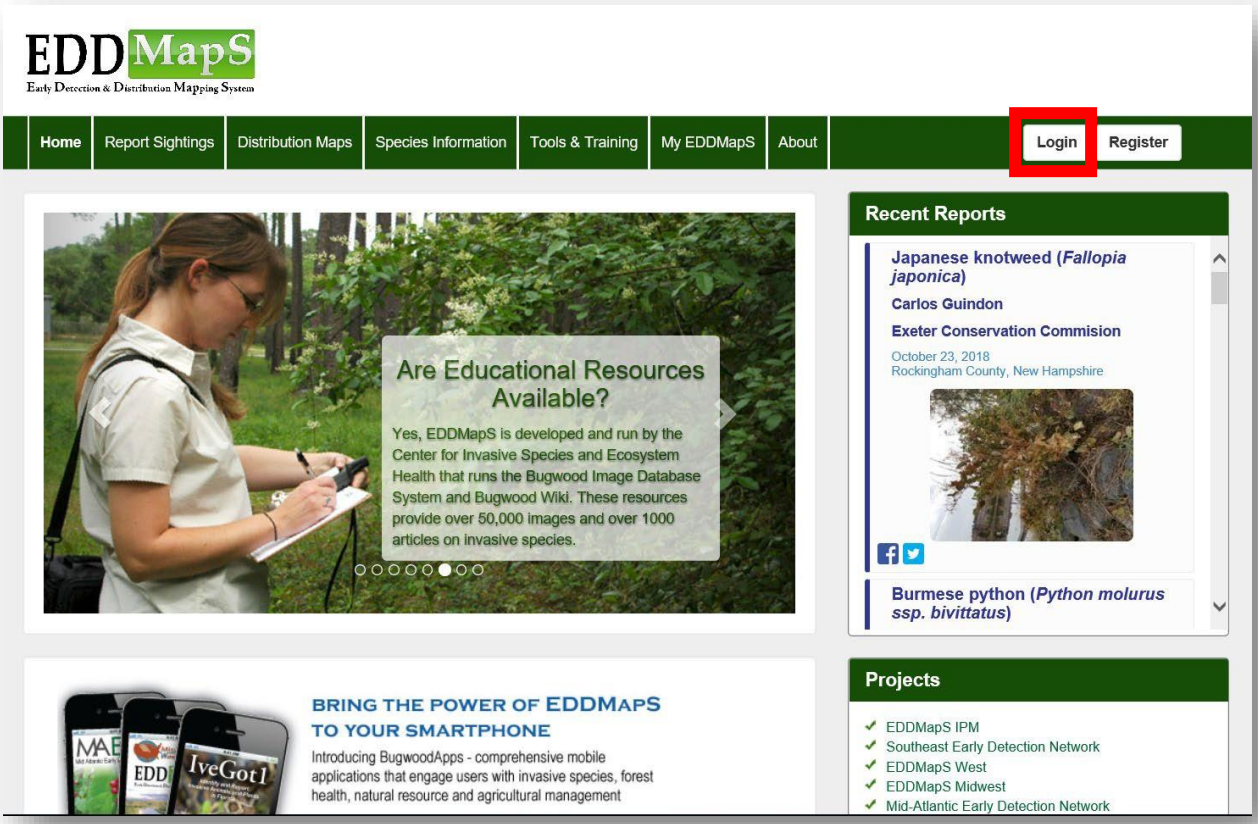
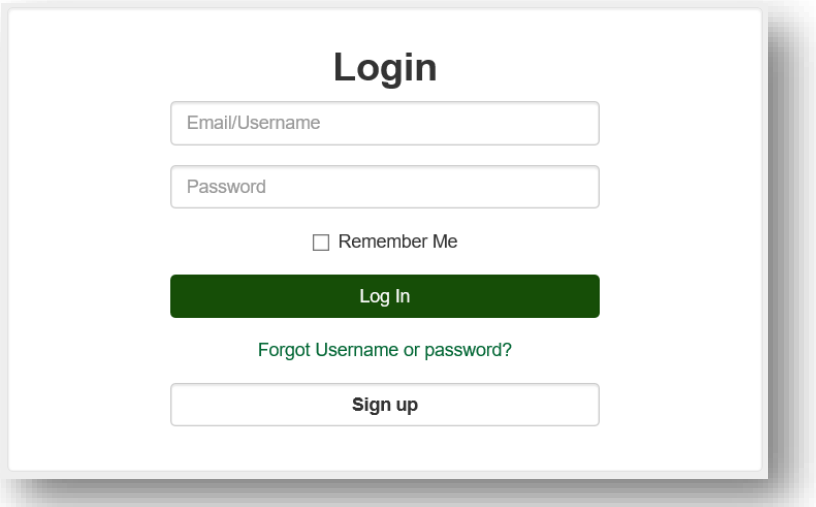
ArcGIS Mapping Instructions

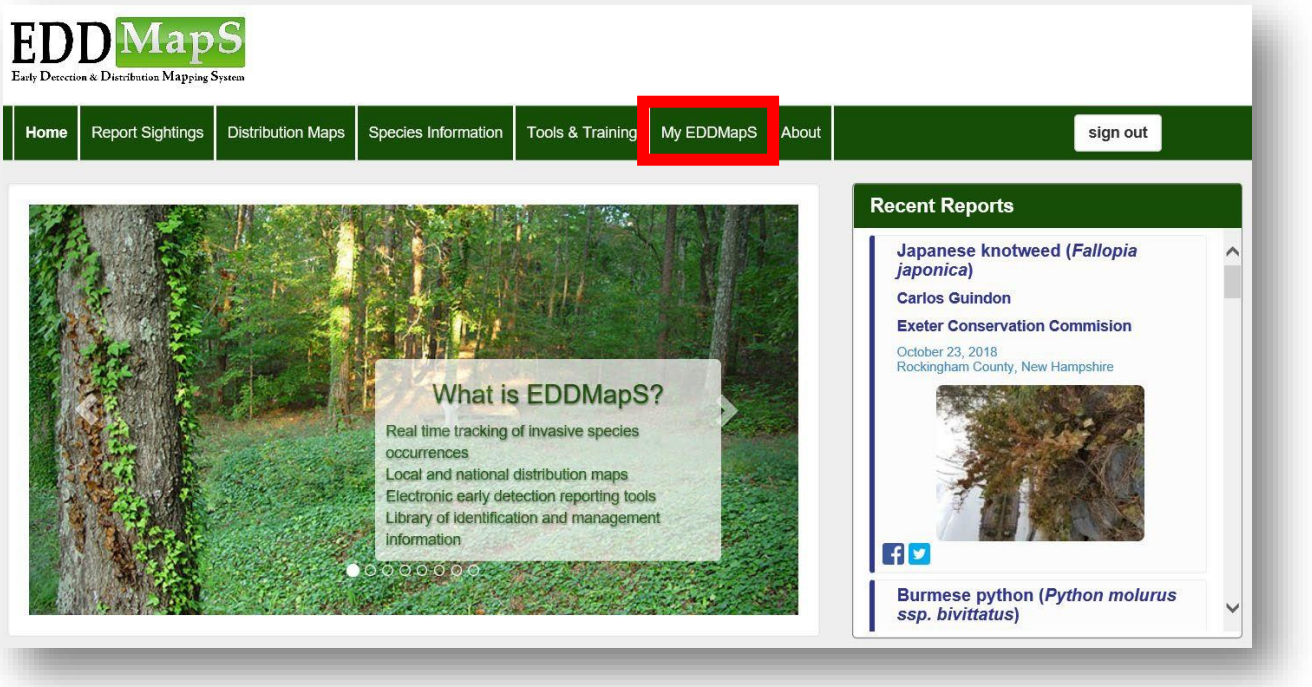
Part 1: Download and Save Dataset

1) Log in at http://www.eddmaps.org/index.cfm.

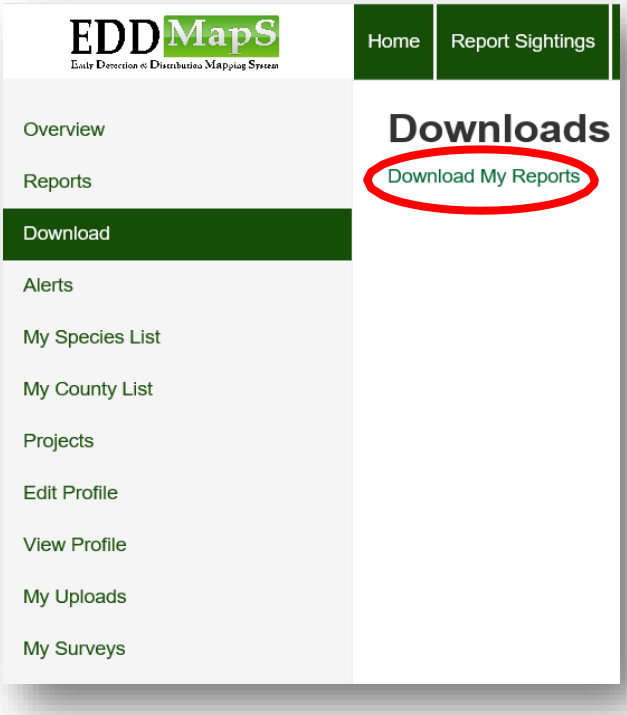




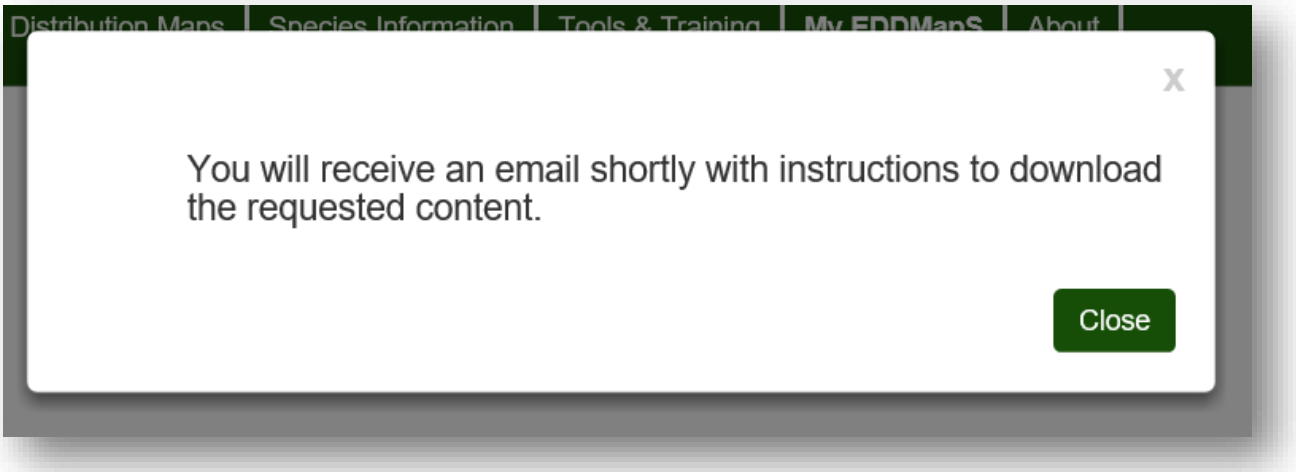
2) Navigate to My “EDDMapS.”



3) On the left-hand side, go to “Download.” On the “Download” page, click “Download My Reports.”



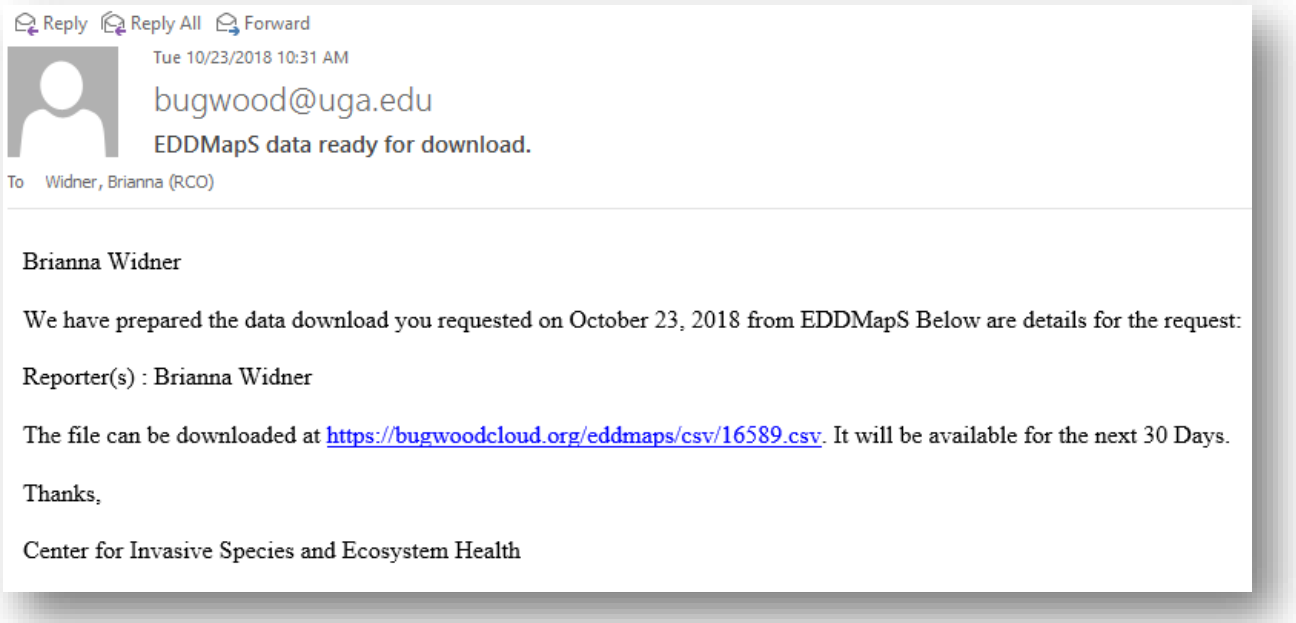
4) This message box will pop up:



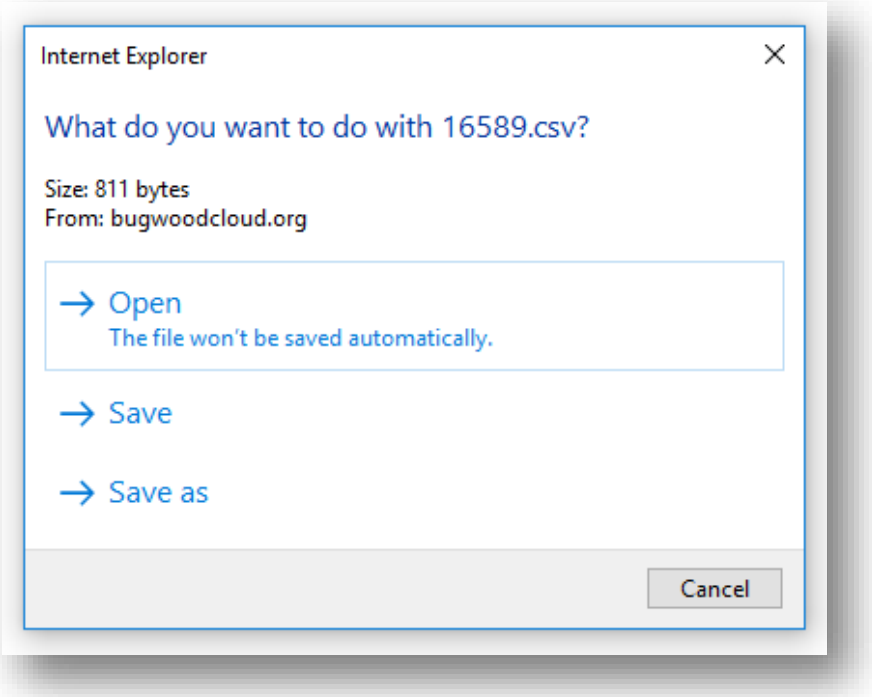
Press close and check your e-mail for a message from bugwood@uga.edu.

Be patient. There may be a slight lag (about 5 minutes) between requesting the data and receiving an e-mail.

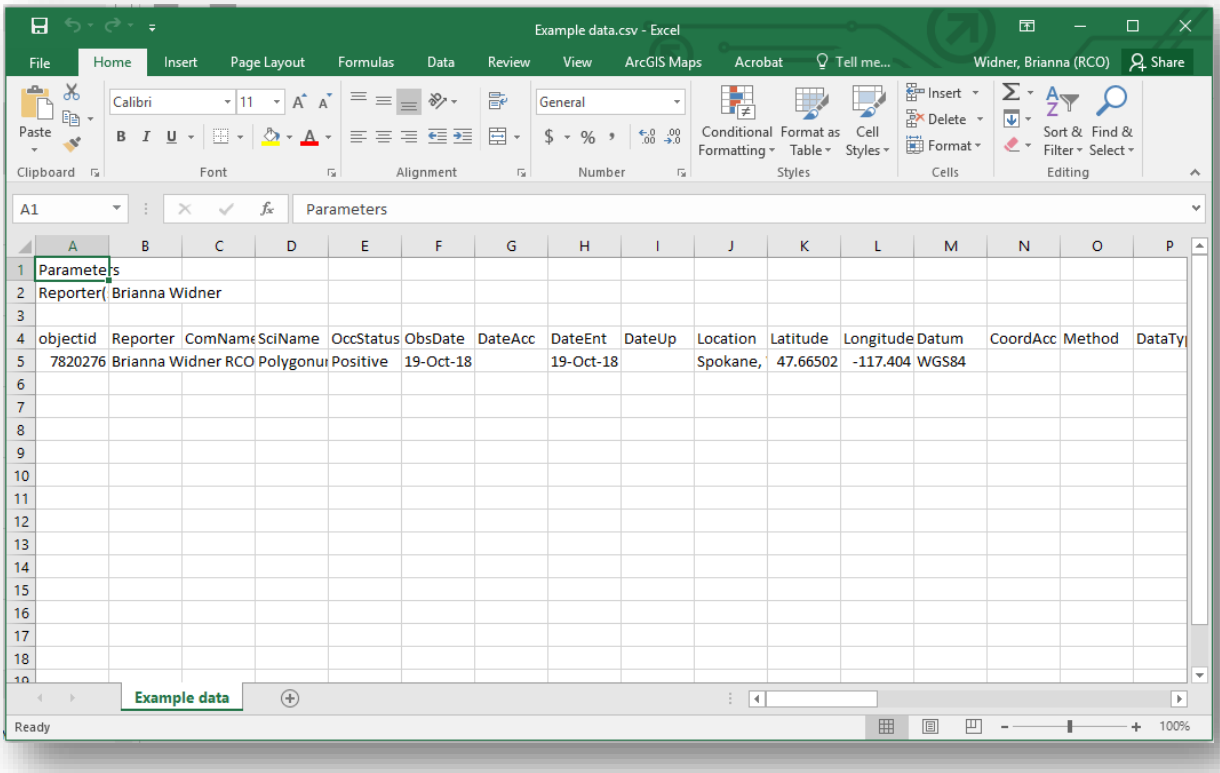
5) Open the e-mail and click the provided link in the e-mail to download your data.



6) After you click the link, select “Open” on the pop-up box:

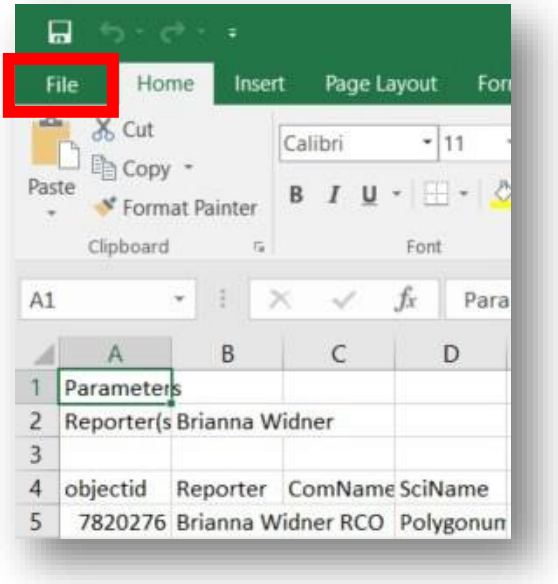


7) Your data set will open in Excel.

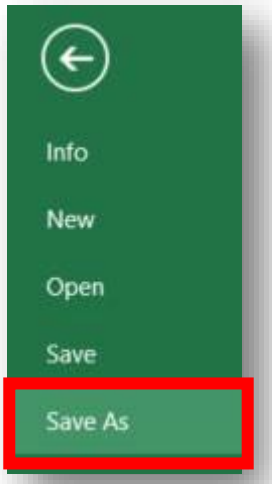


8) Save your dataset.

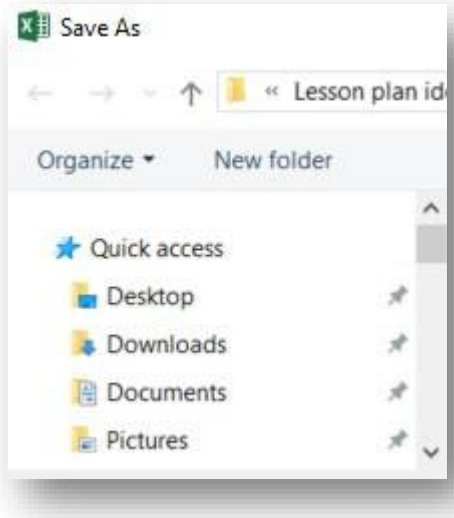
- Use a location and name that will make it easy for you to find your dataset again later. If you lose your data, the link in your e-mail is good for 30 days or you can go back to EDDMapS and repeat Steps 1-5 to receive a new link.
- Click **File**.



- Click **Save As.**



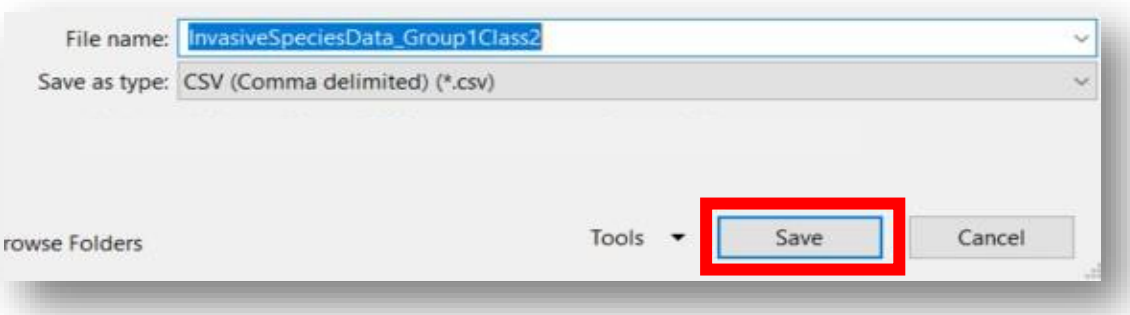
- Choose a location (Ex: Desktop).



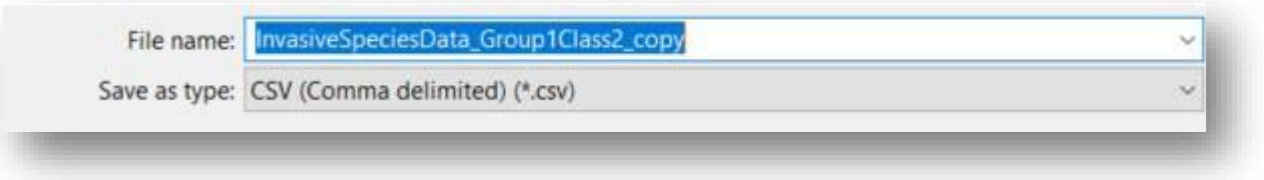
- Choose a name. (Ex: InvasiveSpeciesData_Group1Class2)

- In the "Save as type" field, choose "CSV (Comma delimited) (*.csv) from the drop-down menu if it is not selected already.

- Click **Save.**

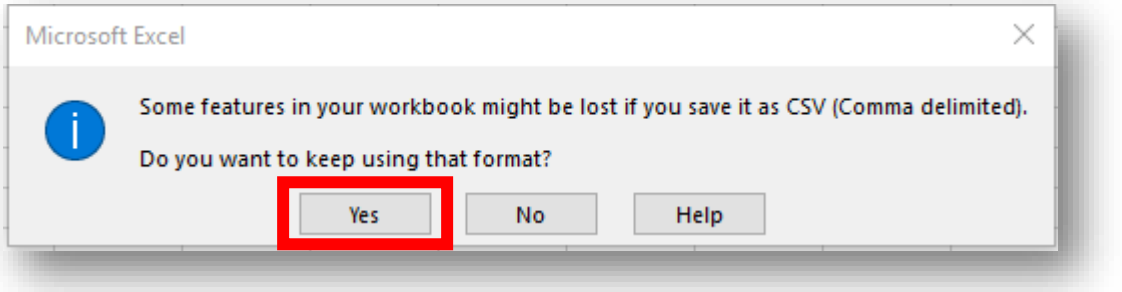


9) Next, repeat Step 8 to save a copy of your dataset. The only step you will change is when you name your dataset, add "_copy" to the end, like this:



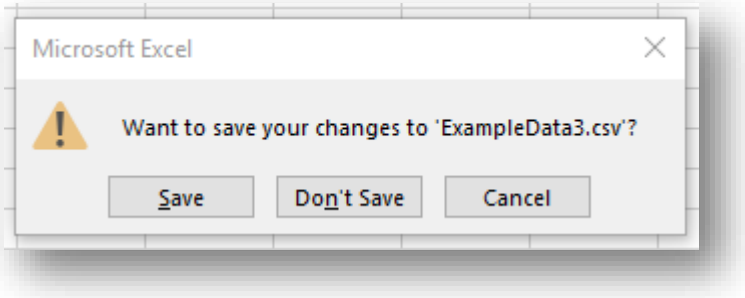
It is good practice to only edit a copy of your original dataset in case you make a mistake and need to return to the original.

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



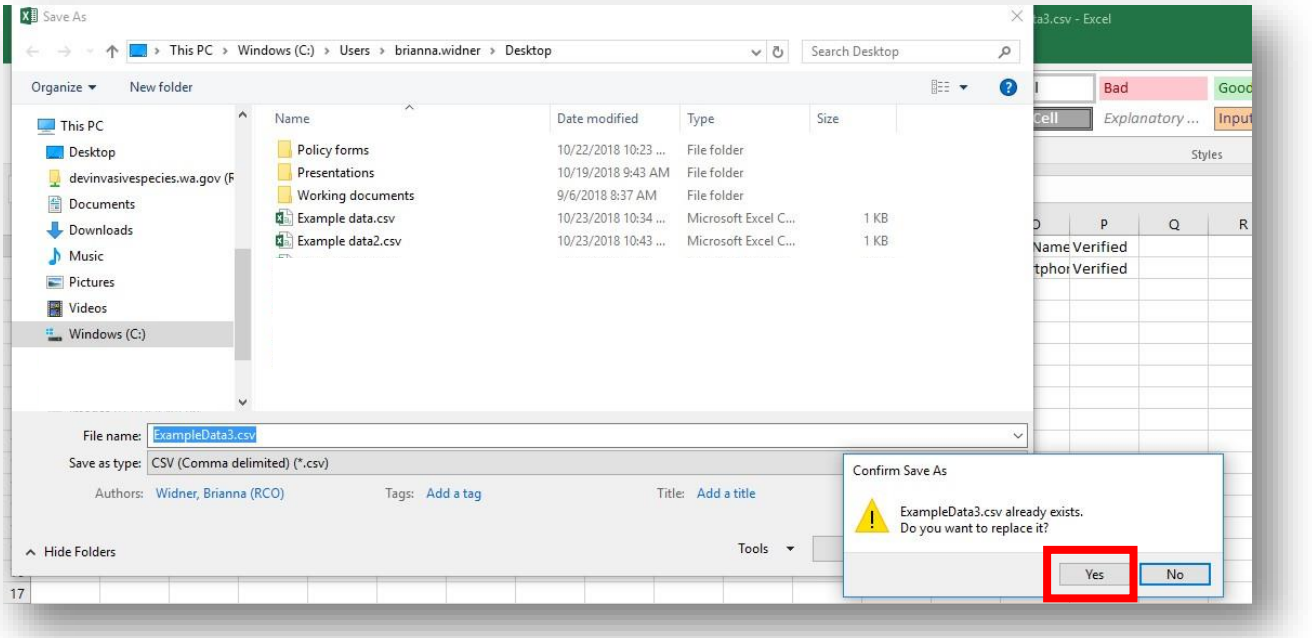
Select "Yes." Keeping your document as a CSV will allow you to add it to your map. Do this any time Excel asks to save as a CSV.

11) If you need to close your Excel sheet, you may be prompted to save again.

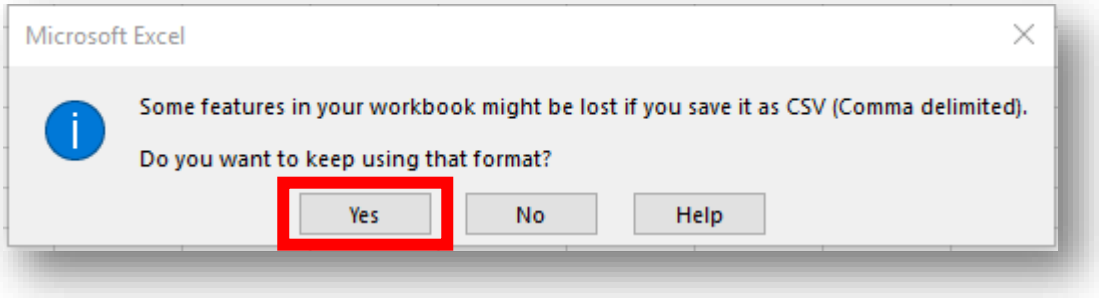


Select, "Save." You will then get a "Save As" window. Do not change anything and hit "Save."

You will get a “Confirm Save As” window. Select, “Yes.”



You will receive the same pop-up window from Step 10 about saving your document as a CSV.

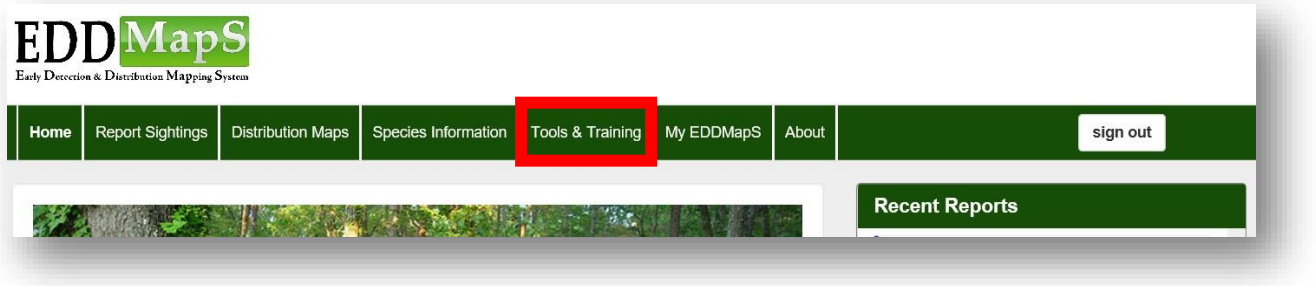


Select, “Yes.” Your document now should close.

Optional: Download Other Datasets

Sometimes additional data are required on maps to better illustrate your message or answer questions that are more complex. The following steps outline how to download other datasets from EDDMapS.

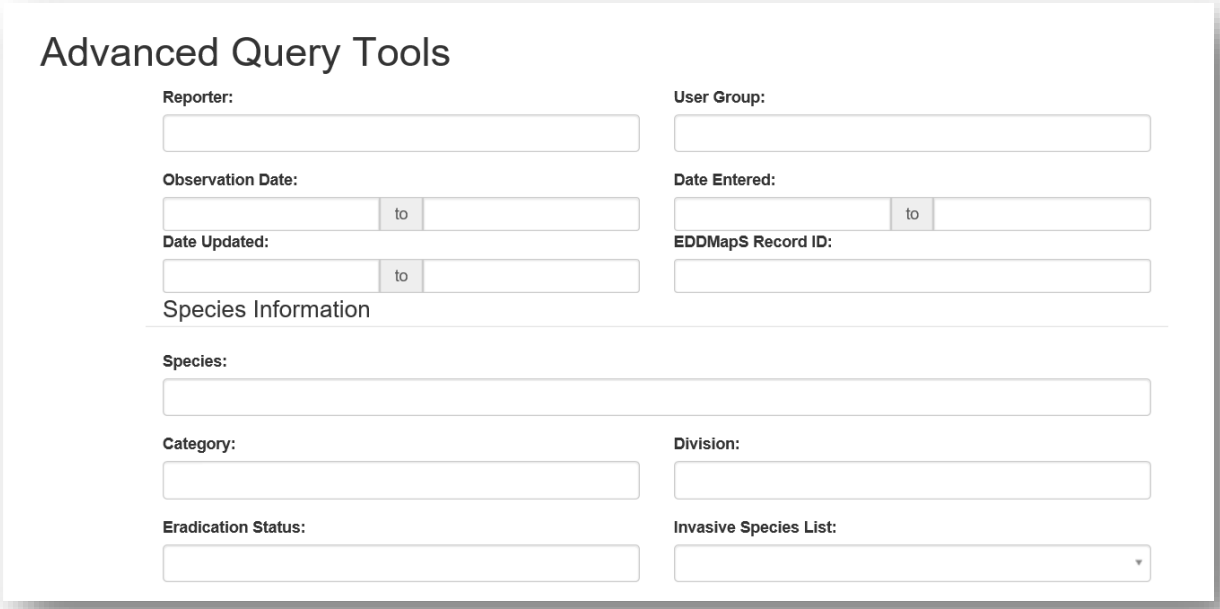
1) From the tabs at the top of EDDMapS, select “Tools and Trainings.



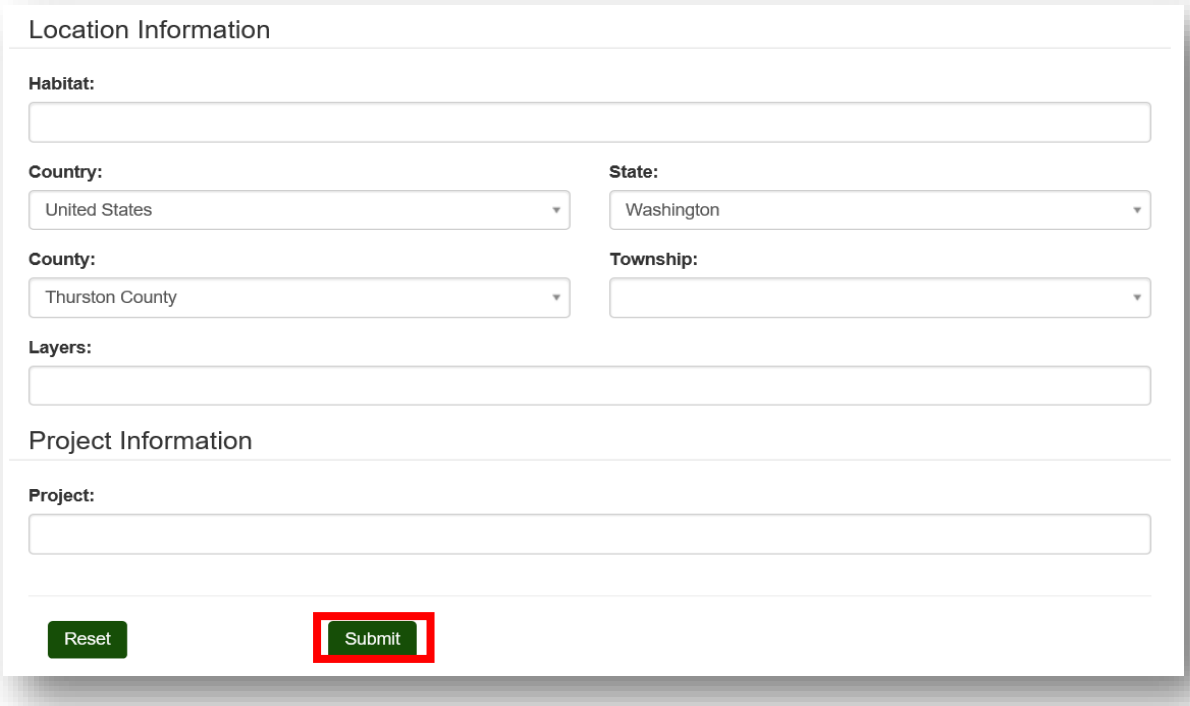
This will open the “Tools and Training Materials” page.

2) Under “Database Tools,” select, “Advanced Query Tools.”

3) The “Advanced Query” page has many options for searching for data.

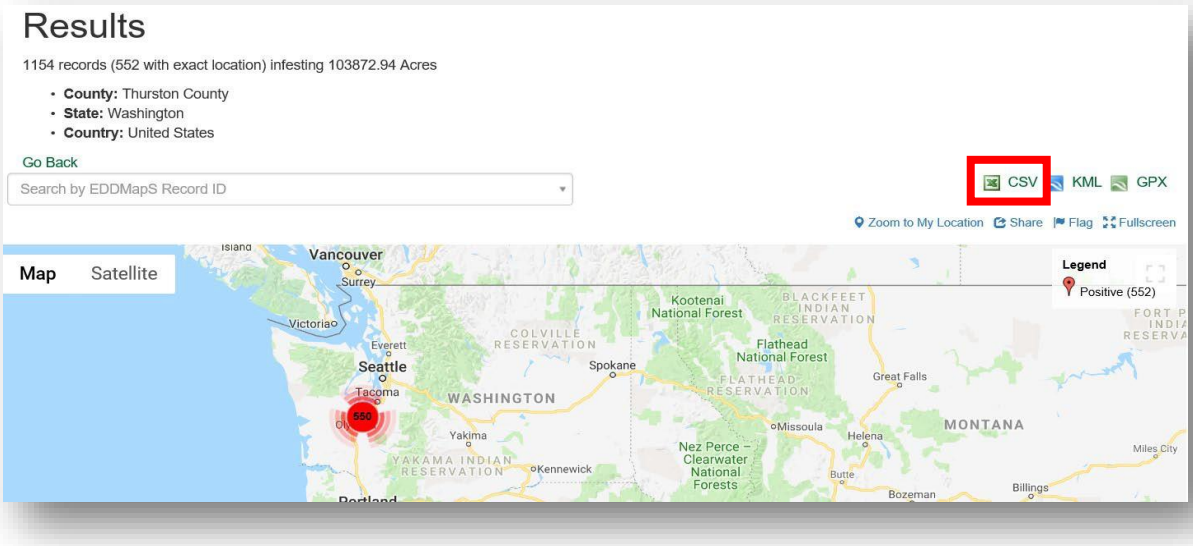


For example, if I want to see all the invasive species reports in Thurston County, I simply fill out the form as follows:



And hit “Submit.”

4) You will be taken to a results page with a map showing the data you requested. If this is the data you want, click the “CSV” button.



5) You will receive the data in an e-mail and you simply save a copy of the dataset and move on to **Part 2: Clean Your Data** to make this data compatible with your ArcGIS Online map.

This is not the only way to download additional data sets from EDDMapS, but it is one of the most direct paths. You also may obtain data through the “Distribution Maps” and “Species Information” tabs. The steps are very similar to the ones outlined in this document. If you have the time, you can explore different methods for downloading data.

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

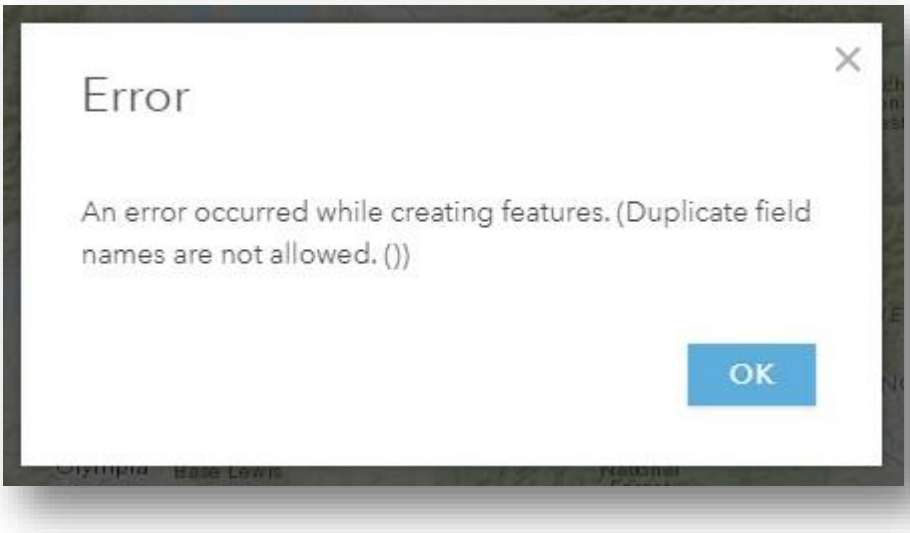
ArcGIS Mapping Instructions

Part 2: Clean Your Dataset

This is a very basic introduction to cleaning, or editing, data sets. 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 format. 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 may be useful, it is more information than we need.

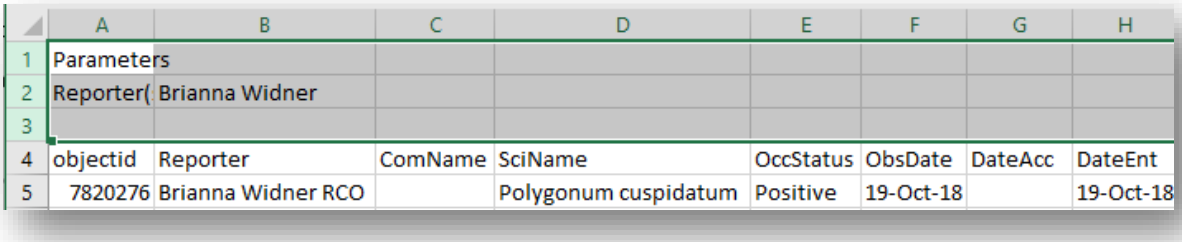
If you try to upload your dataset like this into ArcGIS Online you will receive an error message like this:



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.

1) Open the copy of your dataset from **Part 1**.

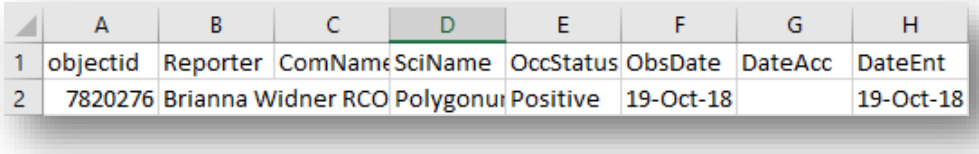
2) Starting with Row 1, highlight all the rows down to the row that start with “objected” and delete them (right-click the highlighted rows and click “Delete”).



	A	B	C	D	E	F	G	H
1	Parameters							
2	Reporter(	Brianna Widner						
3								
4	objectid	Reporter	ComName	SciName	OccStatus	ObsDate	DateAcc	DateEnt
5	7820276	Brianna Widner RCO		Polygonum cuspidatum	Positive	19-Oct-18		19-Oct-18

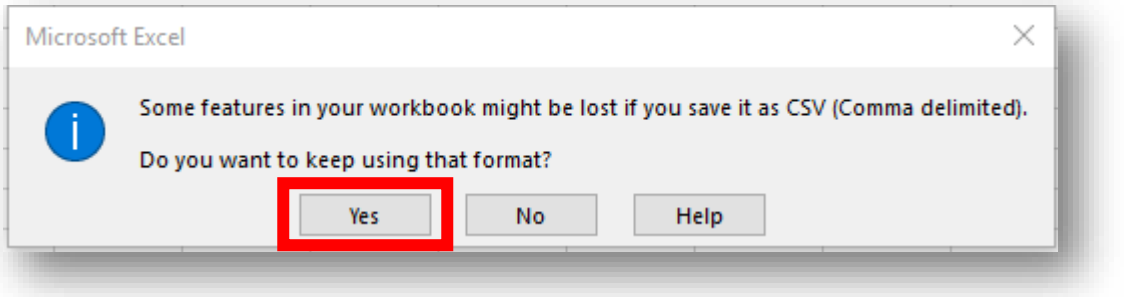
The number of rows you will highlight and delete varies depending on whether you are using your own data or if you used search terms to download other people’s data; each search term adds an additional row.

3) Row 1 should now have the headers for each column and your data should start in Row 2:



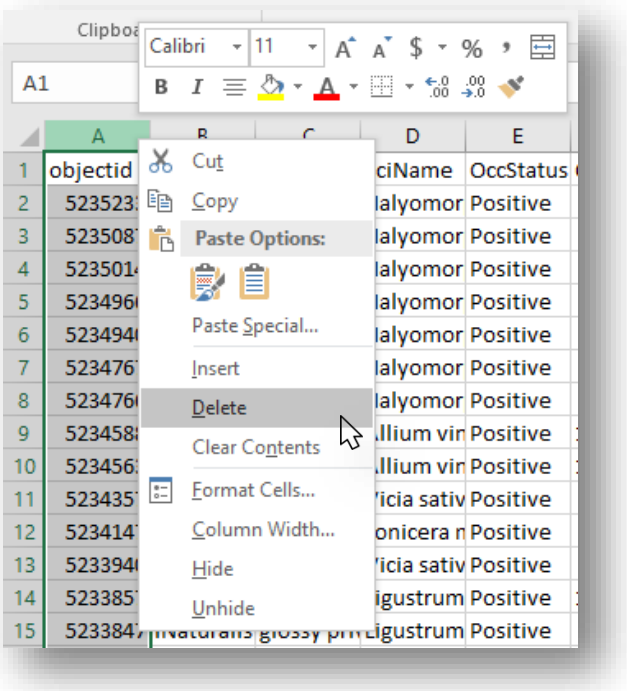
	A	B	C	D	E	F	G	H
1	objectid	Reporter	ComName	SciName	OccStatus	ObsDate	DateAcc	DateEnt
2	7820276	Brianna Widner RCO		Polygonu	Positive	19-Oct-18		19-Oct-18

4) Save your work. 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.

5) 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. 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

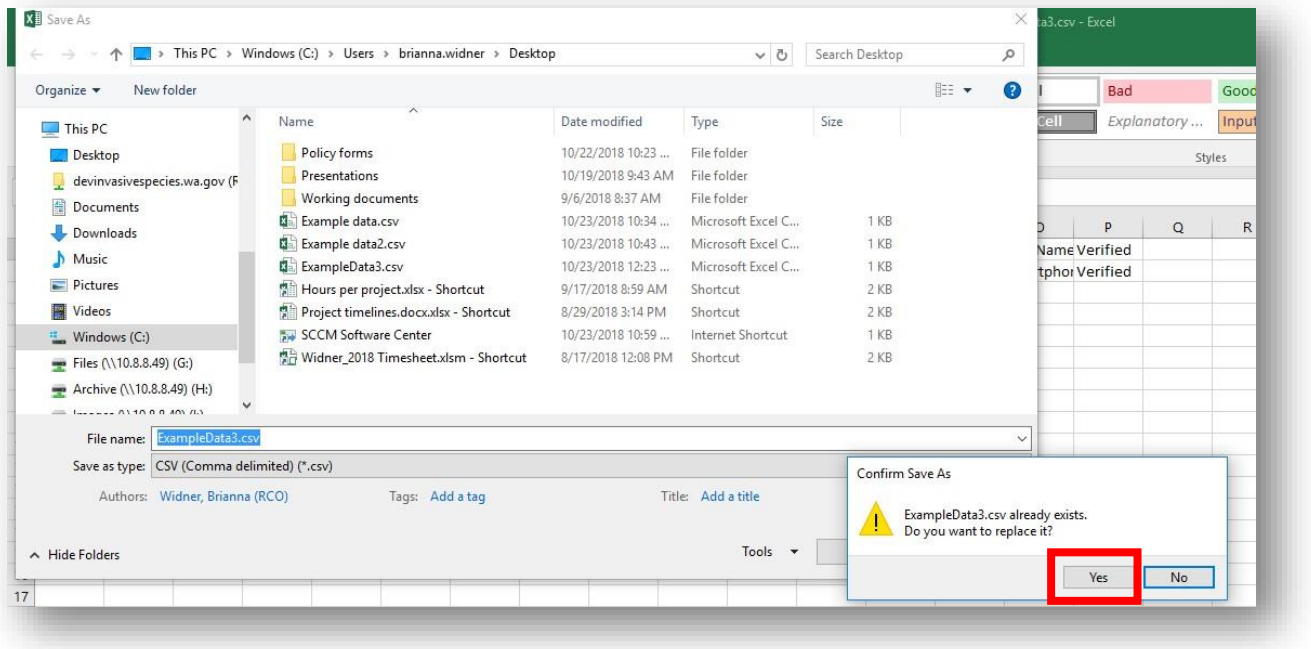
You may choose to keep additional columns, but these are the most useful data for your map.

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 may right-click and “Delete.”

6) Save your work. Close your Excel sheet.

7) When you close your Excel sheet, you may be prompted to save again.

Select, “Save.” You then will get a “Save As” window. Do not change anything and hit “Save.” You will get a “Confirm Save As” window. Select, “Yes.”



You will receive the same pop-up window from Step 4 about saving your document as a CSV. Select, “Yes.” Your document now should close.

Other first detectors upload their data to EDDMapS using tools other than the “WA Invasives” app so they may have more of the columns filled out than you do. If you download another dataset to use in your map, you may choose to use it as is or you may remove the extra columns so it matches your dataset. It may make the two datasets easier to compare.

Your data is ready to use now. Continue to **Part 3: Create a Map in ArcGIS Online**.

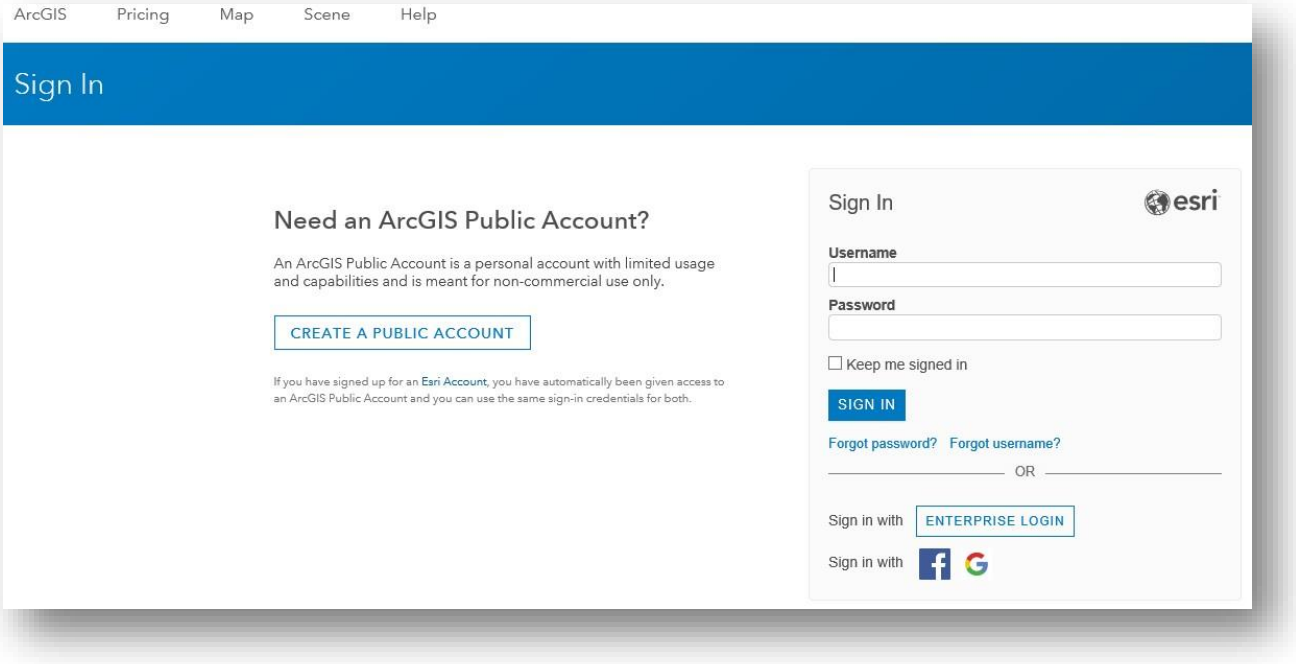
ArcGIS Mapping Instructions

Part 3: Create a Map in ArcGIS Online

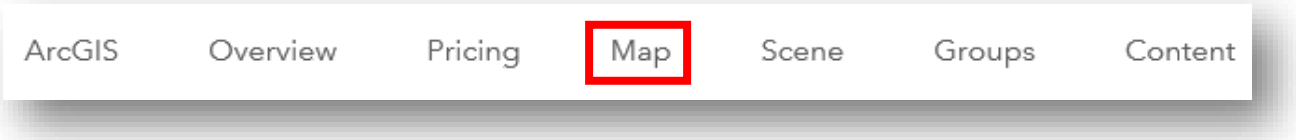
Now you will use your survey data to create a map that will tell the viewer the following:

- Which invasives species are in your survey area.
- Where invasive species are located in your survey area.

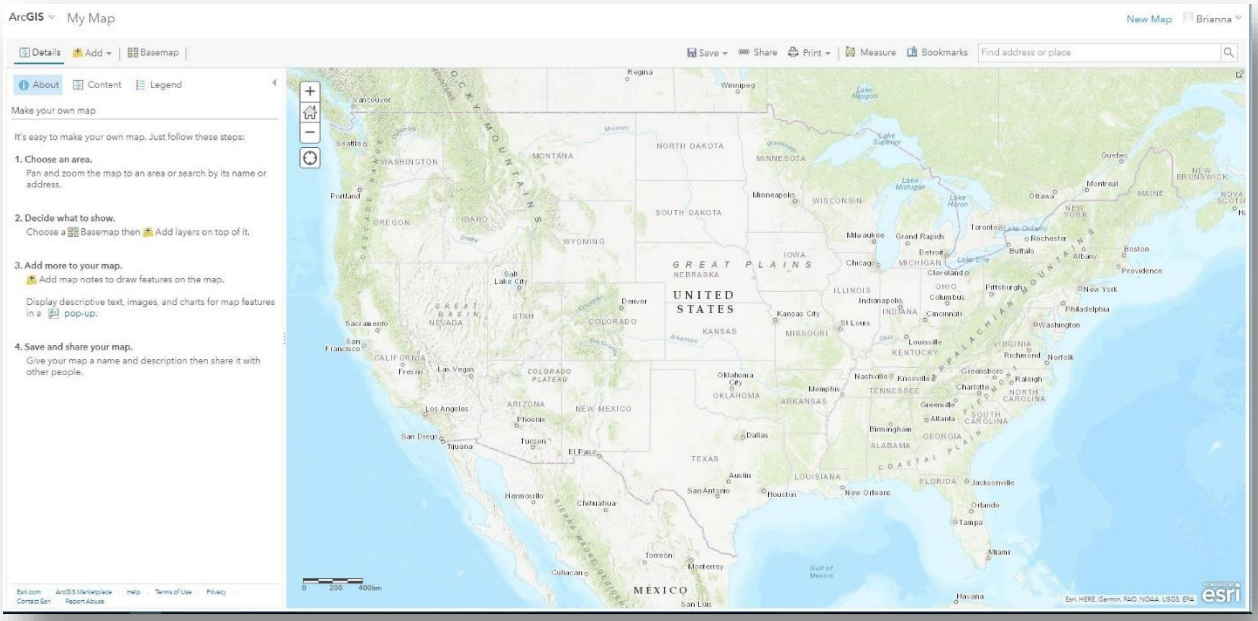
1) Log in to your ArcGIS account: https://www.arcgis.com/home/signin.html



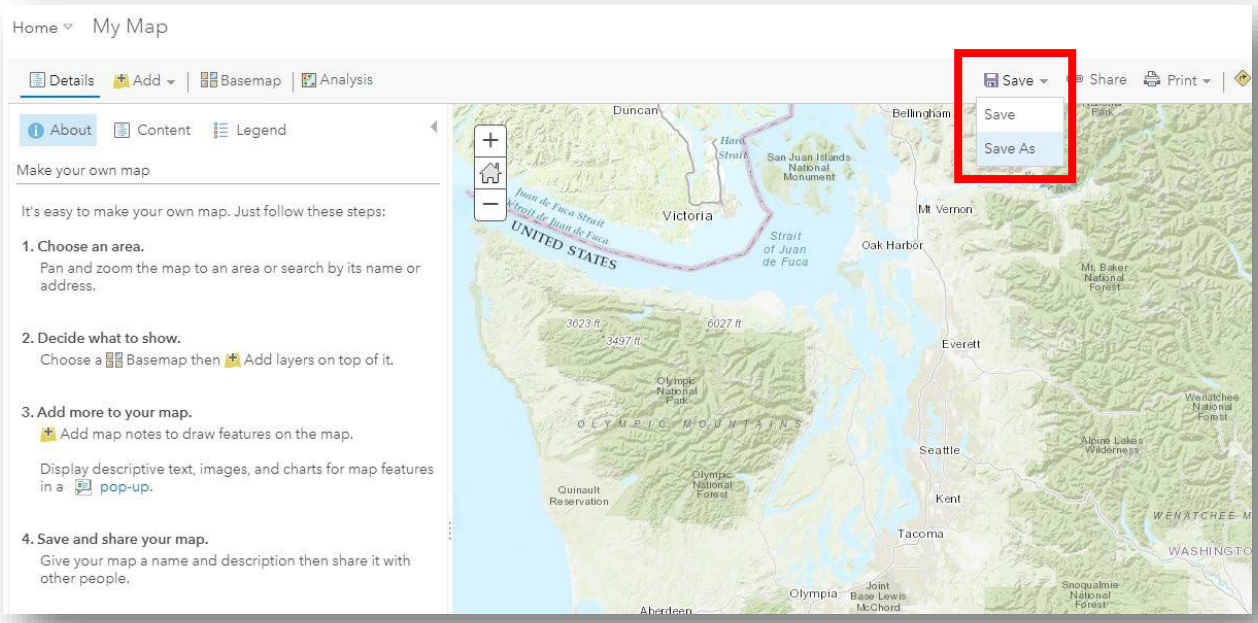
2) From the tabs at the top of the page, select "Map."



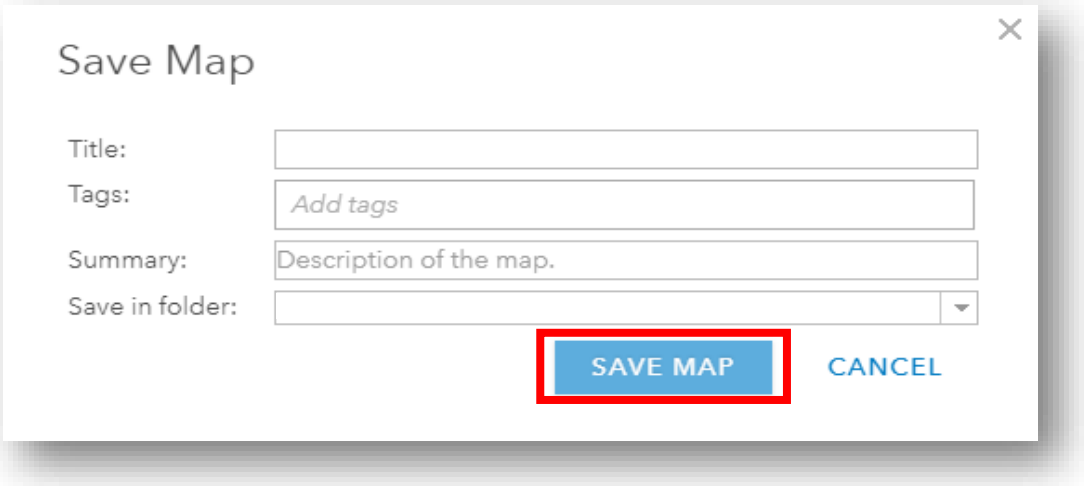
Your view now will show a blank map.



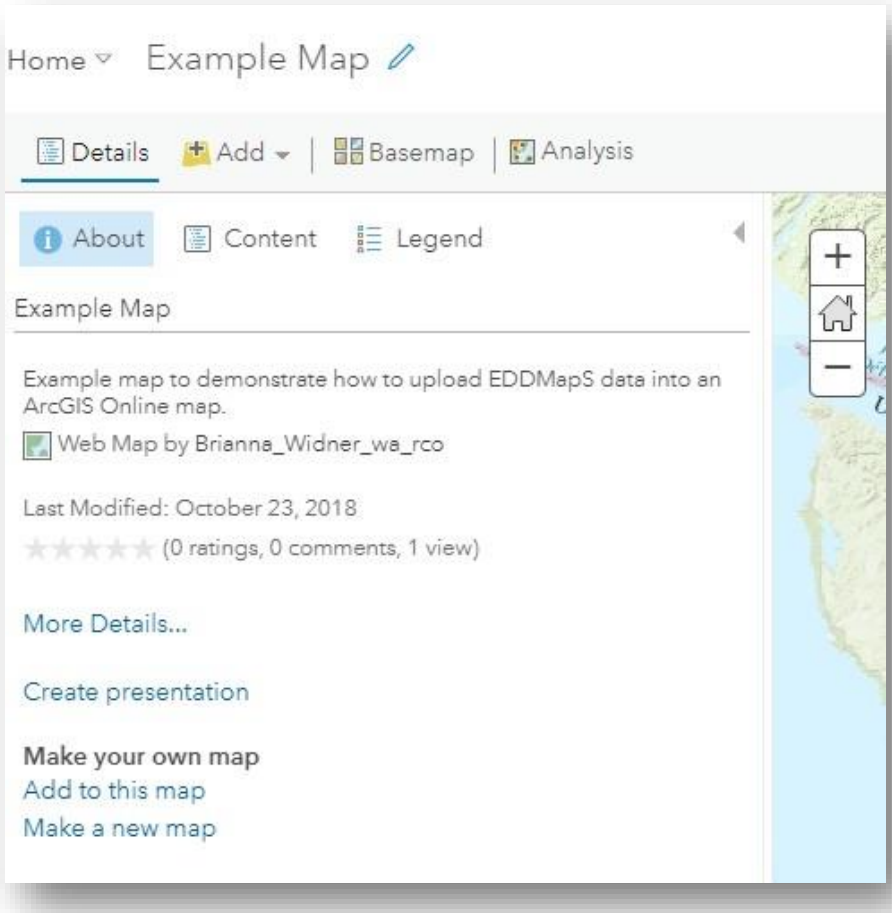
3) Click the “Save” dropdown menu and select, “Save As.”



4) Fill out each field and select “Save Map.”

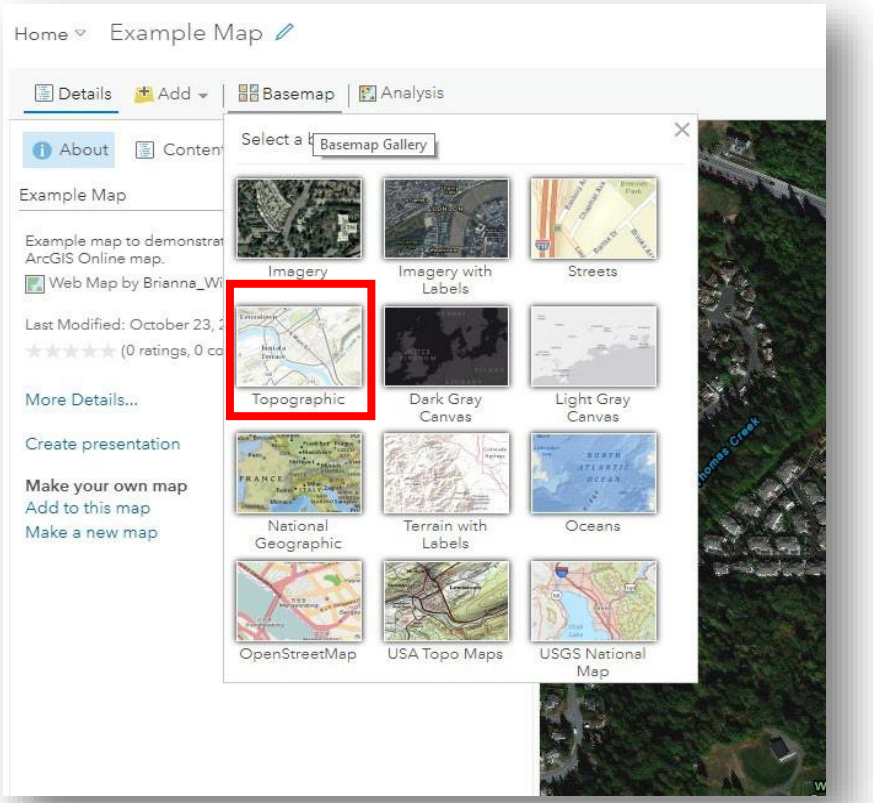


5) Your map’s name and the information you input now will appear on the far left of the screen under the “Details” tab in the “About” section.

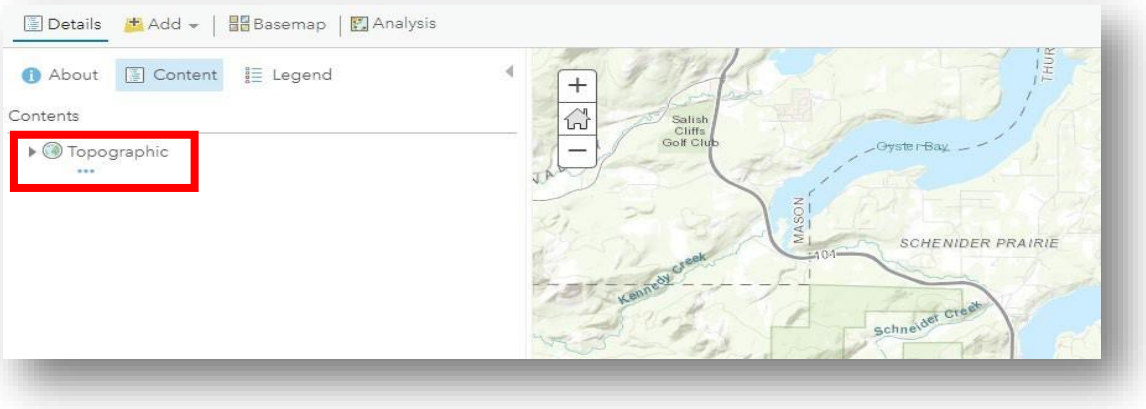


6) You now will start putting your map together. The first thing to add to your map is a basemap. Basemaps provide the background image for all of the other layers you add to your map. ArcGIS provides a wide array of basemaps; you are even able to upload your own. Which basemap you choose depends upon 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 all be using the basemap entitled "Topographic."

From the tabs at the top left, select "Basemap." A drop down menu will appear. Select "Topographic."



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

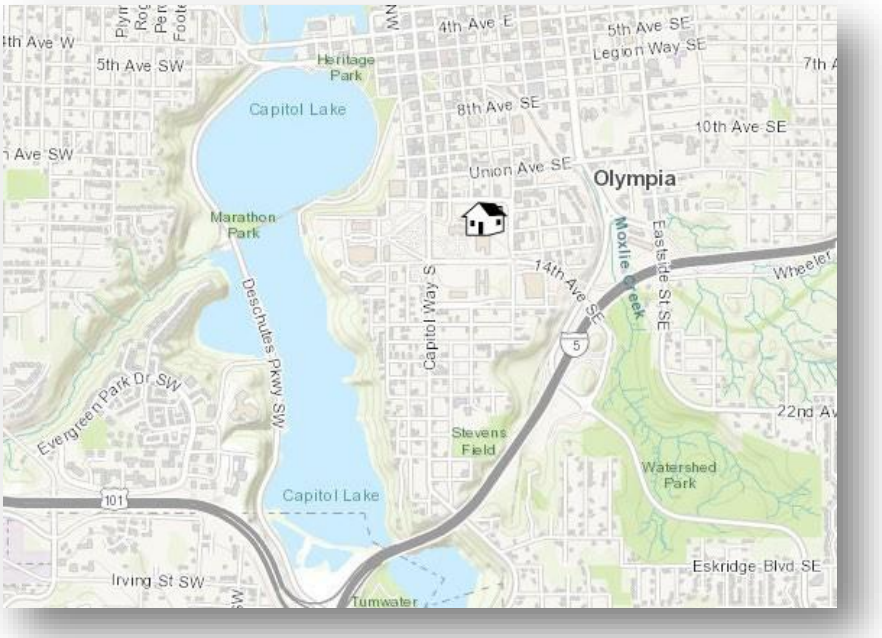


7) Save your work

The next step is to add additional layers on top of our 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.

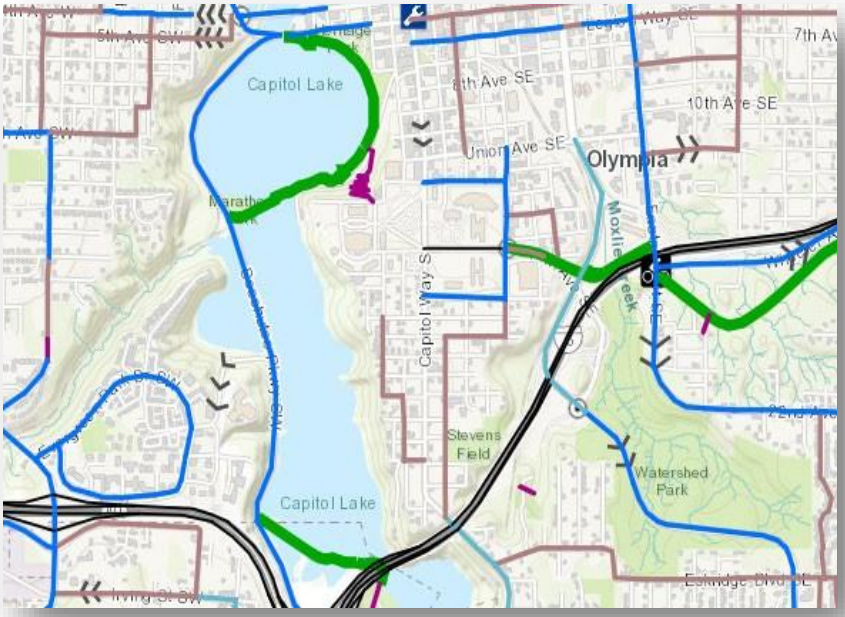
For example, if you wanted to make a map showing how to bike from your house to different parks in your county you could use the following layers:

- Layer with a point showing your house.

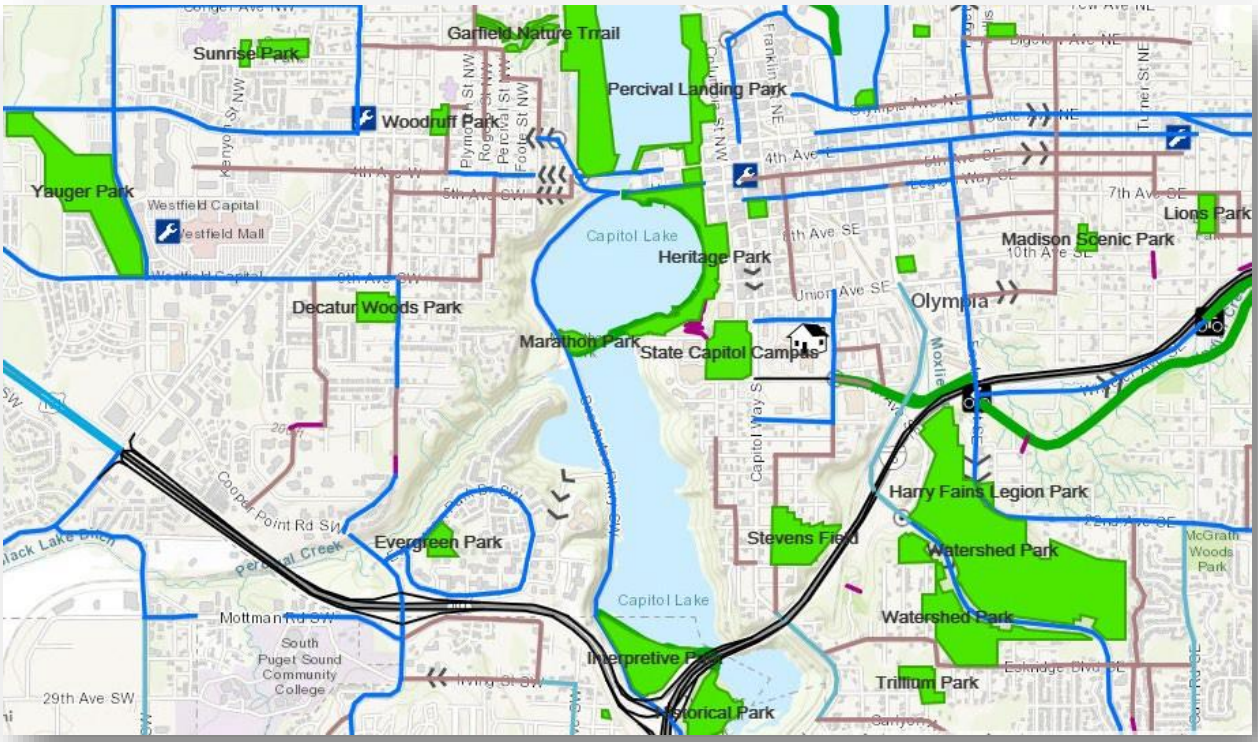


- Layer showing parks in your county.

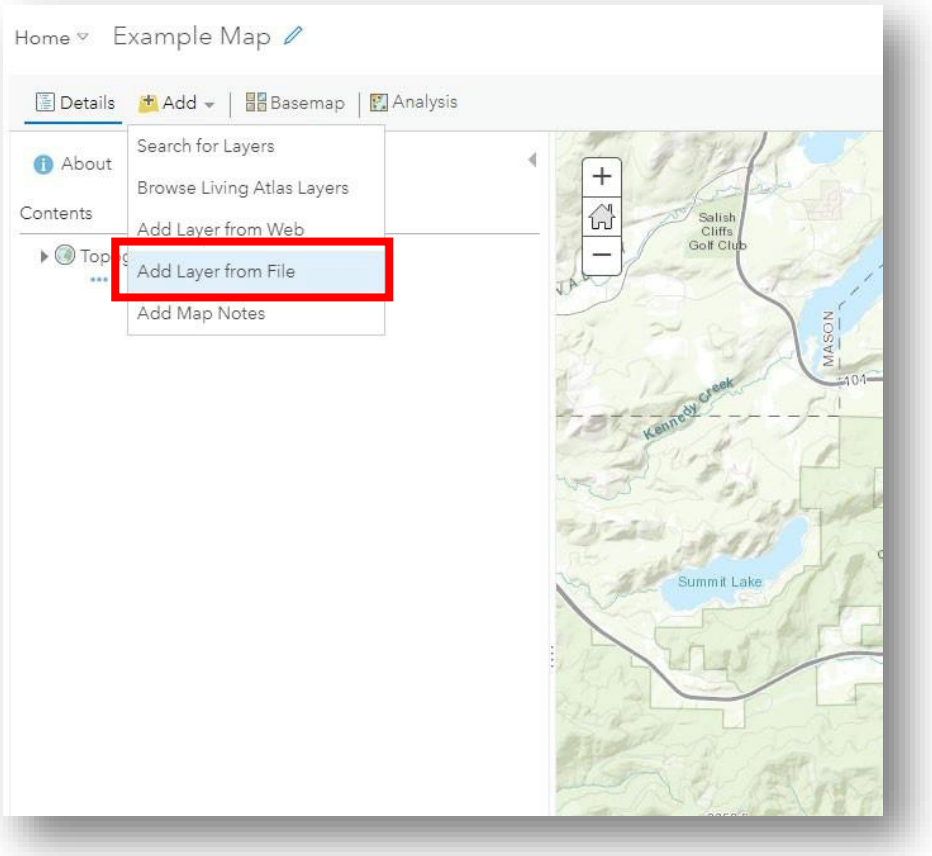
- Layer with bicycle paths.



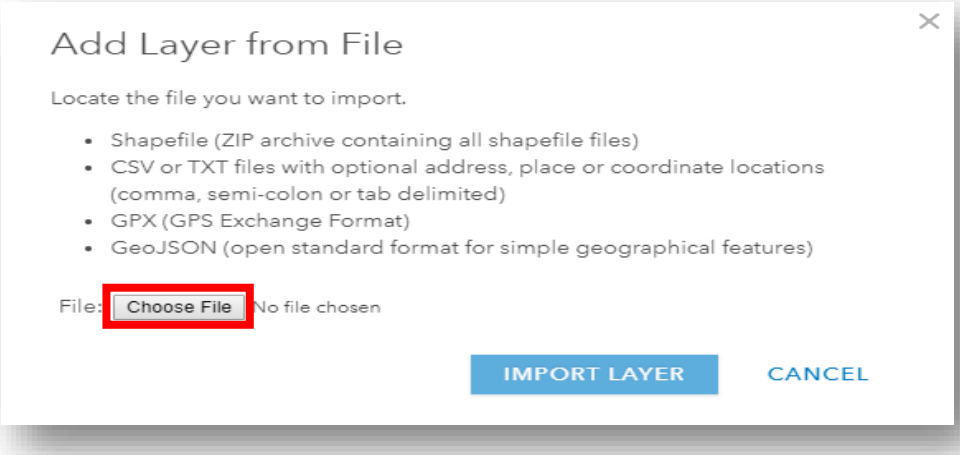
On their own, none of these layers can answer your question, but if you stack them all together, you can see the different paths you could take from your house to different parks in your county.



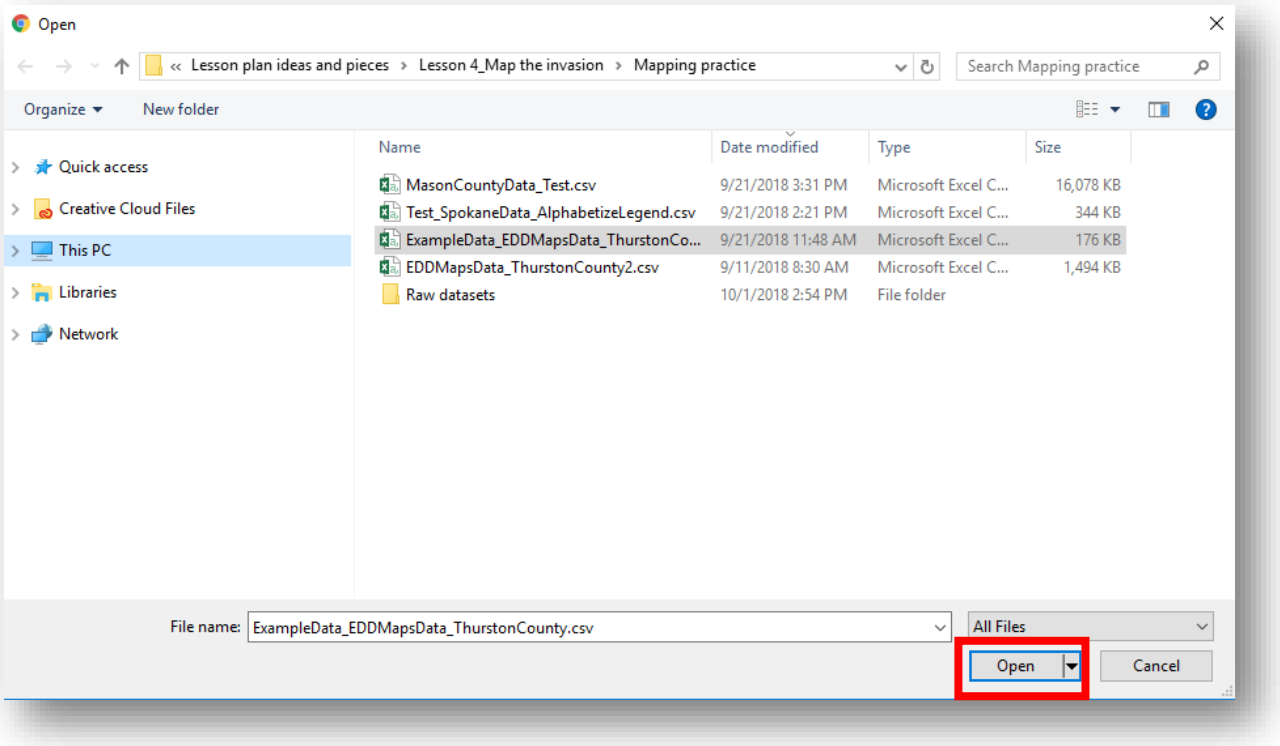
8) Now you will add layers to your map. On the left-hand side, above your information panel, select the “Add” button and select “Add Layer from File” from the drop-down options.



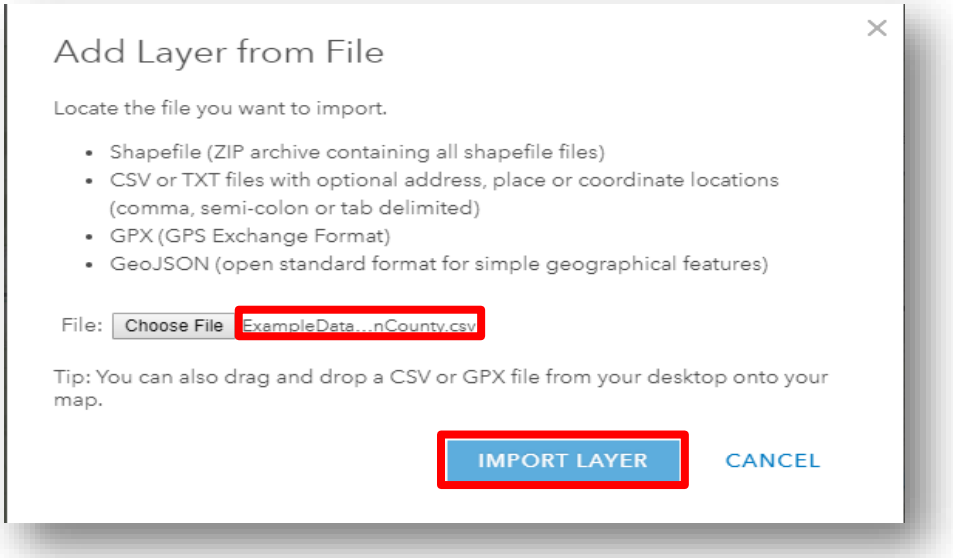
9) You will receive the following pop-up window. Select the “Choose File” button.



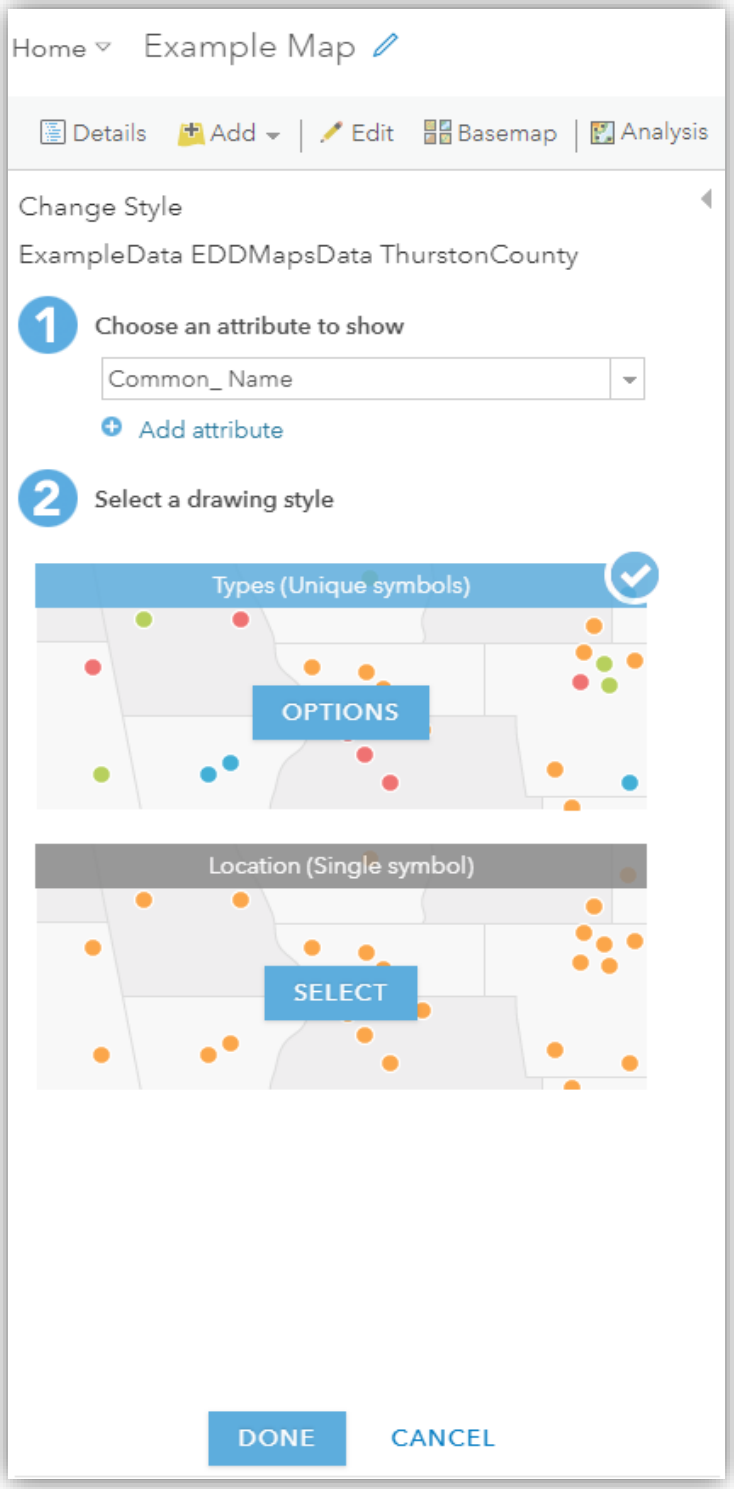
10) Navigate to where you saved your EDDMapS dataset. Select the file and click “Open.”



11) You now 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.”



12) If you receive an error message during this step, go back and look at your dataset. Make sure that all the columns are filled out and that there are no duplicated rows. **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. 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.

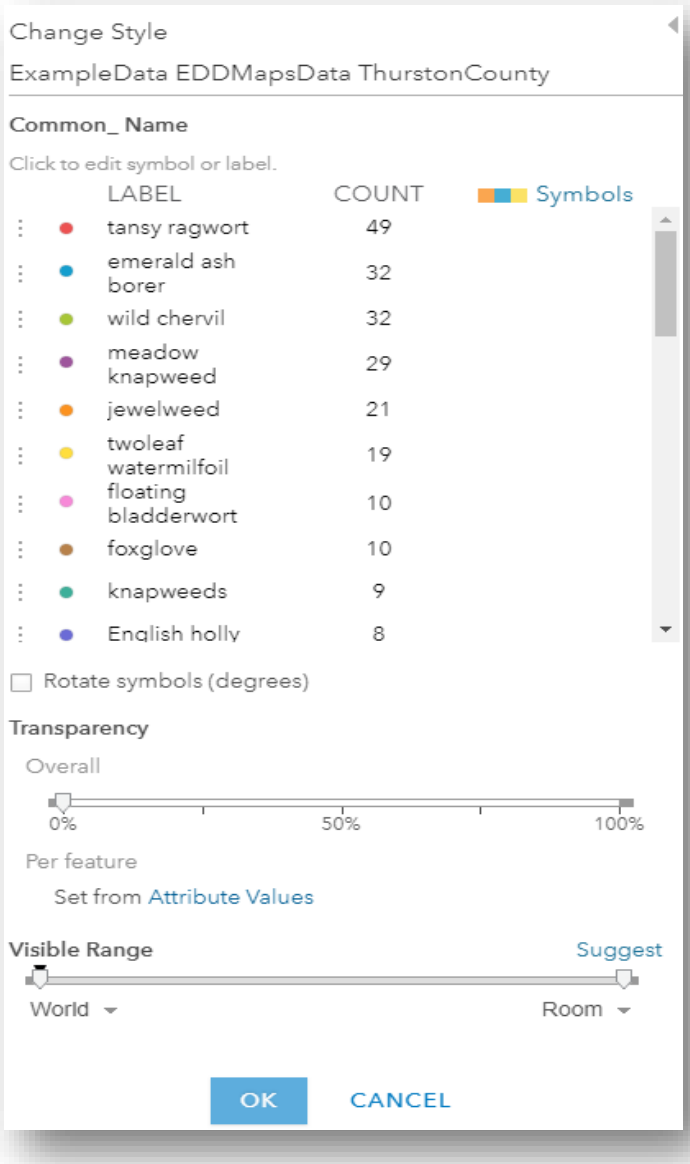
If you select "Location" you will get the same color dot for each invasive species, regardless of attribute. This can be useful if you only want to see where invasive species are present, but you do not need to know which species they are.

We will choose "Types."

13) Save your work.

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

15) Your information panel will now look like this:



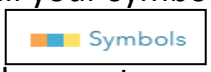
This is where we will edit the information that appears in our map legend. A map **legend** helps the viewer understand the story the map is telling. In our case, it tells the viewer which invasive species is present at each colored dot on the map.

Here we can change the symbol shapes, sizes, and colors. We also may 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.

Colors and symbols may be used strategically. For example, you could choose to use different shades of green for each of your invasive plant species or blues for your different aquatic invasive species. As most people associate green with plants and blue with water, you are subtly telling the viewer more information about the invasive species. Another example could be showing the invasive species you found the most with red dots and the species you found the least of in blue to suggest a sense of urgency in addressing the species that has spread the most in your survey area.

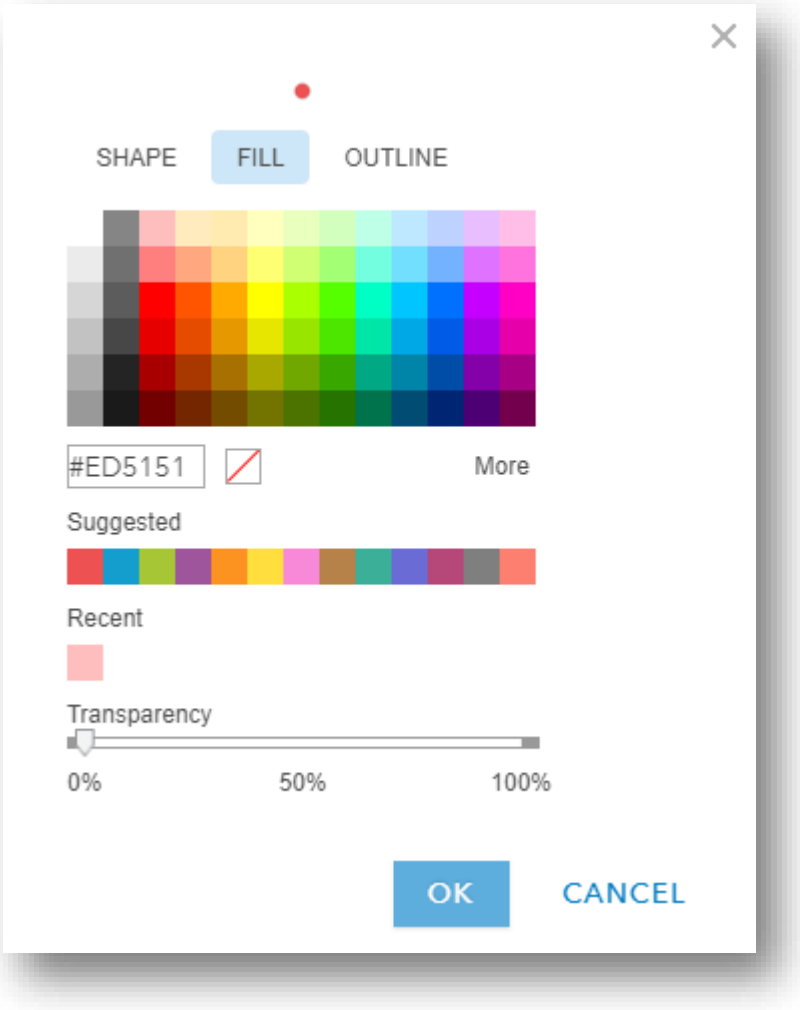
Because the goals of our map are to show 1. Which invasives species are in your survey area, and 2.Where invasive species are located in your survey area, the colors and symbols we choose are not too crucial. However, try not to choose something hard to see, such as all neon colors, or misleading symbols that do not relate to your map's topic, such as hearts or racing cars. You always want to make sure viewers can understand your map without you being there to explain it.

You can change all your symbols and colors at once using pre-defined options from ArcGIS. Simply select the 

button at the top right of your information panel and choose the shape and color spectrum you would like from the options in the pop-up window. Hit "OK."

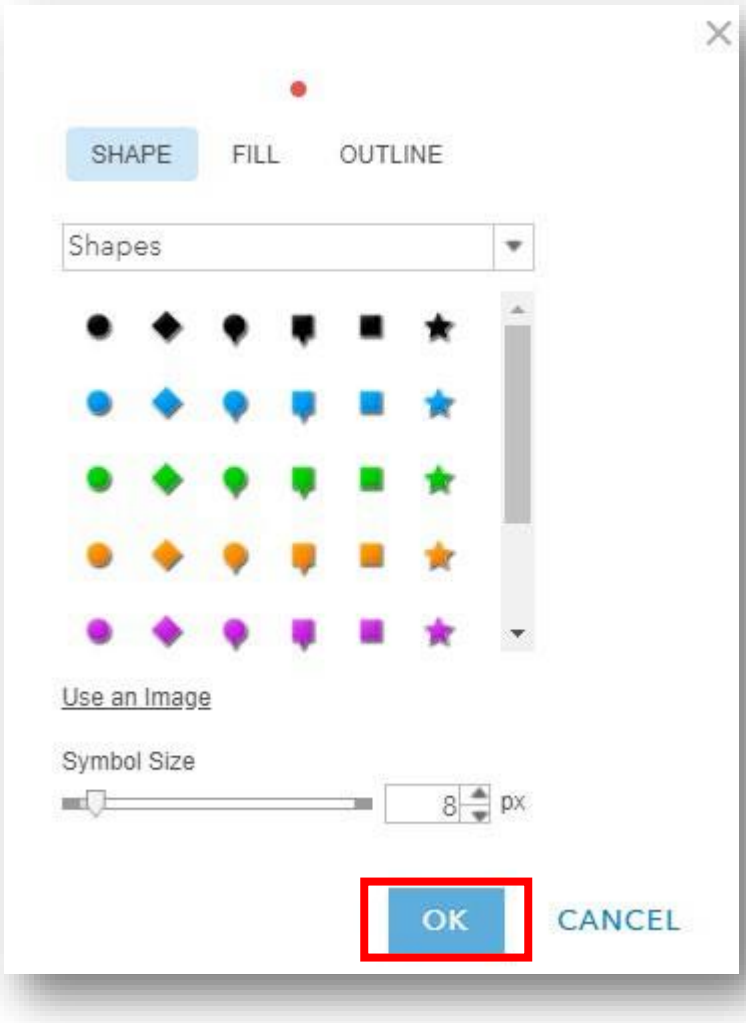
If you would like to change the colors of individual symbols, click the symbol:

and you will receive this pop-up window:



Here you may choose whichever color you would like. If you want to add an outline to your symbol, click the “Outline” button and a different color.

You also may change the shape and size of your symbol. There are different shapes to choose from as well as many different icons. You even may upload your own image. Again, this may help group your invasive species together in different ways and convey different information to your viewer.



16) Select whichever colors and symbols you would like for your map. Your map does not need to look like your classmates' maps. There are many different ways to display data and the ultimate decision is up to you.

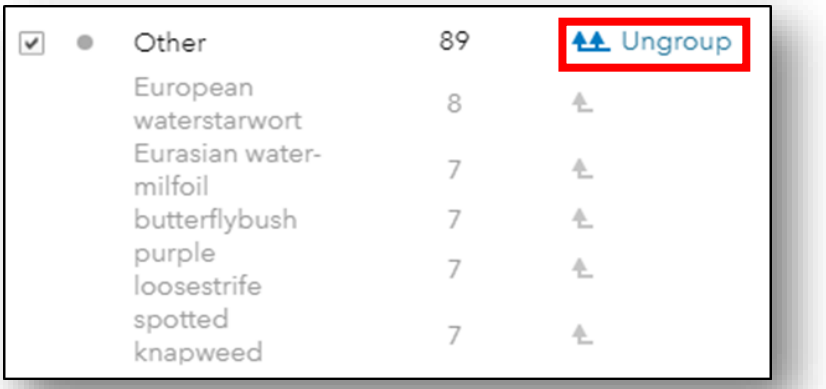
When you are done making your selections, click "OK."

17) Save your work.

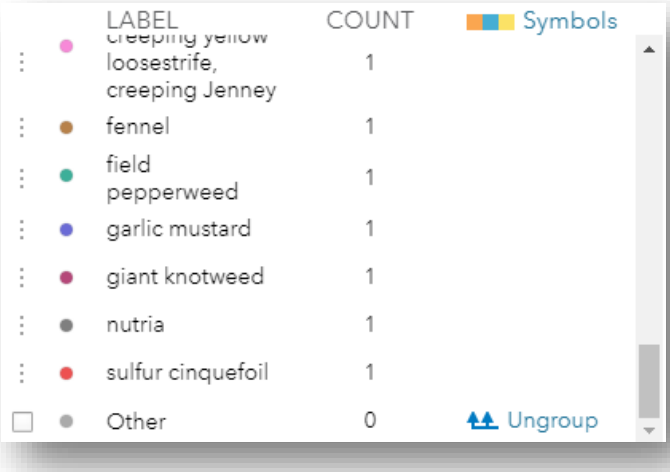
18) Depending on how many invasive species you have in your dataset, you may see a category in your legend with a grey dot labeled "Other."

ArcGIS automatically bundles entries into the "Other" category once it has run out of uniquely colored symbols to assign. For example, my legend came with a color spectrum that only had ten color options, so only ten invasive species were assigned a color. My other 27 invasive species were grouped into the "Other" category. If I were to click "OK" at this point, those 27 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' names are.

To fix this, I can click "Ungroup."



All of the invasive species are added to my legend.



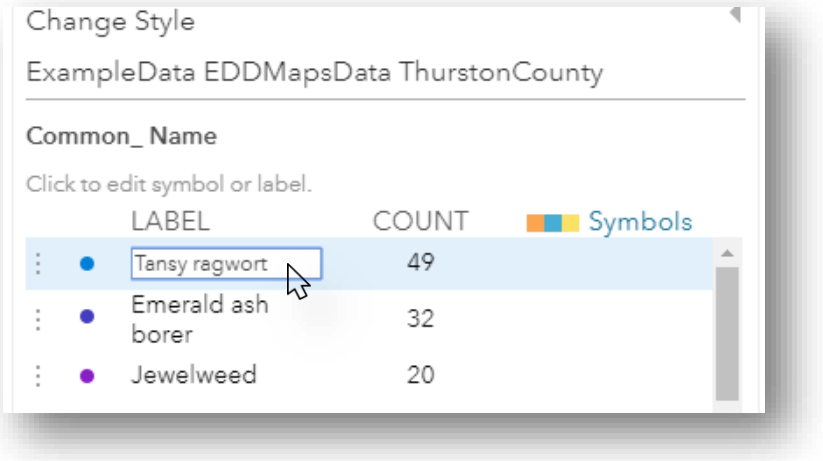
I then need to check the symbol colors to ensure that each invasive species has its own unique color because ArcGIS will repeat colors once it reaches the end of a color spectrum.

Alternatively, if you do not want a particular invasive species to show up on your map, you may drag and drop that species into the “Other” category.

For display purposes, I have chosen to return some species to the “Other” category. This could be useful if later you bring in the invasive species data for your county but you decide you are interested only in seeing the same invasive species you found in your survey area.

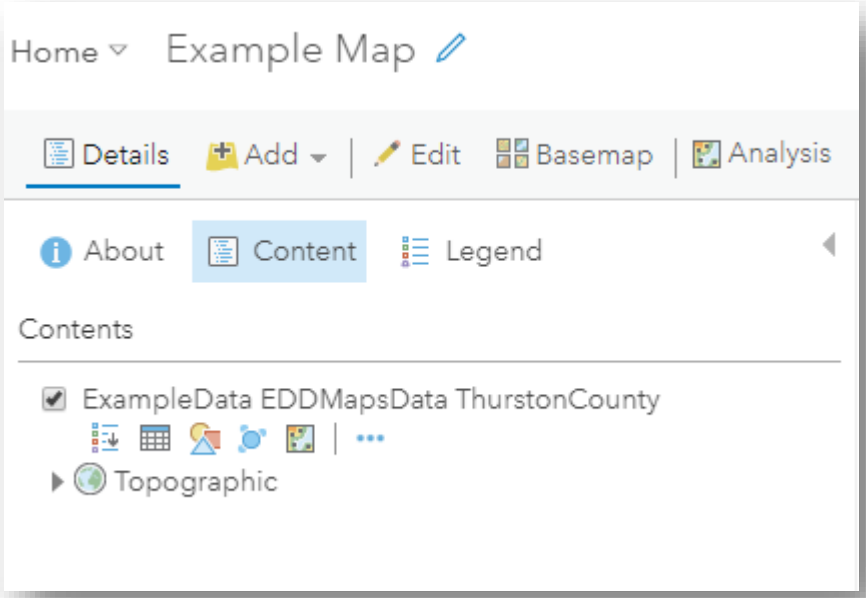
You likely will not run into the problem when using your own datasets, but if you decide to add a countywide set to your map in the future, there are many more reports to handle.

19) If you would like to change a label, click the name of the invasive species you would like to change, type what you would like, and hit the “Enter” key.



20) Once you have made all the changes you would like for your legend, click the “OK” button at the bottom of your information panel. You will be taken back to your original information panel where you selected your attribute and drawing style. Select the “DONE” button at the bottom of your information panel.

21) You will be taken to your “Content” pane. Here you may see what layers are in your map. Currently, you should have two layers, your basemap and your newly added data set.



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

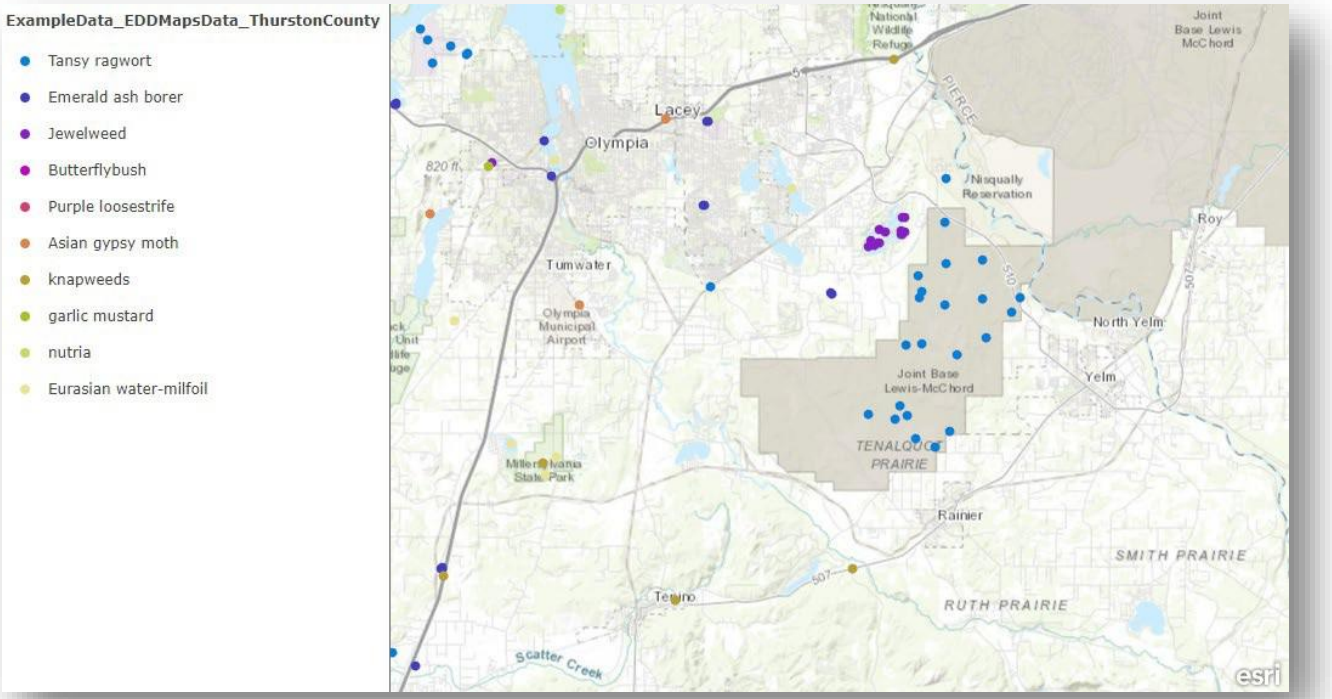
22) Save your work.

23) 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.

Your map tells viewers the following:

- Which invasives species are in your survey area
- Where invasive species are located in your survey area

Here is my example map for Thurston County:



Keep your map open and move on to Part 4: Add an Additional Layer to Your Map in ArcGIS Online.

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=8fca4181f2c742e78ca66f6 aed211a3d. (October 25, 2018).

EDDMapS. “Thurston County, Washington, 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=53&fipscode=53067&township=&layersourceid=&project=(November 5, 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).

OnlineMapSupport_WSDOT. “WSDOT–County Boundaries” [layer]. Scale Not Given. “County Boundaries of Washington State.” October 29, 2012. https://wa-rco.maps.arcgis.com/home/item.html?id=fe229f9df5aa4289b8ccd2a9928 9951b. (October 25, 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).

ArcGIS Mapping Instructions

Part 4: Add an Additional Layer to Your Map in ArcGIS Online

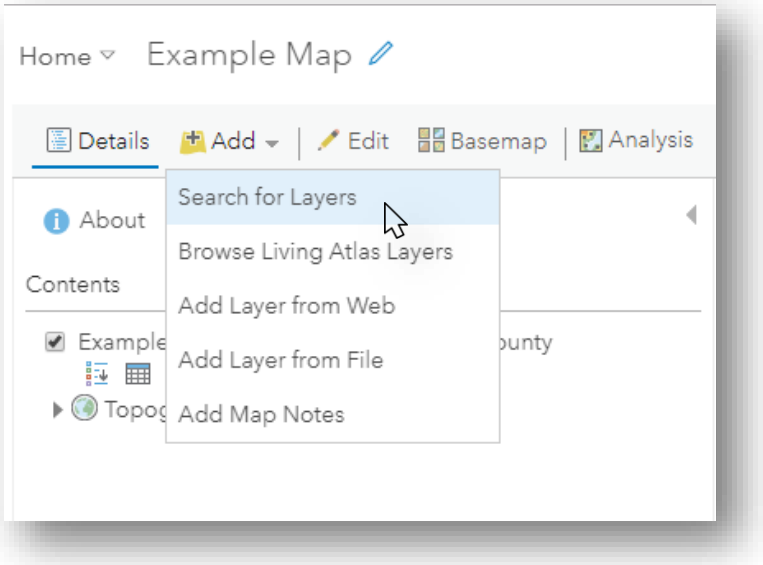
Now that you have your dataset on a map, you may choose to add more layers to answer other questions you may have or just to make it look more professional.

ArcGIS Online makes adding layers easy. You already learned how to add datasets from your own computer in Part 3, now you will learn how to add another layer within ArcGIS Online.

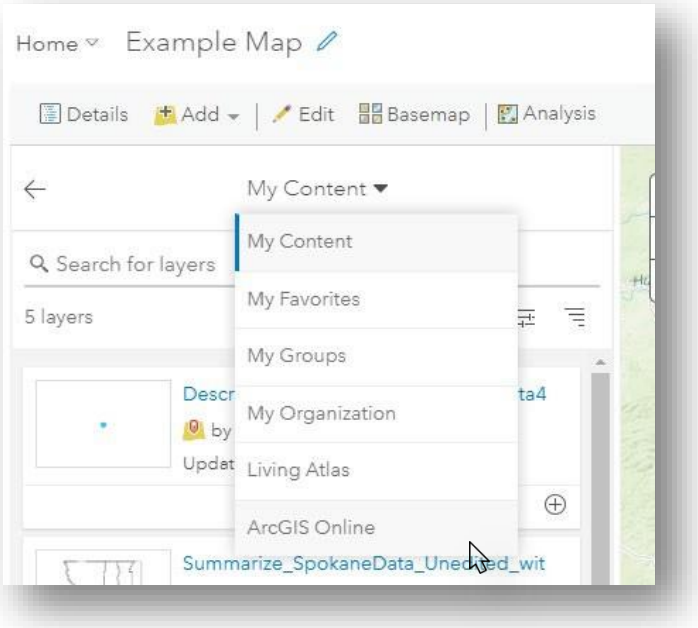
We will add a layer showing the county boundaries for Washington State. This makes it easier to see which invasive species are in each county. Were you to plot invasive species data for surrounding counties, the county boundaries layer also illustrates an important fact: invasive species do not respect 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. It will show the points on your map and your Content pane will be open on the left-hand side.

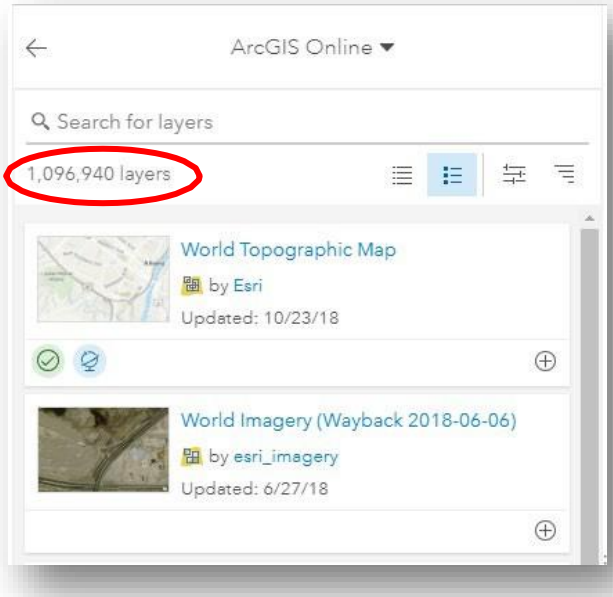
2) Above the Content pane, there is an "Add" button. Click this button and from the drop-down menu, select "Search for Layer."



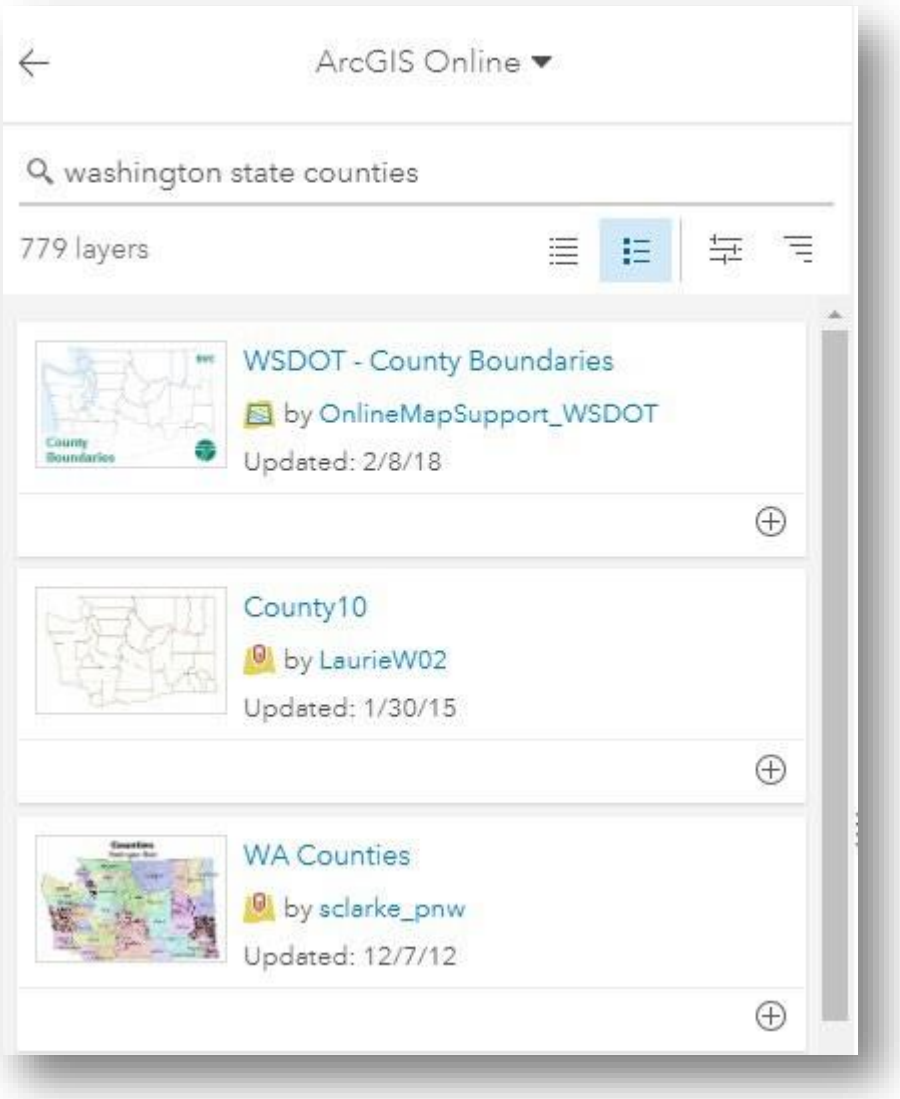
3) You are taken to a search box. When you first get to this search box, it has “My Content” at the top with a drop-down arrow. Select “My Content” and from the drop-down menu choose “ArcGIS Online.”



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 Washington State. In the search bar type: “Washington state counties.”



You will receive many options; I have 779 layers from which to choose. How do you narrow it down?

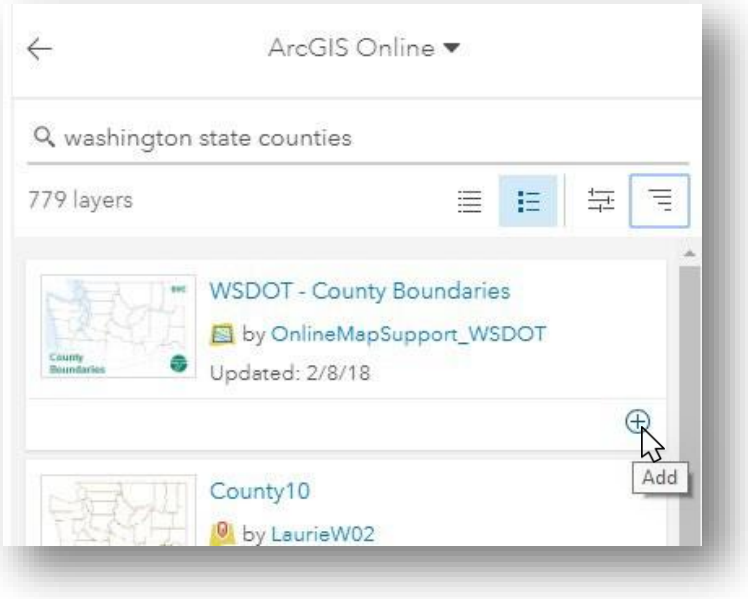
Just like facts you find online for reports and research, layers are sources of information and some are better and more credible (or trustworthy) than others. Here are a few things to consider:

- **Who made it?** Anyone with an ArcGIS Online account can 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.

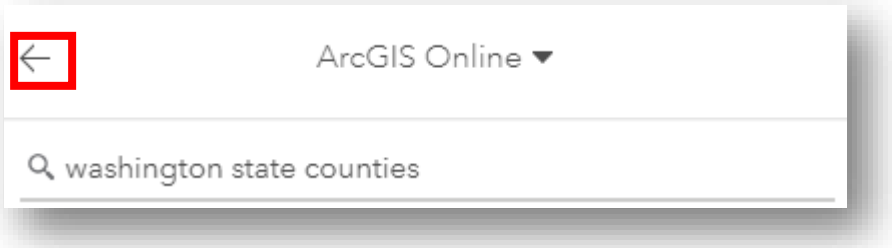
- **When was it made?** New data is uploaded daily so older layers may be outdated and inaccurate.

- **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.

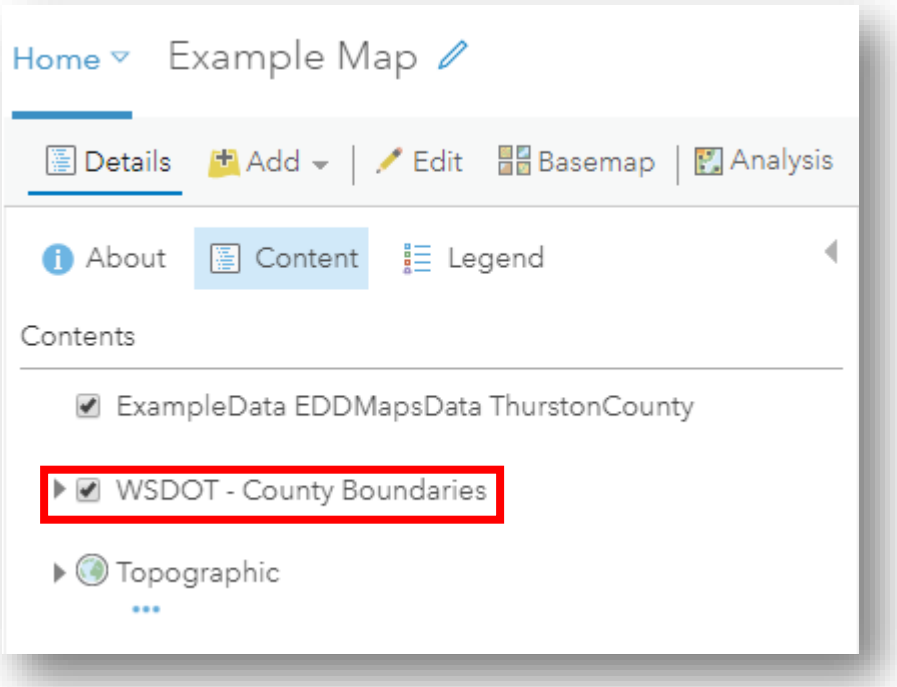
6) We will use the "WSDOT-County Boundaries" layer. It was created by a state agency, the Washington State Department of Transportation, and it is recent. To add this layer to your map, simply click the + at the bottom right of the layer.



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

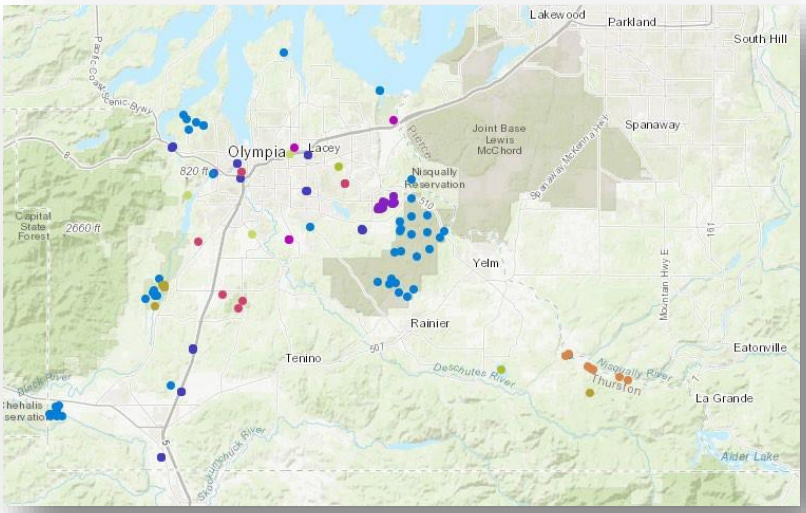


8) Your new layer now shows up in your Contents pane too.

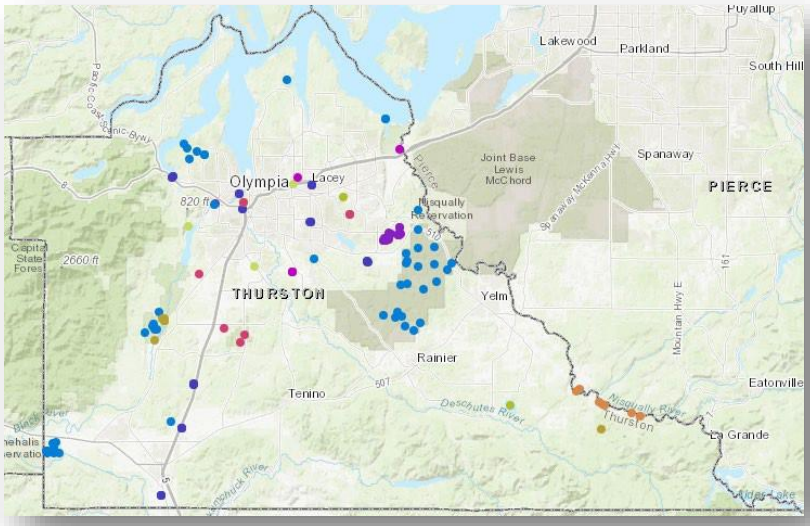


9) It now is easier to see where invasive species are distributed throughout my county and which invasive species may be threatening to spread to nearby counties:

- Without County Boundaries:



- With County Boundaries:



Keep your map open and continue to **Part 5: Cite Your Sources**.

References

EDDMapS. “Thurston County, Washington, 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=53&fipscode=53067&township=&layersourceid=&project= (November 5, 2018).

Esri. "Topographic" [basemap]. Scale Not Given. "World Topographic Map." February 19, 2012. http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5b bf808f. (October 25, 2018).

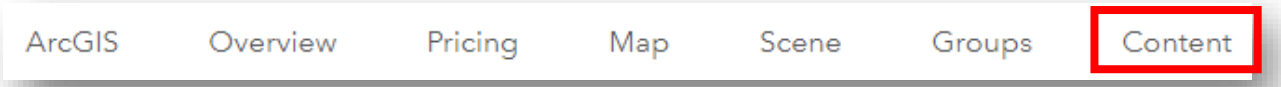
WSDOT-Julie Jackson. “CountyBoundaries” [layer]. Scale Not Given. “WSDOT- County Boundaries.” February 8, 2018. https://www.arcgis.com/home/item.html?id=fe229f9df5aa4289b8ccd2a99 289951b. (October 25, 2018).

ArcGIS Mapping Instructions

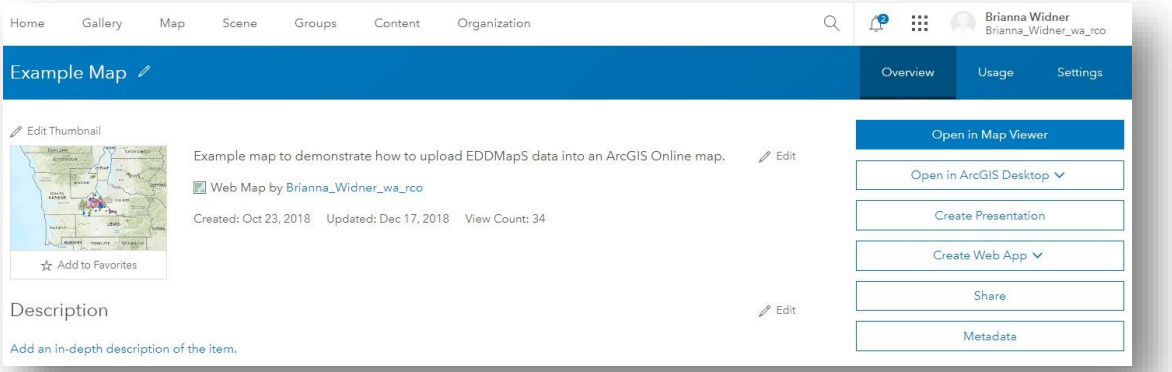
Part 5: Cite Your Sources

If you ever plan on publishing your map, in a presentation or a paper, for example, the final step is citing your sources. Map data is like any other kind of information you get from another source, if it is not your original work, you must give credit to the person who created it.

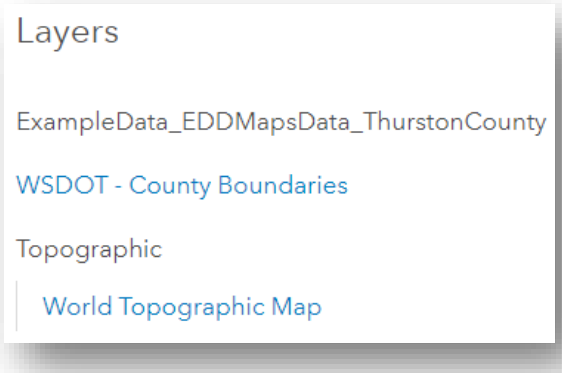
1) In ArcGIS Online, all the layers contained in your map are listed on your map's home page. To navigate to your map's home page, click "Content" on the toolbar at the top of the page:



2) Your page now should resemble this:



3) In the section titled "Layers," all of the layers in your map are listed:



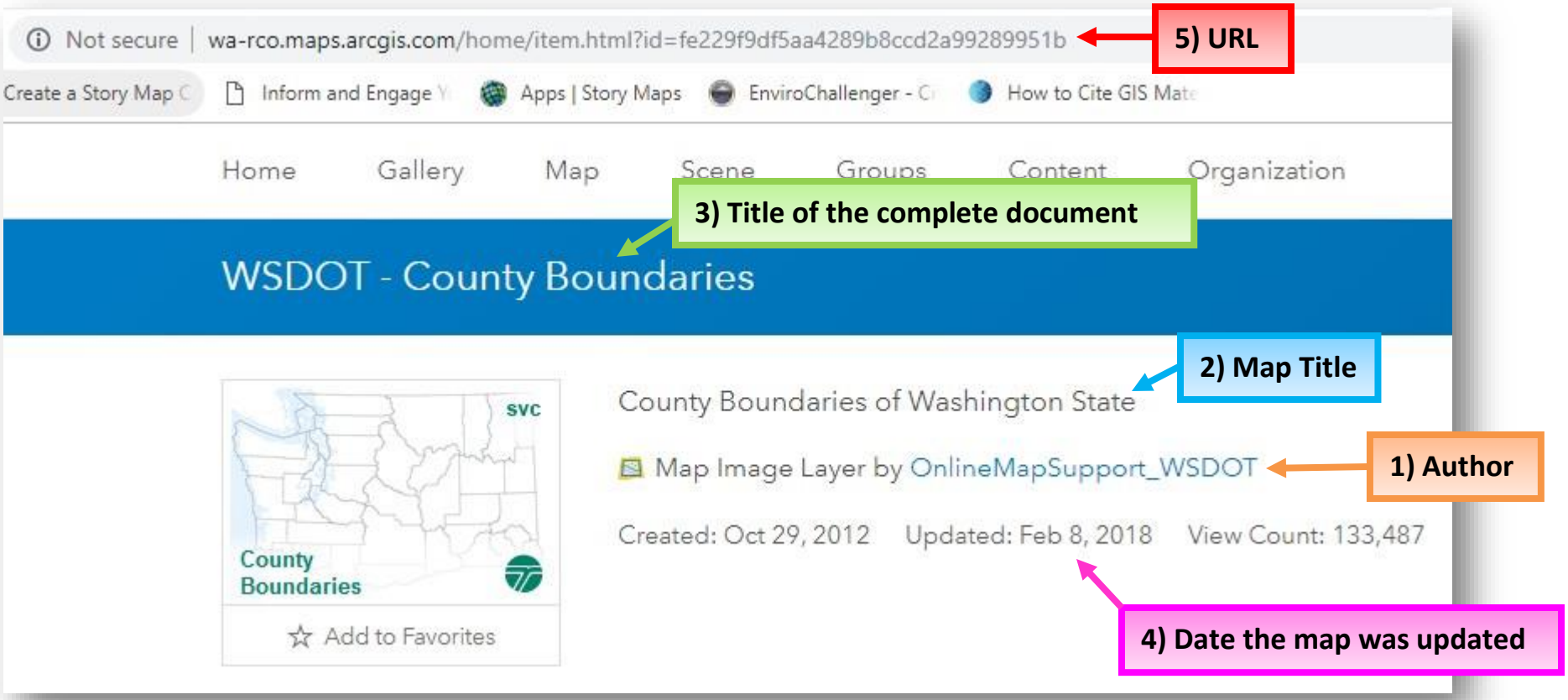
4) The layers in blue font are the ones we need to cite; other people made these layers and we need to give them credit for their work.

5) Click “WSDOT–County Boundaries” and we are taken to its information page:

To cite map data, include the following information:

- Author
- Map title
- Format (**for our maps, this will be “layer”**)
- Title of the complete document
- Date the map was updated
- URL–this must include the full path of the document address, not just the home page of the Web site
- Date you viewed the map

The information page contains the following information we need for a citation.



Put the information together in the following way:

1) Author **2) Map Title** [layer] **3) Title of the complete document** **4) Date the map was updated** **5) URL** (Date you viewed the map).

For this layer, our citation will look like this:

OnlineMapSupport_WSDOT. "WSDOT–County Boundaries" [layer]. "County Boundaries of Washington State." February 8, 2018. https://wa-rco.maps.arcgis.com/home/item.html?id=fe229f9df5aa4289b8ccd2a99289951b. (December 18, 2018).