

CHAPTER 5

Joining data to maps

One of the most frequently used GIS skills involves connecting an Excel spreadsheet of data to a shapefile. 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.

Exercise goal

Join the senior population spreadsheet created in the last exercise to a county shapefile (downloaded in exercise 1). **1**

Exercise file locations

Chapter directions: Follow the exercise as it appears in this book

Files for this exercise were created and used in chapters 1 and 4.

The following files are used in this exercise:

- **Age.xlsx** (created in chapter 4)
- **tl_2008_01_county.shp** (a shapefile of Alabama counties that was downloaded in chapter 1).

Note: The file derived in this chapter will be used again in chapters 6 and 7.

CD: Use the CD included with this book


All files needed for this exercise are included on the book's CD. Files are organized by chapter.

Personal files: Use files you've gathered from other sources

This exercise assumes you have the following:

- A shapefile with an attributes table that includes several columns of data.
- An Excel spreadsheet with several columns of data that you would like to join to a shapefile.
- Both files must have overlapping data. Often each file has one identical column of geographic data, such as the name of the county or census tracts. This is the column that will be used to join the two files together.

1 Add two files to join

1. Open ArcGIS.
2. To add a shapefile to the ArcGIS window, click the Add Data icon .
3. Either open Folder Connections or select the Connect to Folder icon and navigate to **tl_2009_01_county**, which was downloaded in chapter 1.
4. Use the Add Data icon again to add the Excel file. In the previous exercise, you named this worksheet **Age.xlsx**. To add the Excel worksheet, navigate to the file and double-click the file name. Double-click **AGES**. If you did not change the name of the worksheet in the last exercise, the existing worksheet will be called **Sheet0\$**. Worksheets are denoted with \$ in the name. **2**
5. Check to make sure the data is correct. The **AGES** data table should now appear in the table of contents. To view the data table, right-click the data table and select Open. Review the data to

1

2

Table

H_2009_01_county

	FID	Shape	STATEFP	COUNTYFP	COUNTYFIPS	CNTYIDFP	NAME	NAMESAD	LSAD	CLASSFP
	0	Polygon	01	113	00161583	01113	Russell	Russell County	06	H1
	1	Polygon	01	067	00161559	01067	Henry	Henry County	06	H1
	2	Polygon	01	029	00161540	01029	Cleburne	Cleburne County	06	H1
	3	Polygon	01	037	00161544	01037	Coosa	Coosa County	06	H1
	4	Polygon	01	093	00161573	01093	Marion	Marion County	06	H1
	5	Polygon	01	099	00161578	01099	Monroe	Monroe County	06	H1
	6	Polygon	01	107	00161580	01107	Pickens	Pickens County	06	H1
	7	Polygon	01	129	00161590	01129	Washington	Washington County	06	H1
	8	Polygon	01	007	00161529	01007	Bibb	Bibb County	06	H1
	9	Polygon	01	013	00161532	01013	Butler	Butler County	06	H1
	10	Polygon	01	023	00161537	01023	Choctaw	Choctaw County	06	H1
	11	Polygon	01	057	00161554	01057	Fayette	Fayette County	06	H1
	12	Polygon	01	071	00161561	01071	Jackson	Jackson County	06	H1
	13	Polygon	01	133	00161592	01133	Winston	Winston County	06	H1
	14	Polygon	01	003	00161527	01003	Baldwin	Baldwin County	06	H1
	15	Polygon	01	001	00161526	01001	Autauga	Autauga County	06	H1
	16	Polygon	01	005	00161528	01005	Barbour	Barbour County	06	H1
	17	Polygon	01	015	00161533	01015	Calhoun	Calhoun County	06	H1
	18	Polygon	01	027	00161539	01027	Clay	Clay County	06	H1
	19	Polygon	01	063	00161557	01063	Greene	Greene County	06	H1
	20	Polygon	01	033	00161542	01033	Colbert	Colbert County	06	H1
	21	Polygon	01	009	00161530	01009	Blount	Blount County	06	H1

L23

	A	B	C	D	E
	JoinID	County	Population	Seniors	Percent
1					
2	01001	Autauga	43671	4442	0.101715
3	01003	Baldwin	140415	21674	0.154357
4	01005	Barbour	29038	3915	0.134823
5	01007	Bibb	20826	2414	0.115913
6	01009	Blount	51024	6462	0.126646
7	01011	Bullock	11714	1513	0.129162
8	01013	Butler	21399	3516	0.164307
9	01015	Calhoun	112249	15825	0.140981
10	01017	Chambers	36583	5889	0.160976
11	01019	Cherokee	23988	3835	0.159872
12	01021	Chilton	39593	5081	0.128331
13	01023	Choctaw	15922	2294	0.144077
14	01025	Clarke	27867	3742	0.134281
15	01027	Clay	14254	2378	0.16683
16	01029	Cleburne	14123	1947	0.13786
17	01031	Coffee	43615	6229	0.142818

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. In this case, the columns will be identical.

PROBLEM ALERT

If you are using a version of ArcGIS that is older than 9.3, you cannot have more than ten characters for column names. This must be fixed ahead of time. The two files will not join properly if you have more than ten characters, spaces in column names, periods, or any character that is not a letter (no numbers).

2 Join the data table to the map

1. Identify the two columns you will use for joining by opening the attributes table for each. The attributes table for Age may already be open from the previous step. Right-click the county shapefile in the table of contents, and select Open Attributes Table. Notice that two tabs are now open at the bottom of the table.

NOTE: Working with attribute tables is covered in detail in chapter seven.

2. Click each one of the tabs in the lower left corner, scan the data in each, and find the 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 CNTYIDFP and the column name in the spreadsheet is JoinID.
3. In the table of contents, right-click the shapefile name (not the data table).
4. Select Joins and Relates from the menu.
5. In the field Choose the field in this layer that the join will be based on, select the appropriate column heading, in this case CNTYIDFP.
6. In the field Choose the table to join to this layer, select AGE\$.
7. In the field Choose the field in the table to base the join on, select the appropriate column heading, in this case JoinID.
8. Select the Keep Only Matching Records option.
9. Click OK. **3**

CNTYIDFP	JoinID
01113	01001
01067	01003
01029	01005
01037	01007
01093	01009
01099	01011
01107	01013
01129	01015
01007	01017
01013	01019
01023	01021
01057	01023
01071	01025

3 Verify that the join worked correctly

1. Right-click the shapefile and select Open Attributes Table.
2. Scroll to the far right to see if the data from the Excel spreadsheet has been appended to the end of the attribute table. You should not see any error messages or null values.
3. Double-check the number of records in the Age\$ tab by right-clicking the file and selecting 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 table window by clicking the red x in the upper right hand corner.

4 Create a new shapefile

When files are joined, it's a temporary join. To permanently join these files, you must create a new shapefile with the merged files. To do this, do the following:

1. In the table of contents, right-click the shapefile name, select Data, and then select Export Data.
2. Click the browse folder icon to name your new shapefile and to save it on your computer. Name it **AgeJoined**. Never use spaces in file names as it will generate all sorts of problems.
3. When asked if you want to add the exported data to the map as a layer, click Yes.
4. The original Excel file and shapefile are no longer needed. To remove them, right-click the AGE\$ file and select Remove. Then right-click the original county file and select Remove. Congratulations! You now have a permanently joined shapefile (AgeJoined) that contains data about the senior population. We will use this file in the next exercise.