CHAPTER 5

Joining data to maps

One of the most frequently used GIS skills involves connecting an Excel spreadsheet to a shapefile. This is where the magic of GIS happens! Often, the purpose of joining data to a map is to visually display the distribution of a dataset through a thematic map (covered in the next chapter). Joining your own data to a shapefile can be extremely useful.

In this exercise, you will learn how to join your own data to a map, emphasizing the concept of a unique ID.

Files and tools

Files needed: You will need age.xlsx (chapter 4) and countiesprj.shp (chapter 3). Or, if you prefer, you can install this book's DVD and access chapter files at C:\EsriPress\ GIS20\05. Don't know how to install the DVD? See "DVD installation" on page xii.

Tools needed: ArcGIS 10.1 for Desktop.

1 Add two files to a join

1. Open ArcMap. Click the Add Data button and add countiesprj.shp from chapter 3. (If you are unable to find this file, you can access as similar one at C:\EsriPress\ GIS20\05.)

2. Click the Add Data button, add age.xlsx by double-clicking the file name, and then double-click AGE$. If you did not change the name of the worksheet in the last exercise, the existing worksheet will be called Sheet1$ or Sheet0$. Worksheets are denoted with $ in the name.

2 Double-check and find the FIPS columns

1. Check to make sure the data is correct. The AGE$ data table should now appear in the table of contents. To view the data table, right-click the data table name, and then click Open. Review the data to make sure it looks as you would expect it to look.

To join data to maps, we must link two columns that have overlapping data, one column from the data table and its comparable column in the map layer.

2. Identify the two columns you will use for joining by opening the attributes table for each. The table for Age is already open. Right-click the county shapefile in the table of contents, and then click Open Attribute Table. Notice two tabs are now open at the bottom of the table. →
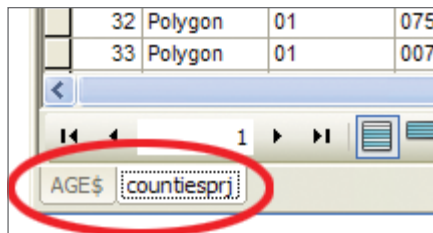
3. Click each tab in the lower left corner, review each, and find two columns that match. The column names do not have to be the same, but the content of the columns does. In this example, the column name in the shapefile attribute table is GEOID and the column name in the spreadsheet is ID.

It is imperative you understand the concept here. We have two columns and we are going to link the map to the data table using these columns. They contain identical information. Note the five-digit FIPS code in each. You can even sort these so you can compare line by line.

4. Close the attribute tables.

3 Join the data table to a map

1. In the table of contents, right-click the countiesprj.shp shapefile (not the data table from Excel).

2. Click Joins and Relates, and then click Join.

3. In the "What do you want to join to this layer?" field, select "Join attributes from a table."

4. In the "Choose the field in this layer that the join will be based on" field, select the appropriate column heading, in this case GEOID.

5. In the "Choose the table to join to this layer" field, AGE$ will already be selected.

6. In the "Choose the field in the table to base the join on" field, ID will already be populated. (If it is not, the column is incorrectly formatted. The genesis of this error is not importing the Excel spreadsheet into Excel, but rather just opening it. You will need to close ArcMap and Excel, go back to chapter 4, step 5.)

7. Select the "Keep Only Matching Records" option and click OK. To save a step here, skip the Validate Join button.

4 Verify the join worked correctly

1. Right-click the shapefile name, and then click Open Attribute Table.

2. Scroll to the far right to see if data from the spreadsheet has been appended to the end of the attribute table. You should not see any error messages or null values. ➜

ID	County	Pop	Seniors	Percent
01005	Barbour	27457	3909	14.2
01113	Russell	52947	6720	12.7
01087	Macon	21452	3031	14.1
01097	Mobile	412992	53321	12.9
01031	Coffee	49948	7210	14.4

3. Double-check the number of records in the Age$ tab by right-clicking the file and clicking Open. In the lower right corner, the number of records is listed (in this case, 67). Now check the number of records in the newly joined shapefile—it should be the same number. If it is not, then the two columns are not identical and must be corrected.

4. Close the attribute table.

5 Create a new shapefile

When files are joined, it is a temporary join. To permanently join these files, create a new shapefile out of one that was just joined. To do this, do the following:

1. In the table of contents, right-click the shapefile name, click Data, and then click Export Data.

2. Click the Browse button 📂 to browse to your save folder, name the new shapefile **agejoined** (no spaces in file names). The Save as type should be shapefile. Click Save. Verify it is saving where you would like, and then click OK.

3. When asked if you want to add the exported data to the map as a layer, click Yes. Notice the new file added to the table of contents.

4. The original Excel file and shapefile are no longer needed. To remove them, right-click the AGE$ file and click Remove. Then, right-click the original county file and click Remove.
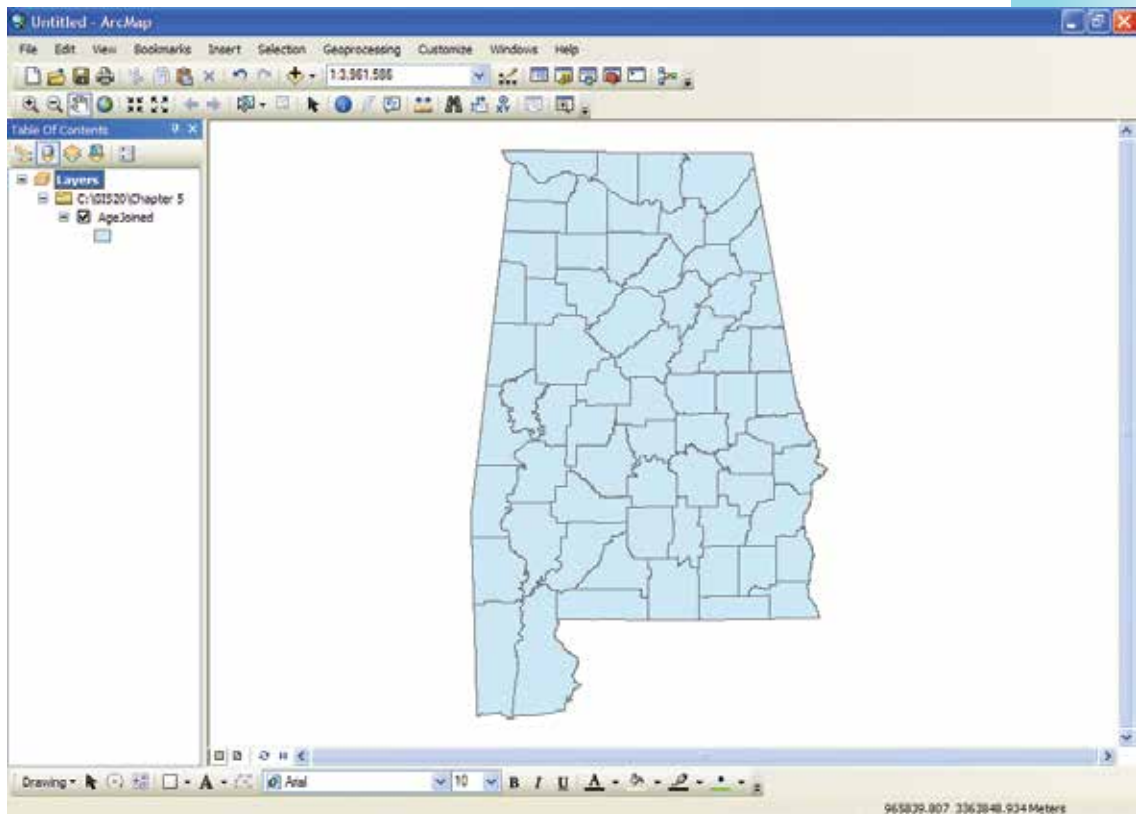
Congratulations! You now have a permanently joined a shapefile (agejoined) that contains data about the senior population. We will use this file in the next chapter.