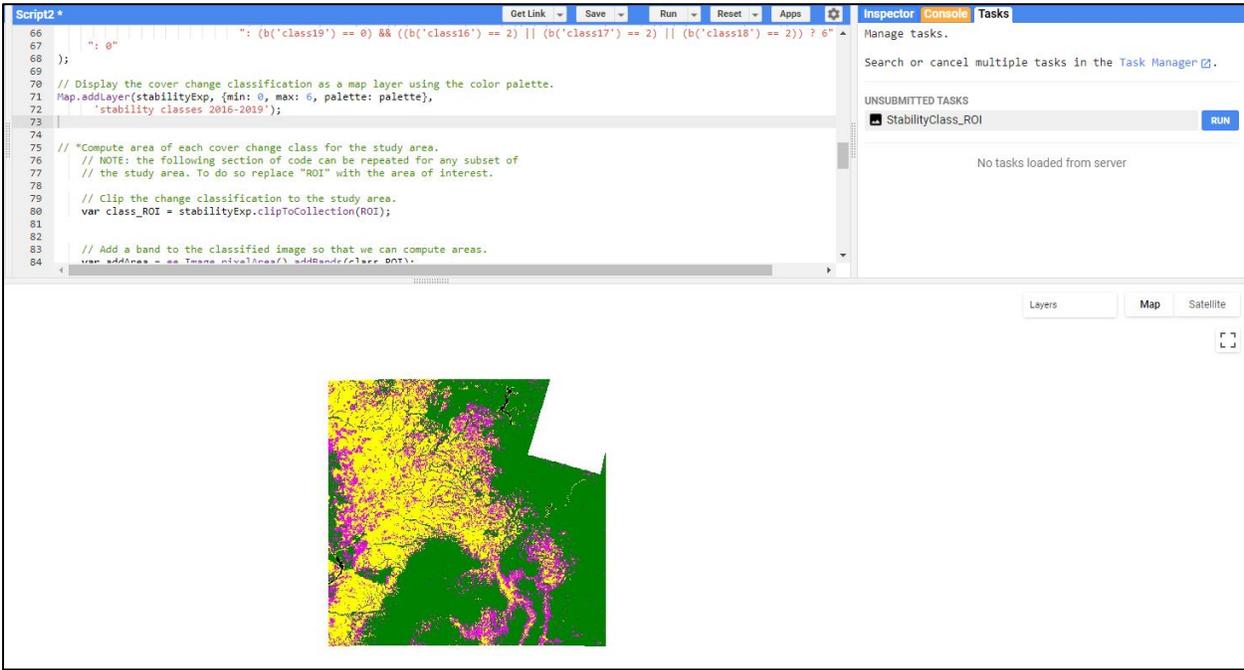


Vegetation Analysis Export: Google Earth Engine to ArcPro

Once you have run your vegetation analysis in Google Earth Engine (GEE), you may wish to do further analysis or create a map. One of the best ways to do this is by importing the TIFF into ArcMap or ArcPro. This document will help guide you step-by-step on how to import your new TIFF and create a map in ArcPro, though it is a very similar procedure to import into ArcMap.

1. Exporting the TIFF from GEE

After running the default program, you should get a screen that looks like this....



The highlighted “Console” tab is where you will find any measurements made in the program (like area computations). The “Tasks” tab will contain a new “unsubmitted task” with your change analysis export. To export the analysis from GEE as a TIFF, click the “Run” button. Clicking this button will prompt the window below...

Note: If you have changed the Region of Interest for your analysis (for example, you have used a shapefile of your own watershed) and would like to display its vegetation change analysis only within Google Earth Engine, simply follow the steps on the last page of this document. Otherwise, continue to page 2.

Task: Initiate image export

Task name (no spaces) *
StabilityClass_ROI

Coordinate Reference System (CRS)
 EPSG:3857

Scale (m/px)
 10

DRIVE **CLOUD STORAGE** **EE ASSET**

Drive folder
 Drive folder name or blank for root

Filename *
StabilityClass_ROI

File format *
 GEO_TIFF ▼

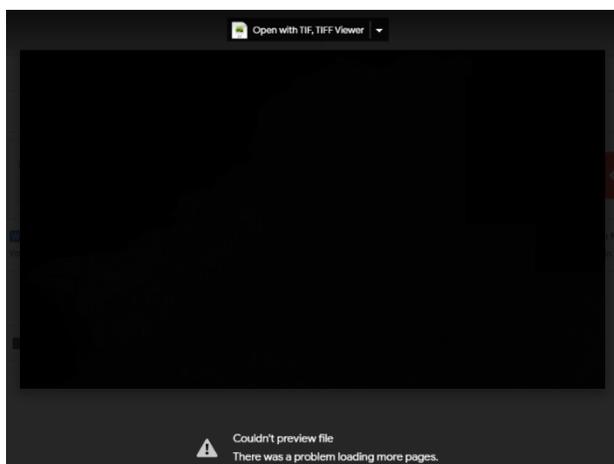
CANCEL RUN

When exporting our image from Google Earth Engine to Google Drive, the TIFF name saved in your Drive will be the same as the Task Name (I have left it as the default).

You can also provide a Google Drive Folder Name, if you would like the TIFF file to have its own separate folder in your Google Drive.

Make sure the File Format is selected as "GEO_TIFF", as this will be important for any analysis you do later.

Exporting the file to Google Drive may take a few minutes depending on the size of the file, but you can monitor the progress in the "Task" tab. Once the file is fully exported to Google Drive, you can save any changes to the code and close the GEE window. In your Google Drive, you will see an image that looks like this...

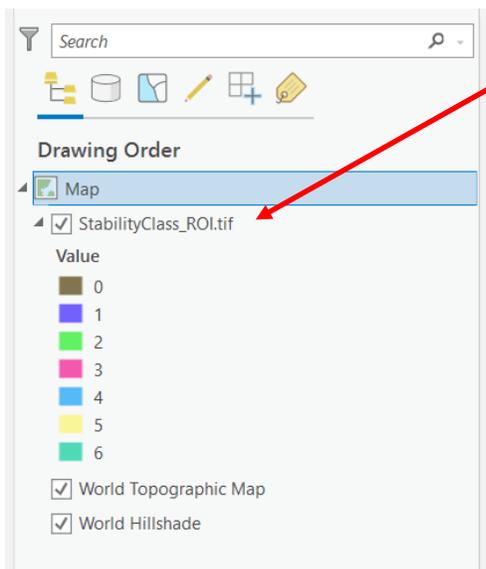
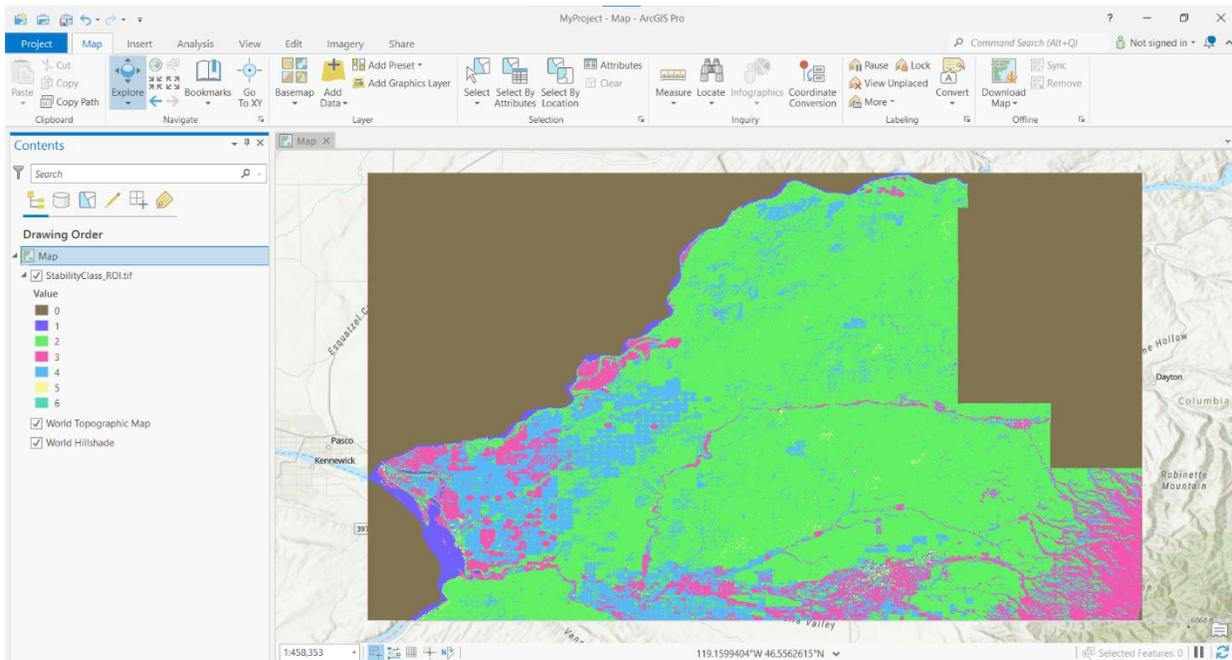


DO NOT PANIC! Google Drive doesn't know what colors were assigned to values in the TIFF, so it displays as all black. To get a usable map and display, you need to download the TIFF and open it in a program that can display the colors. We will be using ArcPro. Click the download button to download the TIFF from Google Drive onto your computer (usually they end up in your computer's Download folder).

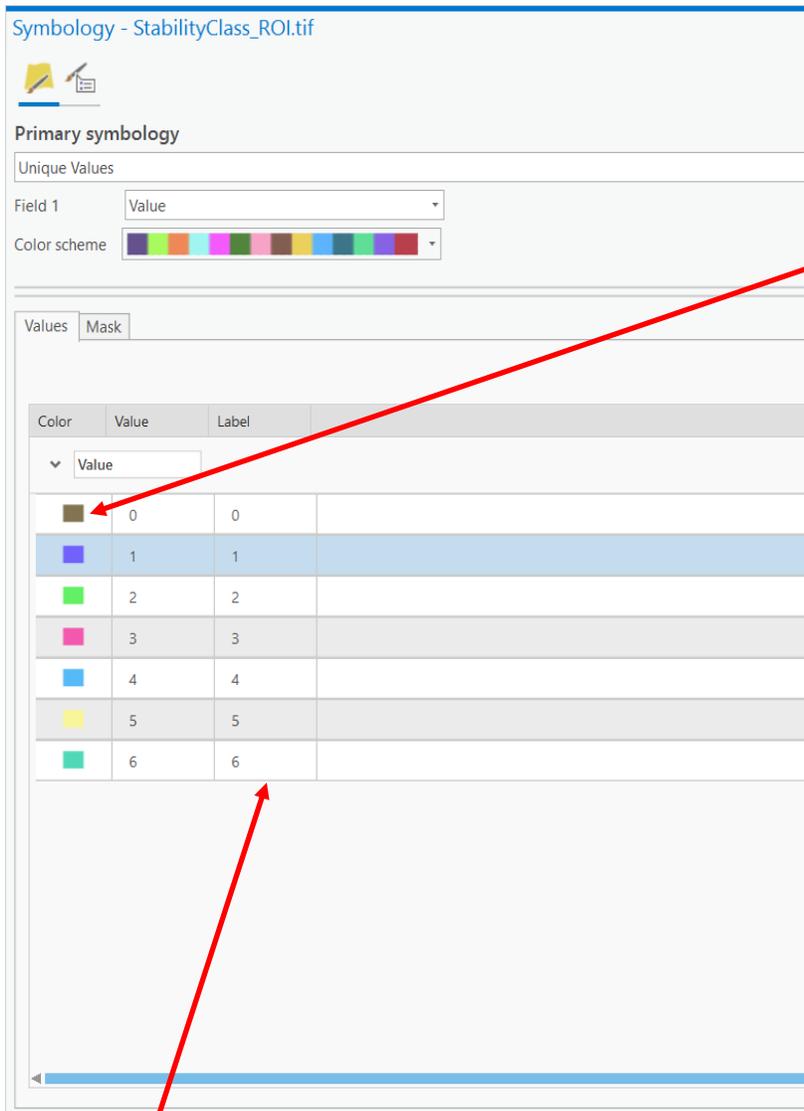
2. Importing and Displaying the TIFF

Now that you have a TIFF saved to your computer, you can import it into ArcPro to display it, run analysis, and create a map. Create a new project with ArcPro and use the “Add Data” button in the “Map” tab to add the TIFF. After importing, one of 2 things will happen...

- A. You will see a TIFF with the wrong colors assigned to the map (as shown below)
- B. You will see a TIFF simply displayed as a large black square (like it was in Google Drive)



The solution to both of these problems is to right-click the TIFF File name (in this case StabilityGlass_ROI.tif) and select “Symbology”. This will open a window as shown below.



If it isn't already selected, make sure the Primary Symbology is "Unique Values", and the Field Selected is "Value".

Right-click the colored squares next to each value and assign the same colors as Google Earth Engine...

- 0 = White or No Color
- 1 = Black
- 2 = Yellow
- 3 = Green
- 4 = Magenta
- 5 = Gray
- 6 = Blue

DO NOT ATTEMPT TO CHANGE ANYTHING IN THE "VALUE" COLUMN.

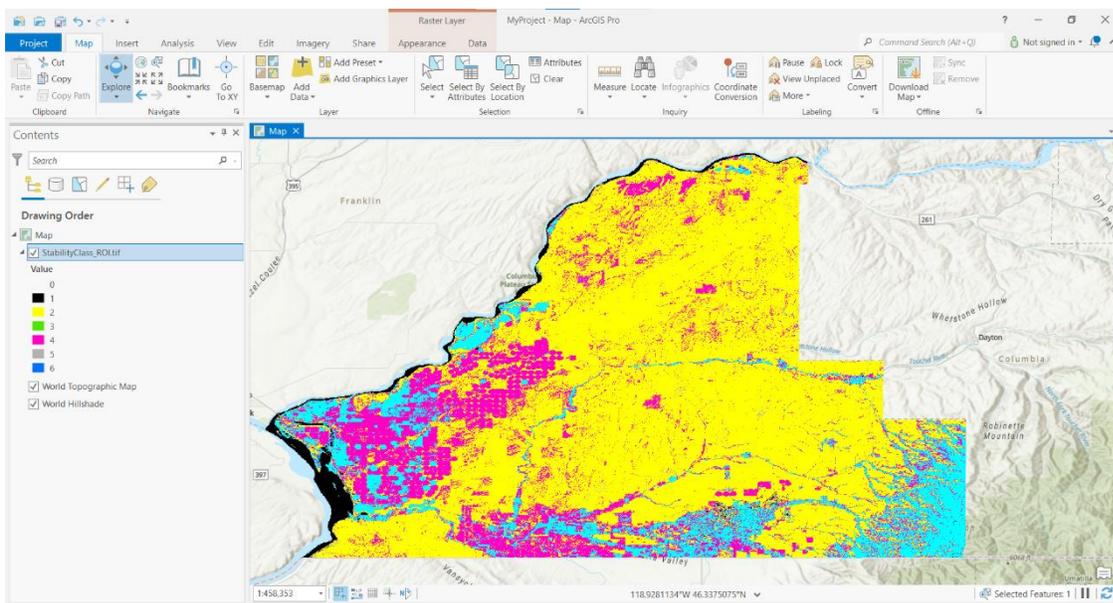
In the "Label" Column, you want to put the descriptions for each value that you used in Google Earth Engine. The labels for each value are as follows...

- 0 = not classified
- 1 = Black = "non-vegetated" in all 4 years
- 2 = Yellow = "senesced" in all 4 years
- 3 = Green = "evergreen" in all 4 years
- 4 = Magenta = "evergreen" in at least 1 year, "senesced" in at least one year
- 5 = "other" in at least 1 year, "senesced" or "other" in other years
- 6 = Blue = "other" in at least 1 year, "evergreen" in other years

Your window should now look something like the one below...

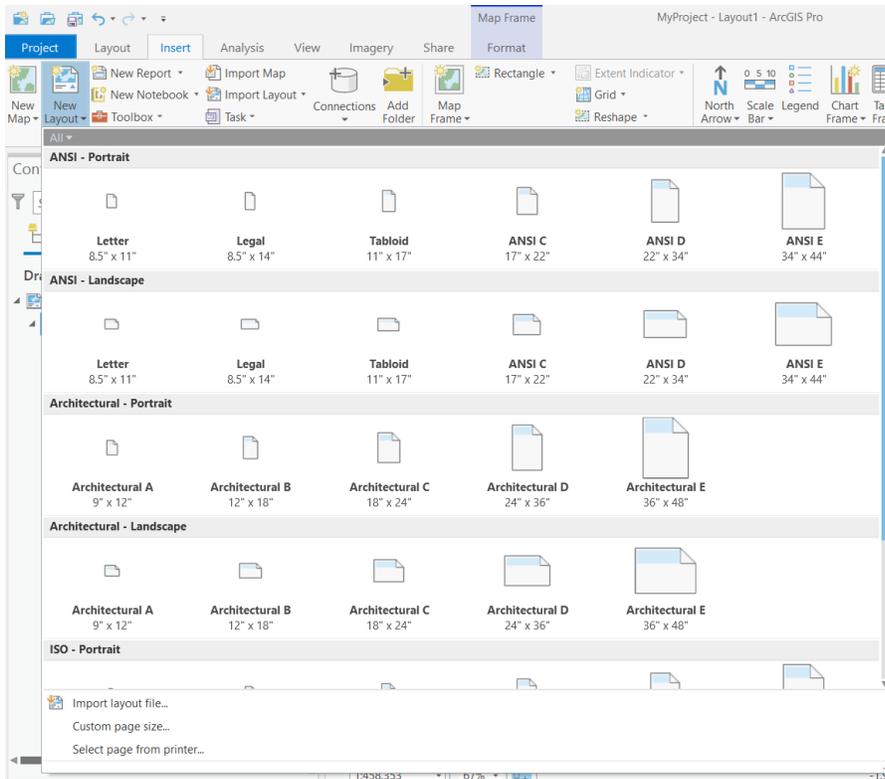
Color	Value	Label
	0	NotClassified
■	1	Non-Vegetated All 4
■	2	Senesced All 4
■	3	Evergreen All 4
■	4	Evergreen at least 1 yr, Senesced other yr
■	5	Other 1 at least yr, Senesced/Other other yrs
■	6	Other at lease 1 yr, Evergreen other yrs

Close the “Symbology” window and view your map. You now have a usable/readable TIFF for analysis and map-making. For example, you can select all areas that “were evergreen” each year simply by using the “Select By Attribute” tool and selecting all pixels with a Value of 3 (shown below as bright blue).

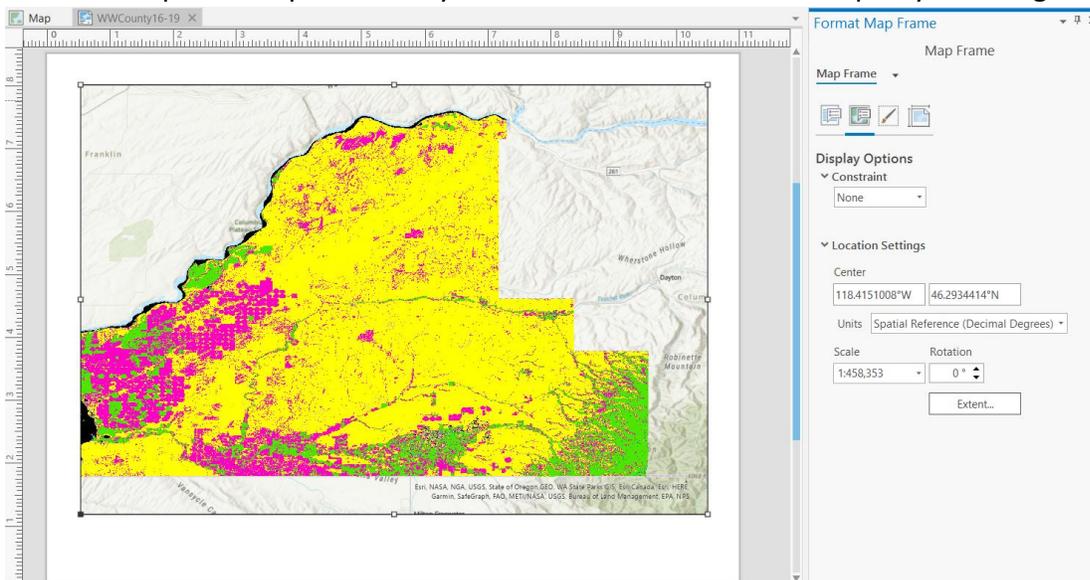


3. Creating a map

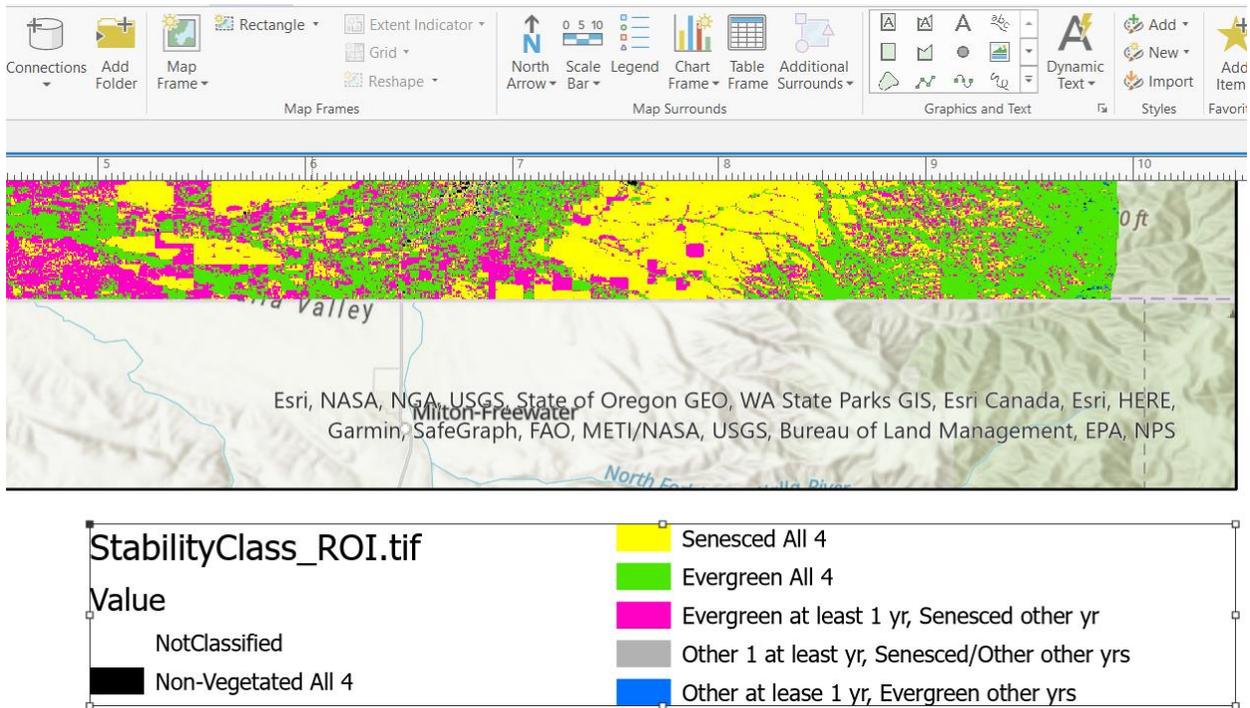
To create a map to show the results of your vegetation analysis, click the “Insert” tab and select “New Layout” to select your map size. Then select the scale you wish for your new map.



In the New Layout tab, insert a Map Frame. Then double-click the displayed map to open the “Format Map Frame” pane. Here you can center and scale the map to your liking.



The final major step is adding a legend, which can be done using the “Legend” button at the top of the page to draw a legend. Notice how the labels you created for each value carry over to this legend!



Once this is done, you can add whatever titles or descriptors you would like to the map and export it when finished. If you need to change something on the map for display (ex. change a legend color), YOU MUST CHANGE IT IN THE MAP TAB.

