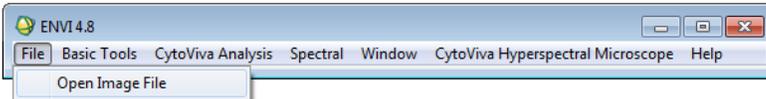
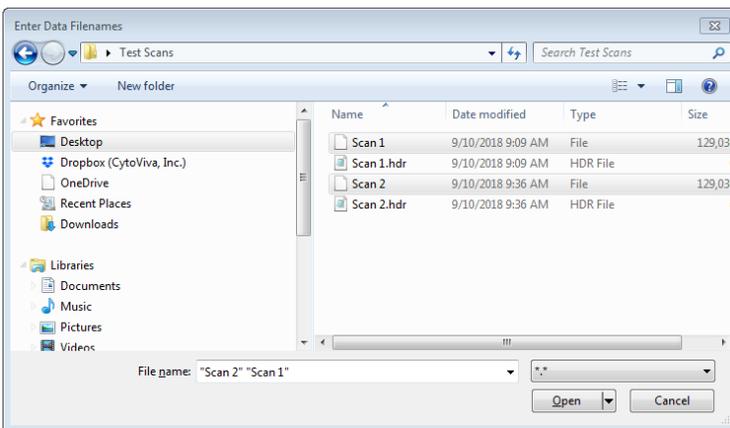


Mosaicking is used to assemble (or stitch) multiple images together. In this example, we will illustrate the basic technique of stitching together two images of equal size using the *Pixel Based* technique and saving them as a single consolidated image. *There are advanced techniques for mosaicking that can be reviewed in further detail on the manufacturer website here: <https://www.harrisgeospatial.com/docs/MosaicImages.html>*

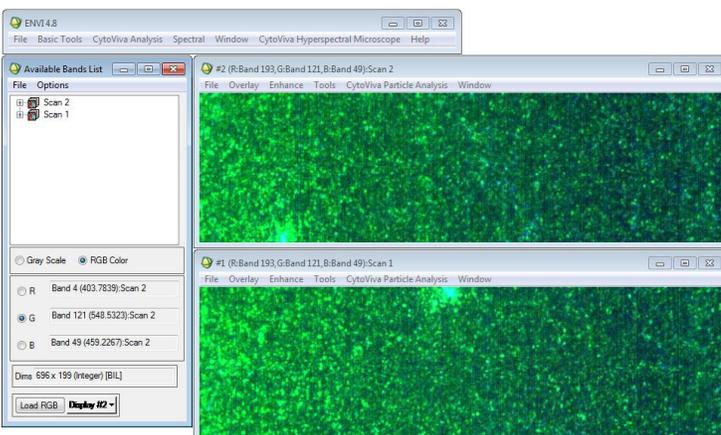
- 1) To begin, open ENVI and go to **File > Open Image File**.



- 2) Go to the folder containing the images you wish to stitch together. You can open the images one at a time or select more than one by holding down the **CTRL** key. Once all of the desired images are chosen, select **Open**.



- 3) Next, the images will display. In this example note that we have changed the enhancement filter from the default display to visualize the images and ensure they are the images we want to use (*this point will come into effect in a future step*). You can leave the images open or close the image window, but the image files must remain in the Available Bands List window to be accessible in the next steps.

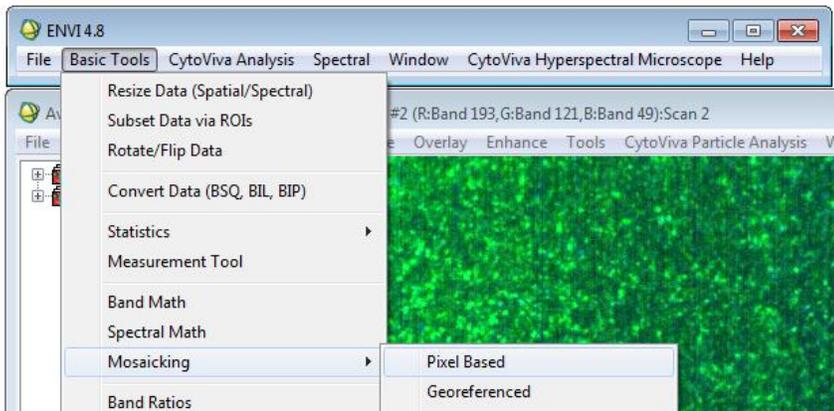




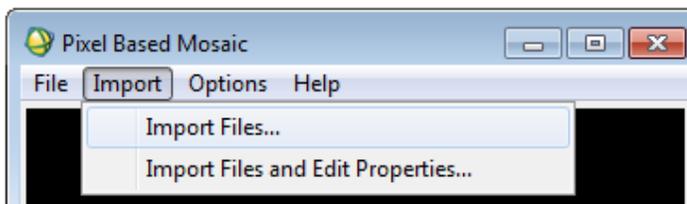
- 4) Before proceeding it is helpful to know the size (in pixels) of the images. You can locate this information by opening the image header (.hdr) file in notepad. In the image below we can see that the width is 696 pixels (all scans are 696 pixels wide) and the height is 199 pixels/lines. The height is variable and a user defined value set when the original scan was taken. *It is important to note that the images being combined do not have to be the same size.*

```
Scan1.hdr - Notepad
File Edit Format View Help
ENVI
description = {
CytoViva HSI Microscopy image,
Date = Mon Sep 10 09:09:03 2018,
Camera vendor = Cooke/PCO PixelFly Camera,
CCD dimensions = 696x520x1392x1040,
Exposure time = 0.250000,
Gain = 0.000000,
Trigger = 0,
Objective magnification = 100.000
}
samples = 696
lines = 199
bands = 477
```

- 5) Now that we know the image size, we can proceed to the mosaicking too by selecting **Basic Tools > Mosaicking > Pixel Based**.

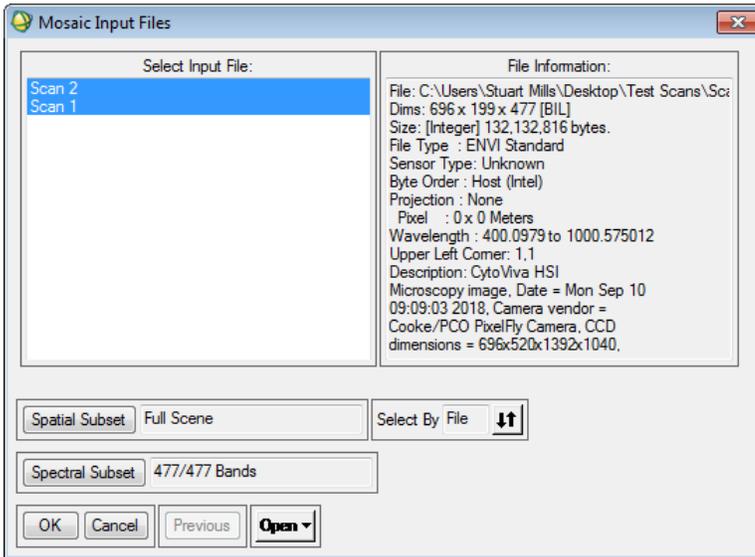


- 6) To add the images that you are combining, go to **Import > Import Files**.

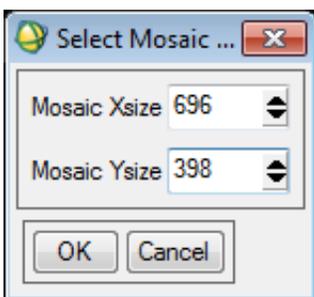




- 7) Next you will see the 'active' images that are in your current session of ENVI that you can add. Select the desired images by holding down the **CTRL** key and selecting the images. Then select **OK**. (As with other ENVI processes, you can load additional files into the current ENVI session by selecting **Open** at the bottom of the window).

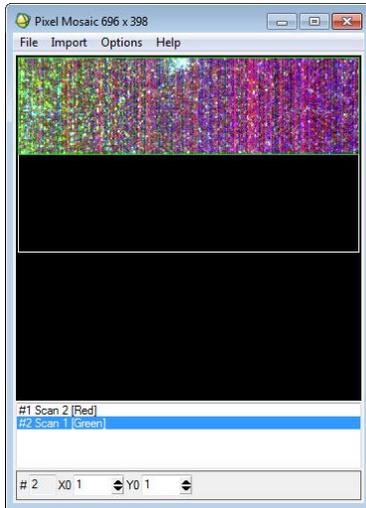


- 8) The next procedure presents you with the size settings for the mosaic. Note that this will be the final size of the combine images. In this example we know that our two images are 696 pixels wide and 199 pixels high. Since we want to combine them vertically we will choose a final size of 696 wide (Mosaic Xsize) by 398 pixels high (Mosaic Ysize). *If we wanted to combine the images horizontally we would select 1392 as the Mosaic Xsize and 199 for the Mosaic Ysize.* When completed, select **OK**.

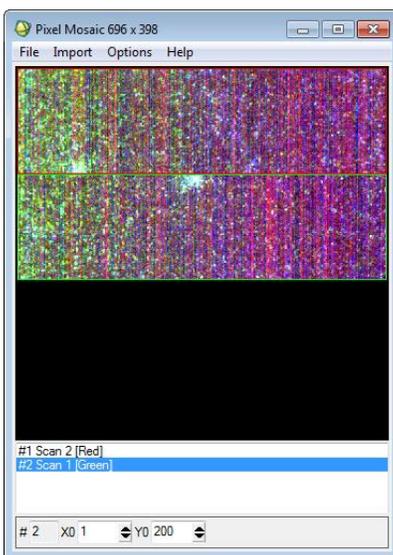




- 9) You are now presented with the canvas window, and you can see the file names listed in the bottom of the window. *Don't be alarmed that you only see one image, as the images are simply stacked on top of one another which is addressed in the next step.* You can see the mosaic size in the header (696 x 398) and the visible reference to the canvas size referenced by the white border. Also note that the images optically appear different than what we see in step 3. Remember, in step 3 we changed the enhancement filters, but when you are mosaicking images the preview uses the enhancement filter that your ENVI profile is set to.

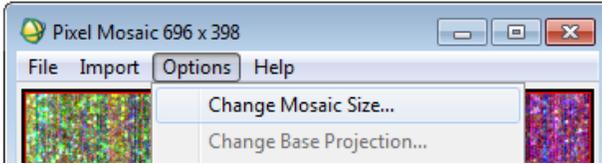


- 10) To align the images, first select the image in the list at the bottom that you wish to move. You can move the selected image within the canvas by adjusting the values in the boxes at the bottom manually or by selecting the up or down arrows. This can be helpful for final, precise alignments at the individual level when you are aligning multiple images with varied sizes. In this example, we simply selected Scan 1 and using our mouse, clicked on the image, dragged it by holding the mouse button, then releasing the mouse button when the image is at the desired position.

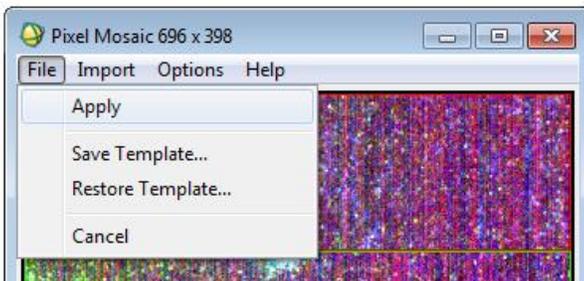




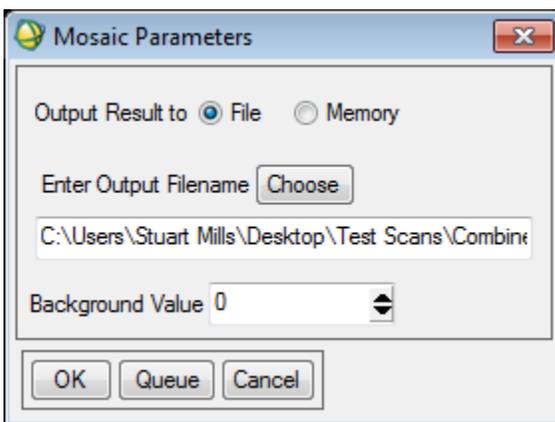
11) If you determine that you need to change the mosaic canvas size, go to **Options > Change Mosaic Size**.



12) If you are satisfied with your combined image layout and are ready to save as a single combined image, go to **File > Apply**.



13) Select **Choose** to designate the combined image file name and location where it should be saved. Then select **OK**.





14) You are now presented with the combined image. In this example we have adjusted our enhancement filter back to the one desired for this image. All standard analysis tools are viable to begin analyzing this combined image.

