QGIS Workshop

1. Introduction to Quantum GIS (QGIS)

QGIS is a free and open source Geographic Information System (GIS).

QGIS can help users create, edit, visualize, analyze, and publish geospatial information on various operating systems including Windows, Mac OS, Linux, BSD, etc.

2. QGIS vs. ArcMap

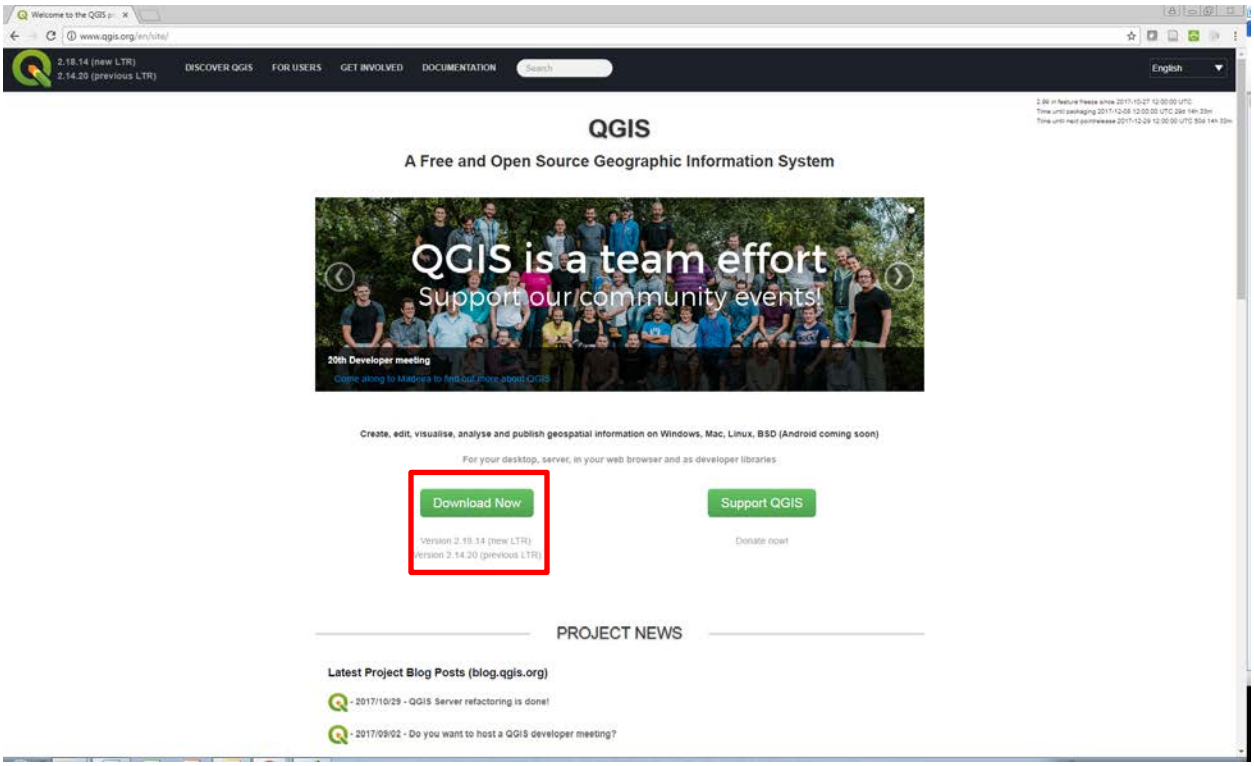
QGIS --- free and open source software package, more stable, less analysis tools, multi-platform

ArcMap --- commercial software package, less stable, more analysis tools, single-platform

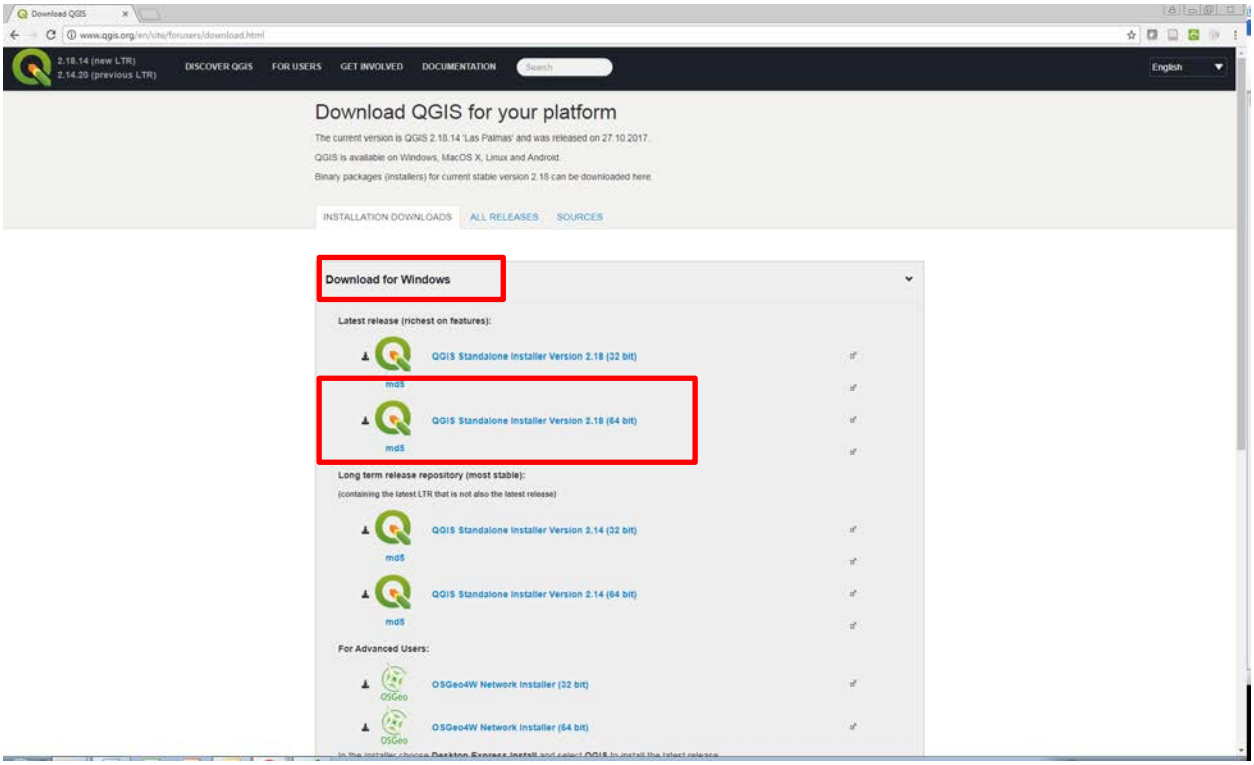
3. Download QGIS

Please go to www.qgis.com

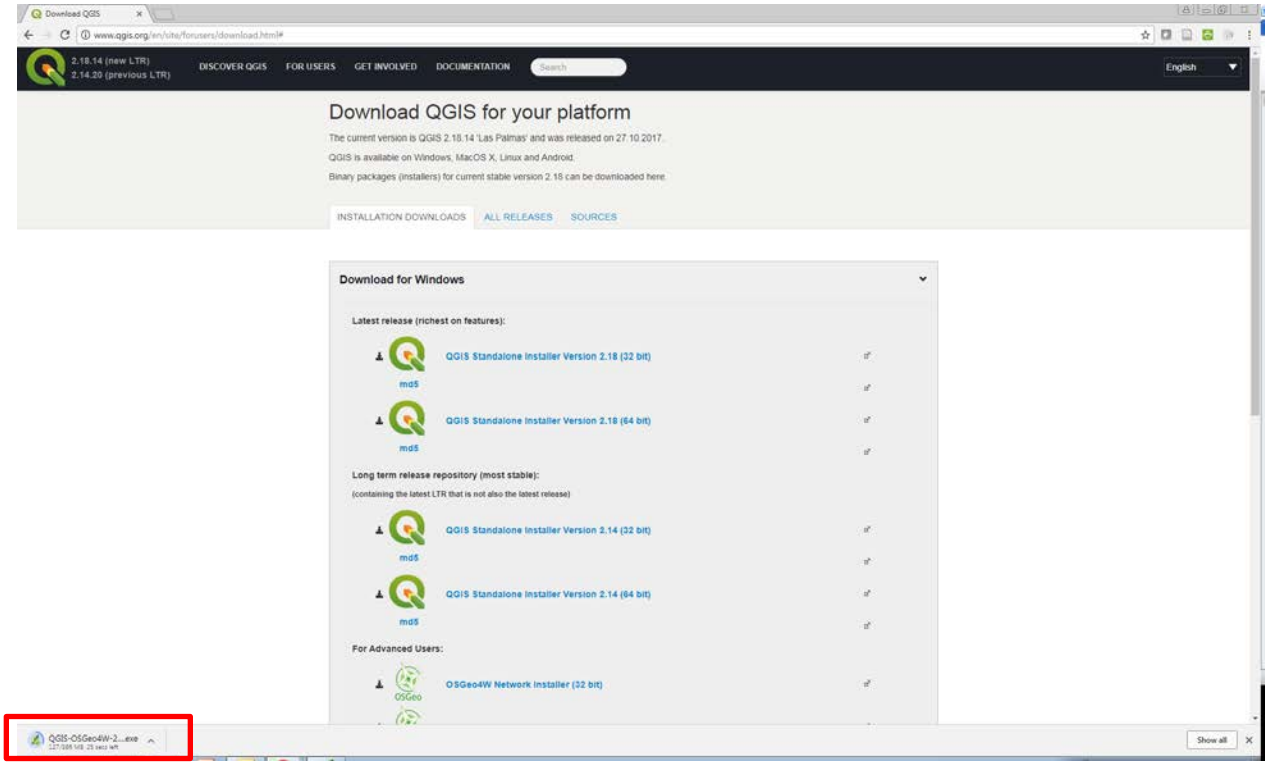
1) You will see a webpage looks like this; please click download now



2) Select the latest version that is compatible with your operating system to download; please download the 64-bit version if it is compatible with the operating system



3) Once you click QGIS Standalone Installer Version 2.18 (64 bit), your browser should be able to automatically download the QGIS installer.



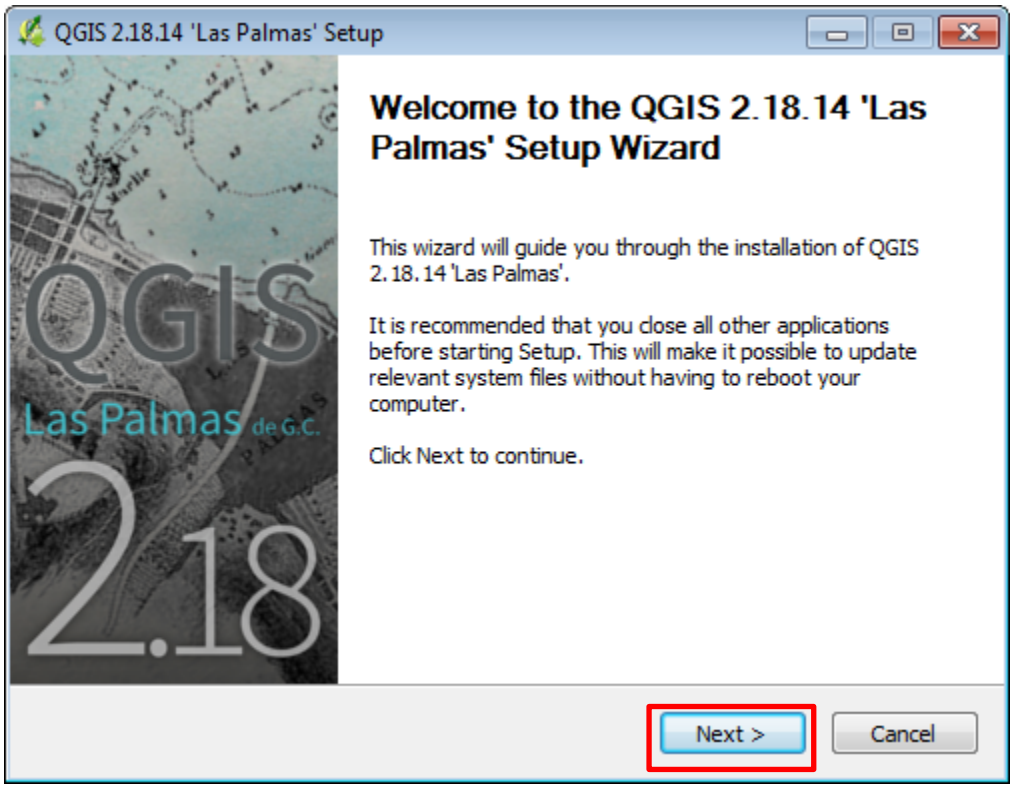
4. QGIS Installation

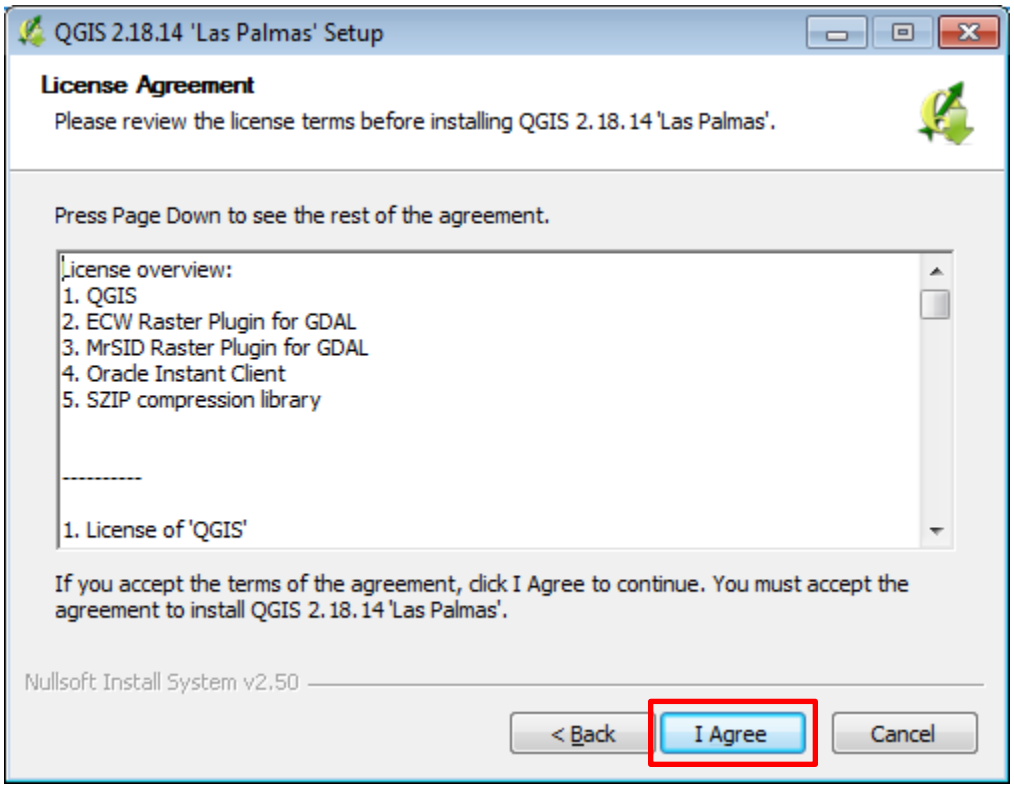
1) Double click the installer that you have downloaded

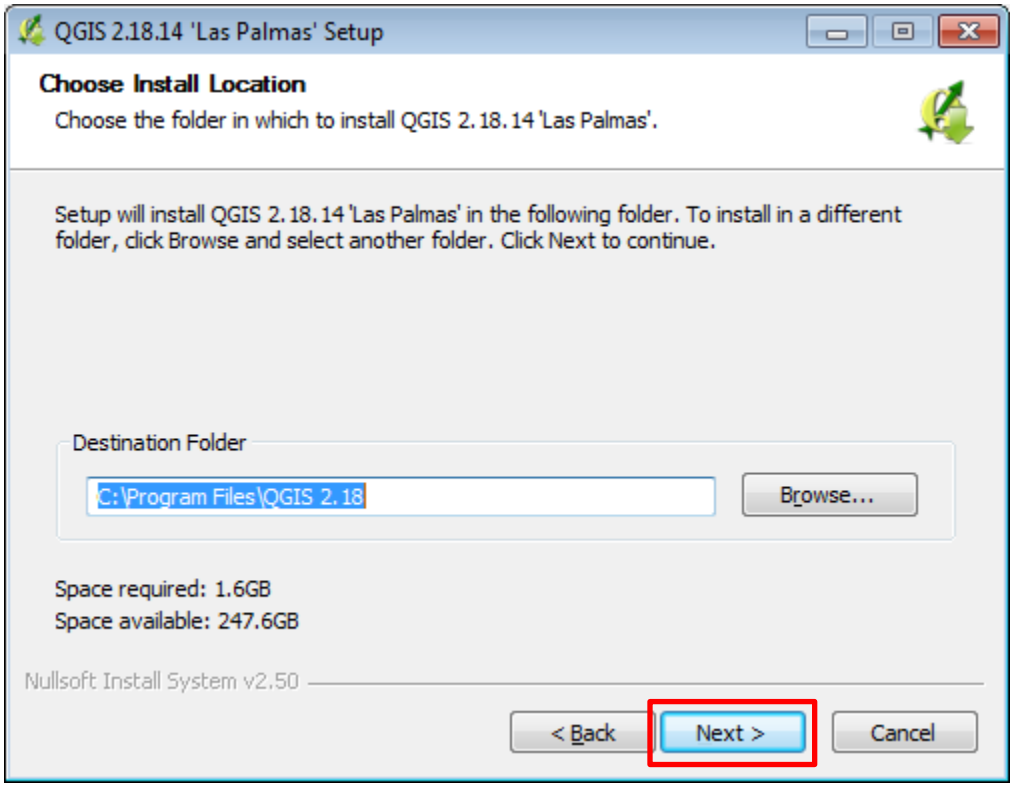
2) QGIS Setup Wizard should show up

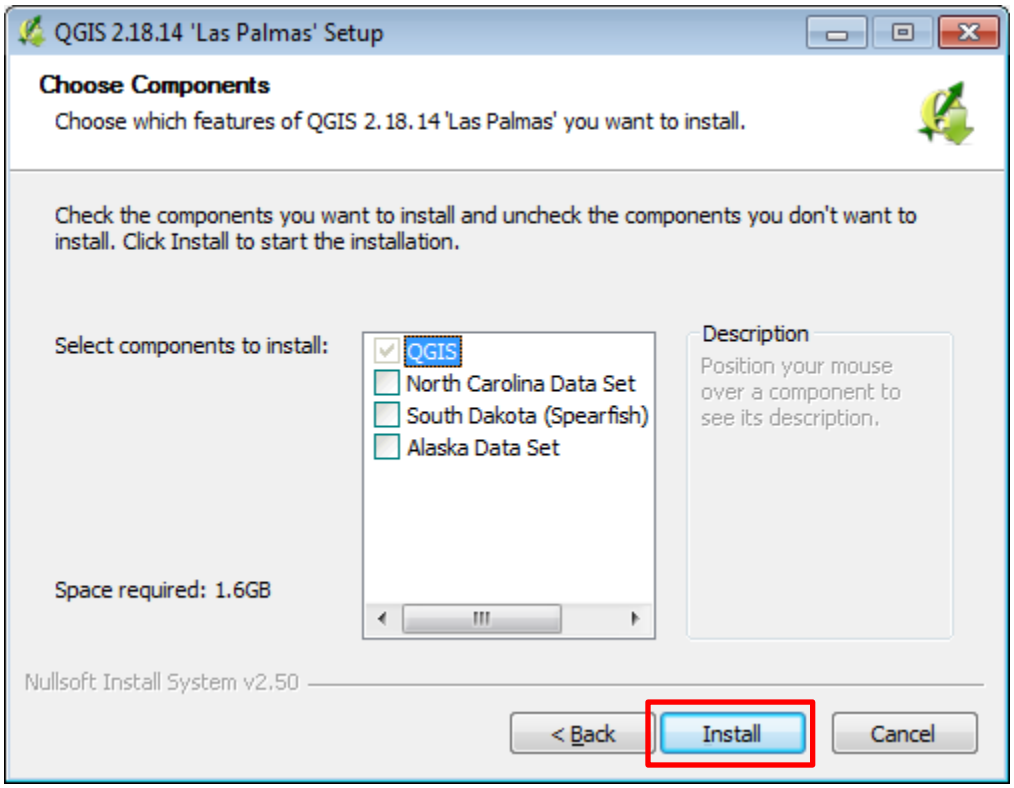
3) Click Next to start the installation process

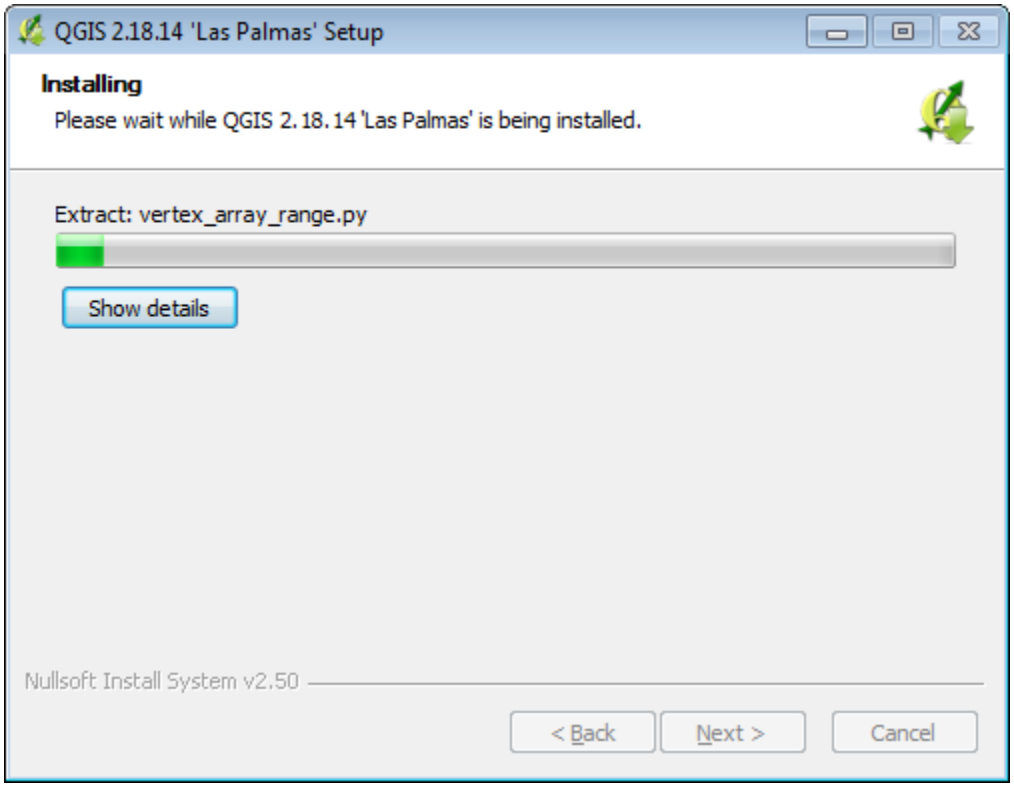
4) You will see the License Agreement, installation location, components to install, etc.



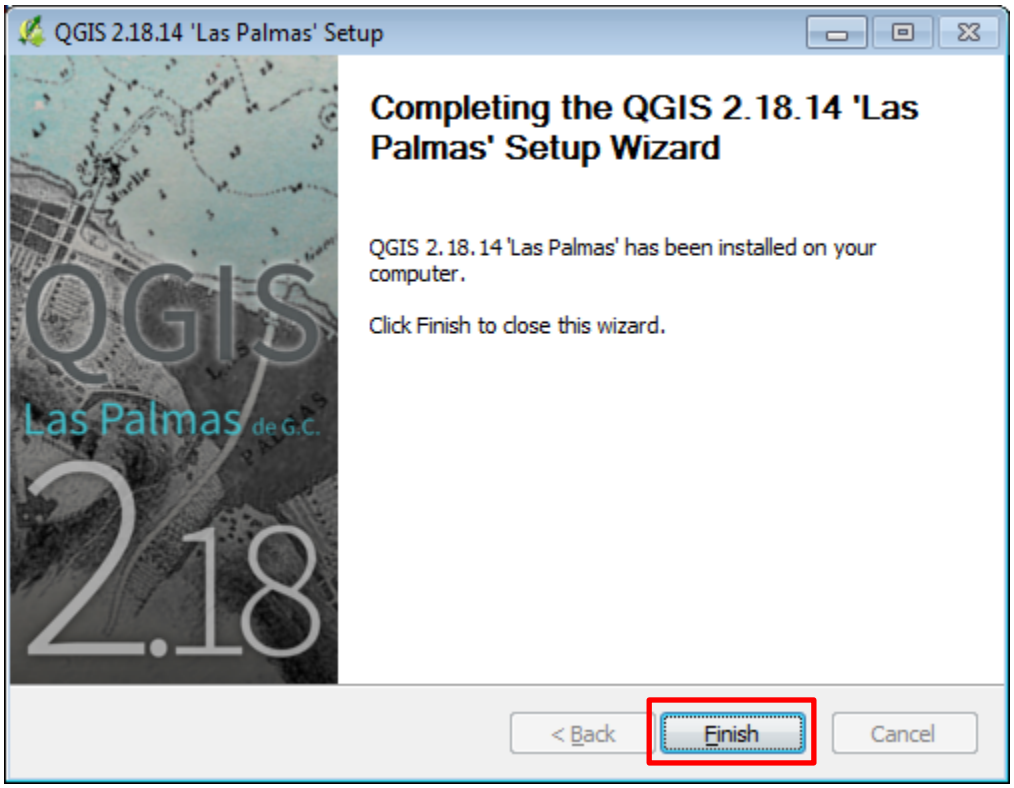

QGIS 2.18.14 'Las Palmas' Setup
License Agreement
Please review the license terms before installing QGIS 2.18.14 'Las Palmas'.
Press Page Down to see the rest of the agreement.
License overview:
1. QGIS
2. ECW Raster Plugin for GDAL
3. MrSID Raster Plugin for GDAL
4. Oracle Instant Client
5. SZIP compression library
---
1. License of 'QGIS'
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install QGIS 2.18.14 'Las Palmas'.
Nullsoft Install System v2.50
< Back
I Agree
Cancel


QGIS 2.18.14 'Las Palmas' Setup
Choose Install Location
Choose the folder in which to install QGIS 2.18.14 'Las Palmas'.
Setup will install QGIS 2.18.14 'Las Palmas' in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.
Destination Folder
C:\Program Files\QGIS 2.18
Browse...
Space required: 1.6GB
Space available: 247.6GB
Nullsoft Install System v2.50
< Back
Next >
Cancel


QGIS 2.18.14 'Las Palmas' Setup
Choose Components
Choose which features of QGIS 2.18.14 'Las Palmas' you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Install to start the installation.
Select components to install:
QGIS
North Carolina Data Set
South Dakota (Spearfish)
Alaska Data Set
Description
Position your mouse over a component to see its description.
Space required: 1.6GB
Nullsoft Install System v2.50
< Back
Install
Cancel


QGIS 2.18.14 'Las Palmas' Setup
Installing
Please wait while QGIS 2.18.14 'Las Palmas' is being installed.
Extract: vertex_array_range.py
Show details
Nullsoft Install System v2.50
< Back
Next >
Cancel

5) Click Finish to complete the installation

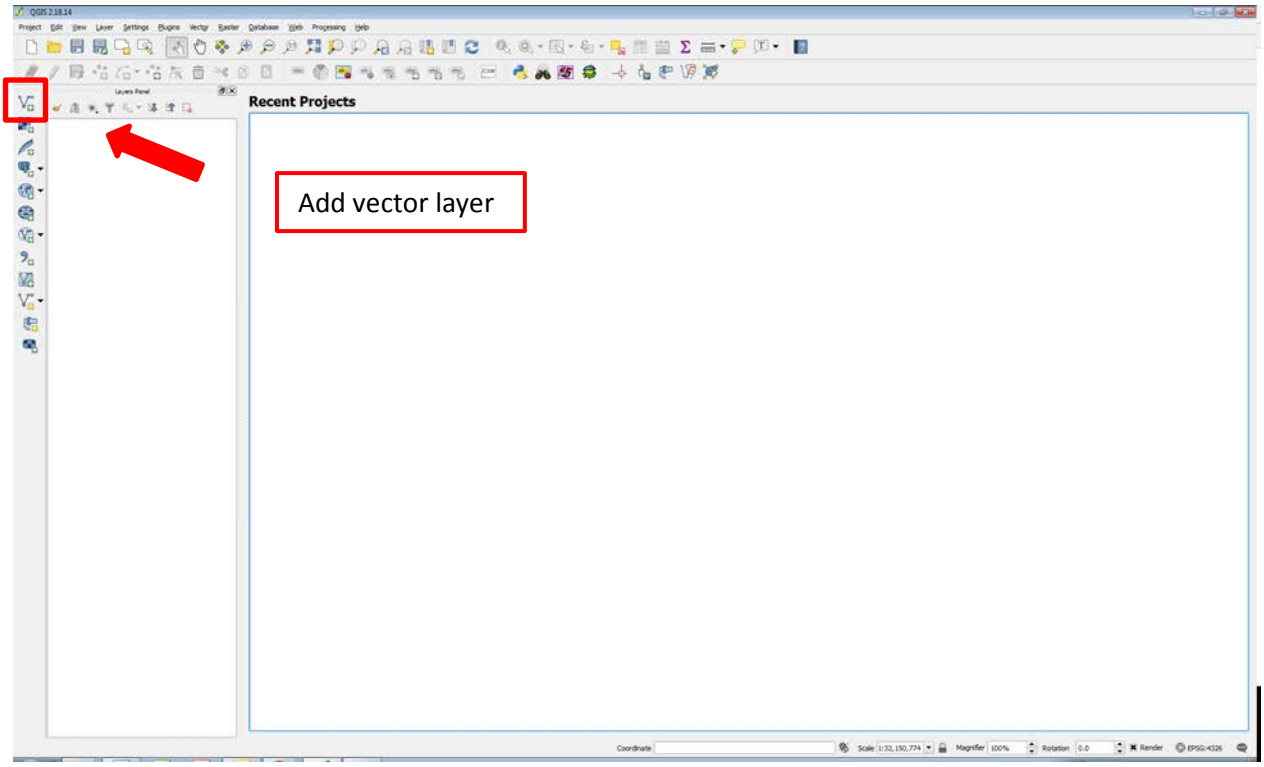


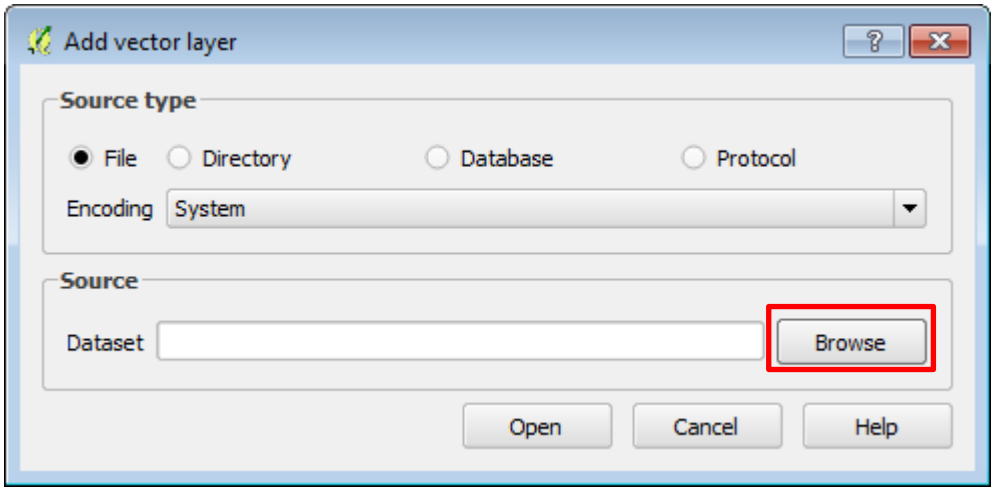
4. Start QGIS

Click the "QGIS Desktop 2.18.14" application icon on your desktop or please go to my computer ---- all programs (all apps for Windows 10) --- QGIS Desktop 2.18.14

Note: The first time may take a few minutes to start. For this workshop, we will only focus on vector data (points, polylines, and polygons).

1. Click Add vector layer button

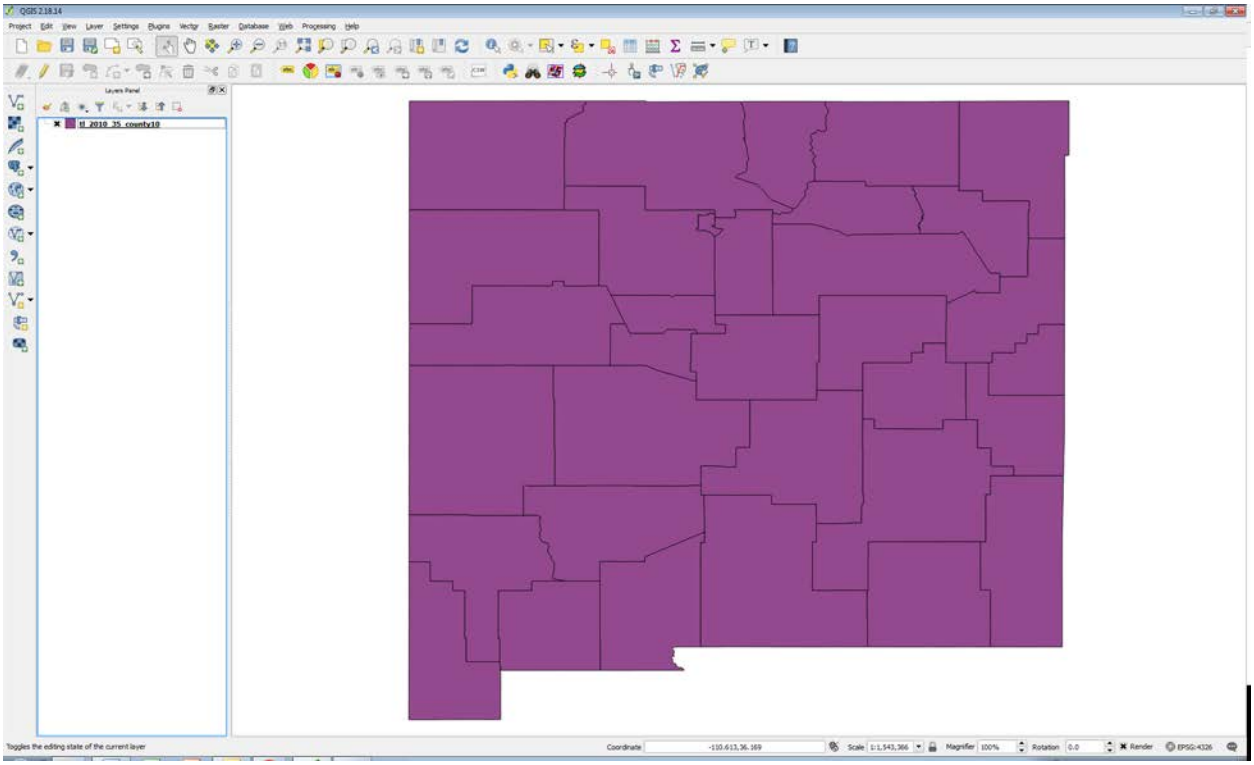




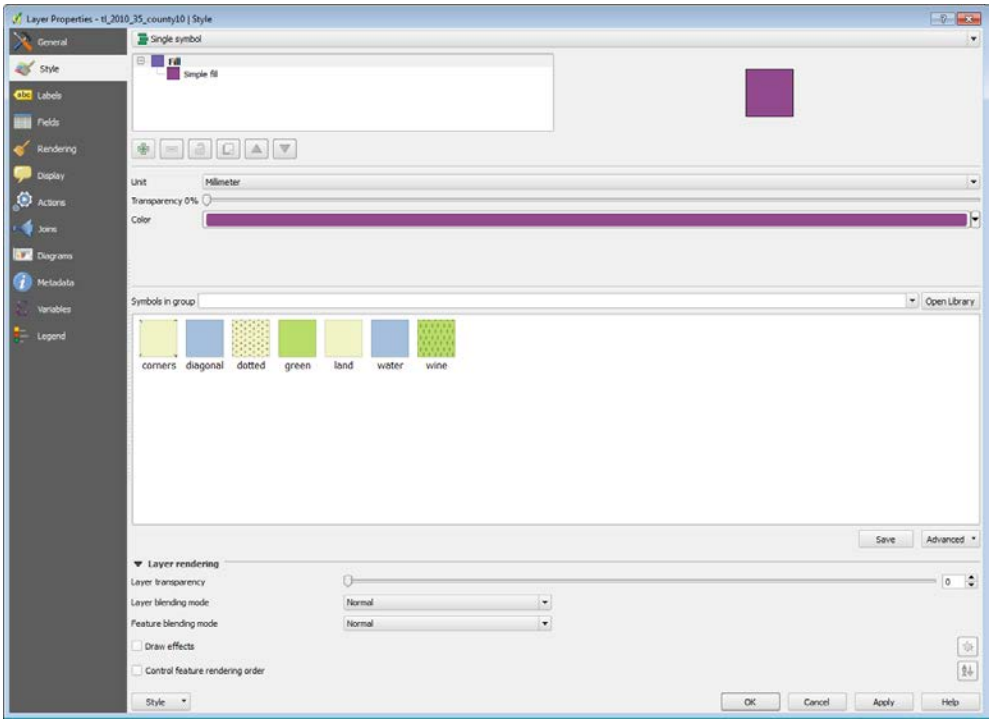
2) Browse to the path that you save your data; make sure you choose the "SHP File" file in Type to upload, please load the New Mexico County Boundary polygon shapefile first

5. Basic Editing

1) Now you should have already successfully added the New Mexico county boundary polygon shapefile, and it should look like this



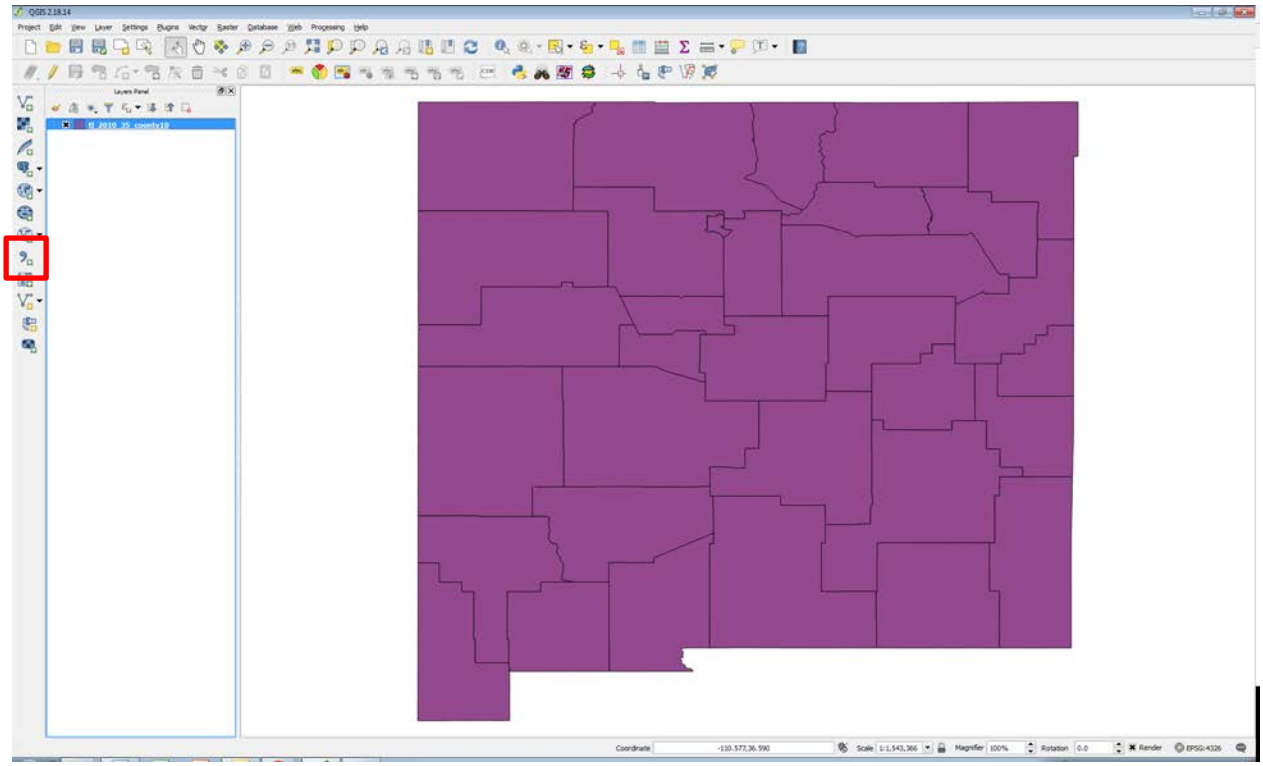
2) Right click on the layer name, and then choose Properties for editing

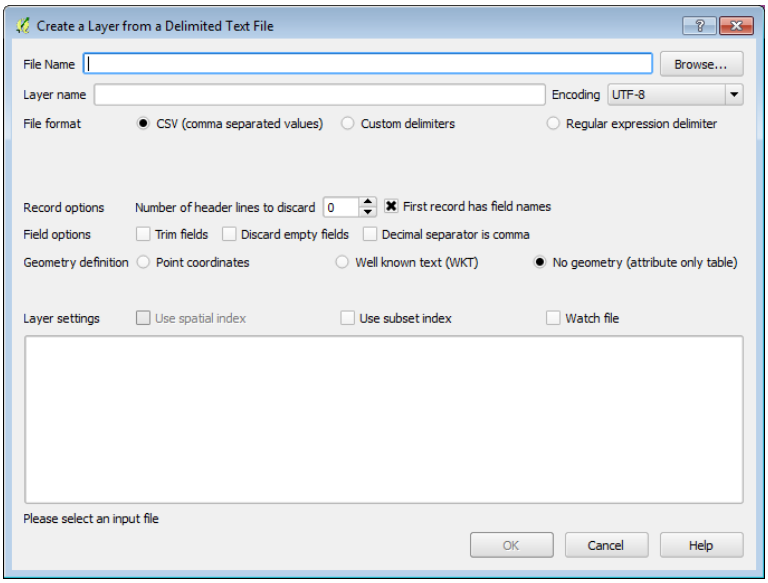


3) Table Join

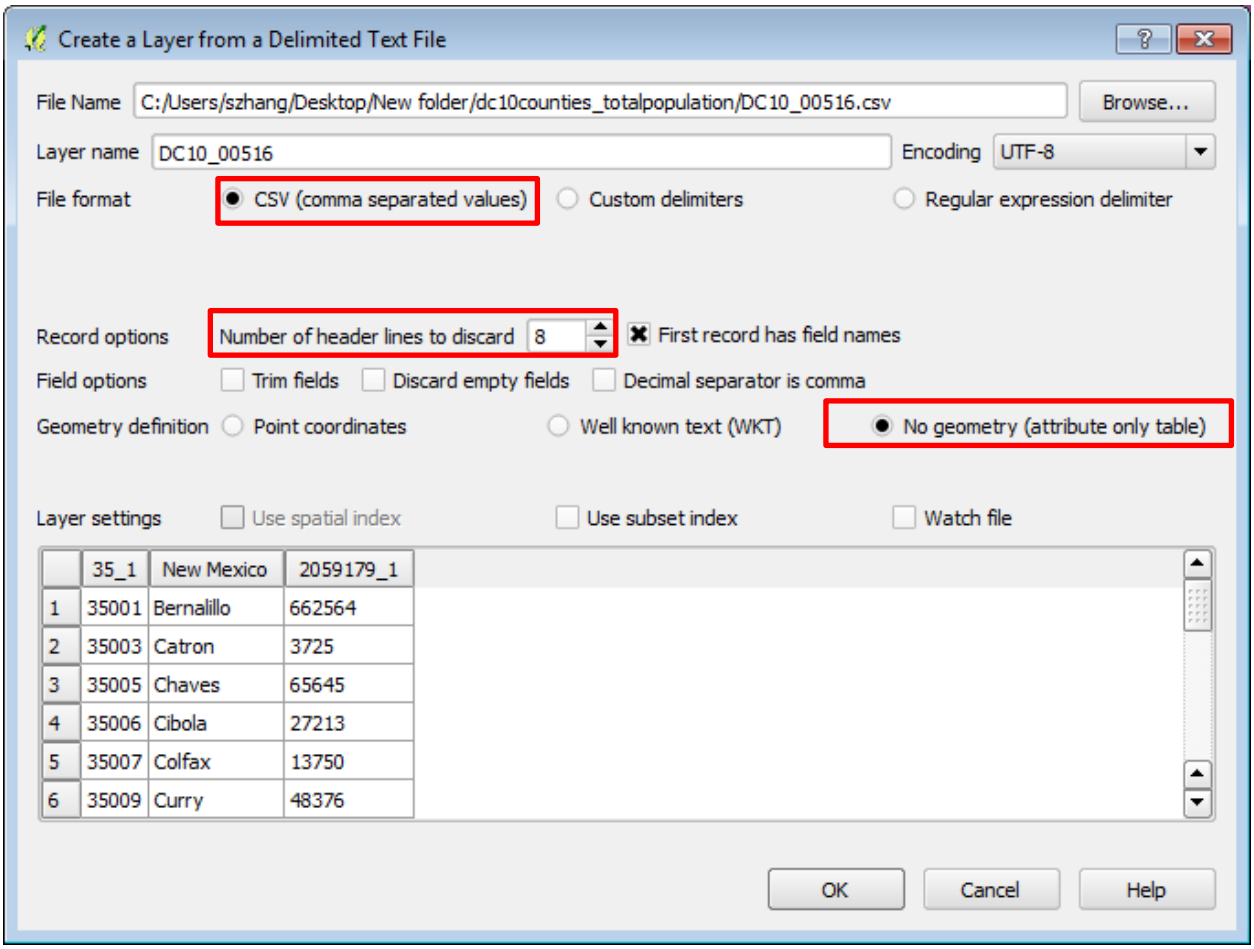
Sometimes a single shapefile does not include all the information that you want, which makes "table join" tool to be necessary and useful. Table join is typically used to append the fields of one table to another through an attribute or field common to both tables.

a. Click Add Delimited Text Layer, and then the create a layer from a Delimited Text File dialogue should show up



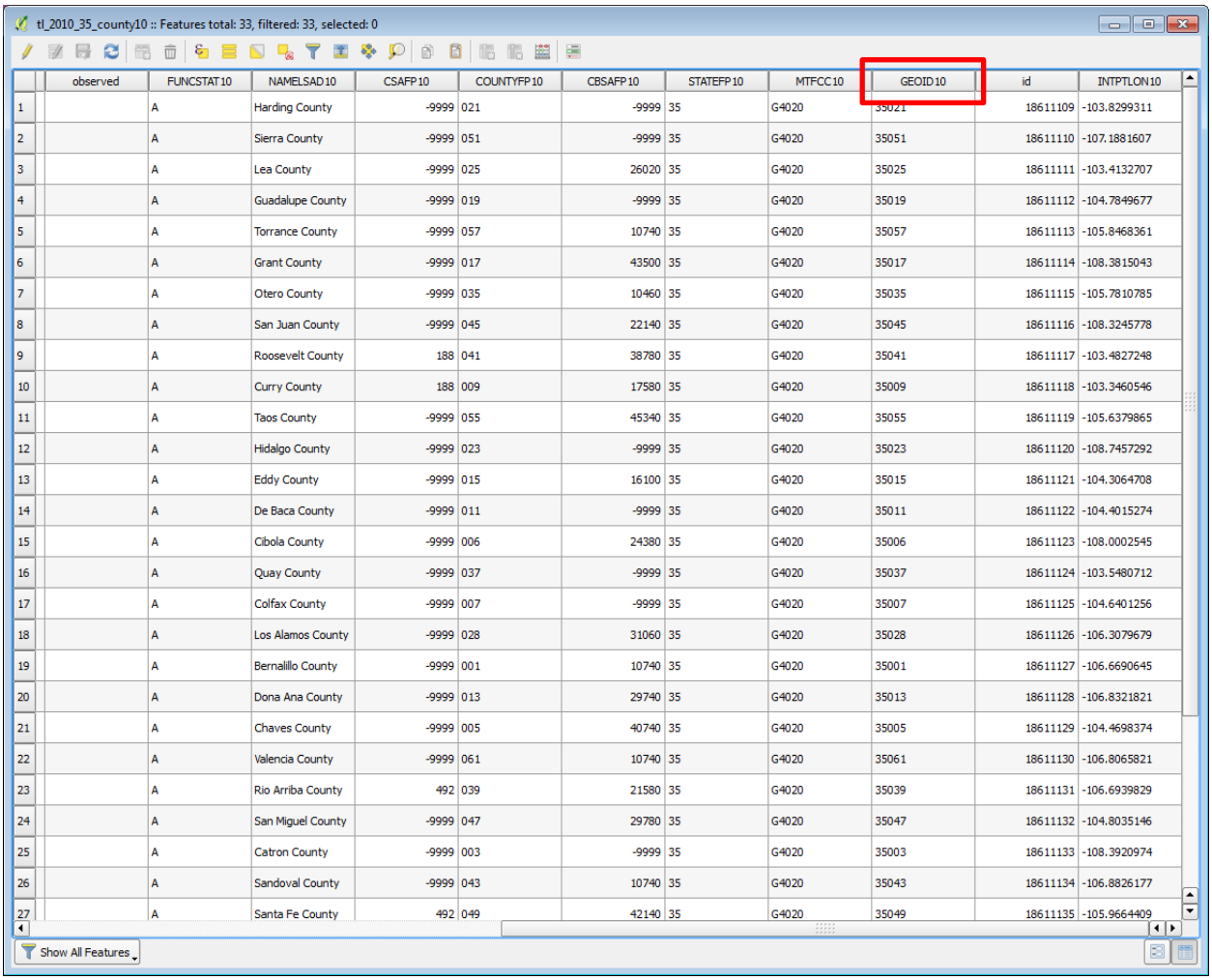


b. Browse to the path that you save your population data, make sure you choose the csv file; the file format should be “Microsoft Comma Separated Values File”, the number of header lines to discard should be 8, and the geometry definition should be no geometry (attribute only table)



	35_1	New Mexico	2059179_1
1	35001	Bernalillo	662564
2	35003	Catron	3725
3	35005	Chaves	65645
4	35006	Cibola	27213
5	35007	Colfax	13750
6	35009	Curry	48376

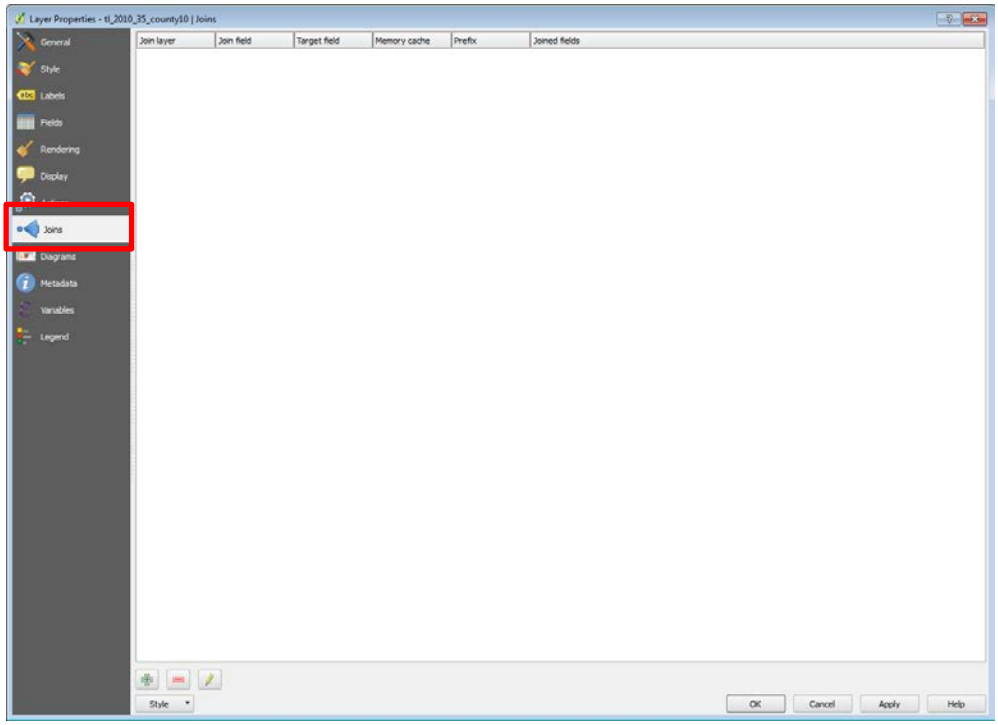
c. Right click on the layer name of the New Mexico county boundary (tl_2010_35_county10), and then click on Open Attribute Table, please browse the table to find unique IDs (GEOID10) and examine it

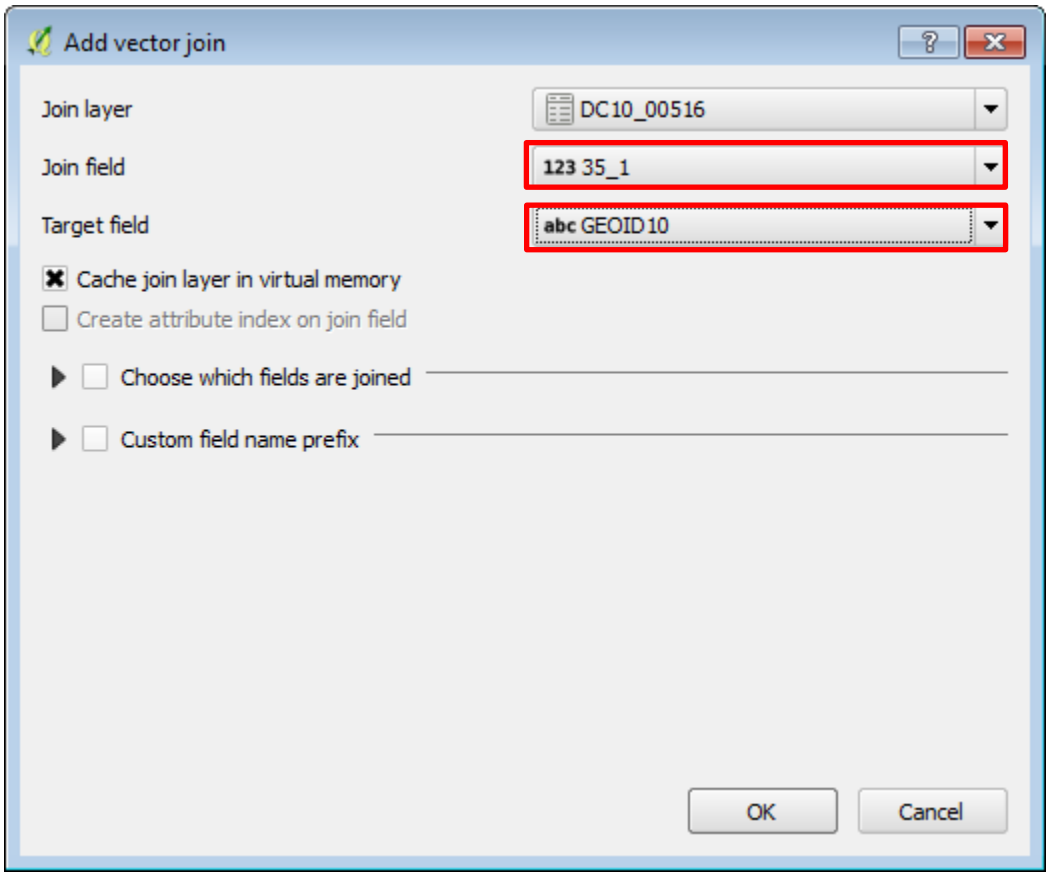


	observed	FUNCSTAT10	NAMELSAD10	CSAFP10	COUNTYFP10	CBSAFP10	STATEFP10	MTFCC10	GEOID10	id	INTPTLON10
1		A	Harding County	-9999	021	-9999	35	G4020	35021	18611109	-103.8299311
2		A	Sierra County	-9999	051	-9999	35	G4020	35051	18611110	-107.1881607
3		A	Lea County	-9999	025	26020	35	G4020	35025	18611111	-103.4132707
4		A	Guadalupe County	-9999	019	-9999	35	G4020	35019	18611112	-104.7849677
5		A	Torrance County	-9999	057	10740	35	G4020	35057	18611113	-105.8468361
6		A	Grant County	-9999	017	43500	35	G4020	35017	18611114	-108.3815043
7		A	Otero County	-9999	035	10460	35	G4020	35035	18611115	-105.7810785
8		A	San Juan County	-9999	045	22140	35	G4020	35045	18611116	-108.3245778
9		A	Roosevelt County	188	041	38780	35	G4020	35041	18611117	-103.4827248
10		A	Curry County	188	009	17580	35	G4020	35009	18611118	-103.3460546
11		A	Taos County	-9999	055	45340	35	G4020	35055	18611119	-105.6379865
12		A	Hidalgo County	-9999	023	-9999	35	G4020	35023	18611120	-108.7457292
13		A	Eddy County	-9999	015	16100	35	G4020	35015	18611121	-104.3064708
14		A	De Baca County	-9999	011	-9999	35	G4020	35011	18611122	-104.4015274
15		A	Cibola County	-9999	006	24380	35	G4020	35006	18611123	-108.0002545
16		A	Quay County	-9999	037	-9999	35	G4020	35037	18611124	-103.5480712
17		A	Colfax County	-9999	007	-9999	35	G4020	35007	18611125	-104.6401256
18		A	Los Alamos County	-9999	028	31060	35	G4020	35028	18611126	-106.3079679
19		A	Bernalillo County	-9999	001	10740	35	G4020	35001	18611127	-106.6690645
20		A	Dona Ana County	-9999	013	29740	35	G4020	35013	18611128	-106.8321821
21		A	Chaves County	-9999	005	40740	35	G4020	35005	18611129	-104.4698374
22		A	Valencia County	-9999	061	10740	35	G4020	35061	18611130	-106.8065821
23		A	Rio Arriba County	492	039	21580	35	G4020	35039	18611131	-106.6939829
24		A	San Miguel County	-9999	047	29780	35	G4020	35047	18611132	-104.8035146
25		A	Catron County	-9999	003	-9999	35	G4020	35003	18611133	-108.3920974
26		A	Sandoval County	-9999	043	10740	35	G4020	35043	18611134	-106.8826177
27		A	Santa Fe County	492	049	42140	35	G4020	35049	18611135	-105.9664409

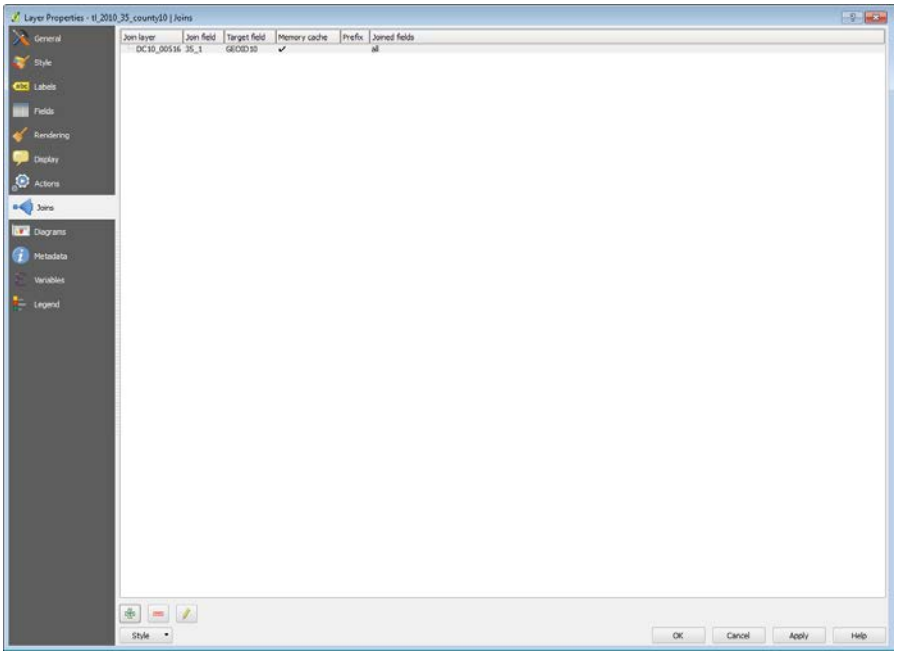
d. Right click on the layer name of the New Mexico county boundary (tl_2010_35_county10), and then click on Properties

e. Click Joins and then click the green plus sign and the following dialog should appear, the john field should be 35_1 and the target field should be GEOID 10, and then click OK

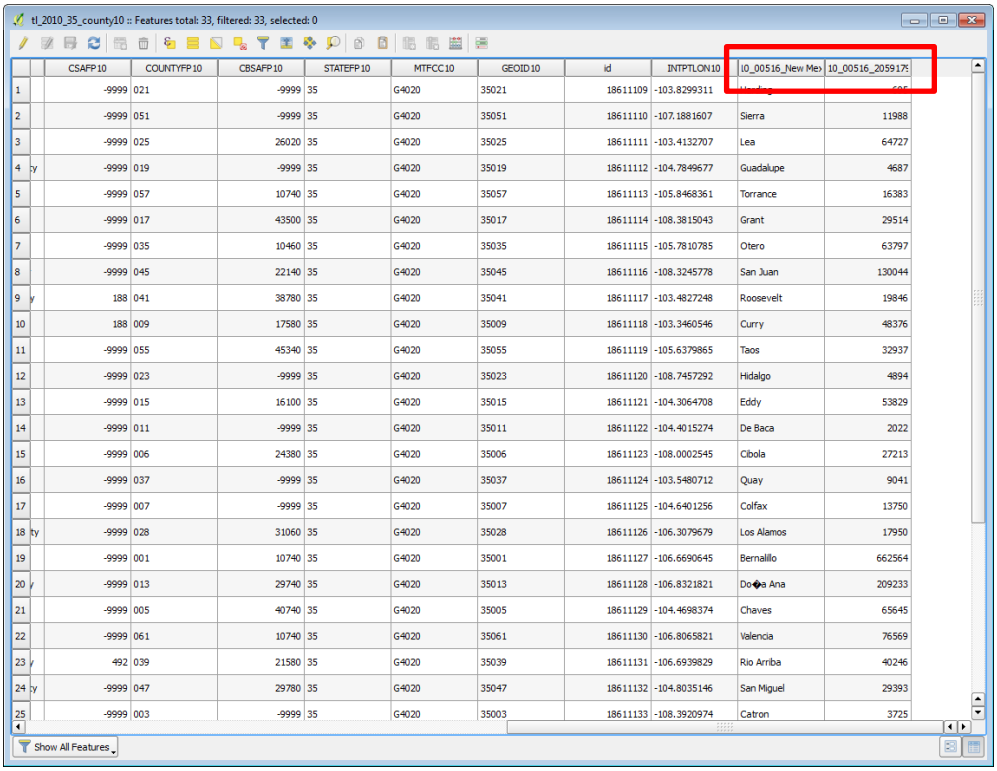




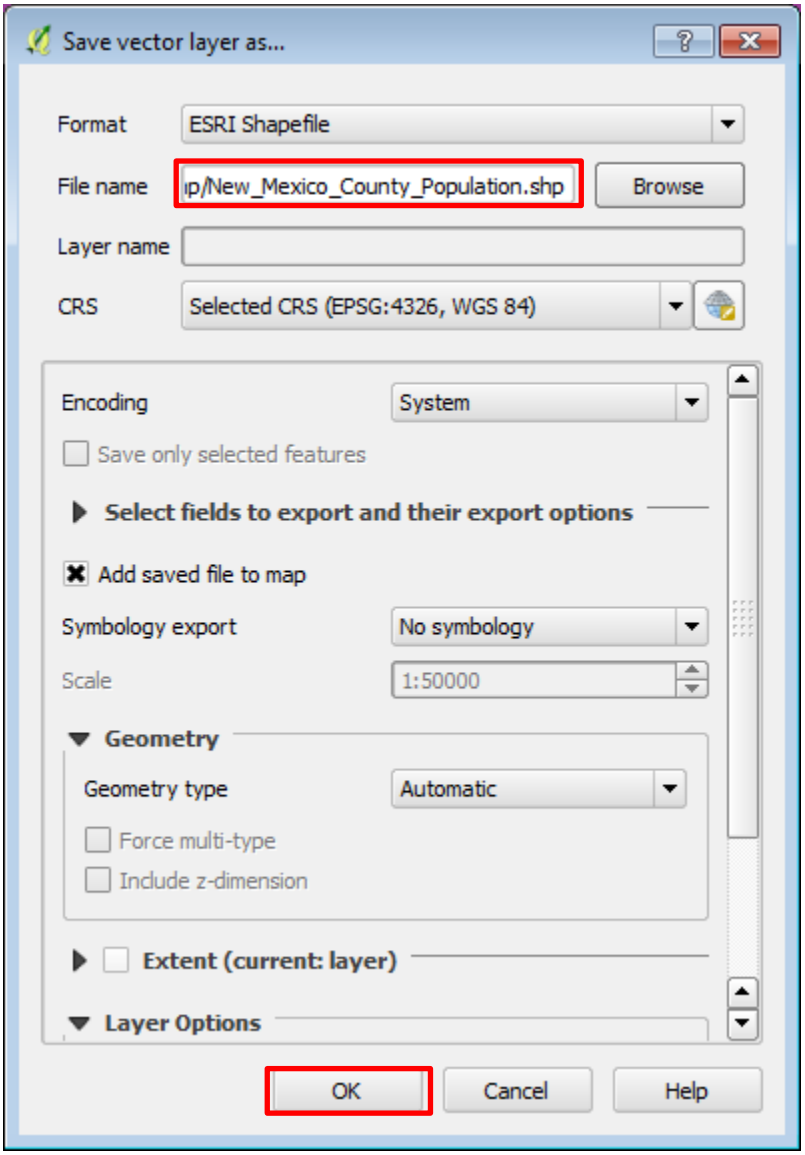
g. successfully jointed process should show the following dialogue, and please click Ok.



h. You table should be joined with your shapefile, please right click on your shapefile layer and then click on Open Attribute Table, you can find that the two new attribute fields associated with the CSV file is appended to the back of the attribute table.



i. Please save your joined shapefile to a new shapefile to permanently save your shapefile; to do this, you need to right click the joined shapefile and then click on Save As, a save vector layer as dialogue should show up, choose the path you want to save the layer and provide a name to the new file, and then click OK.



4) Visualize your shapefile

a. Add the newly saved shapefile from you path

b. Right click on the layer name, and then click on Properties

c. Click style

d. Click Single Symbol

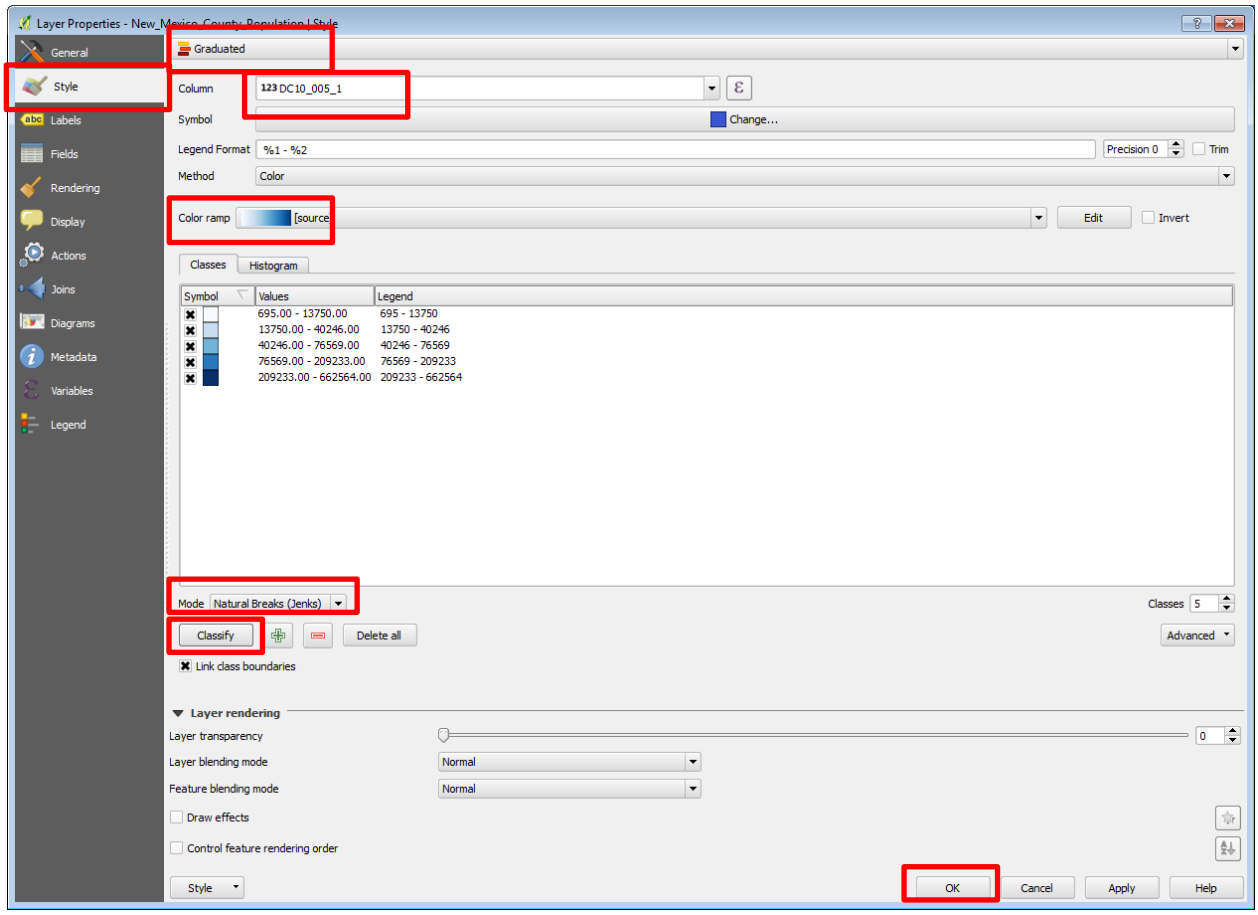
e. Choose Graduated

f. Column chooses your population attribute field

g. Choose the color ramp you like

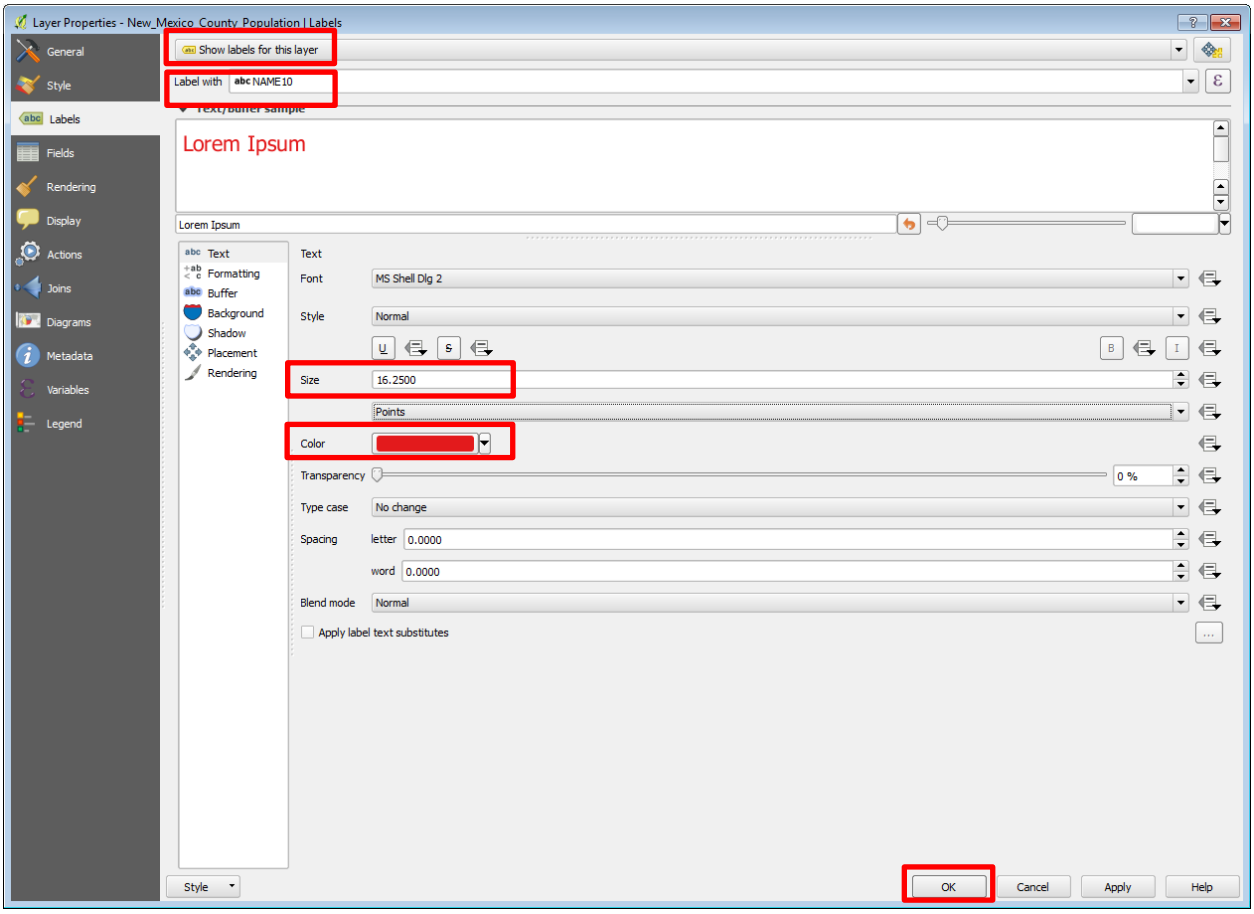
h. Choose mode of Natural Break (Jenks) for classes, and then click classify

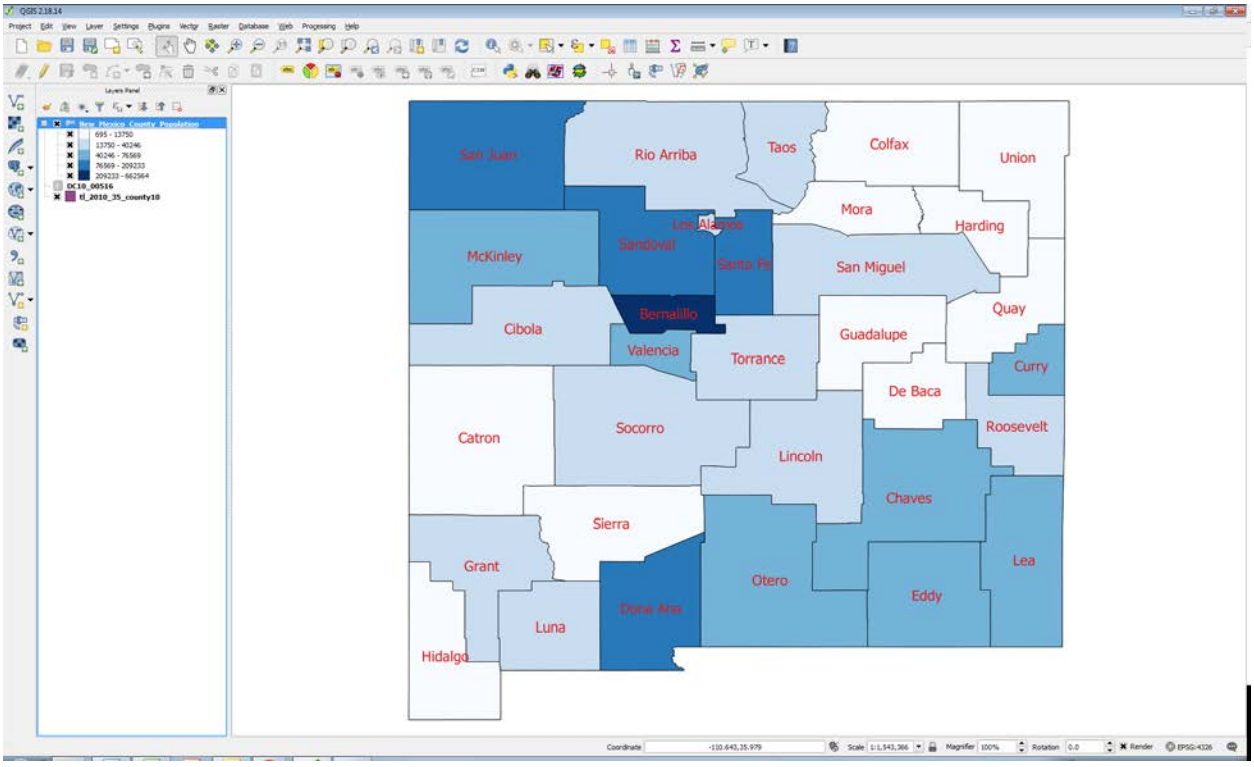
i. Apply and then click OK.



j. Right click on the layer name again and click on Properties, choose the labels option and then start explore the settings

k. Please at least select red color for text and choose size 16.25.


Layer Properties - New_Mexico_County_Population | Labels
General
Style
Labels
Fields
Rendering
Display
Actions
Joins
Diagrams
Metadata
Variables
Legend
Show labels for this layer
Label with
abc NAME10
Lorem Ipsum
Text
Formatting
Buffer
Background
Shadow
Placement
Rendering
Font
MS Shell Dlg 2
Style
Normal
Size
16.2500
Points
Color
Transparency
0 %
Type case
No change
Spacing
letter
0.0000
word
0.0000
Blend mode
Normal
Apply label text substitutes
Style
OK
Cancel
Apply
Help

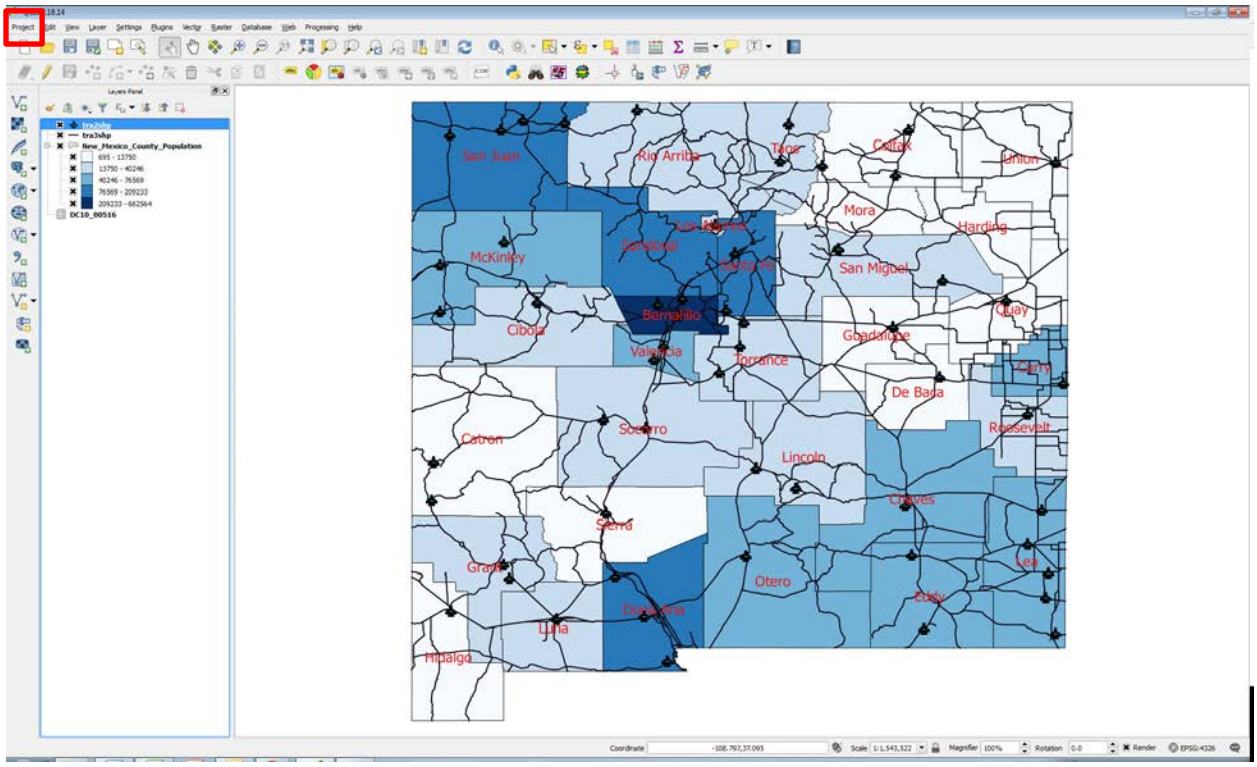

San Juan
Rio Arriba
Taos
Colfax
Union
Mora
Harding
McKinley
Sandoval
Los Alamos
Santa Fe
San Miguel
Bernalillo
Cibola
Valencia
Torrance
Guadalupe
Quay
Curry
De Baca
Roosevelt
Catron
Socorro
Lincoln
Chaves
Sierra
Grant
Otero
Eddy
Lea
Luna
Dona Ana
Hidalgo

5. Creating Maps

1) Add more shapefiles, including airport data and highways data

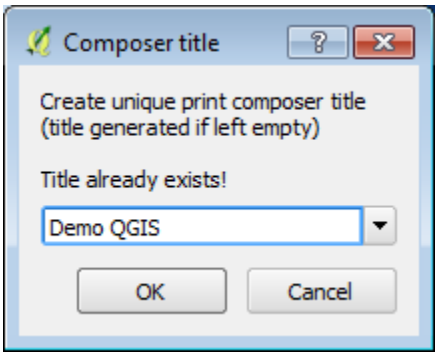
2) You can explore the editing of these data

3) Click Project

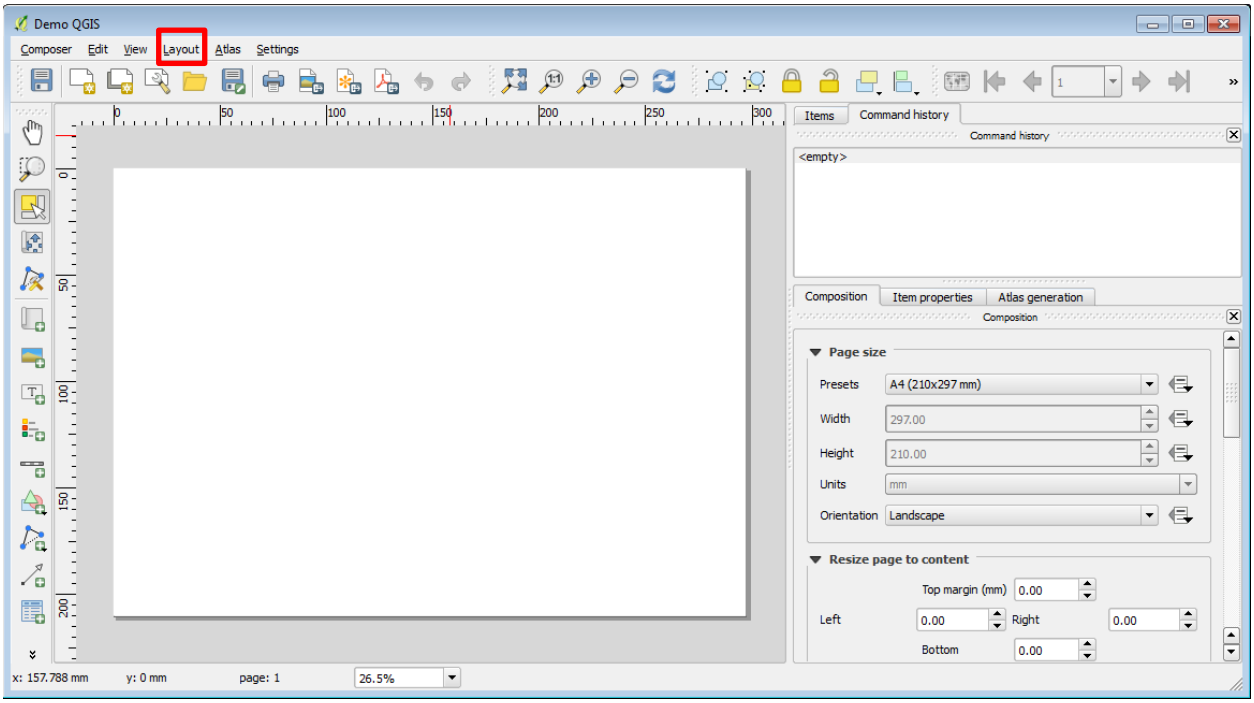


4) Click on New Print Composer

5) Type in a name for your composer

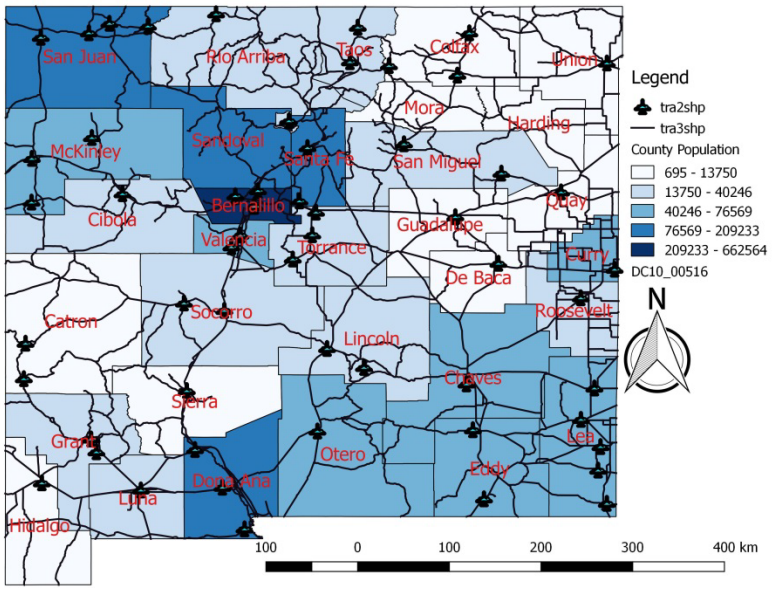


6) The composition panel should appear



7) Click Layout and then click add map

8) User your mouse pointer to select the area on the white canvas of the composer for adding the map

9) Click Layout and then click Add Scalebar, Add Legend, and Add Image (for north arrow)

10) Click Composer and then click Export as Image