

NJCU GIS I Exercise 1 - Arc Pro: Map your Home with ArcPro v1, 200204

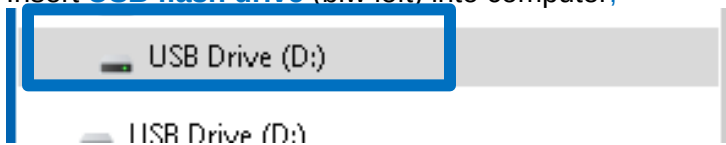
Desired Student Learning Outcomes:

- **DEMONSTRATE** computer proficiency with basic operational tasks
- **UTILIZE** storage & access capabilities with servers, sites, and/or drives
- **CREATE** an ArcGIS Pro map
- **DIFFERENTIATE** spatial from non-spatial data
- **MODIFY** ESRI &/or PPTX files to user-friendly, transferrable JPEG images
- **SUMMARIZE** the exercise and your performance through a written summary

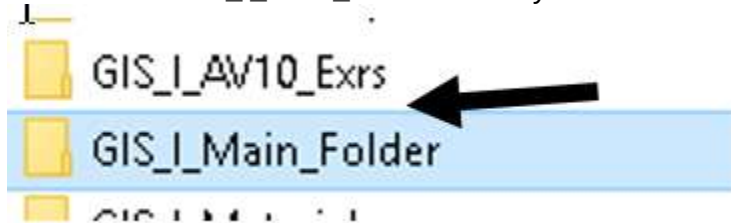
Introduction: In this exercise you are introduced to the three main elements that are used to model the real world when mapping it with **vector** features: points, lines, and polygons. In Exercise 02 you will be introduced to raster GIS. Please refer to your Heywood et al. and Law & Collins texts and other resources for a comprehensive treatment of [vector GIS](#). Some data can be found online- in fact, this new version of ArcGIS (Pro) is geared to work with online and server-based ("cloud") data. Other data can be produced through [onscreen digitizing](#). This exercise will combine a few of these techniques for producing data.

Step 01 - Create a GIS_I_Main_Folder on your flash drive

- If you have not yet procured an 8 GB or larger flash drive, do so now
- Insert **USB flash drive** (blw left) into computer,

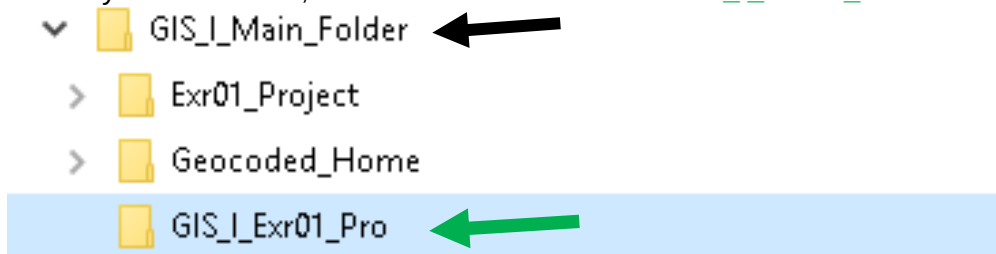


- Create a **GIS_I_Main_Folder** inside your USB drive

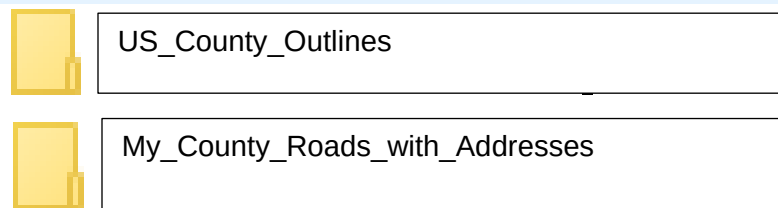


Step 02 – Create additional folders inside GIS_I_Main_Folder

- On your flash drive, create a new folder named **GIS_I_Exr01_Pro** inside your **GIS_I_Main_Folder**.(below)

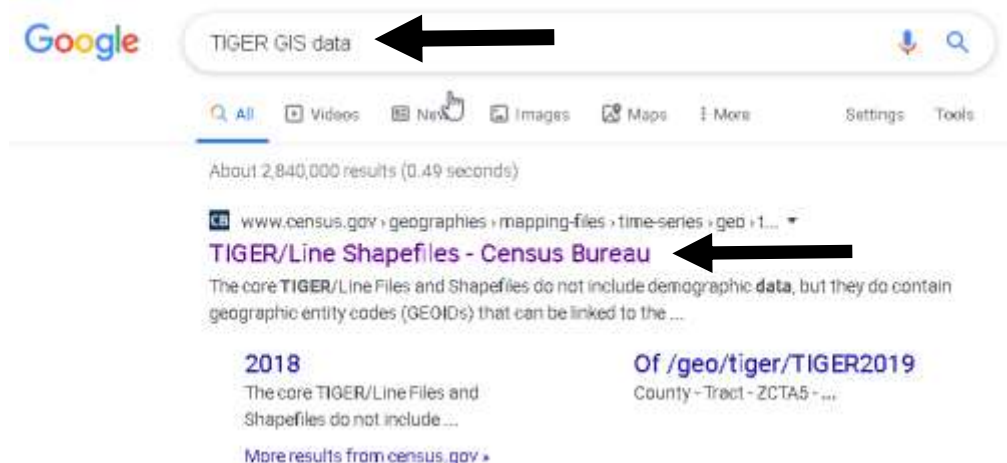


- Inside your GIS_I_Exr01_Pro folder, create 2 more folders, with names as follows:

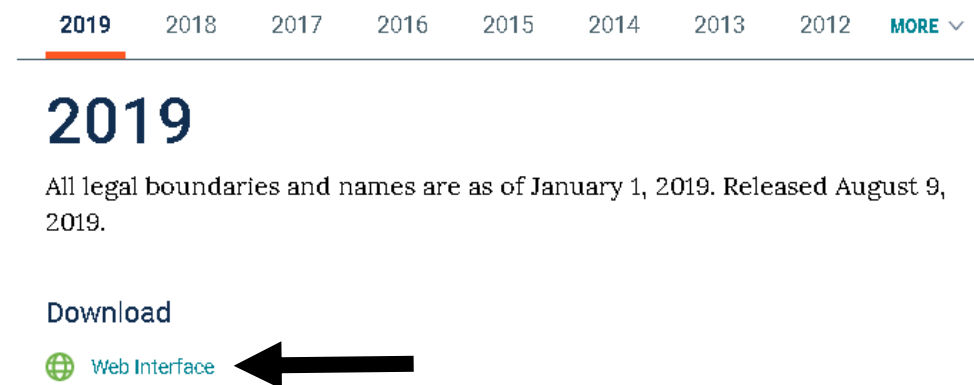


Step 03 – Search for and retrieve TIGER map data layers

- Open Google Chrome as a web browser; type TIGER GIS data into the search window
- Select **TIGER/Line Shapefiles** (below):



- Select the **Web interface** option at the bottom of the 2019 screen (below)



The primary interface for download of TIGER data appears (below).

A screenshot of the 'TIGER/Line® Shapefiles' download interface. At the top, there is a header with the 'United States Census Bureau' logo. Below the header, the title 'TIGER/Line® Shapefiles' is displayed in large white font on a dark background. Below the title, there is a paragraph: 'Select the year and layer you are interested in from the dropdown menus below and click "Submit" for a list of the available geographic areas.' Below this paragraph, there are two dropdown menus: 'Select year' with '2019' selected, and 'Select a layer type' with 'American Indian Area Geography' selected. Below the dropdown menus, there is a 'Submit' button.

Step 03 – Download US County outlines from Census Bureau

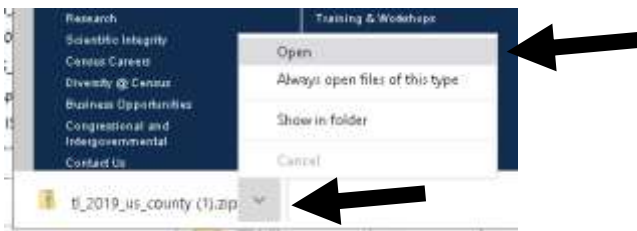
- From the TIGER web interface (below), use the “scroll” arrow to select “counties and equivalent”:
- Press **Submit**

The screenshot shows the TIGER web interface. On the left, there is a sidebar with links like 'ABOUT US', 'Are You in a Survey?', 'FAQs', etc. The main area has a 'Select year' dropdown set to '2019'. Below it, a 'Select a layer type' dropdown is open, showing a list of options: 'American Indian Area Geography', 'Geographic Areas', 'American Indian Area Geography', 'Blocks', 'Black Groups', 'Census Tracts', 'Congressional Districts', 'Consolidated Cities', 'Core Based Statistical Areas', 'Counties (and equivalent)', and 'County Subdivisions'. The 'Counties (and equivalent)' option is highlighted. To the right of the dropdown, there is a 'Submit' button. Arrows point to the 'Counties (and equivalent)' option and the 'Submit' button.

- Your only option is to **download a nationwide file** of all US Counties (below left)



- Select the **grey arrow** of the “zip” file in the lower LH corner of your web browser (below) > select **Open**



Please note: downloading and unzipping files, especially GIS files, is not a standardized process. I apologize to students, as unzipping and managing files are frequently the most confusing parts of GIS exercises.

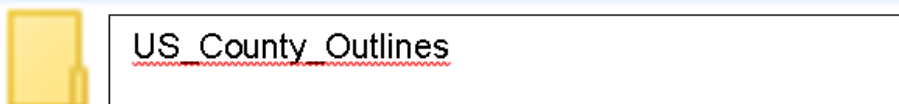
On my Windows laptop using Google Chrome, the zip file is automatically downloaded AND unzipped into a Downloads folder (below). *All of the file components are important to the GIS.*

- Select all of the files below

The screenshot shows a Windows File Explorer window with the address bar set to 'This PC > Downloads > tl_2019_us_county'. The file list contains the following items:

Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
tl_2019_us_county	DBF File	158 KB	No	926 KB	84%	8/2/2019 2:18 AM
tl_2019_us_county	SHP File	77,191 KB	No	124,370 KB	38%	8/2/2019 2:18 AM
tl_2019_us_county.cpg	CPG File	1 KB	No	1 KB	0%	8/2/2019 2:18 AM
tl_2019_us_county.prj	PRJ File	1 KB	No	1 KB	20%	8/2/2019 2:18 AM
tl_2019_us_county.shp.esa.iso	XML Document	4 KB	No	41 KB	93%	8/2/2019 2:19 AM
tl_2019_us_county.shp.iso	XML Document	8 KB	No	39 KB	82%	8/2/2019 2:19 AM
tl_2019_us_county.shx	SHX File	21 KB	No	26 KB	21%	8/2/2019 2:18 AM

- Copy > Paste them into the US_County_Outlines folder:



Step 04 – Download your county roads with addresses (aka “addrfeat”) from Census Bureau

- Return to the TIGER site. Select Feature Relationships – Relationship Files (below); press **Submit**

Select year: 2019 ▼

Select a layer type: Relationship Files ▼

Submit

- Select **Address Range-Feature Shapefile** (below) *no other file type is appropriate*
- Select **New Jersey, your County** (mine is Somerset); select **Download** (below)

Address Range-Feature Shapefile

Select a State: New Jersey ▼

Select a County: Somerset County ▼

Download

- As in Step03a, select the **grey arrow** near the downloaded zip file in browser window (below) > **Open**

Select a State: -- SELECT STATE -- ▼

Topological Faces- Select a State: -- SELECT STATE -- ▼

Topological Faces- Select a State: -- SELECT STATE -- ▼

tl_2019_34035_addrfeat.zip ▼

Open

Always open files of this type

Show in folder

Cancel

- Select all of the file components in the zip file (see below)

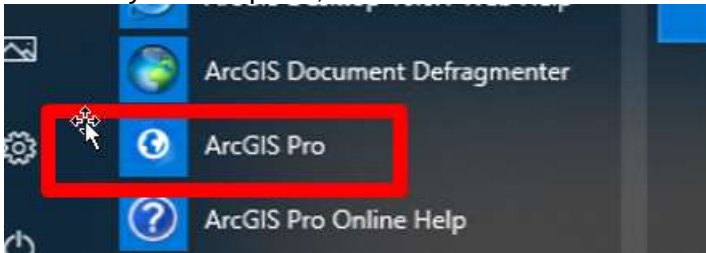
Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
tl_2019_34035_addrfeat	DBF File	603 KB	No	4,432 KB	87%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat	SHP File	1,025 KB	No	2,428 KB	58%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat.cpg	CPG File	1 KB	No	1 KB	0%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat.prj	PRJ File	1 KB	No	1 KB	20%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat.shp.ea.iso	XML Document	3 KB	No	52 KB	95%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat.shp.iso	XML Document	11 KB	No	173 KB	95%	7/30/2019 12:21 PM
tl_2019_34035_addrfeat.shx	SHX File	54 KB	No	127 KB	58%	7/30/2019 12:21 PM

My County Roads with Addresses

- Copy > Paste** files into

Step 05 – Open ArcGIS Pro, Create and Name a New Project file

- From your computer, select **Start > ArcGIS > ArcGIS Pro** (see below)

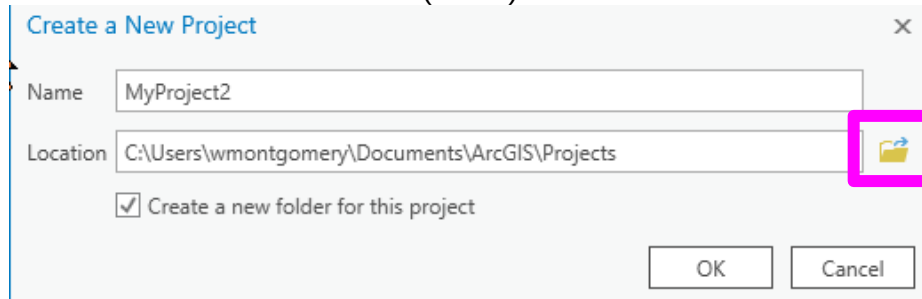


An ArcGIS Pro window (below) will appear:

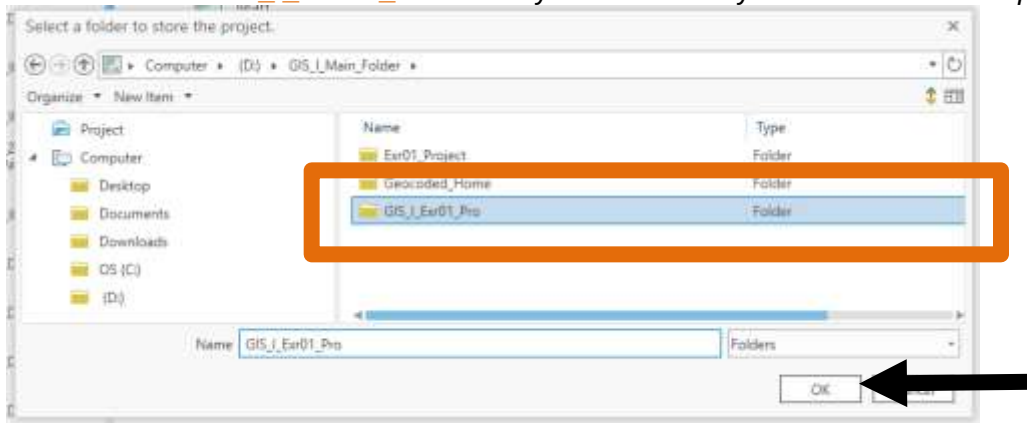
- Choose new **Map** (see below)



- Press the **Folder button** (below)

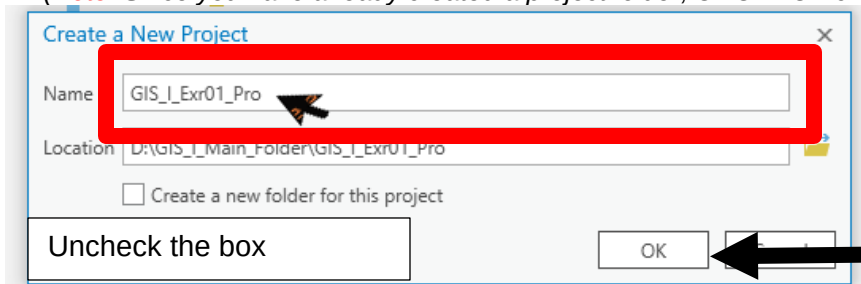


- Scroll to the **GIS_I_Exr01_Pro** folder you created on your flash drive in Step 02 (below); press **OK**



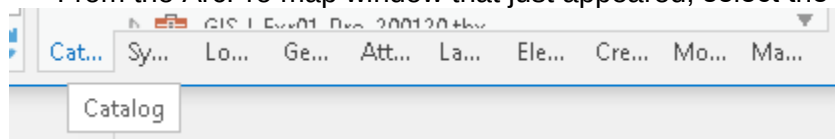
- When the **Create New Project** window re-appears, type in a **project name** that makes sense to you, such as **GIS_I_Exr01_Pro**; press **OK**

(Note: Since you have already created a project folder, **UNCHECK** create a new folder (below))

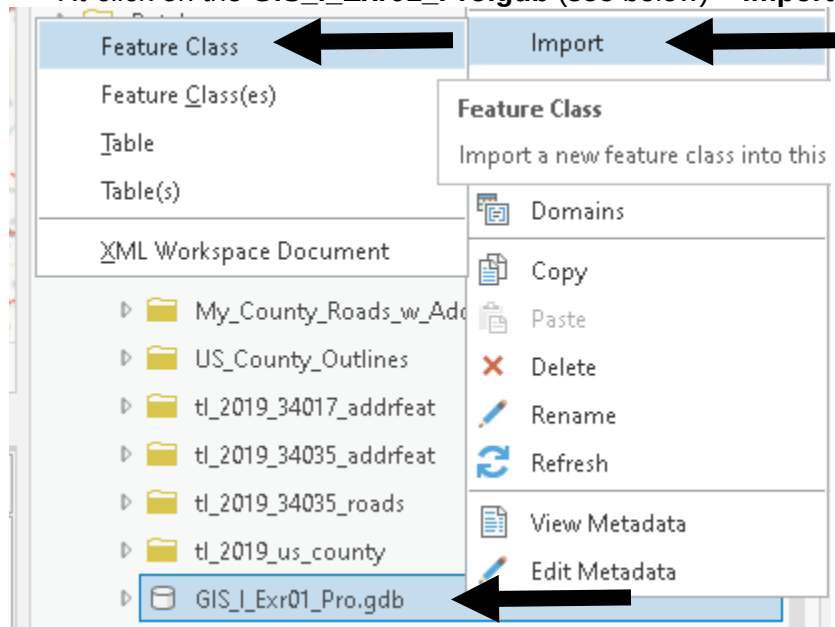


Step 06 - Import shapefiles into GDB as feature classes

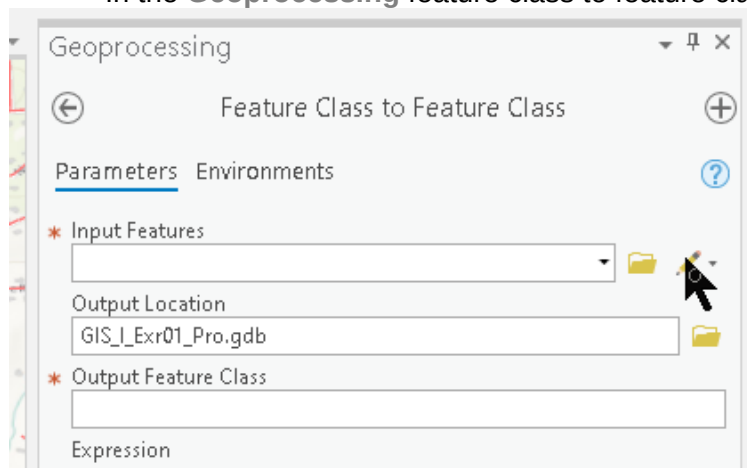
- From the ArcPro map window that just appeared; select the "Catalog" tab in the lower part of RH pane



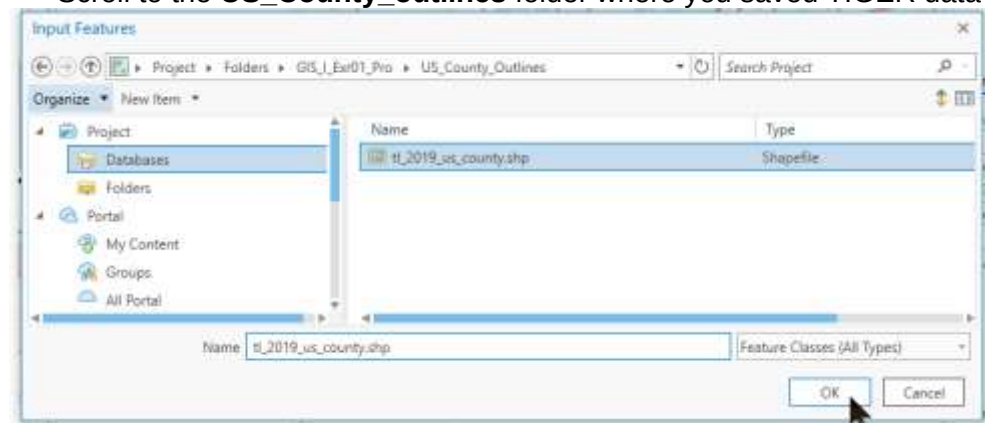
- Rt-click on the **GIS_I_Exr01_Pro.gdb** (see below) > **Import** > **Feature Class**



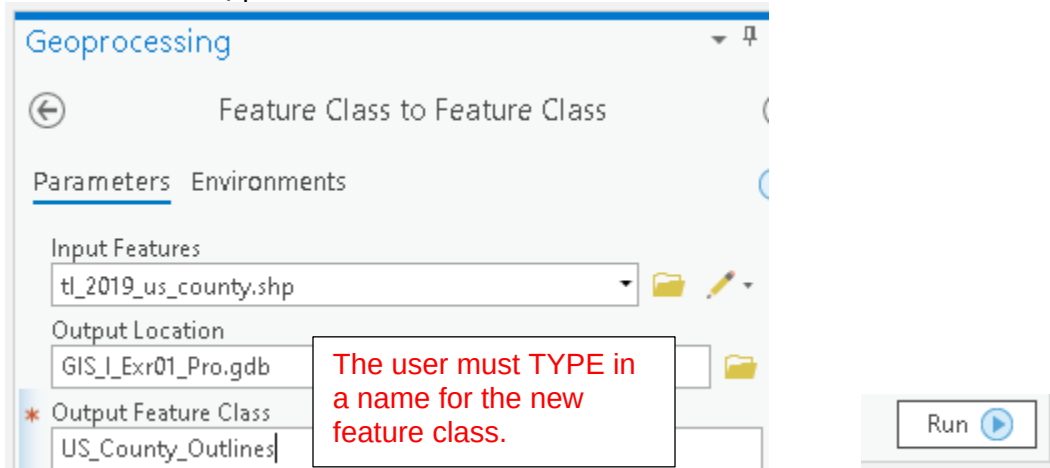
- In the **Geoprocessing** feature class to feature class pane (below), select the **folder** button



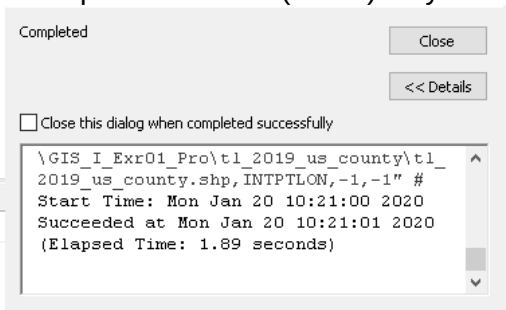
- Scroll to the **US_County_outlines** folder where you saved TIGER data in Step 03a, select **.shp**; **OK**



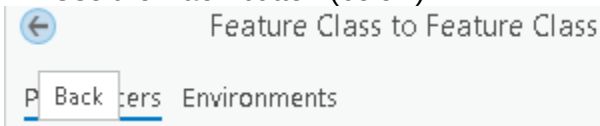
- When the Feature class – to Feature class window returns (below), **type in the name** for the **output feature class**; press **Run**



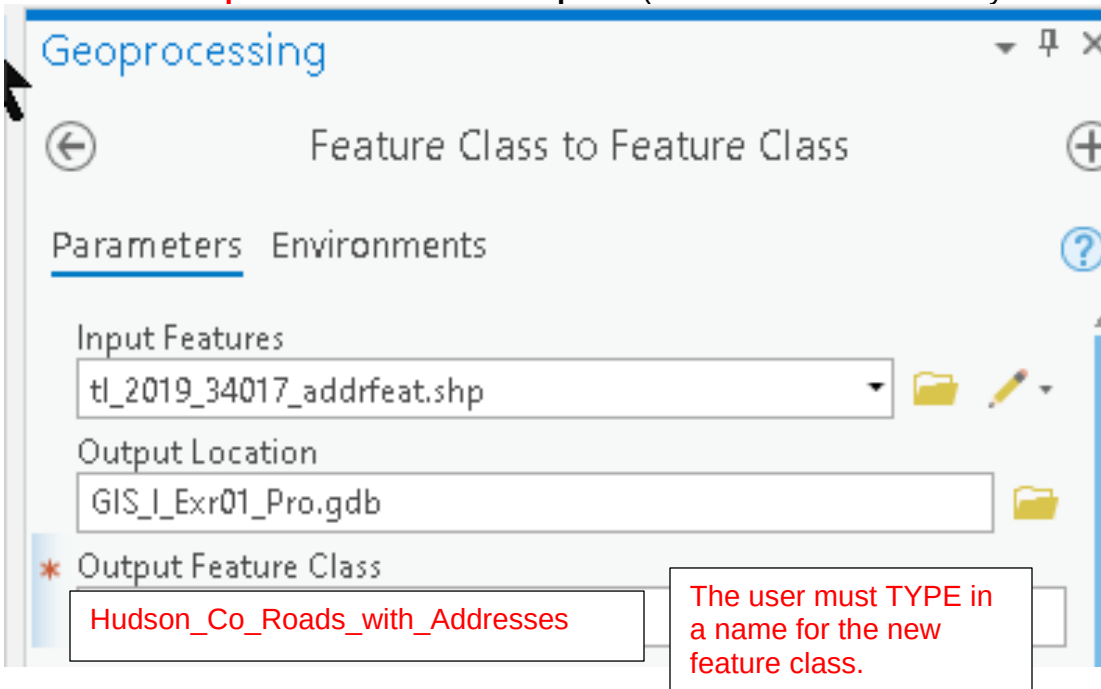
A completion window (below) may document successful completion of the import into the GDB



- Use the **Back** button (below)

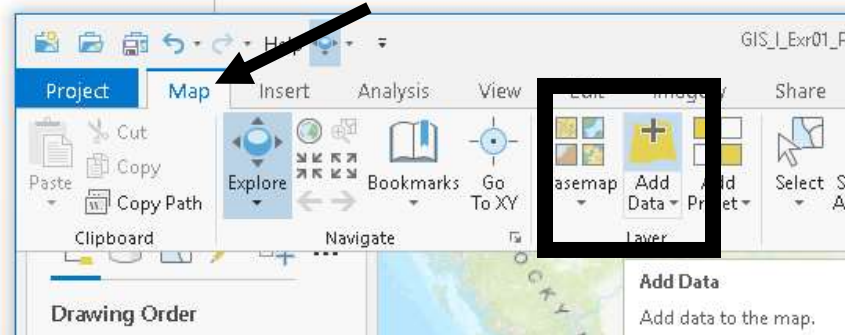


- REPEAT Step 06** for the **addrfeat** shapefile (*Note: I use Hudson County as an example below*)

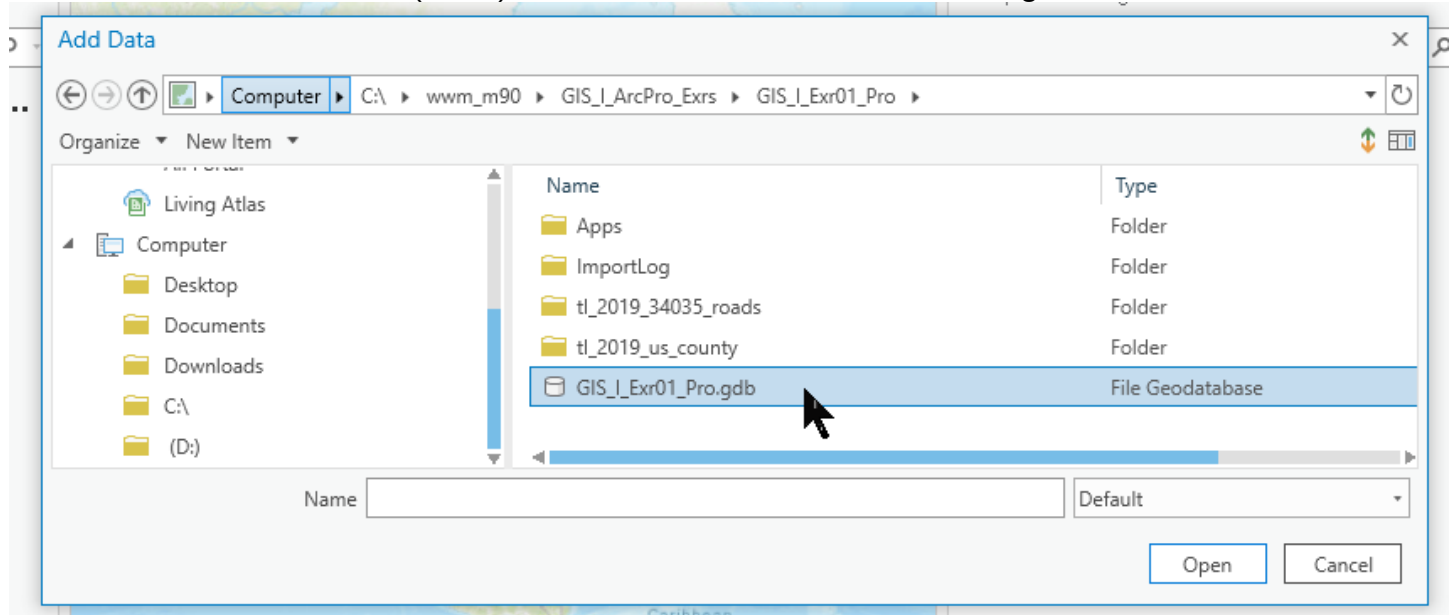


Step 07 - Add feature classes to ArcPro Map

- From ArcPro, select the **Map tab > Add Data**

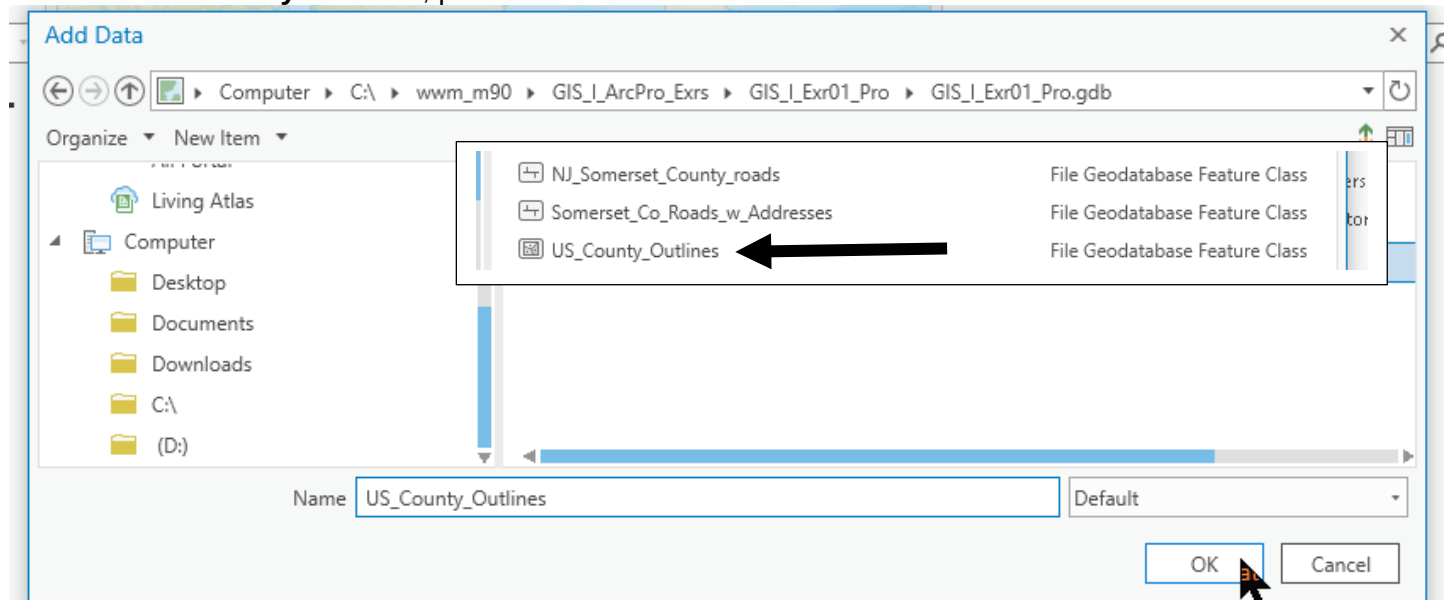


- From the Add Data window (below), scroll to and select **GIS_I_Exr01_Pro.gdb**



Inside the GDB (below), you will see the feature classes that you imported in **Step 06**:

- Select **US County Outlines**, press **OK**



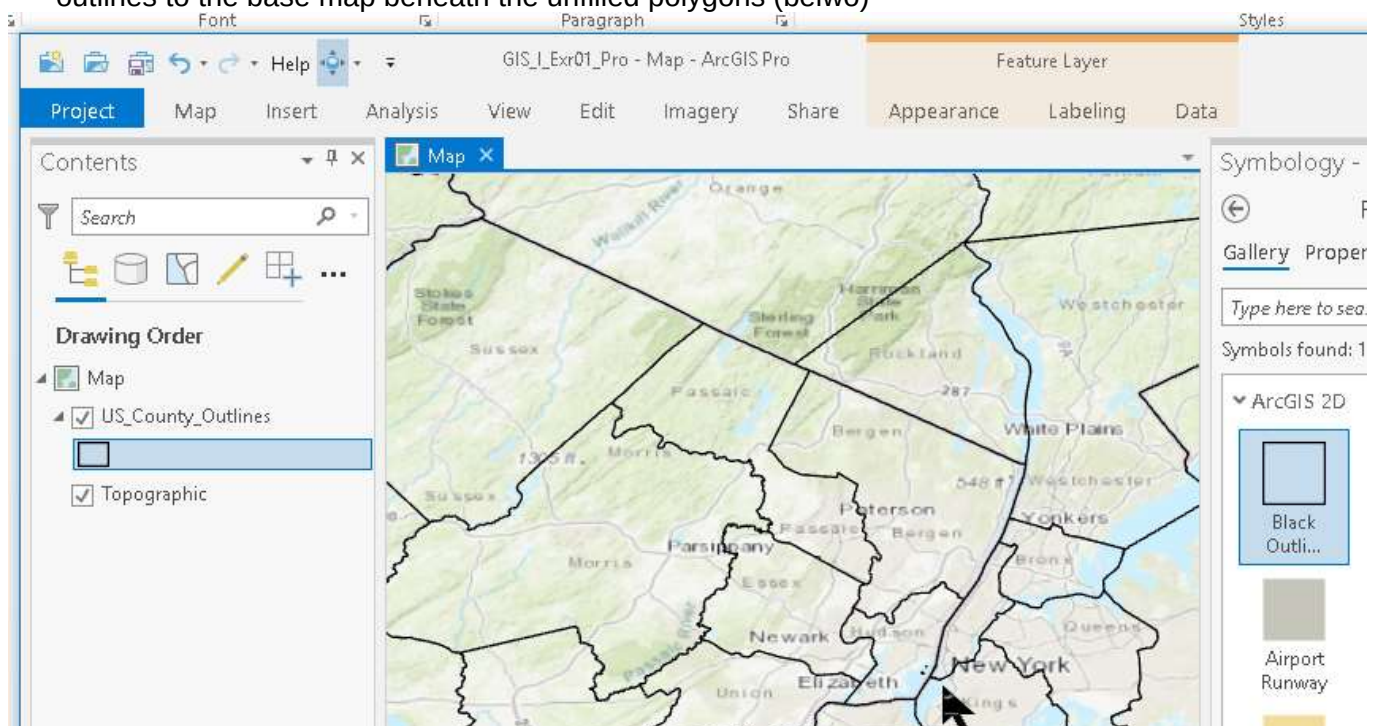
A map layer comprising filled polygons appears in the ArcPro Map window (below):



- Dbl-click on the **filled polygon** under US_County_Outlines in the LH side (Contents pane, below)
- Select one of the **unfilled polygons** on the RH side of the map window (Symbology tab)



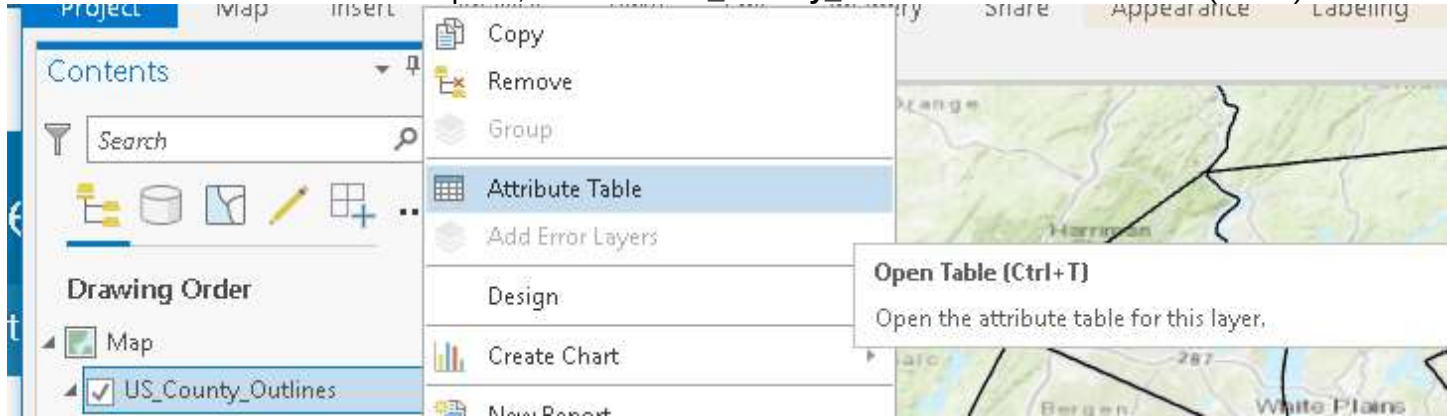
- Zoom in a bit further (below) and you can start to get your bearings by **peering beneath** the county outlines to the base map beneath the unfilled polygons (below)



Step 08 – Sort US Counties by State, extract NJ Counties

Discussion: GIS data frequently come packaged in large, “aggregated” data files that contain more information than you want or need for a particular project. In the 21st century, TIGER data files for U.S. county boundaries are packaged together. This is cumbersome, so we will extract only the data we need (New Jersey Counties). This gives you the opportunity to learn useful tools like “query”.

- From the ArcPro Contents pane, rt-click on **US_County_Outlines** > **Attribute Table** (below).

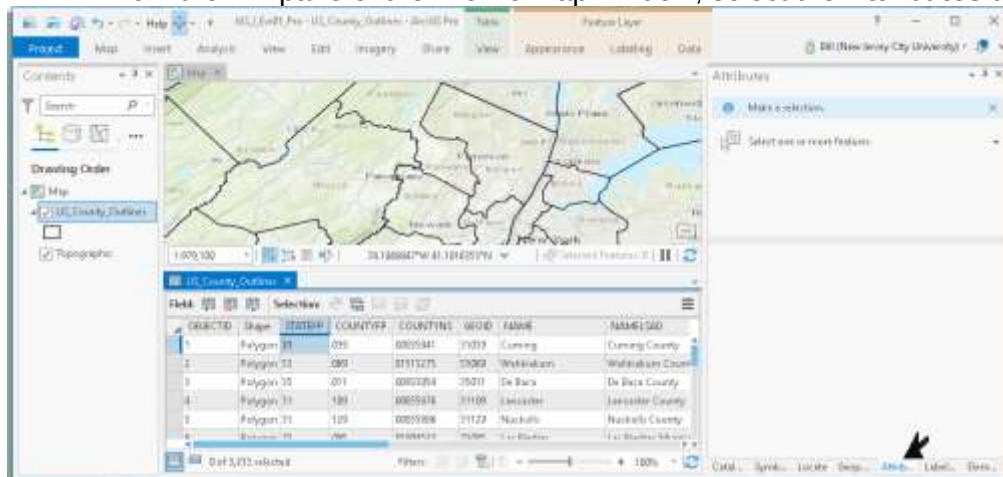


Examine the various “[non-spatial attributes](#)” associated with these US Counties – **Name**, **area size**, unique identifying numbers like **GEOID**, etc presented at the bottom of the map window. We want to determine the counties that comprise New Jersey. We don’t see a State name, but there IS a **StateFP** column. If we determine New Jersey’s STATEFP number, we will be able to extract NJ counties.

OBJECTID	Shape	STATEFP	COUNTYFP	COUNTYN	GEOID	NAME	NAMELSAD	LSAD	CLASSFP	MTFCC	CSAFP	CBSAFP	METDIVE
1	Polygon	31	039	00835841	31039	Cuming	Cuming County	06	H1	G4020			
2	Polygon	53	069	01513275	53069	Wahkiakum	Wahkiakum County	06	H1	G4020			
3	Polygon	35	011	00933054	35011	De Baca	De Baca County	06	H1	G4020			
4	Polygon	31	109	00835876	31109	Lancaster	Lancaster County	06	H1	G4020	339	30700	
5	Polygon	31	129	00835886	31129	Nuckolls	Nuckolls County	06	H1	G4020			
6	Polygon	72	005	01000522	72005	Las Diablas	Las Diablas Municipio	12	H1	G4020	100	11000	

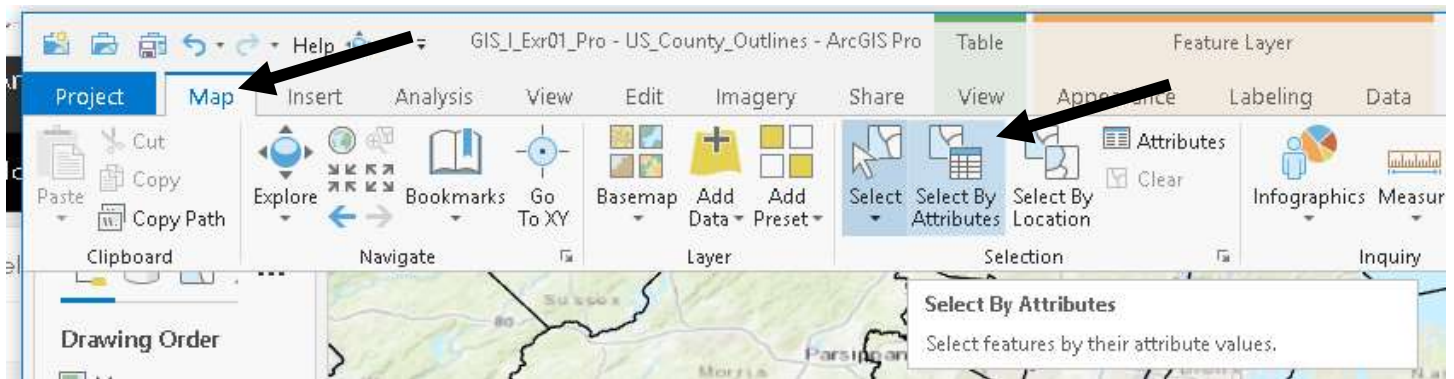
STATEFP is part of a larger taxonomy known as [FIPS code](#). The USDA provides a [list](#) of all State FIPS codes.

- From the RH pane of the ArcPro Map window, select the **Attributes** tab;

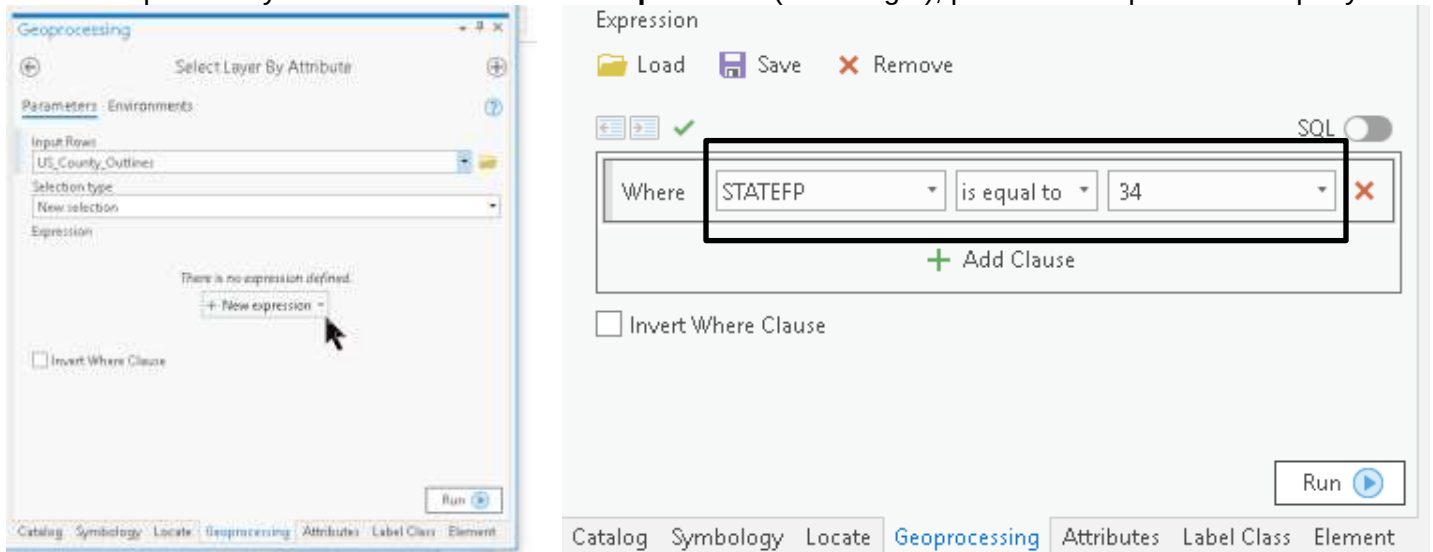


You can use “[selecting by attributes](#)” to extract only New Jersey Counties from the US Counties database.

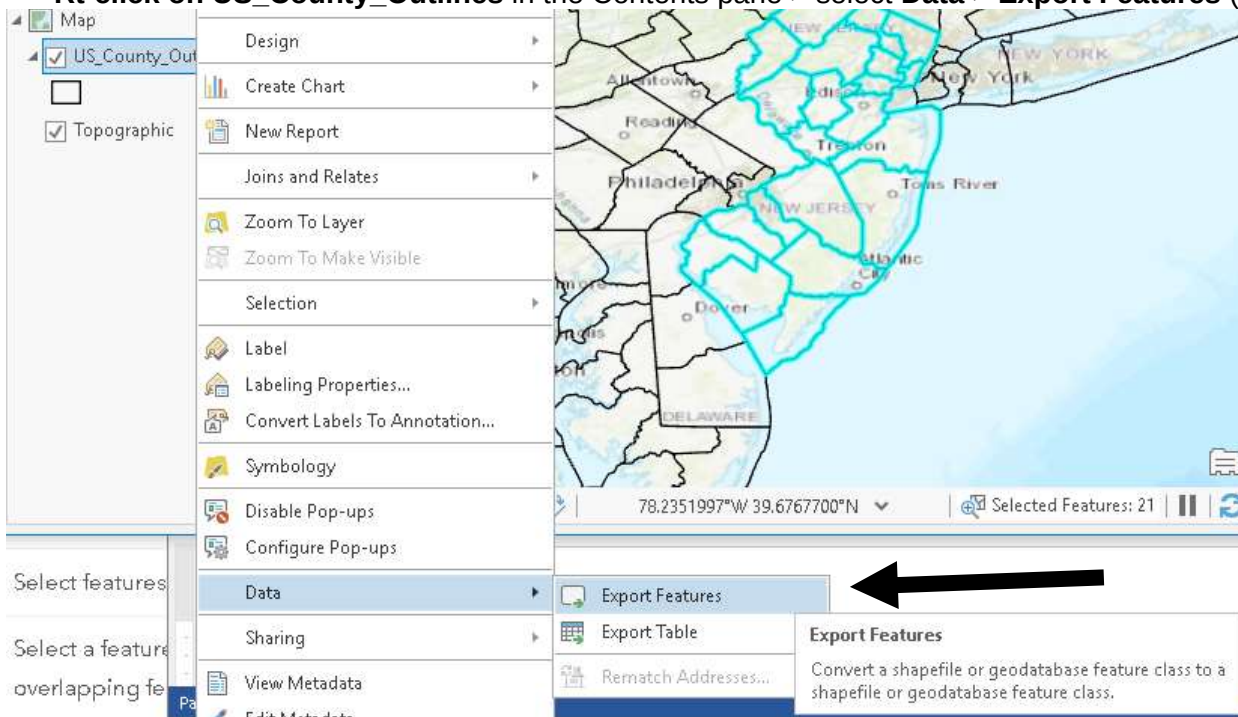
- From the upper menu bar of ArcPro, select the **Map** tab > **Select by Attributes**



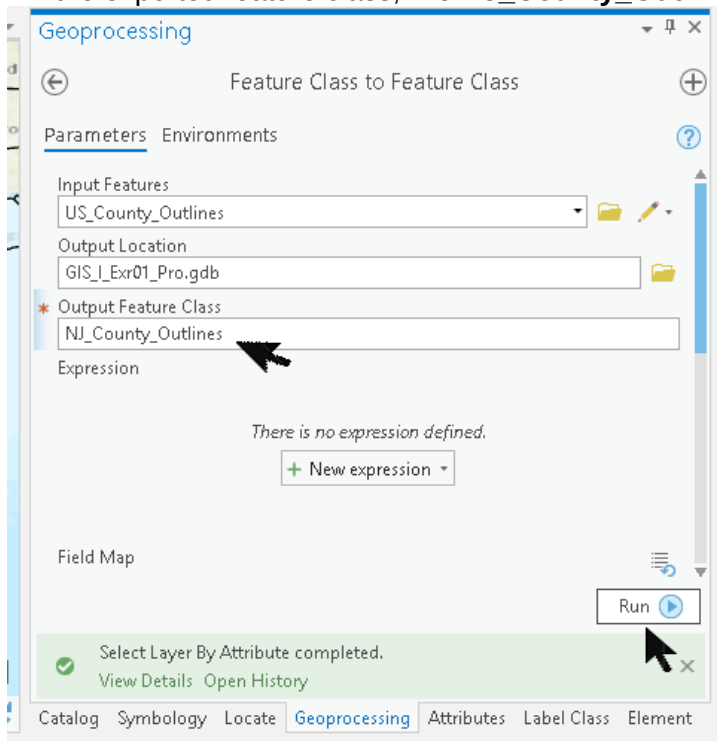
- From the **Geoprocessing** pane (below left), select “new expression”
- The expression you create is **STATEFP is equal to 34** (below right); press **Run** to perform the query



- **Rt-click on US_County_Outlines in the Contents pane > select Data > Export Features** (below)

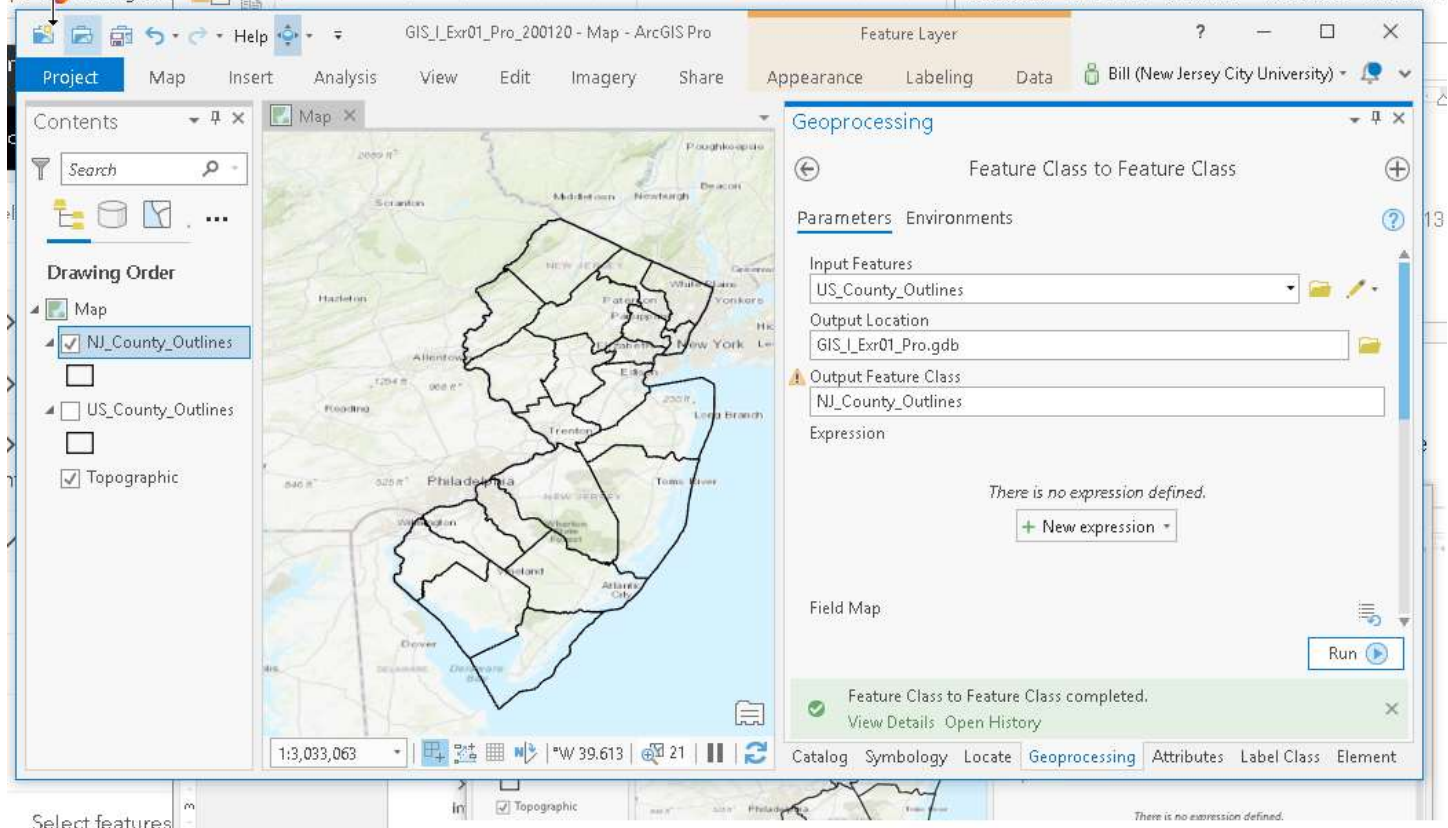


- In the Geoprocessing pane, confirm the output location as GIS_I_Exr01_Pro.gdb. **TYPE IN** a new name for the exported feature class, like **NJ_County_Outlines** (below); press **Run**.



NOTE: WWM had to close down and re-open ArcPro in order to get the data export operation to work, then re-connect to GDB in order to export, perhaps due to earlier confusion over file mgmt. and folder connctions..

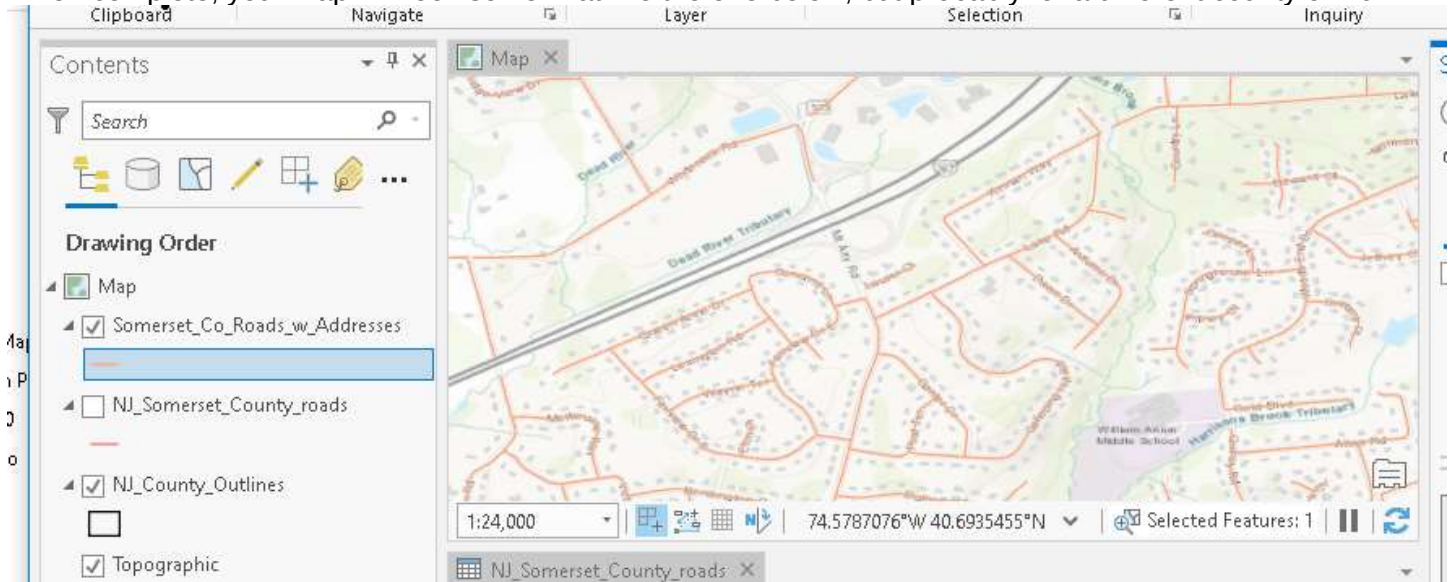
- Turn **ON** NJ_County_Outlines in the Contents pane (below); turn **off** (uncheck) US_Counties:
- Project > File > Save AS >** save with the default name in your project folder.



Step 09 – Add Roads_w Addresses to ArcPro

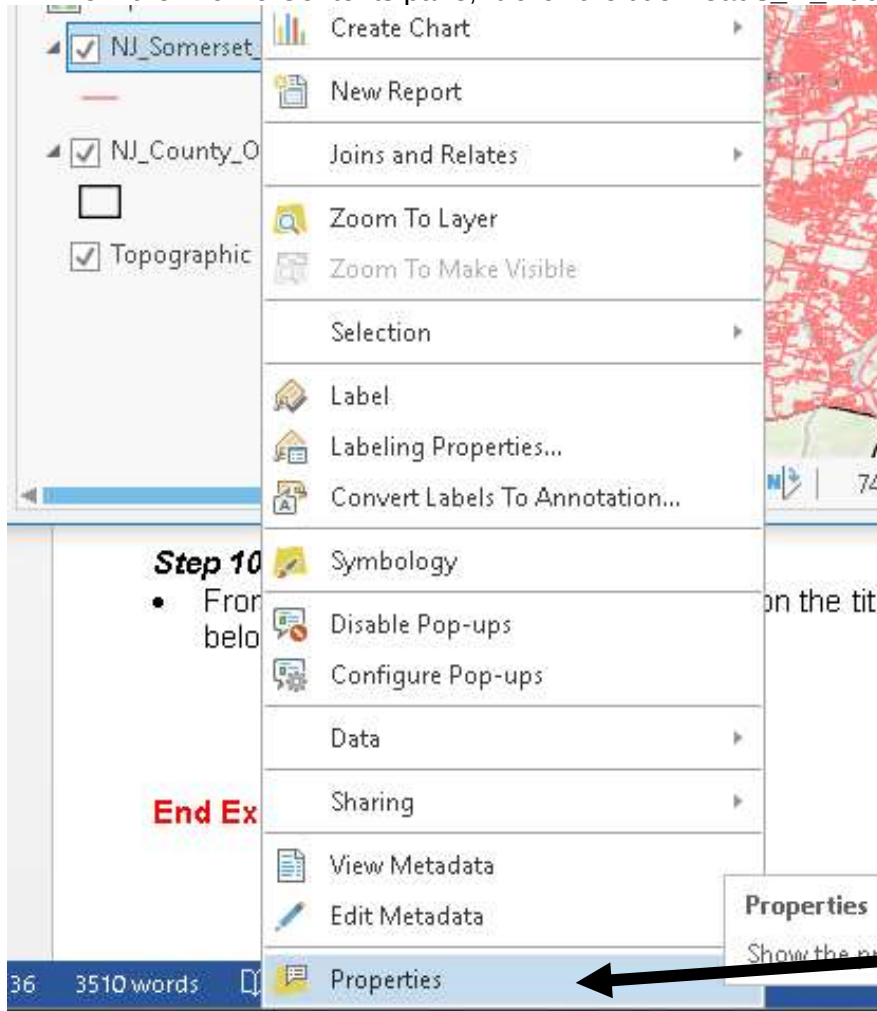
- Use the directions from Step 08 (and your newfound knowledge) to independently use **File > Add Data** to add **roads_w_addresses** feature class (aka layers) from the GDB to the ArcPro map.

When complete, your map will look somewhat like the one below, but probably for a different county of NJ:

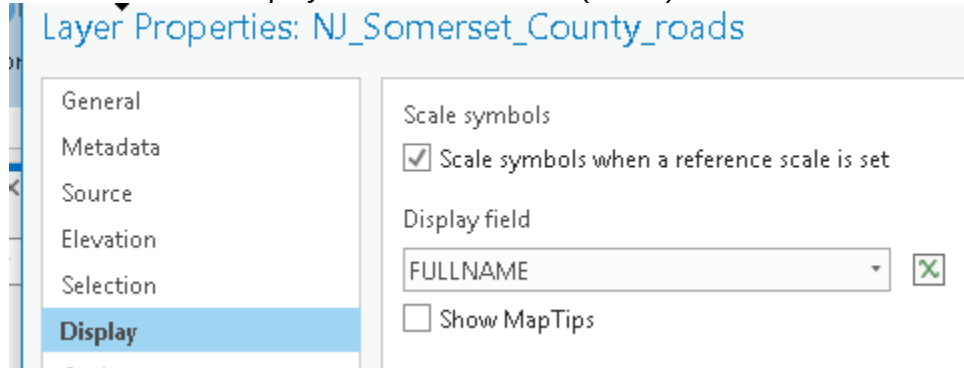


Step 10 – Label Roads_w Addresses

- From the ArcPro Contents pane, rt-click the title **Roads_w Addresses** feature class > **Properties** (below)



Confirm that the Display is set to **FullName** (below)

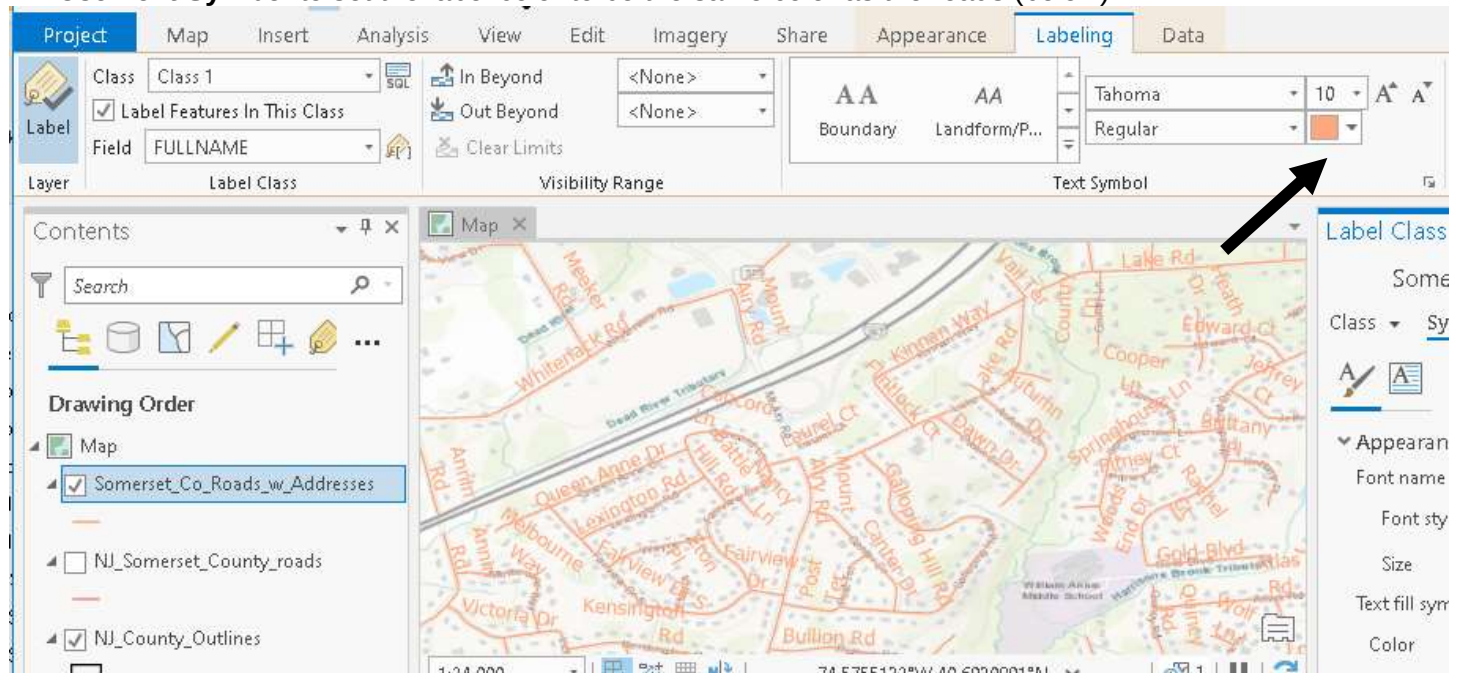


- With county roads title selected in **Contents**, at the top of the map, select the **Labeling** tab > **Label** (below)



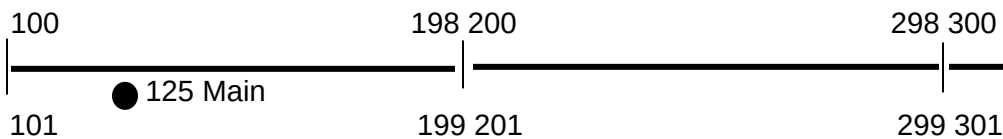
Zoom in far enough to get a closeup view of your labeled streets – this will help you locate yourself in Part B:

- Use **Text Symbol** to set the label color to be the same color as the roads (below)



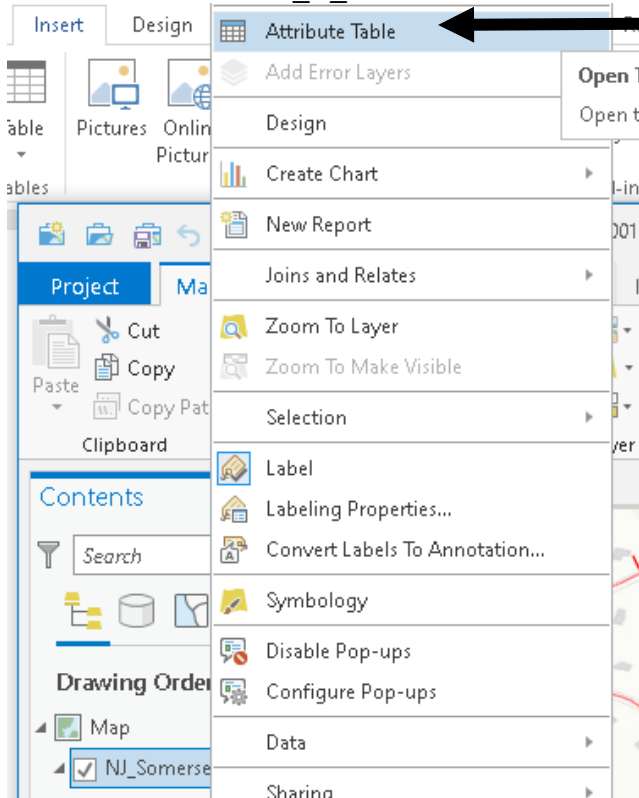
Step 11 – Find the city block (street segment) on which your home is located

Discussion – The **roads_w_addresses** feature class is appropriate for [geocoding](#) because it is composed of individual line segments with beginning and ending addresses (as shown diagrammatically below).



In the above diagram, the text data “125 Main Street” is converted to a point on a map, like Google maps would do for you. You are going “geocode” your home manually, so that you see and understand the process.

- Rt-click the Roads_w_Addresses feature class name in ArcPro Contents (below), select **Attribute Table**



The attribute table that “drives” the line features displays at the bottom of the map window (below)

NJ_Somerset_County_roads

Field: Add Delete Calculate Selection: Zoom To Switch Clear Delete Copy

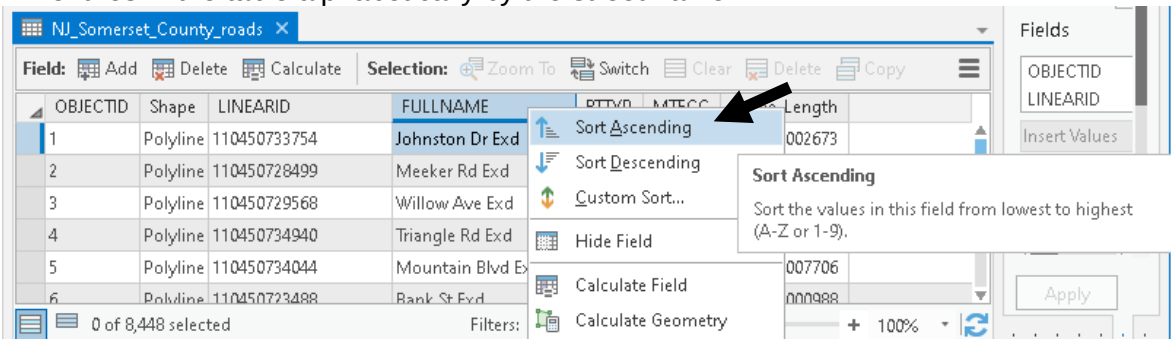
OBJECTID	Shape	LINEARID	FULLNAME	RTTYP	MTFCC	Shape_Length
1	Polyline	110450733754	Johnston Dr Exd	M	S1400	0.002673
2	Polyline	110450728499	Meeker Rd Exd	M	S1400	0.009534
3	Polyline	110450729568	Willow Ave Exd	M	S1400	0.004358
4	Polyline	110450734940	Triangle Rd Exd	M	S1400	0.007638
5	Polyline	110450734044	Mountain Blvd Exd	M	S1400	0.007706
6	Polyline	110450723488	Bank St Exd	M	S1400	0.000988

0 of 8,448 selected

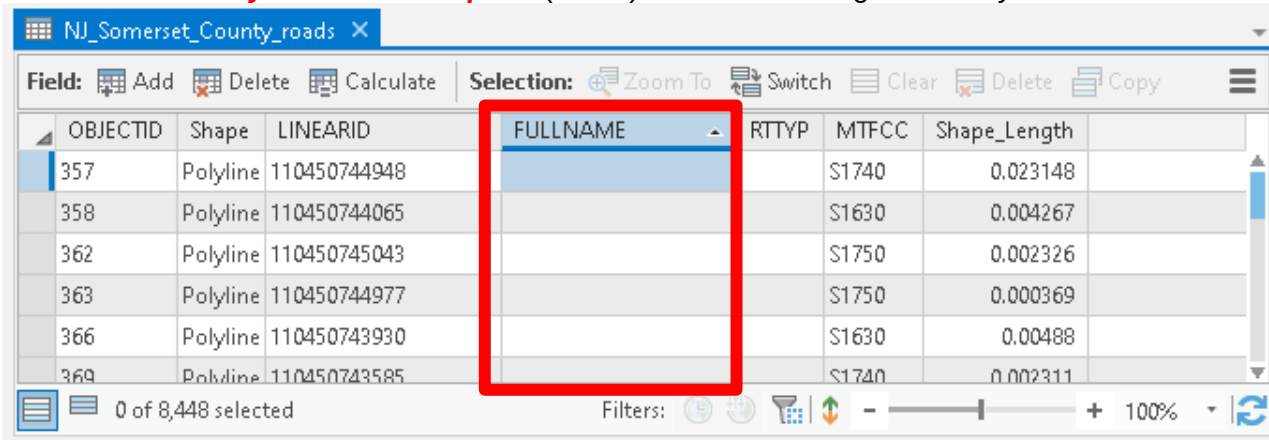
Filters: 100%

This is an excellent example of the difference between “spatial” and “non-spatial” attributes. The attribute table (AT, abbreviated in this course) is filled with “non-spatial” attributes, including ObjectID, LinearID, and FullName. In fact, most attribute tables are composed of non-spatial attributes. You will find that this is where the true power of GIS lies: **bringing non-spatial data into the spatial domain.**

- In the AT in your ArcPro window, rt-click on **FULLNAME** > **Sort Ascending** (below); this will sort the entries in the table alphabetically by the street name.



DO NOT PANIC if you see blank space (below)! Some street segments may not be named.



- Scroll down and find the street upon which your home is located (see below). Refer to the example below

LFROMHN	LTOHN	RFROMHN	RTOHN
98	16	99	17

Each column header reads as follows:

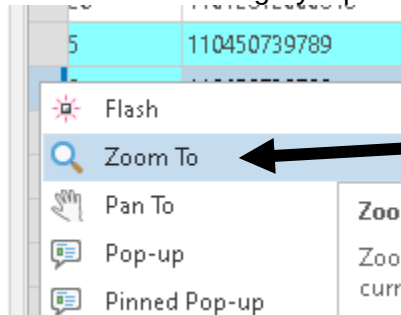
Left **FROM** House Number Left **TO** House Number Right **FROM** House Number Right **TO** House Number

The beginning and ending points of each line segment correspond to street addresses. To identify the location of a particular street address, the computer first finds the segment whose endpoints bracket the subject address, then it interpolates from the address endpoints to determine where to plot the point.

For example, "125 Main Street" above is located on a line segment whose endpoint addresses are 100 and 198 on the even side, and 101 and 199 on the odd side. Find your home by locating the line segment that represents your block, then find the location of your residence from there. In my case, my address is 105 Galloping Hill Rd (Somerset Co., NJ). I highlight the 3 street segments that are shown in the database (below).

	LINEARID	FULLNAME	LFROMHN	LTOHN	RFROMHN	RTOHN	ZIPL	ZIPR	EDGE
26	11012812000848	Gallop Ln	98	16	99	17	08873	08873	S1400
5	110450739789	Galloping Hill Rd	150	168	137	157	07920	07920	S1400
8	110450739789	Galloping Hill Rd	2	148	1	135	07920	07920	S1400
7	110450739789	Galloping Hill Rd	170	298	159	199	07920	07920	S1400

- I rt-click on the grey squares on the LH side of the AT (below) and select Zoom to:

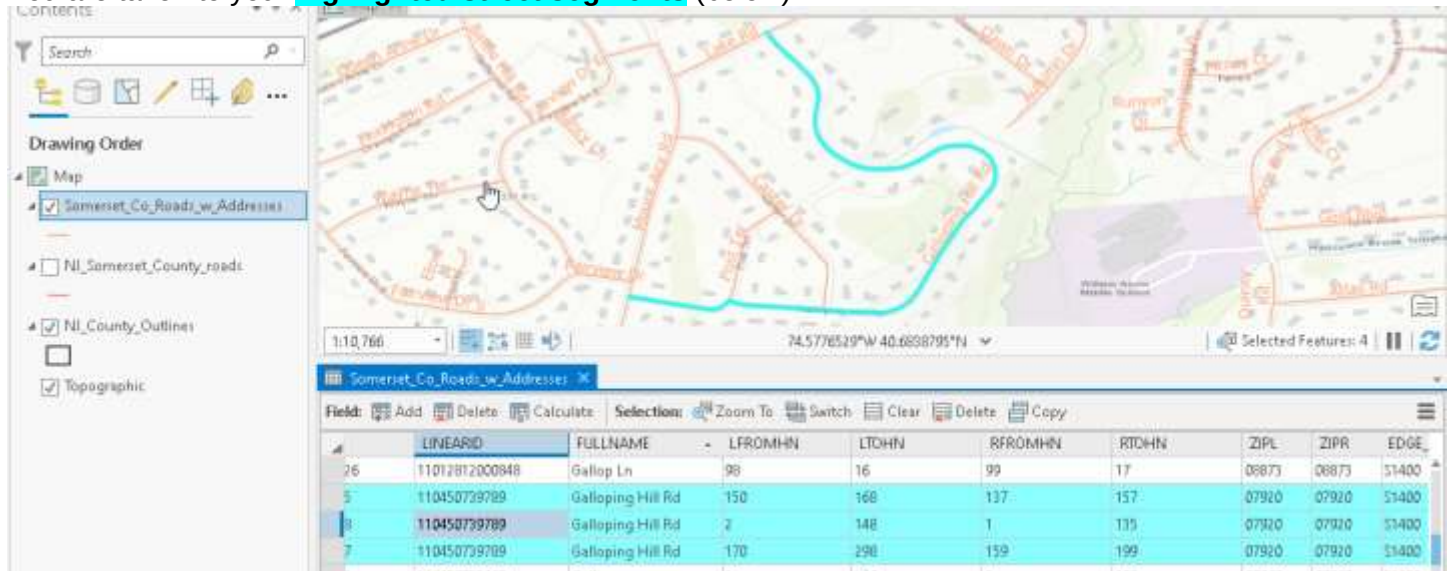


5	110450739789	Galloping Hill Rd	150	168
		Galloping Hill Rd	2	148
		Galloping Hill Rd	170	298
		Galloway	1	199

Zoom To(Ctrl+=)

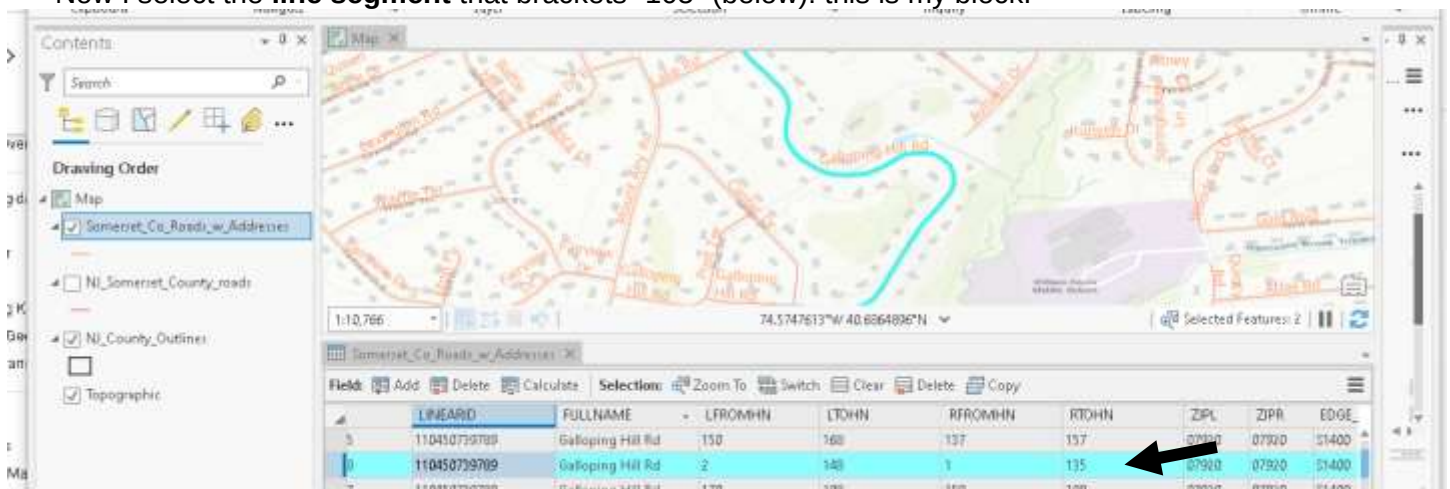
Zoom in and center the map on the feature in the current row.

You are taken to your **highlighted street segments** (below).



	LINEARID	FULLNAME	LFROMMH	LTOHN	RFROMMH	RTOHN	ZIPL	ZIPR	EDGE
26	1101281200848	Gallop Ln	98	16	99	17	08873	08873	51400
5	110450739789	Galloping Hill Rd	150	168	137	157	07920	07920	51400
8	110450739789	Galloping Hill Rd	2	148	1	135	07920	07920	51400
7	110450739789	Galloping Hill Rd	170	298	159	199	07920	07920	51400

- Now I select the **line segment** that brackets "105" (below): this is my block.

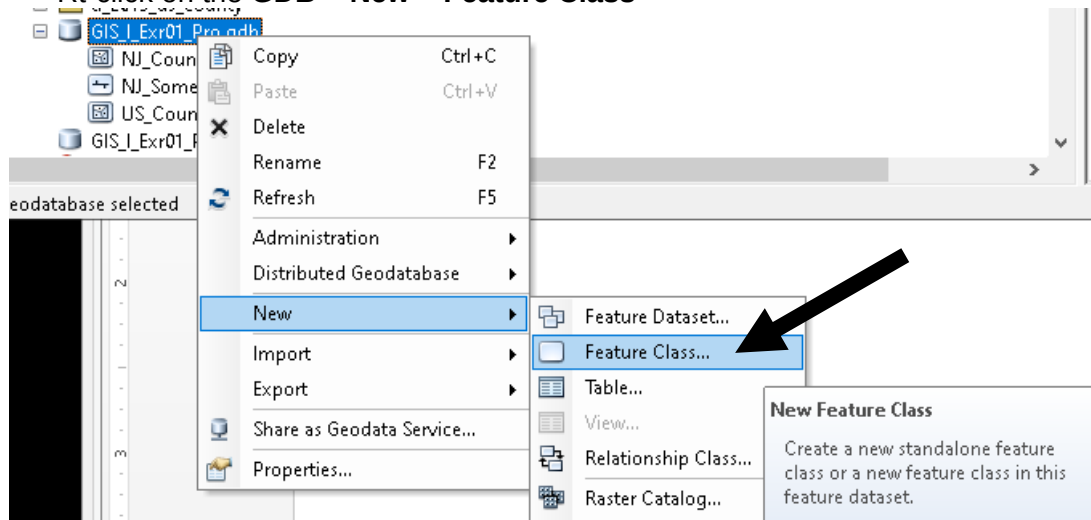


	LINEARID	FULLNAME	LFROMMH	LTOHN	RFROMMH	RTOHN	ZIPL	ZIPR	EDGE
5	110450739789	Galloping Hill Rd	150	168	137	157	07920	07920	51400
8	110450739789	Galloping Hill Rd	2	148	1	135	07920	07920	51400
7	110450739789	Galloping Hill Rd	170	298	159	199	07920	07920	51400

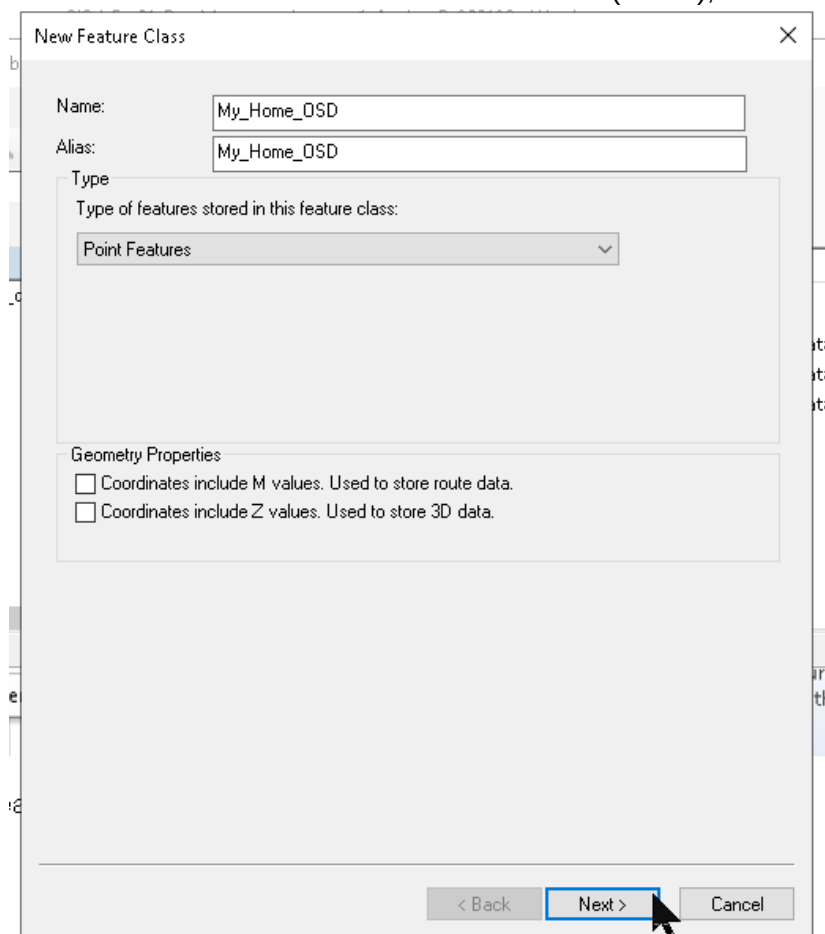
Step 12 - Create a new feature class in the GDB to represent your home

Discussion: You will now create a point to mark your home through a process known as onscreen digitizing (OSD). However, before we create the spatial feature (the actual point), we need to create the required computer “files” for that point by creating a [feature class](#) using ArcCatalog.

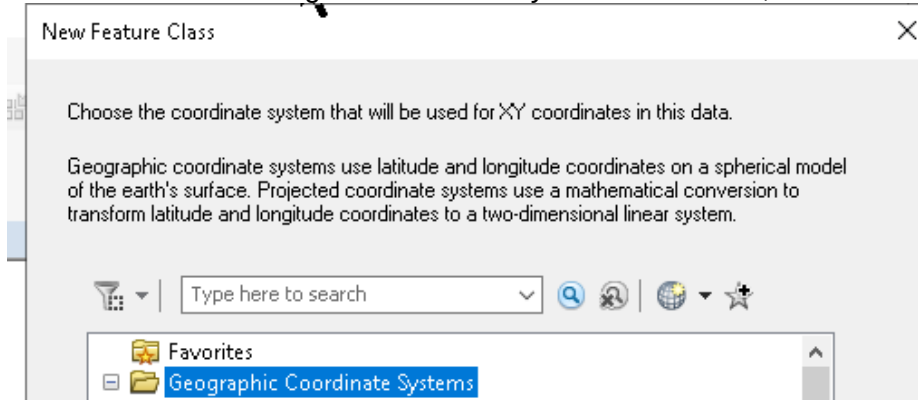
- From your computer, select **Start > ArcGIS > ArcCatalog**
- Navigate to your **GIS_I_Exr01_Pro.gdb** (below)
- Rt-click on the **GDB > New > Feature Class**



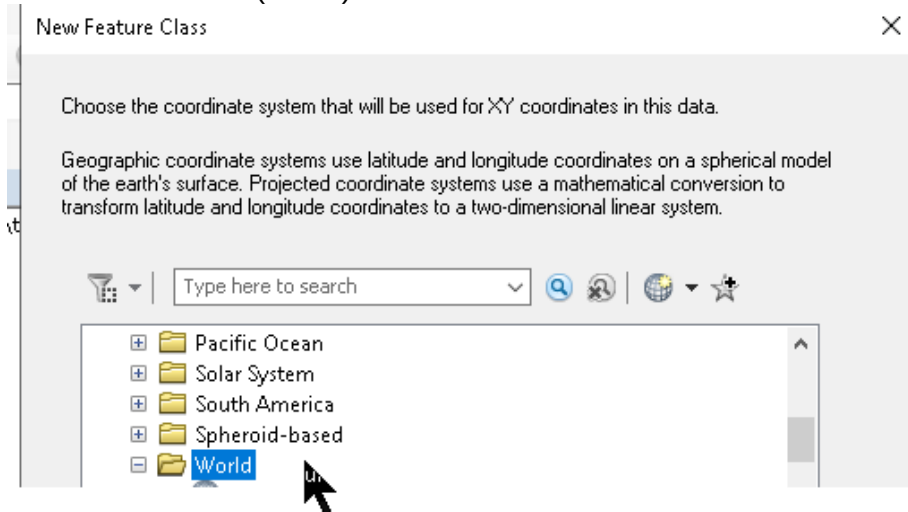
- From the Create new feature class screen (below), fill in as follows, **Next**,



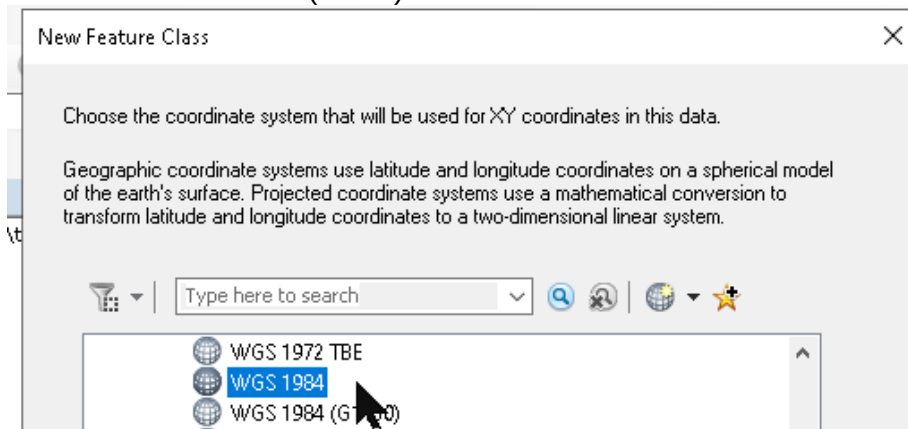
- At the screen asking for coordinate system information, choose **Geographic Coord System** (below):



- Choose **World** (below)



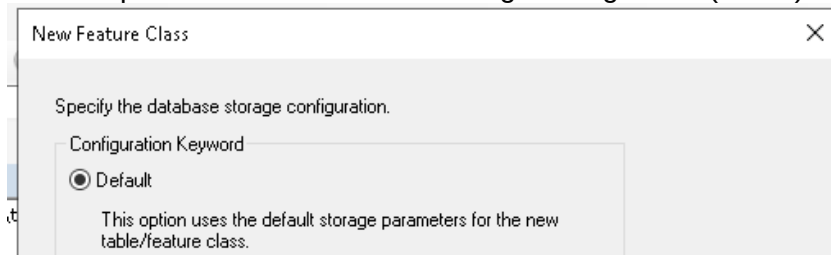
- Choose **WGS1984** (below)



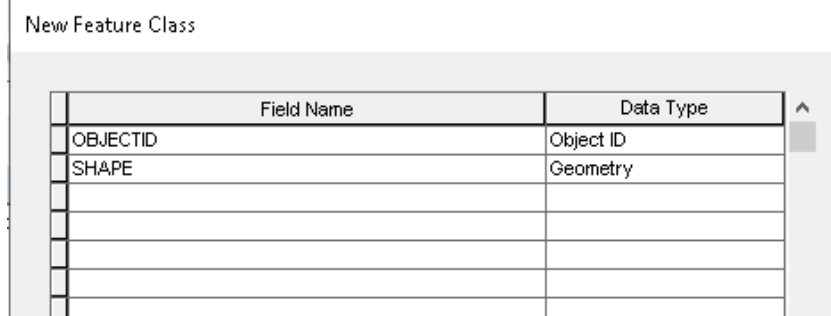
- Press **Next**
- Accept the default XY tolerance (below)



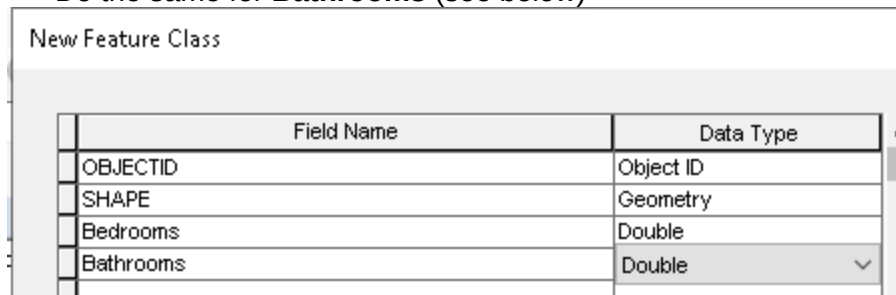
- Accept the default database storage configuration(below)



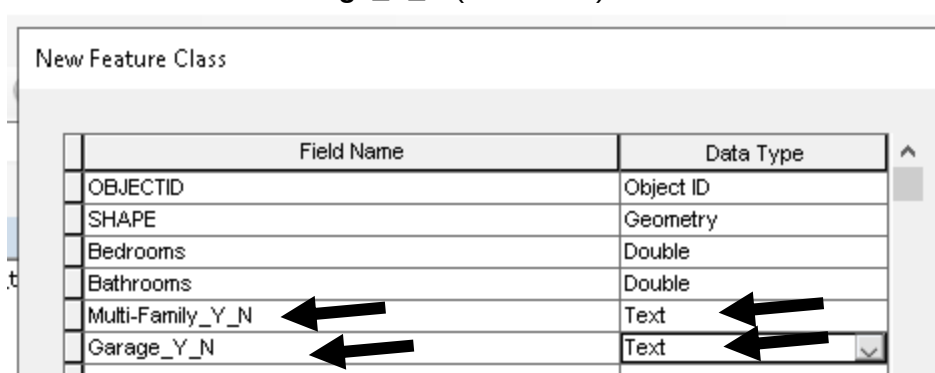
- At the final window (below), with field name and data type, we are going to add some attributes to help describe your home, as though we were going to put it up for sale with a real estate agent. This will give you some experience with adding "[Non-Spatial attributes](#)" to a place with which you are familiar.



- In the Field Name column, on the line under shape, type **Bedrooms** ; rt-click on the matching line in the Data Type column, select **Double** (for double precision, meaning a numeric data type, not a text data type)
- Do the same for **Bathrooms** (see below)



- Below the Bathrooms line, type **Multi-Family_Y_N**; rt-click on the corresponding line in the data type column and select "**Text**"
- Do the same for **Garage_Y_N** (see below)



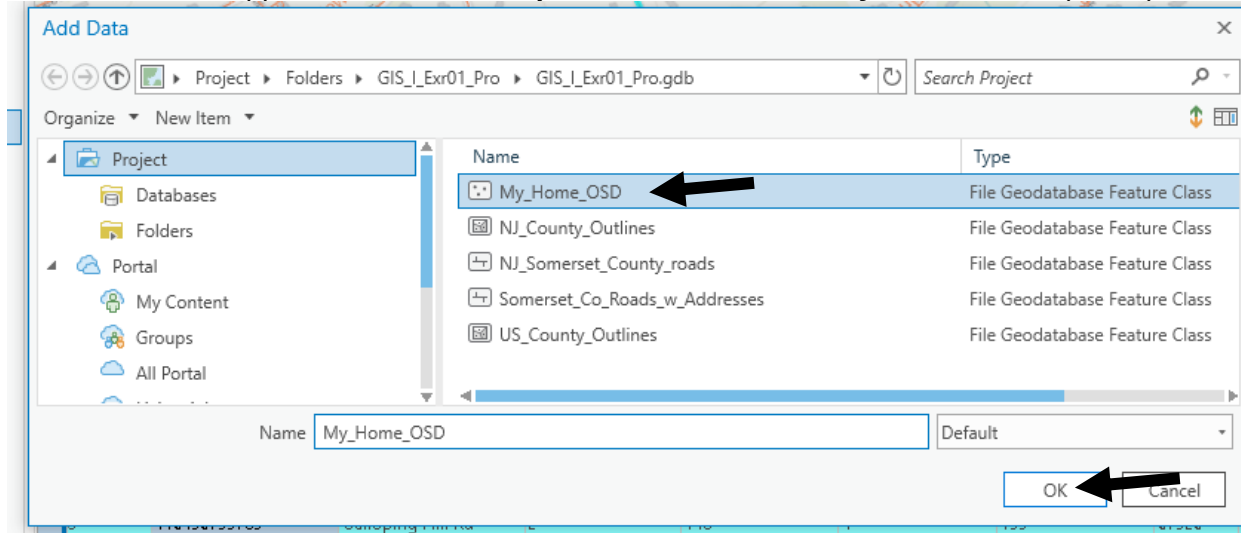
- Press **Finish**

Step 13 – Plot your home on your map through OnScreen Digitizing (OSD)

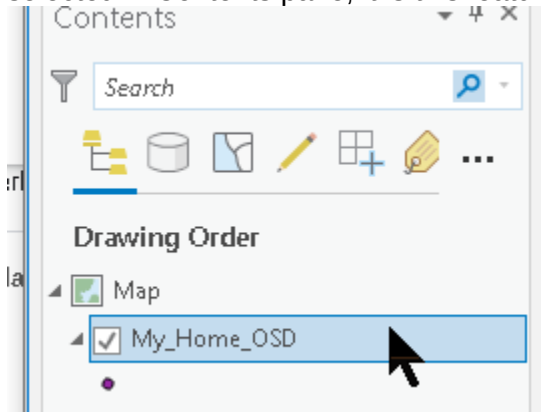
For reference, here is a [VIDEO](#) on creating points with ArcGIS Pro. It is quite detailed.

The feature you created in Step 12 is **present** in the GDB (see below), and has been characterized as a point (look at its icon, which shows dots). But no actual point feature has yet been created or plotted on the map.

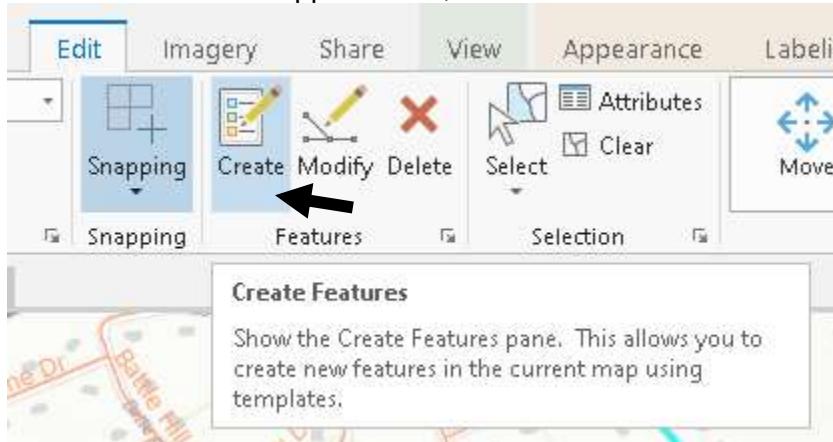
- From ArcPro upper ribbon, select **Map > Add Data > select My_Home_OSD (below) > OK**



The point feature class (My_Home_OSD) is added to the ArcPro Contents pane (below). Keep this feature selected in Contents pane; it is this feature upon which subsequent operations are performed.



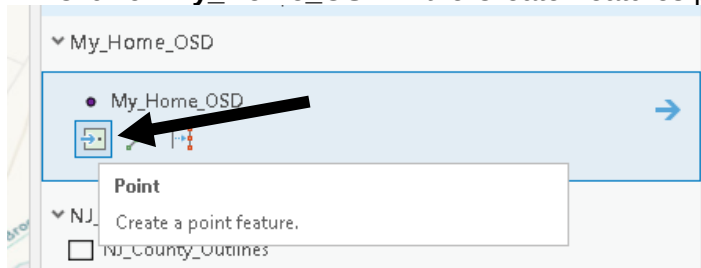
- From the ArcPro upper ribbon, select the Edit tab > **Create Features** (below)



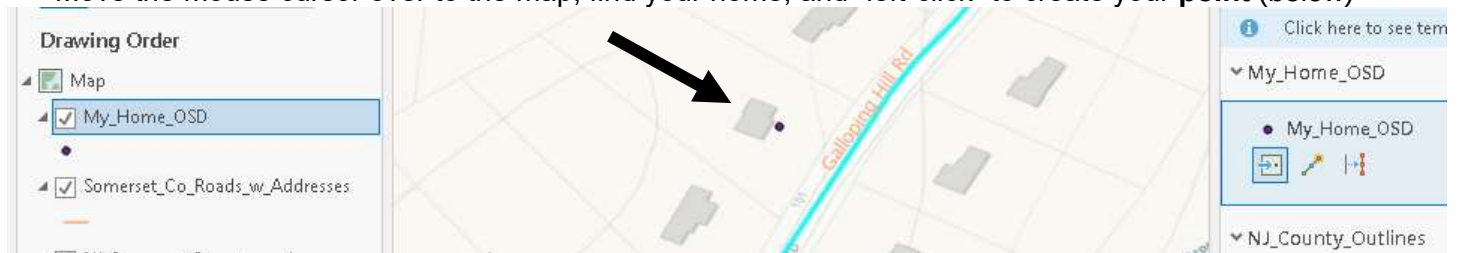
- Expand the RH pane of the ArcPro window in order to see the new “**Create Features**” pane (below)



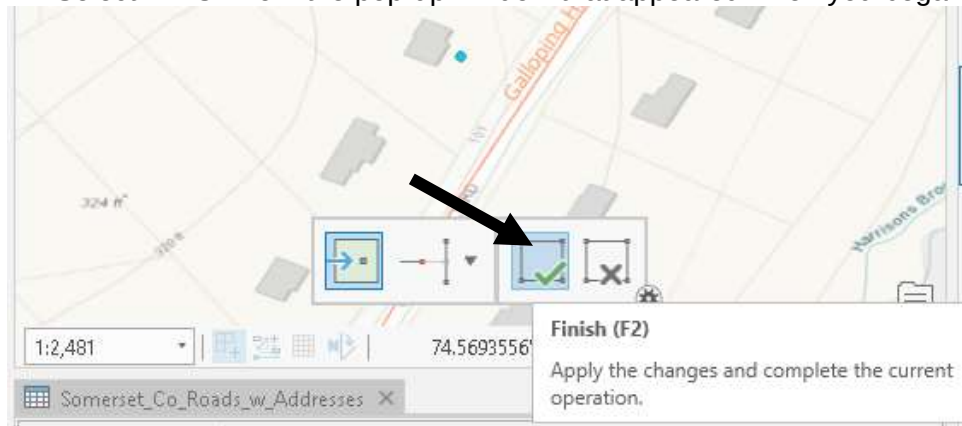
- Click on **My_Home_OSD** in the Create Features pane > **Point** (create a point feature)



- Move the mouse cursor over to the map, find your home, and “left-click” to create your **point** (below)



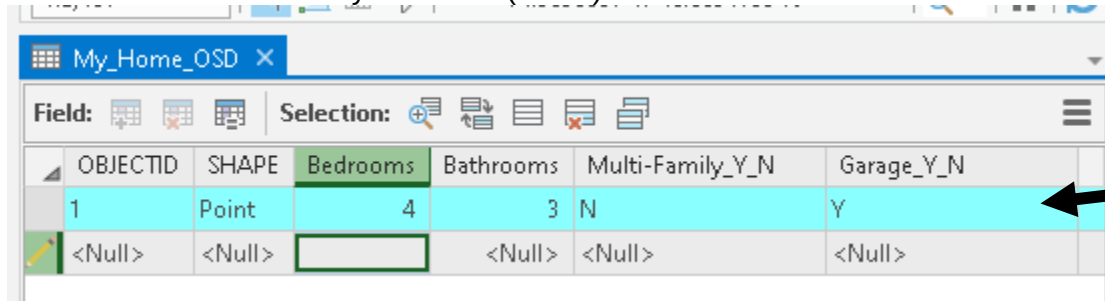
- Select **Finish** from the pop-up window that appeared when you began to edit (see below)



- Rt-click on the **My_Home_OSD** feature name in the Contents pane > **Attribute Table** (below)

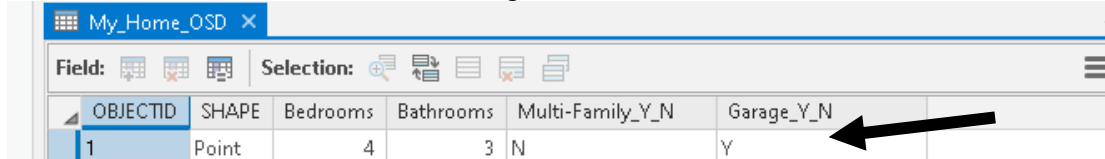


- Fill in the attributes for your home: (below)



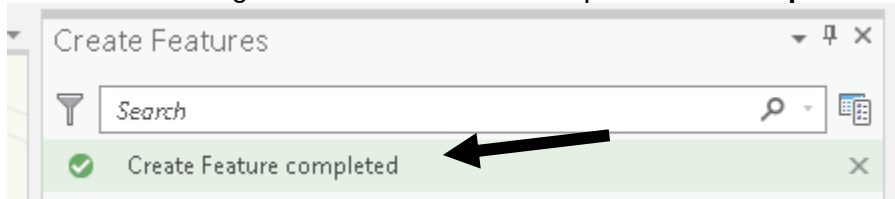
OBJECTID	SHAPE	Bedrooms	Bathrooms	Multi-Family_Y_N	Garage_Y_N
1	Point	4	3	N	Y
<Null>	<Null>		<Null>	<Null>	<Null>

- De-select the row to turn off the bright Blue selection color, as it will interfere with map presentation(below)

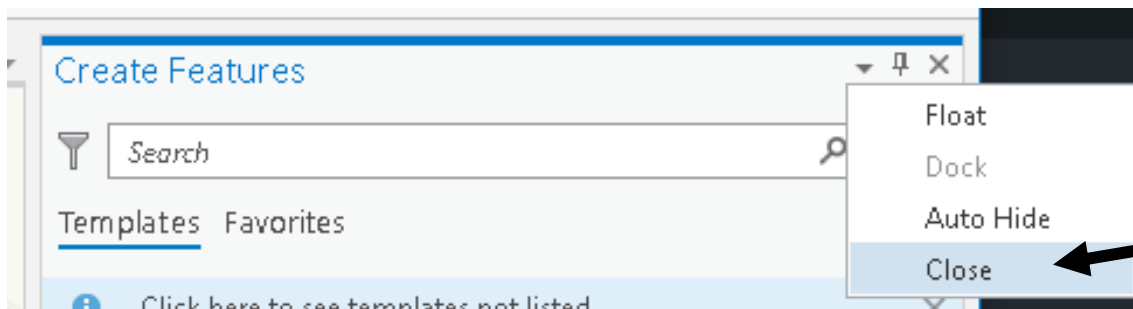
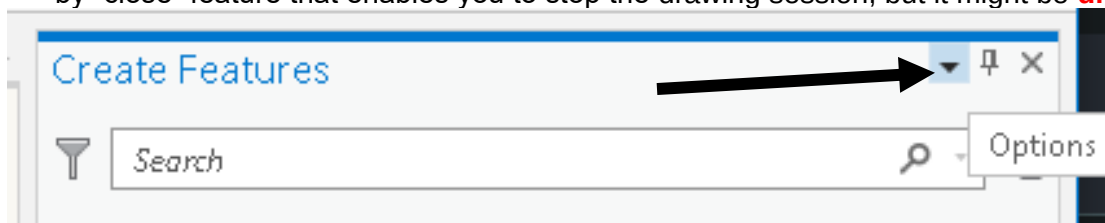


OBJECTID	SHAPE	Bedrooms	Bathrooms	Multi-Family_Y_N	Garage_Y_N
1	Point	4	3	N	Y

There is a message that the create feature operation is **completed** in the RH pane of ArcPro (see below):



- If you have trouble finding where to “stop” creating new features (drove me nuts for a while), go to the upper RH corner of the RH **Create Features** pane (see below) – there is a small “options” arrow followed by “close” feature that enables you to stop the drawing session, but it might be **difficult to see**:

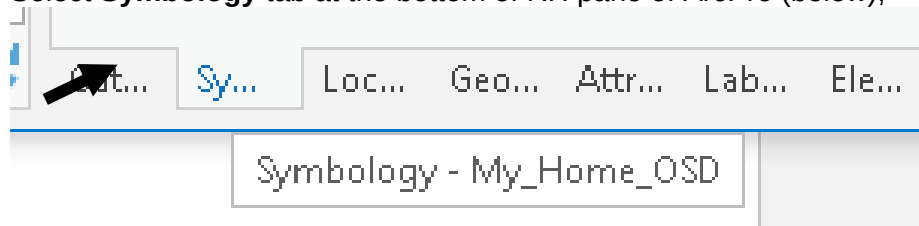


This might be a good time to [save](#) your project, if you have not done so recently.

Step 14 – Edit My_Home_OSD Symbology

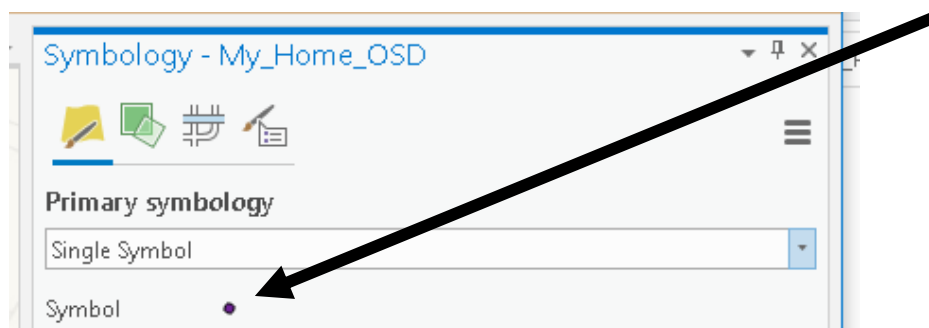
The point marking the location of your home is drab and is hard to see. You want to make it more visible.

- Select **Symbology** tab at the bottom of RH pane of ArcPro (below);

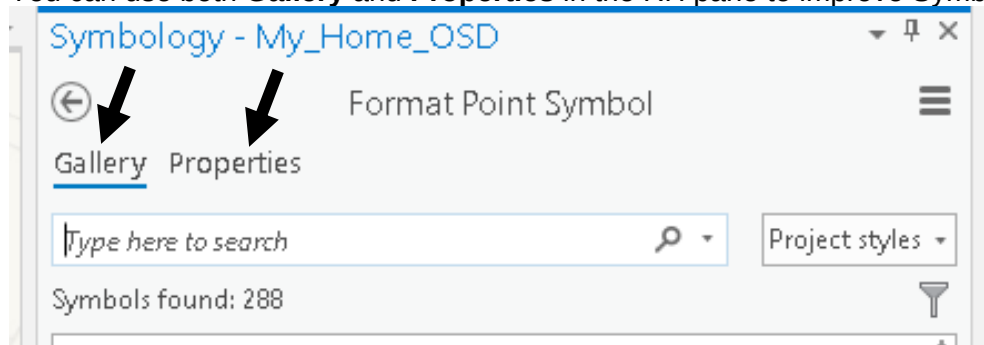


Symbology pane appears on the RH side of ArcPro(below)

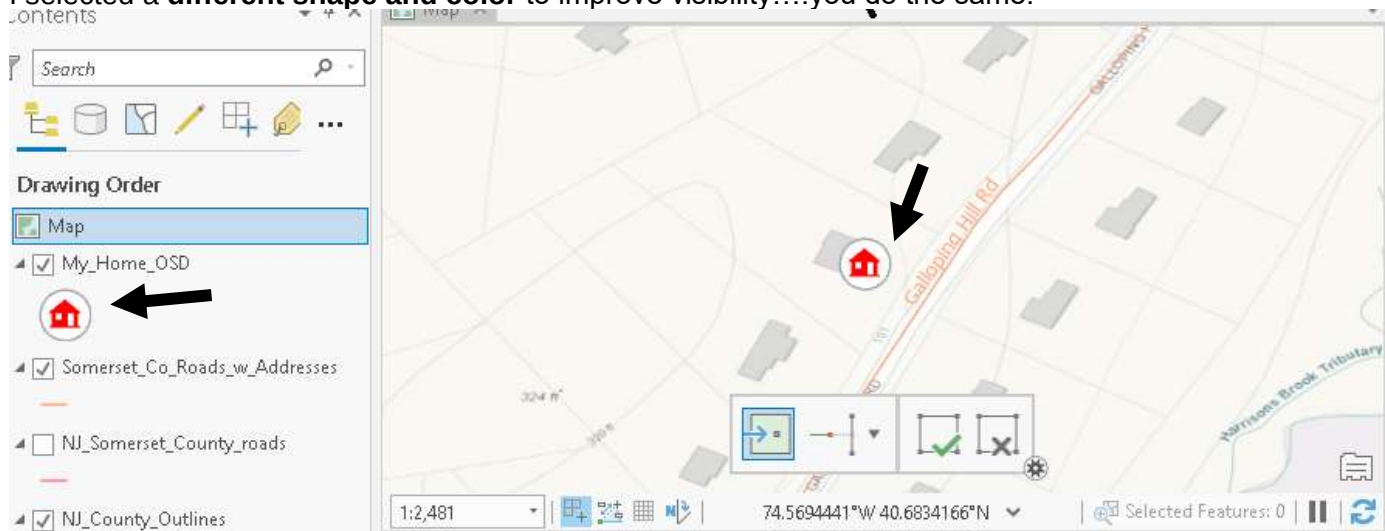
- From the Contents pane, LH side, select the point **under** the My_Home_OSD title (below)



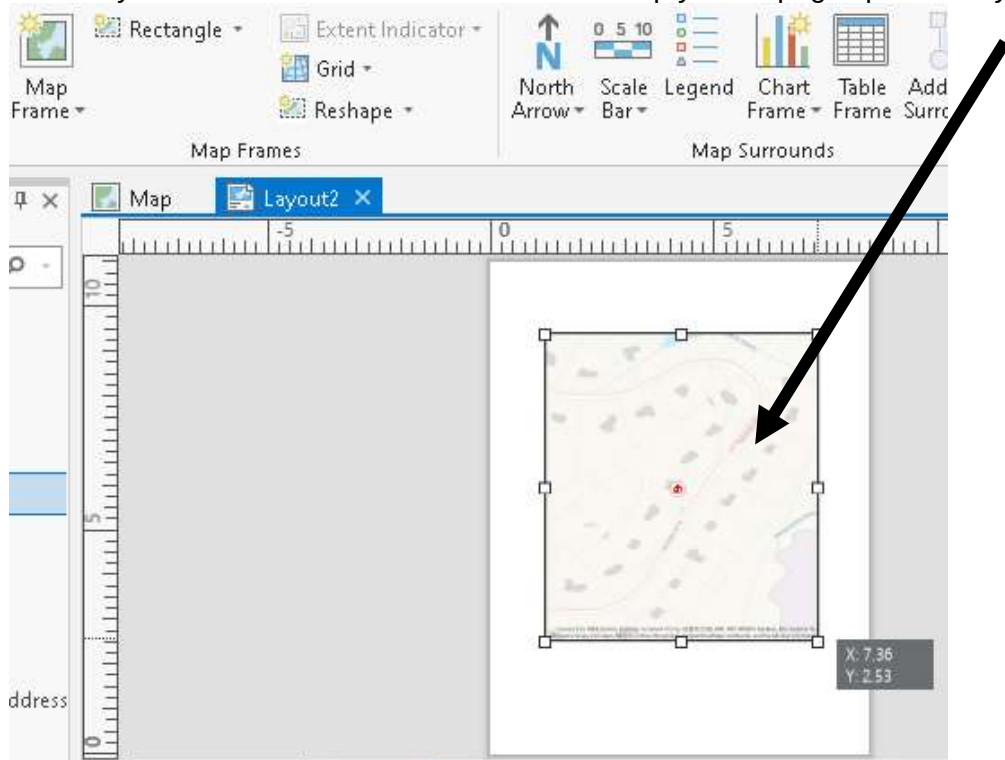
You can use both **Gallery** and **Properties** in the RH pane to improve Symbology



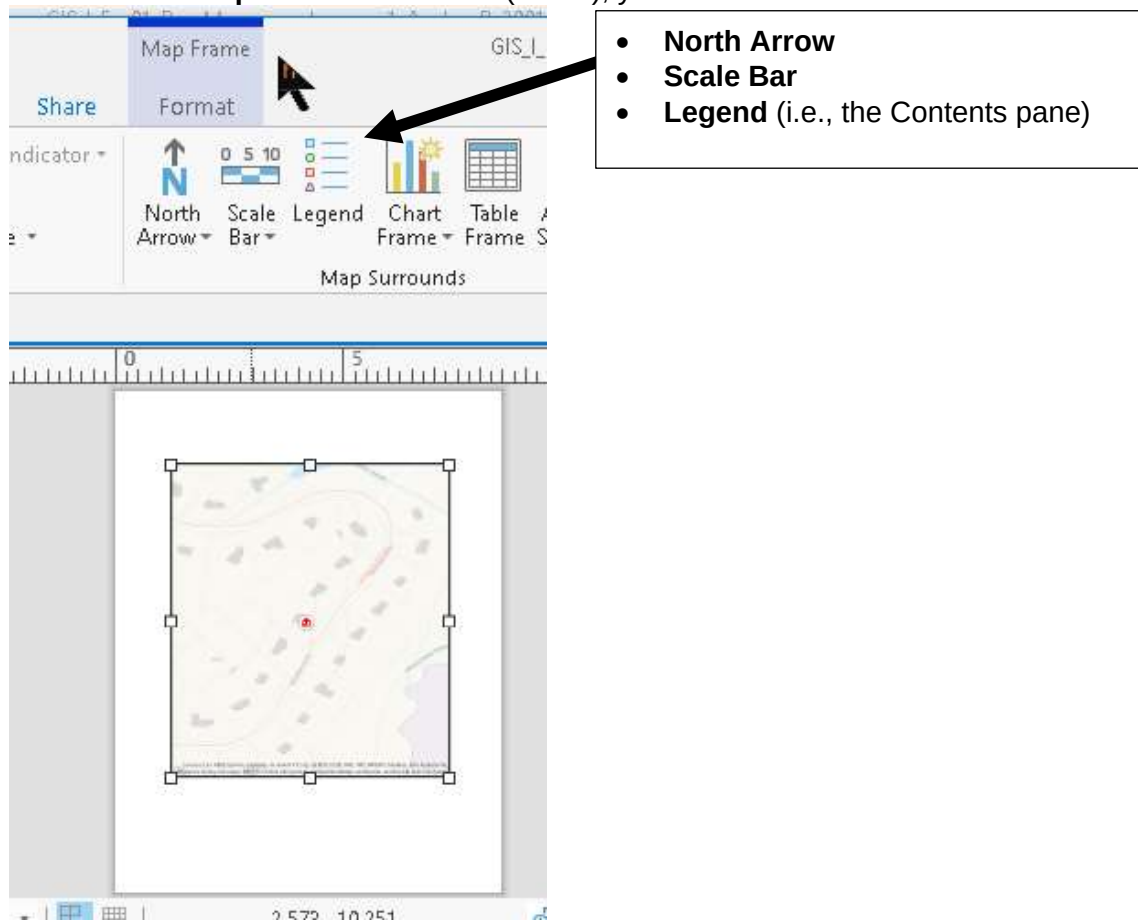
I selected a **different shape and color** to improve visibility....you do the same.



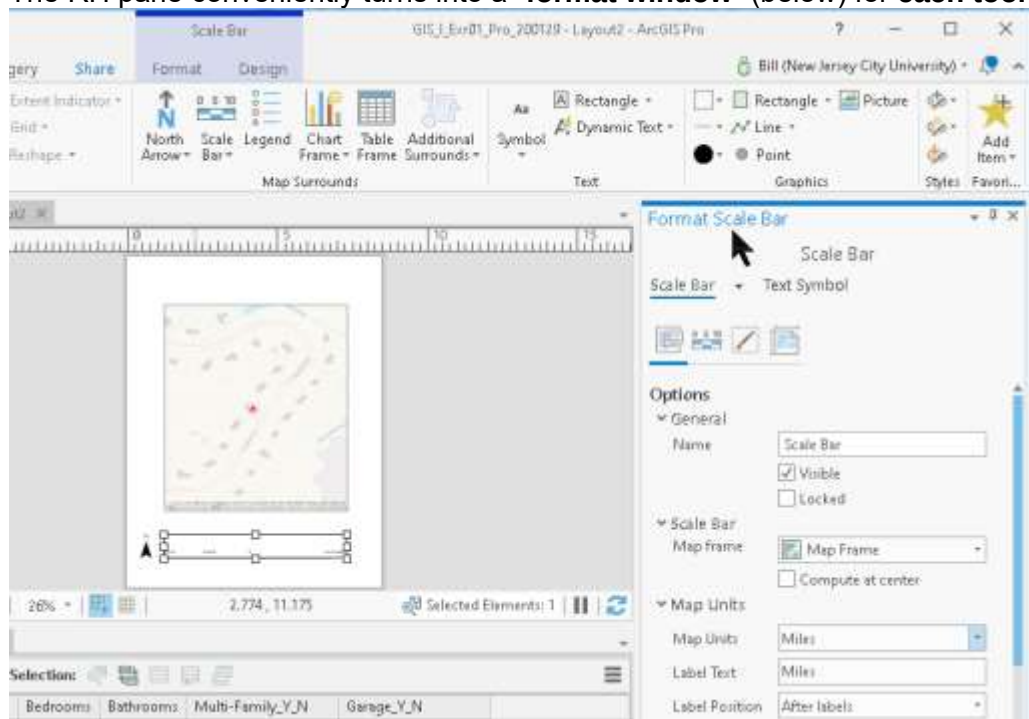
- Use your mouse to draw a **window** on the empty white page space and your **map** will fill the window:



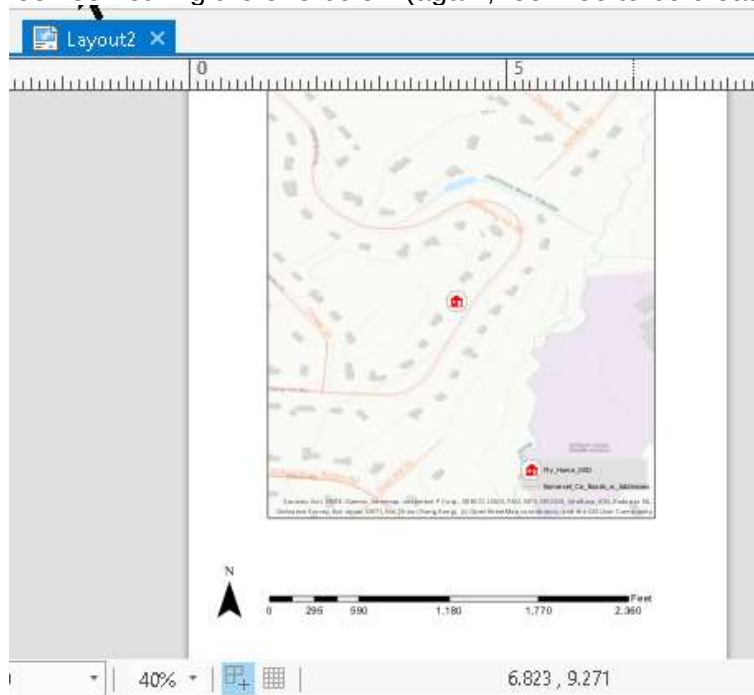
- Under the **Map Frame** format tab (below), you can add other elements:



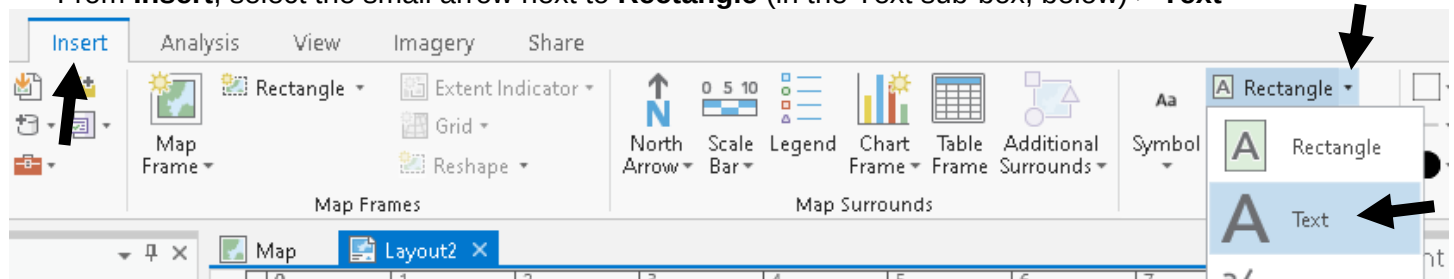
The RH pane conveniently turns into a “**format window**” (below) for **each tool** you use to add an element



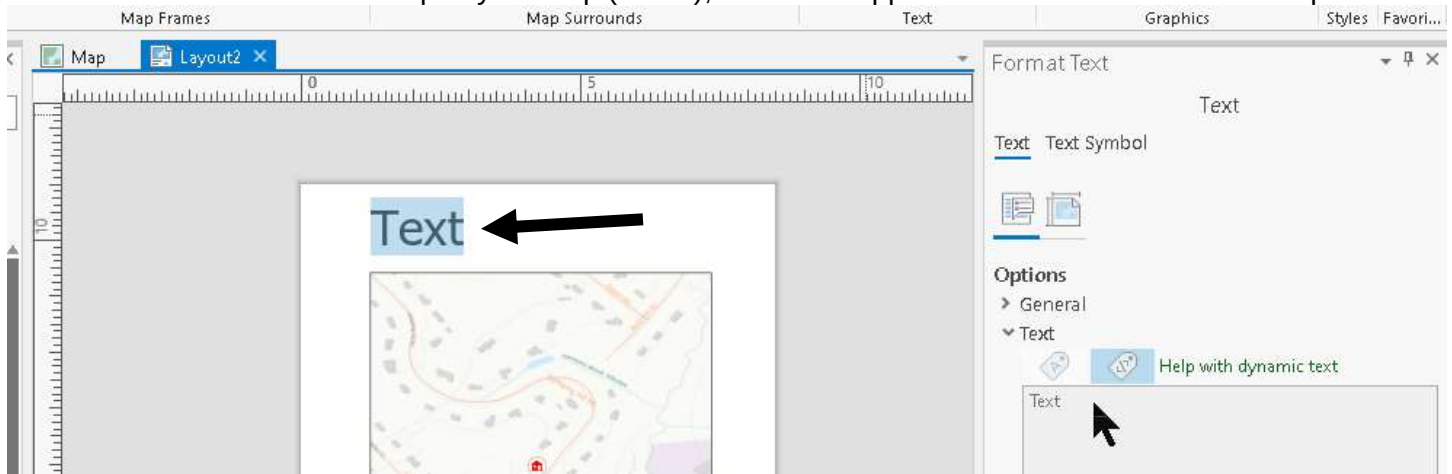
After you have added a North Arrow, Scale, and Legend (see lower part of my Layout, below), your map will look something the one below (again, feel free to be creative with your layout to maximize communication):



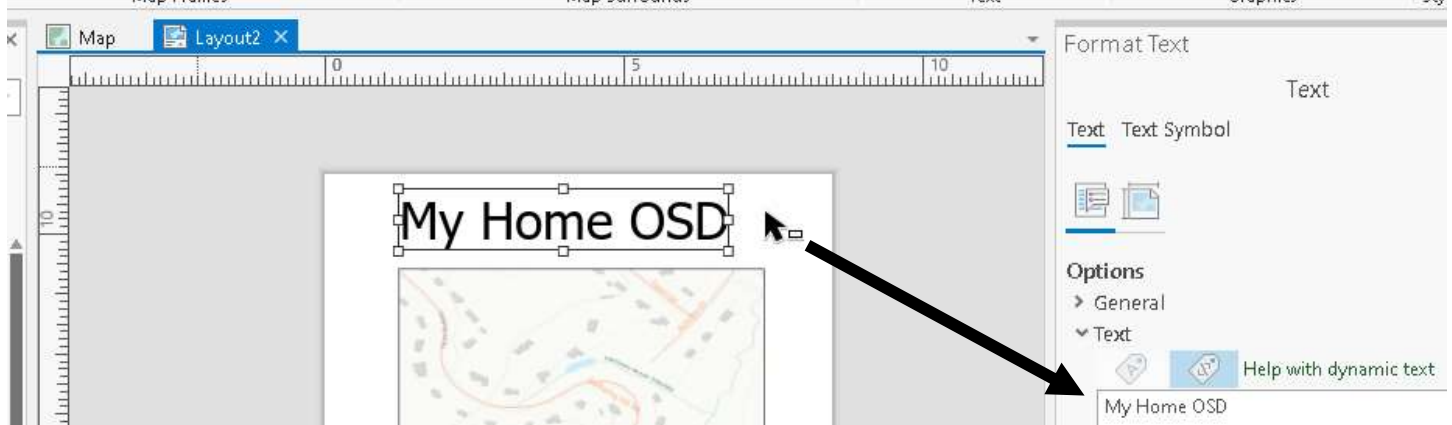
- From **Insert**, select the small arrow next to **Rectangle** (in the Text sub-box, below) > **Text**



- Draw a text box near the top of your map (below); a text box appears as well as a “format text” pane



- I typed **My Home OSD** in the text box in the **RH pane**
- I select the text in the pane as though I would Copy > Paste it, but it **auto-appeared** on the map (below)



We still want to [insert a Table](#) into our layout. The link shows us how to do this:

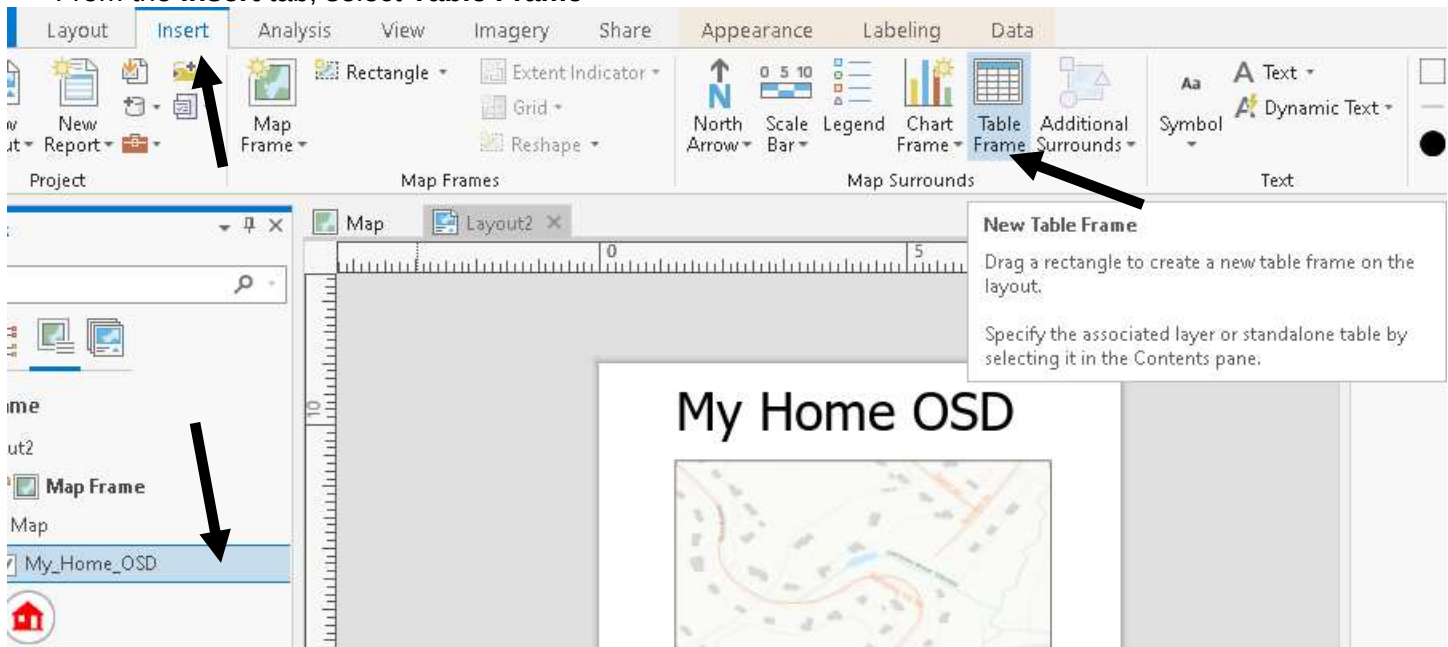
Insert a table frame

To insert a table frame, complete the following steps:

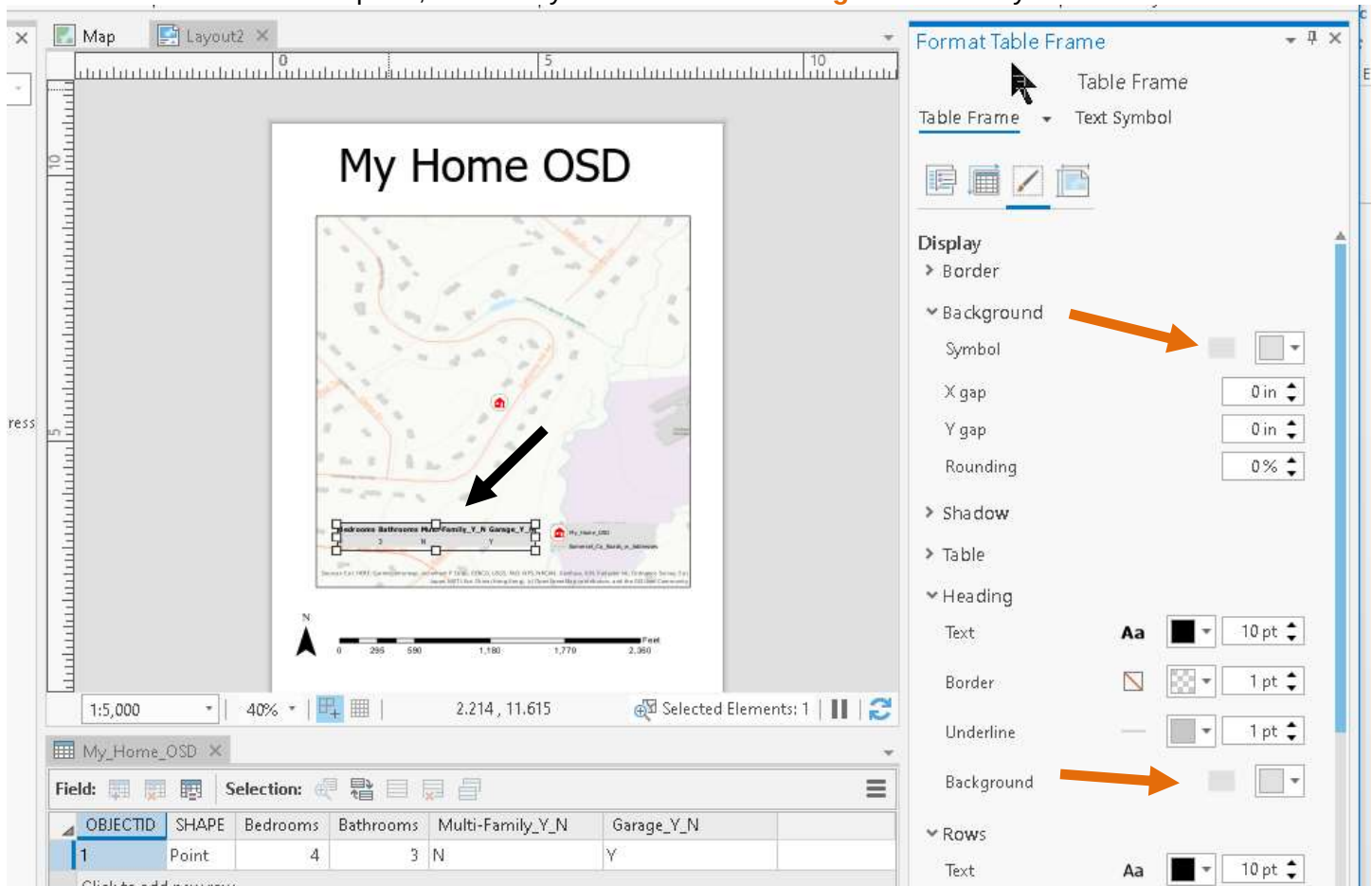
- 1 In the **Contents** pane, select the layer you want to use to create the table.
- 2 On the **Insert** tab, in the **Map Surrounds** group, click **Table Frame**.
- 3 On the layout, draw a rectangle to define the limits of the table frame.

Let's try this on the map:

- Select **My_Home_OSD** on the Contents (LH) pane (we want to show the AT from this feature)
- From the **Insert** tab, select **Table Frame**

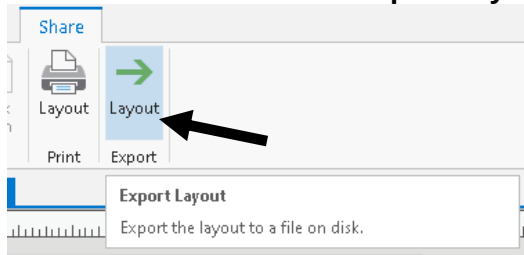


- **Navigate** to the place on the Layout where you want to **draw** your table:
- In **Format Table Frame** pane, note that you have to set a **background fill** so your table values will show

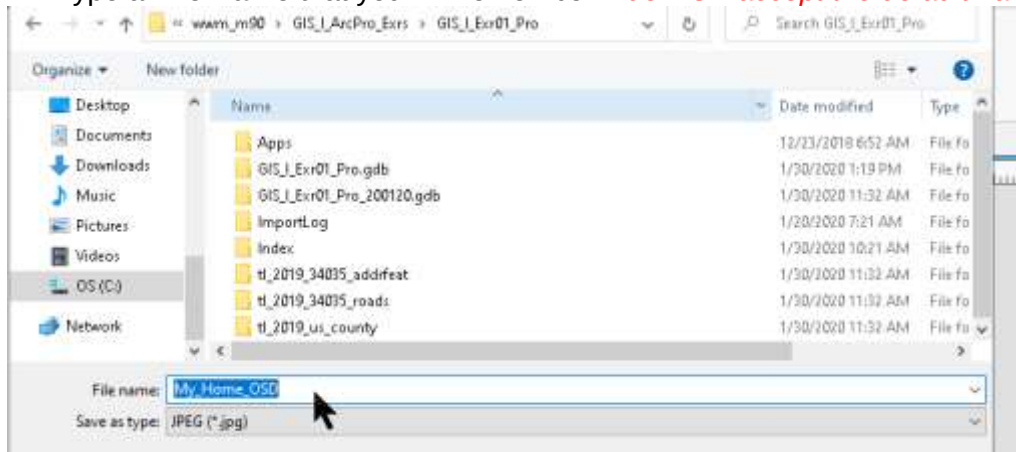


Step 16 - Create a .jpg of the layout.

- From the Share Tab > Export Layout



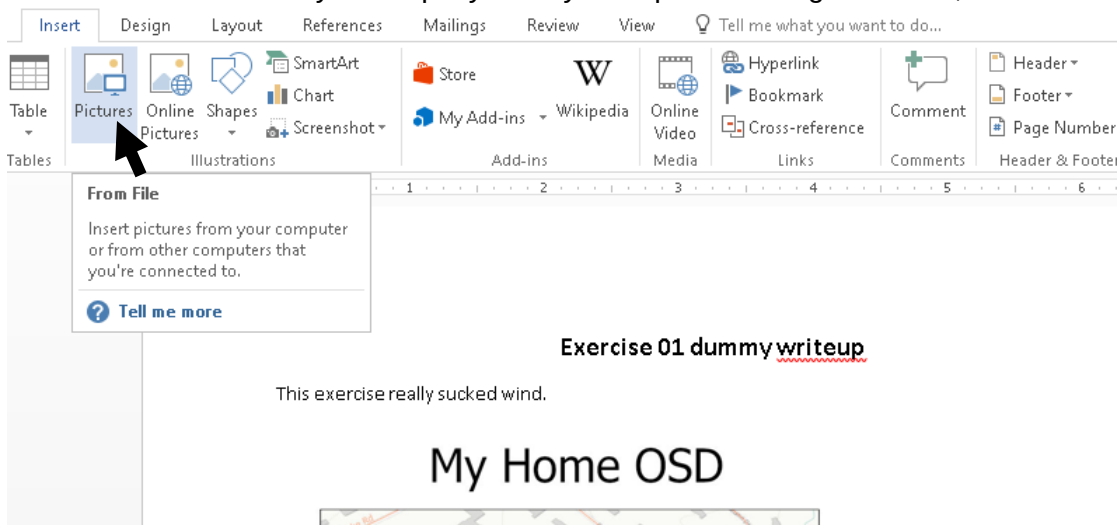
- Direct the file to be saved in your **GIS_I_Exr01_Pro** folder
- Type a **File Name** that you will remember – **do NOT accept the default name** - you will never remember it



Step 17 - Prepare a report with JPG explaining exercise & provide feedback

For full credit, in no less than 250 words:

- Summarize** the procedure you used to perform the exercise.
- Indicate** what you have learned about spatial vs non-spatial data,(i.e., the relationship between a feature (point, line, or polygon) and its attributes.
- Explain** what you liked (and didn't like) about the exercise – Be specific
- Identify** areas for improvement or expansion, if any. Your feedback improves all NJCU GIS classes!
- Embed** the .JPG of your map layout in your report. If using MS Word, use **Insert > Picture**



- Convert the MS Word document to an **ADOBE PDF**
- Submit** the **PDF** to your instructor through Blackboard per submission video instructions.

EXTRA CREDIT (10 pts):

For XC, use ArcPro to prepare your layout for posting, then post it to ArcGIS Online (AGOL).