

Software Application Training

WEST CHESTER UNIVERSITY



Introduction to GIS

Intro to GIS

(requirements: basic Windows computer skills and a flash drive)

Part 1. What is GIS.

1. System: hardware (computers, devices), software (proprietary or free), people.
2. Inside a shapefile. (what do I need to make a map?)
3. Two kinds of data: spatial and attribute.

Part 2. Download the GIS Exercise data to your USB drive

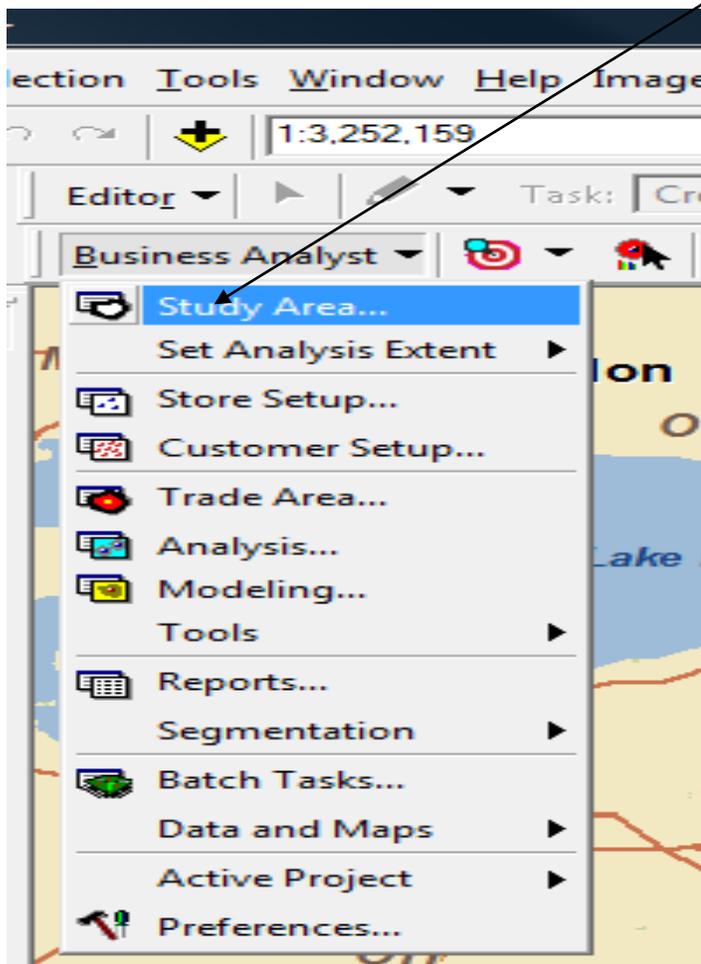
1. Insert your USB drive into the USB port (you cannot save to the C: drive, only temporary. The T: drive is not only for your use).
2. Open My Computer from the Desktop, then open the USB drive and create a folder where you will store your data.

Part 3. Start a Map Project and Set the Printer Settings

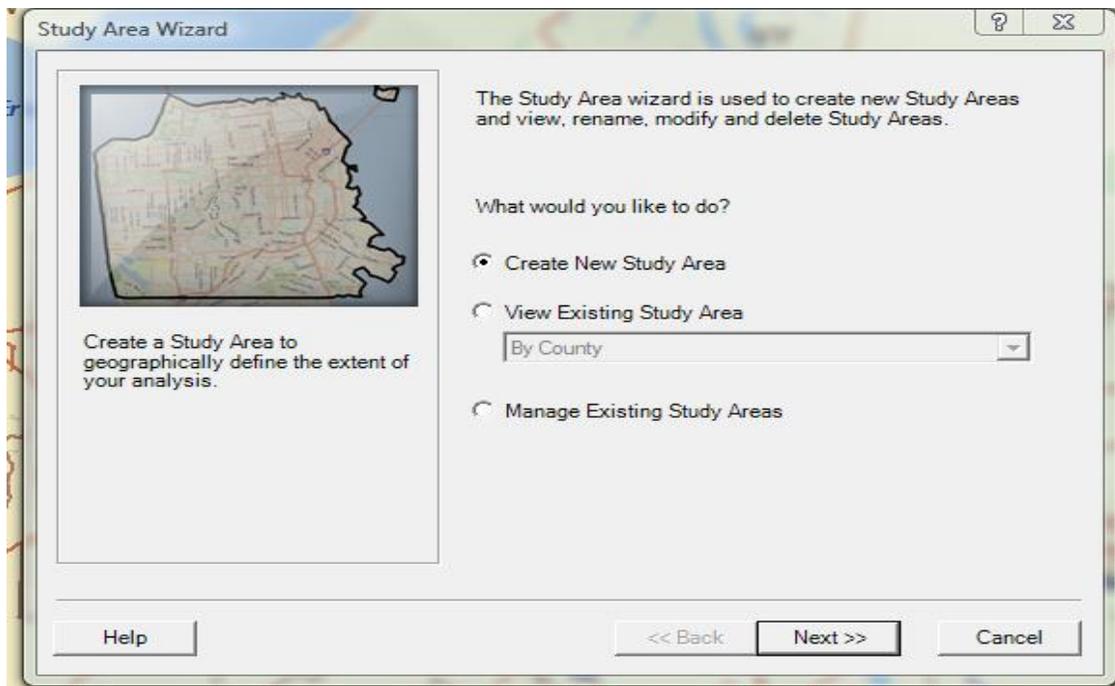
1. For this occasion we will be using one particular product of the ArcGIS family, which is named Business analyst. The main difference between the standard product and the one we will be using is that the last one contains data, and a set of tool that are not standard.
2. Open Business Analyst ... click on the Start icon on the desktop , select All Programs, click the ArcGIS folder, Business Analyst folder, and then Business Analyst (this will take a few seconds).
3. Lets repeat the same process but using Citrix. If you do not want to install the software (we can provide you with a copy) you can access to it through the Citrix server (access.wcupa.edu). Be aware that if you keep the basemaps it will run very slowly. You better remove them and be sure you have your USB drive already in your machine.

Part 4. Create a Study Area

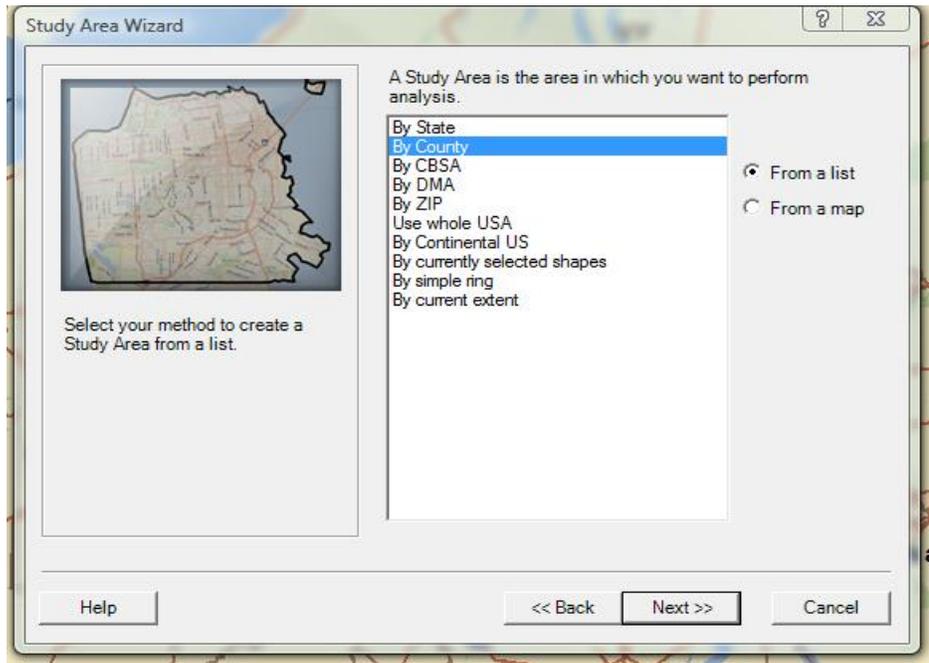
1. On the Business Analyst toolbar, click the dropdown arrow next to “Business Analyst” and select study area.



4. Select “create new study area”, click next.



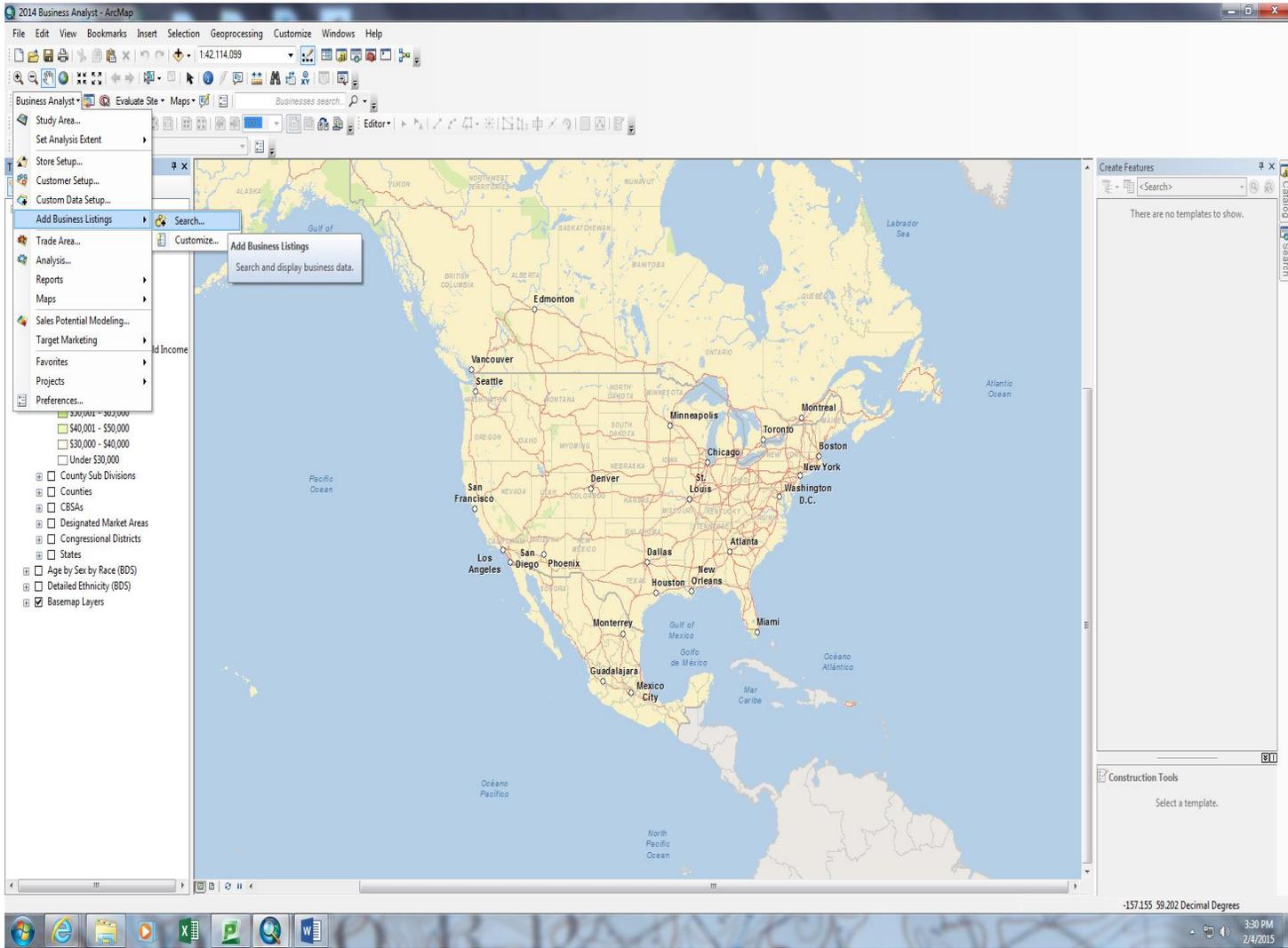
5. Select by County. Then select the county of your interest (Philadelphia). Select Next. Give the study area a name like “Philadelphia County”, then click finish



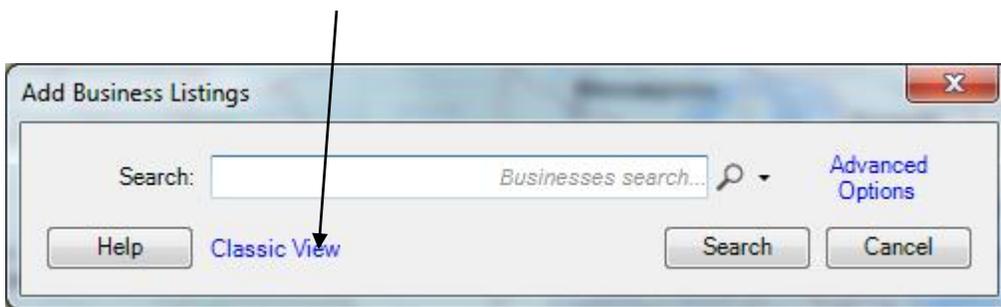
6. The study area layer will appear in the map Table of Contents (list of layers on the left side), but it is only a temporary file. You need to save this layer to your USB thumb drive to make it a permanent layer. So, right click on the layer name, then select Data, then Export. In the window that pops up, navigate to your USB drive and name the layer –without spaces- then click OK to save it. The last step we are prompted to add it to the current map which we will do.

Part 5. Find your businesses.

1. Next we will want to add a layer with the NAICS codes. The NAICS stands for **North American Industry Classification System**. We want to add a list of business to overlay to our study area to show its spatial distribution. Notice that for the NAICS classification any kind of agency has a code, profit (businesses) or non-profit (NGOs or Universities). We can accomplish that through the business analyst drop down menu, navigate to data and maps and go to add business listing.



Check Search and “Classic View”.



2. Select Location and “Search inside features” (here you will select your Philadelphia area). Hit OK.

Select Location [X]

Select one of the ways to specify location search criteria.

Search inside current extent

Search inside the features of the polygonal layer specified

Block Group Level

Use selected features only

Select geographic search criteria

Select one or more geographic search criteria by placing a check next to the desired location in the selection box. The Find box allows you to quickly locate an area in the selection list. Once selected, the areas will be shown in the Selected Locations box.

Find

State	City	Zip
<input type="text"/>	<input type="text"/>	<input type="text"/>

Select

<input type="checkbox"/> AK	<input type="checkbox"/> 29 Palms, CA	<input type="checkbox"/> 00501
<input type="checkbox"/> AL	<input type="checkbox"/> Aaron, KY	<input type="checkbox"/> 01001
<input type="checkbox"/> AR	<input type="checkbox"/> Aaronsburg, PA	<input type="checkbox"/> 01002
<input type="checkbox"/> AZ	<input type="checkbox"/> Abilene, TX	<input type="checkbox"/> 01003

Clear All Clear All Clear All

Selected Locations

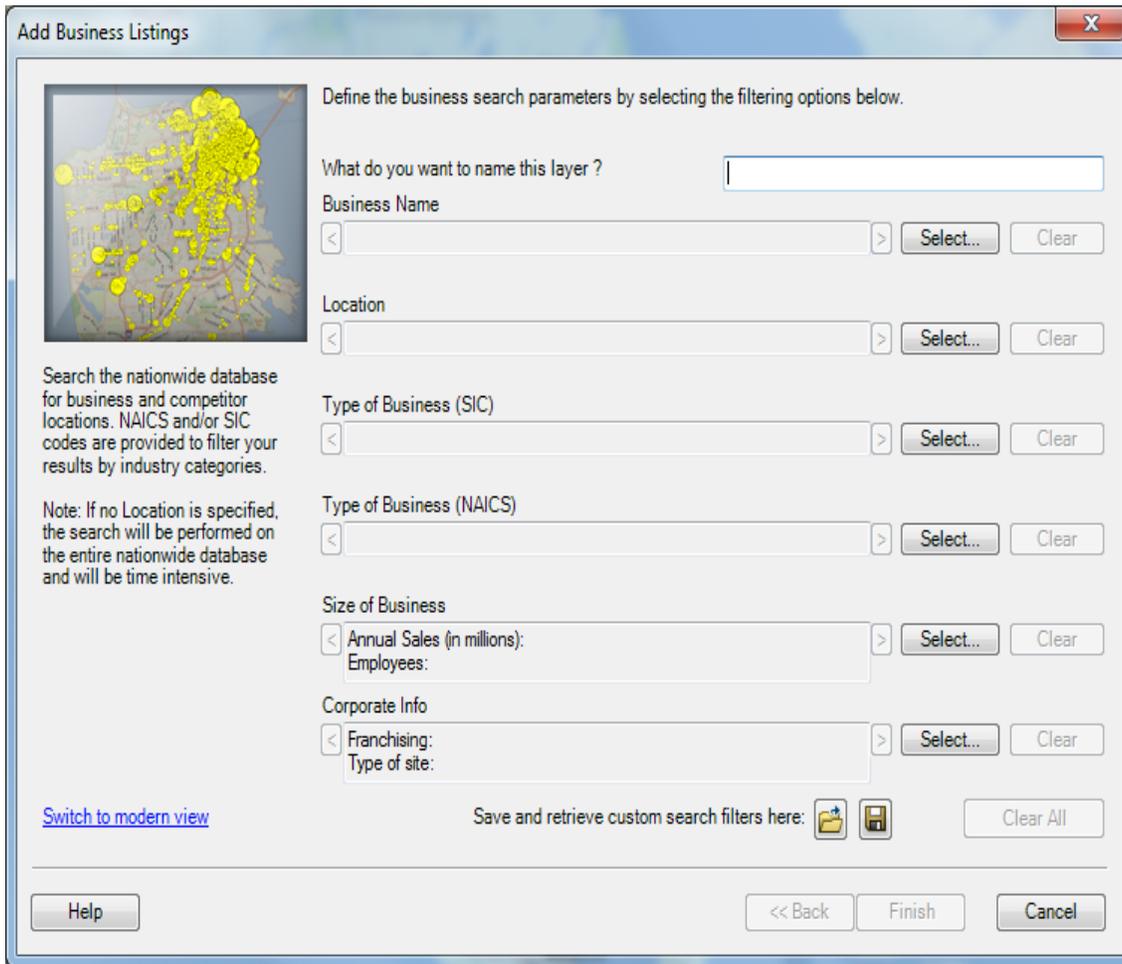
<input type="text"/>

Clear

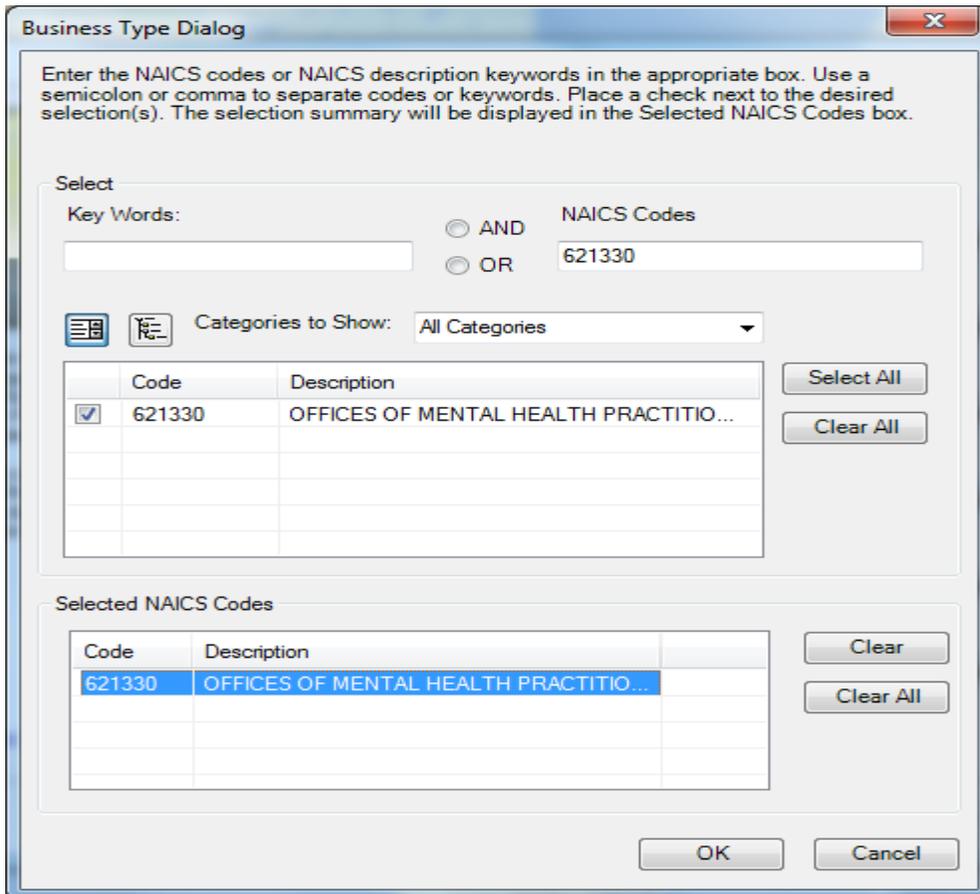
Clear All

OK Cancel

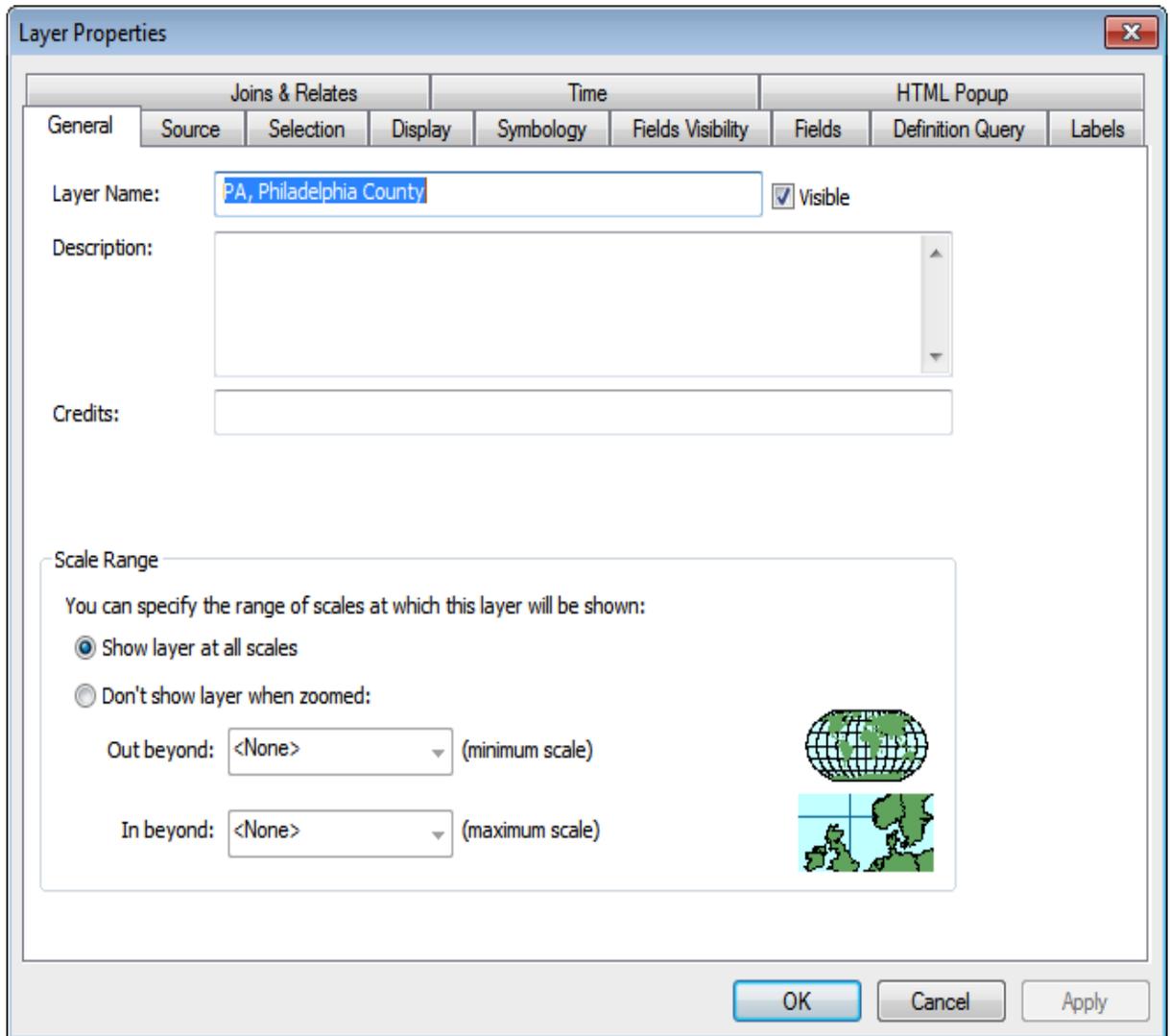
3. Go to type of Business and select NAICS



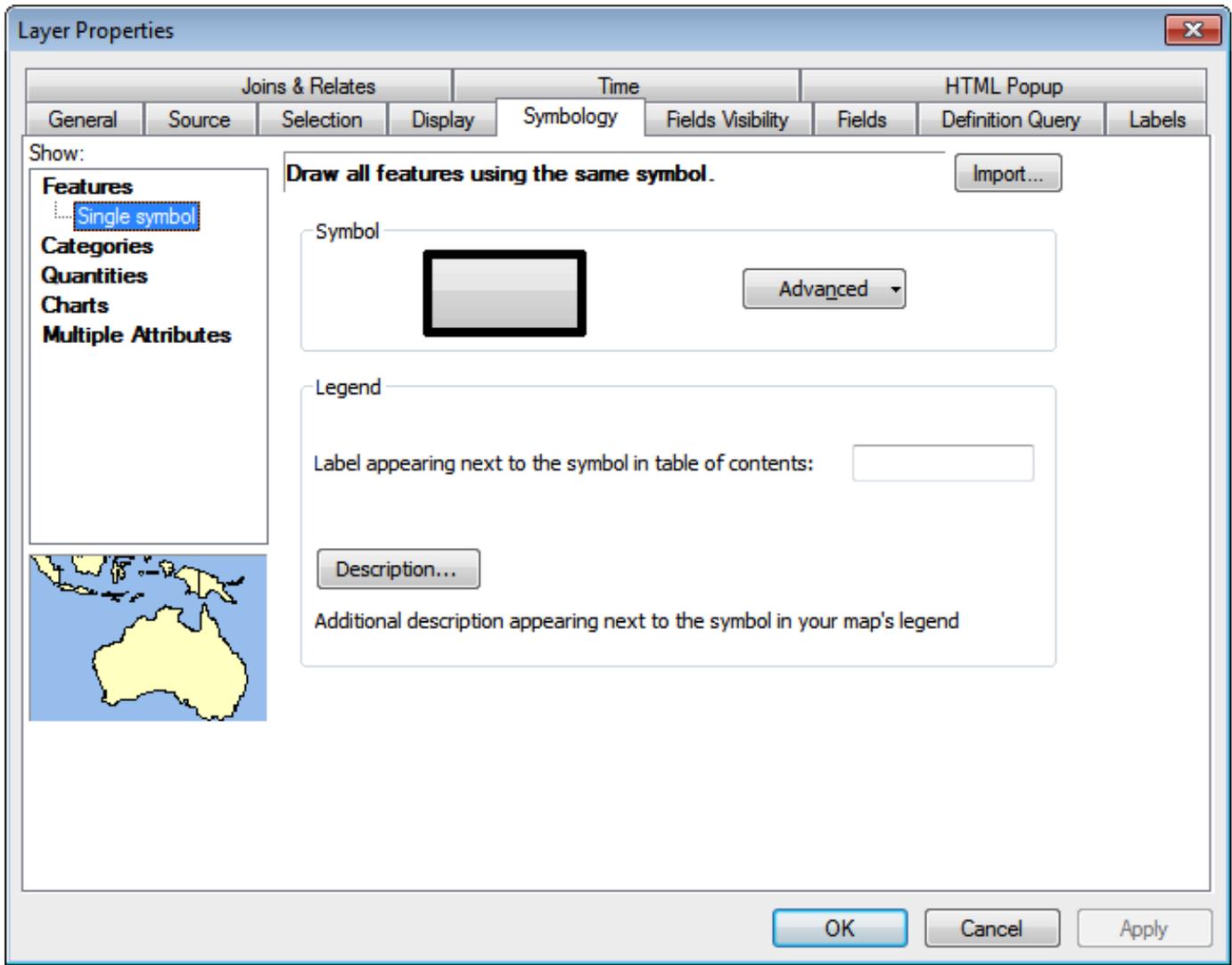
4. **You can enter key words and the software will find the correspondent code or you can navigate to the internet and find the code of your interest (<http://www.naics.com/search/>).**



5. A list of all businesses in the study area will appear. Click Finish and a set of points representing the NAICS locations will appear on the map and in the map's Table of Contents.
6. Like the study area layer, this layer is also temporary. Repeat step #6 in Part 4 to export, save the layer to your USB drive and bring it to the map.
7. The layers appear on the left side of the window in the map's "Table of Contents." Go ahead and give each of the layers a proper name (spelling, capitalization, etc.). To do this:
 - Right click on the layer and select "properties." You can also just double click.
 - In the dialog box that opens, select the "General" Tab.
 - Next to "Layer name" type in the name of the layer as you want it to appear on your final map layout.
 - Do this for every layer.



8. Symbolize each of the layers with appropriate symbols (colors, marker symbols, line symbols, etc). To do this, double click on the layer's symbol in the Table of Contents...OR:
 - In the map table of contents, right click on the first layer, select "Properties," (just like you did with the layer name)
 - select the "Symbology" tab
 - On the left, select *Features* and *Single Symbol* (See picture on next page)....
 - Click directly on the symbol and a palette will appear.
 - Choose a symbol style, color and size. Click OK.
 - Do this for each of the layers, your county and your businesses.

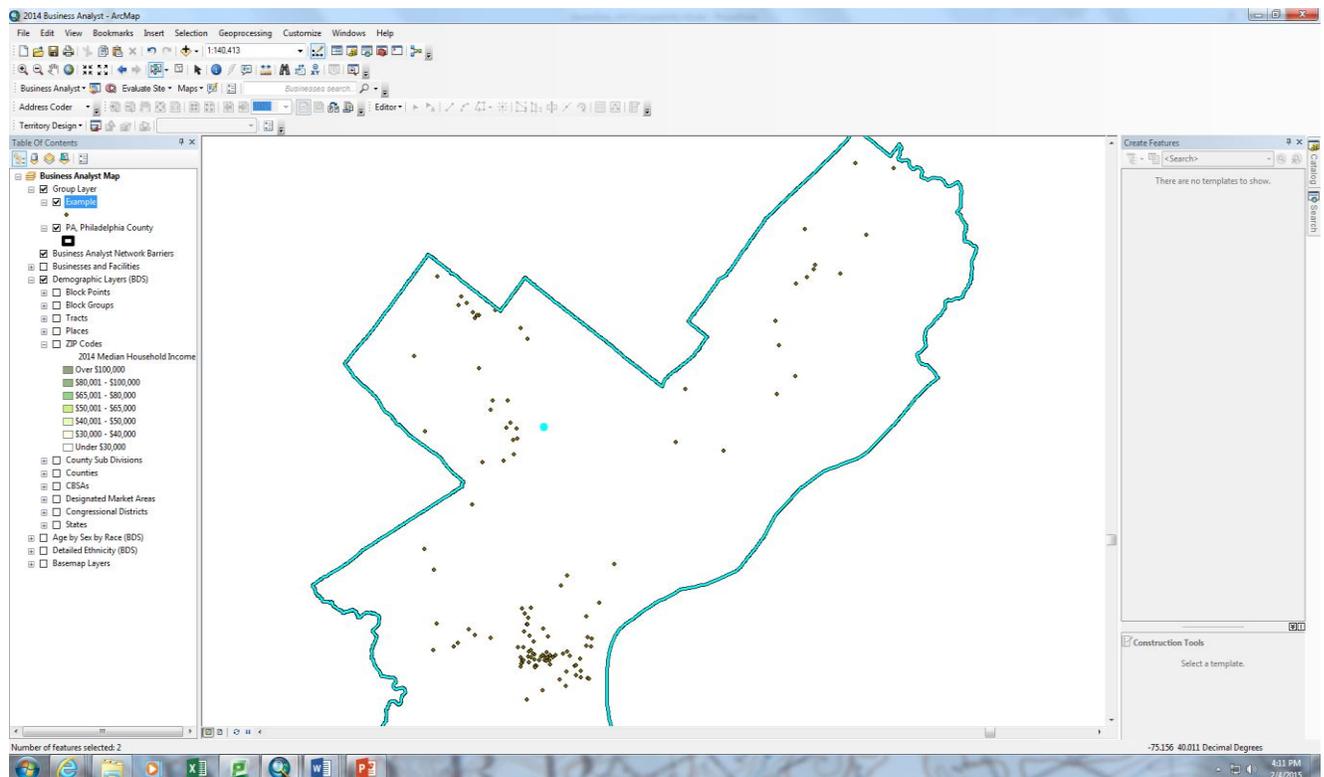


(Before you add layers to the map project you will switch from the Layout View to the Data View. The Data View is the view in which you build the map and conduct analyses. To do so, click on the **View** menu, then select **Data View**).

3. **The Attribute (called variables in social sciences) Table.** The attribute table contains descriptive data that describes the spatial data you see on the map. Every layer has an attribute table. There is one record (row) of data in the attribute table for each of the shapes in the layer. The attribute table and the spatial data are linked. Write click on the layer and scroll down to Open Attribute Layer.

Shape	DUNSNUM	CONAME	ADDR	CITY	STATE	STATE_NAME	ZIP	ZIP4	PHONE	NAICS	SIC	SALESVOL	HC
Point	790956494	THOMAS A BARTLETT MA	111 N 49th St	Philadelphia	PA	Pennsylvania	1913	2718		621330	80490401	55000	0
Point	054157954	EMILY WEISS PSYCHOLOGIST	4910 Osage Ave	Philadelphia	PA	Pennsylvania	1914	1609	2677023027	621330	80490401	61000	0
Point	806516258	CHARLES A JOHNSON	4401 Spruce St	Philadelphia	PA	Pennsylvania	1910	4764	2152220755	621330	80490401	170000	0
Point	806547642	SHARON GREEN	204 S 43rd St	Philadelphia	PA	Pennsylvania	1910	2927	2152222224	621330	80490402	180000	0
Point	014075483	TO OUR CHILDREN'S FUTURE WITH HEALTH	4035 Powelton Ave	Philadelphia	PA	Pennsylvania	1910	2262	2152221117	621330	80490400	63000	0
Point	844740907	NAOMI F ROSENBERG PHD	Medical Tower Blvd	Philadelphia	PA	Pennsylvania	1910		2155451088	621330	80490401	69000	0
Point	121735443	CENTER FOR COGNITIVE THERAPY	3535 Market St FL 2	Philadelphia	PA	Pennsylvania	1910	3317	2158984100	621330	80490404	320000	0
Point	795423834	EDNA B FOA	3535 Market St FL 6	Philadelphia	PA	Pennsylvania	1910	3322	2157463327	621330	80490400	24000	0
Point	849719059	HARMONY MENTAL HEALTH INC	2400 Chestnut St Ste 19	Philadelphia	PA	Pennsylvania	1910	4313	2155685900	621330	80490401	840000	0
Point	802355110	KLEIN HENRY DR PSYCHOLOGIST	2401 Pennsylvania Ave 10c51	Philadelphia	PA	Pennsylvania	1913	3010	2152355855	621330	80490400	64000	0
Point	805849179	VALERIE KELLOM	315 S 22nd St	Philadelphia	PA	Pennsylvania	1910	2559	2157901770	621330	80490400	55000	0
Point	806393844	ANN BORDEN PSYCHOLOGY	221 N 23rd St	Philadelphia	PA	Pennsylvania	1910	1005	2159881220	621330	80490400	54000	0
Point	806527420	ROBIN L SMITH PHD	210 W Rittenhouse Sq	Philadelphia	PA	Pennsylvania	1910	5726	2157901160	621330	80490400	53000	0
Point	806542452	EVA Z ABRAMS PHD	315 S 22nd St	Philadelphia	PA	Pennsylvania	1910	2559	2155461996	621330	80490401	89000	0
Point	849884950	RITTENHOUSE COUNSELING ASSOCS	2201 Chestnut St Ofc 101	Philadelphia	PA	Pennsylvania	1910	3009	2155579007	621330	80490401	57000	0
Point	861273936	WILLIAM P LIBERI PHD	2123 Pine St	Philadelphia	PA	Pennsylvania	1910	6513	2159852968	621330	80490401	54000	0
Point	861283216	LLOYD BROTMAN PHD	2123 Pine St	Philadelphia	PA	Pennsylvania	1910	6513	2159852967	621330	80490401	89000	0
Point	791071285	GOLDSMITH BARBARA L PSY D	2200 Bnjinm Frnkln N110	Philadelphia	PA	Pennsylvania	1913	3601	2159778811	621330	80490401	91000	0
Point	036367253	ESTELLE PRICE	2200 Bnjinm Franklin Pkwy	Philadelphia	PA	Pennsylvania	1913	3601	2159889301	621330	80490401	110000	0
Point	042462379	ELLEN STERLING PHD	2200 Ben Franklin Pkwy	Philadelphia	PA	Pennsylvania	1913	3601	2152320175	621330	80490404	87000	0
Point	059522727	THE CENTER FOR CONTEXTUAL	2130 Pine St	Philadelphia	PA	Pennsylvania	1910	6535	2157310773	621330	80490401	86000	0
Point	061154863	CLINICAL PRACTICE ENRICHMENT SERIES	2120 Spruce St APT 1	Philadelphia	PA	Pennsylvania	1910	2555	2157323720	621330	80490400	59000	0
Point	078435416	KEVIN T KUEHLWEIN, PSYD	505 S 22nd St	Philadelphia	PA	Pennsylvania	1914	1246		621330	80490401	44000	0
Point	802400973	KAREN DYBNER MADERO	2201 Pennsylvania Ave	Philadelphia	PA	Pennsylvania	1913	3513	2156360887	621330	80490401	63000	0
Point	791091085	ADRENNIE MENDELL	135 S 19th St Ste 250	Philadelphia	PA	Pennsylvania	1910	4906	2155451855	621330	80490401	72000	0
Point	016060904	Y M AGAZARIAN	553 N Judson St	Philadelphia	PA	Pennsylvania	1913	3122	2155617428	621330	80490401	62000	0
Point	036376916	JOHN HARTKE	135 S 19th St Ste 240	Philadelphia	PA	Pennsylvania	1910	4921	2155645657	621330	80490401	110000	0
Point	036541410	JUDITH SILLS PHD	135 S 19th St Ste 250	Philadelphia	PA	Pennsylvania	1910	4906	2155577940	621330	80490401	68000	0
Point	042459532	SPECTOR, ANN ROSEN PHD	2030 Sansom St	Philadelphia	PA	Pennsylvania	1910	4527	2155634748	621330	80490401	110000	0
Point	042459698	BARBARA FRIEDMAN PSYCHOLOGISTS	2031 Locust St APT 802	Philadelphia	PA	Pennsylvania	1910	5610	2155645964	621330	80490401	110000	0

- b. Click on the Select Features tool , then click on one of the polygons in businesses layer. The selected will be highlighted blue (see picture below). Notice the similarities between the information obtained by the Identify button and the select tools in the attribute table.



- c. Now clear the selected features (remove the blue highlight) by clicking the Clear Selected Features

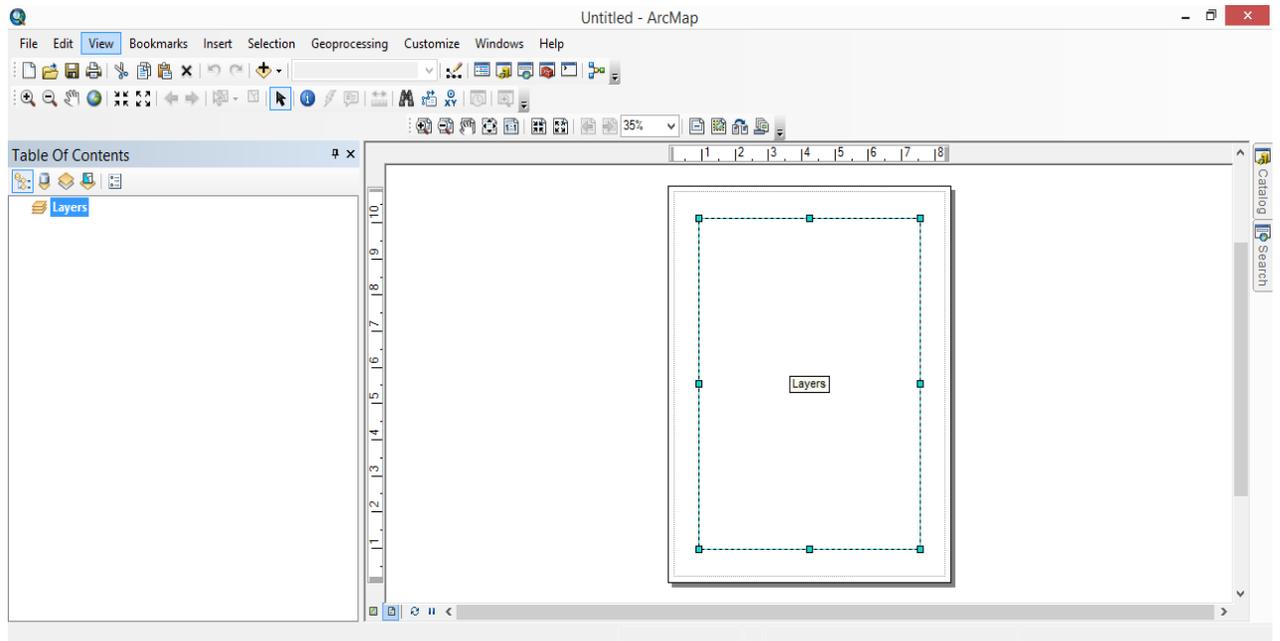


tool at the top of the table. The blue highlights will be cleared from the table and the map. Next, close the table.

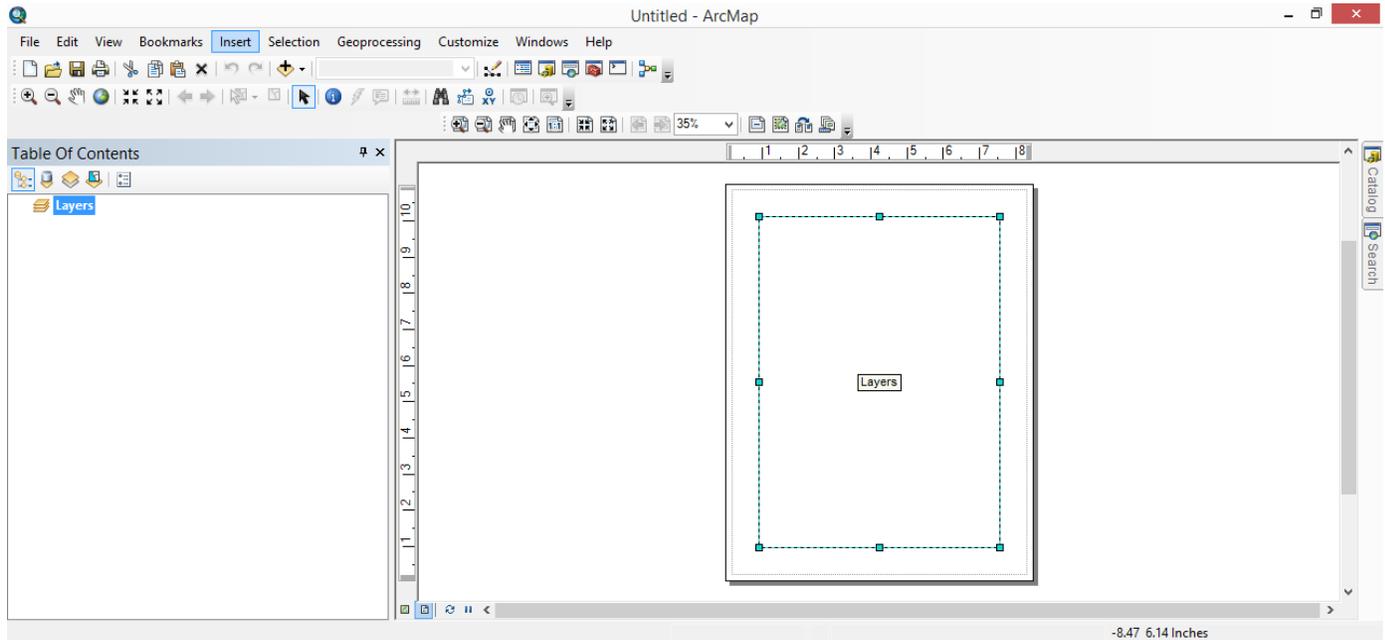
4. Create a Map

The Map Layout is the page that you hand. In the professional world, it is the page that is printed for inclusion in a report or for presentation purposes. It must look neat and adhere to graphic standards. This means that the map should have NO typos, spelling or grammatical errors. After all your audience needs to be able to read the map and understand the legend.

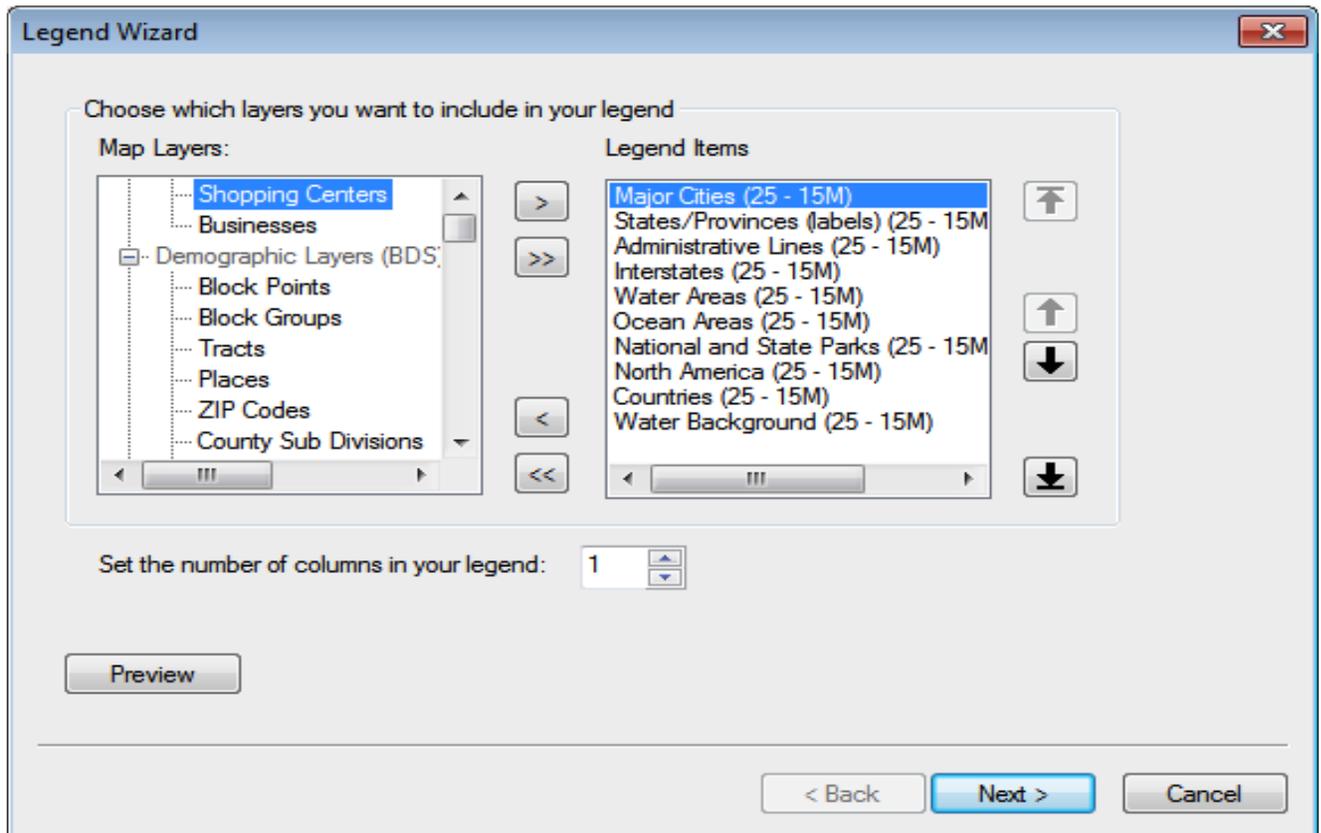
11. Change from the Data View to the Layout View by clicking on the View Menu and selecting Layout View.



12. Use the Zoom and Pan tools to make your Philadelphia Area as large as possible without cutting off its boundaries and to center it on the page or, right click on the layer in the table of contents and select "Zoom to layer"
13. The tools for the map composition (North Arrow, Title, Text, Legend, Scale bar), will show up only in the layout mode. Once you are there you can go to Insert where you can find all the elements that compose a map, such as title, text to write your name and data sources, a north arrow and scale bar array, and the most important part of all ... the Legend!



14. Enter a title on the top of the layout where it says “Double click to enter a title.” The title should communicate the map’s primary message (what is this map showing? what are you trying to show your audience?) You have to repeat the process for the text (the software creates a little window to enter the text placed in the middle of the map, very difficult to find).
15. The legend wizard allows you to give a title to the legend itself, organize the items, change the color, background, borders, and add or remove items from your legend. The Business Analyst software adds a big number of layers to the legend. You don’t need them all. Said that, it is a good exercise to add them all just to see an awful and unnecessary amount of layers.



16. Notice that the software provides a significant number of North Arrows and Scale Bars to choose. Sometimes the software creates a scale bar with measurement units that don't make much sense. For instance, inches are not a good unit to measure a continent, and vice versa, miles are not accurate units to measure a room!

17. You can arrange the map elements (scale bar, north arrow, text) by clicking and dragging. You will know that we can move it when it is highlighted in blue. Make the map look organized and professional. Make sure that all of the map elements, font sizes, etc are visible yet proportional. One tip: The legend, the title and the author's name are more important than the north arrow or scale bar. The text can be used for both the author's name as well as the data source. In some cases you will need to report the source for proprietary rights (like in the case of the software we are using). However, we usually do it to give credit to those who collected the data.