SECTION 2: DOWNLOADING AND PROCESSING DATA

2.1 Joining Data Tables

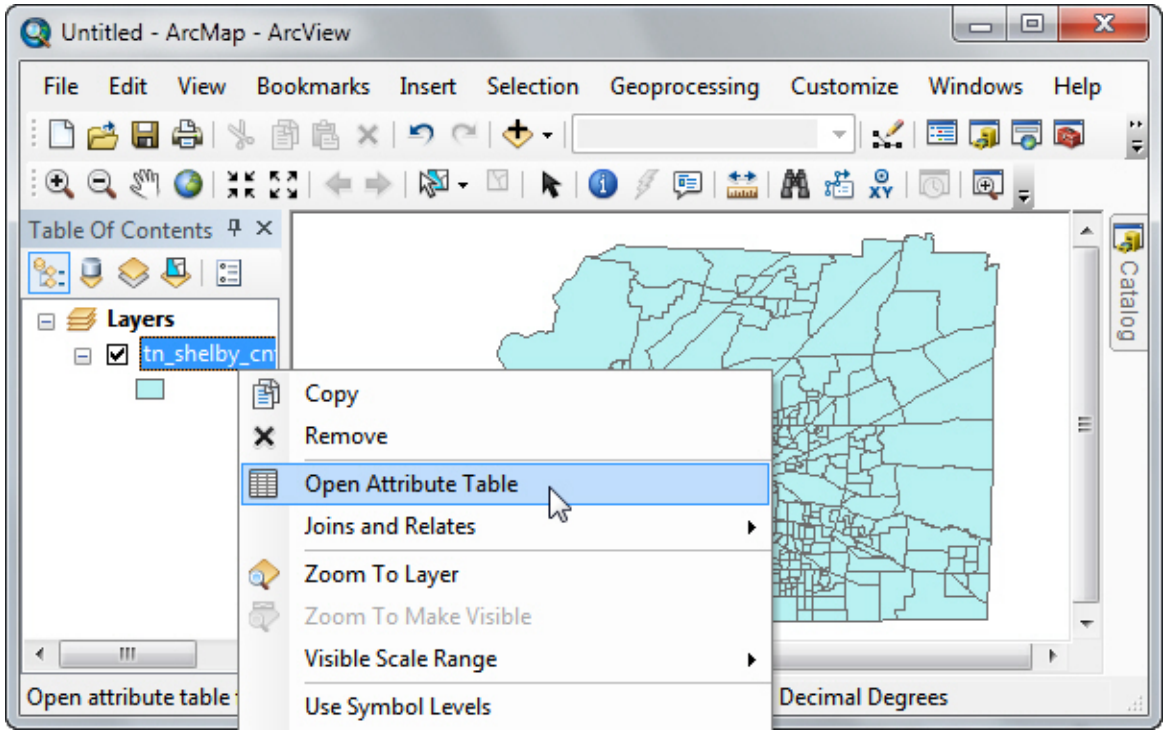
Many times you will find a table of data that you want to map, perhaps as an Excel spreadsheet or on a web page. If you have a shapefile that has the relevant geography, you can join the two pretty readily. For example, a table of data with crime statistics by zip code can be joined to a zip code shapefile, allowing you to map the data.

In this example, we will map the demographics of Shelby County (including Memphis), Tennessee. More information on how to access this kind of data is included on page 2.1.9.

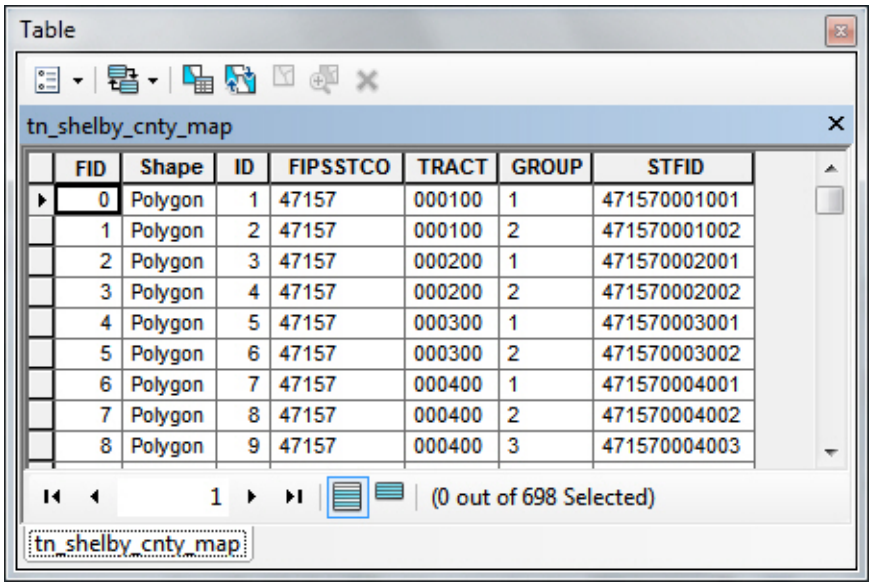
Mapping the base shapefile

In ArcMap, create a new map. Add the shapefile with the relevant geography—in this case a map of Shelby County, Tennessee—by dragging the file from the Catalog window to the data frame.

If you'd like to see what data you have available in this shapefile, right-click on the layer name in the Table of Contents, and then click "Open Attribute Table."



Notice that the table contains primarily just coding to identify each block group—nothing much of interest here:



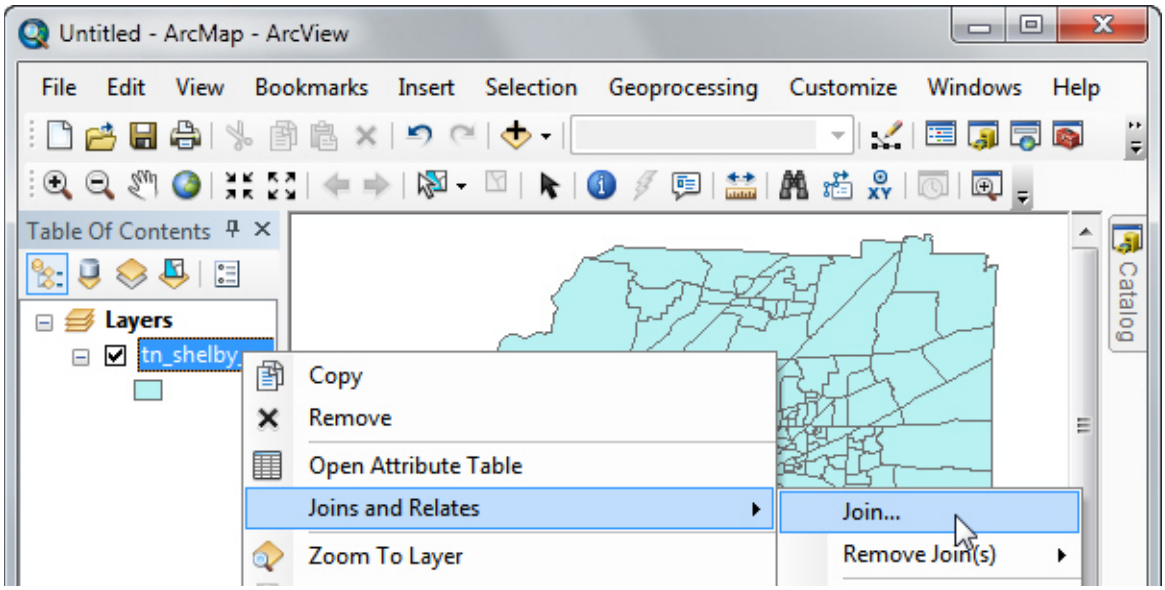
FID	Shape	ID	FIPSSTCO	TRACT	GROUP	STFID
0	Polygon	1	47157	000100	1	471570001001
1	Polygon	2	47157	000100	2	471570001002
2	Polygon	3	47157	000200	1	471570002001
3	Polygon	4	47157	000200	2	471570002002
4	Polygon	5	47157	000300	1	471570003001
5	Polygon	6	47157	000300	2	471570003002
6	Polygon	7	47157	000400	1	471570004001
7	Polygon	8	47157	000400	2	471570004002
8	Polygon	9	47157	000400	3	471570004003

You can close the Attribute Table window now.

Adding data from a table

If you have information in a table for the area you just mapped, you can add this data to your map.

Right-click the layer name in the Table of Contents. Choose "Joins and Relates" from the popup menu, and then choose "Join" from the submenu.

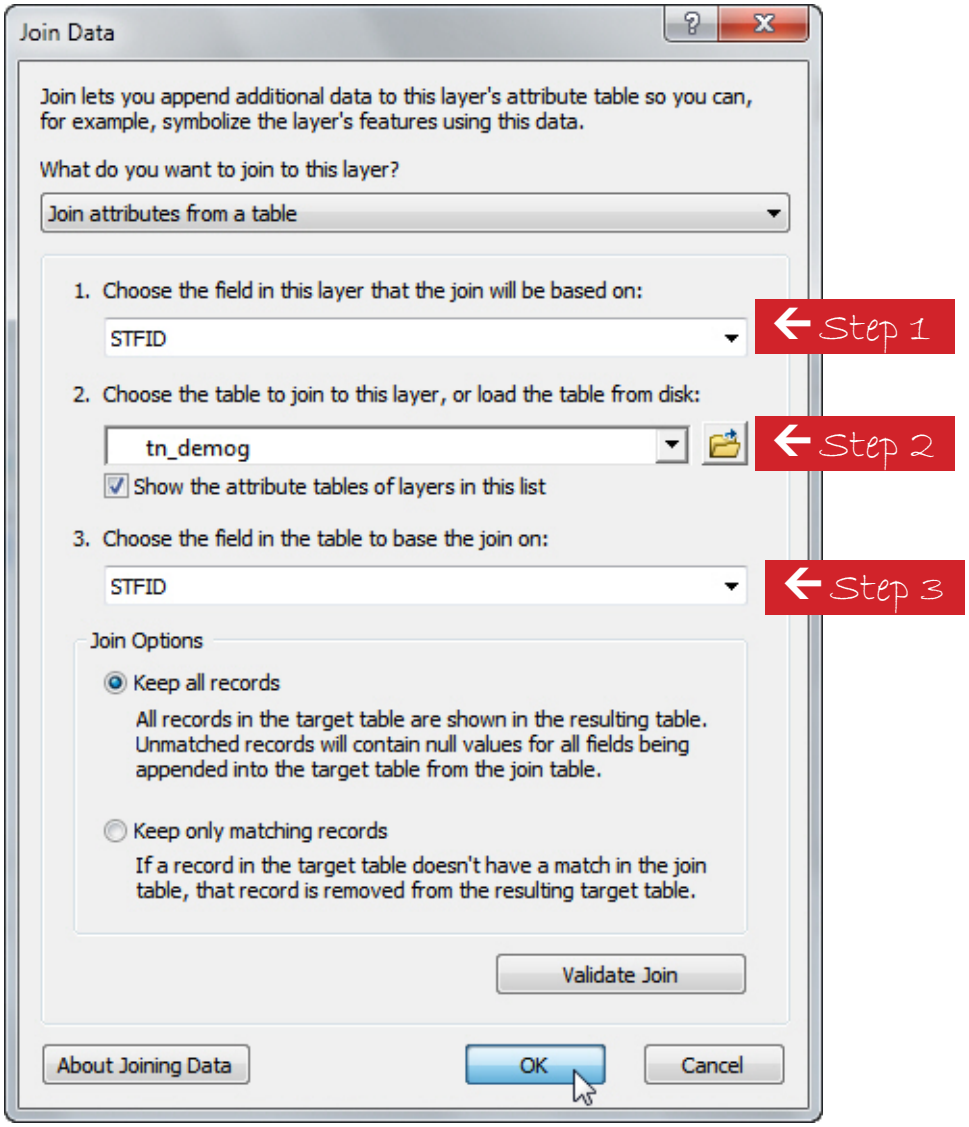


In the first box in the Wizard that appears select "Join attributes from a table."

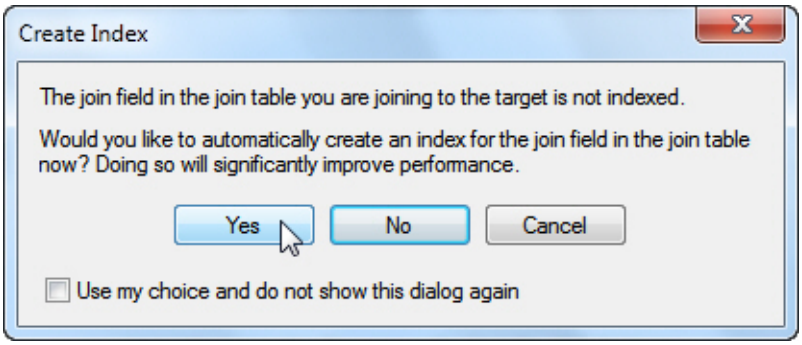
1) You are going to make the join based on columns that your base map layer and your data table have in common. In this example, we will choose the **STFID** column since this identifies each census block group in the country uniquely.

2) Click on the small folder icon and navigate to where you saved the table file. When you have found the file, select it and click "Add."

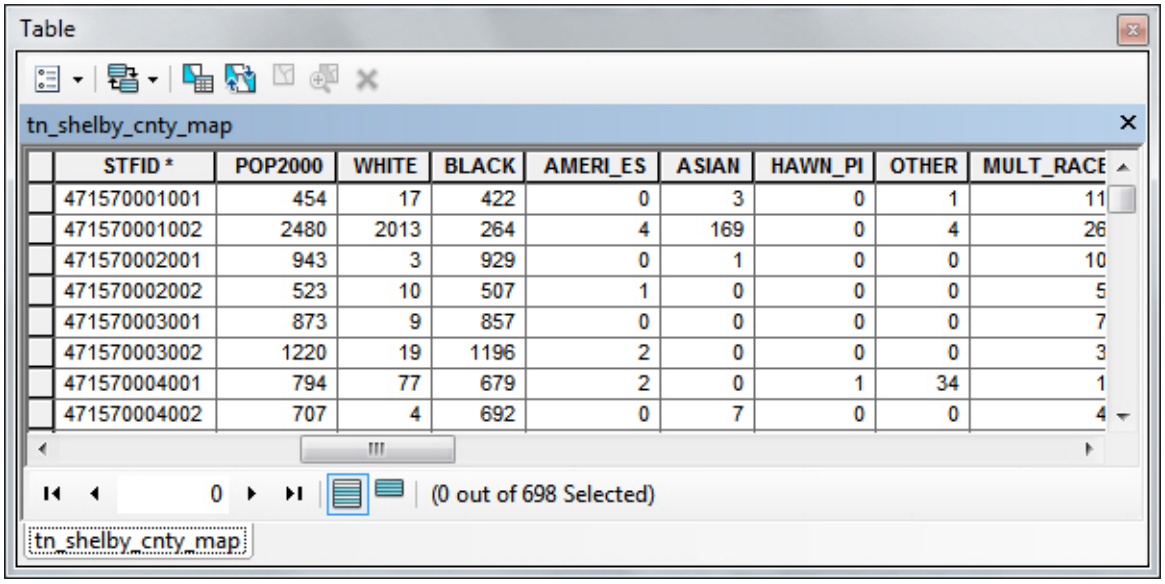
3) Next choose the field in the table that corresponds with the base layer's field you chose in step 1. In this case, the field is again called STFID, but the column headings don't necessarily have to have the same names in both tables. The key is for each record in each table to match up one to one, regardless of what the columns are called. (For example: one column might be called STFID and the other census_block_group_id.)



Click the "OK" button at the bottom and ArcMap will join the data for you. When asked, allow ArcMap to index the data.



If you right-click on the block group layer again and choose "Open Attribute Table," you can see many fields of useful demographic data attached to the layer.



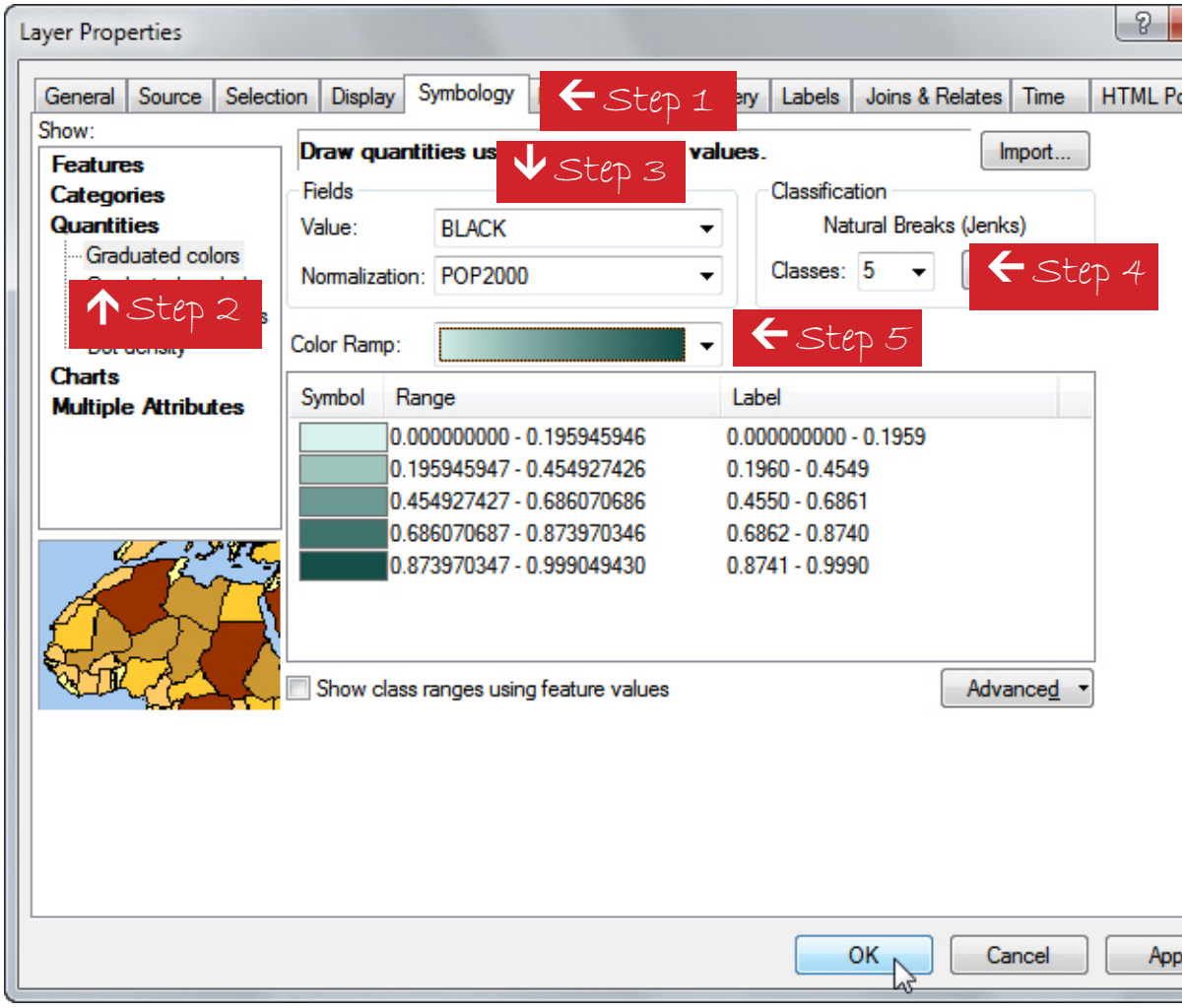
STFID *	POP2000	WHITE	BLACK	AMERI_ES	ASIAN	HAWN_PI	OTHER	MULT_RACE
471570001001	454	17	422	0	3	0	1	11
471570001002	2480	2013	264	4	169	0	4	26
471570002001	943	3	929	0	1	0	0	10
471570002002	523	10	507	1	0	0	0	5
471570003001	873	9	857	0	0	0	0	7
471570003002	1220	19	1196	2	0	0	0	3
471570004001	794	77	679	2	0	1	34	1
471570004002	707	4	692	0	7	0	0	4

Mapping the combined data

To map the demographic data, simply double-click the layer name in the Table of Contents to open the Layer Properties dialog box.

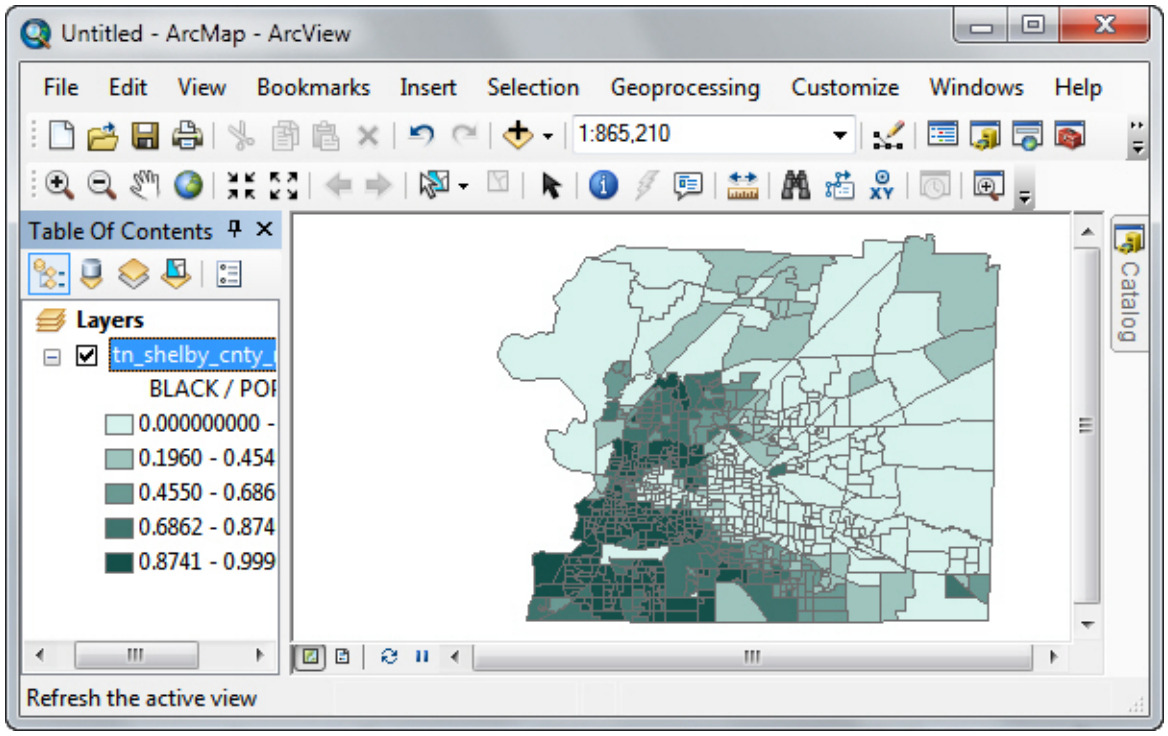
In the "Layer Properties" box:

1) Choose the "Symbology" tab
2) In the "Show" section, click "Quantities" and then click "Graduated colors."
3) Now look at the "Fields" section. In this case, I'm choosing fields from the dropdown menu so the map will show the Black population (tn_demog.BLACK), divided (normalized) by the total population within each block group (tn_demog.POP2000).
4) Under Classification I want five levels or *classes*.
5) You can adjust the Color Ramp to whatever colors you desire.



Click "OK" close the dialog box and see the mapped data.

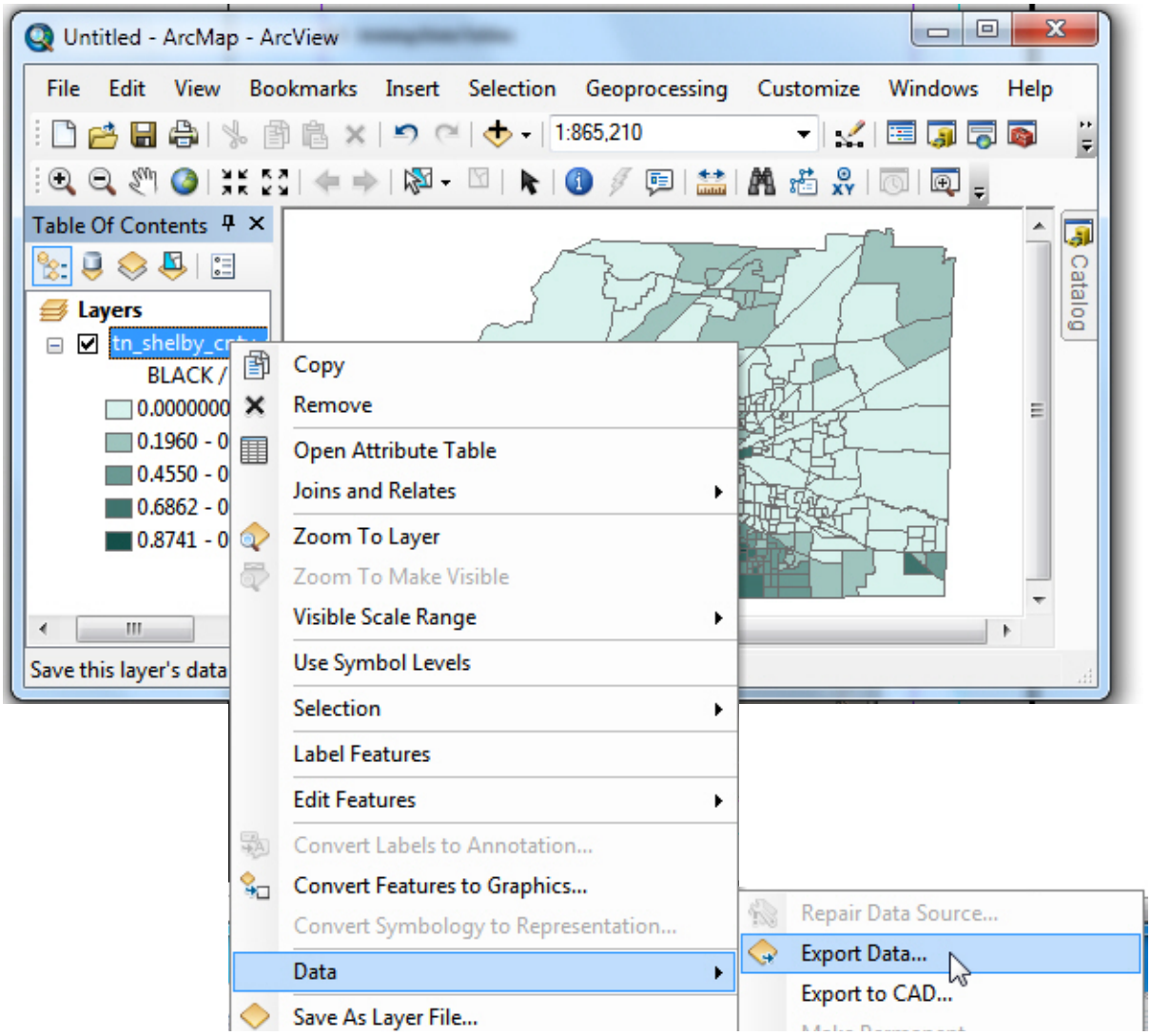
In this case, it shows distinctive segregation patterns:



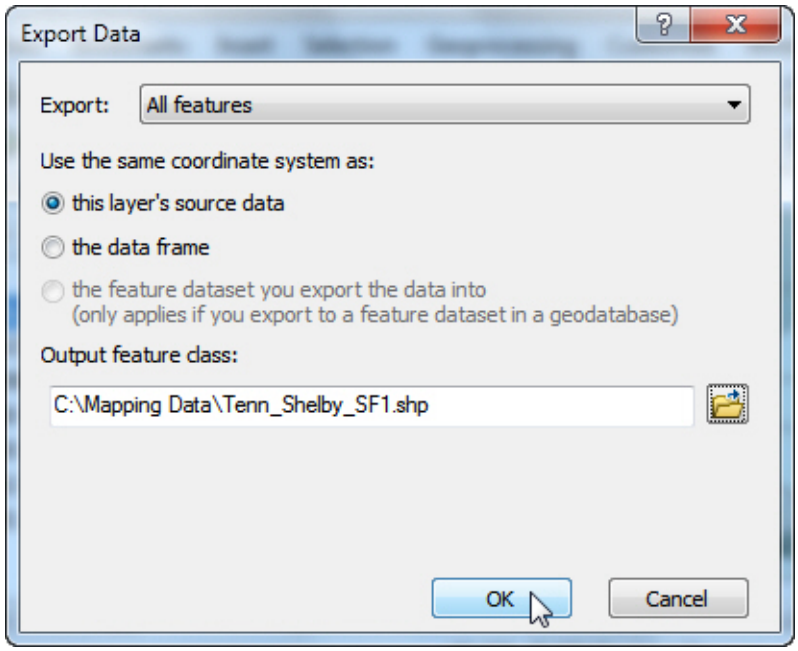
Saving the combined data as a shapefile

The data you just joined will not automatically be kept together; you need to make the join permanent by making a new shapefile.

Simply right-click on the original layer's name in the Table of Contents, choose "Data" from the popup menu, and then "Export Data" in the sub-menu.



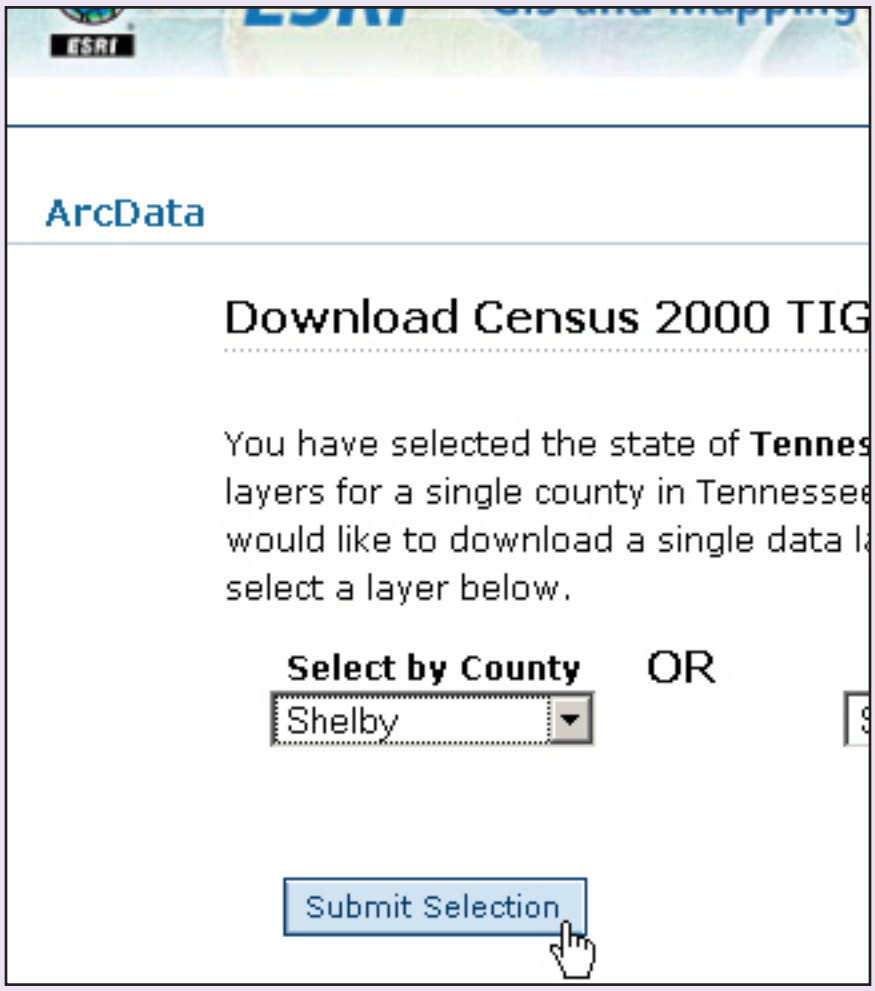
In the dialog box that appears, choose to export "All features" and use the same coordinate system as "this layer's source data." Then choose a name and location for the new shapefile and click "OK."



Getting the data

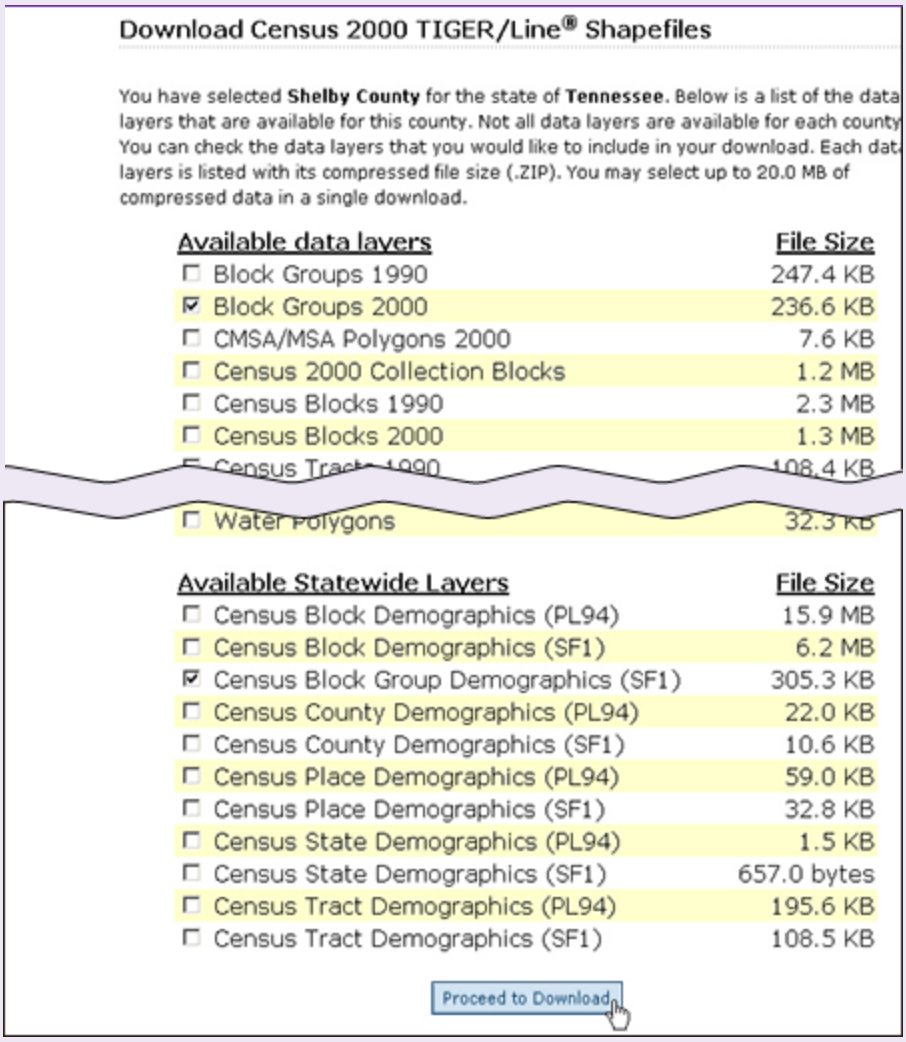
You can map similar data for your county by downloading the data from *http://arcdata.esri.com/data/tiger2000/tiger_download.cfm*.

From this web page choose your state via the dropdown box or the map. On the next web page choose the county you want and click the "Submit Selection" button below the county dropdown box:



Now you need to check the box or boxes next to the data layer or layers you want to download. Then click "Proceed to Download."

For this example, I downloaded the **block groups** (this is a map of the county) for the year 2000 and the **SF1 demographics for block groups**:



Once you have this data downloaded, unzip the zip files and save the extracted files somewhere easy to find. You may want to rename the files to something more straightforward.

In this case, I've changed the name of all block group files from "tgr47157grp00" to "tn_shelby_cnty_map" since it is a map of Shelby County, Tennessee. (All three files from this zip group must be changed to the same thing, without changing their file type extensions: .dbf, .shp, .shx.) And I renamed the "tgr47000sf1blk" file "tn_demog" since it is the demographic information for the entire state of Tennessee.

This material is based upon work supported by the National Science Foundation under Grants No. 0639638 and 0833663. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.