Utilizing Data from American FactFinder with TIGER/Line Shapefiles in ArcGIS

Getting Started

- You will need the following to use these instructions:

  - An Internet browser.

  - A utility to unzip files, such as WinZip.

  - Data processing software, such as Microsoft Excel

  - Esri's ArcGIS, version 10.x

- In these instructions, we will map the 2010 median age by census tract for those living in Oakland County, Michigan.

- First, we will download the table from American FactFinder.

- Then, we will download the TIGER/Line Shapefile.

- Finally, we will join the two in ArcGIS.

American FactFinder (AFF)

- Access data from:
  - 2010 and 2000 Decennial Census
  - Economic Census
  - American Community Survey

- http://factfinder2.census.gov

AFF Homepage

- Click on **Advanced Search**

- First, select the 2010 dataset: Age

  - Click **Topics, Dataset.**

  - Click the **2010 SF1 100% Data** and AFF adds the dataset to the **Your Selections** box.

  - Within the same **Select Topics** window, click on **People** (at the top), then **Age & Sex.**

  - Click on **Age** and AFF adds the data to the **Your Selections** box.

  - Close the **Select Topics** window using the **Close X** button.

- Now select the geography: all census tracts in Oakland County, MI

  - Click **Geographies.**

  - There are four search method options: **List** (choose between most requested geographic types or all geographic types), **Name** (contains all geographic types), **Address**, and **Map.**

    - Using the **List** search method, select **Census Tract - 140** in the dropdown.

    - Select **Michigan** as the state, **Oakland** as the county, and then **All Census Tracts within Oakland County, Michigan.**

    - Click **Add to Your Selections.**

    - Close the Geographies Window using the **Close X** button.

  - For additional information on using American FactFinder visit their Help Guides at http://factfinder2.census.gov/help/en/american_factfinder_help.htm#.

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- All available data tables are shown in the **Search Results** section.

- In this example, we will view the **Median Age by Sex** (**P13**) table.

  – The table is on **Page 2** of the search results.

    - You can scroll through the pages using the numbers in the top, right corner, or you can change your results per page, also found in the top, right corner.

  – Check the box next to **P13 Median Age by Sex** and click **Download.**
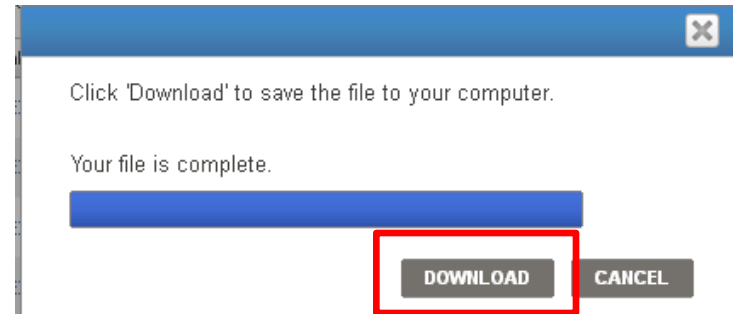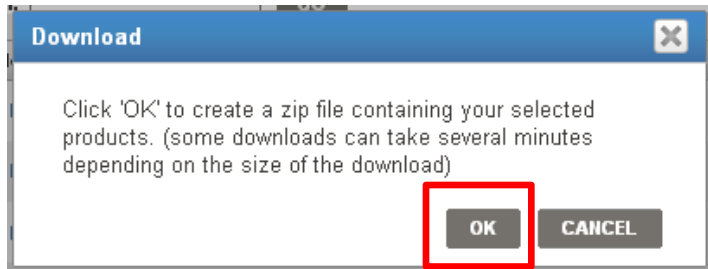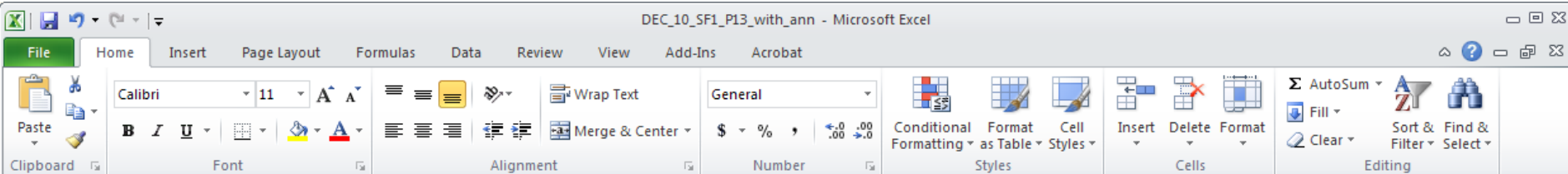
- Click **OK.**
- Click **Download.**
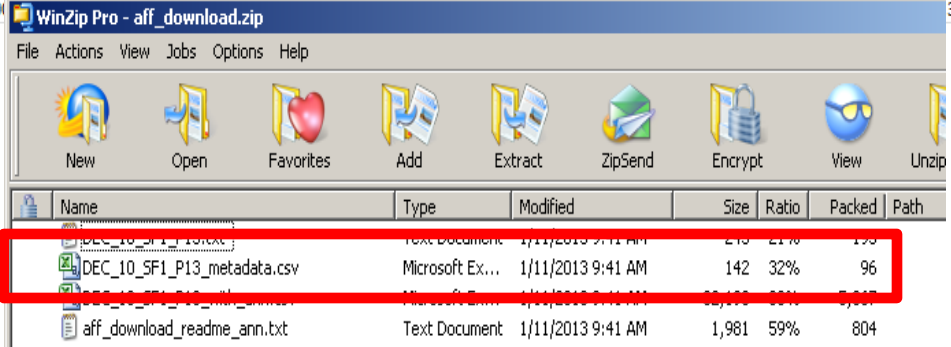- Save the zipped file to your computer and unzip it.

- Once unzipped, open **DEC_10_SF1_P13_with_ann.csv** in Excel.

- AFF provides a column with the fully qualified geographic identifier (**GEO.id2**) needed to join the data to the shapefiles, but it is not formatted as **Text** and that is necessary for use in ArcGIS.

- Change the format of the **GEO.id2** column from **General** to **Text** and **File - Save As** an **Excel Workbook.**

- You may want to change the header rows so they are more meaningful.

- The **DEC_10_SF1_P13_metadata.csv** that is included in the zipped file defines the header rows.

- The three header rows will now become:

  - **D002** - **MedianAgeB**; **D003** - **MedianAgeM**; **D004** – **MedianAgeF**.

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- Save your work and close the **Excel Workbook.**

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TIGER/Line Shapefiles and TIGER/Line Files

- TIGER/Line products are free spatial extracts from the Census Bureau's MAF/TIGER database, containing features such as roads, railroads, rivers, as well as legal and statistical boundaries.

    – Since 2007, the files are in shapefile format.

    – They are available for download here: http://www.census.gov/geo/maps-data/data/tiger-line.html.

Downloading TIGER/Line Shapefiles

- There are four methods for downloading TIGER/Line Shapefiles:
    - Website Interface
    - Direct from the FTP site
    - Connect via FTP client
    - Direct from Data.gov

- This example will utilize the Website Interface method.

- For additional information about downloading and unzipping TIGER/Line Shapefiles, see the brochure "Downloading TIGER/Line Shapefiles", available on our "How To" webpage: http://www.census.gov/geo/education/howtos.html.

- Visit http://www.census.gov/geo/maps-data/data/tiger-line.html.
- Since we downloaded 2010 demographic data, we need to use the 2010 TIGER/Line shapefiles.
- Click on the **2010** Tab.
- Click **Download.**
- Under **Download by File Type**, Click **Web Interface.**

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- Select **Census Tracts** in the dropdown menu and click **submit.**

- Under **Census Tracts (2010)**, Select **Michigan**, click **Submit.**

- Select **Oakland County**, click **Download.**

- Save the zipped file to your computer and unzip it.

Joining the AFF Table to the TIGER/Line Shapefiles

- Open ArcMap

- Add the census tract shapefile you previously downloaded using the **Add Data** icon or **File** – **Add Data** – **Add Data.**

- Both the data file and the TIGER/Line Shapefile contain fields that uniquely identify a geographic entity necessary for creating a join.
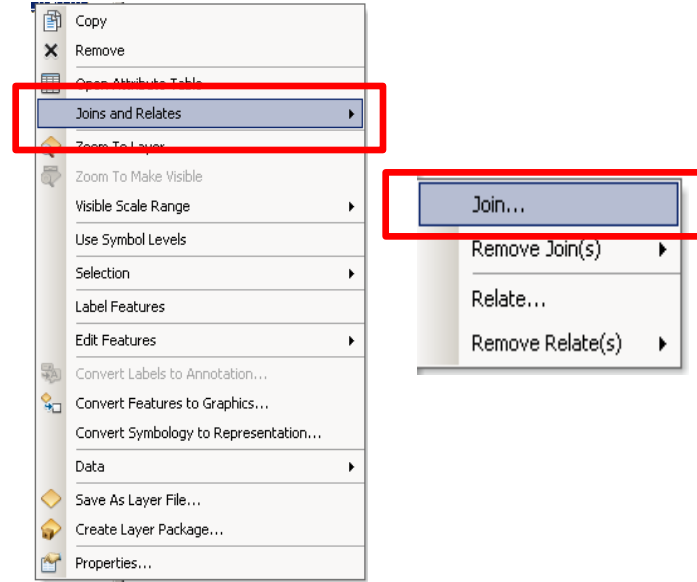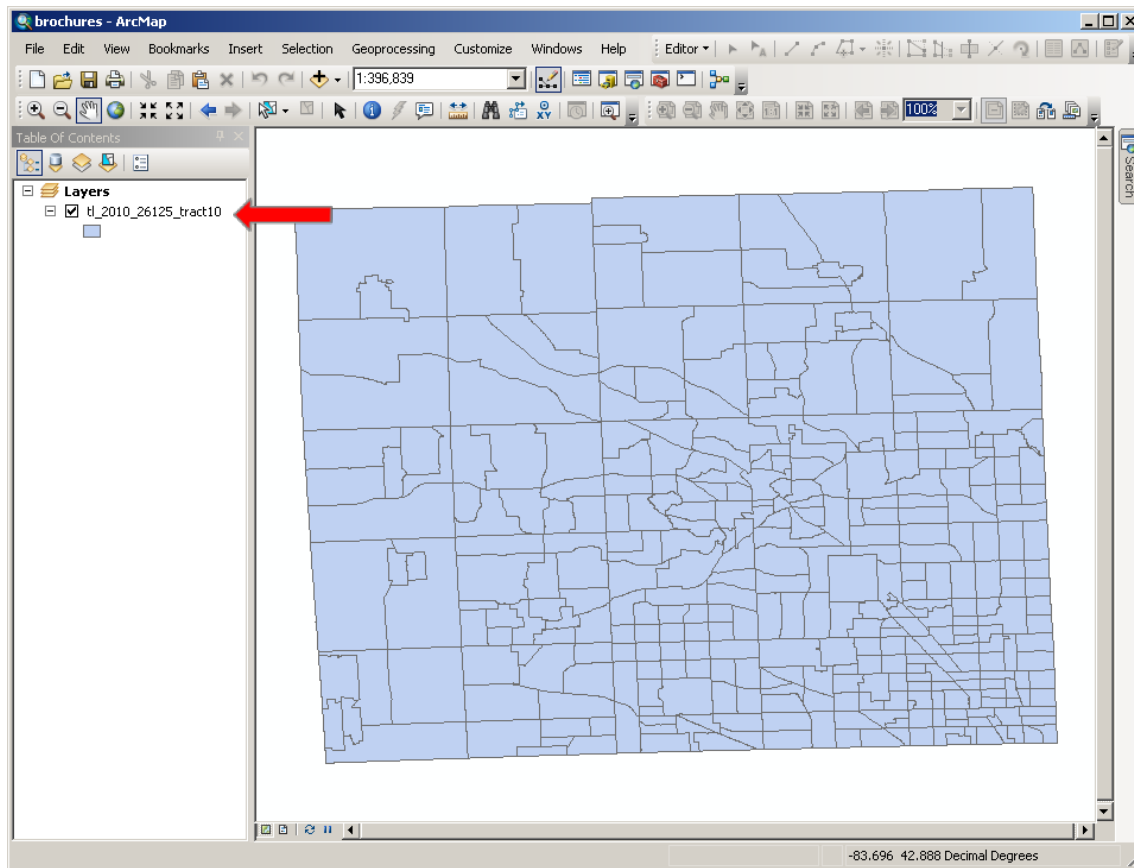
- Right-click on the TIGER/Line Shapefile name.

- Select **Joins and Relates.**

- Select **Join.**

- A new screen appears for you to select the field from the shapefile that will be used to join the data.

  - You want the fully qualified geographic code. It is **GEOID10** in the 2010 TIGER/Line Shapefiles.

  - The TIGER/Line Shapefiles technical documentation has more information on the record layouts and definition of each field.

- Next, select the data file you saved as an Excel Workbook, using the browse (open folder icon).

- Finally, choose the field from the data table to base the join on.

  - The fully qualified geographic code in the AFF table is **GEO#id2** (ArcGIS changes the "**.**" from the original file to a "**#**").

- Click **OK**.

Join Data

Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
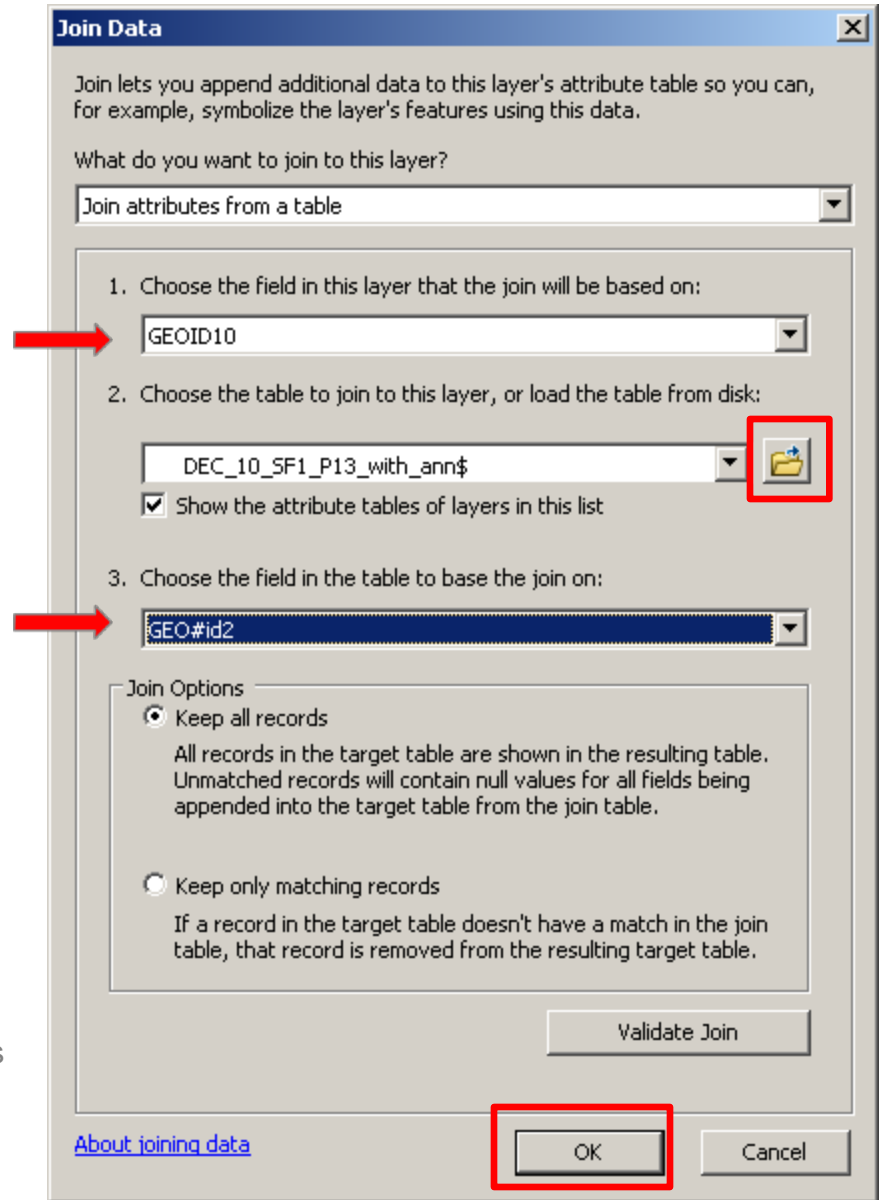
What do you want to join to this layer?

Join attributes from a table

1. Choose the field in this layer that the join will be based on:

   GEOID10

2. Choose the table to join to this layer, or load the table from disk:

   DEC_10_SF1_P13_with_ann$

   ☑ Show the attribute tables of layers in this list

3. Choose the field in the table to base the join on:

   GEO#id2

Join Options

◉ Keep all records

All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.

○ Keep only matching records

If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.

Validate Join

About joining data   OK   Cancel

- To see the results, right-click on the TIGER/Line Shapefile name and select **Open Attribute Table.**

  - ArcMap builds a relationship between the shapefile and the data table.

  - The table now has the attributes from both the shapefile and the data table.

- The data can be used to create a thematic map or for other analysis.

- Multiple files can be joined to the shapefile.

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Removing the Join
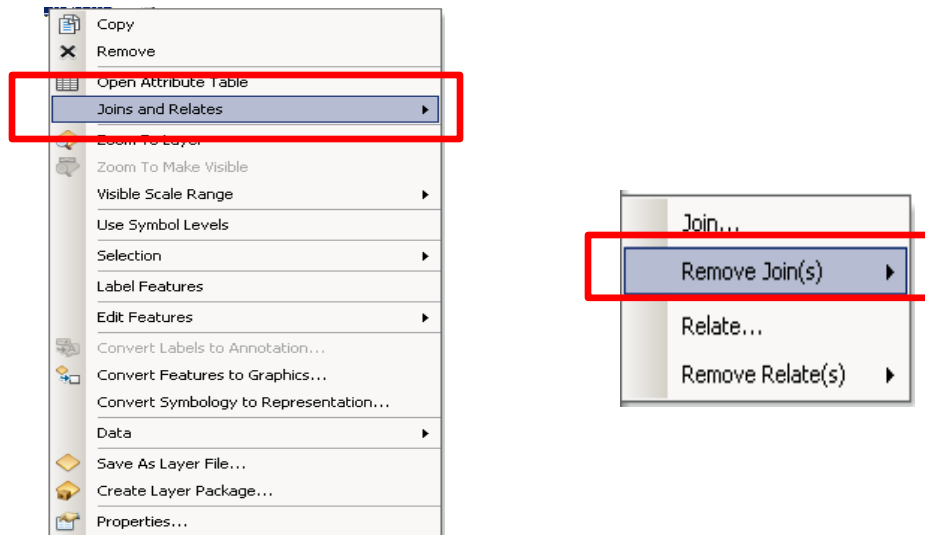
- Right-click on the TIGER/Line Shapefile name and select **Joins and Relates.**

- Select **Remove Joins.**

- Select the join to be removed or select **Remove All Joins.**

Questions

- Visit: www.census.gov/geo

- Email: geo.tiger@census.gov

- Call: (301) 763-1128