ERC ArcGIS Tutorial Step-by-step guide:

This guide is for use with the ERCGISWORKSHOP materials available on the ERC site page for Environmental and Natural Resource Economics, Spring 2016

Download the zip file – extract the entire file into a USB or hard drive – **KEEP ALL THE FILES TOGETHER and DO NOT DELETE ANY OF THE FILES**

Loading the data and shapefile into ArcMap:

Open ArcMap 10.3.1 (on a Columbia or Barnard campus computer)

Click on the catalog tab (all the way on the right), when you click on it, the catalog dialog box will expand. Click the pushpin/thumbtack icon (it's small) in the right corner of the catalog dialog box (by the X).

Click on the icon with a folder and a plus sign. "Folder connections" should appear in the menu.

Click the plus sign (+) next to "folder connections"

Select the folder where the zip file is located on your computer, i.e. the file path (temp drive on lab computers).

You should see the two green shapefile icons for the files labeled "Counties_Shoreline.shp" and "NY_counties_clip.shp".

Drag and drop Counties_Shoreline.shp into the white space in the data view of the ArcMap interface. Do not use the NY_Counties_clip file.

You should see Counties_Shoreline show up in the Table of Contents dialog box on the left hand side of the interface (with the box checked). If the box is unchecked, check the box to use the Counties_Shoreline shapefile.

Drag and drop the TUTORIAL.CSV csv/tabular file from the catalog dialog box to the Table of Contents dialog box (or drag and drop it on the map). Nothing will happen, but you should see the csv/tabular file show up in the Table of Contents dialog box.

If you can't see the csv/tabular file, make sure you have selected the "List by Source" icon at the top of the Table of Contents dialog box (make sure you are not clicked on the "List by Drawing Order").

Now you need to join your tabular data (TUTORIAL.csv) with your shapefile (Counties_Shoreline). Each file contains data, you are joining the tabular data on the same geographic variable that is contained in the shapefile (in this case, it's New York counties).

**Tip: "joining" files in GIS is functionally equivalent to the merge command in Stata (i.e. you are creating one dataset from two, by merging them on a variable that is contained in both datasets and sorted in the same order).

**Second tip: you can always check your data in tabular form by right-clicking on the shapefile or csv file in the Table of Contents and selecting "Open Attributes Table"

Example of trouble-shooting mismatched data types when joining shapefiles and .csv:

Right click on Counties_Shoreline in the Table of Contents dialog box and click "joins and relates" and then "join."

A pop up dialog box. The first drop down menu allows you to select the variable you want to join the files on. Select "CountyFIPS". (Because you join files on the geographic variable/attribute in common)

In number 3 of the pop up dialog box (another drop-down menu), you should be allowed to select the variable you want to join from the csv file. However, when you select the drop-down menu, you only see "NAMES" and one other "NAMES" type of variable. The numeric variables do not appear, so you know there's a problem.

This is a common problem: mismatched data types.

Right click on TUTORIAL.CSV and open the attribute table. Right click on the first cell of the COUNTYFP column and check the data type (it should be long, short, or an integer).

Close the TUTORIAL.CSV attribute table, right click on Counties_Shoreline and open the attribute table. Right click on the first cell of the COUNTYFIPS column and check the data type (it should be a string). You need to create a new variable for counties that's an integer so that it will join with the .csv file.

In the attribute table for Counties_Shoreline, click the first icon on the left in the menu ("Table Options"), then select "add field."

In the pop up dialog box, type in a name for the new variable, it must be less than 12 characters (county_num).

Set the new variable/field to a "long integer" and hit OK (or save). When that box is closed, scroll to the end of the attribute table. You should see the new variable. Right click on the

variable name (the first cell in the first row for that variable), and select “field calculator” from the menu.

In the field calculator, scroll through the variable until you find the numeric version of the county variable (COUNTYFP), and double click on it. It should appear in the box below. Once you have selected “OK” or save and the dialog box closes, you should see the numbers appear in the new variable column. You can close the attribute table and go through the steps again to join the tabular file and shapefile (right click Counties_Shoreline and click “joins and relates” and then “join”). You should now be able to select your newly created variable (county_num or whatever you named it - it will be at the end of the drop down menu) and then select COUNTYFP.

Click “Validate join”. Make sure the cases match (don’t worry about the error-looking message if the cases match). Then click OK or continue and your data should be joined.

Adding a variable/layer to your map:

Right click on Counties_Shoreline in the Table of Contents dialog box and click “properties”.

When the dialog box pops up, click on the “Symbology” tab.
In the symbology tab, click “quantities”. In the “Quantities” tab, select the drop-down menu labeled “values” and select the variable that you want to display on the map.

If the variable needs to be normalized (not raw numbers), select “normalization” and change it to percent.

If you want to change the number of categories displayed on the map, click “classify” in the classification box on the right of the dialog box and change the classification method to something other than “natural breaks” (e.g. quantiles) and click “OK”.

To add a variable, right click on Counties_Shapefile and click “copy”. Then click the bold word “Layers” so that it is highlighted, and then right click on “Layers” and click “Paste layer(s)”.

Right click on second Counties_Shapefile layer and click “properties” and repeat the steps to add a variable (quantities → values → classify, etc.).

Making your map legible and exporting map(s):

Switch to “Layout view” (bottom right, tiny icon - there are two tiny icons, one is the data view, one is the layout view).

Up in the main menu bar, click “Insert”, and click “Legend”. Go through the legend wizard to add the items that you want to the legend.

In the “Insert” menu, add a north arrow and a scale bar.

Select “File” in the main menu, and then click “export map” to save a .pdf or .jpg of the map that is currently in the layout view. You can repeat this step for any map that you create, but once you change the map in ArcMap you can no longer navigate back to previous maps. So, you should export each map that you create before generating any further maps.

To save the data and the map, select “Save as” from the “File” drop down menu in the main menu bar, and save the map and the data as a .mxd file, which can only be opened in ArcMap software.