Last Updated: February, 2017
Version: ArcMap 10.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 ArcMap (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 **ArcMap** from the start menu by clicking **Start | Programs | ArcGIS | ArcMap**.

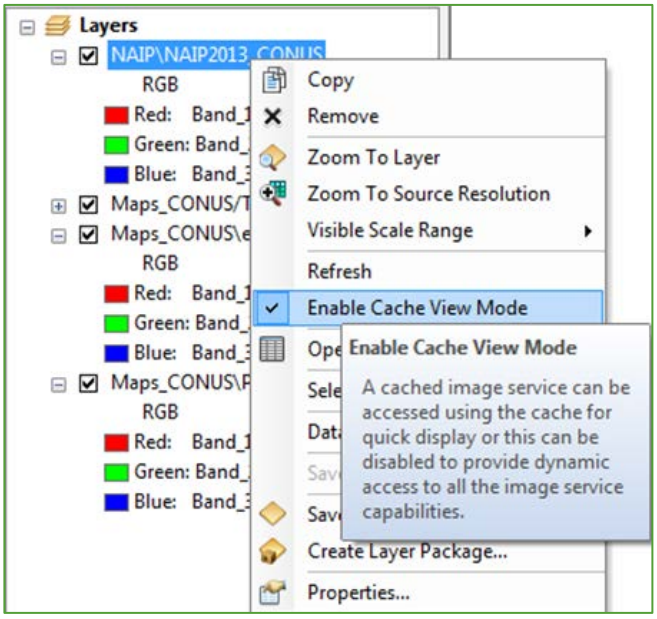
2. Close any start-up screens that may appear.

3. Open the **Catalog** and select some **NAIP** imagery to load into the Table of Contents.

4. In the Table of Contents, right-click on the image service layer.

5. In the contextual menu that appears, click on **Enable Cache View Mode** (see below) to remove the check mark and turn off caching.

Note: If a checkmark is not present and the Enable Cache View Mode 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.

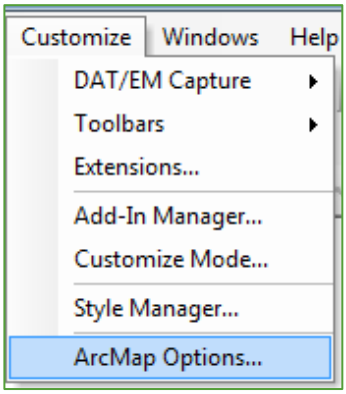
7. To return to cached data, right-click on the image service, and click on **Enable Cache View Mode**.

Part 2: Changing and Clearing the Cache Folder

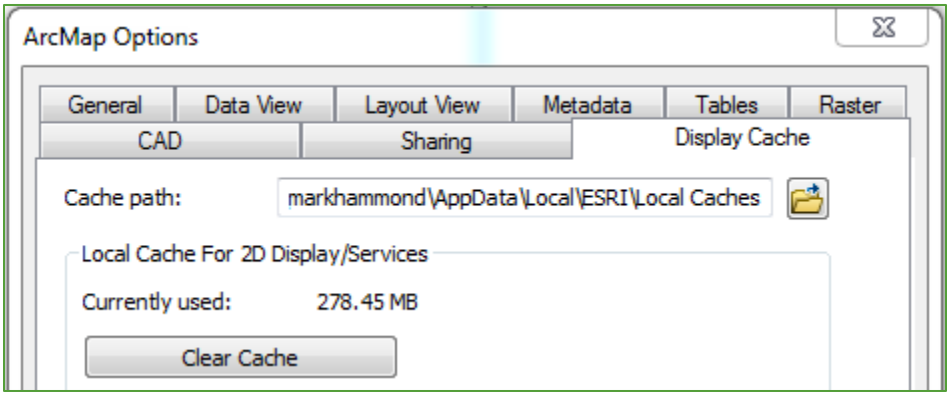
Cached imagery is saved on your local hard drive; this is what allows for the improved refresh speed while navigating the services. You have the ability to designate the folder where the cache tiles are saved, which is useful if the default drive is running short on space. It is recommended that you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

A. Changing the Cache Folder

1. In the ArcMap main menu, select **Customize | ArcMap Options…** (see below).



2. Click on the **Display Cache** tab (see below).



3. Next to Cache path, click on the yellow folder icon, and select a new folder.

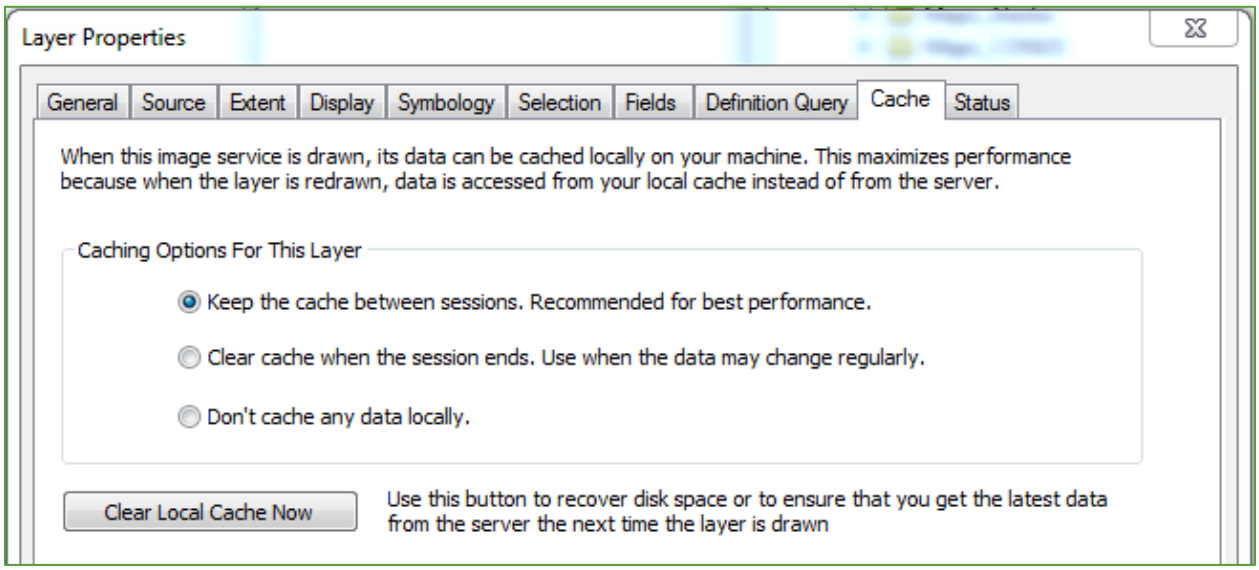
B. Clearing the Cache

1. Make sure that you are in Cache view mode

2. In the **Table of Contents**, right-click on the desired service.

3. Click on **Properties**, then click on the **Cache** tab.

4. Finally, click on the **Clear Local Cache Now** button (see below).



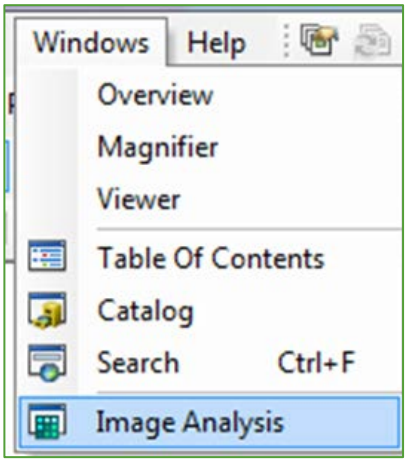
*Note that you can also choose other caching options: to keep the cache between sessions, to clear the cache when you close ArcMap, or to not cache any data locally. Since the Image Services will rarely change over time, you can keep the default **Keep the cache between sessions** option to have optimal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

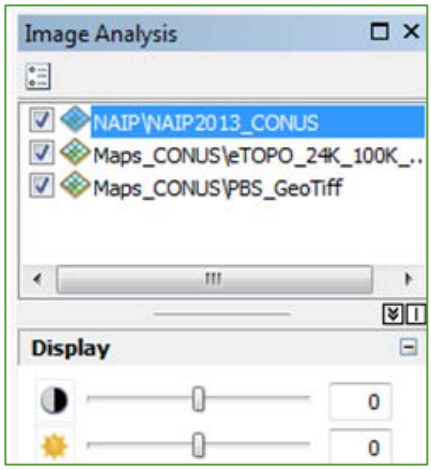
1. On the ArcMap main menu, click **Windows | Image Analysis** to turn on the Image Analysis tool (see following graphic).

    i. Make sure you have a Service in **Dynamic** mode.



2. The Image Analysis tool will open. Dock it if desired; you may need to click and drag the bottom of the window down to view the entire tool.

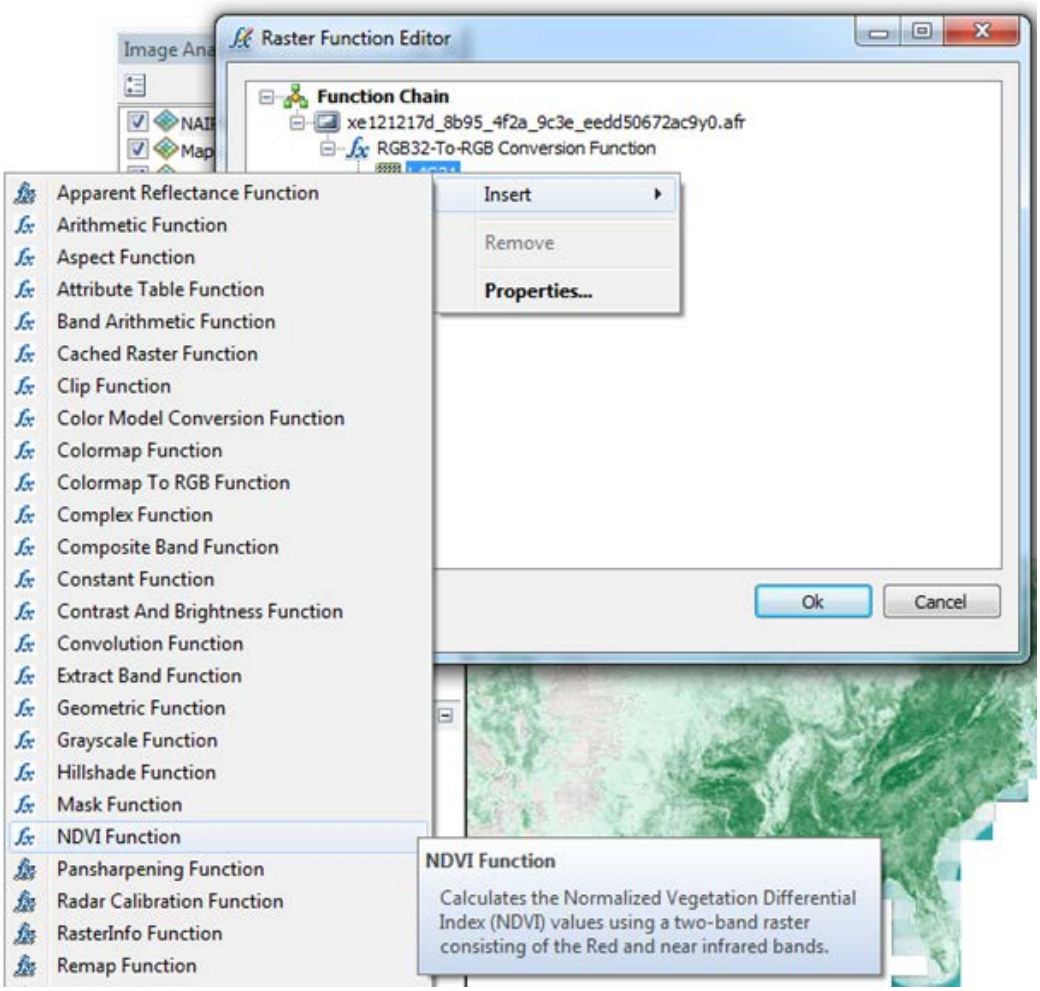
3. In the top window, click on the image service which you would like use. Notice that when you do, most of the tools will now be available.



4. In the Processing section click on the **Add Functions** button.

5. In the **Raster Function Editor** dialog, right-click on the service name at the bottom of the Function Chain, click on **Insert**, and select one of the available functions.

6. For example, if you are viewing 4-band imagery click on **NDVI Function** (see following graphic).



7. In the **NDVI** tab of the **Raster Function Properties** dialog, make sure the Visible Band ID is set to **3** and the Infrared Band ID is set to **4**, click **OK**, then click **OK** in the Editor.

8. The function will be processed, and then the result added to your map document.

9. If you would like to save the results locally, right-click on the result in the Table of Contents and choose **Data | Export Data**. Be sure to change the **Extent** setting to **Data Frame**, and make any other desired changes.

   (a) 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

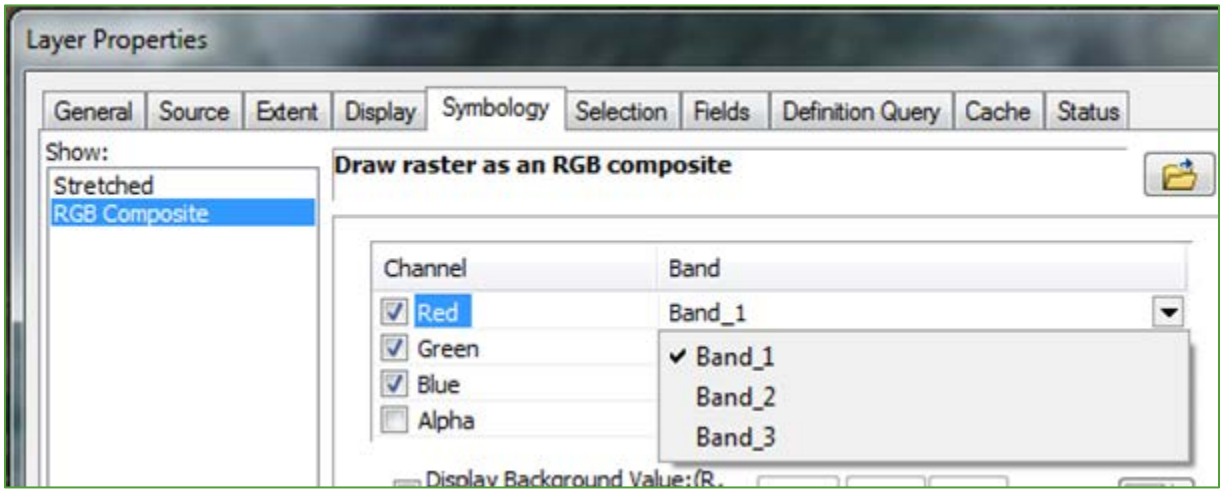
Cached tiles restrict viewing to the three bands as published. Use the following steps to view your desired band combination. The best practice for a larger data set is to first zoom to an area of interest using the cached imagery, then turn the cache off to view and interact with the dynamically served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

1. In the Table of Contents, right-click on the image service layer and make sure the **Enable Cache View Mode** has a check next to it.

2. Right click on the image service layer again, then click **Properties.**

3. Click the **Symbology** tab and then click one of the down arrows next to the Bands.

   (a) Notice that there are only 3 bands available. This is because the service is in Cache View Mode (see below).

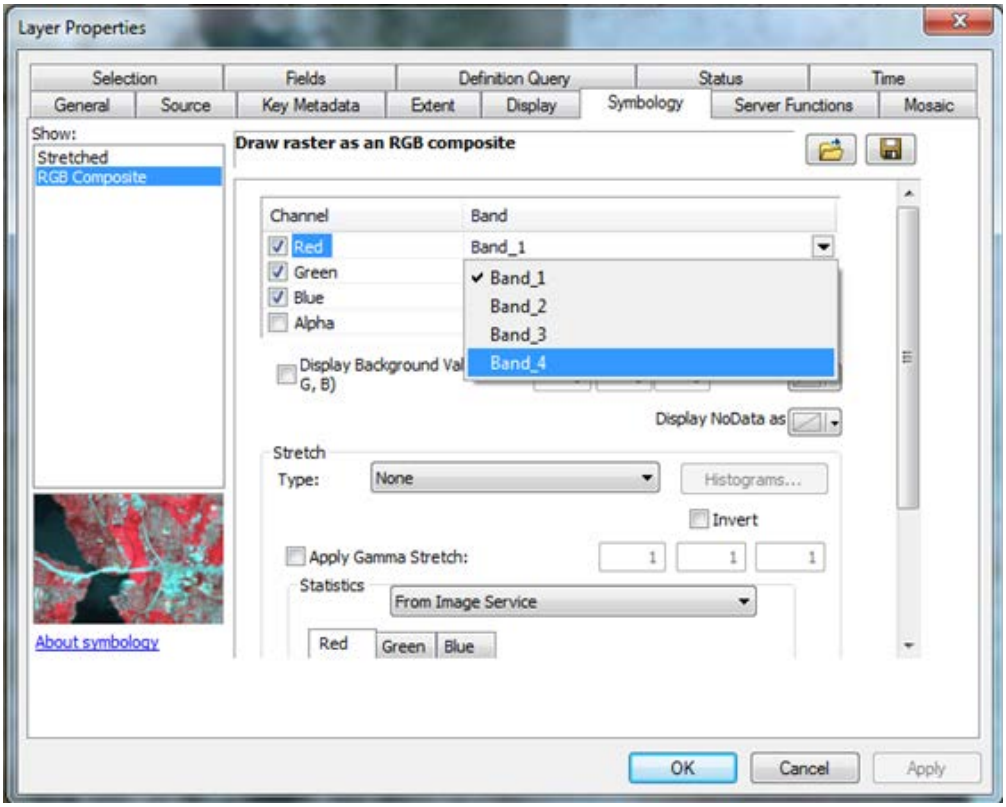


4. Close the Layer Properties dialog and right click on the service layer again.,

5. Click on **Enable Cache View Mode** to remove the check mark and turn off caching. The image service is now in Dynamic Mode.

6. Right-click again on the layer then click **Properties|Symbology.**

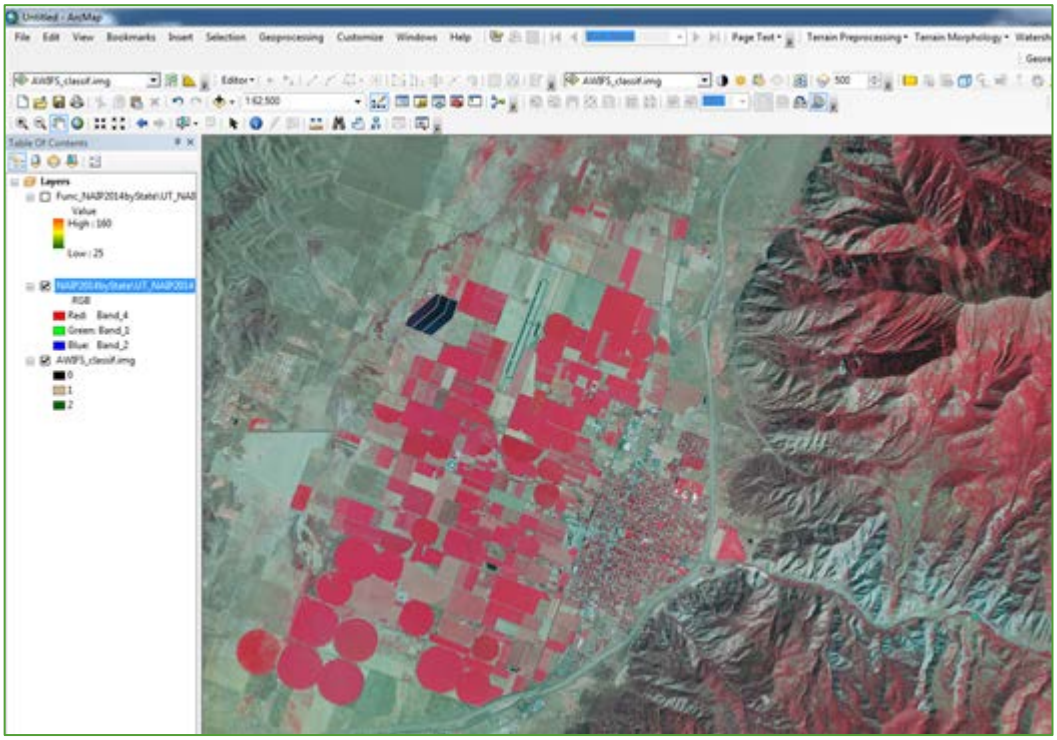
7. To make a color infrared combination, first assign the Red channel to the near infrared band by clicking the arrow next to **Band 1** and selecting **Band 4**.



8. Assign the Green channel to **Band 1** (the red band) .

9. Assign the Blue channel to **Band 2** (the green band).

10. Click **Ok,** then inspect the resulting image (healthy vegetation should appear red as in the following graphic).



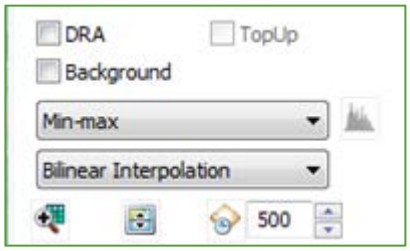
Part 5: Adjusting the Display

Typically you use the Layer Properties to change the appearance of data in the map window. However, the Image Analysis tool allows 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. With a service displayed in the map window, make sure the Image Analysis tool is open.

2. In the image list, click on the desired service to select it.

3. In the lower half of the **Display** section, click on the top drop down (see below; the bottom drop down is usually set to Bilinear Interpolation.)



4. Choose a image stretch method for displaying your imagery, such as Min-max. You may want to try different methods to decide which one suits your requirements.

5. Note that you can also dynamically adjust the appearance of your imagery based on the extent shown in the display. Activate this by clicking in the check box to the left of DRA (which stands for Dynamic Range Adjust.)

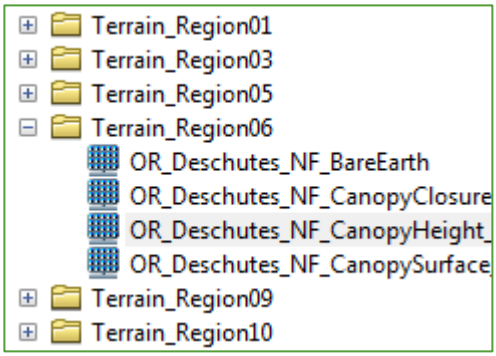
6. You can also click on the Histogram button (to the right of the stretch method dropdown, see below) to fine tune the display stretch properties for each band.

There are many other tools in the Image Analysis dialog. You are encouraged to investigate them on your own, or review the documentation on the ESRI website (http://resources.arcgis.com/en/help/)

Part 6: Changing the Color Ramp for Canopy Height

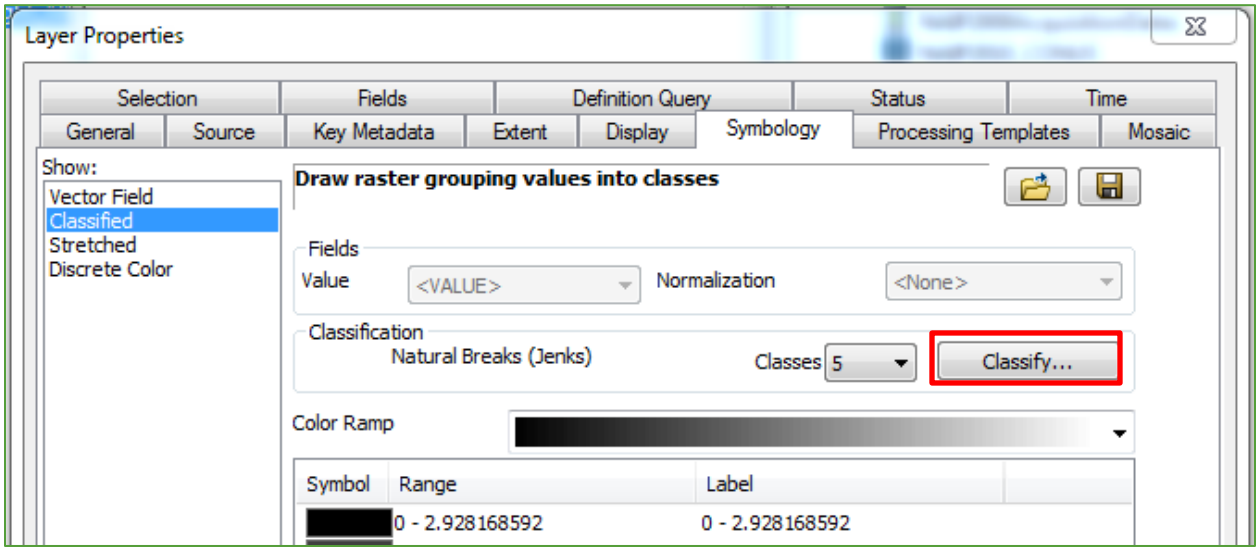
In order to have the Canopy Height data appear with the correct height values, it must be served as a gray scale layer. This may not be the best display version for some users. Follow these steps to choose your own color ramp. Note that these steps are the same as changing the color ramp for any local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

1. 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).



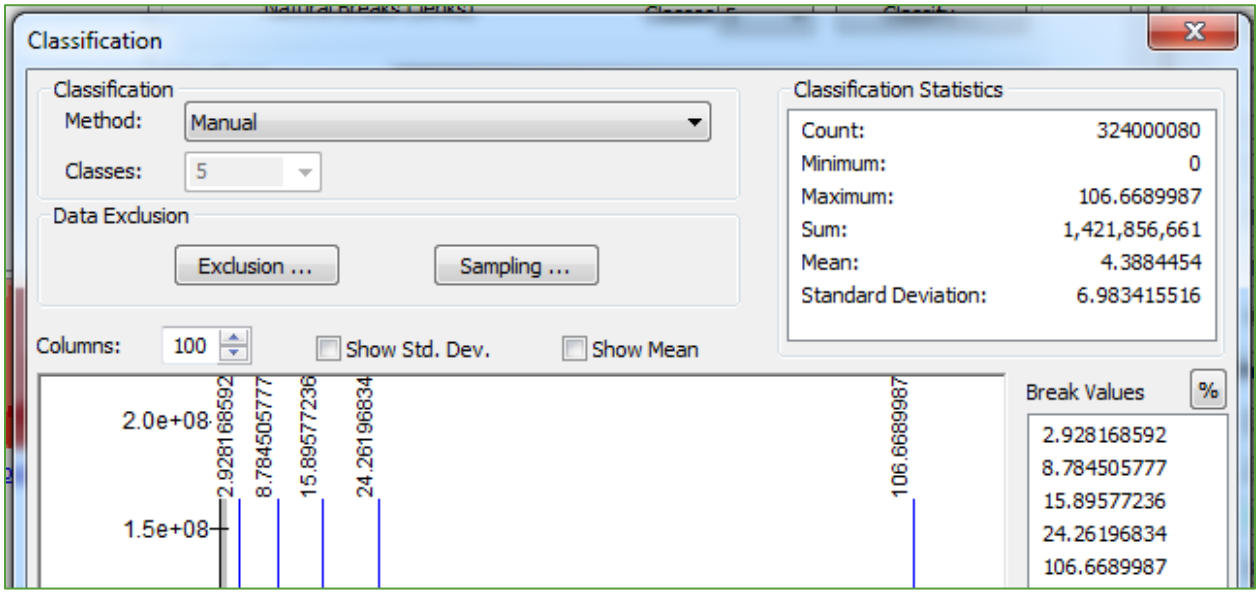
2. Double-click on the canopy height layer in the Table of Contents to open up the Layer Properties window.

3. Click on the **Symbology** tab and then select **Classified** in the section to the left and click on the **Classify…** button (see below).



4. In the **Classification** window select the number of classes you want to display and then select **Manual** as the classification method (you can experiment with other classification methods as well).

5. You can then edit the break values in the **Break Value** section to the right to reflect your desired height classes (see below).



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