




## Guided ArcGIS Online Practice

### Lesson 1: Save a Copy of Your Dataset

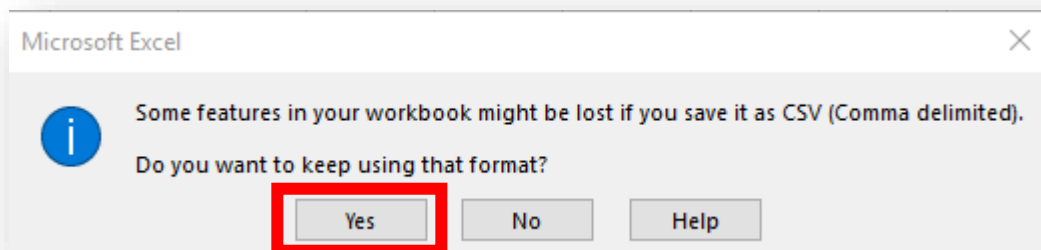
First detectors all over North America are submitting invasive species reports. Scientists then can use that data to better combat the spread of invasive species. This tutorial will walk you through step-by-step how to clean a dataset and upload it into ArcGIS Online to make a simple map. In Part 1, we will simply save a copy of our dataset.

- 1) Open the provided dataset “OrangeCounty\_Practice dataset.”
- 2) Save a copy of the dataset. In the top left corner of the Excel sheet go to the following:
  - “File”
  - “Save As”
  - Select a location where you will be able to find it again easily
  - Name it “OrangeCounty\_Practice\_Your initials”

*Ex: If your name is Jane Doe, it should be saved as “OrangeCounty\_Practice\_JD”*

	OrangeCounty_PracticeDataset.csv	12/17/2018 8:47 AM	Microsoft Excel C...	531 KB
	OrangeCounty_PracticeDataset_JD.csv	12/17/2018 8:48 AM	Microsoft Excel C...	531 KB
	Practice Mapping Exercise.docx	12/14/2018 3:03 PM	Microsoft Word D...	615 KB

- 3) You may receive a pop-up like this:



Select “Yes.” Keeping your document as a CSV will allow you to add it to your map. Do this any time Excel asks to save as a CSV.

Keep your dataset open and continue to **Guided Practice 2: Clean Your Dataset.**

## Guided ArcGIS Online Practice

### Lesson 2: Clean Your Dataset

This is a very basic introduction to cleaning, or editing, datasets. Researchers often share data with one another, but they rarely use one standard data sheet so they need to edit the datasets slightly to match their formats. Editing is usually minor and may include things such as changing column headings (ex: changing “Sp\_Name” to “Species Name”) or changing the order of the data.

Now you will clean your data. In this case we will get rid of excess rows and columns. EDDMapS allows for much more information on invasive species reports than is required through the “WA Invasives” app. While this data can be useful, it is more information than we need.

1) Open the copy of your dataset:

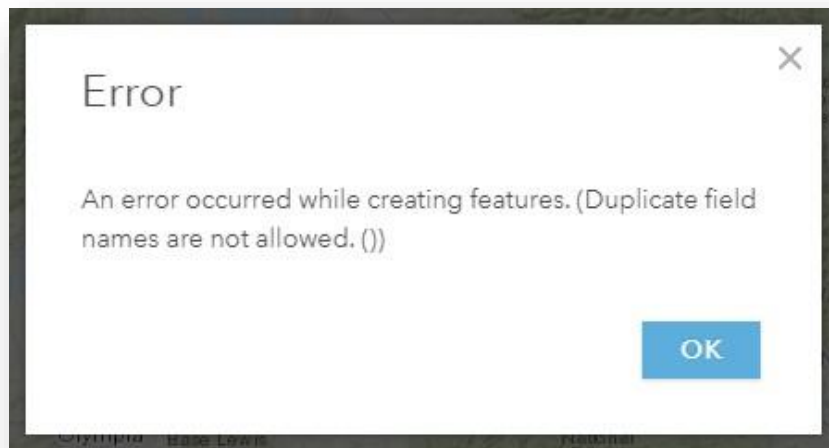
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Parameters													
2	County	Orange County												
3	State	North Carolina												
4	Country	United States												
5														
6	objectid	Reporter	ComName	SciName	OccStatus	ObsDate	DateAcc	DateEnt	DateUp	Location	Latitude	Longitude	Datum	CoordAcc
7	5235233	iNaturalis	brown ma	Halyomor	Positive	#####		10-Jan-18	#####	Orange, N	35.87765	-79.0363		
8	5235087	iNaturalis	brown ma	Halyomor	Positive	#####		10-Jan-18	#####	Orange, N	35.93899	-79.0853		
9	5235014	iNaturalis	brown ma	Halyomor	Positive	#####		10-Jan-18	#####	Orange, N	35.96814	-79.0224		

Notice in Row 1 it says “Parameters” and the following rows list “County,” “State,” and “Country” information. These were the key words used to select this dataset.

- Q1: What state is our dataset from?
- Q2: What county is our dataset from?

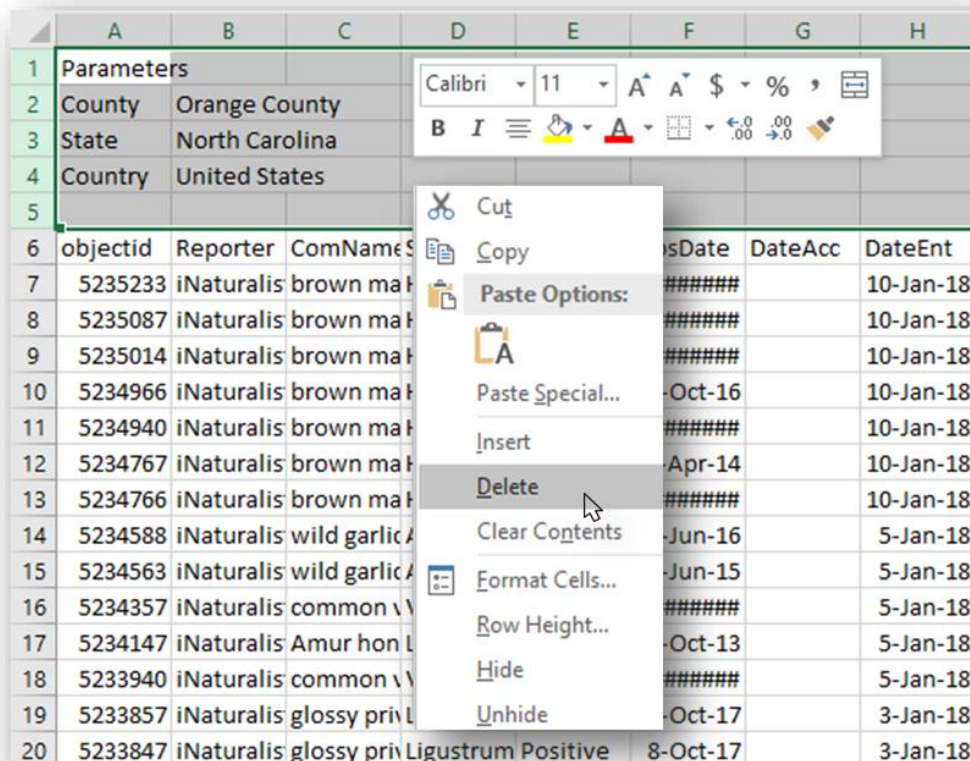
These details were important for finding the data I wanted, but now to upload this dataset into ArcGIS Online, we need to get rid of these extra rows.

If you try to upload your dataset like this into ArcGIS Online you will receive an error message like this:



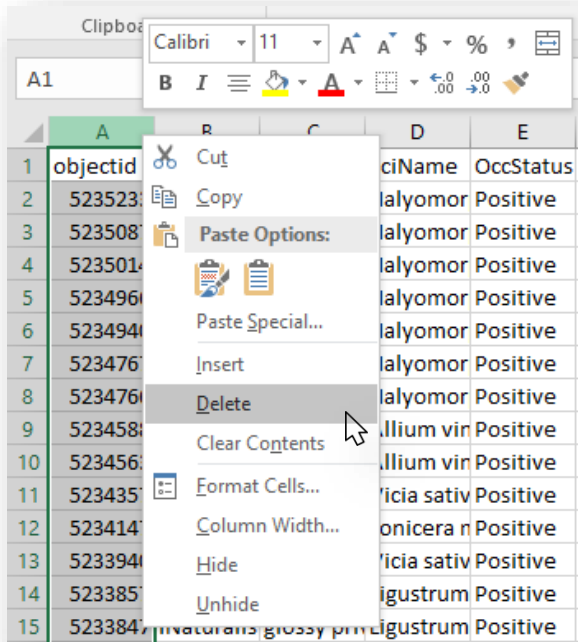
These extra rows do not contain information that ArcGIS Online can use, so it rejects the entire dataset. We will fix this by cleaning our data.

- 2) Starting with Row 1, highlight all the rows down to the row that starts with "objectid" (left-click row Number 1 and drag down to row Number 5).
- 3) Delete the highlighted rows (right-click the highlighted rows and click "Delete").



The number of rows you highlight and delete varies depending upon how many search terms you used to find your dataset; each search term adds an additional row.

- Q3: How many rows did you delete?
- 4) If you scroll left to right in your dataset, you will notice many columns with headings, but no data. These are the extra data that users may add to their reports, but we do not need them for our purposes.



We will delete the excess columns to make your data easier to work with in ArcGIS Online (right-click the column letter, the column highlights, and click “Delete”)

Keep the following columns:

- Reporter
- ComName
- SciName
- ObsDate
- Location
- Latitude
- Longitude
- Datum
- Comments

On future maps you may choose to keep additional columns, but these are the most useful data for your map.

*Tip: You may delete quickly by highlighting multiple columns. Click the letter of the column you want to delete on top. Once that column is highlighted, scroll to the last column you want to delete, hit the “Shift” key, and select the letter of the last column you want to delete. At this point, all of the columns between the two columns you selected should be highlighted and you now can right-click and “Delete.”*

- 5) Save your work.

Keep your dataset open and continue on to Guided Practice 3: Create a Map in ArcGIS Online.

## Guided ArcGIS Online Practice

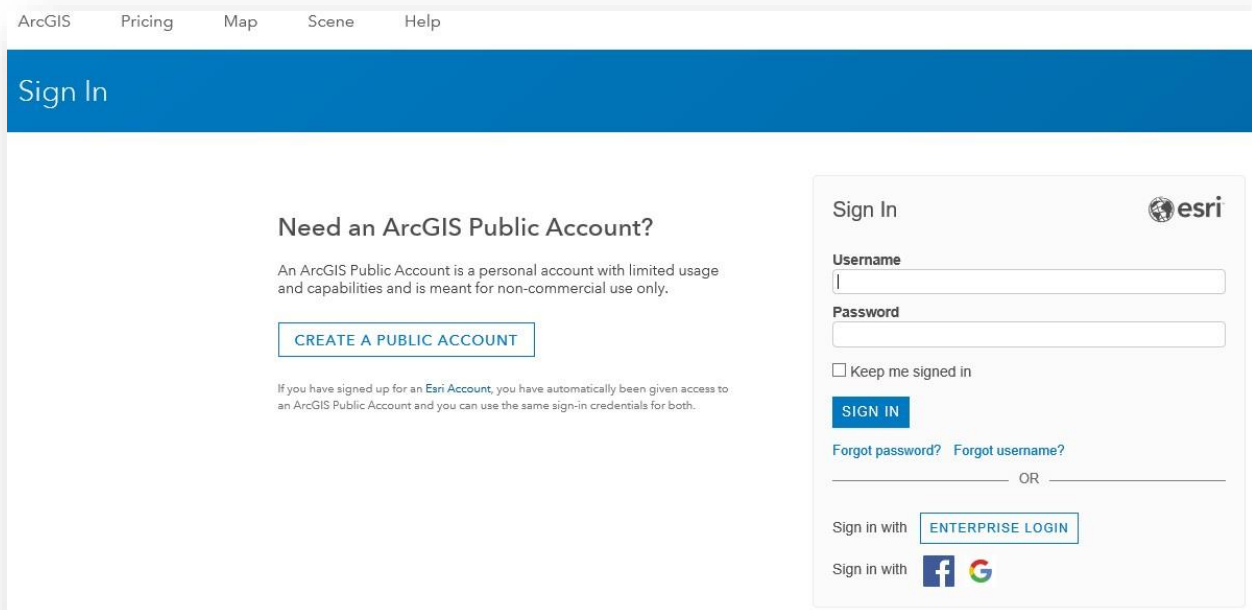
### Lesson 3: Create a Map in ArcGIS Online

You now will use your survey data to create a map. You will use your data to create a map that will tell the viewer:

- Which invasives species are in Orange County, NC.
- Where invasive species are located in Orange County, NC.

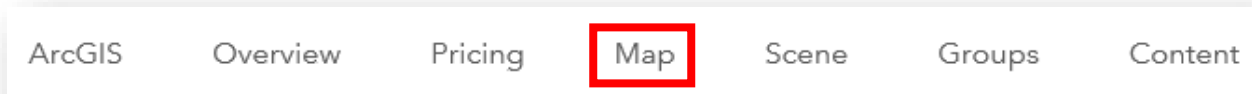
#### Uploading Data

1) Log in to your ArcGIS account: <https://www.arcgis.com/home/signin.html>



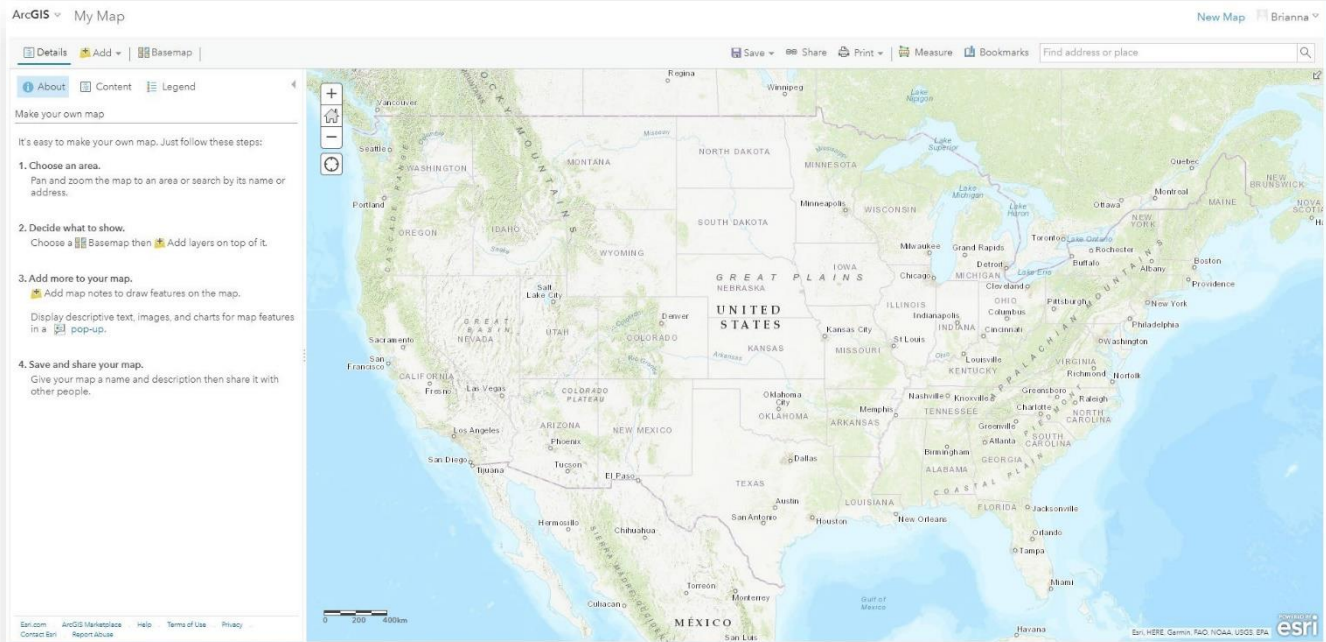
The screenshot shows the ArcGIS Sign In page. At the top, there is a navigation bar with links: ArcGIS, Pricing, Map, Scene, and Help. Below this is a blue header with the text "Sign In". The main content area is divided into two sections. On the left, under the heading "Need an ArcGIS Public Account?", there is a paragraph explaining that an ArcGIS Public Account is a personal account with limited usage and capabilities, intended for non-commercial use only. Below this text is a button labeled "CREATE A PUBLIC ACCOUNT". A smaller note below the button states: "If you have signed up for an Esri Account, you have automatically been given access to an ArcGIS Public Account and you can use the same sign-in credentials for both." On the right, there is a "Sign In" form. It includes fields for "Username" and "Password", a checkbox for "Keep me signed in", and a "SIGN IN" button. Below the button are links for "Forgot password?" and "Forgot username?". There is an "OR" separator, followed by a "Sign in with" section containing an "ENTERPRISE LOGIN" button and social media login options for Facebook and Google.

2) From the tabs at the top of the page, select "Map."

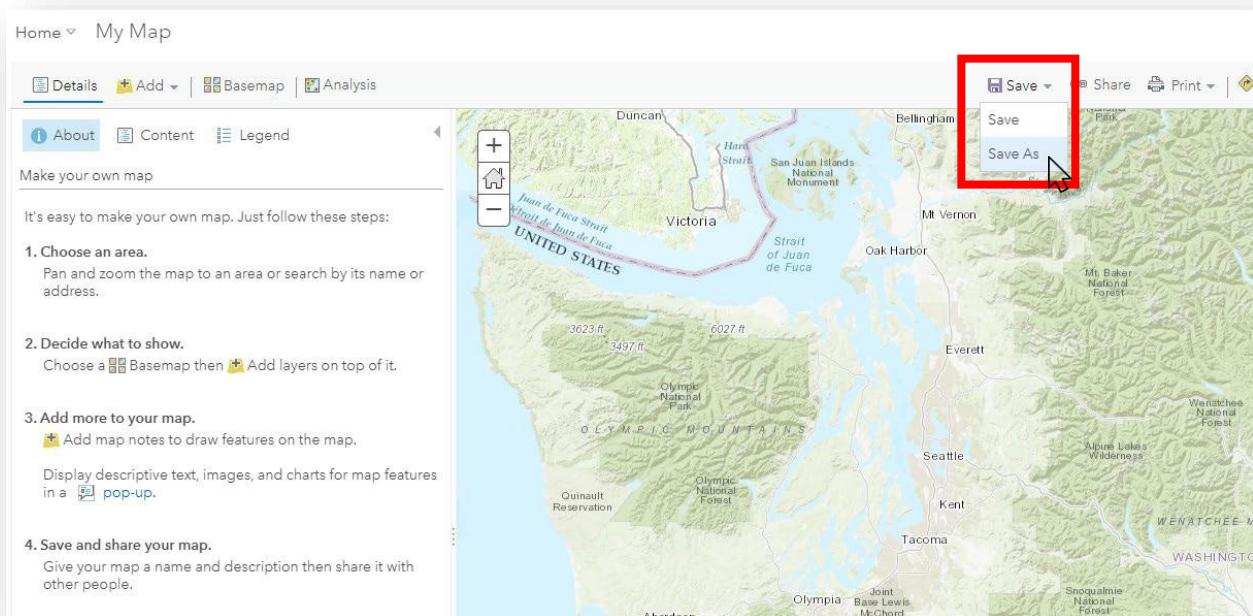




3) You will be taken to a page that looks like this:

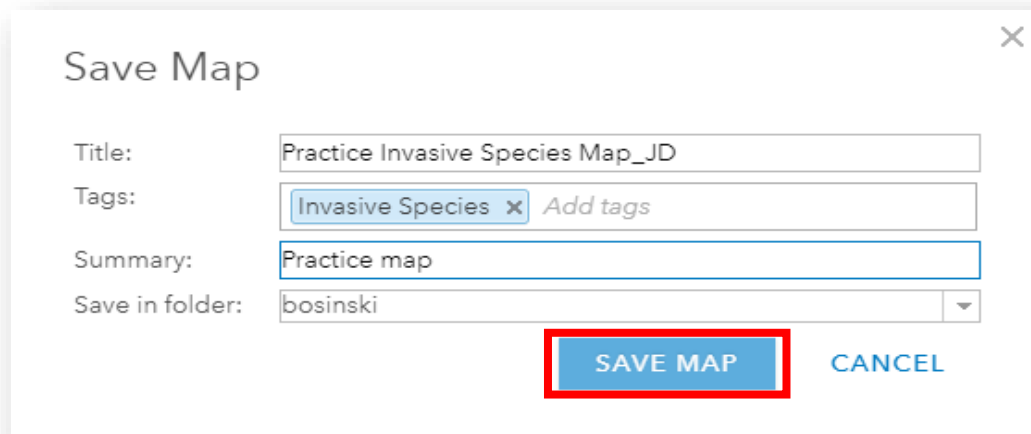


4) Click the “Save” dropdown menu and select, “Save As.”



5) Fill out the required fields as follows:

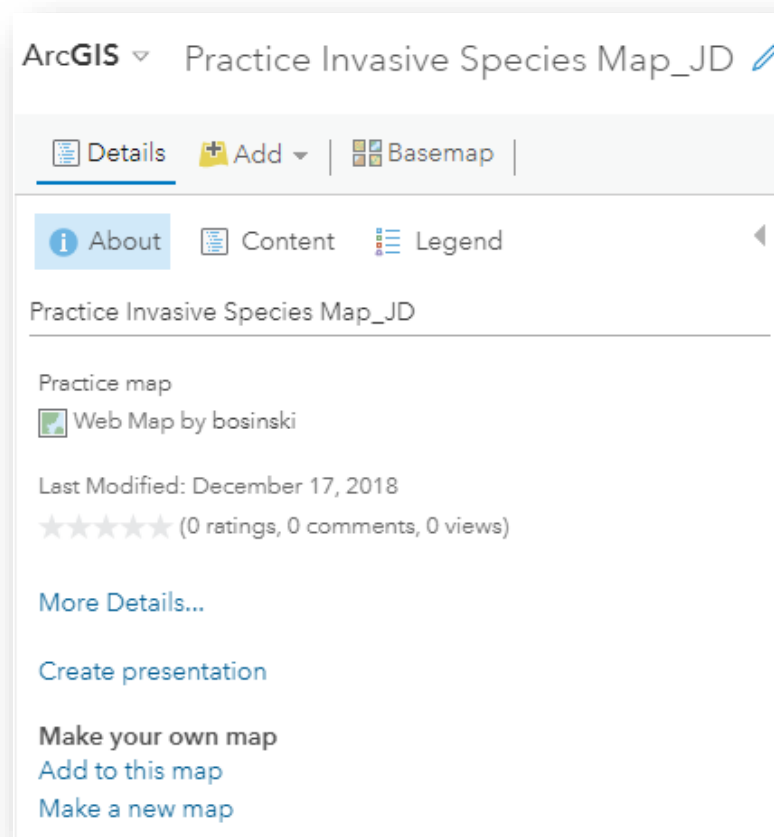
- **Title:** Practice Invasive Species Map\_ \*Your Initials\*
- **Tags:** Invasive Species
- **Summary:** Practice map
- **Save in folder:** \*Select your folder\*



A dialog box titled "Save Map" with a close button (X) in the top right corner. It contains four input fields: "Title" with the text "Practice Invasive Species Map\_JD", "Tags" with a tag "Invasive Species" and an "Add tags" button, "Summary" with the text "Practice map", and "Save in folder" with a dropdown menu showing "bosinski". At the bottom right, there are two buttons: "SAVE MAP" (highlighted with a red rectangle) and "CANCEL".

Then select "Save Map."

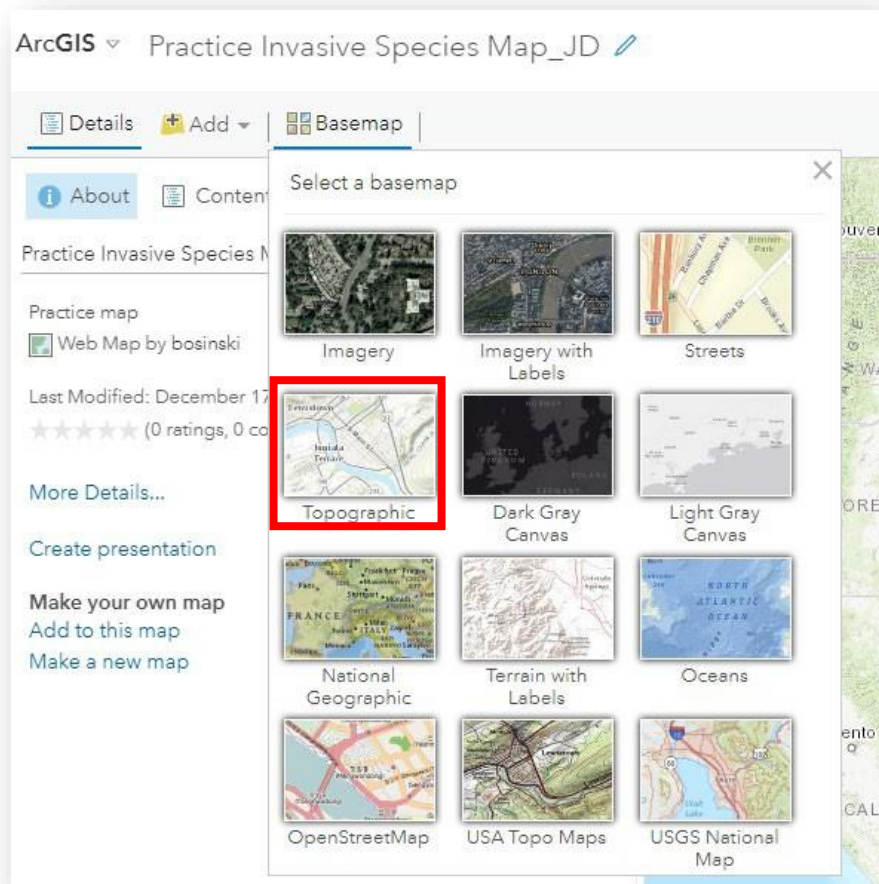
6) Your map's name and the information you input will now appear on the far left of the screen under the "Details" tab in the "About" section.



## Adding a Basemap

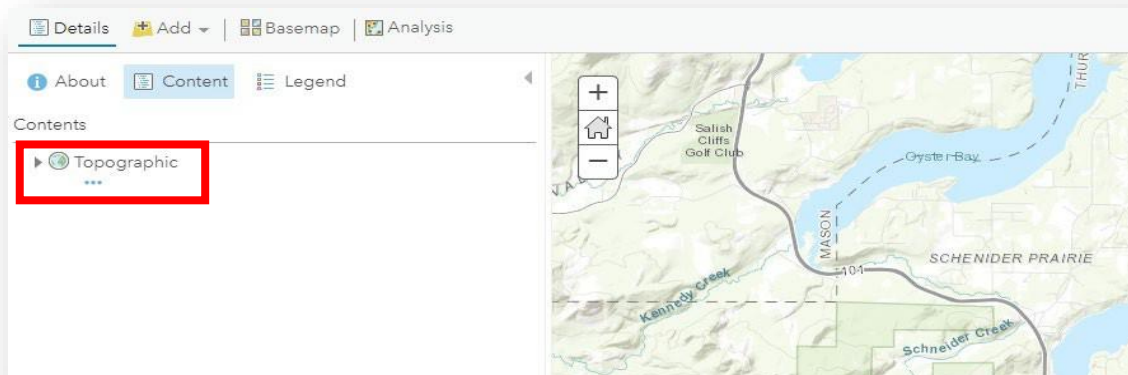
Now, you will start putting your map together. The first thing to add to your map is a basemap. Basemaps provide the background image for all of the other layers you add to your map. ArcGIS provides a wide array of basemaps; you are even able to upload your own. Which basemap you choose depends upon the message you want your map to give. This is a concept you may delve into more if you choose to learn more about making maps. For simplicity and visibility, we will use the basemap entitled “Topographic.”

- 7) From the tabs at the top left, select “Basemap.” A drop down menu will appear. Select “Topographic.”





You will now see a basemap with labels that change depending upon how close you are zoomed in. Which basemap you are using is shown in your “Contents” pane on the far left of the map.



8) Save your work.

### Adding Layers

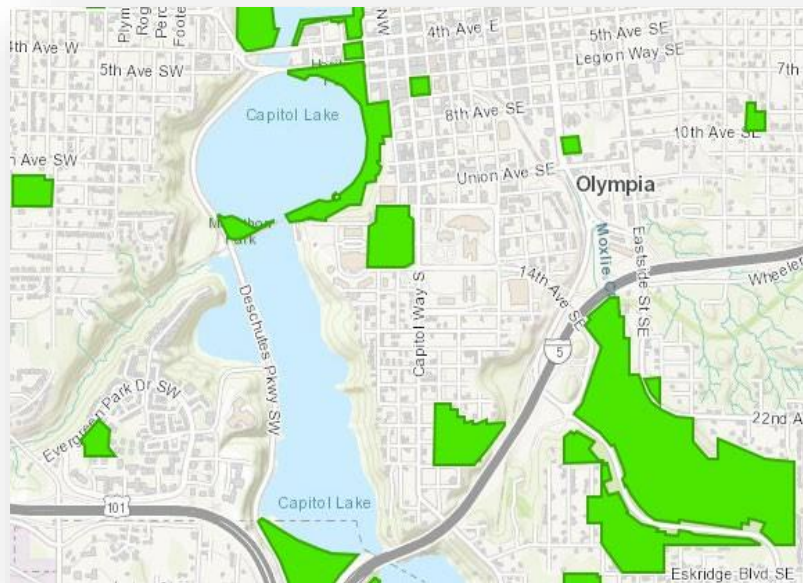
The next step is to add additional layers on top of the basemap. Maps consist of a series of layers. Each layer adds different information to your map. These layers build upon each other to make your map more informative.

For example, if you wanted to make a map showing how to bike from your house to different parks in your county you could use the following layers:

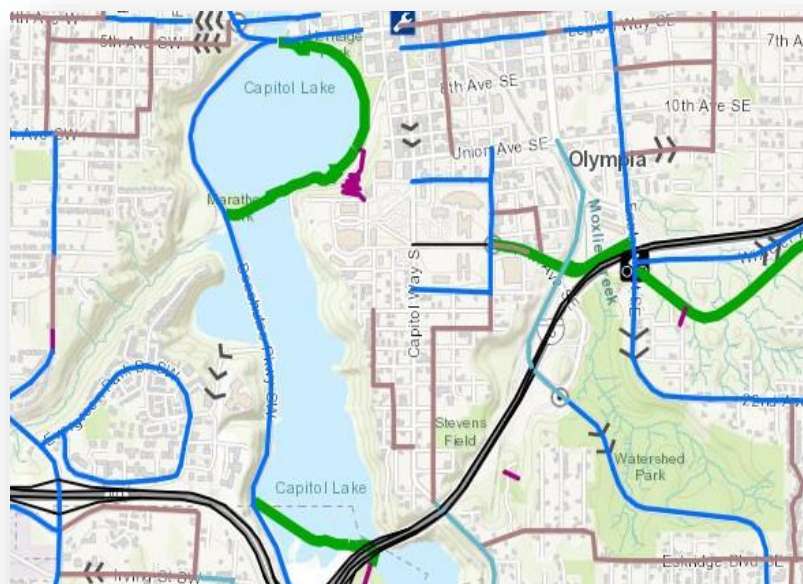
- Layer with a point showing your house.



- Layer showing parks in your county.



- Layer with bicycle paths.

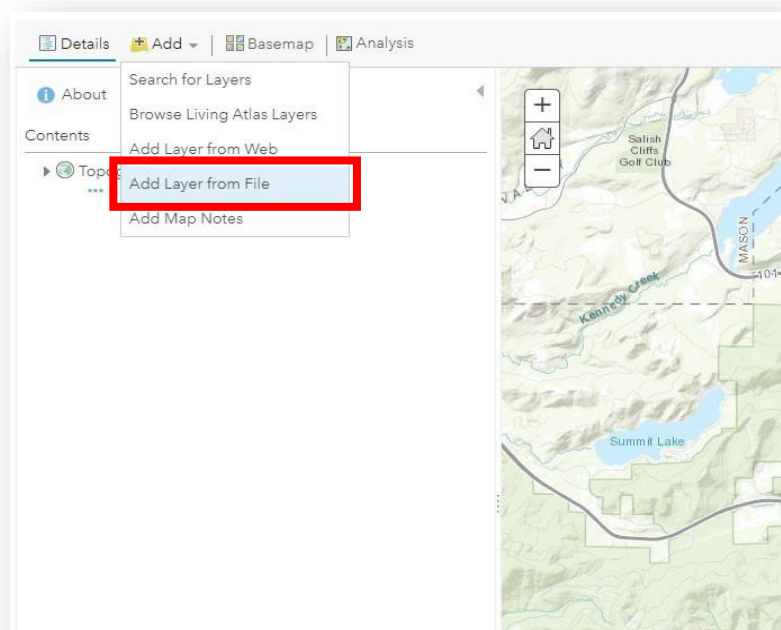


On their own, none of these layers can answer your question, but if you stack them all together, you can see the different paths you could take from your house to different parks in your county.



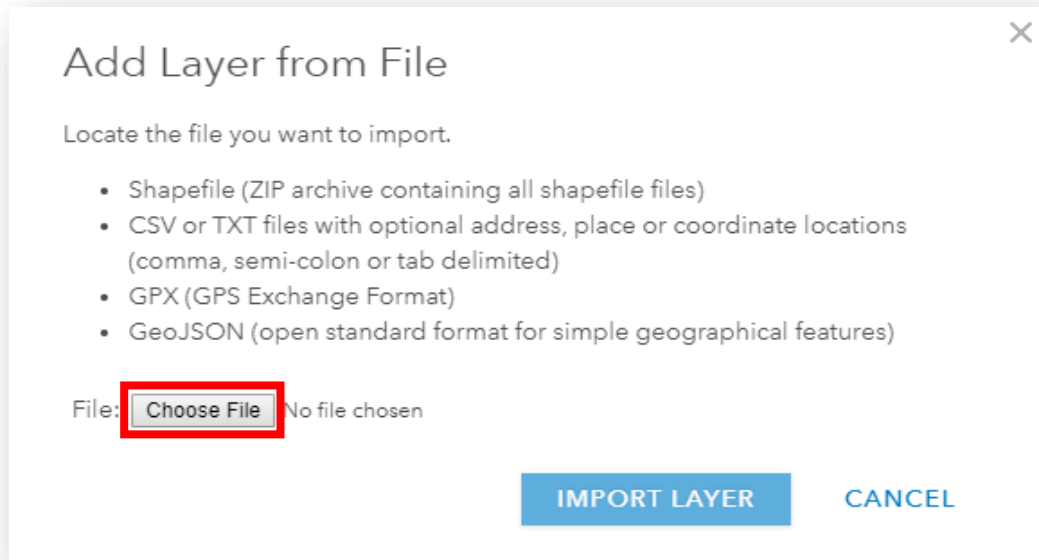
Now you will add layers to your map.

- 9) On the left-hand side, above your information panel, select the “Add” button and select “Add Layer from File” from the drop-down options.

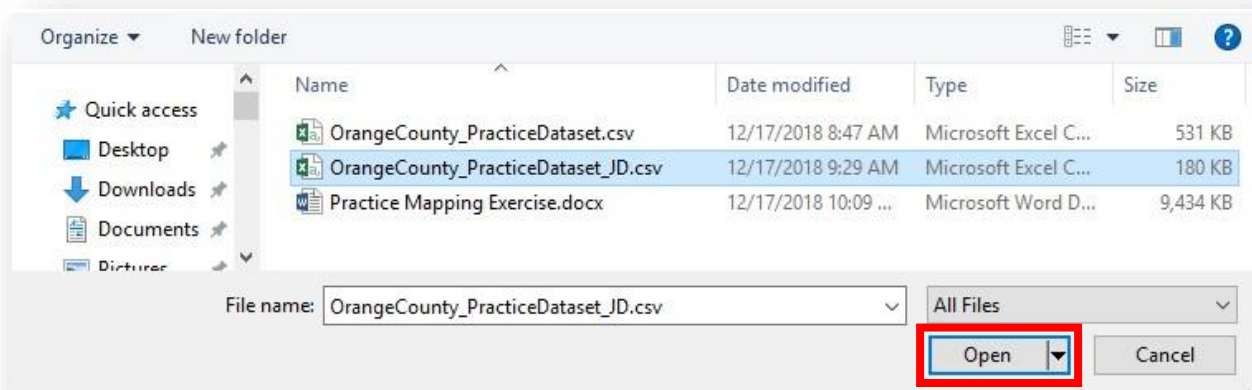




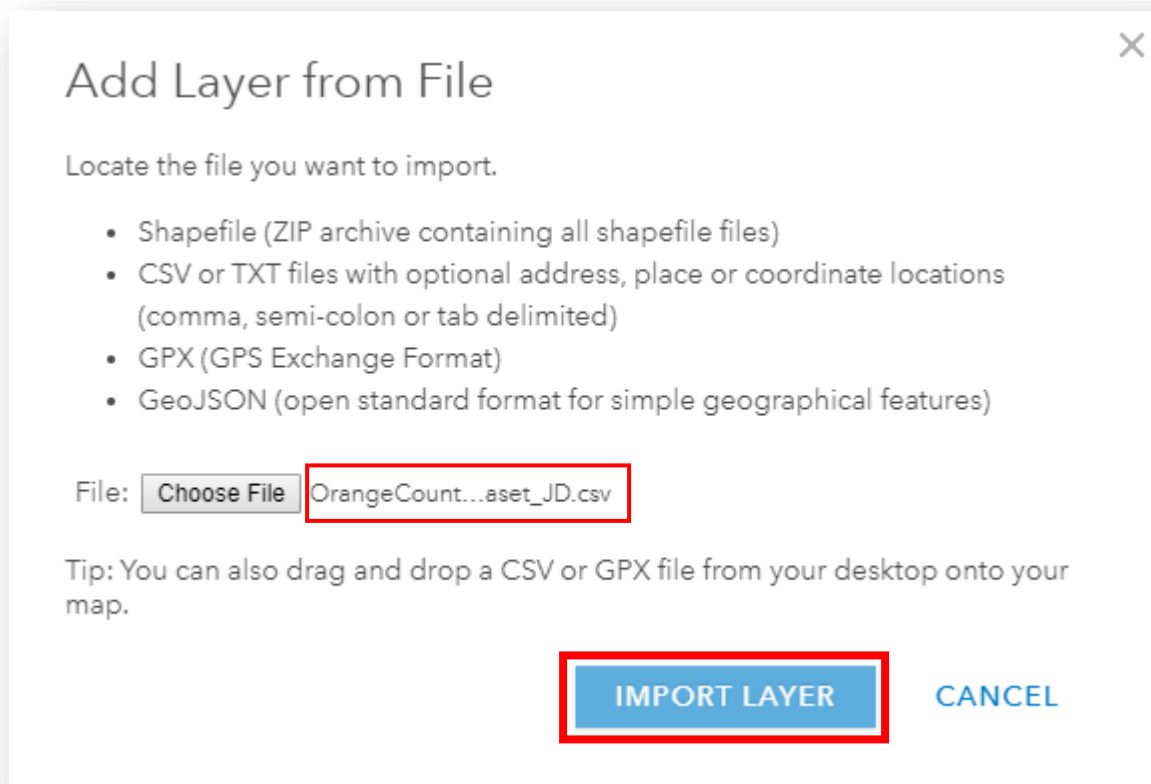
10) You will receive the following pop-up window. Select “Choose File”.



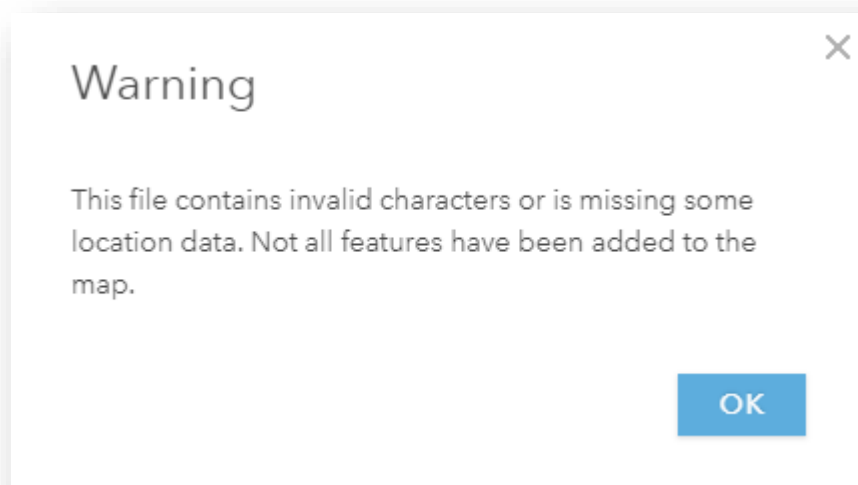
11) Navigate to where you saved the dataset you cleaned. Select the file and click “Open.”



12) Now you will see the name of your file written into the pop-up window. If this is the file you meant to add, click “Import Layer.”



13) With this dataset, we receive a warning message:



This tells us there is something missing or wrong with our data. This is not uncommon when using data you receive from other sources. People sometimes make small errors when entering data or they might be using a format that is different than yours. Let's go back to our dataset to see if we can fix the problem.

14) If you closed your dataset, open the dataset you cleaned earlier.

	A	B	C	D	E	F	G	H	I
1	Reporter	ComName	SciName	ObsDate	Location	Latitude	Longitude	Datum	Comments
2	iNaturalis	brown ma	Halyomor	26-Sep-17	Orange, North Carolina, United States	35.87765	-79.0363		
3	iNaturalis	brown ma	Halyomor	15-Apr-17	Orange, North Carolina, United States	35.93899	-79.0853		
4	iNaturalis	brown ma	Halyomor	11-Sep-16	Orange, North Carolina, United States	35.96814	-79.0224		
5	iNaturalis	brown ma	Halyomor	6-Oct-16	Orange, North Carolina, United States	35.88972	-79.0452		
6	iNaturalis	brown ma	Halyomor	24-Sep-16	Orange, North Carolina, United States	35.87621	-79.1263		
7	iNaturalis	brown ma	Halyomor	6-Apr-14	Orange, North Carolina, United States	35.93838	-79.0535		I found this
8	iNaturalis	brown ma	Halyomor	22-Mar-14	Orange, North Carolina, United States	35.92864	-79.0341		
9	iNaturalis	wild garlic	Allium vin	13-Jun-16	Orange, North Carolina, United States	35.98756	-79.0567		

At this point, we need to be like detectives and look for clues as to what might be broken or missing. This can seem a little overwhelming—there are more than 1,000 reports here! So, instead of picking through each report, let's try to narrow down what information is most important.

- **Think about it:** Looking at the headings, what information do you think would be crucial for the computer program to have so it can plot points on a map?



- **Answer:** Maps help us find the location of places and things, so data that tells us a specific location, like latitude and longitude, are necessary information for the computer program.

15) Scroll down through your dataset and watch the “Latitude” and “Longitude” columns carefully. You will see some gaps in the data.

	A	B	C	D	E	F	G
1	Reporter	ComName	SciName	ObsDate	Location	Latitude	Longitude
519	iNaturalis	mimosa	Albizia jul	10-Jun-12	Orange, North Carolina, United States	35.98457	-79.062
520	iNaturalis	mimosa	Albizia jul	16-Jun-12	Orange, North Carolina, United States	36.04207	-78.9999
521	US Forest	southern	Dendrocto	1-Jan-09	Orange, North Carolina, United States		
522	US Forest	Heterobas	Heterobas	1-Jan-08	Orange, North Carolina, United States		
523	US Forest	hemlock v	Adelges ts	1-Jan-08	Orange, North Carolina, United States		
524	US Forest	southern	Dendrocto	1-Jan-06	Orange, North Carolina, United States		
525	US Forest	Heterobas	Heterobas	1-Jan-05	Orange, North Carolina, United States		
526	US Forest	hemlock v	Adelges ts	1-Jan-05	Orange, North Carolina, United States		
527	US Forest	hemlock v	Adelges ts	1-Jan-09	Orange, North Carolina, United States		
528	US Forest	hemlock v	Adelges ts	1-Jan-06	Orange, North Carolina, United States		
529	US Forest	Heterobas	Heterobas	1-Jan-09	Orange, North Carolina, United States		
530	US Forest	southern	Dendrocto	1-Jan-08	Orange, North Carolina, United States		
531	US Forest	Heterobas	Heterobas	1-Jan-06	Orange, North Carolina, United States		
532	US Forest	hemlock v	Adelges ts	1-Jan-10	Orange, North Carolina, United States		
533	US Forest	southern	Dendrocto	1-Jan-10	Orange, North Carolina, United States		
534	US Forest	Heterobas	Heterobas	1-Jan-07	Orange, North Carolina, United States		
535	US Forest	hemlock v	Adelges ts	1-Jan-07	Orange, North Carolina, United States		
536	US Forest	southern	Dendrocto	1-Jan-05	Orange, North Carolina, United States		
537	US Forest	Heterobas	Heterobas	1-Jan-04	Orange, North Carolina, United States		
538	US Forest	hemlock v	Adelges ts	1-Jan-04	Orange, North Carolina, United States		
539	US Forest	emerald a	Agrilus pla	1-Jan-15	Orange, North Carolina, United States		
540	US Forest	hemlock v	Adelges ts	1-Jan-15	Orange, North Carolina, United States		
541	US Forest	Heterobas	Heterobas	1-Jan-15	Orange, North Carolina, United States		
542	US Forest	southern	Dendrocto	1-Jan-15	Orange, North Carolina, United States		
543	Ann Princ	trifoliata	Citrus trif	14-Jan-17	Orange, North Carolina, United States	35.95135	-79.2515

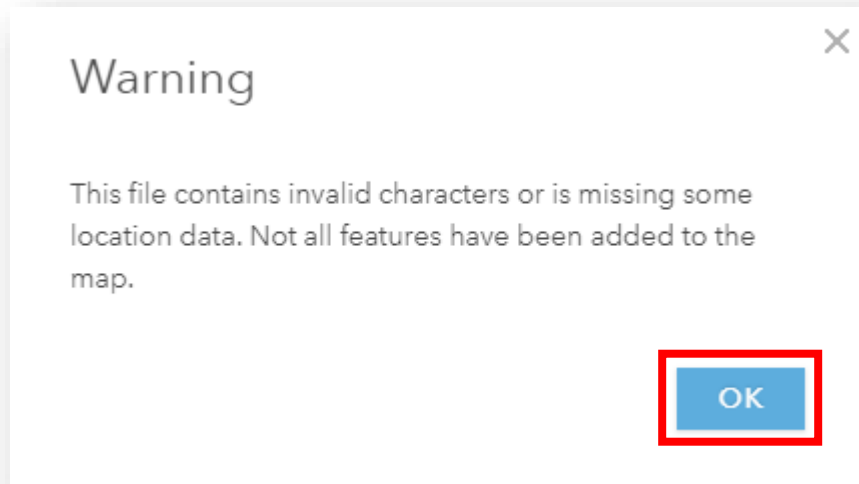
Without those points, the computer doesn’t know where to mark the report on the map. All it knows is that the invasive species is somewhere in Orange County, North Carolina, which is 401 square acres large! Instead of risking putting the report in the wrong place, the computer program simply skips reports that are missing latitude and longitude data.

If this were our dataset, we would try to fill in those gaps. We could check our notes or see if we had the points on our GPS unit. Since this is someone else’s data, however, that information is not available, so we will let the computer program plot as much of the data as possible.

This teaches us a few things:

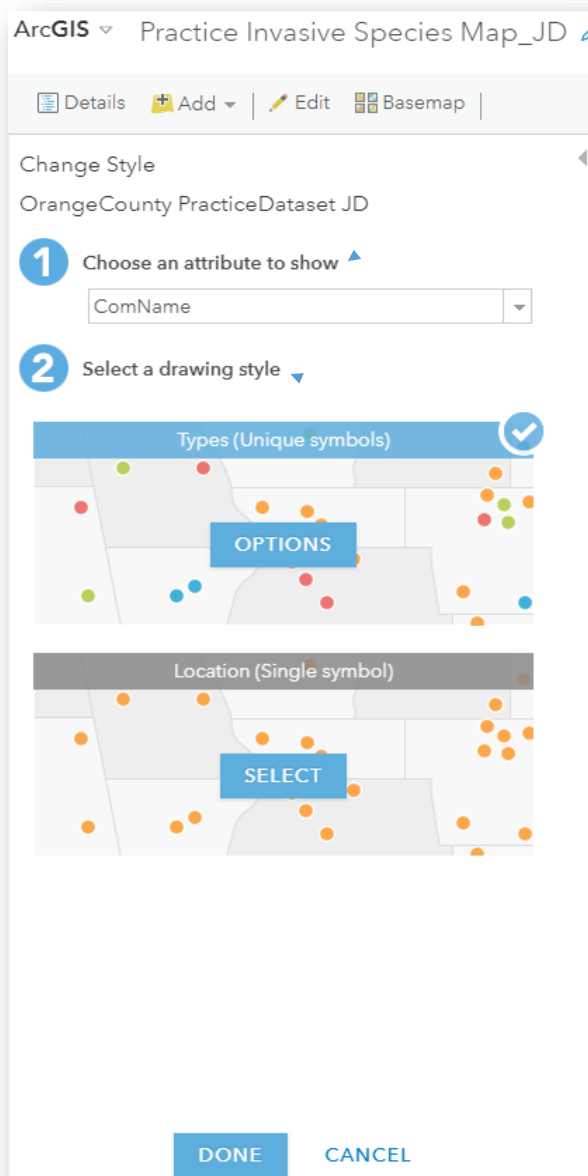
- Always keep detailed data.
- Working with data often requires troubleshooting.

16) Return to your map and click “OK” on the warning message.



## Changing Styles

Your information panel now will look like this:



- You must tell the map which attribute you want it to show. **Attributes** are the descriptive data in your dataset, which is anything other than the spatial data (e.g. latitude and longitude).

Attributes in your dataset include the city where you found the invasive species, who found it, and the species name. Deciding what information you want your map to show will help you choose which attribute to show.

**We will choose “Common\_Name.”**

- You also must select a drawing style.

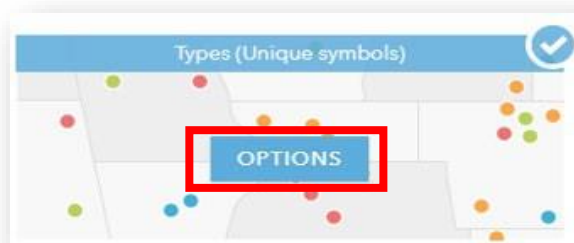
If you select “Types” you will get a different color dot for each category in the attribute you chose. Meaning, in our case, we will get a different colored dot for each type of invasive species we found (e.g. Blue for feral swine, red for knotweed, etc.). This is a great way to show the different invasive species present in your area and their spread.

If you select “Location” you will get the same color dot for each invasive species, regardless of attribute. This can be useful if you only want to see where invasive species are present, but you do not need to know which species they are.

**We will choose “Types.”**

17) Save your work.

18) Within the “Types” box, click the “Options” button.



Your information panel will now look like this:

This is where we will edit the information that appears in our map legend. A map **legend** helps the viewer understand the story the map is telling. In our case, it tells the viewer which invasive species is present at each colored dot on the map.

Details Add | Edit Basemap |

Change Style

OrangeCounty PracticeDataset JD

ComName

Click to edit symbol or label.

	LABEL	COUNT	Symbols
:	English ivy	34	
:	white clover	29	
:	eastern redcedar	27	
:	Japanese honeysuckle	24	
:	common pokeweed	24	
:	ground ivy	23	
:	mimosa	21	
:	Japanese stiltgrass	18	
:	dandelion	16	
:	Chinese privet	15	
<input checked="" type="checkbox"/>	Other ▲	305	Ungroup
	broadleaf plantain	15	

Transparency

0% 50% 100%

Visible Range

County Room








OK CANCEL

Here we can change the symbol shapes, sizes, and colors. We can also edit the species names.


There are more advanced options as well, such as changing the transparency and the visible range. We will not be using these functions for our map today, but you may want to try exploring those tools in the future.

You will notice a category in our legend with a grey dot labeled “Other.” ArcGIS automatically bundles entries into the “Other” category once it has run out of uniquely colored symbols to assign. For example, our legend came with a color spectrum that only had ten color options, so only ten invasive species were assigned a color. Our remaining 74 invasive species were grouped into the “Other” category. If I were to click “OK” at this point, those 74 invasive species would all be represented as gray dots on my map, with no way to visually distinguish them or to tell what the species’ name is.

To fix this, you can click “Ungroup.”

<input checked="" type="checkbox"/>	●	Other	305	 Ungroup
		broadleaf	15	
		plantain	14	
		sacred bamboo	13	
		sericea	13	
		lespedeza	12	
		Queen Anne's lace, wild carrot	12	
		Asiatic dayflower	11	

All of the invasive species are added to the legend.

⋮	●	tall buttercup	1	
⋮	●	tall fescue	1	
⋮	●	trifoliate orange	1	
⋮	●	winged burning bush	1	
<input type="checkbox"/>	●	Other	0	 Ungroup

Then, you would need to check each symbol color to ensure that each invasive species has its own unique color, because ArcGIS will repeat colors once it reaches the end of a color spectrum.

Alternatively, if you do not want a particular invasive species to show up on your map, you can drag and drop that species into the “Other” category. This could be useful if later you bring in the invasive species data for your county but you decide you are only interested in seeing the same invasive species you found in your survey area.

For this exercise, we will return some species to the “Other” category.

19) Drag and drop any invasive species with fewer than 14 reports back into the “Other” category. The number of reports is listed in the column titled “Count.”

- Q4: How many different invasive species do you still have showing in your change style panel?














20) Your Change Style panel should now look like this:

Change Style


OrangeCounty PracticeDataset JD

ComName

Click to edit symbol or label.

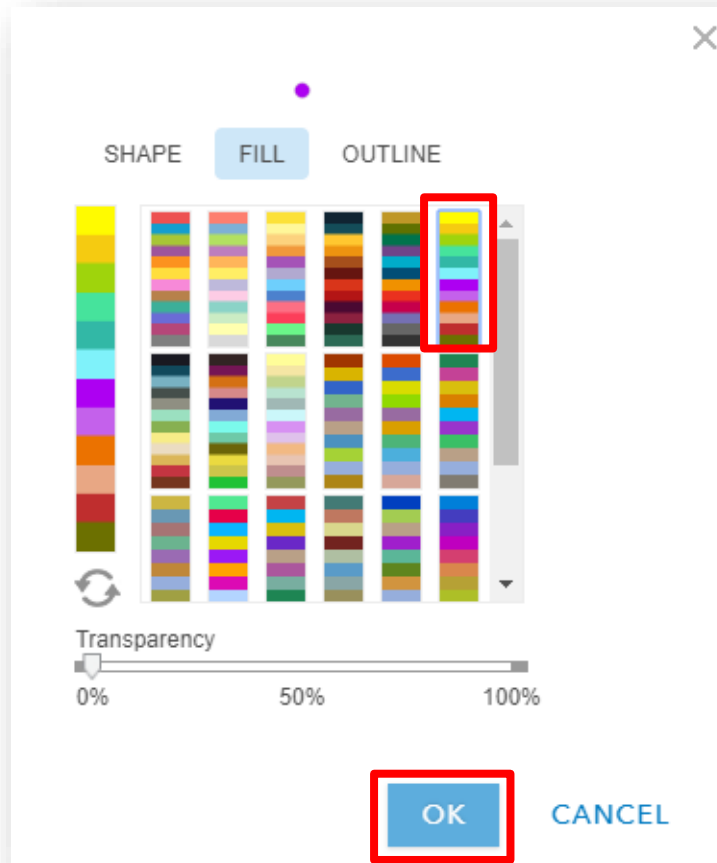
	LABEL	COUNT	
⋮	 English ivy	34	
⋮	 white clover	29	
⋮	 eastern redcedar	27	
⋮	 Japanese honeysuckle	24	
⋮	 common pokeweed	24	
⋮	 ground ivy	23	
⋮	 mimosa	21	
⋮	 Japanese stiltgrass	18	
⋮	 dandelion	16	
⋮	 Chinese privet	15	
⋮	 broadleaf plantain	15	
⋮	 sacred bamboo	14	

At this point, we can change the shape, size, and color of our symbols. For our map, we will do the following:

21) Select the  button at the top right of your information panel.

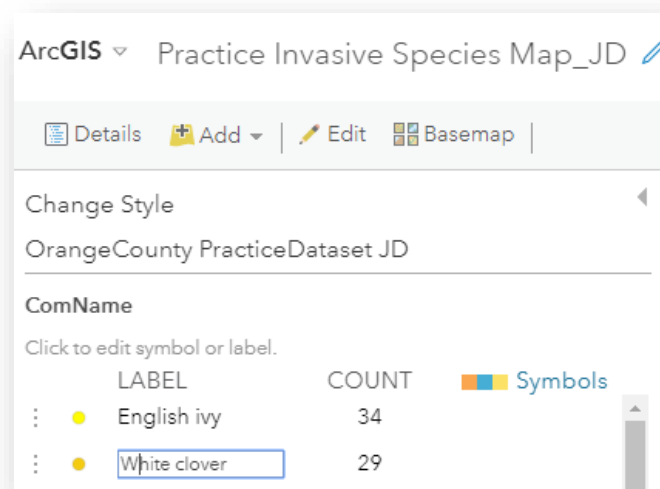


22) On the pop-up window, select the top right color spectrum. Then click, OK.



23) Save your work.

24) Click the name "white clover." A blinking cursor appears. Capitalize the word "white." Repeat this, capitalizing the first word of each invasive species label.



25) Save your work.

26) Scroll down to the “Other” category. Make sure the box next to “Other” does not contain a checkmark, otherwise all of the invasive species we set aside will show as grey dots with no labels.

<input type="checkbox"/>	● Other	276	<a href="#">Ungroup</a>
	sericea	13	<a href="#">↑</a>
	lespedeza		
	Queen Anne's	12	<a href="#">↑</a>
	lace. wild carrot		

At this point, your pane should look like this:

We could continue customizing our legend, changing individual shapes and colors. However, we only need our map to show viewers the following:

- Which invasives species are in Orange County.
- Where invasive species are located in the county.

which our map currently does, so we will keep our current display.

Select OK.














27) Save your work.

Change Style

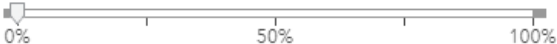
OrangeCounty PracticeDataset JD

ComName


Click to edit symbol or label.

	LABEL	COUNT	 Symbols
:	 English ivy	34	
:	 White clover	29	
:	 Eastern redcedar	27	
:	 Japanese honeysuckle	24	
:	 Common pokeweed	24	
:	 Ground ivy	23	
:	 Mimosa	21	
:	 Japanese stiltgrass	18	
:	 Dandelion	16	
:	 Chinese privet	15	
:	 Broadleaf plantain	15	
:	 Sacred bamboo	14	

Transparency



Visible Range



County

Room

OK

CANCEL

28) You are taken back to this pane:


Change Style

OrangeCounty PracticeDataset JD

**1** Choose an attribute to show

ComName

**2** Select a drawing style

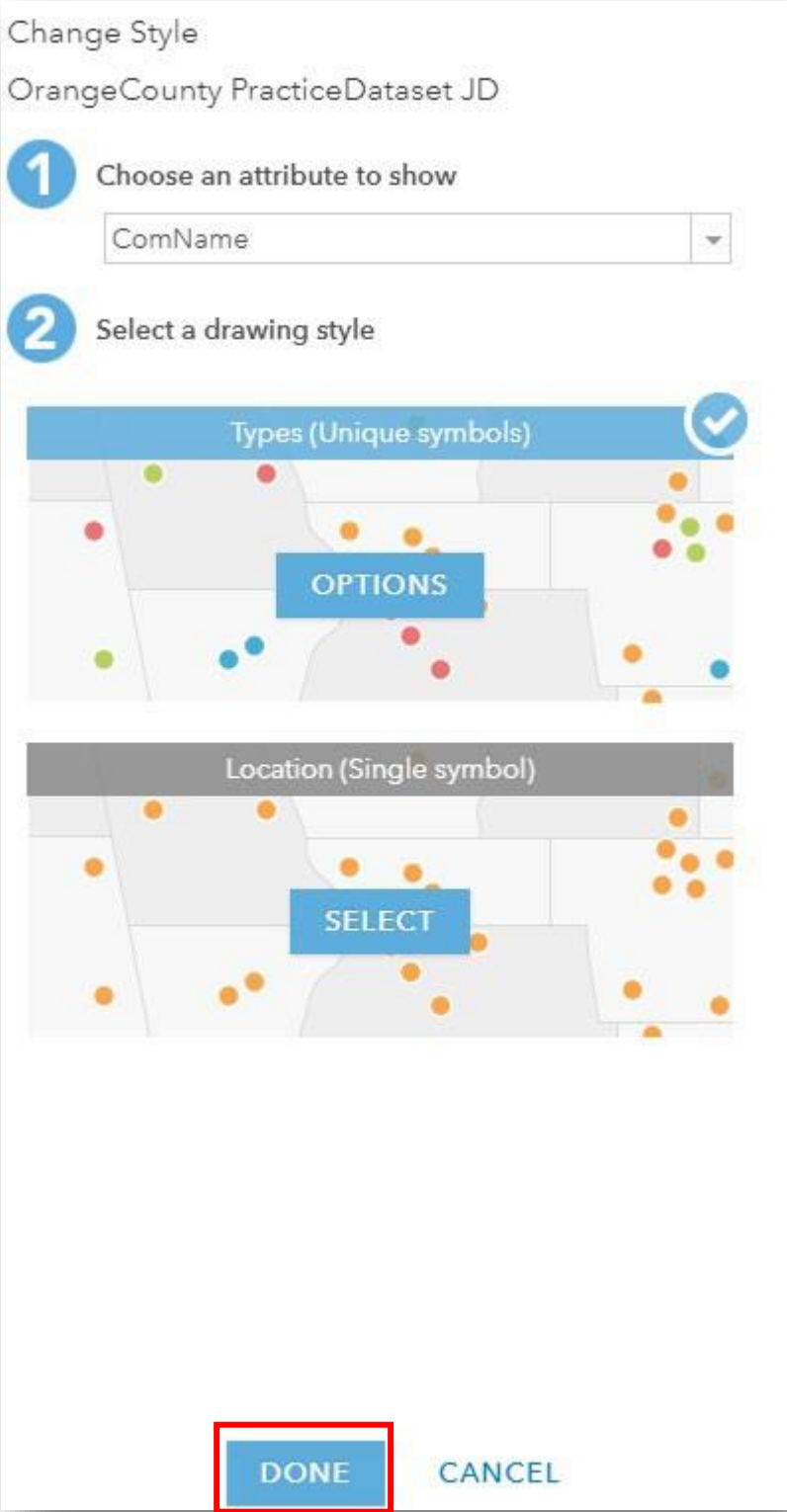
Types (Unique symbols) 

OPTIONS

Location (Single symbol)

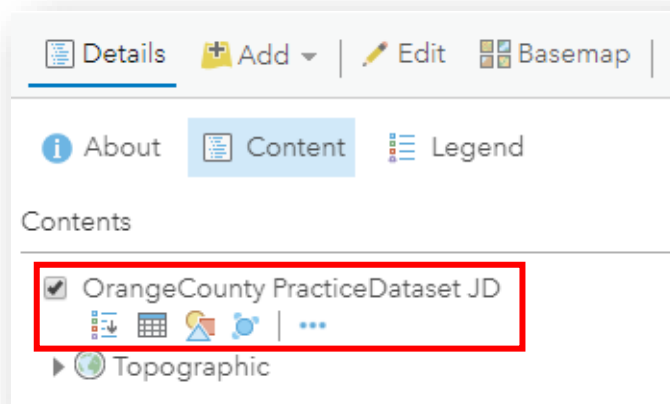
SELECT


**DONE** CANCEL





Select Done.

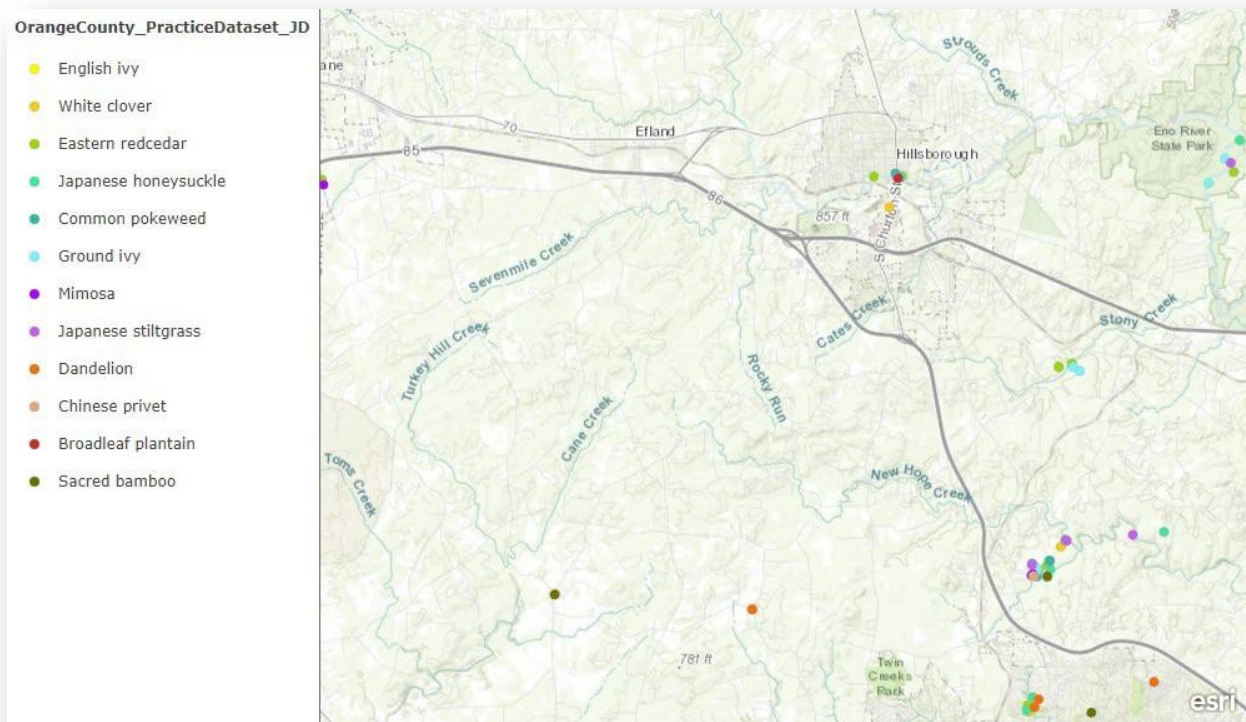
29) Your content pane now should show your new layer above the Topographic base layer you added earlier:



If you ever need to edit your legend again, select the “Change Style” button: 

If you want to see your legend while in the “Content” panel, select the “Show Legend” button: 

30) At this point, you will have a basic map displaying your invasive species data. To zoom to your data, click the  symbol next to the name of your layer in the Content pane. From the drop-down menu, select “Zoom to.” Your map now will focus on the area that contains your invasive species survey data:



Keep your map open and continue on to **Guided Practice 4: Add Another Layer.**

## References

- Ambrogim. "Thurston\_BikeMap" [layer]. Scale Not Given. "Thurston County Washington Bicycle Facilities and Routes." October 13, 2016.  
<https://www.arcgis.com/home/item.html?id=8fca4181f2c742e78ca66f6aed211a3d>.  
(October 25, 2018).
- EDDMapS. "Orange County, North Carolina, United States invasive species reports."  
<http://www.eddmaps.org/tools/query/results.cfm?reporter=&userGroupID=&observationDateStart=&observationDateEnd=&dateEnteredStart=&dateEnteredEnd=&dateUpdatedStart=&dateUpdatedEnd=&objectid=&subjectnumber=&cat=&div=&eradicationstatus=&list=&rank=&habitat=&country=926&state=37&fipscode=37135&township=&layersourceid=&project>=(December 18, 2018).
- ESRI. "Topographic" [basemap]. Scale Not Given. "World Topographic Map." February 19, 2012.  
<http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f>.  
(October 25, 2018).
- North Carolina Department of Transportation. "NCDOT County Boundaries." [layer]. Scale Not Given. "NCDOT County Boundaries." February 12, 2018.  
<https://www.arcgis.com/home/item.html?id=d192da4d0ac249fa9584109b1d626286>.  
(December 18, 2018).
- Thurston\_GeoData. "Thurston\_Parks" [layer]. Scale Not Given. "Thurston Parks." December 11, 2017.  
<http://www.arcgis.com/home/item.html?id=598f95bd373c407ea778010903a97b9f>.  
(October 25, 2018).

## Guided ArcGIS Online Practice

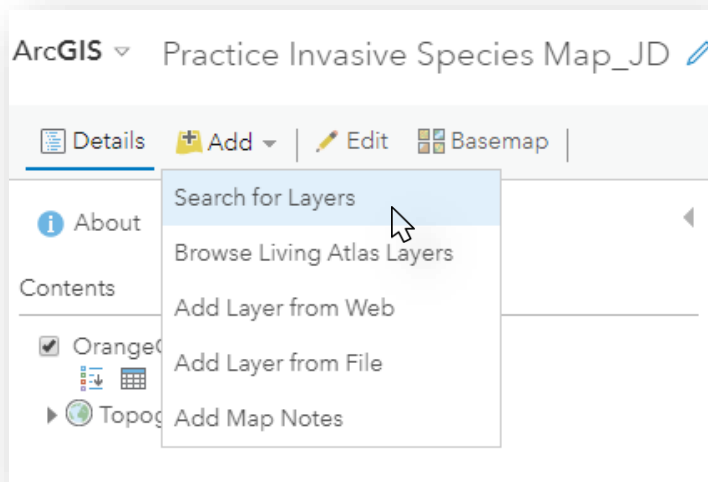
### Lesson 4: Add Another Layer

Now that you have your dataset on a map, you may choose to add more layers to your map.

Additional layers are useful for answering additional questions and making your map look more professional.

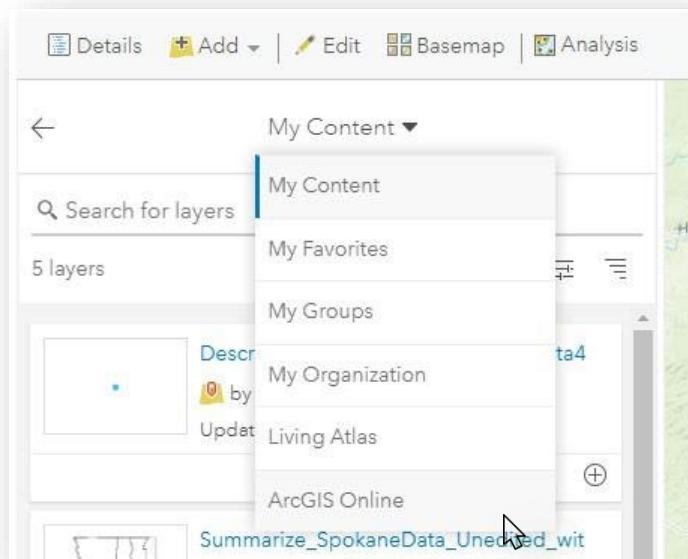
We will add a layer showing the county boundaries for North Carolina. This makes it easier to see which invasive species are in each county. Were you to plot invasive species data for surrounding counties, the county boundaries layer also illustrates an important fact: invasive species do not respect borders. You likely will see invasive species spread across county lines. Everyone needs to work together to address invasive species issues.

- 1) Open your map from **Part 3: Create a Map in ArcGIS Online**. It will show the points on your map and your Content pane will be open on the left hand side.
- 2) Above the Content pane, there is an “Add” button. Click this button and from the drop down menu, select “Search for Layer.”

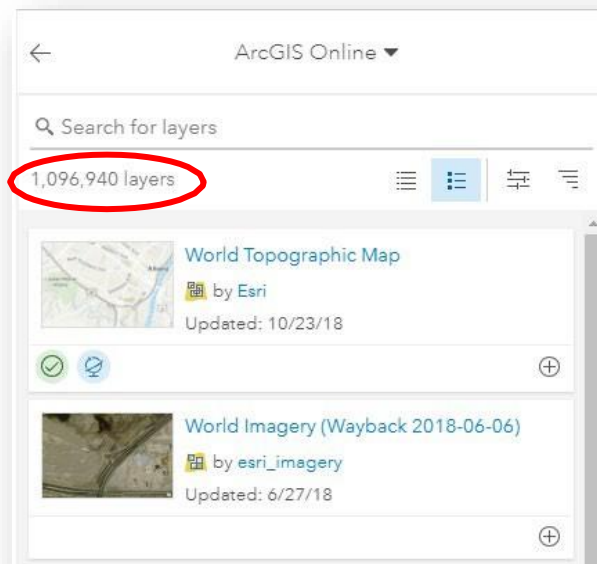




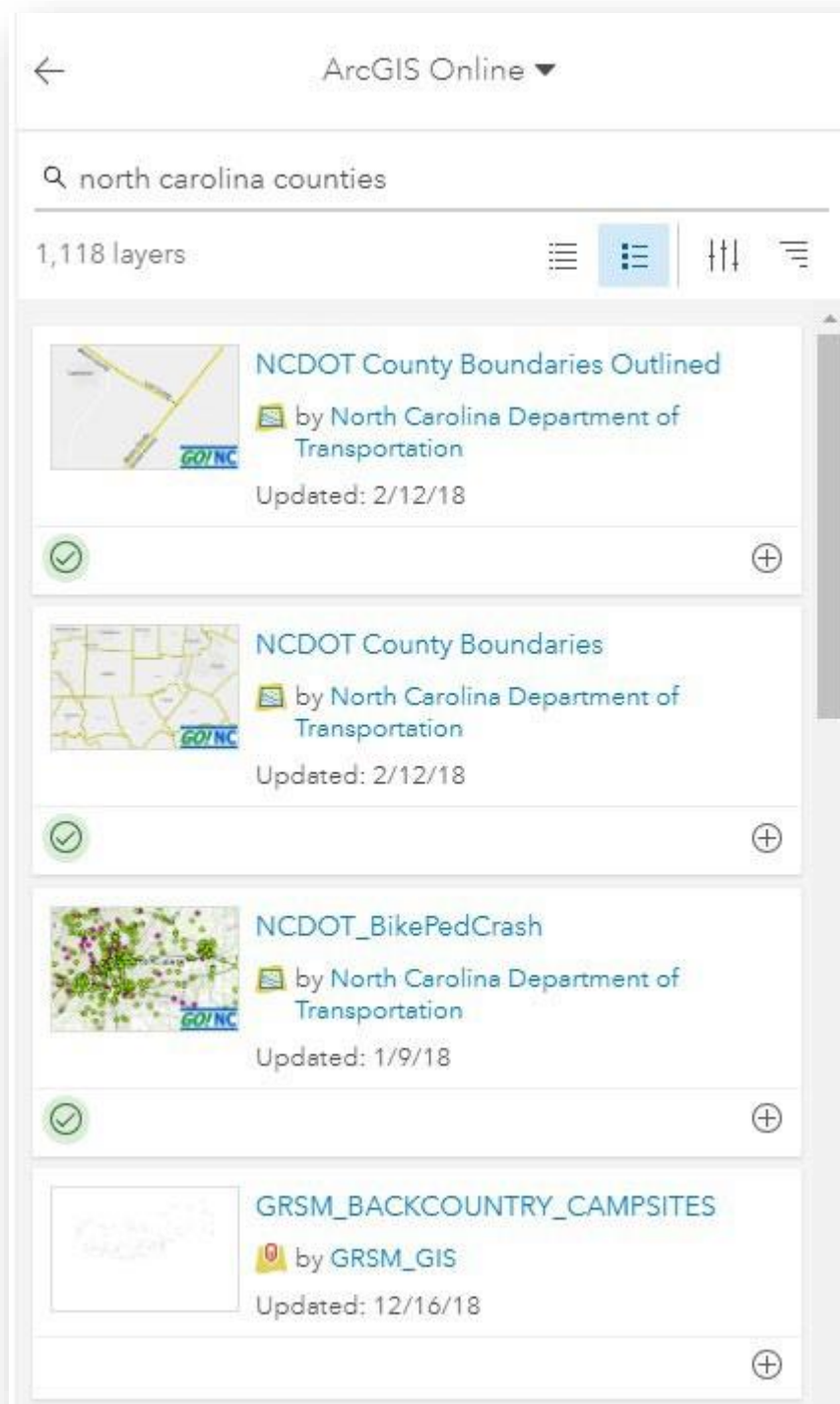
- 3) You are taken to a search box. When you first get to this search box, it has “My Content” at the top with a drop down arrow. Select “My Content” and from the drop-down menu choose “ArcGIS Online.”



- 4) Now your search bar is set to let you find layers from the ArcGIS Online database. People and agencies upload data all the time to share with one another. As I write this, there are 1,096,940 layers to choose from! And more are added every day.



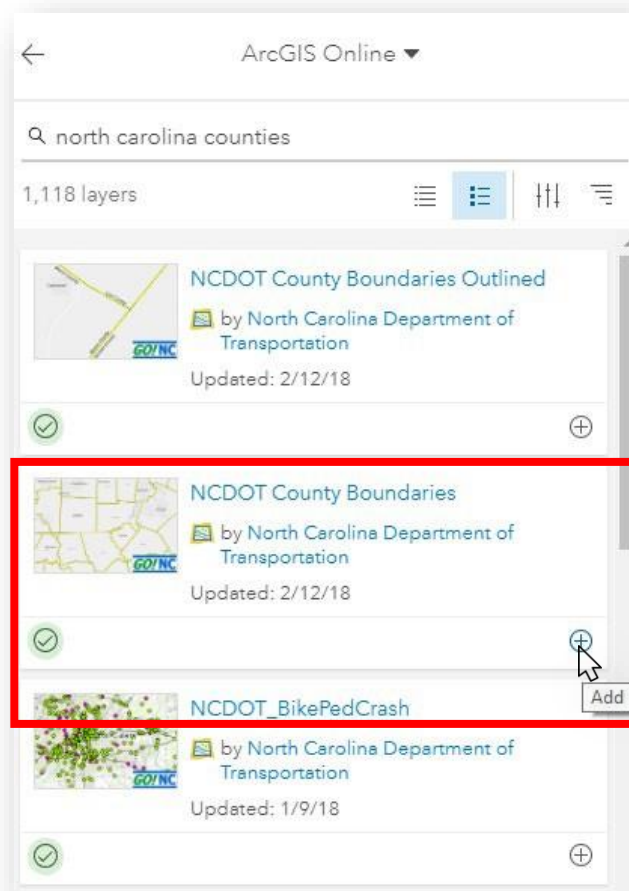
- 5) We want to find a layer showing the county boundaries for North Carolina. In the search bar type: "North Carolina counties."



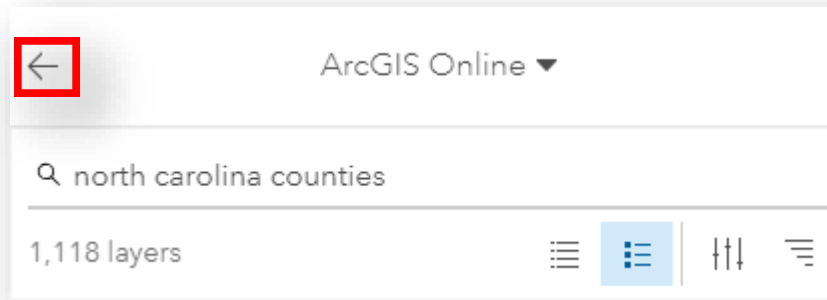
You will receive many options; I have 1,118 layers from which to choose. How do you narrow it down?

Just like facts you find online for reports and research, layers are sources of information and some are better and more credible (or trustworthy) than others. Here are a few things to consider:

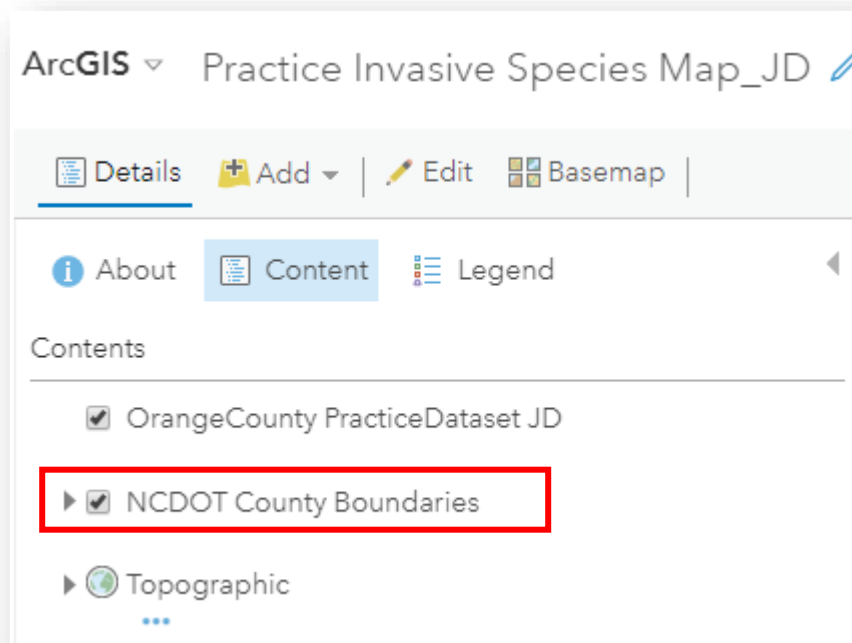
- **Who made it?** Anyone with an ArcGIS Online account may upload layers. Each map layer tells you who made it. Layers made by tribal, state, and federal agencies generally are most accurate. This is not to say layers made by independent parties are not good or useful, but be cautious.
  - **When was it made?** New data is uploaded daily so older layers may be outdated and inaccurate.
  - **Does it look correct?** This may seem simple, but using your best judgement can go a long way. If you are looking for Washington State counties, for example, and a layer featuring Florida pops up, disregard it.
- 6) We will use the “NCDOT County Boundaries” layer. It was created by a state agency, the North Carolina Department of Transportation, and it is recent. To add this layer to your map, simply click the + at the bottom right of the layer.



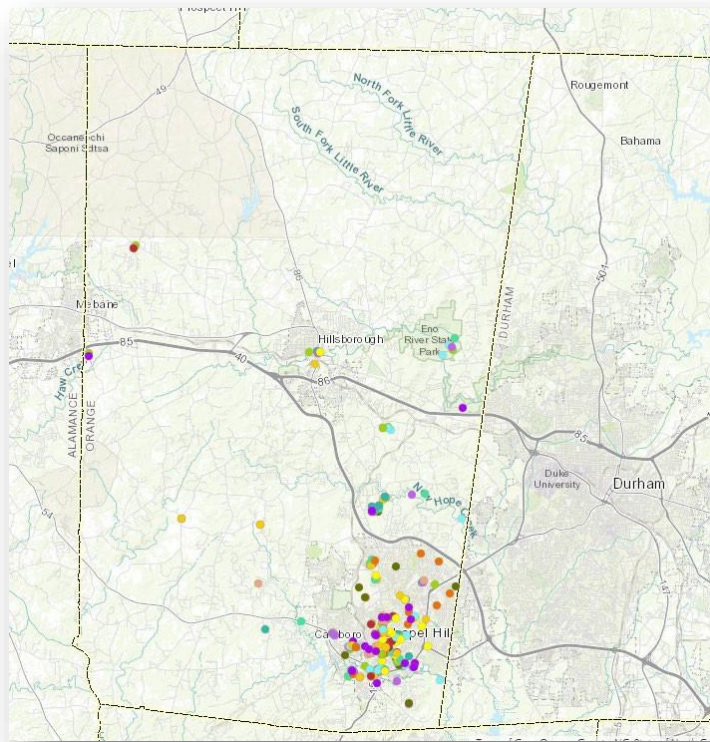
7) Click the left arrow at the top of the search box to return to your Contents pane.



8) Your new layer now shows up in your Contents pane.



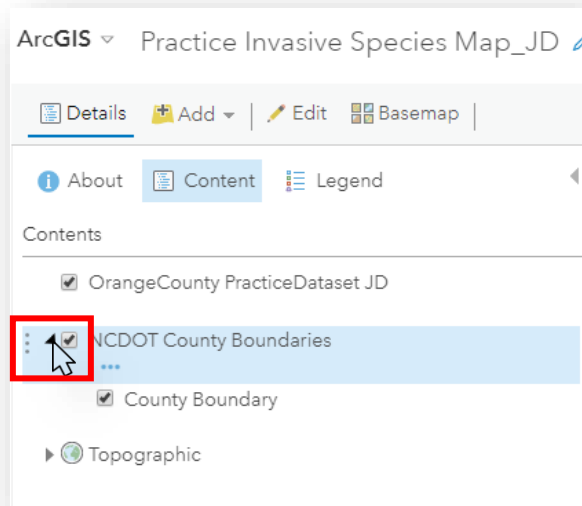
- 9) It now is easier to see where invasive species are distributed throughout Orange County and which invasive species may be threatening to spread to nearby counties:



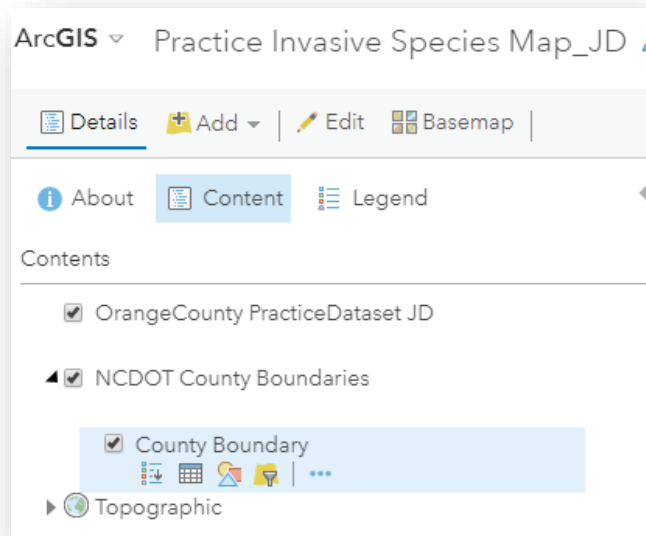
## Edit a Layer

Another neat thing is that now that this map layer is on our map, we may edit it just like we edited our dataset. We will change the yellow county boundary lines to black so they are easier to see.

10) Click the arrow to the left of “NCDOT County Boundaries.” A new level entitled, “County Boundary” appears.



11) Hover over “County Boundary” and a variety of buttons appear.

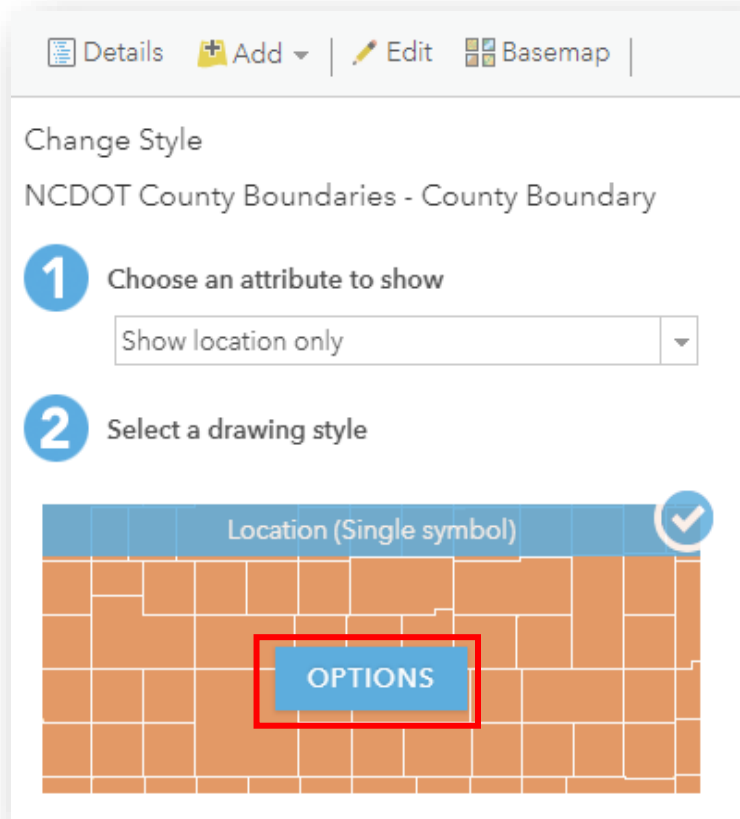


12) Select the “Change Style” button:



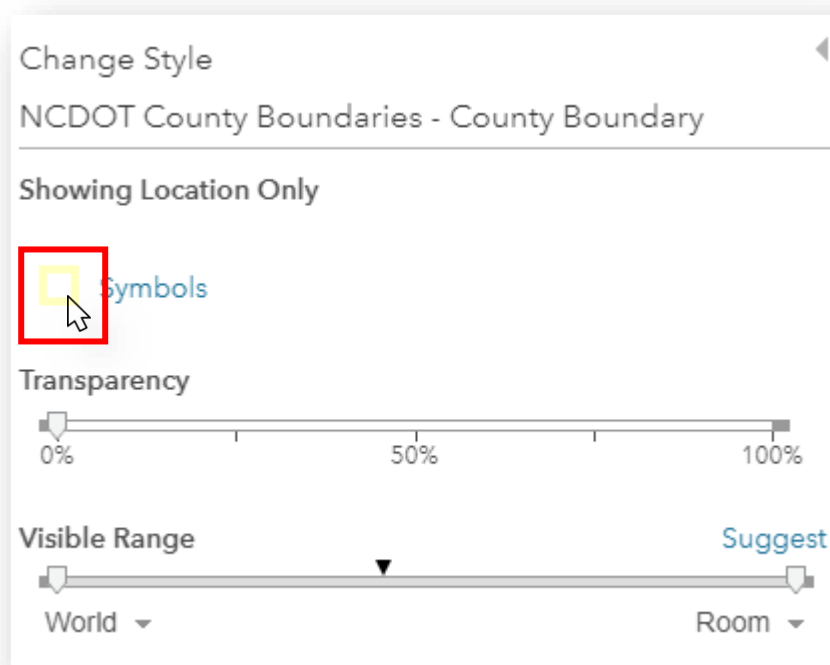


13) You are taken back to the editing pane:



Select “Options.”

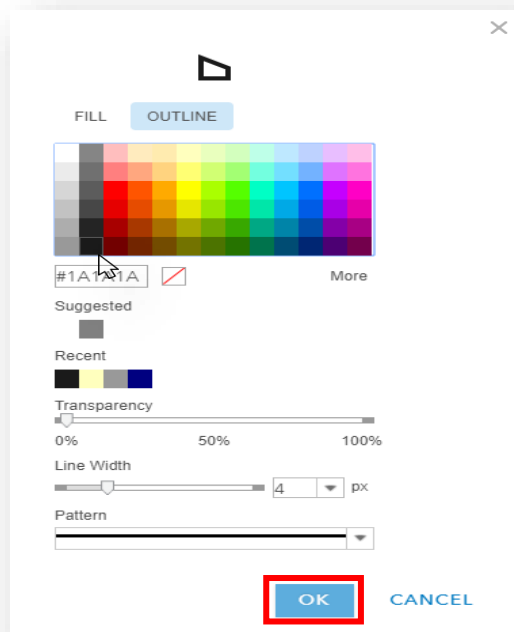
14) On the “Change Style” pane that pops up, click the yellow polygon next to “Symbols.”



15) On the pane that pops up, select “Outline.”



16) Now select the color black and hit OK.



17) Click OK on the “Change Style” pane.

18) Click Done on the “Change Style” pane.

Change Style

NCDOT County Boundaries - County Boundary

**1** Choose an attribute to show

Show location only

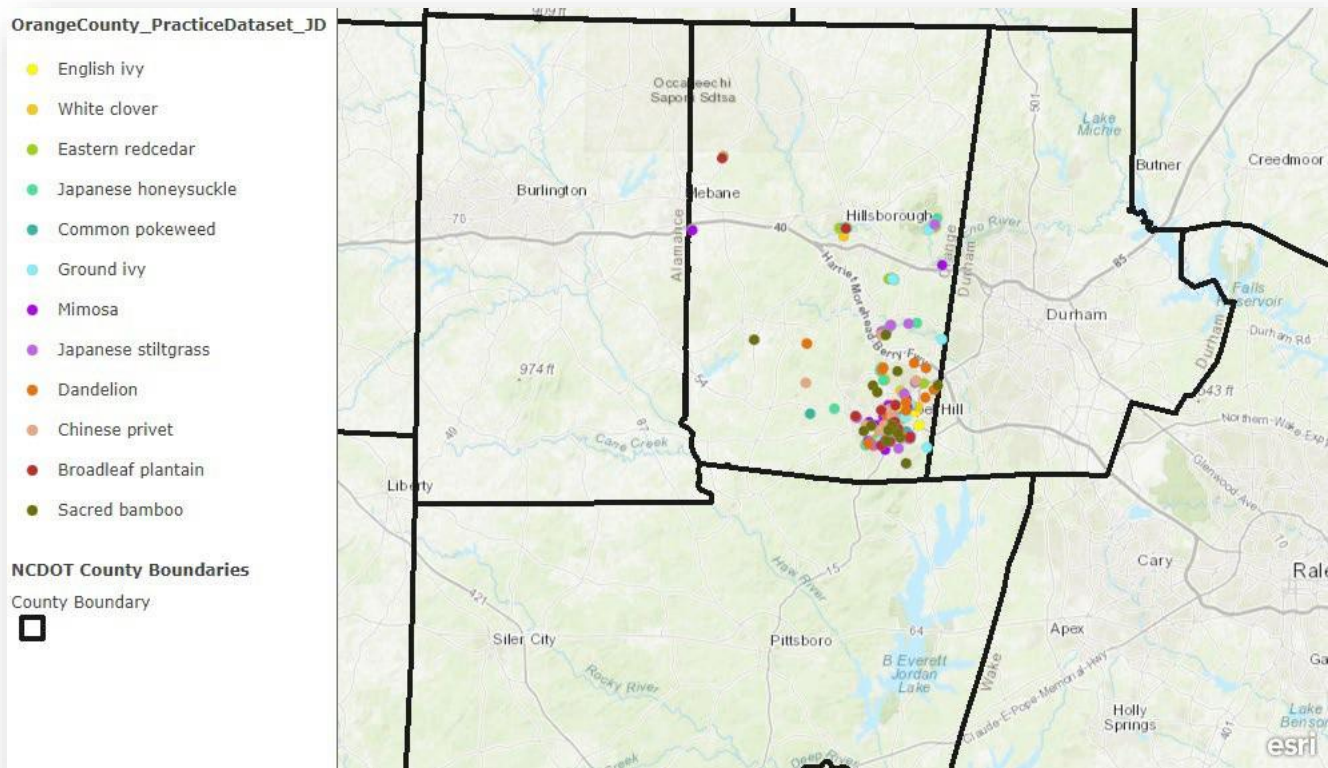
**2** Select a drawing style

Location (Single symbol) ☒

OPTIONS

**DONE** CANCEL

Our map now has nice, distinct black county boundary lines.



Congratulations! You have completed your practice map. You now may go on to make more maps using your own invasive species data or other datasets you have available.

## References

EDDMapS. "Orange County, North Carolina, United States invasive species reports."

<http://www.eddmaps.org/tools/query/results.cfm?reporter=&userGroupID=&observationDateStart=&observationDateEnd=&dateEnteredStart=&dateEnteredEnd=&dateUpdatedStart=&dateUpdatedEnd=&objectid=&subjectnumber=&cat=&div=&eradicationstatus=&list=&rank=&habitat=&country=926&state=37&fipscode=37135&township=&layersourceid=&project=> (December 18, 2018).

Esri. "Topographic" [basemap]. Scale Not Given. "World Topographic Map." February 19, 2012.

<http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f>. (October 25, 2018).

North Carolina Department of Transportation. "NCDOT County Boundaries" [layer]. Scale Not Given. "NCDOT County Boundaries." February 12, 2018.

<https://www.arcgis.com/home/item.html?id=d192da4d0ac249fa9584109b1d626286>. (December 18, 2018).