
created_us
created_da
last_edite
last_edi_1
STAr
STLe
Select All
Clear Selection
Toggle Selection
OK
Cancel

(5) Click Run

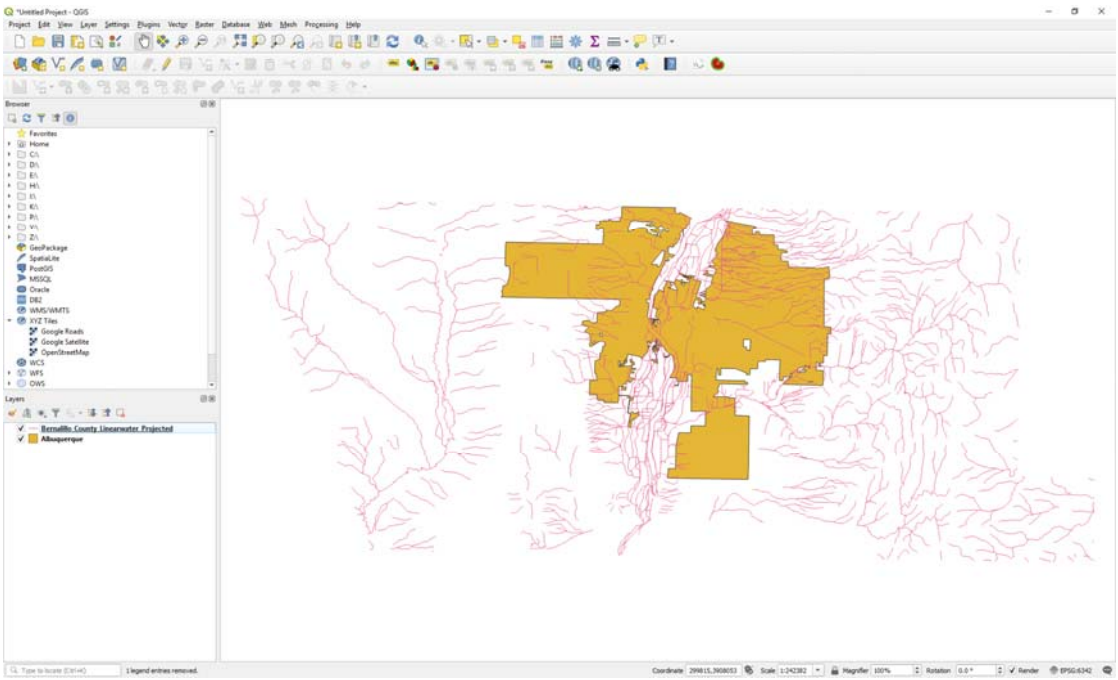


5. Intersection

(1) Start a new QGIS project

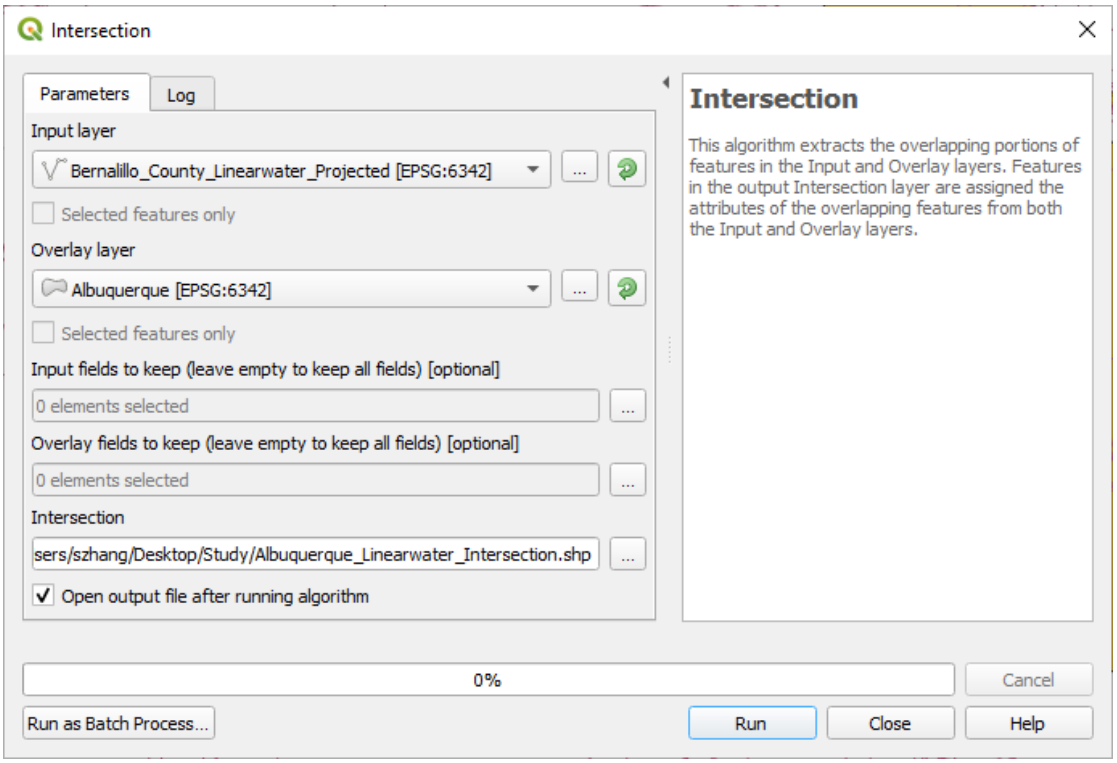
(2) Insert the Bernalillo County Linearwater Projected layer

(3) Insert the Albuquerque city boundary layer



(4) Go to Vector >>> Geoprocessing Tools >>> Intersection

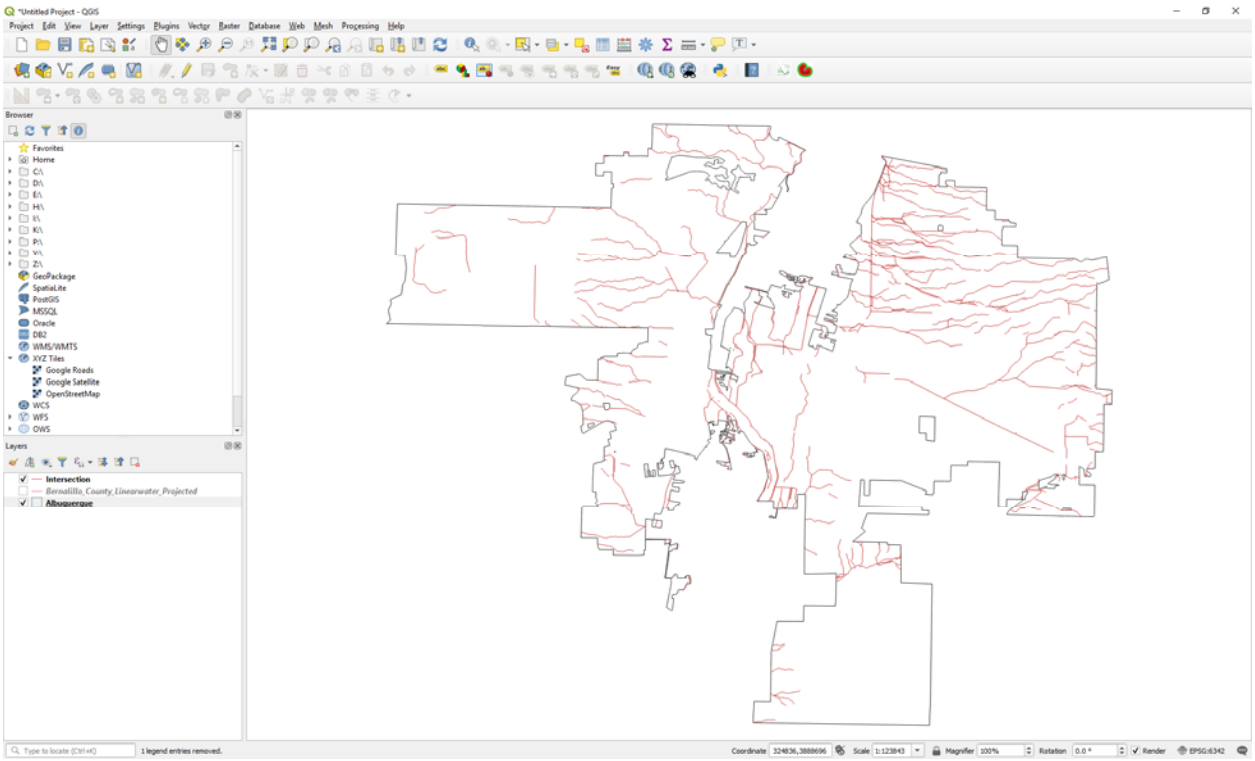
(5) Input the parameters as below

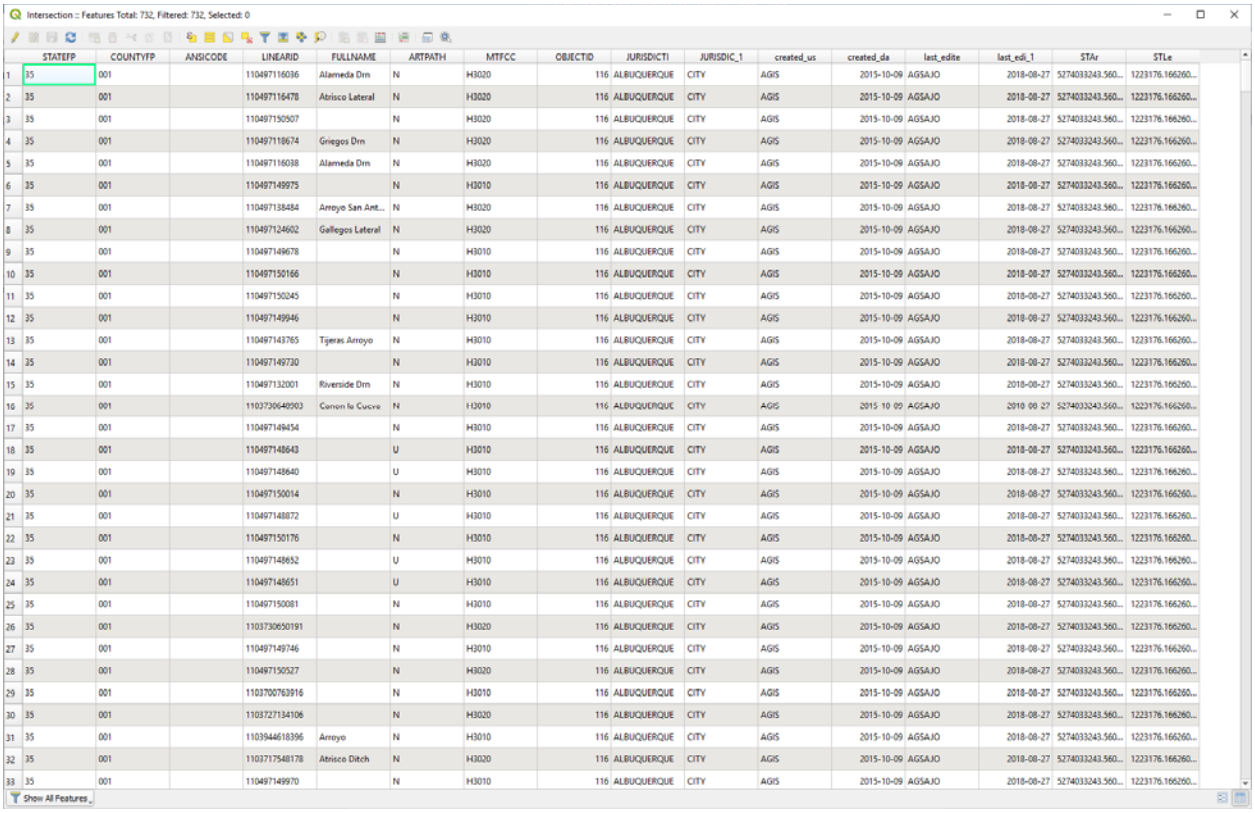


(6) Click Run

(7) It will take a while to complete the processing

(8) Open the attribute table of the newly created intersection layer





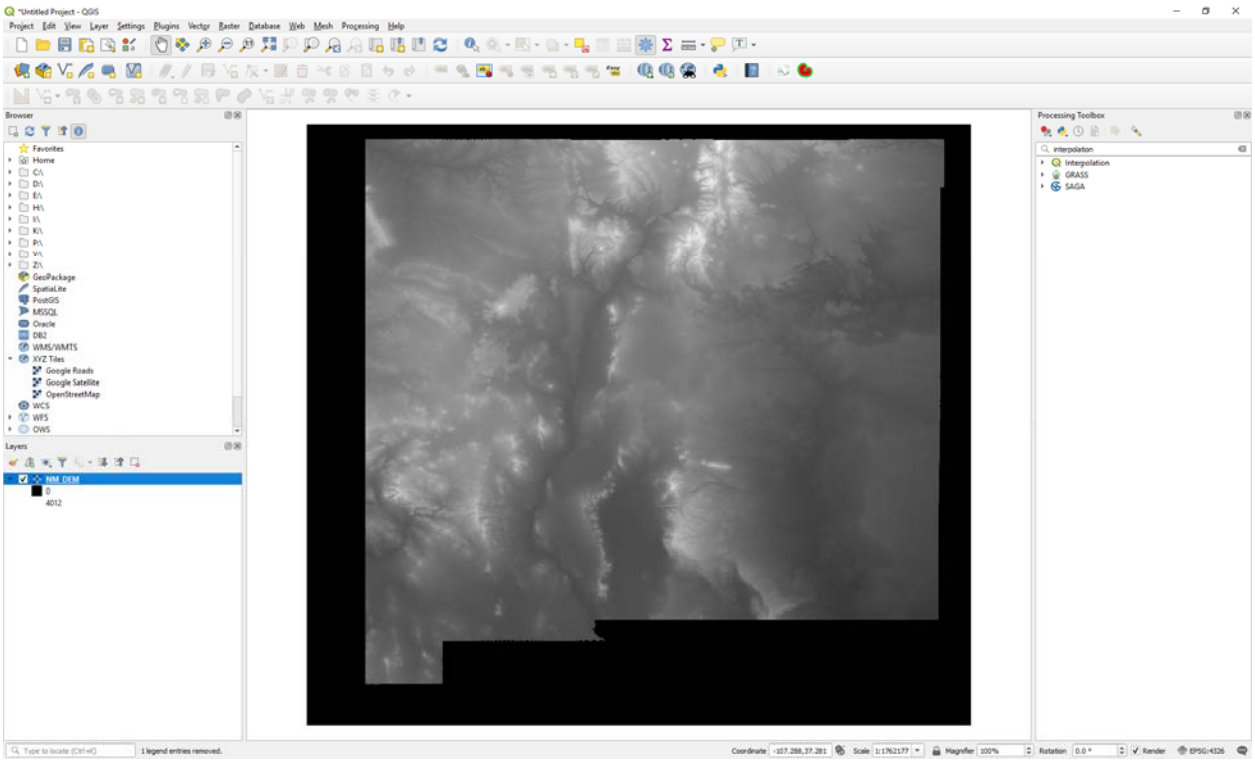
	STATEFP	COUNTYFP	ANSICODE	LINEARID	FULLNAME	ARTPATH	MTFCC	OBJECTID	JURISDICTI	JURISDIC_1	created_us	created_da	last_edite	last_edi_1	STAr	STLe
1	35	001		110497116036	Alameda Drn	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
2	35	001		110497116478	Atrisco Lateral	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
3	35	001		110497150507		N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
4	35	001		110497118674	Griegos Drn	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
5	35	001		110497116038	Alameda Drn	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
6	35	001		110497149975		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
7	35	001		110497138484	Arroyo San Ant...	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
8	35	001		110497124602	Gallegos Lateral	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
9	35	001		110497149678		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
10	35	001		110497150166		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
11	35	001		110497150245		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
12	35	001		110497149946		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
13	35	001		110497143765	Tijeras Arroyo	N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
14	35	001		110497149730		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
15	35	001		110497132001	Riverside Drn	N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
16	35	001		1103730640903	Canon le Cuevre	N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
17	35	001		110497149454		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
18	35	001		110497148643		U	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
19	35	001		110497148640		U	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
20	35	001		110497150014		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
21	35	001		110497148872		U	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
22	35	001		110497150176		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
23	35	001		110497148652		U	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
24	35	001		110497148651		U	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
25	35	001		110497150081		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
26	35	001		1103730650191		N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
27	35	001		110497149746		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
28	35	001		110497150527		N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
29	35	001		1103700763916		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
30	35	001		1103727134106		N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
31	35	001		1103944618396	Arroyo	N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
32	35	001		1103717548178	Atrisco Ditch	N	H3020	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...
33	35	001		110497149970		N	H3010	116	ALBUQUERQUE	CITY	AGIS	2015-10-09	AGSAJO	2018-08-27	5274033243.560...	1223176.166260...

Part E. Processing Raster Data

1. Re-project Layers

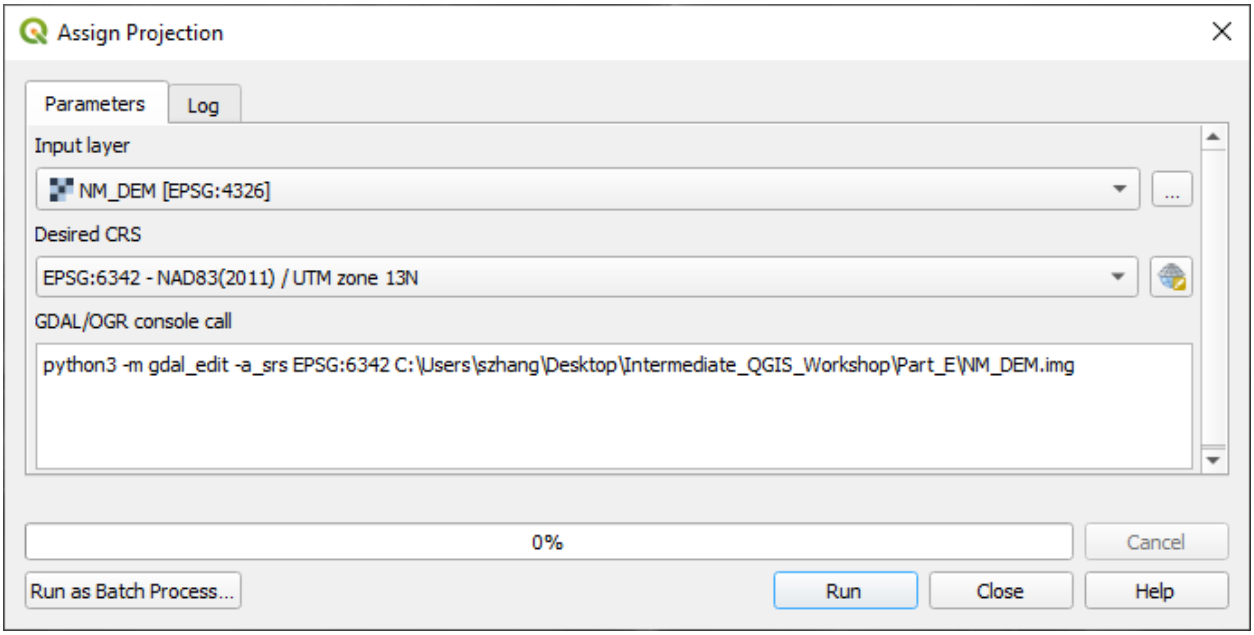
(1) Start a new QGIS project

(2) Insert the NM DEM layer



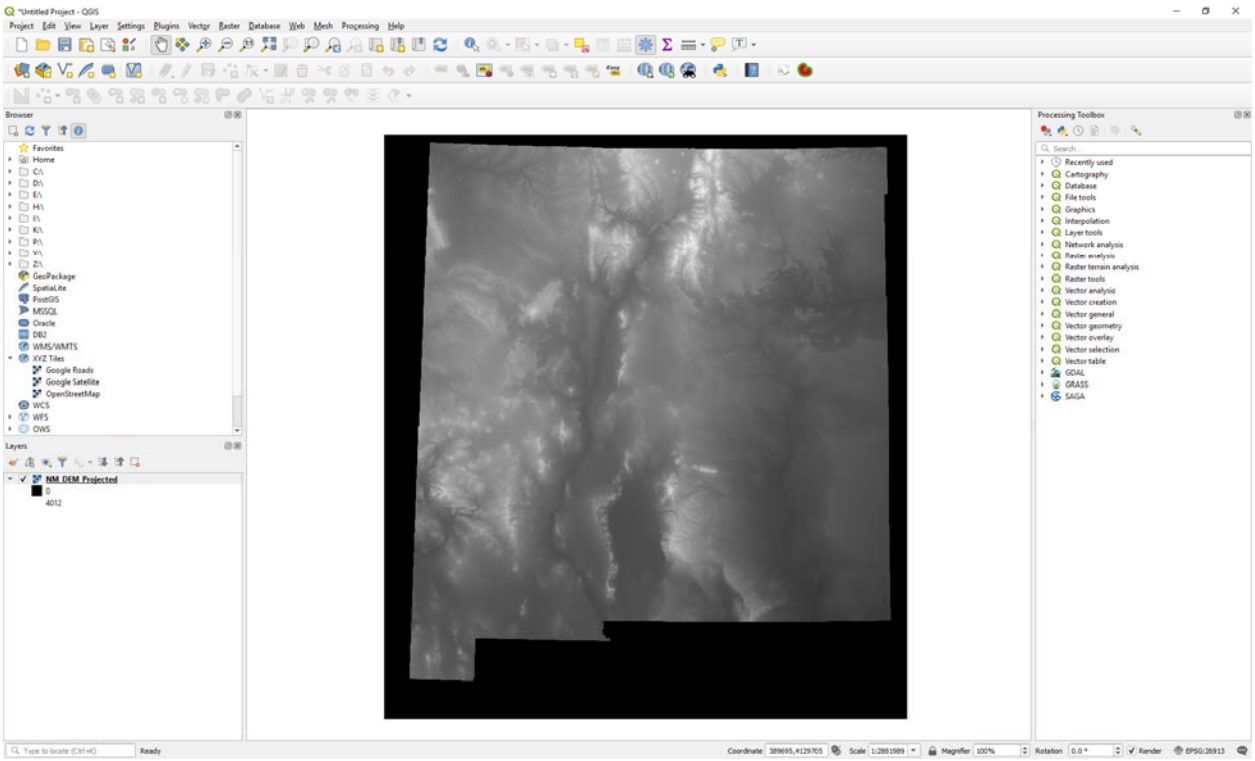
(3) Go to Raster >>> Projections >>> Assign Projection

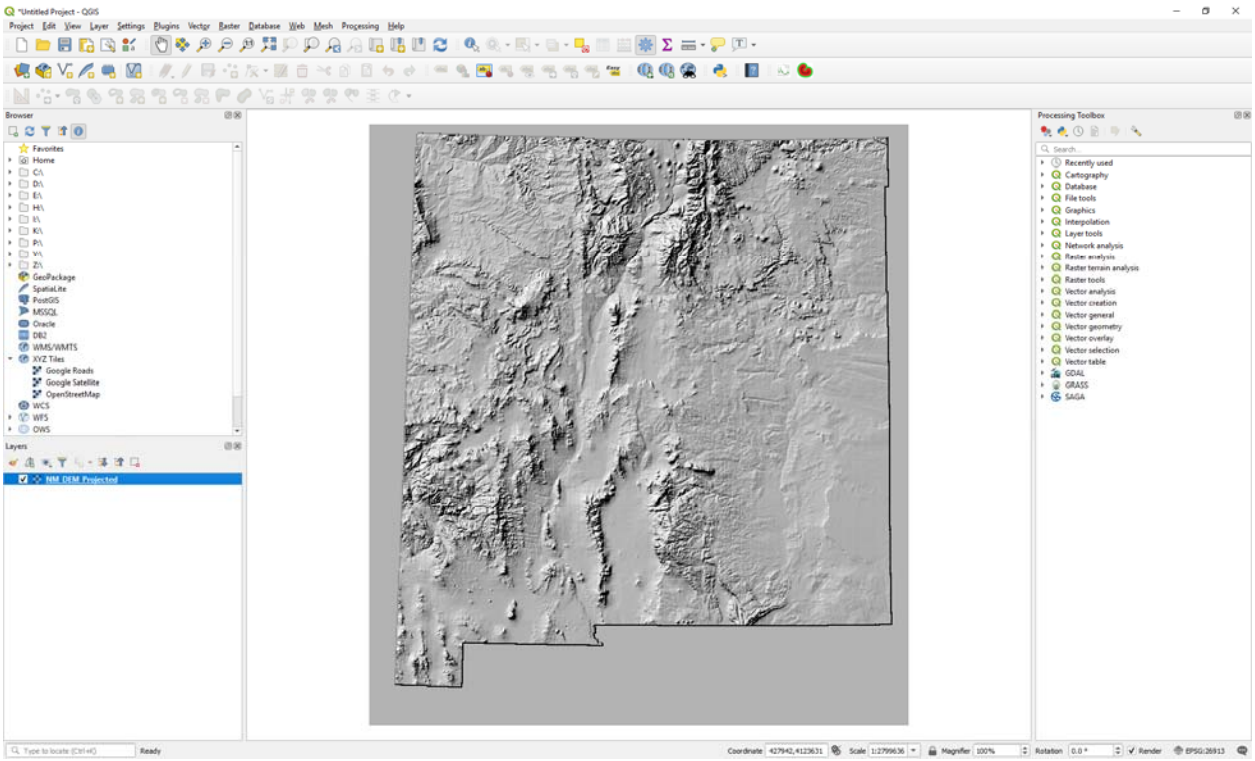
(4) Input the parameters as below



(5) Click Run

(6) The current Version 3.6.1 has problems with this tool. You cannot successfully re-project your raster layers. Therefore, I have provided a projected layer instead.

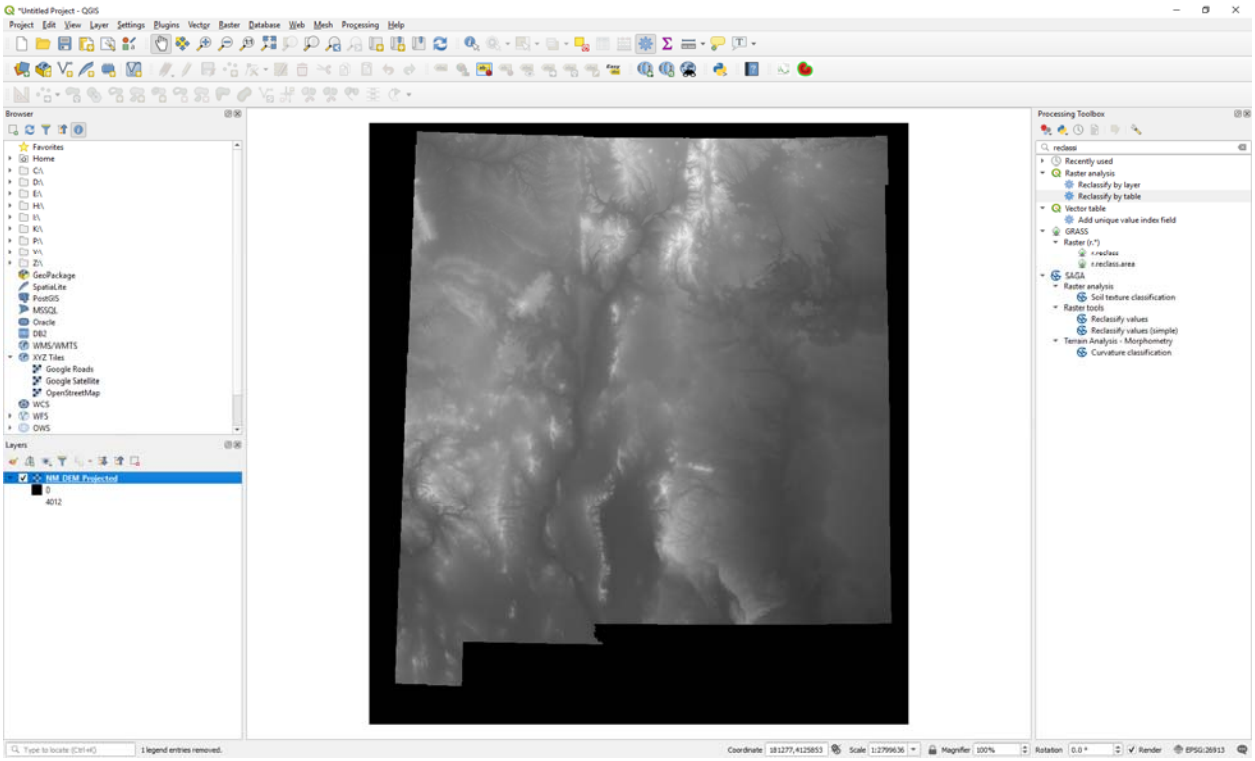




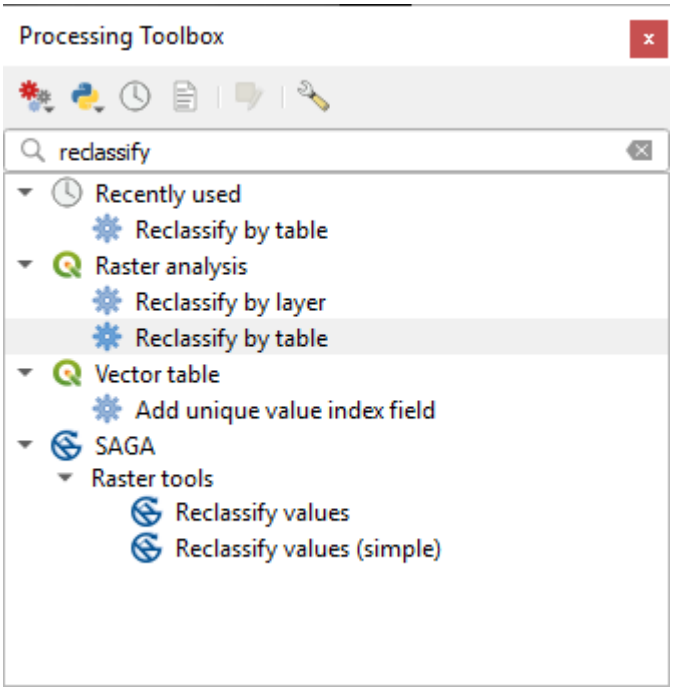
2. Reclassify

(1) Start a new QGIS project

(2) Insert the NM DEM Projected layer

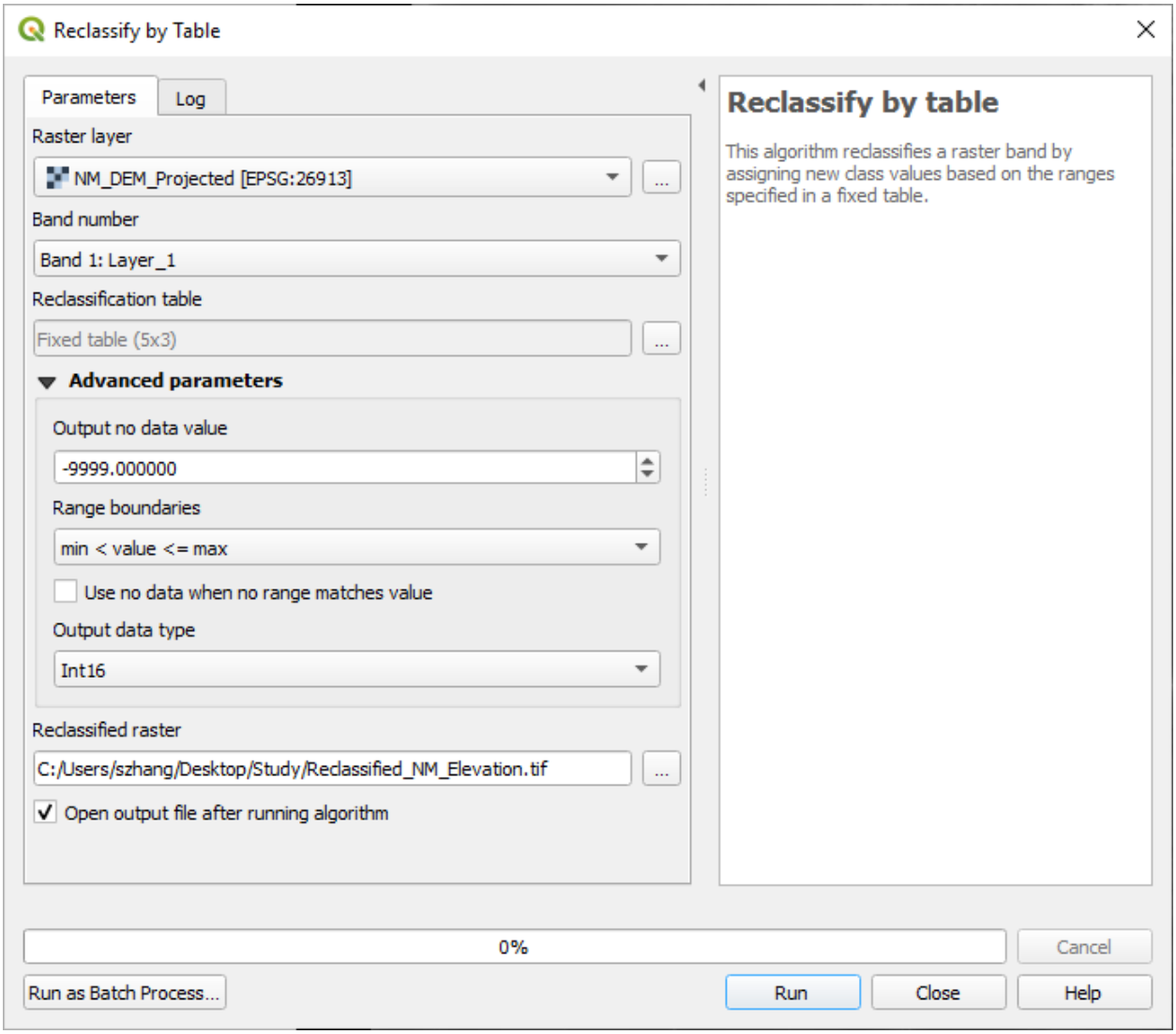


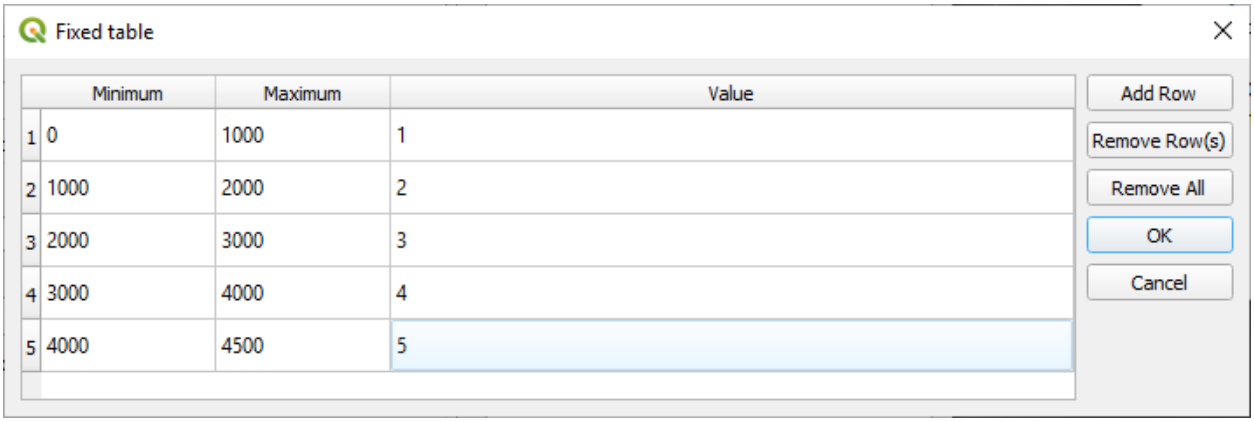
(3) In the Processing Toolbox, search reclassify



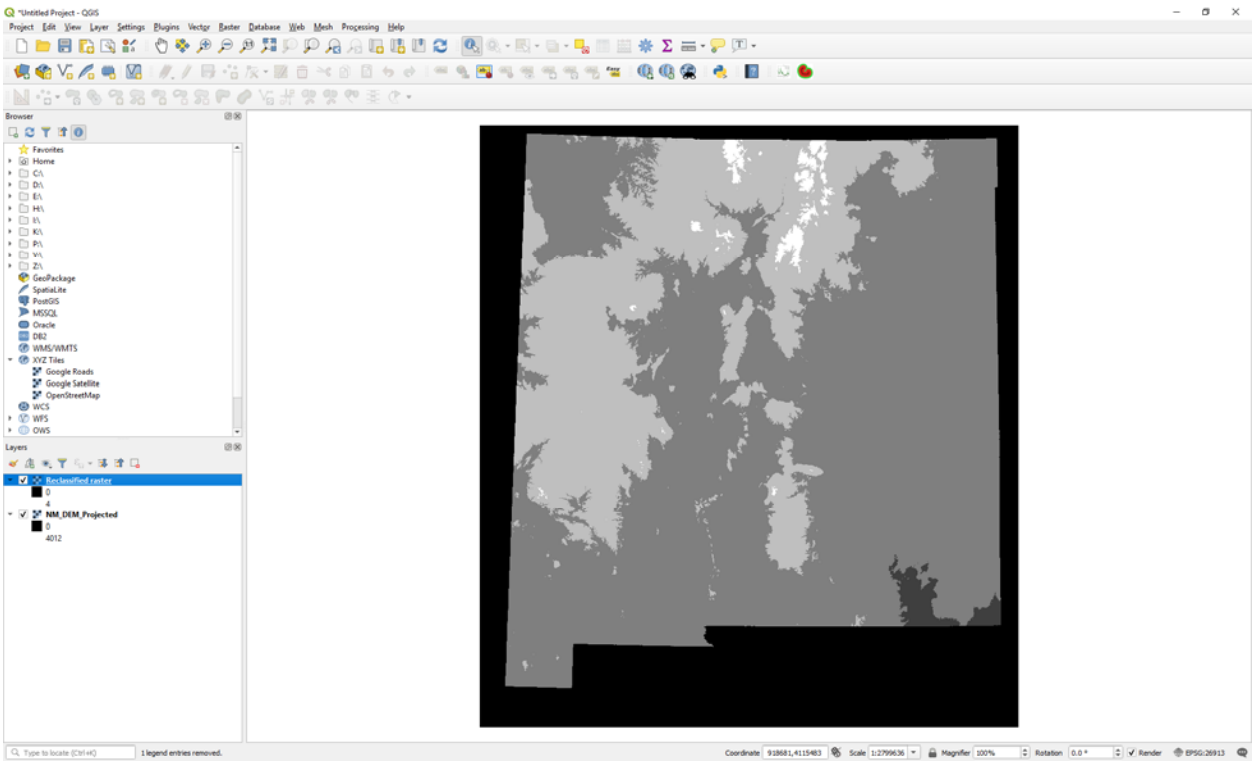
(4) Select Reclassify by table

(5) Input the parameters as below

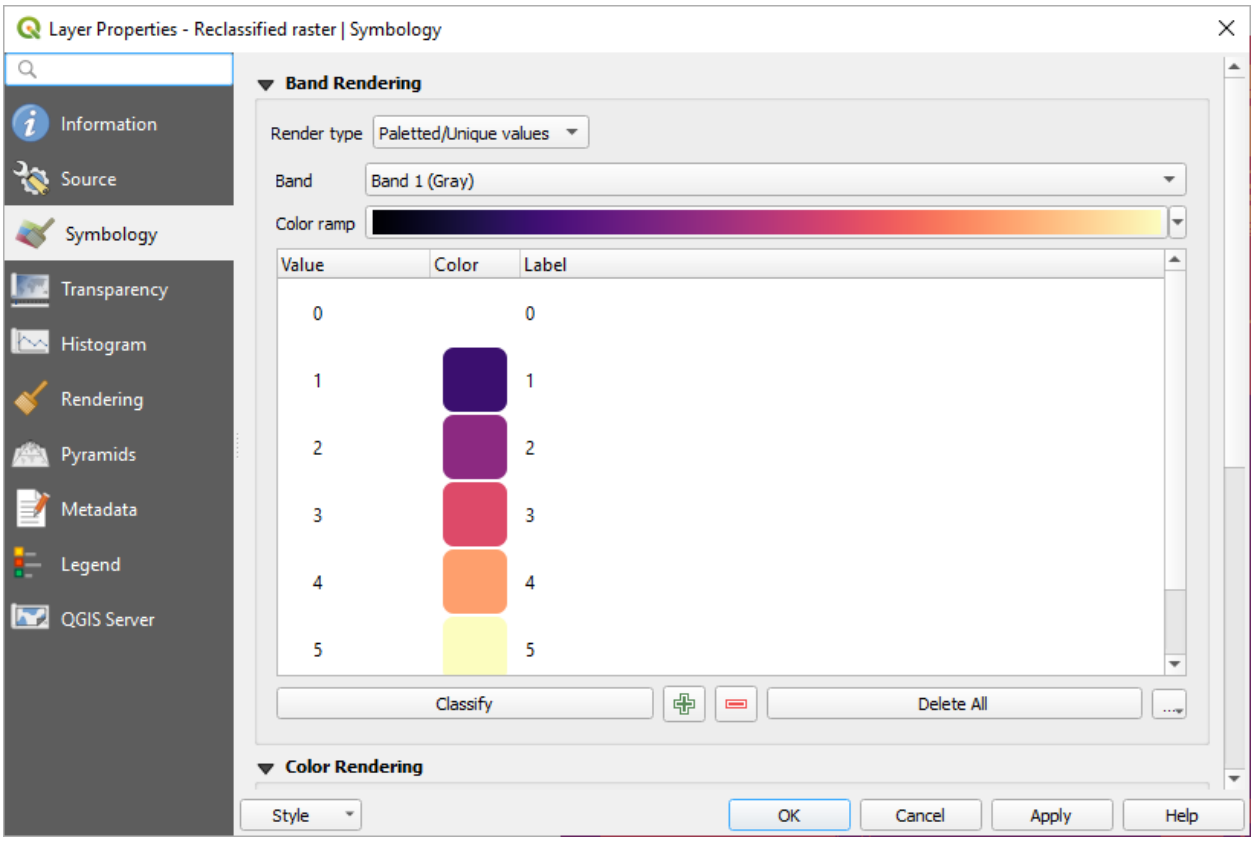


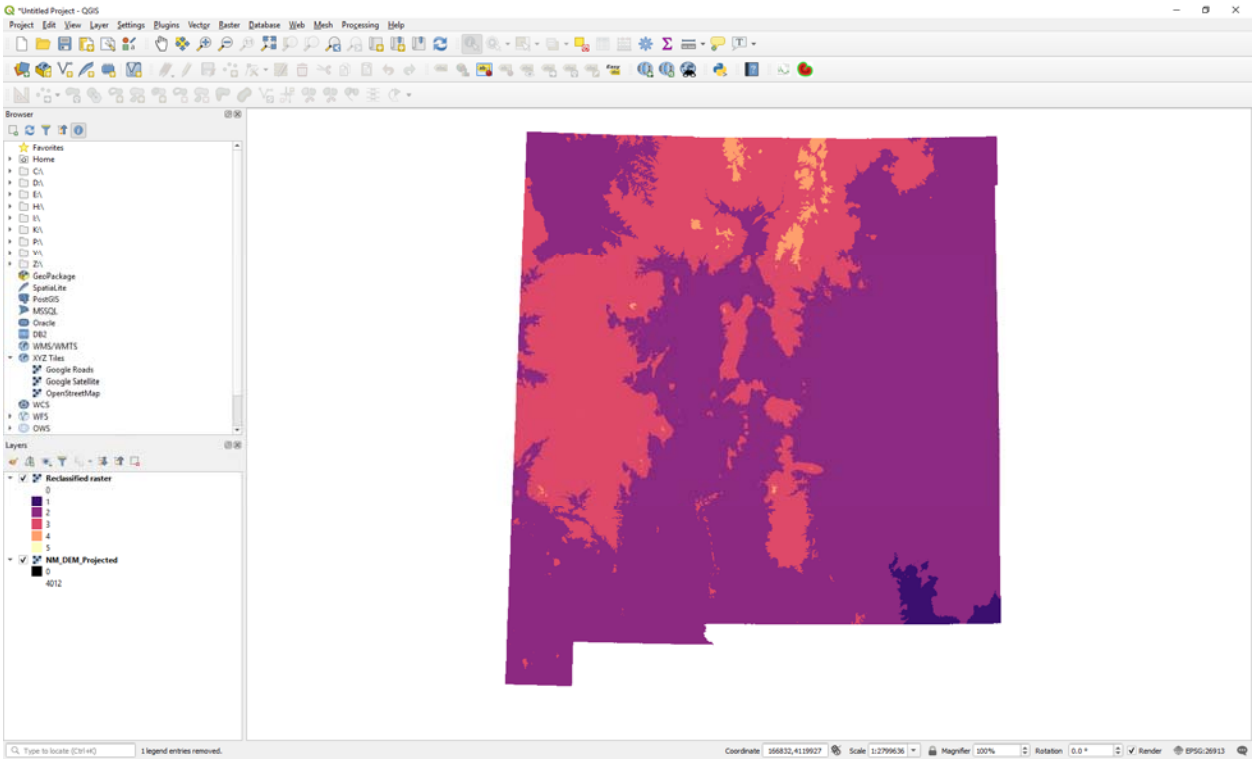


(6) Click Run



(7) Right-click on the Reclassified raster layer and then select symbology



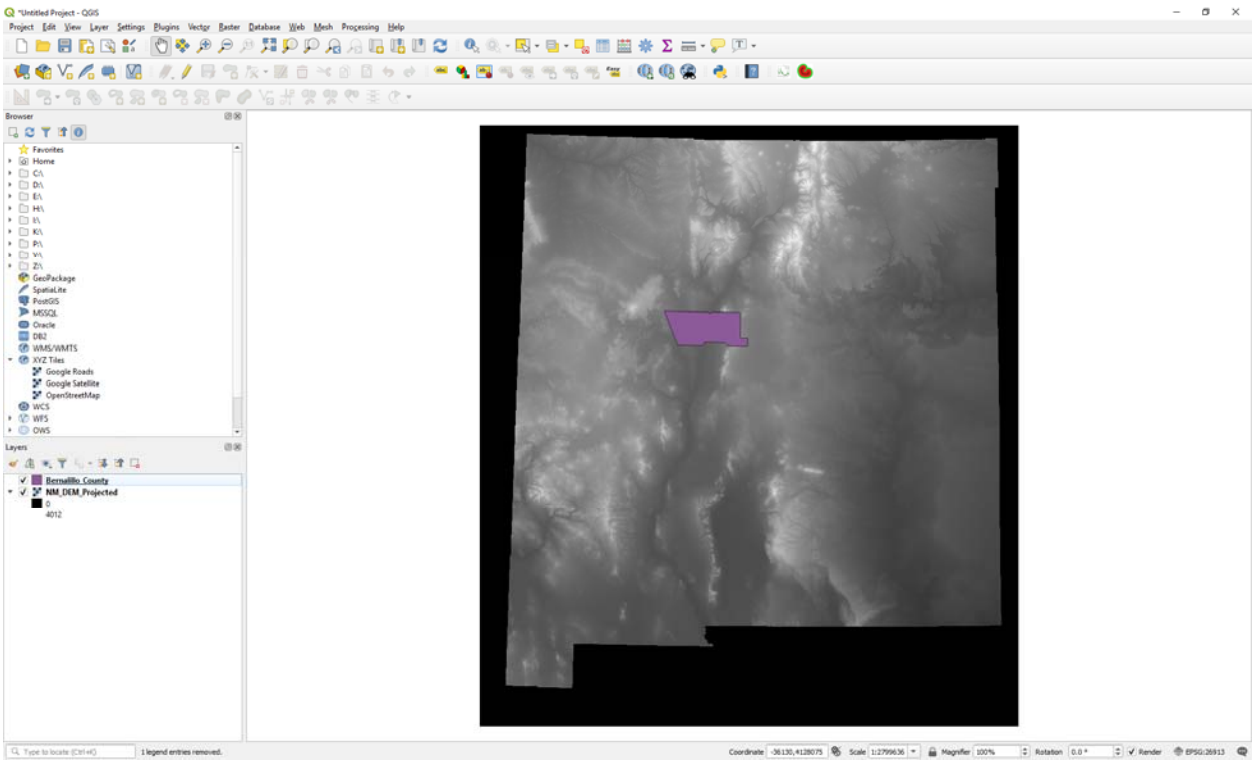

*Untitled Project - QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Home
GeoPackage
SpatiaLite
PostGIS
MSSQL
Oracle
DB2
WMS/WMTS
XYZ Tiles
Google Roads
Google Satellite
OpenStreetMap
WCS
WFS
OWS
Layers
Reclassified raster
0
1
2
3
4
5
NM_DEM_Projected
0
4012
Type to locate (Ctrl+K)
1 legend entries removed.
Coordinate
Scale
Magnifier
Rotation
Render
EPSG:26913

3. Clip

(1) Start a new QGIS project

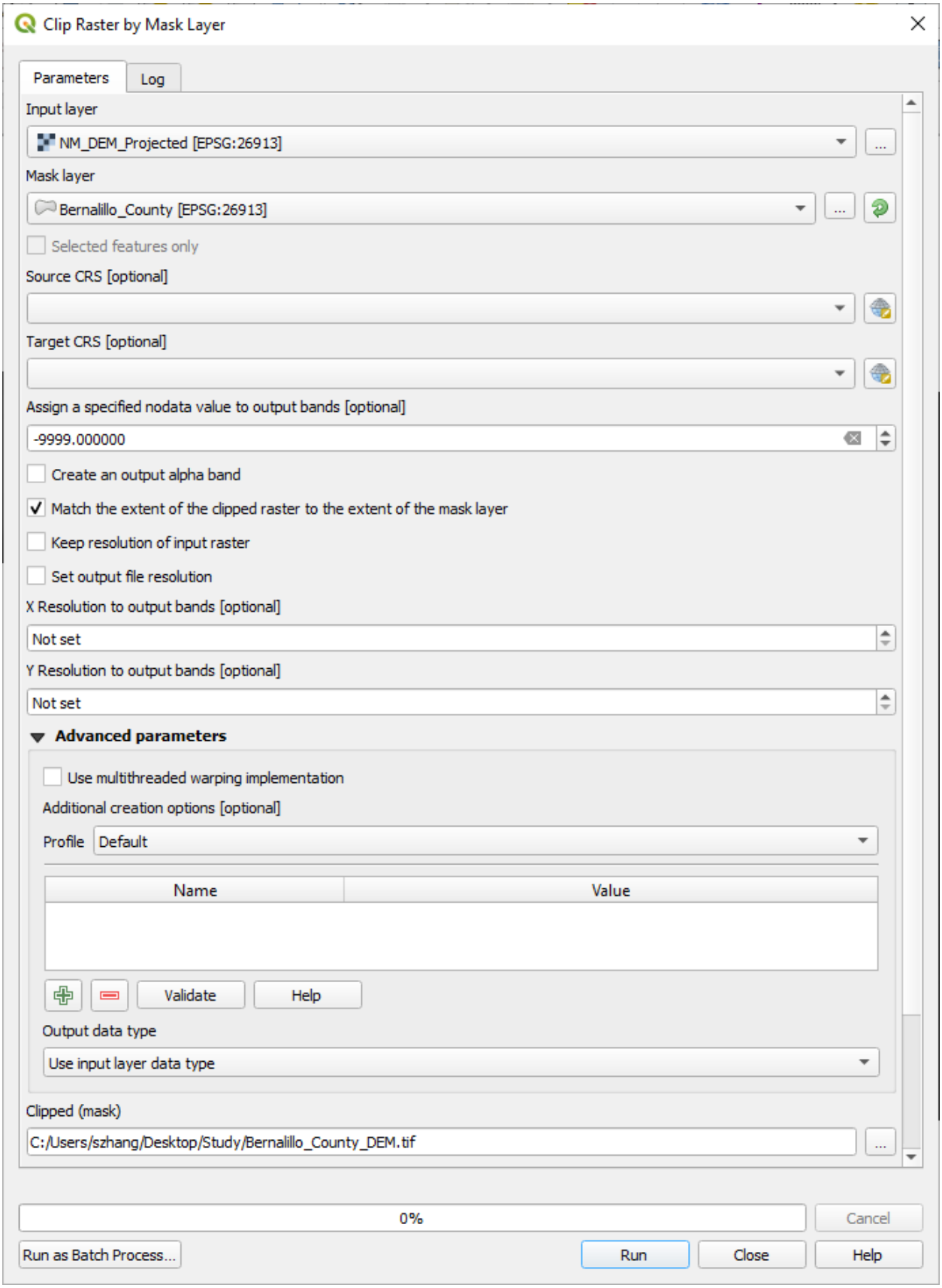
(2) Insert the NM DEM Projected layer

(3) Insert the Bernalillo County boundary layer

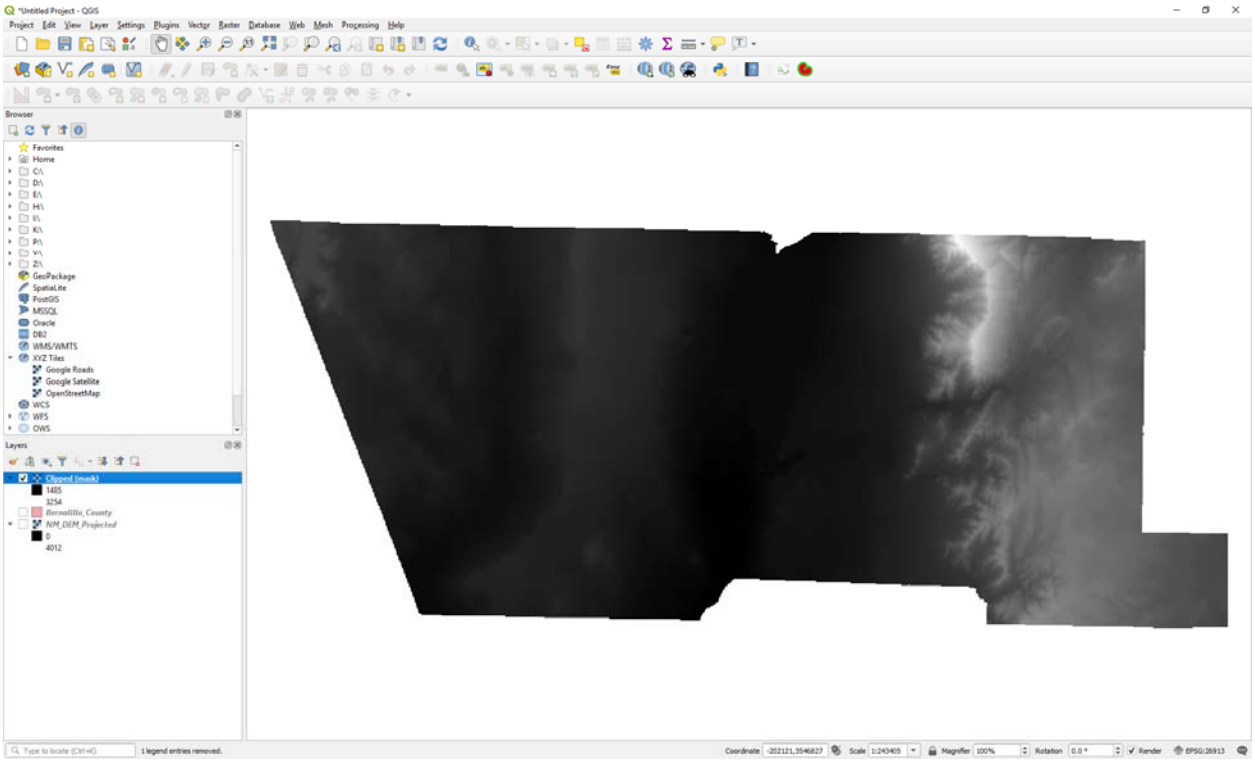


(4) Go to Raster >>> Extraction >>> Clip Raster by Mask Layer

(5) Input the parameters as below


Clip Raster by Mask Layer
Parameters
Log
Input layer
NM_DEM_Projected [EPSG:26913]
Mask layer
Bernalillo_County [EPSG:26913]
Selected features only
Source CRS [optional]
Target CRS [optional]
Assign a specified nodata value to output bands [optional]
-9999.000000
Create an output alpha band
Match the extent of the clipped raster to the extent of the mask layer
Keep resolution of input raster
Set output file resolution
X Resolution to output bands [optional]
Not set
Y Resolution to output bands [optional]
Not set
Advanced parameters
Use multithreaded warping implementation
Additional creation options [optional]
Profile
Default
Name
Value
Validate
Help
Output data type
Use input layer data type
Clipped (mask)
C:/Users/szhang/Desktop/Study/Bernalillo_County_DEM.tif
0%
Cancel
Run as Batch Process...
Run
Close
Help

(6) Click Run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Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Home
GeoPackage
SpatiaLite
PostGIS
MSSQL
Oracle
DB2
WMS/WMTS
XYZ Tiles
Google Roads
Google Satellite
OpenStreetMap
WCS
WFS
OWS
Layers
Clipped (mask)
1485
3254
Bernalillo_County
NM_DEM_Projected
0
4012
Type to locate (Ctrl+K)
1 legend entries removed.
Coordinate
Scale
Magnifier
Rotation
Render
EPSG:26913

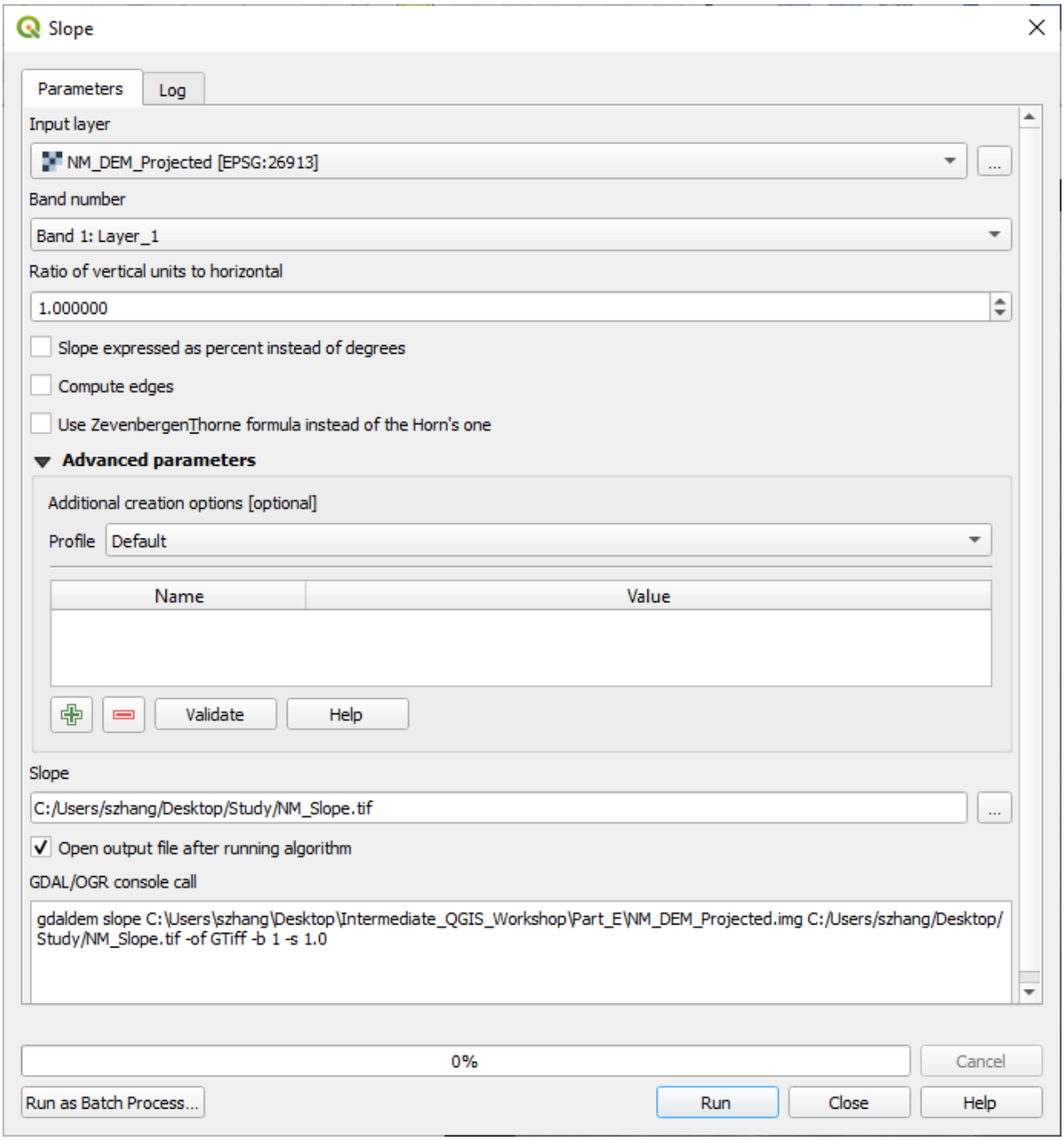
4. Slope

(1) Start a new QGIS project

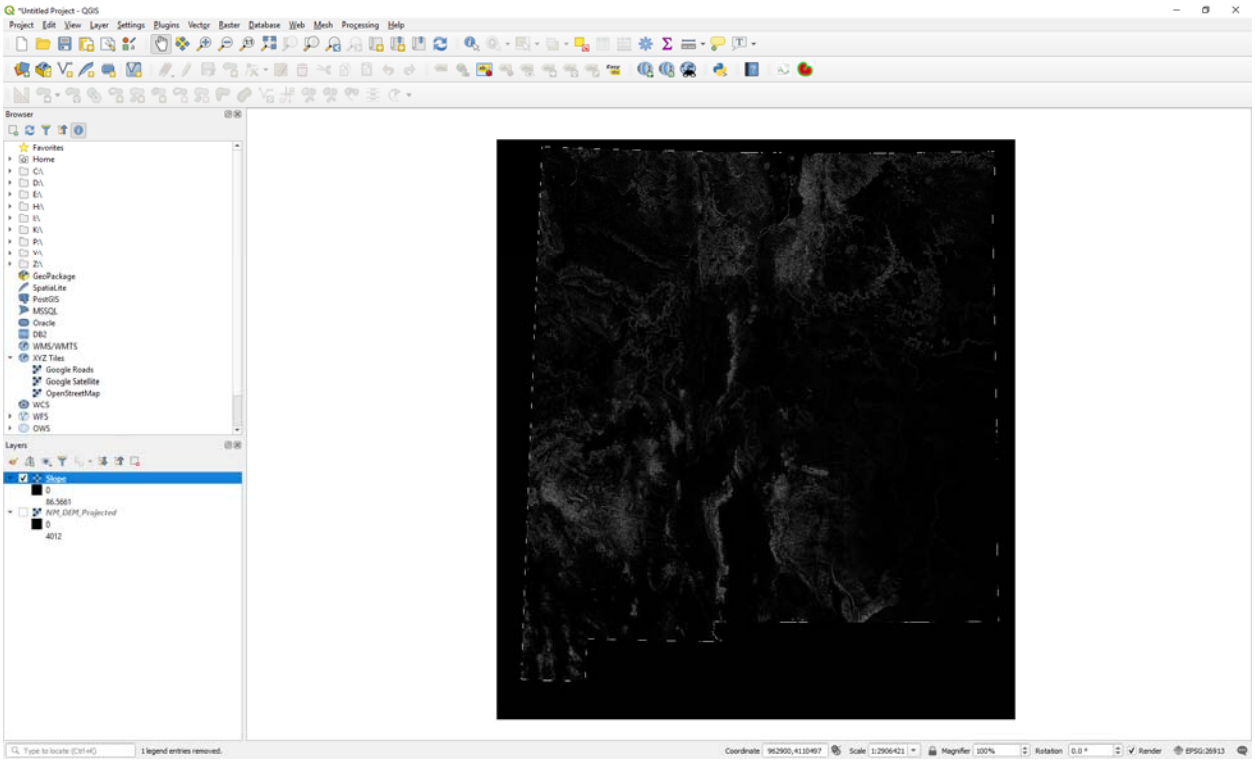
(2) Insert the NM DEM Projected layer

(3) Go to Raster >>> Analysis >>> Slope

(4) Input the parameters as below



(5) Click Run


"Untitled Project - QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Home
GeoPackage
SpatiaLite
PostGIS
MSSQL
Oracle
DB2
WMS/WMTS
XYZ Tiles
Google Roads
Google Satellite
OpenStreetMap
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Slope
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NM_DEM_Projected
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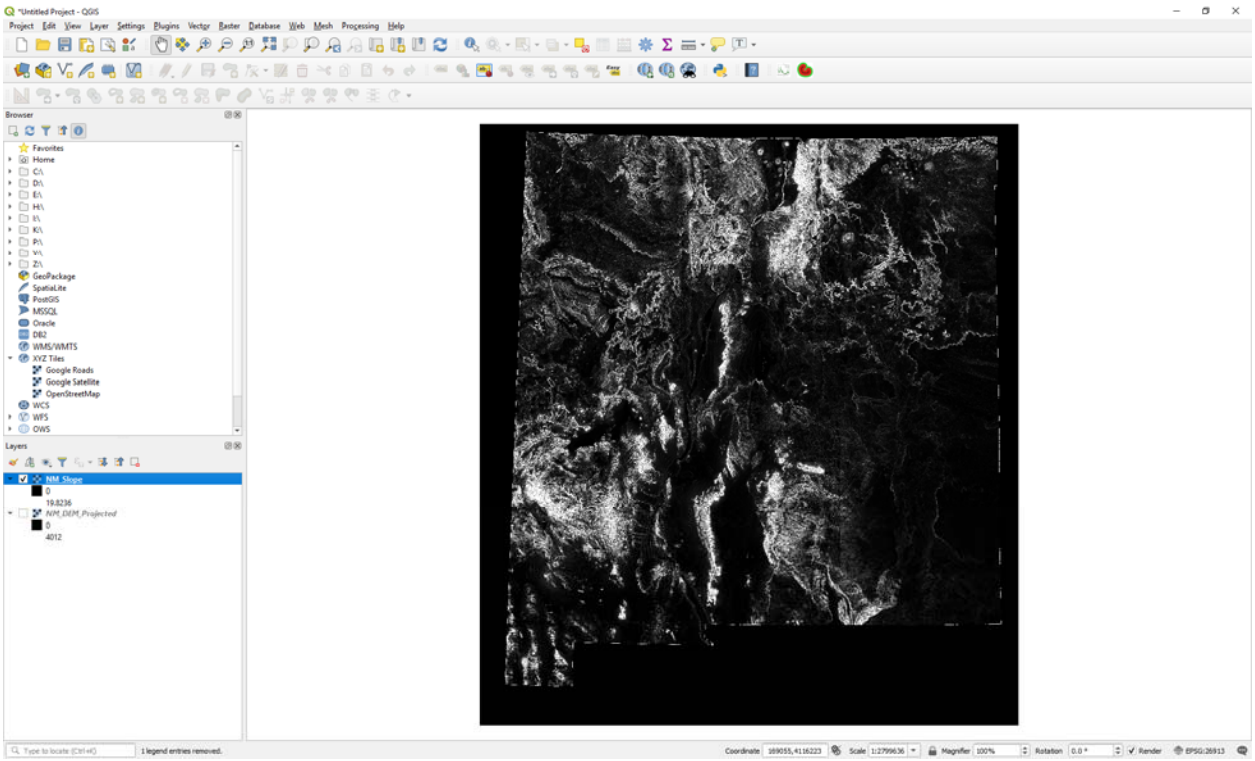
"Untitled Project - QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Home
GeoPackage
SpatiaLite
PostGIS
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Google Satellite
OpenStreetMap
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NM_Slope
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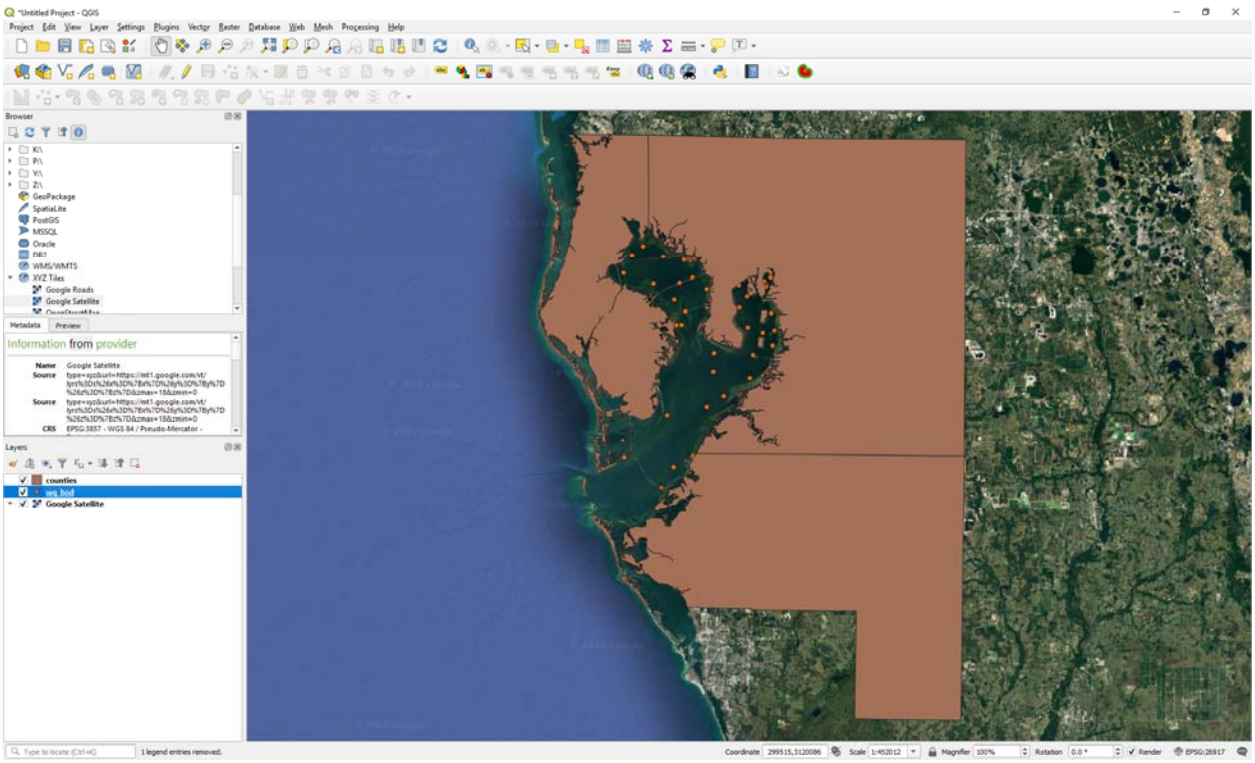
5. Interpolation

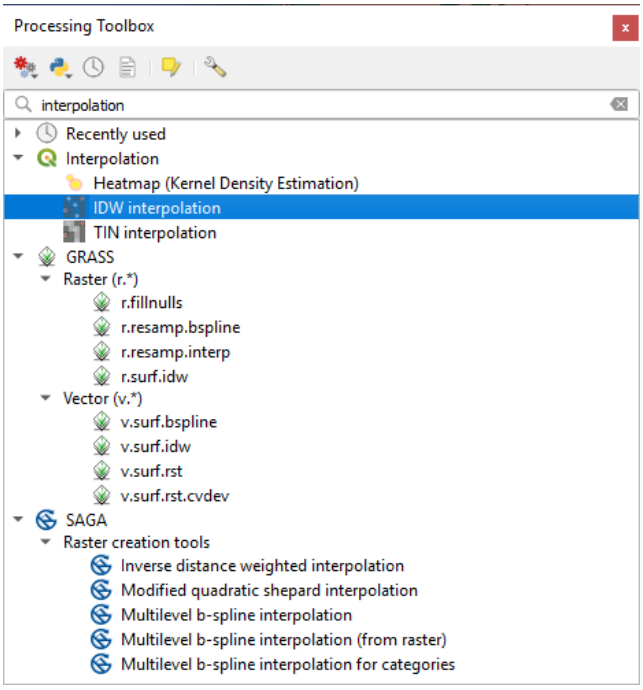
(1) Start a new QGIS project

(2) Insert the Water Quality layer

(3) Insert the Counties layer

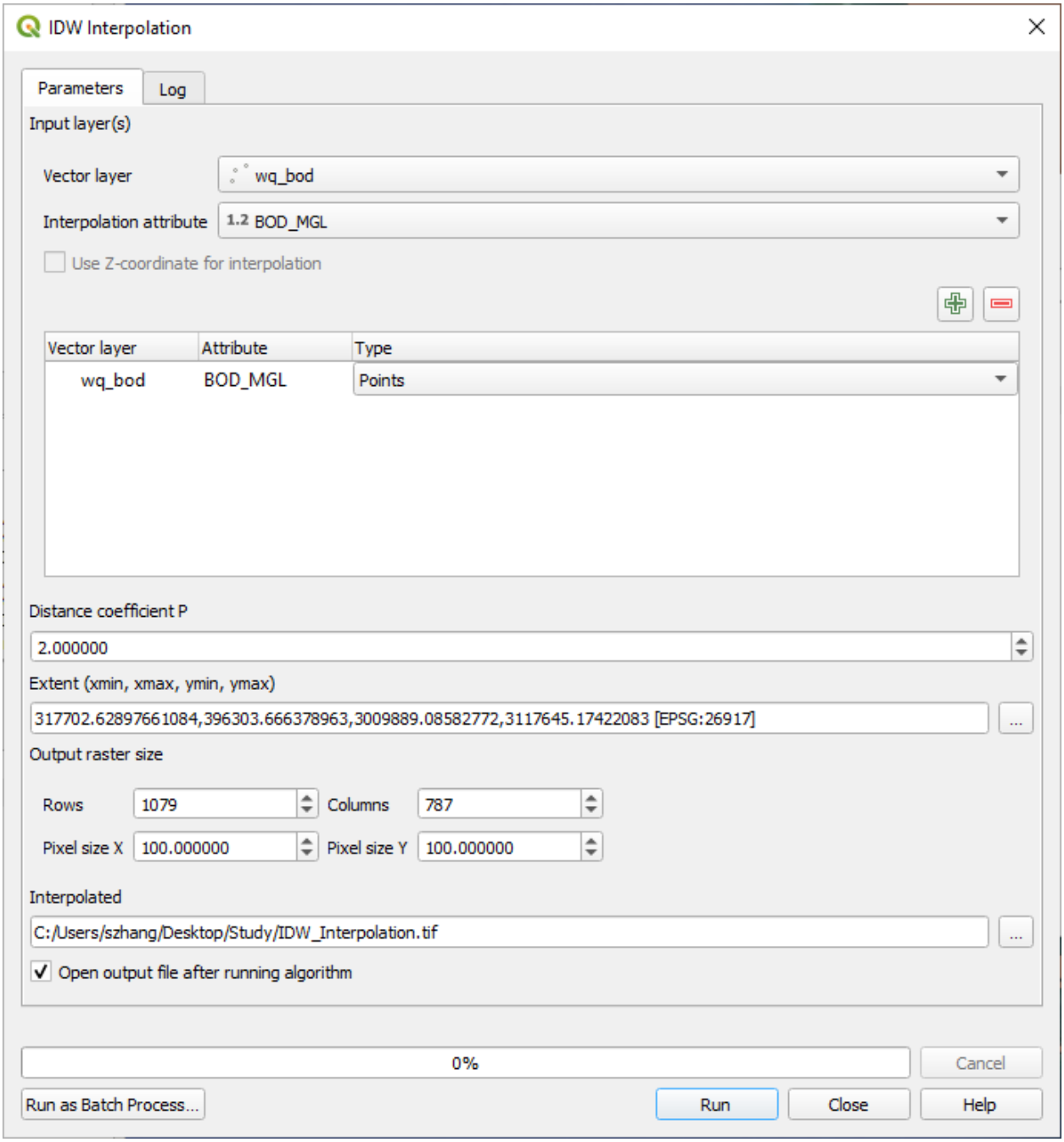


(4) In the Processing Toolbox, search Interpolation



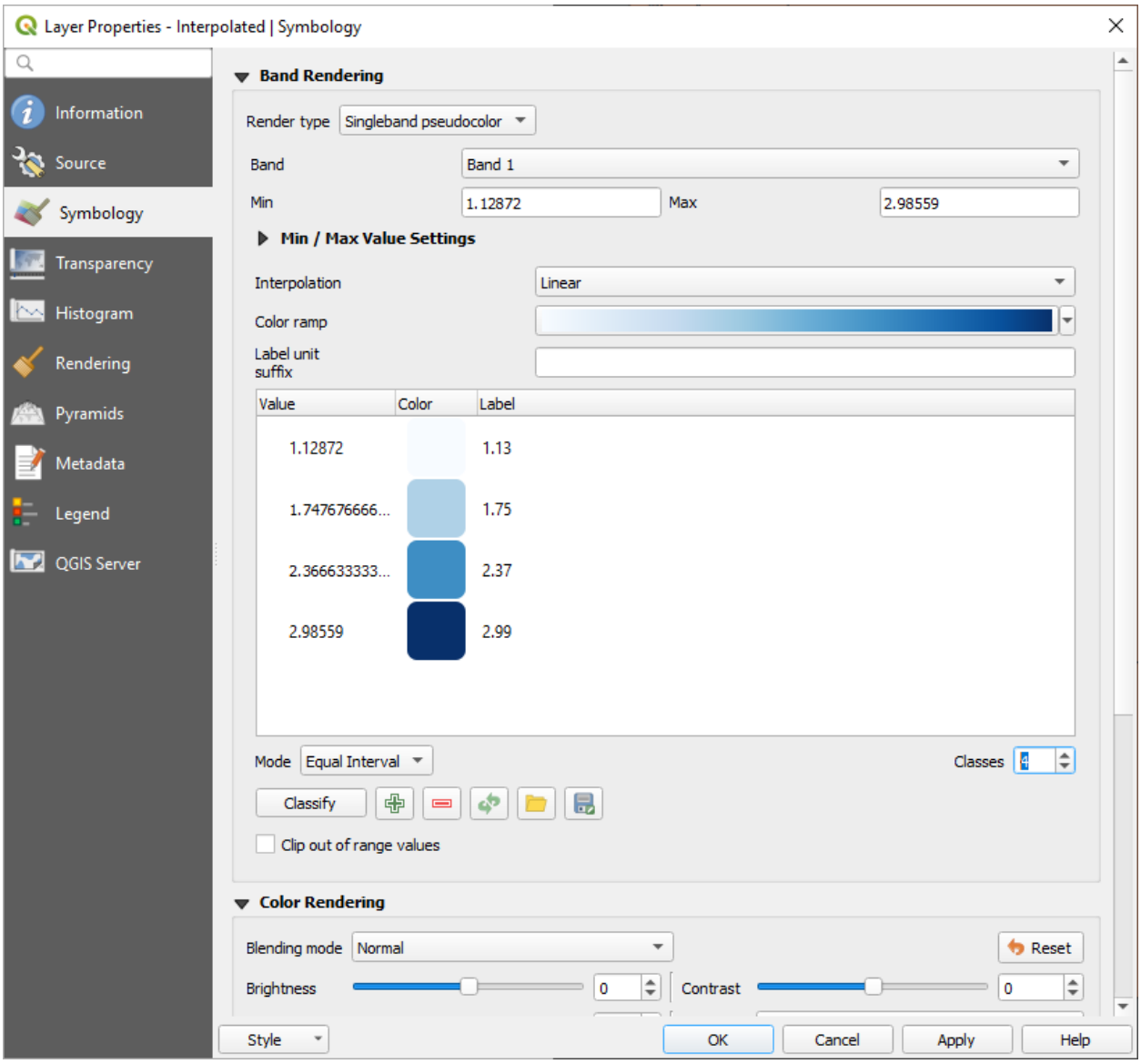
(5) Select IDW Interpolation

(6) Input the parameters as below

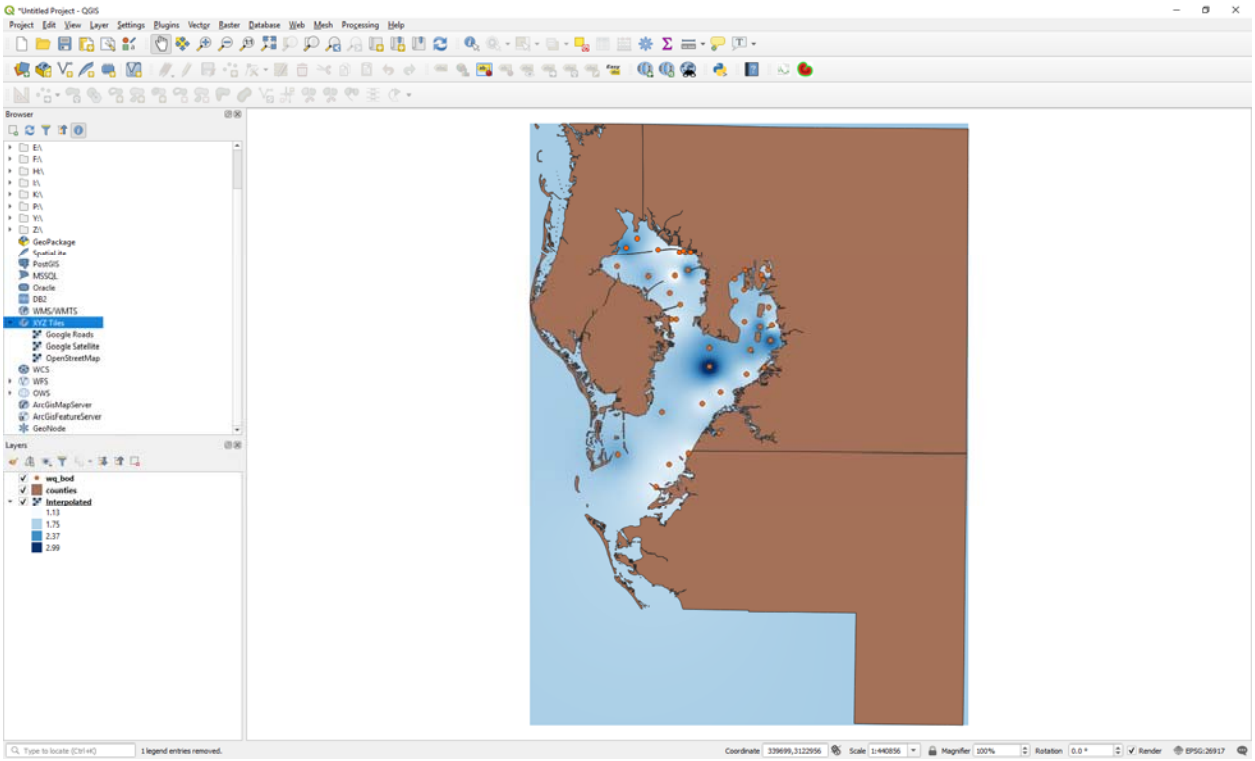


(7) Click Run

(8) Right Click on the created IDW interpolation layer, and then select Symbology and change the settings as below


Layer Properties - Interpolated | Symbology
Information
Source
Symbology
Transparency
Histogram
Rendering
Pyramids
Metadata
Legend
QGIS Server
Band Rendering
Render type
Singleband pseudocolor
Band
Band 1
Min
1.12872
Max
2.98559
Min / Max Value Settings
Interpolation
Linear
Color ramp
Label unit suffix
Value
Color
Label
1.12872
1.13
1.747676666...
1.75
2.366633333...
2.37
2.98559
2.99
Mode
Equal Interval
Classes
Classify
Clip out of range values
Color Rendering
Blending mode
Normal
Reset
Brightness
Contrast
Style
OK
Cancel
Apply
Help

(9) Click OK


*Untitled Project - QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
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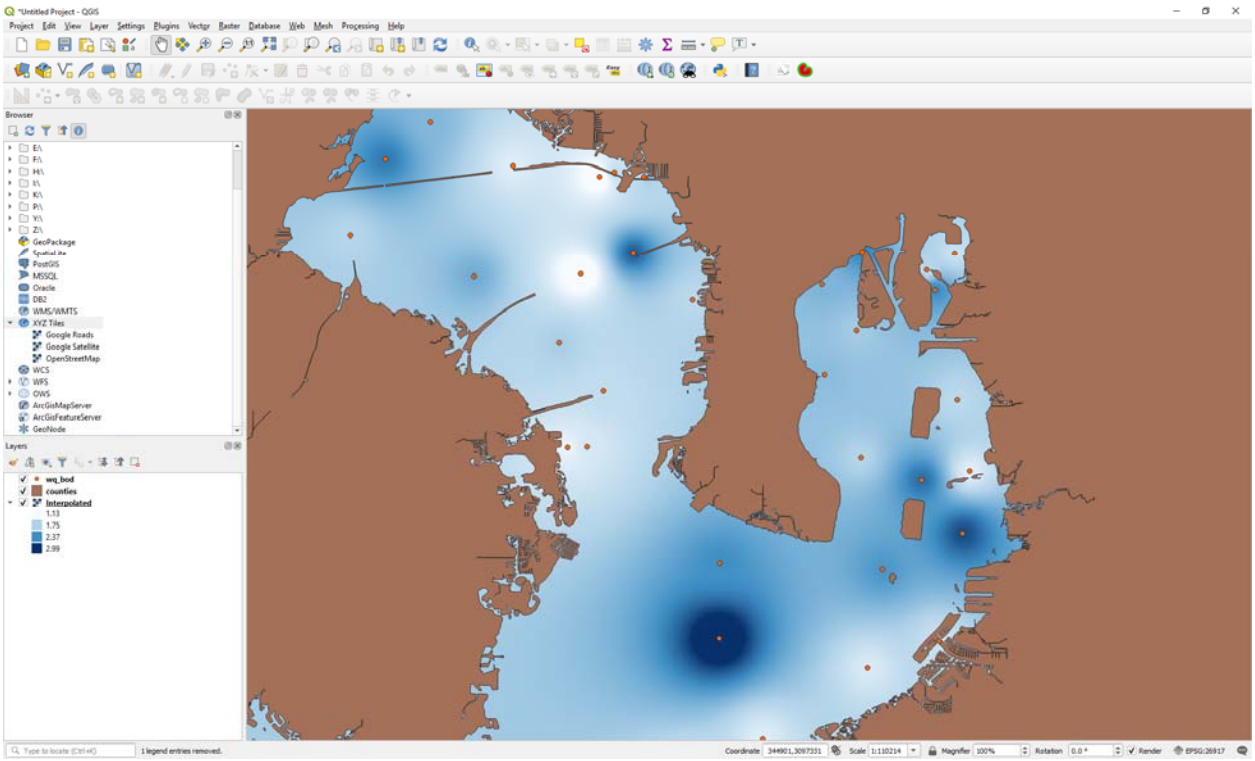
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counties
Interpolated
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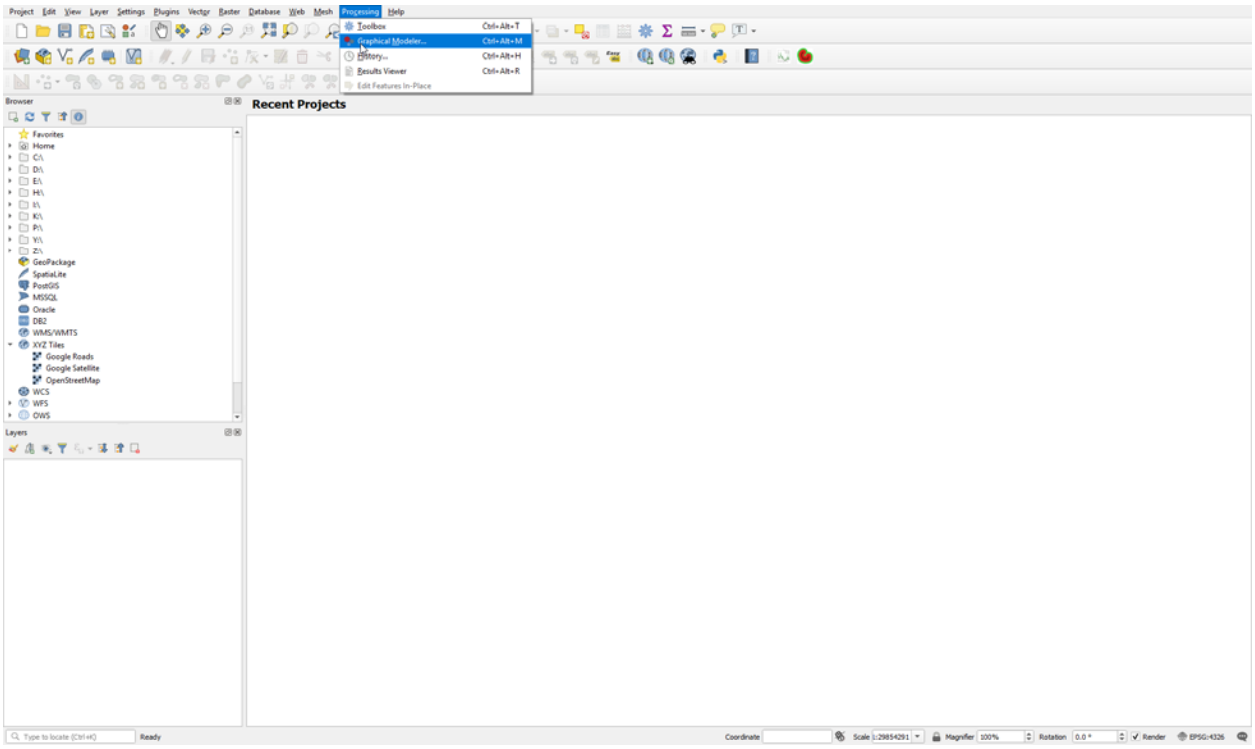
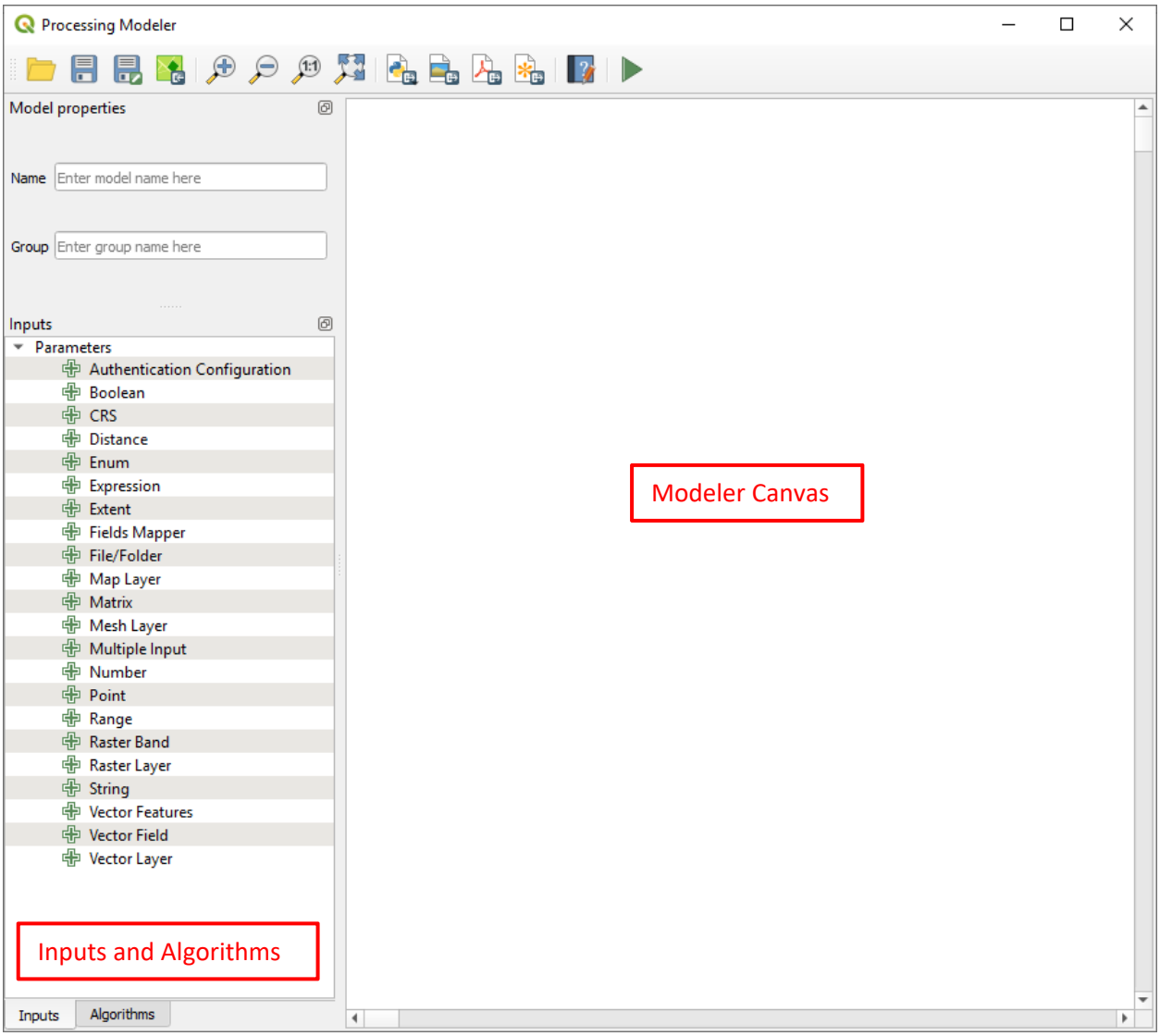
Part F. Working with the Graphical Modeler

A typical spatial analysis involves a series of GIS operations, with the output of one operation as the input for the next one, until the final result is generated. Using the Graphical Modeler, users can combine these individual steps into a single process. Thee interface of Graphical Modeler allows users to visually draw inputs, GIS algorithms, and output. A major benefits of this approach is that the completed analytical workflow can be modified and rerun.

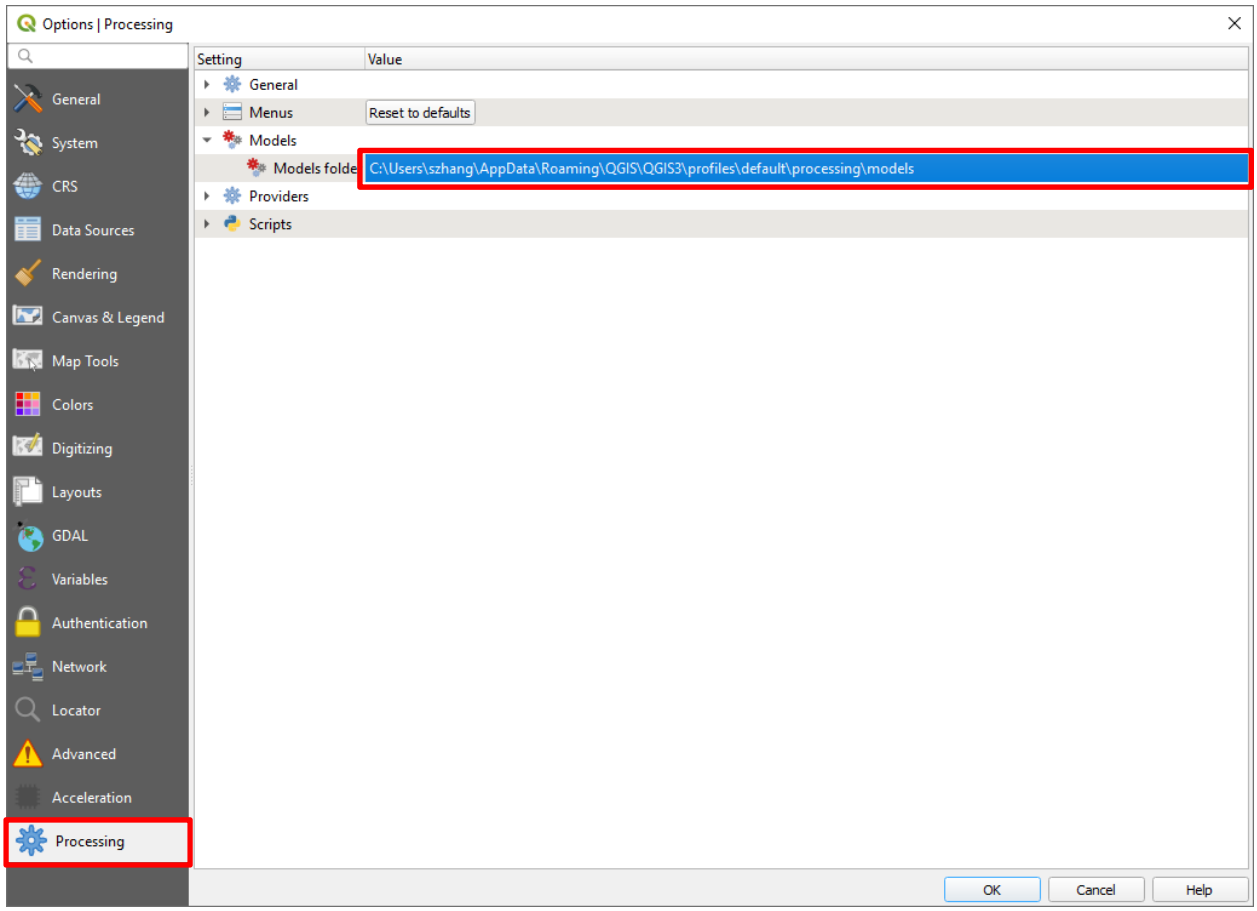
1. Click on Processing and then click on Graphical Modeler



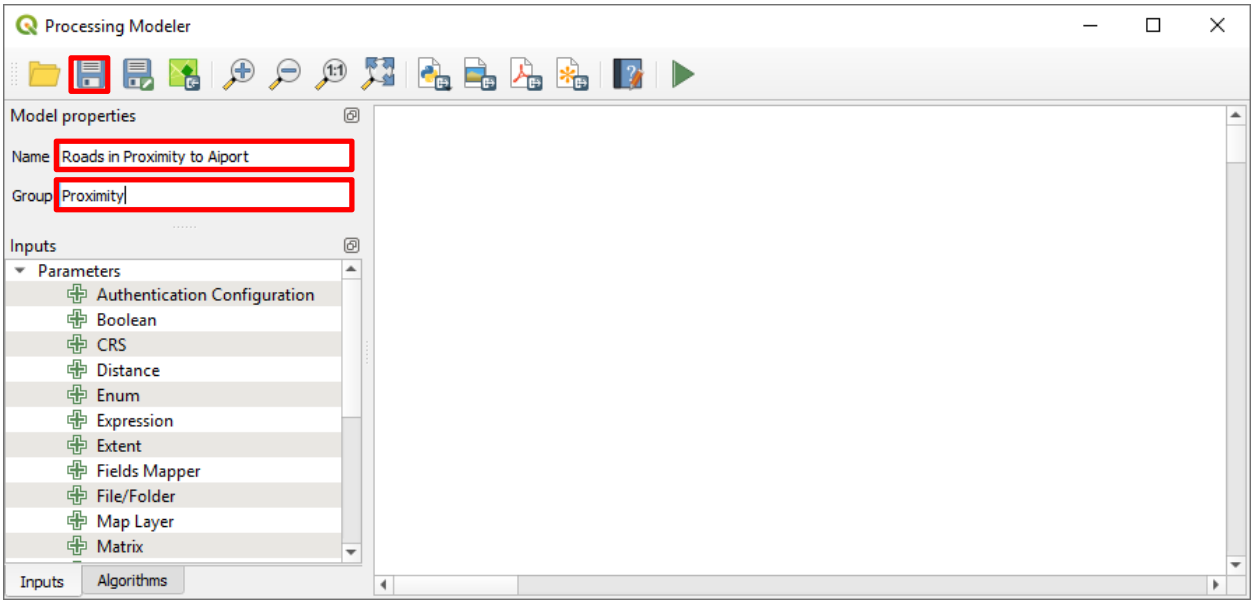
2. The Processing Modeler opens as a new window; on the left-hand side of the window, there are two tabs: **Inputs** and **Algorithms**; these are used to add both types of element to the modeler canvas that takes up the remainder of the window



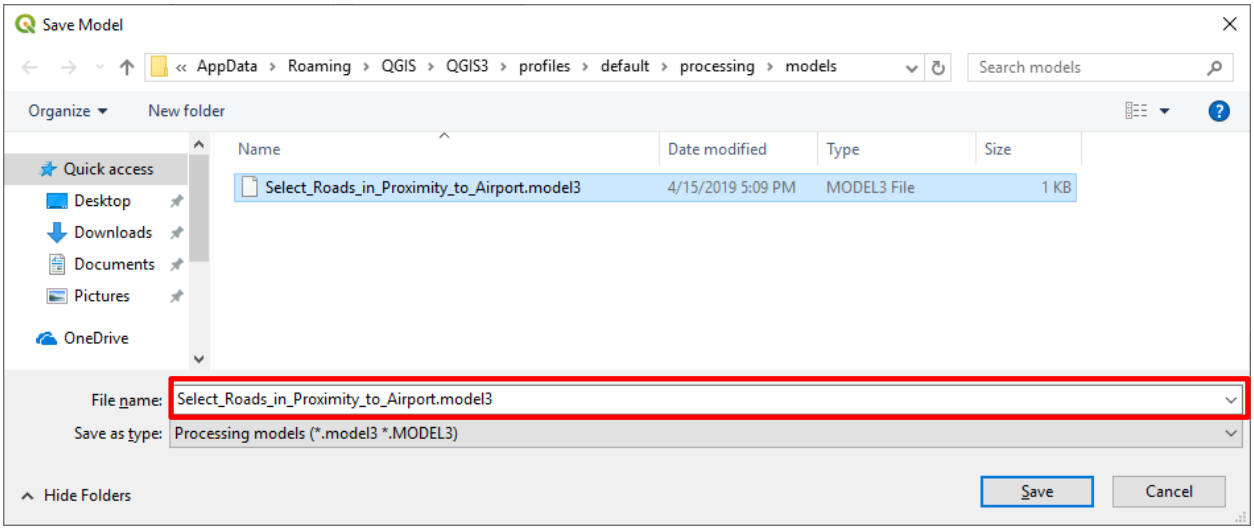
3. Before creating a model, it is always a good practice to configure the modeler; models ae saved as JSON files with a .model extension; when users save a model, QGIS will prompt the users to save the model file to the **Models** folder; users can set the location of the **Models** folder by navigating to Setting >>> Options >>> Processing

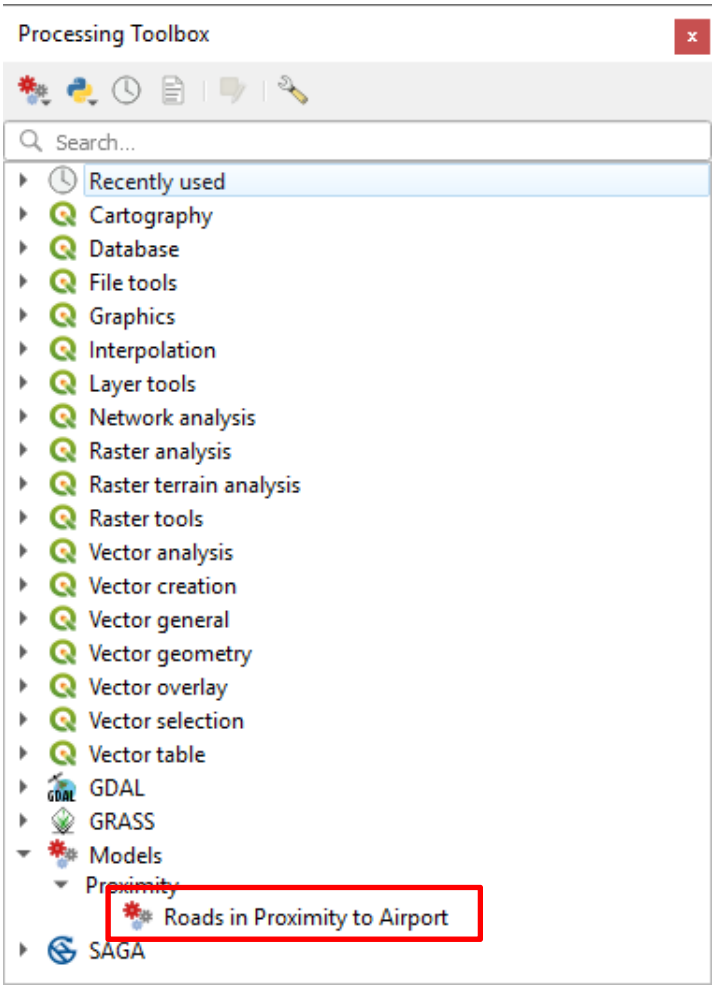


4. Create a new model; type in Roads in Proximity to Airport in “Enter model name here”, and type in Proximity in “Enter group name here”; click on the save button and the Save Model dialog will open

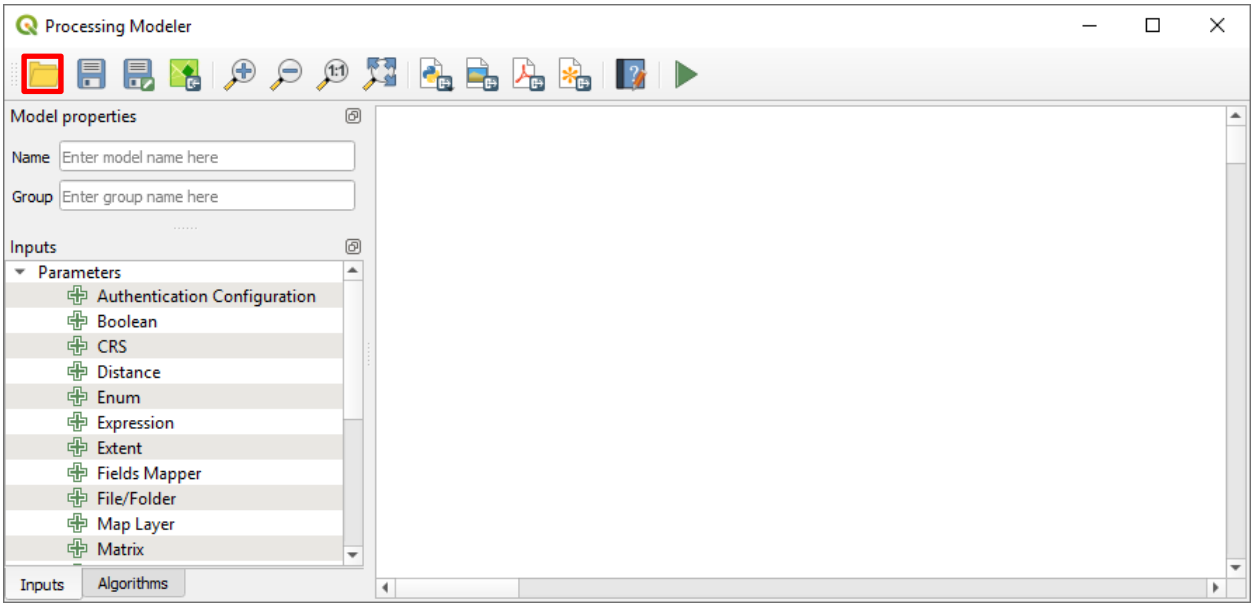


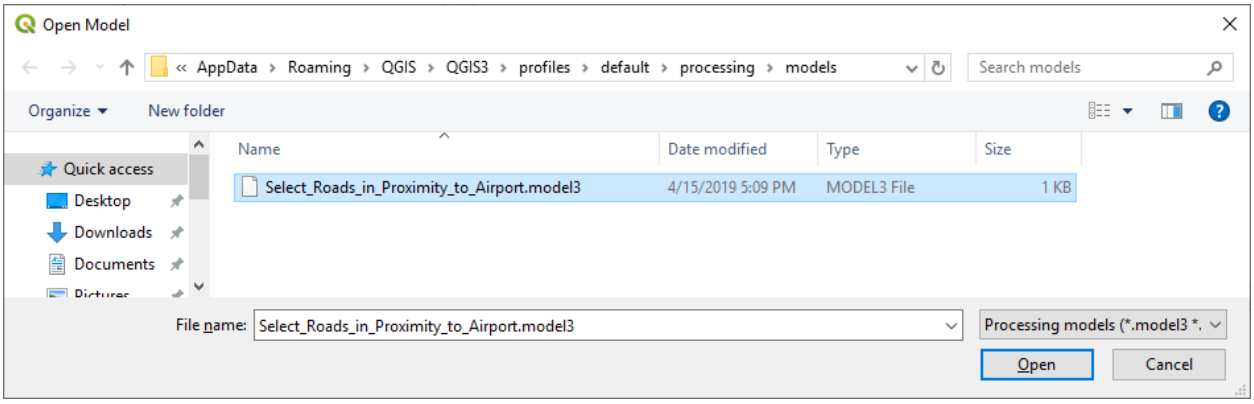
5. In the **Save Model** dialog, type in a name for your model file; the following figure shows the **Save Model** dialog; if models are saved to the **Models** folder, they will appear as model tools in the **Processing Toolbox** panel; the model will appear with the name that was entered into the graphical modeler as opposed to the name of the *.model file. Models can be saved outside the **Models** folder, but they will not appear in the **Processing Box** panel





6. To open a saved model, in the **Processing modeler** dialog, click on the button to open the **Open Model** dialog and then navigate to the location where you model has been saved



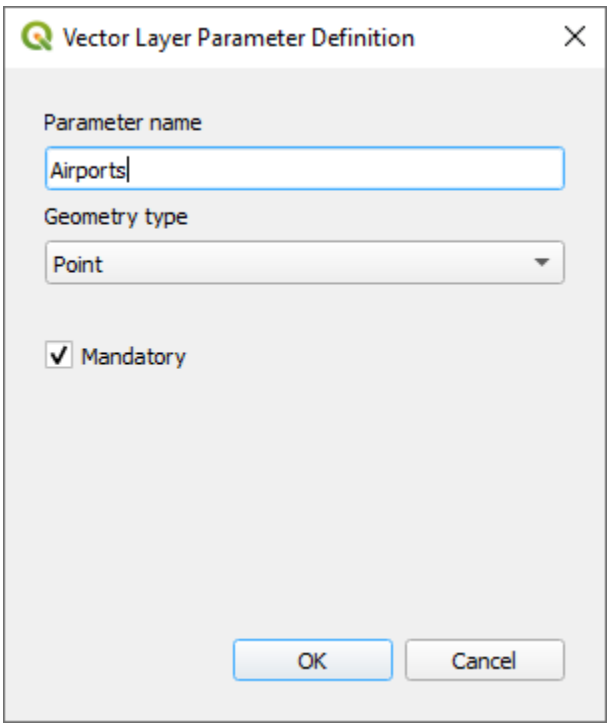


7. To begin the creation of a model, users will need to define the inputs. The graphical modeler will accept the followings as input:

- Boolean
- Extent
- File
- Number
- Raster layer
- String
- Table
- Table field
- Vector layer

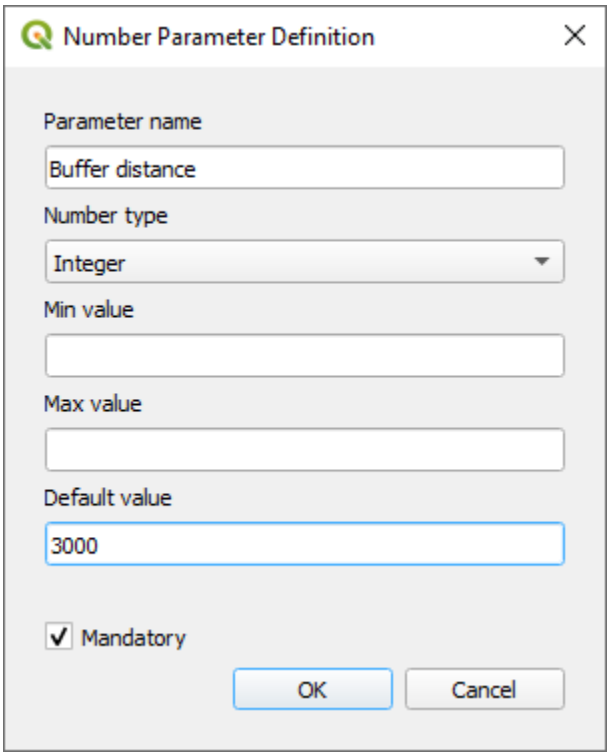
8. To add an input, either double-click on the appropriate category from the Inputs tab or drag the input onto the modeler canvas; the Parameter definition dialog will open; give the parameter a name and fill in any other details, which change depending on the input that is selected; when an input parameter is defined and added to the model, it is essentially a conceptual parameter; it is not actually be connected to a data layer until you are ready to run the model

9. For this exercise, we will add a vector layer; we will specify the geometry of the vector data and select it as a required parameter:

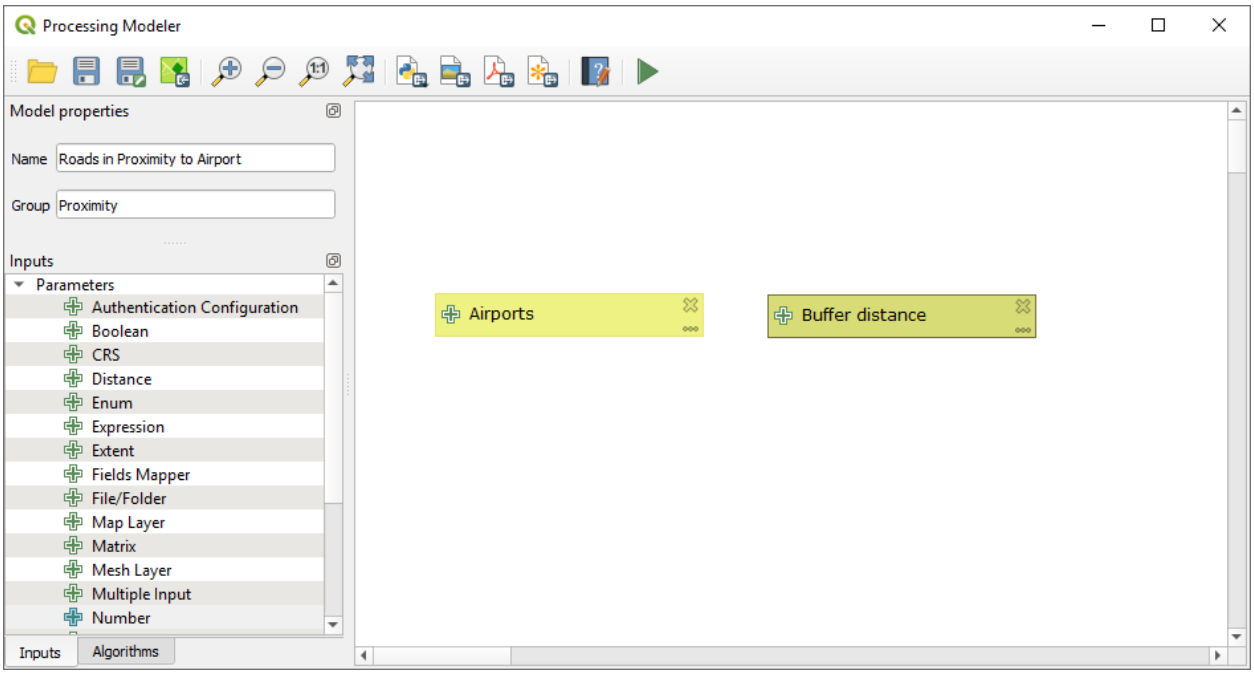


10. Once you click on OK, the input object will be added to the modeler canvas; all the objects in the modeler canvas can be selected with a mouse click and dragged to reposition; click on the three dots icon of an input will open the Parameter definition dialog to make changes; users can also double click on the objects to make changes

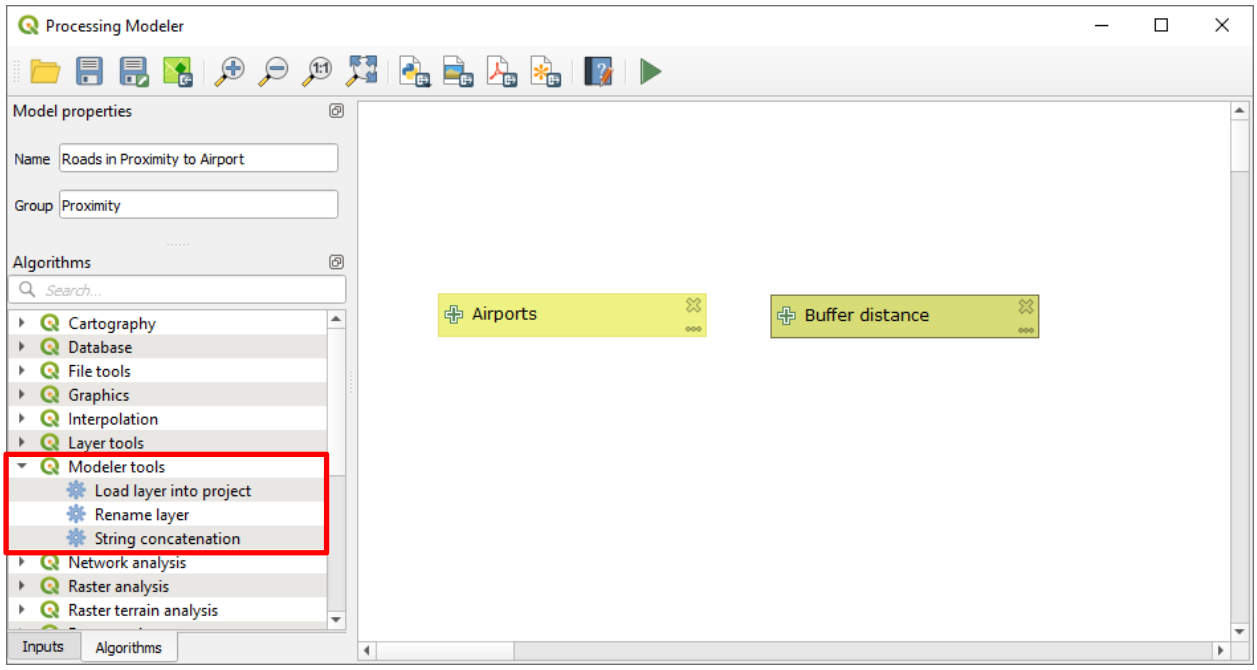
11. We will also add a number input, which allows us to expose the buffer distance value as an input that can be changed when the model is executed; it will be named “Buffer distance” and it will be given a Default value of 3000, since 3000 it the distance that we initially want to use Note: in the graphical modeler, distances are expressed in current project’s coordinate system units



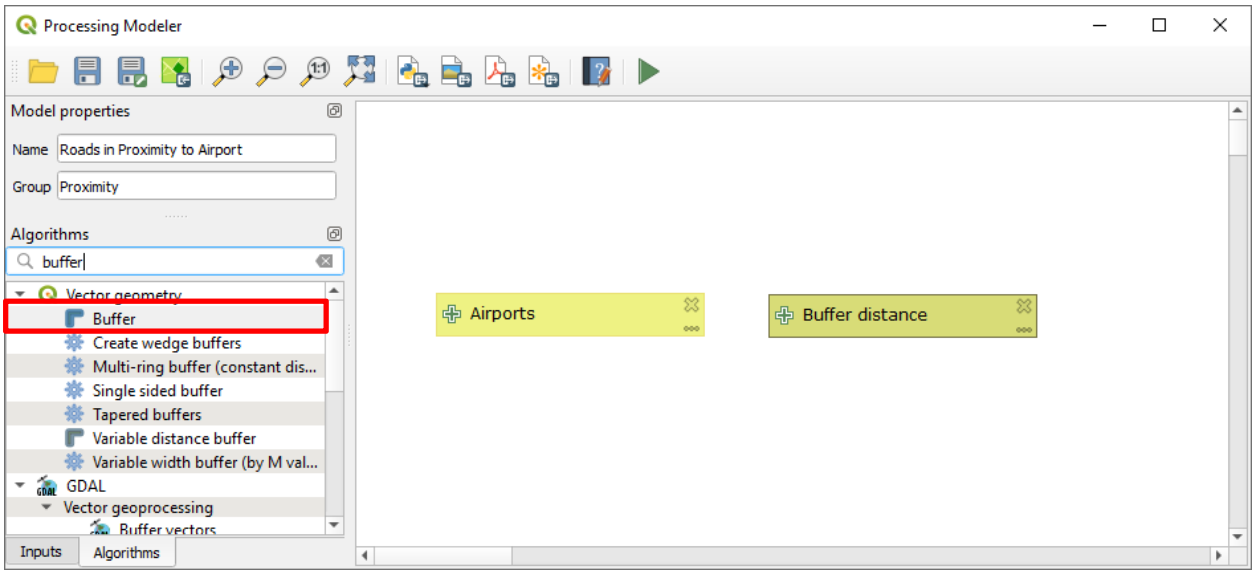
12. The following screenshot shows the model with a vector layer input and a number input



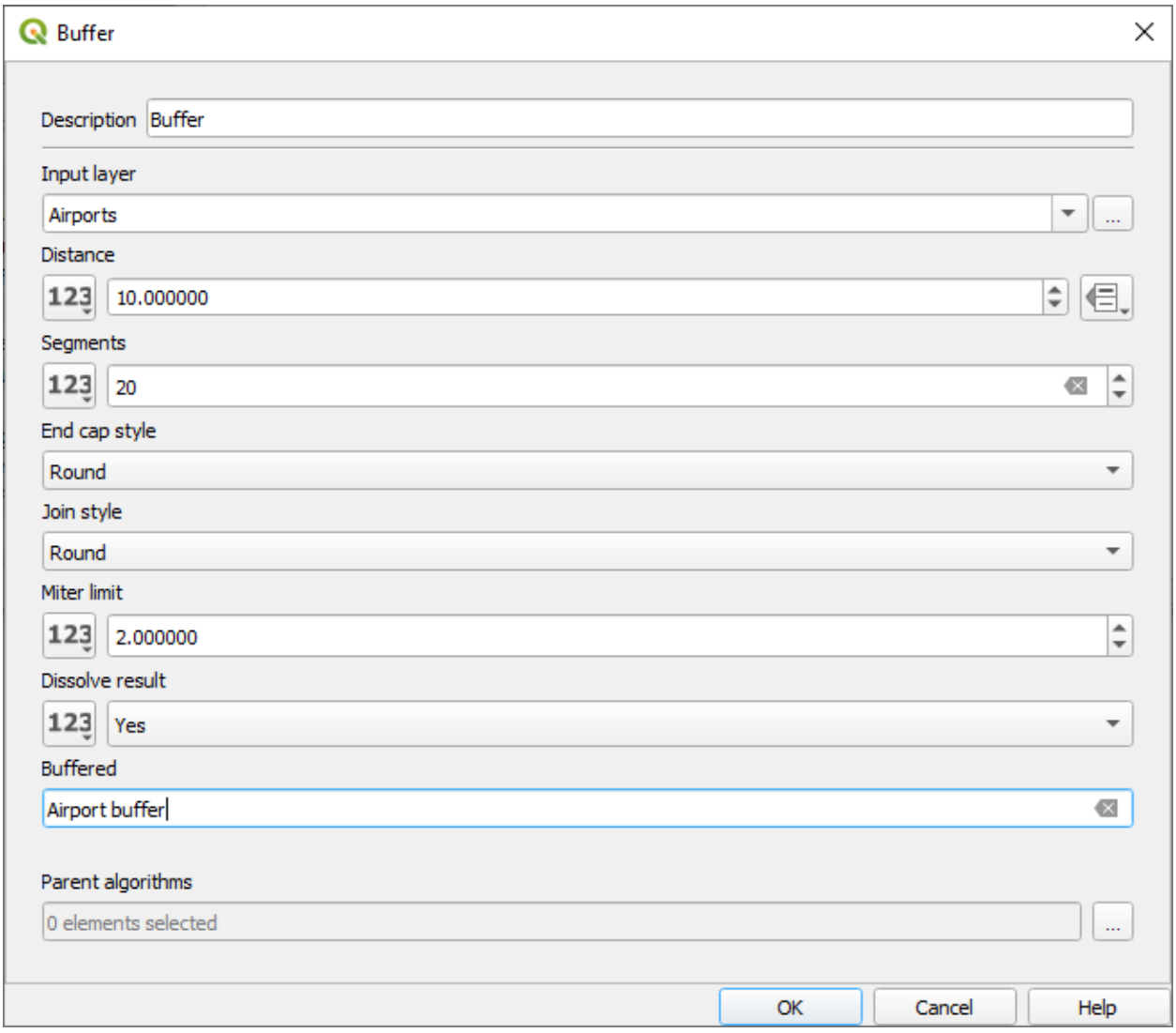
13. Algorithms are added to the graphical modeler in the same way as inputs; click on the "Algorithms" tab; in the Algorithms tab, there is a special category named Modeler tools, and there are three tools, including Calculator, Raster layer bounds, and Vector layer bounds; they are tools that can only be used in the graphical modeler



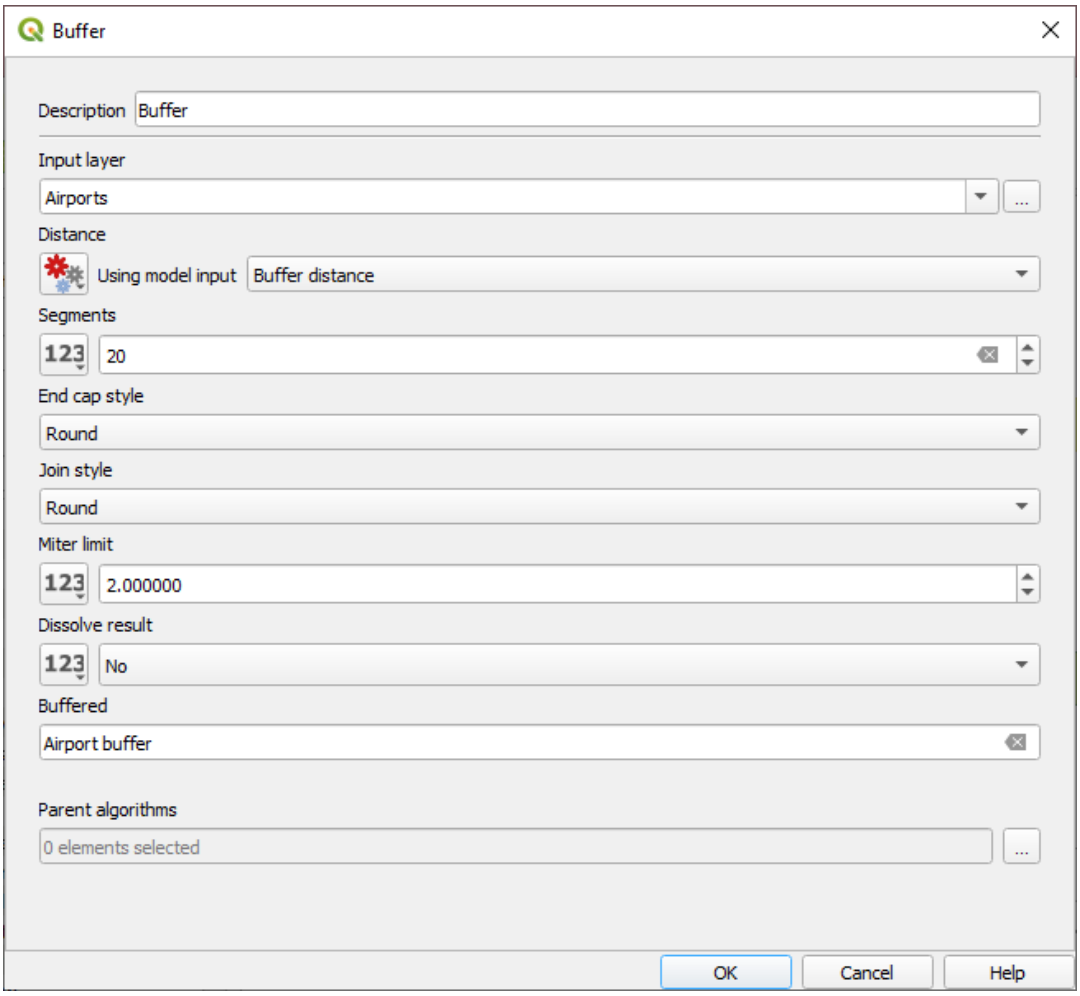
14. In the search bar, type in buffer and many tools show up; click on the "Buffer" tool in Vector geometry >>> Buffer



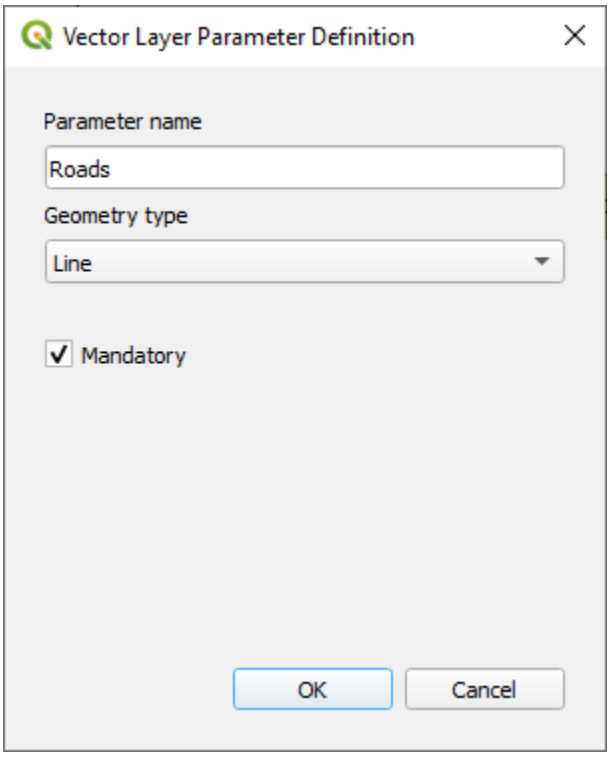
15. Drag the “Buffer” to the canvas and the Buffer dialog open; set up the parameters as below; the **Segments** indicate how many segments that your buffer circle will consist of (the more segments the smoother the circle; default value is 5); output will be Airport buffer;

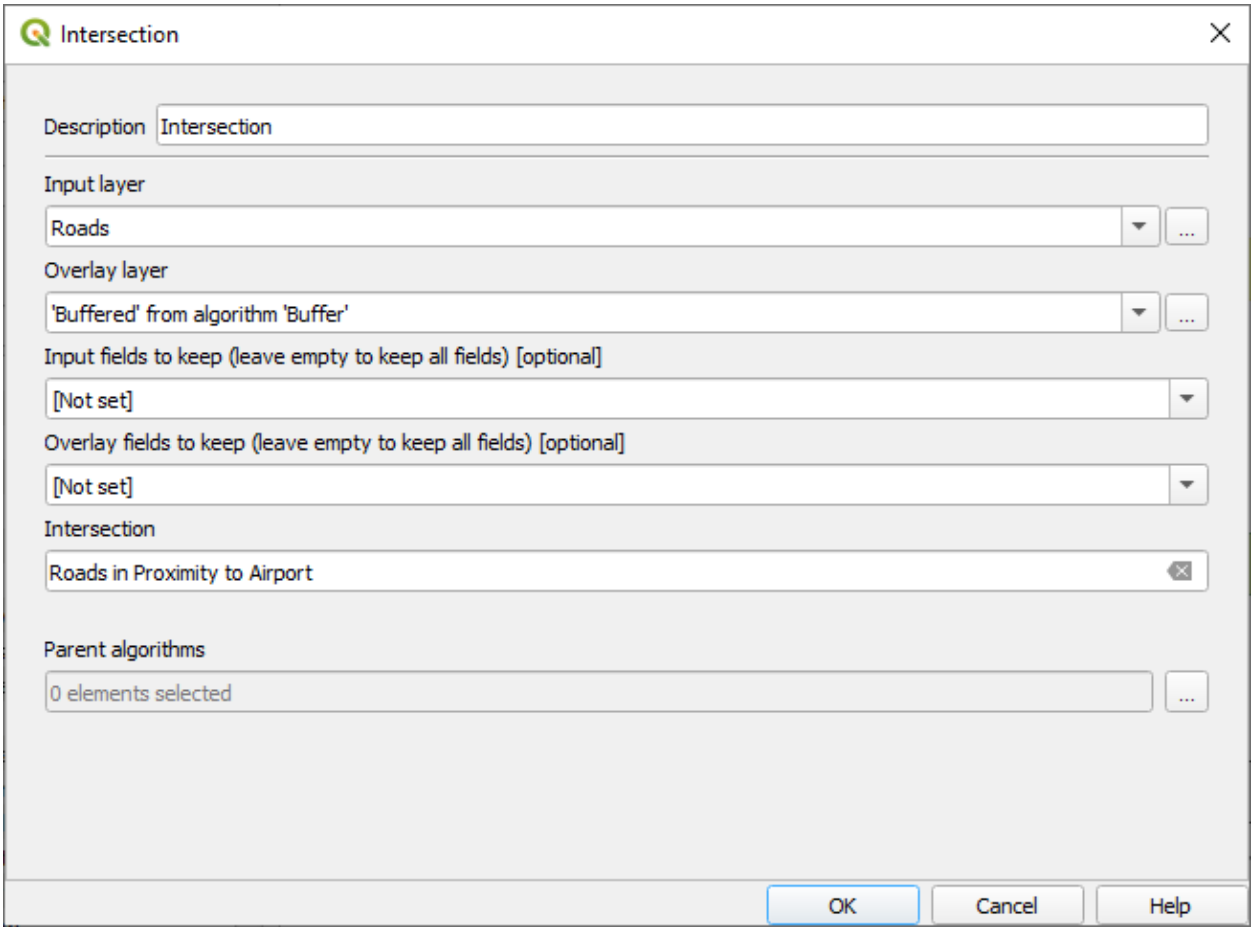


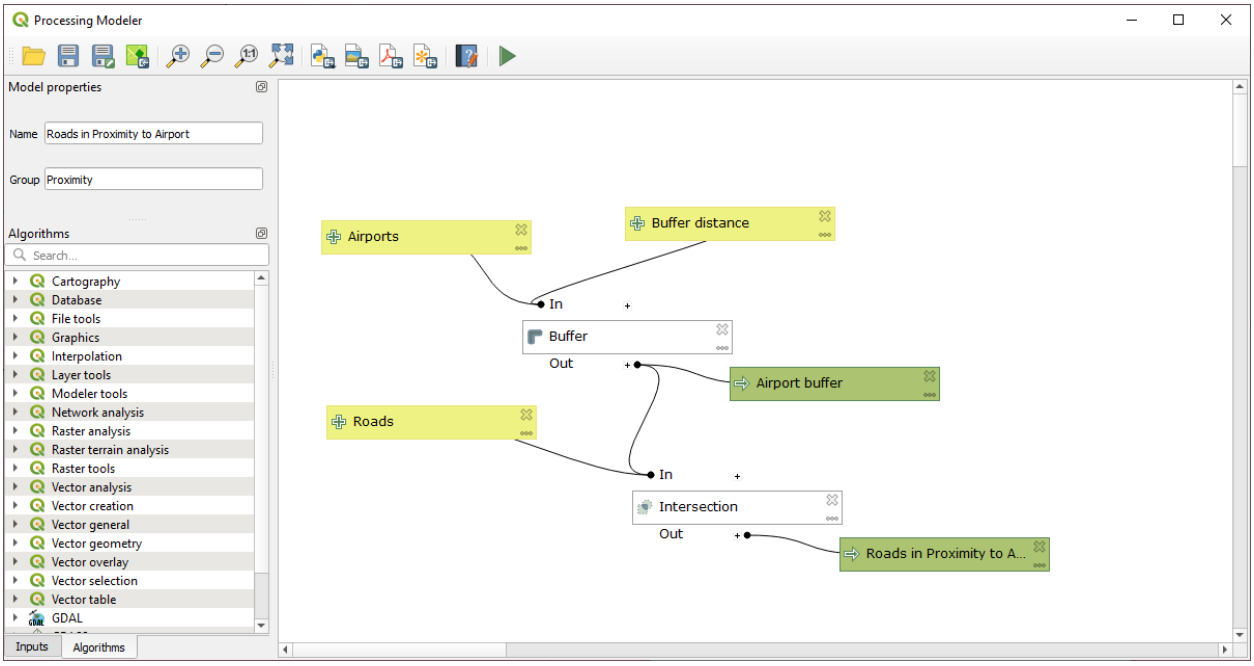
16. Next, click on the button next to Distance and then select Model Input of Buffer distance



16. Next, add the Roads layer and the Clip tool to the model using the following parameters




Intersection
Description
Intersection
Input layer
Roads
Overlay layer
'Buffered' from algorithm 'Buffer'
Input fields to keep (leave empty to keep all fields) [optional]
[Not set]
Overlay fields to keep (leave empty to keep all fields) [optional]
[Not set]
Intersection
Roads in Proximity to Airport
Parent algorithms
0 elements selected
OK
Cancel
Help


Processing Modeler
Model properties
Name
Roads in Proximity to Airport
Group
Proximity
Algorithms
Search...
Cartography
Database
File tools
Graphics
Interpolation
Layer tools
Modeler tools
Network analysis
Raster analysis
Raster terrain analysis
Raster tools
Vector analysis
Vector creation
Vector general
Vector geometry
Vector overlay
Vector selection
Vector table
GDAL
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Buffer distance
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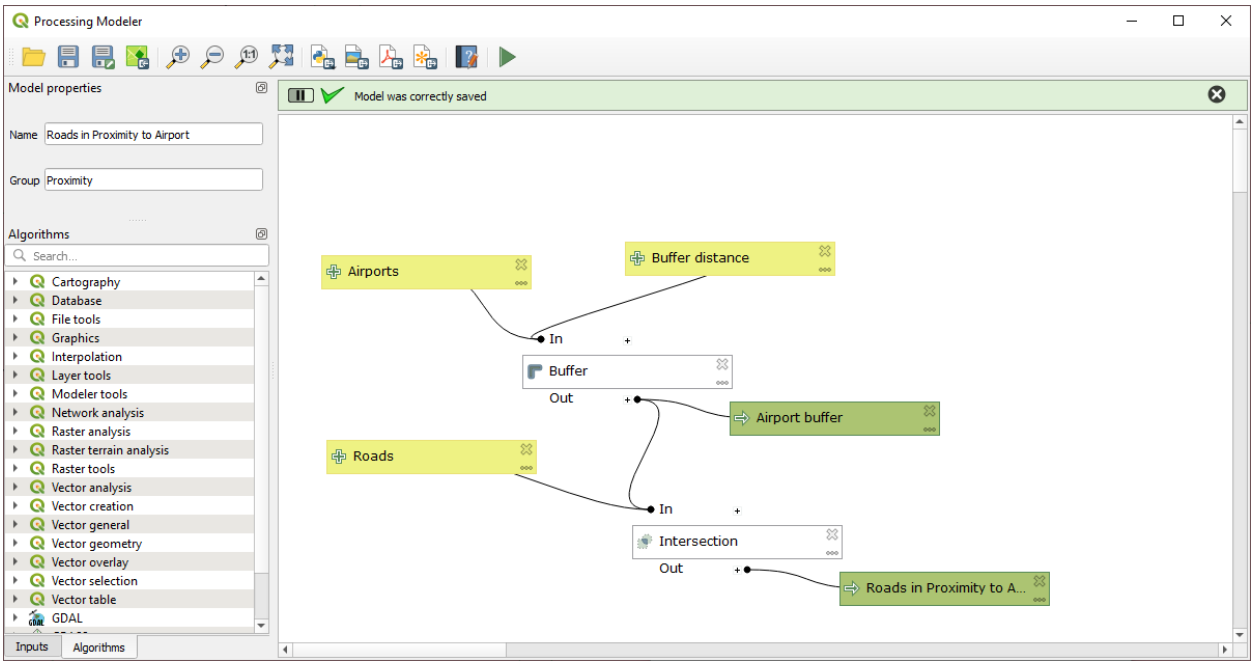
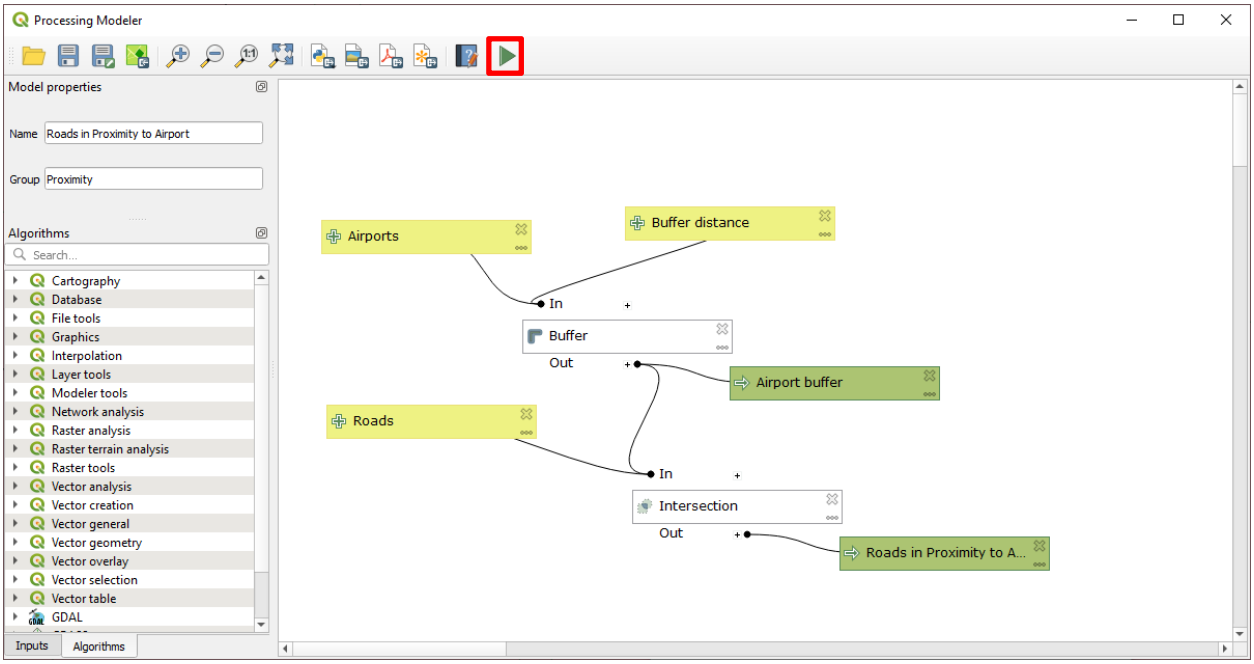
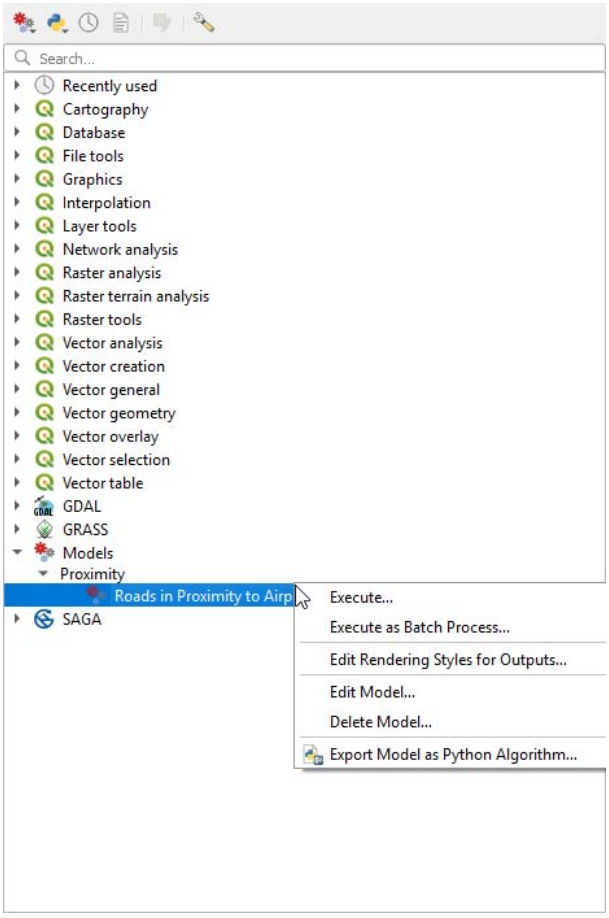
17. Click on the Save button to save your model and then close your model

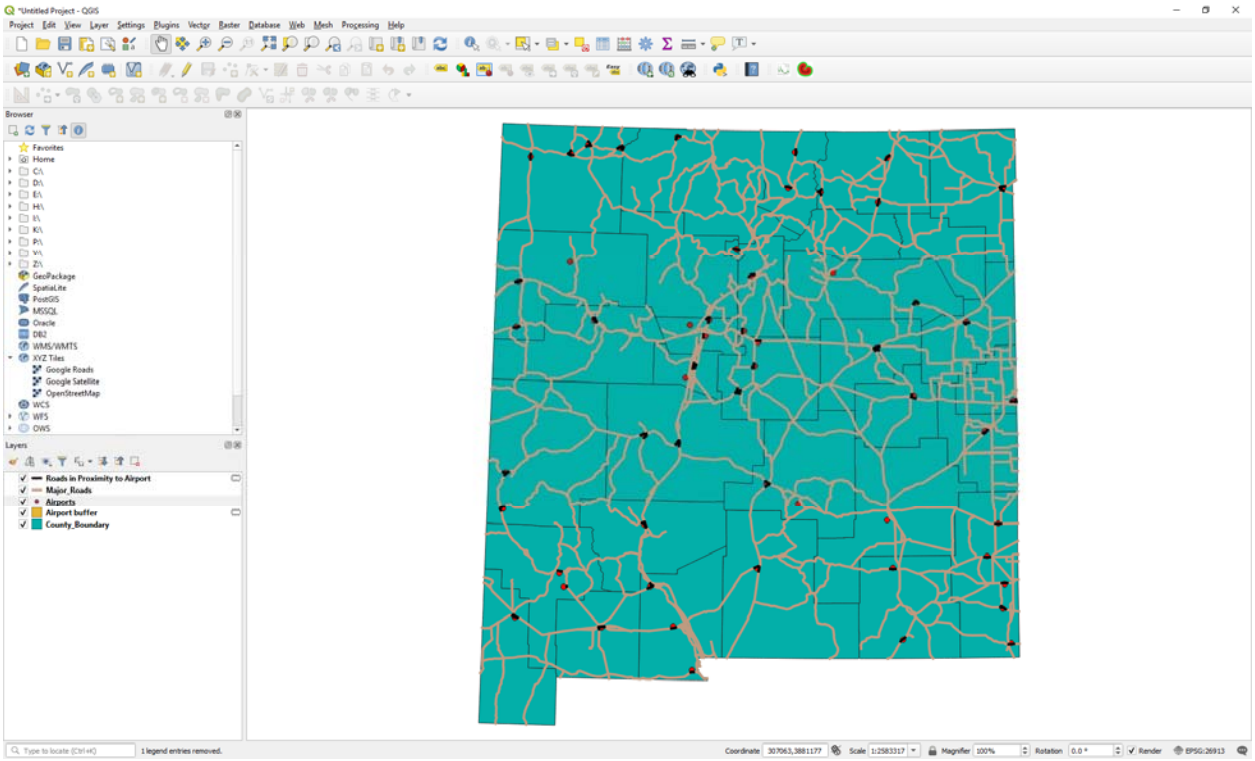


18. The model can be run either from the **Processing modeler** window or from the **Processing Toolbox** panel; in the **Processing modeler** window, click on the **Run model** button ▶; to run from the **Processing Toolbox**, first save and close the model and then find the model by navigating to model and then right-click on it, and choose **Execute** from the context menu





19. The tool will open with a regular tool interface, fill in the parameters as below and then click on Run; the results will be placed in the folder that you selected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Roads in Proximity to Airport
Major_Roads
Airports
Airport buffer
County_Boundary
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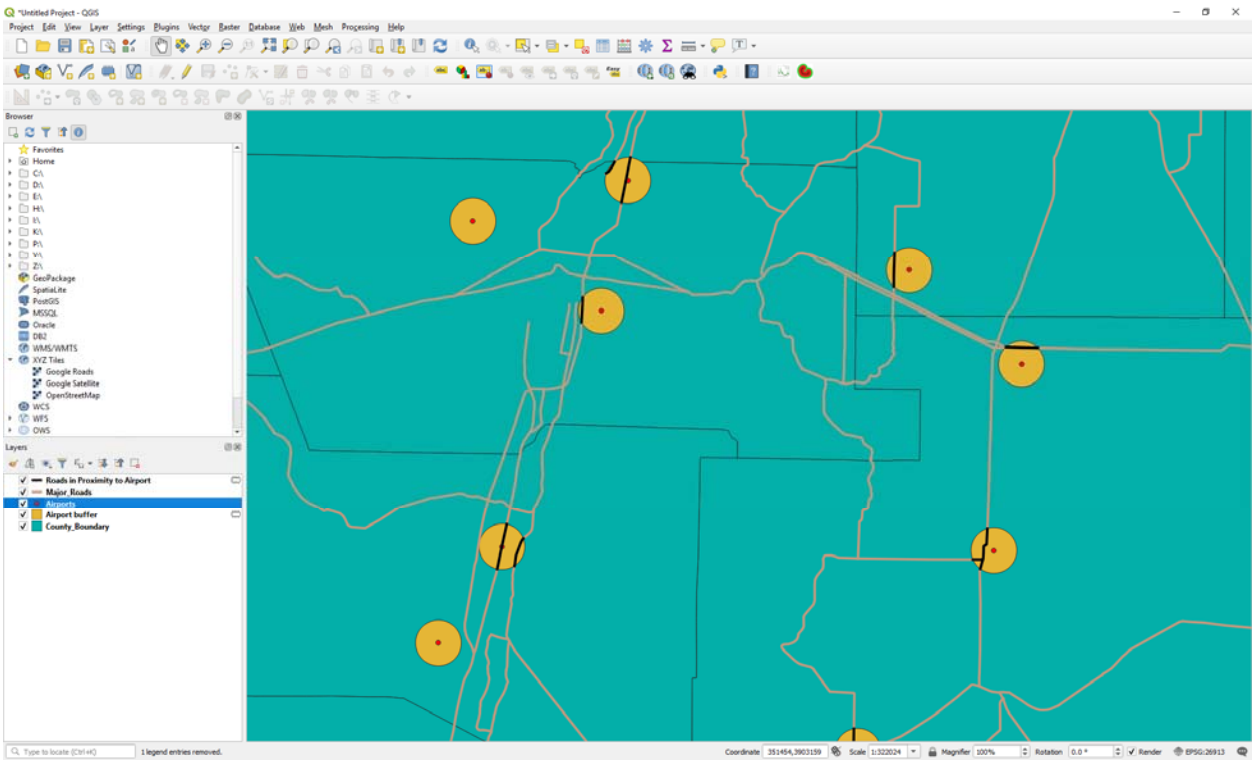
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