Using ArcGIS to Visualize Spatial Data and Create Interesting Maps

ArcGIS is a powerful set of applications for organizing, analyzing, and visualizing spatial data for a wide variety of disciplines. ArcMap is the application to use for creating maps that can be exported as image files like jpg and pdf.

Table of Contents

Data from this tutorial come from the U.S. Census and the website flowingdata.com.

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Copy Data Files to the Desktop

To complete this tutorial, you will need to copy the **Geocoding** folder from the **O:\envstudies\GIS Tuorials** folder to the desktop of your computer. If you have done this already, skip to the next section, **Start a New Map Document.**

1. Go to the **Start** menu

2. Click **My Computer**

3. Double click on the **O:** Drive
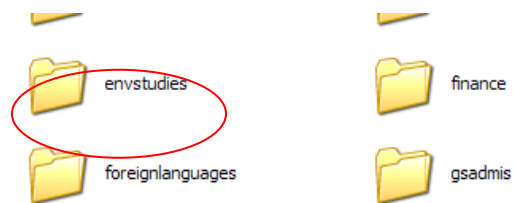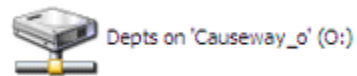
4. Folders are listed alphabetically by department acronym. Double click on the **envstudies** folder.

5. Double click on the **GIS Tutorial** folder. Inside you will see the **Walmart** folder.

6. Right click on the **Walmart** folder, and choose the **Copy** option.

7. Close the **GIS Tutorial** window.

8. Right click anywhere in the blank, blue space on the **Desktop**. Choose the **Paste** option. You should now see the **Walmart** folder on your **Desktop**.

Open a Map Document

1. Open **ArcMap.**
2. Choose the button for **An Existing Map:** and choose **Browse for Maps…**
3. Navigate to the document **TargetWalmart.mxd** on your Desktop and open the file.

Navigate the Map

When you open the map document, you should see the ArcMap Project Window, which includes the main map (the data frame), a table of contents showing the data layers, and a few toolbars to help you navigate and perform some basic tasks. The toolbars can be moved around, as well as added or removed, so your view may not look exactly like the image below.
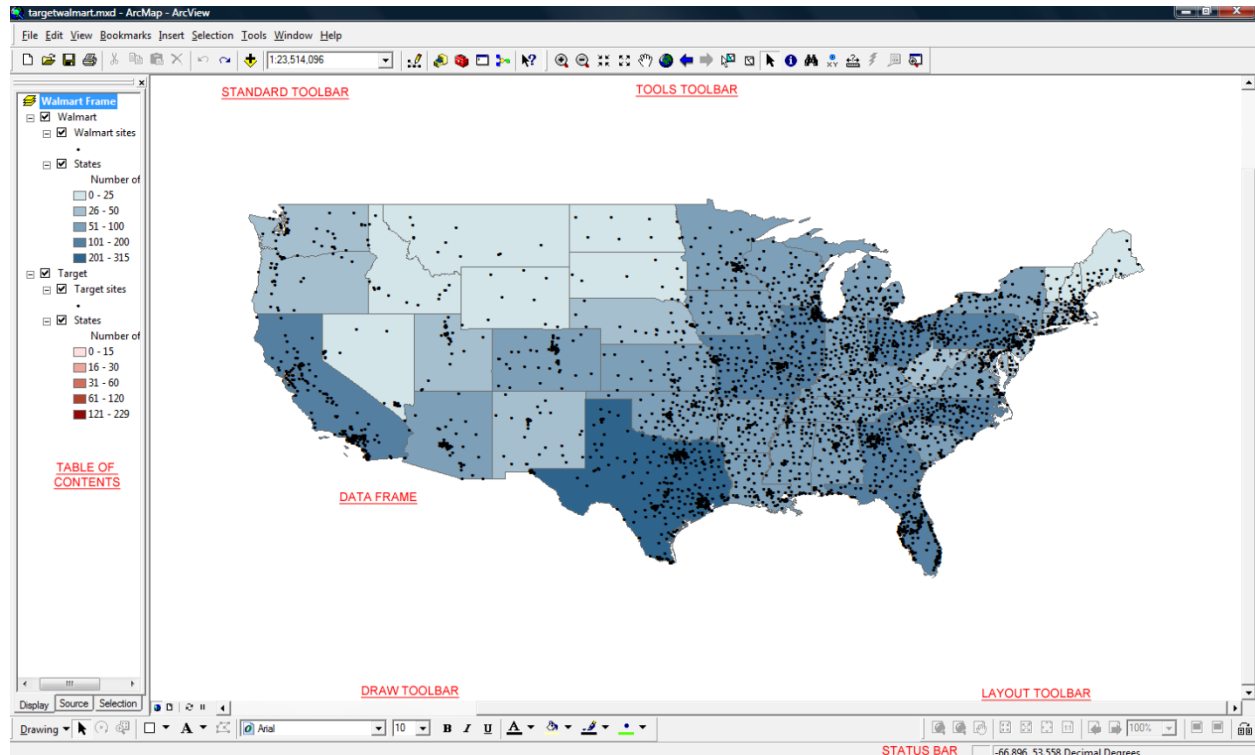

1. Use the Tools Toolbar to navigate the map, zooming in on New Jersey to see the Walmart store locations in the state. Each black dot represents a store, while the background color of each state represents the number of stores within the state.
2. In the Table of Contents, unclick the check-box next to the layer named **Walmart**. This should turn off the two layers with Walmart-related data, so you can see the Target data below.
3. Turn the Walmart data on and off to compare the distribution of the two stores.

Change the Symbology

The Walmart and Target store locations are both currently shown as black dots. We can change the symbology using the Layer Properties window.

1. In the Table of Contents, right-click the **Walmart sites** layer and choose **Properties…** from the pull-down menu.
2. Choose the **Symbology** tab and click the square showing the current symbol under the heading "Symbol."
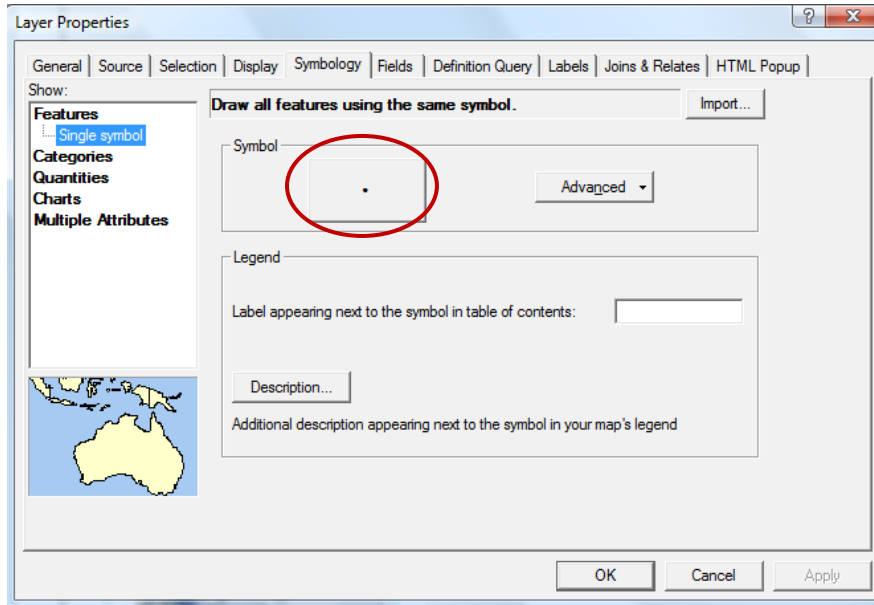
3. Change the symbol to Circle 2, with Quetzel Green color and size of 6. Click OK twice to see the new symbology.
4. Change the Target sites to Circle 2, with White color and size of 6. Now you will be able to distinguish the two stores if they are mapped together.

Design a Map Layout

1. Choose **Layout View** from the **View** menu to see how your map would look on a printed or exported page.
2. The **Layout Toolbar** should now be active. You can use this toolbar to navigate the layout page, while the Tools Toolbar can still be used to navigate the map itself.
3. From the **Insert** menu, add a title and legend to your map.
4. To modify any new layout item (e.g., the legend), right-click the item and choose **Properties** from the pull-down menu.
5. When you are happy with your layout design, choose **Export Map…** from the **File** menu. You have a variety of image formats that can be used, and the option to change the resolution to meet your needs. Save the map as **MyMap.pdf** with format type **PDF** and resolution of **300 dpi**.
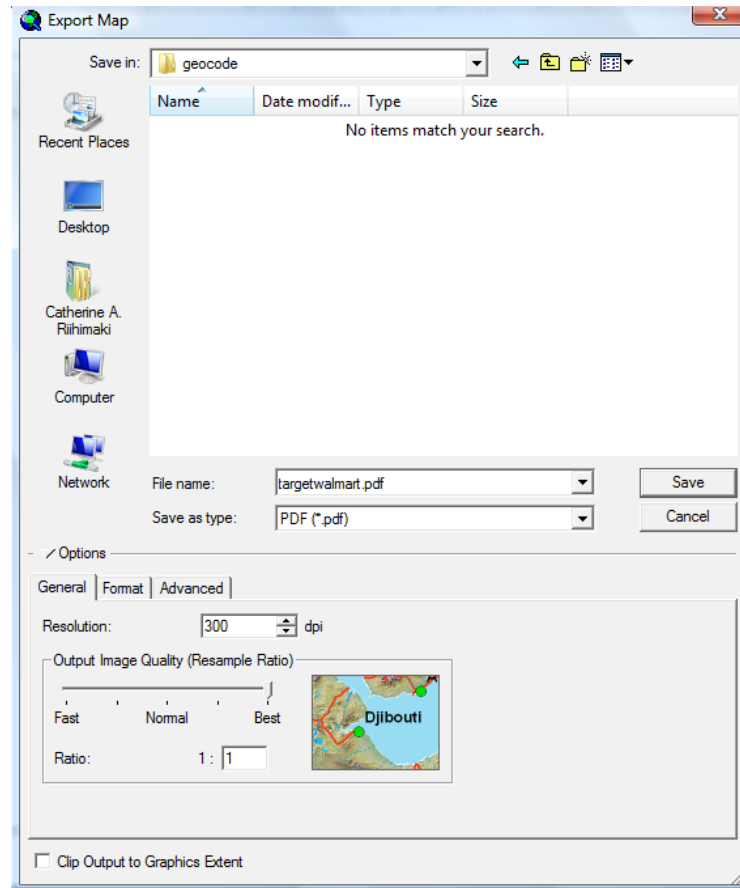
Epilogue: Analyze the Data

ArcMap has a few different ways to analyze the spatial data quantitatively instead of purely qualitatively. One way is to generate summary plots of the data to augment the maps. These plots can be added to a layout, or simply used within the ArcMap environment to explore relationships between spatial variables. Two graphs have been made for you already.

1. From the **Tools** menu, choose **Graphs** and then choose the two graphs at the bottom of the pull-down menu. One shows the relationship between a state's population and the number of Walmart stores in the state, and the other shows population versus the number of Target stores. A best-fit line has been added as a simple model of the relationship between the variables.
2. On the graph, click any of the points that are of interest to you. Notice that the corresponding state is highlighted on the map. From these graphs, you can develop an understanding of the business model of each company, and you can investigate states that may have surprisingly few or many stores.
3. Right-click the graph and choose **Add to Layout** to create a graph as part of your map layout. You can also modify the format of the graph by choosing **Properties…** or **Advanced Properties…**