Last Updated: September 2021
Version: ArcGIS Pro 2.X

EXERCISE 2
Cached and Dynamic Services

Objectives

1. To explore some of the capabilities of dynamic imagery

Prerequisites

1. You should already have a connection to Image Services in ArcGIS Pro (Exercise 1)

Introduction:

When you first begin using an image set or map from the Forest Service Image Services, you are actually accessing a set of tiles called **cached imagery**. These are sets of images created at reduced resolution (similar to image pyramids) that allow for improved refresh rates of the imagery at lower scales. By default, these are saved to a folder on your computer to allow for faster navigation. However, there are many functions with the new Image Services that cannot be done with the cached imagery, and instead require you to explore the dynamic version of the data. This guide will take you through the steps for working with the cache and using some of the Dynamic Service capabilities.

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Part 1: Turning Caching On and Off

Note: Using the Dynamic services will cause the data to refresh at a much slower rate! You should wait to turn on the dynamic layers until you are at a scale and location for which you need to use dynamic tools. It is easy to switch back to cached data for navigating again.

1. Launch **ArcGIS Pro**.

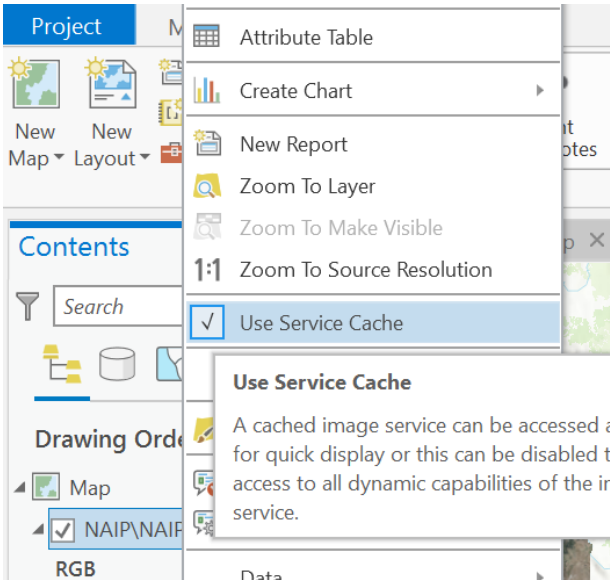
2. Open a new map.

3. Open the **Catalog** and select some **NAIP** imagery to load into the map.

4. In the Contents pane, right-click the NAIP layer.

5. In the contextual menu that appears, click **Use Service Cache** to remove the check mark and turn off caching.

Note: If a checkmark is not present and the Use Service Cache option is greyed out, then the service has been published without a cache, and you can skip the remainder of this section.



6. If the layer was active, the screen will take a few moments to refresh.

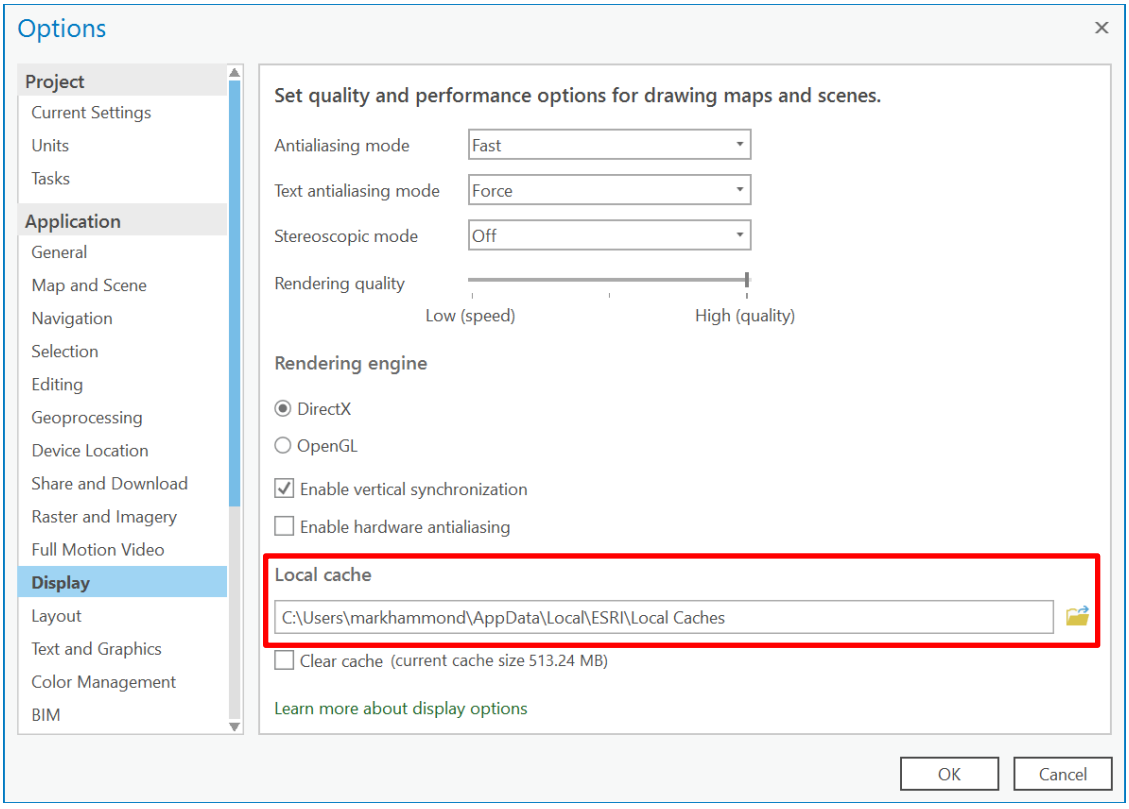
7. To return to cached data, right-click on the NAIP layer and click on **Use Service Cache**.

Part 2: Changing and Clearing the Cache Folder

Cached imagery is saved on your local hard drive; this is what allows for the improved refresh speed while navigating the services. You have the ability to designate the folder where the cache tiles are saved, which is useful if the default drive is running short on space. It is recommended that you should leave the folder as the default unless you have good reason to change the cache location.

A. Changing the cache folder

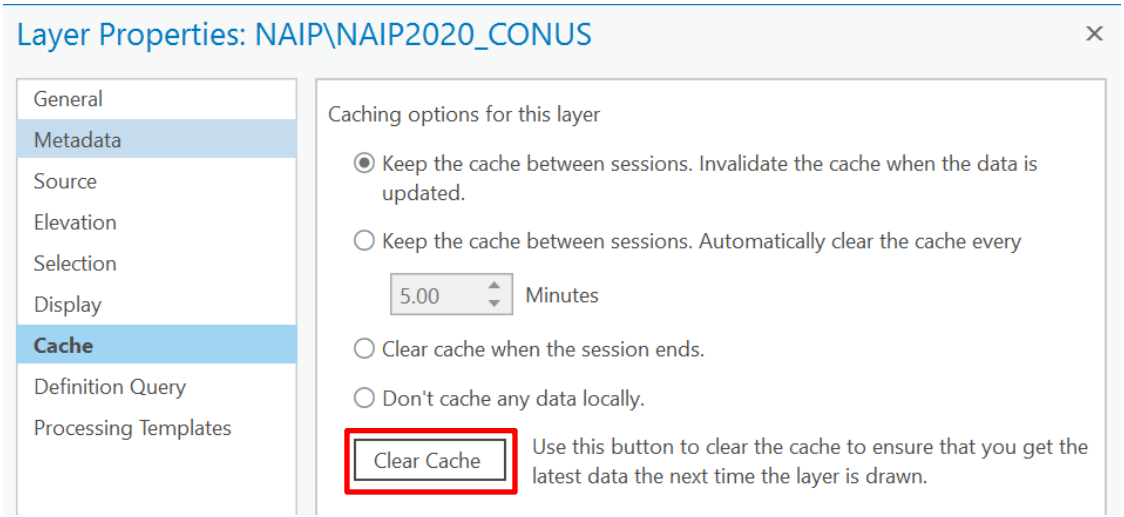
1. Click the **Project** tab.
2. On the left side menu click **Options**.
3. On the left side menu click **Display**.
4. Click the yellow folder icon next to the **Local cache** field and select a new folder.
5. To clear the cache click the box next to **Clear cache** then click **OK**.



B. Clearing the Cache

1. In the **Contents** pane, right-click on the desired service then click **Properties**.
2. In the Layer Properties window click the **Cache** tab.

3. Finally, click the **Clear Cache** button.

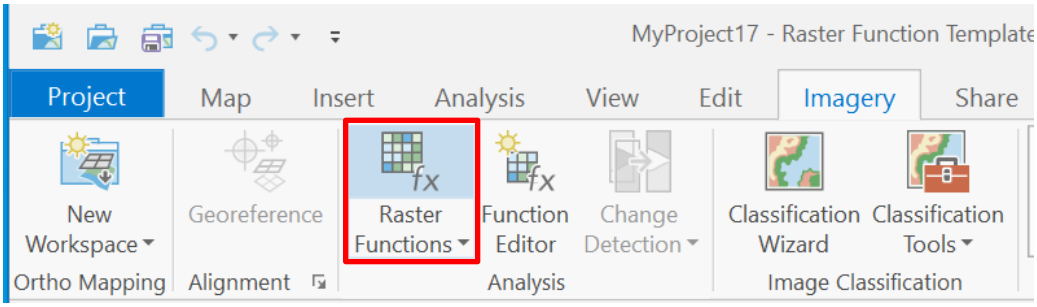


*Note that you can also choose other caching options: to keep the cache between sessions, to clear the cache when you close ArcGIS Pro, or to not cache any data locally. Since the Image Services will rarely change over time, you can keep the default **Keep the cache between sessions** option to have optimal performance, and clear the cache occasionally if needed.*

Part 3: Exploring Dynamic Capabilities

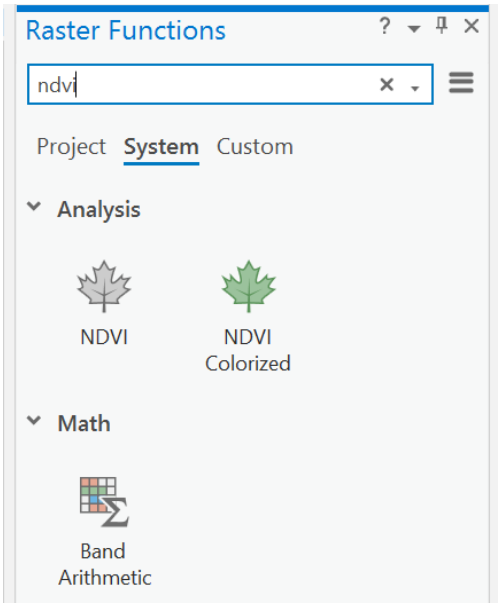
This section gives general directions to use on any digital elevation or digital surface services.

1. Go to the **Imagery** tab (**Analysis** group) and click **Raster Functions**.



   i. Make sure the NAIP layer is in **Dynamic** mode (Use Service Cache is **unchecked**).

2. In the Raster Functions search field type **ndvi.**

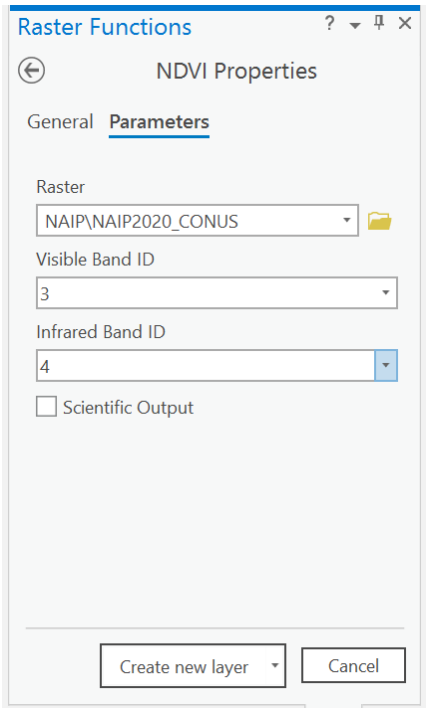


3. Click **NDVI**.

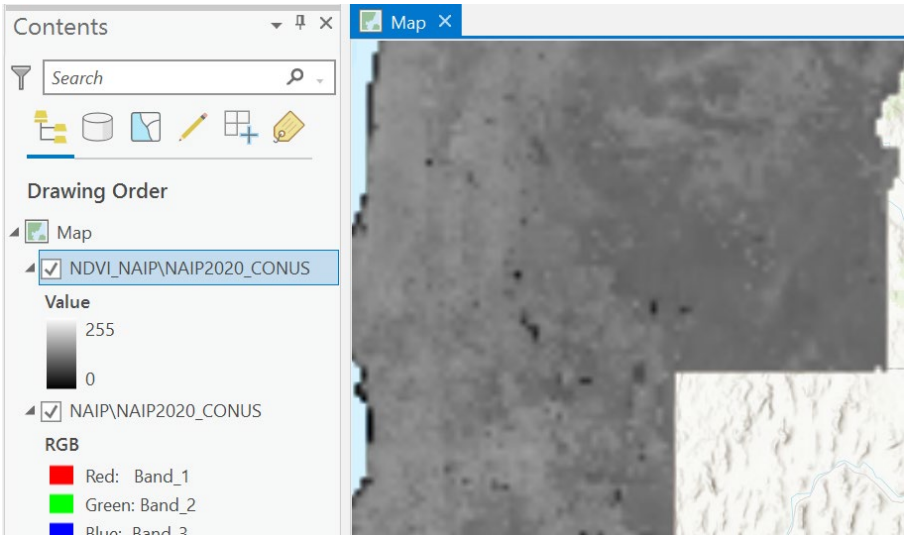
4. In the NDVI Properties pane set the Raster to the NAIP imagery you have loaded.

   i. Visible Band ID: **3**.

   ii. Infrared Band ID: **4**.



5. Click **Create new layer**.



6. If you would like to save the results locally, right-click on the result in the Contents pane and choose **Data | Export Raster**.

   i. Be sure to change the **Clipping Geometry** setting to **Current Display Extent** if you only want a subset of the layer.

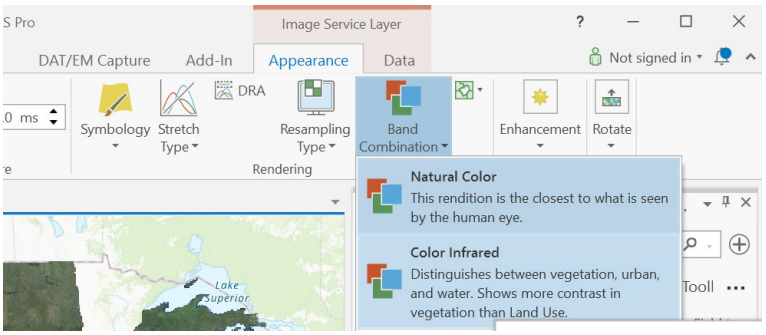
7. Feel free to explore the other functions in the list. For example, you could use terrain data (DEM) to create derivatives such as a Hillshade layer.

Part 4: Changing the Band Combination

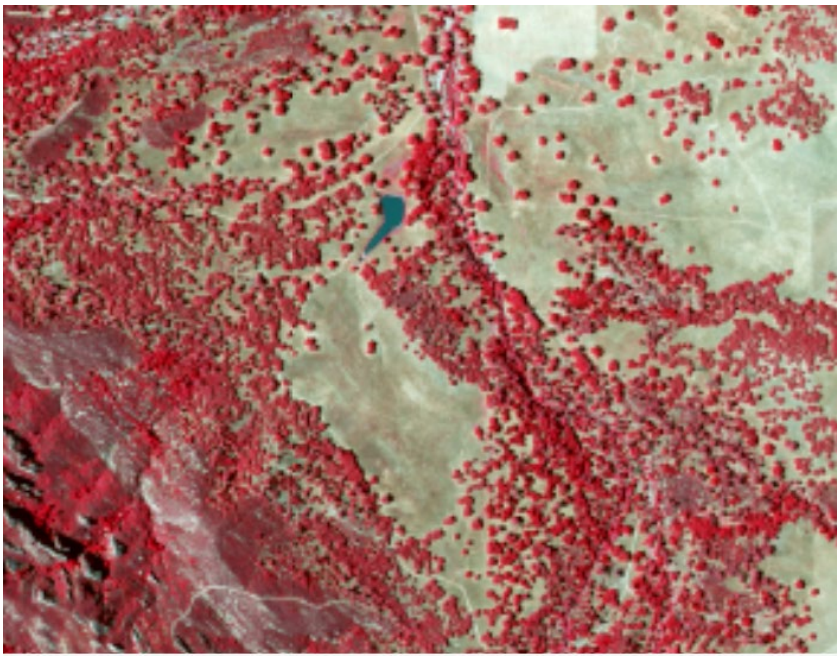
Cached tiles restrict viewing to the three bands as published. Use the following steps to view your desired band combination. The best practice for a larger data set is to first zoom to an area of interest using the cached imagery, then turn the cache off to view and interact with the dynamically served imagery based on the original data.

1. Make sure the NAIP service is in **Dynamic** mode (Use Service Cache is **unchecked**).

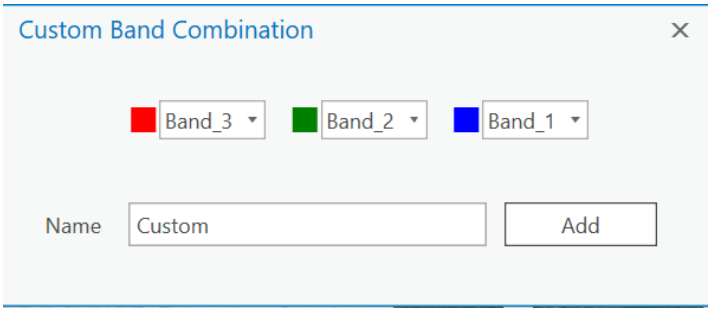
2. Go to the **Appearance** tab (**Rendering** group) and click the **Band Combination** menu**.**



3. Choose the **Color Infrared** option then examine how well vegetation stands out in the imagery.



4. Click the Band Combination menu again then click **Custom**.



5. Expiriment with different band combinations and examine how they make certain features easier to distinguish in the imagery.

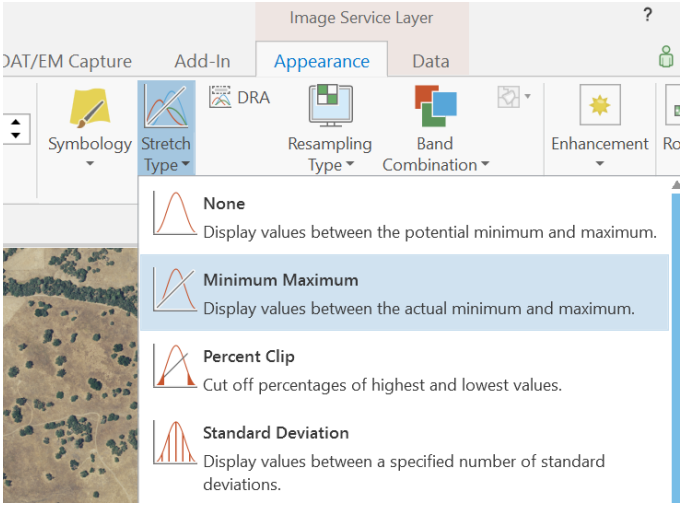
Part 5: Adjusting the Display

Tools on the Appearance tab allow you to quickly adjust the display properties and immediately review the results. This tool can work with services in either cached and dynamic modes, but should ONLY be used with dynamic mode as statistics cannot be calculated for cached services on the client end, and are not always available from the server.

1. In Contents pane make sure the NAIP service is selected.

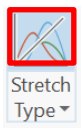
2. Click the **Appearance** tab.

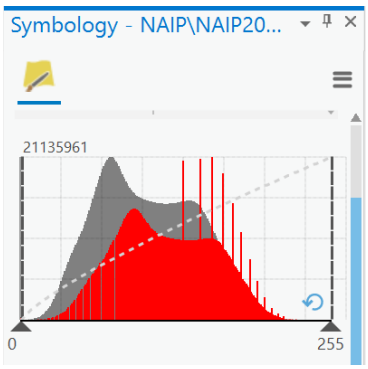
3. In the **Rendering** group click the **Stretch Type** menu button then click an image stretch method for displaying your imagery such as **Minimum Maximum**. You may want to try different methods to decide which one suits your requirements.



4. Note that you can also dynamically adjust the appearance of your imagery based on the extent shown in the display. Activate this by clicking the **DRA** button next to the Stretch Type menu (DRA stands for Dynamic Range Adjustment).

5. You can also click the **Stretch Type** button (the graph above the menu button) to directly open the Histogram pane which allows you to fine tune the display stretch properties for each band.

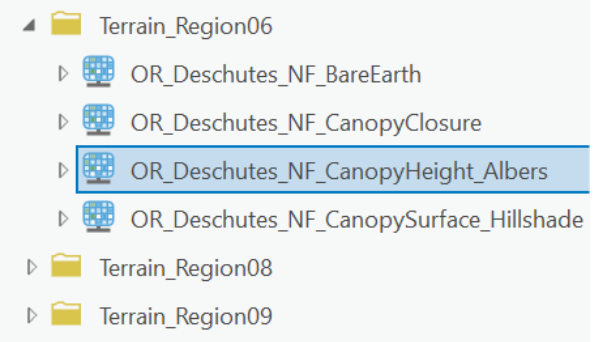




Part 6: Changing the Color Ramp for Canopy Height

In order to have the Canopy Height data appear with the correct height values, it must be served as a gray scale layer. This may not be the best display version for some users. Follow these steps to choose your own color ramp. Note that these steps are the same as changing the color ramp for any local dataset.

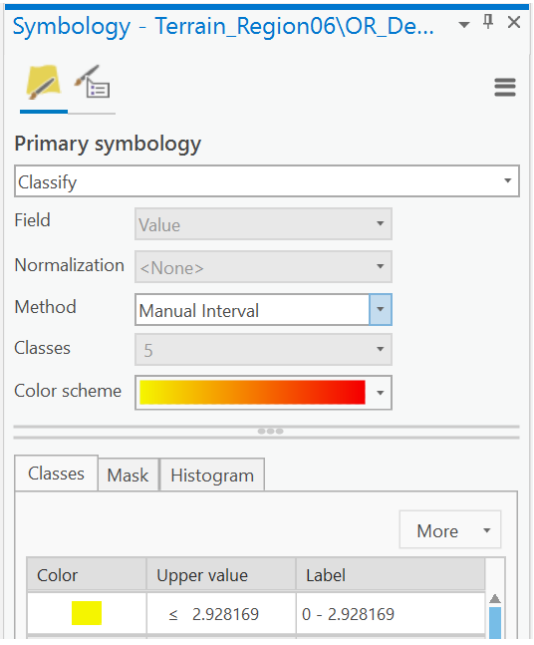
1. In the Catalog, navigate to one of the Regional Terrain folders in Image Services and add one of the Canopy Height layers to the Table of Contents (see below).



2. In the Contents pane, right-click the canopy height layer then click **Symbology**.

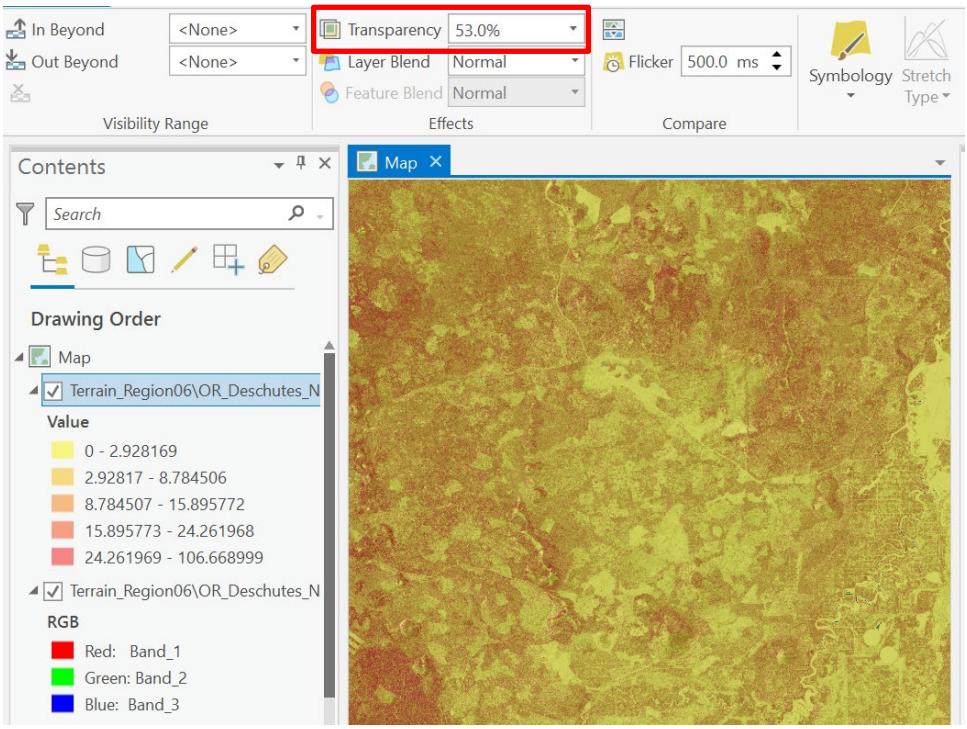
3. In the Symbology pane set the Primary symbology to **Classify**.

   i. Set the Method to **Manual Interval**.



4. You can then edit the class values in the lower section of the window.

5. Try displaying your color height classes with a transparency on top of the highest hit hillshade layer.



End of exercise