




Exercise 3.2

Table Join

Background:

In this exercise, you will join the census table you downloaded with the shapefile you downloaded from NHGIS. You will make a map based on your selected variable.

Step 1: Preparation

1. Start ArcMap. In the “Getting Started” dialog, start a new blank map.
1. Click the “add data” button, and find the folder where you have extracted your downloaded NHGIS file. If you cannot find the folder, it means that you have to “connect” your folder for ArcMap. To connect your folder, in the “Add Data” dialog, click the “Connect to folder” button (), browse to the folder you want to connect, and click “OK”.

This is a national county boundary file. In the next step, you will “clip” this national map into the study area you are interested.

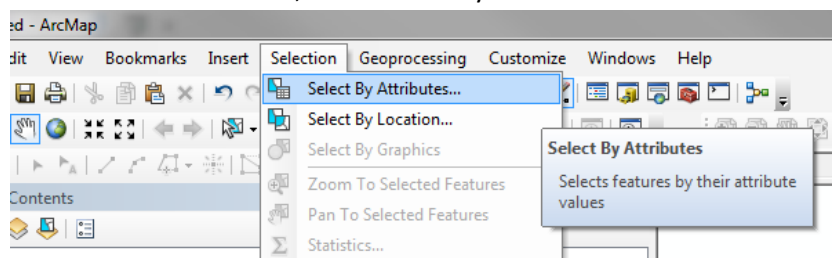


2. Click the “add data” button again, and add your census csv table to ArcMap.

Step 2: Creating a new shapefile for your study area

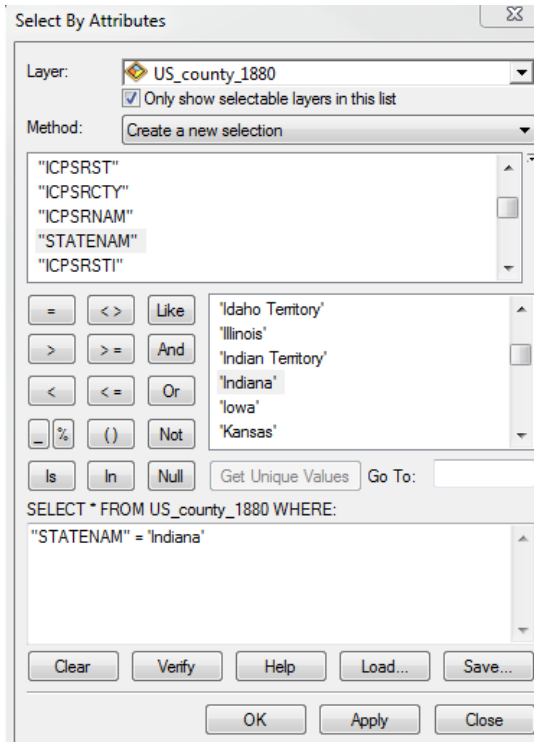
In this step, you will create a new GIS file for the state you are interested to study. First, you need to build a query to select the counties in your state.

1. In the “Selection” menu, click “Select by Attribute”.

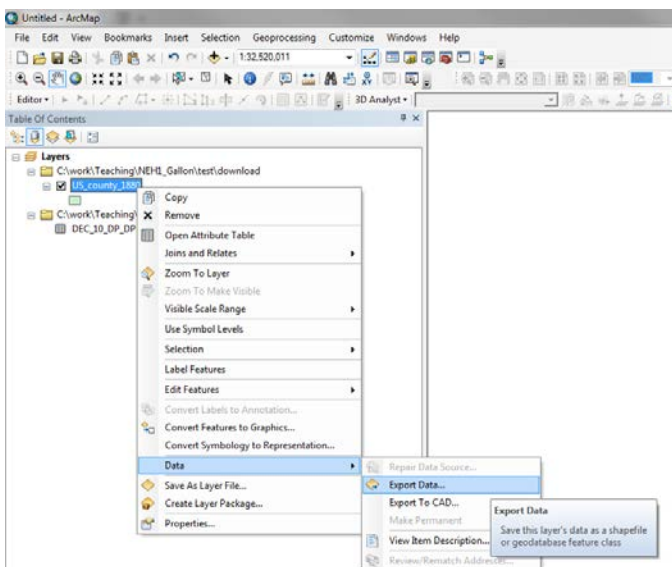


- In the pop-up dialog box, make sure the “layer” is your NHGIS shapefile. Scroll down in the list box below, double click on “STATENAM” in the list box, then click “=” button. Then, click on the button “Get Unique Values”, so that all the state names are listed in the lower list box. Double click on the state name that you are interested.

In the query box below, your query should look like this: “STATENAM” = ‘Indiana’



- Click “OK”. You will find that all the counties in your selected state are highlighted in the map. Now, we need to create a new shapefile from these selected counties.
- In Table Of Content, right click on your NHGIS layer name, select “Data”, and click on “Export data”.



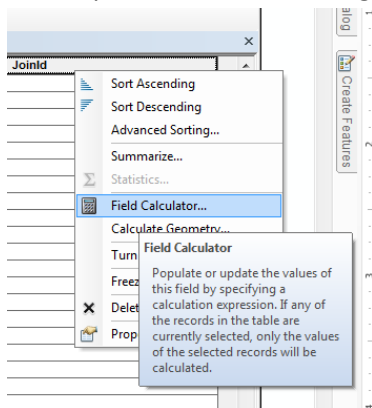
5. Save the exported file to your work folder, and give it a meaning full name. When ArcMap ask you if you want to add the layer to your map, click “Yes”.
6. Turn off the NHGIS layer. Now, you should be able to see your state map.
7. In Table Of Content, right click on your state map layer, then click “zoom to layer”, so that the display extent is optimized for your layer.

Step 3: Creating the common field

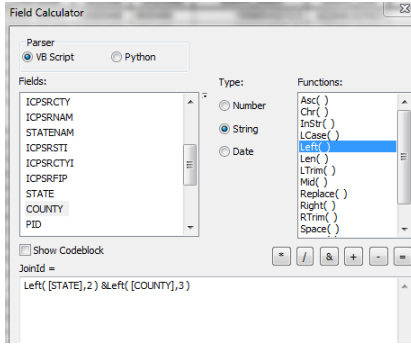
In order to join the shapefile with your census csv table, we will need a common field. Open attribute table of your shapefile, and also open your csv file. Which fields look similar on both tables?

There is no exactly same field in both tables. We have to create a new field in one table in order to match one field in another table. In the csv file, there is a field called “GEO.id2” which is the FIPS code of each county. Here is an example of one county in California “06001”. In your shapefile, there is a “STATE” field (such as “060”), and a “COUNTY” filed (such as “0010”). We need to create a new field in this shapefile to combine these two information together in a way same as the “GEO.id2” field in your csv file.

1. Make sure you are viewing your recently created state shapfile attribute table. On top of the table, click on the small triangle next to the table options button, then click “Add field...”.
2. In the dialog box, give a name “JoinId” to this new field. Select the Type as “Text”. Then click OK. Scroll to the right side of your table, you will see there is an empty field added in your table.
3. At the top of this new field, right click on the field name, then click “Field Calculator”. Click “Yes” to accept the field value change.



4. We need to combine the “STATE” (only take the first two characters from this field) and “COUNTY” (only take the first three characters from this field) fields. In your field calculator box, type in the following line, then click “OK”.
`Left([STATE],2) &Left([COUNTY],3)`



Notice that your new field is calculated with new values exactly like the values in your csv file.

Step 4: Join Table

Now, we can join the two files with the common field.

1. In table of content, right click on your recently created state shapefile, choose “join” to join the csv file to your data.
2. In the Join dialog box, make sure you choose the new filed “JoinId”, and for the source table (your csv file), choose “GEO.id2”. Keep other items as default, then click OK.
3. After your join, open the attribute table of your state shapefile, you will find that the csv file fields are appended to your shapefile.

Step 5: Create a thematic map based on your interested variable in census

1. Check on the appended fields types. If the field you are interested is “text”, you need to convert it to a real number. To do so, you need to add a new field (click on top of the table, choose add field). Define this field as “short” for integer type, or “double” for decimal type. Then, do a field calculation to convert the text value into number. Refer to the above steps in STEP 3 if you need.
2. In table of content, right click on your state shapefile, choose “properties”. Click on the tab “Symbology”. Choose “Quantities” from the left, then click on “Graduated Colors”. In the “Value” selection box, select the new variable you created above. Click “OK” to make your map.

