

Miscellaneous Operations and Integrating Data

ERDAS Imagine 2016

Description: Assembling your data rarely goes as smoothly as planned. This lab describes some operations you can do to fix some of these shortcomings

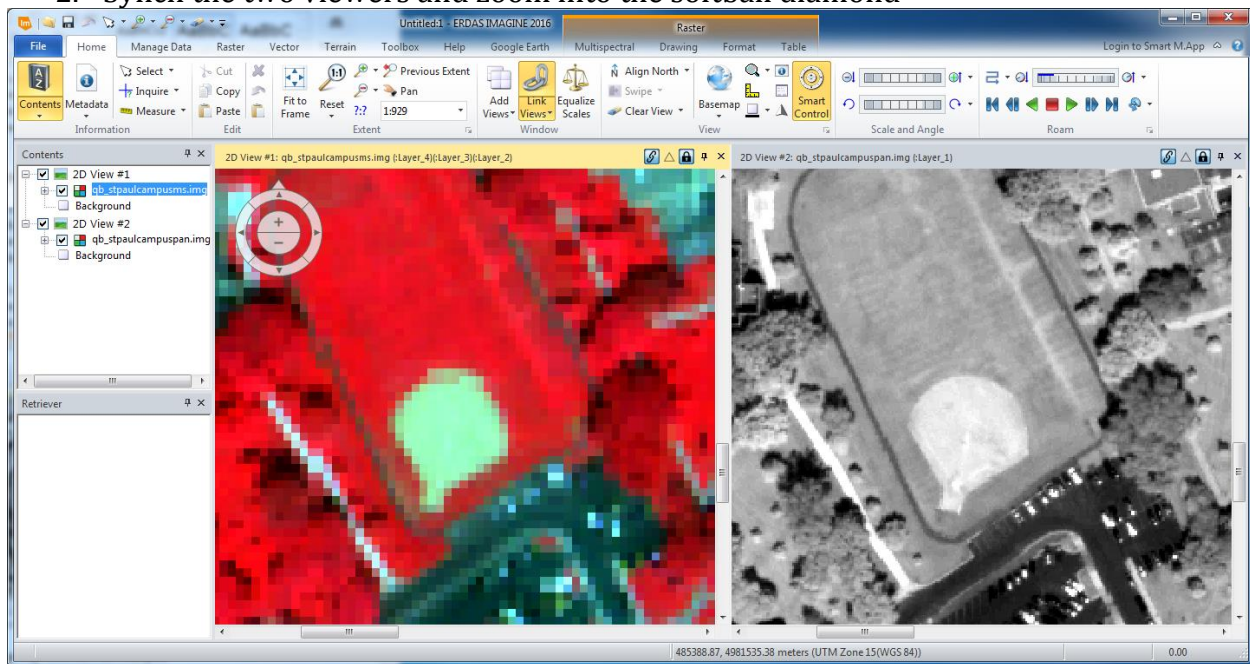
Miscellaneous Operations

Very frequently we need to clean up data that we want to use for a project. Perhaps we want to improve resolution of Landsat by utilizing the pan-chromatic band to “sharpen” the data. As you have learned by using the Glovis browser, clouds are an often occurring irritant, especially when doing change assessment across several years. Perhaps you were able to acquire 3 color NAIP and your project sorely could utilize that useful NIR band of imagery. In this lab we’ll look at some of the steps you can utilize to mitigate some of these issues.

Pan Sharpening Imagery

Many of the commercial satellites provide a panchromatic band of imagery that is at a higher resolution than the multispectral information. In this lab we will look at some Quickbird 4 band imagery of the St. Paul Campus area and utilize the Panchromatic band to sharpen the imagery. Both images were taken acquired on June 25, 2009.

1. Open ERDAS Imagine, add a second viewer and open the following files, one in each viewer: QB_StPaulCampusMS.img and QB_StPaulCampusPan.img
2. Synch the two viewers and zoom into the softball diamond

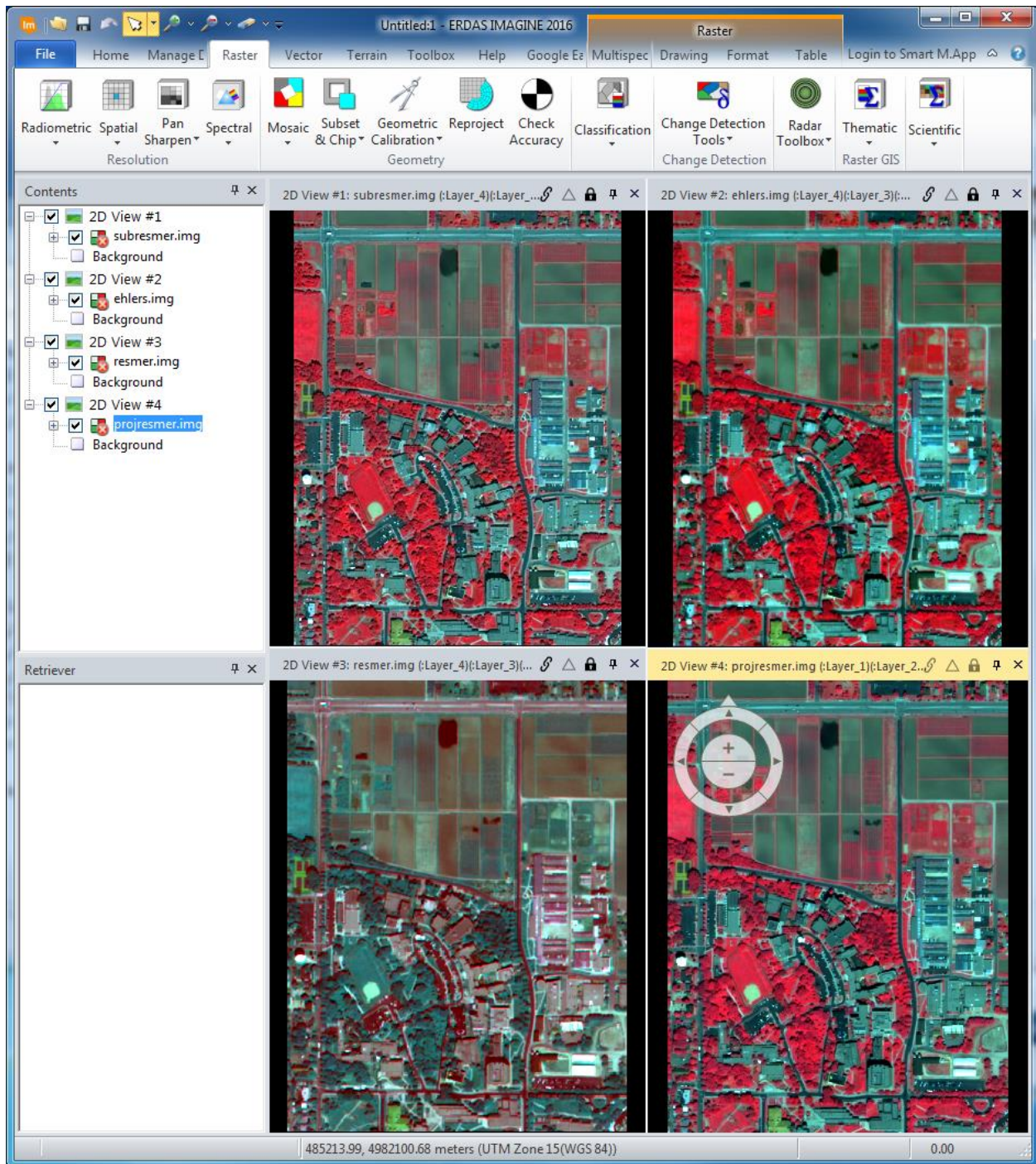


What do you notice about the two views in terms of resolution? Record the resolution of each of the scenes in your lab assignment.

3. On the Raster tab in the resolution group click on Pan Sharpen



4. Notice there are 8 different algorithms available to Pan Sharpen our imagery. We'll look at 4 of them. Use the default settings and take a screen shot of each of your input dialog boxes prior to clicking OK:
 - a. Subtractive Resolution Merge
 - b. Ehlers Fusion (Be sure to click **Use all Bands** in the Multispectral Input File section)
 - c. Resolution Merge
 - d. Projective Resolution Merge
5. Place the four output images into a ERDAS session with 4 viewers open

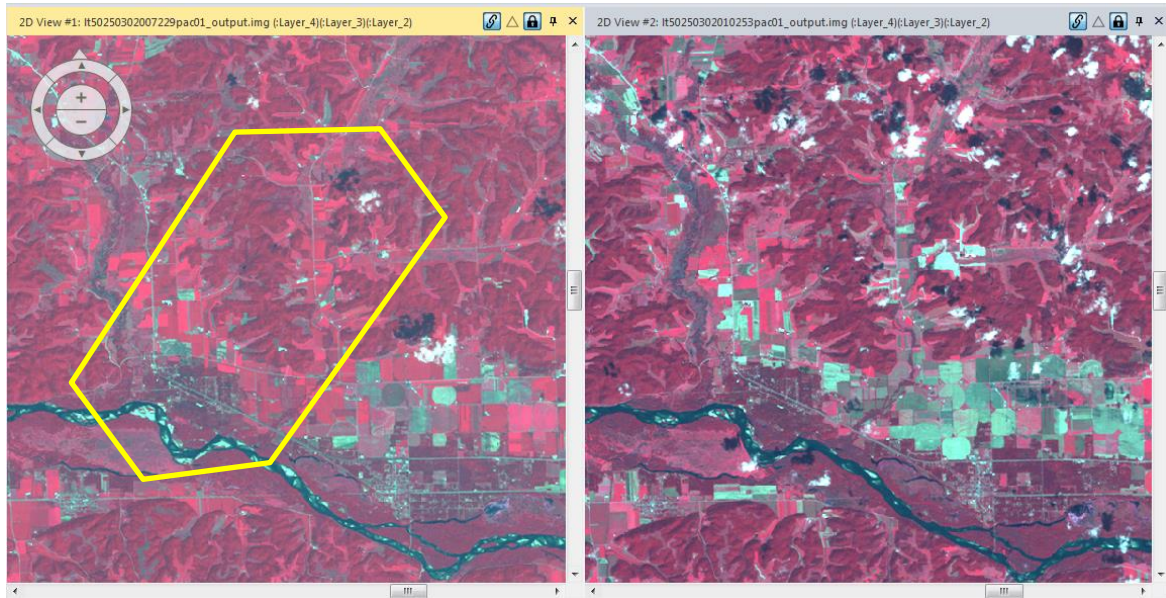


6. In your lab write-up, review each of the 4 and determine which you would want to use and why. Zoom in during your analysis and look at objects like sidewalks with distinct boundaries that may have split the larger multispectral pixels. You will find it extremely useful to Sync Views while doing your examination.

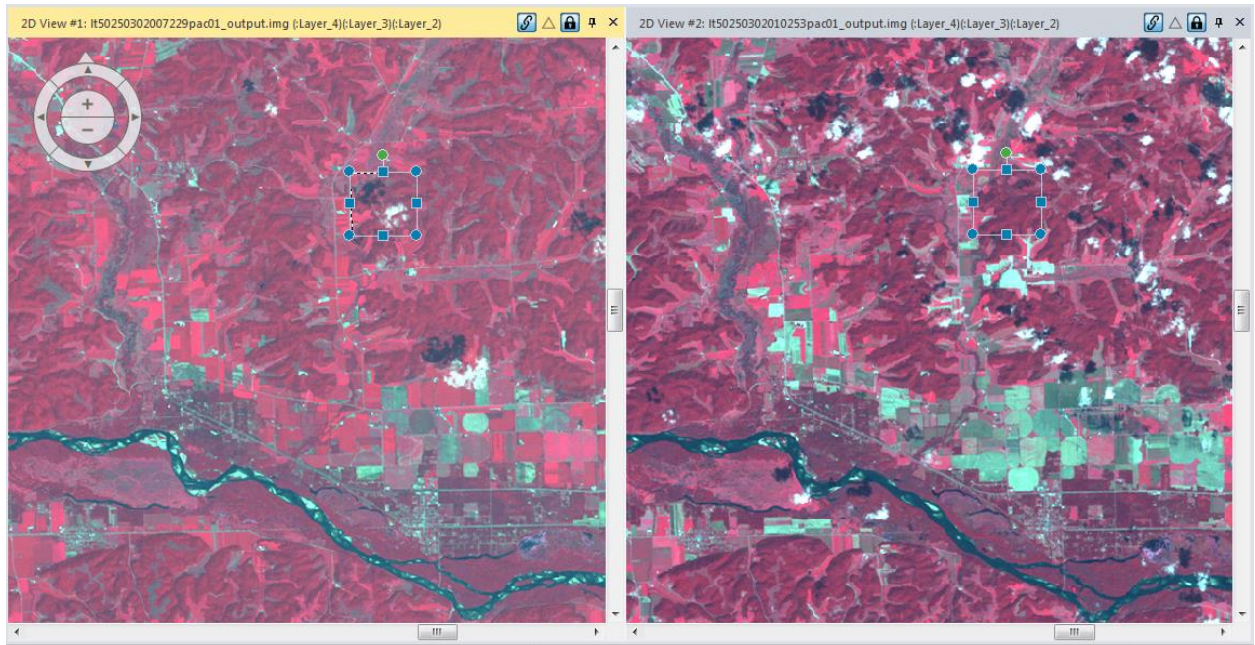
Cloud Reduction

Clouds seem to be an ever present menace in remote sensing (unless you're using radar!) In this section we'll look at a way that you can utilize two images and utilize the cloud free imagery area of one to replace clouds on the other.

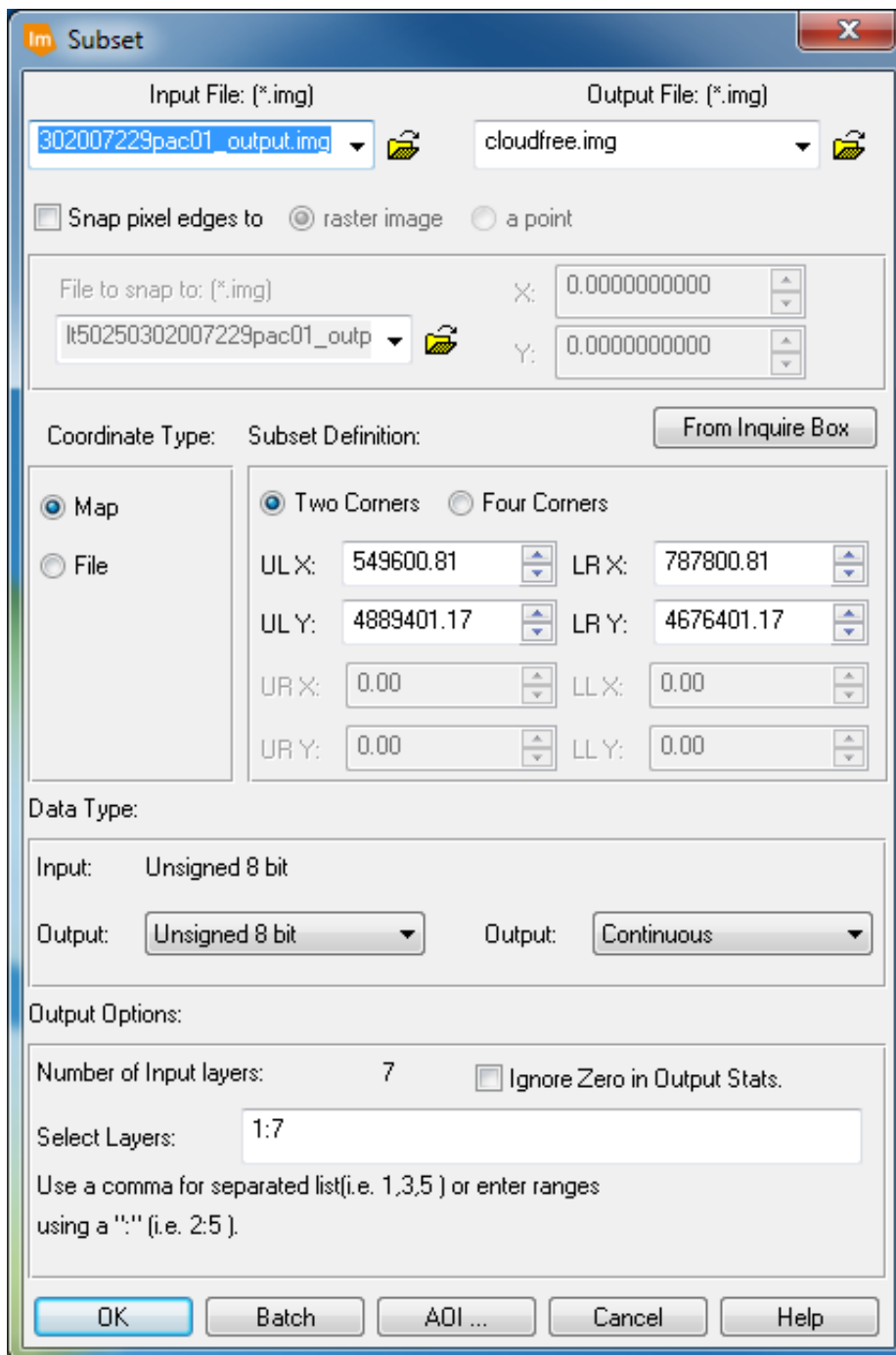
7. Open an ERDAS Imagine session with two 2D Viewers. Load into them the following rasters
 - a. lt50250302007229pac01_output
 - b. lt50250302010253pac01_output
8. Zoom in to the northeast portion of the screen until you find a scene similar to below



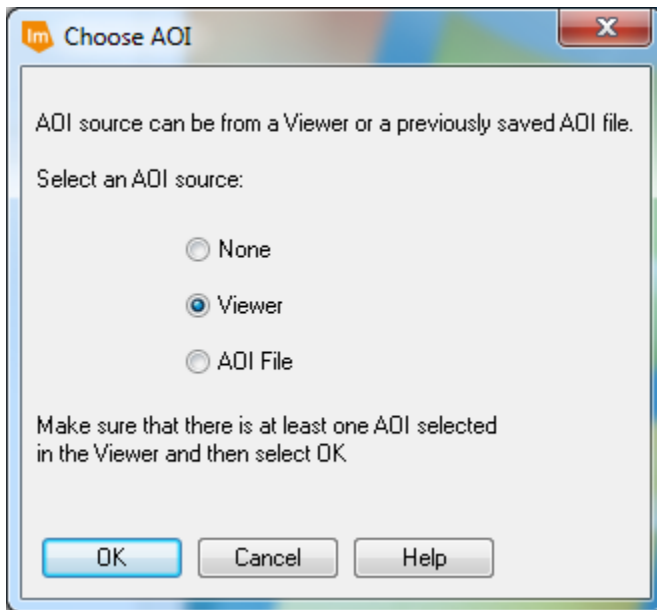
9. Let's say our study area is in the polygon on the left. Notice the small cloud and its shadow that are in the northeast corner of our study area. We want to remove the cloud that is in our study area and replace it with the imagery on the right.
10. The First step is to draw and AOI of the area we want to replace, similar to how we used the drawing tools in the Supervised Classification Lab. Your screen should look like below when you are done:



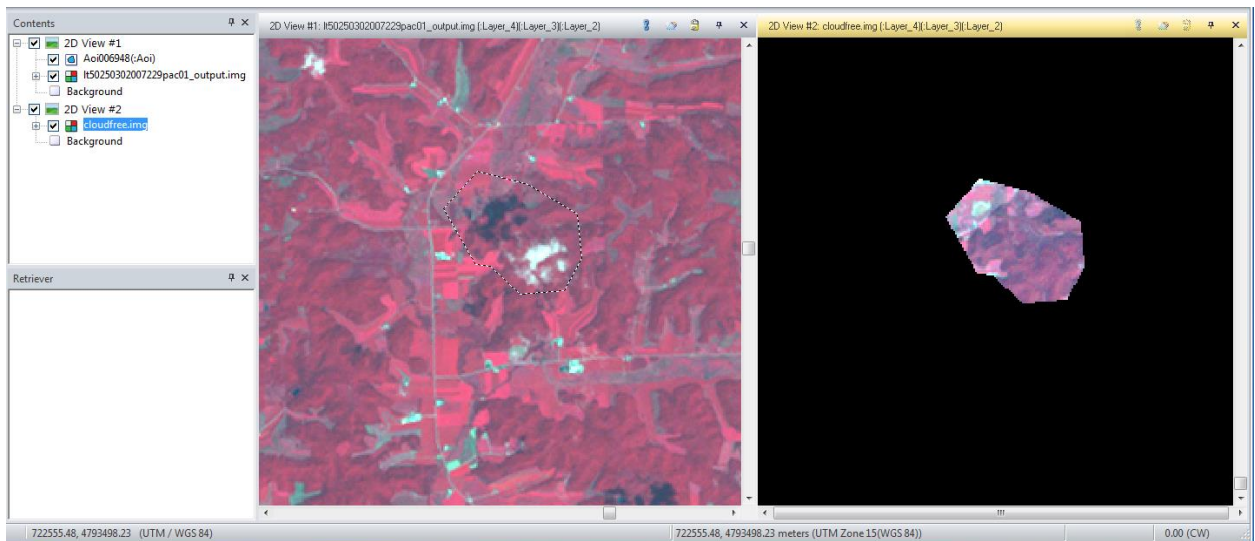
11. Notice the AOI is highlighted
12. Go into Raster > Subset & Chip > Create Subset Image
13. For the input file pick lt50250302010253pac01_output
14. For the output File create a file called CloudFree.img on your student drive



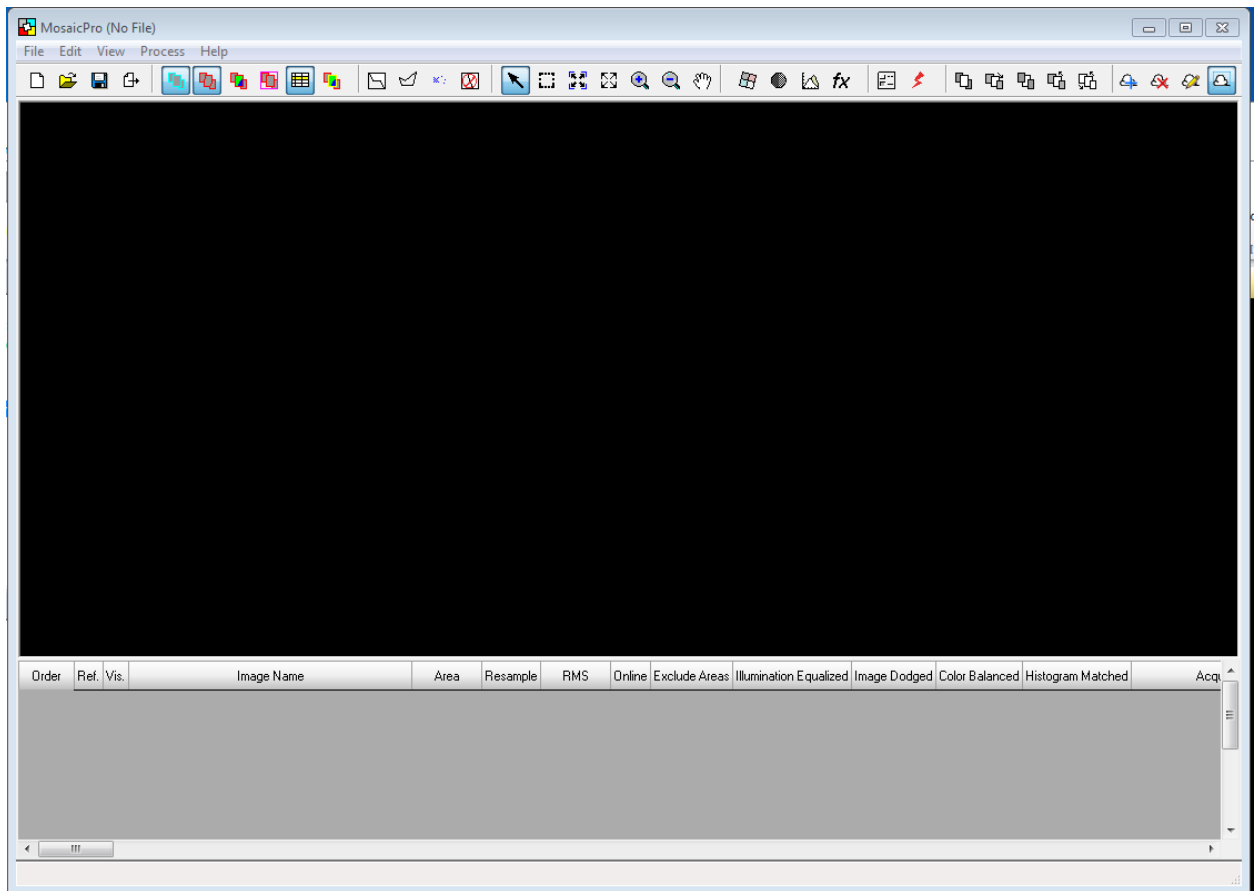
15. Click on AOI>>> and from the Chose AOI window make certain that **Viewer** is selected




16. And click OK to close the Chose AOI window
17. Click OK on the Subset Window to clip the cloudfree imagery
18. Remove lt50250302010253pac01_output from the viewer and replace it with the CloudFree image. Your two viewers should look like:




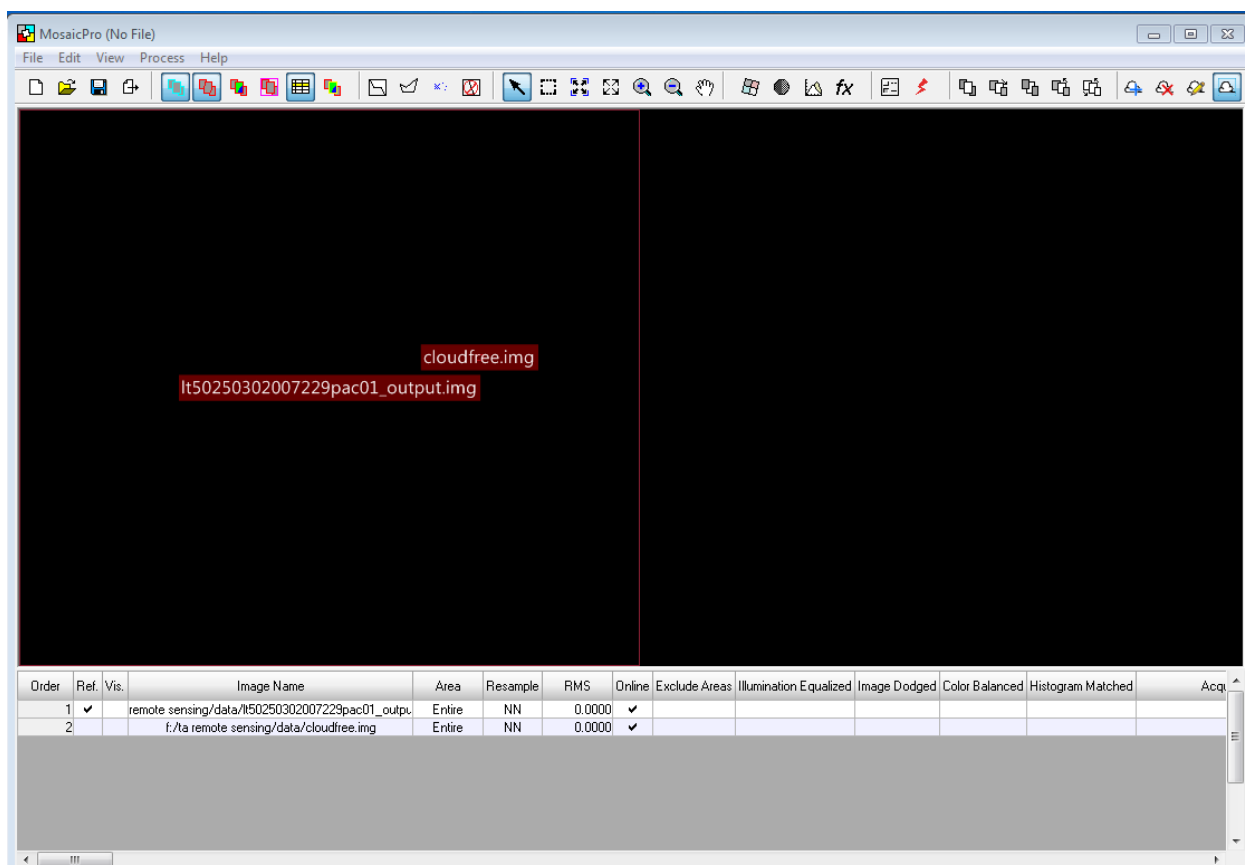
19. Our last step is to Mosaic the cloud free imagery on top of the original imagery. From the Raster tab select Mosaic and Mosaic Pro to open its main window



20. Click the Add Images icon  and browse to and load both:

lt50250302007229pac01_output and the CloudFree subset image you made.


21. You can display the imagery by clicking on the Display Raster Images button 

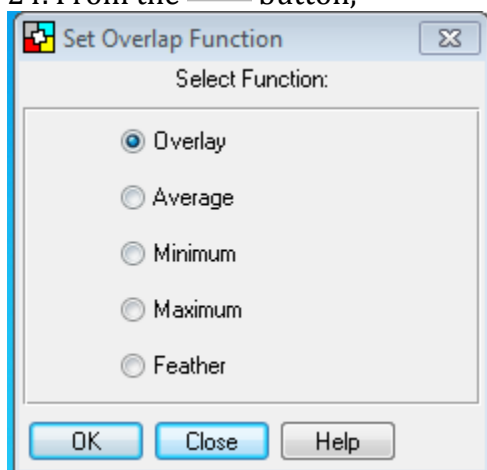


Notice the file names show in the pane below.

22. Click the Vis column for each row to view the images

23. Make sure the cloudless file is the Ref file by clicking in the appropriate cell

24. From the  button,



25. select Overlay

26. Click on the Run Icon 

27. In a few moments, you will be asked for an Output file name, chose a name and place it on your student drive and click OK to begin the Mosaic process. After pyramids are computed, load the new image into your Imagine screen along with the original lt50250302007229pac01_output.

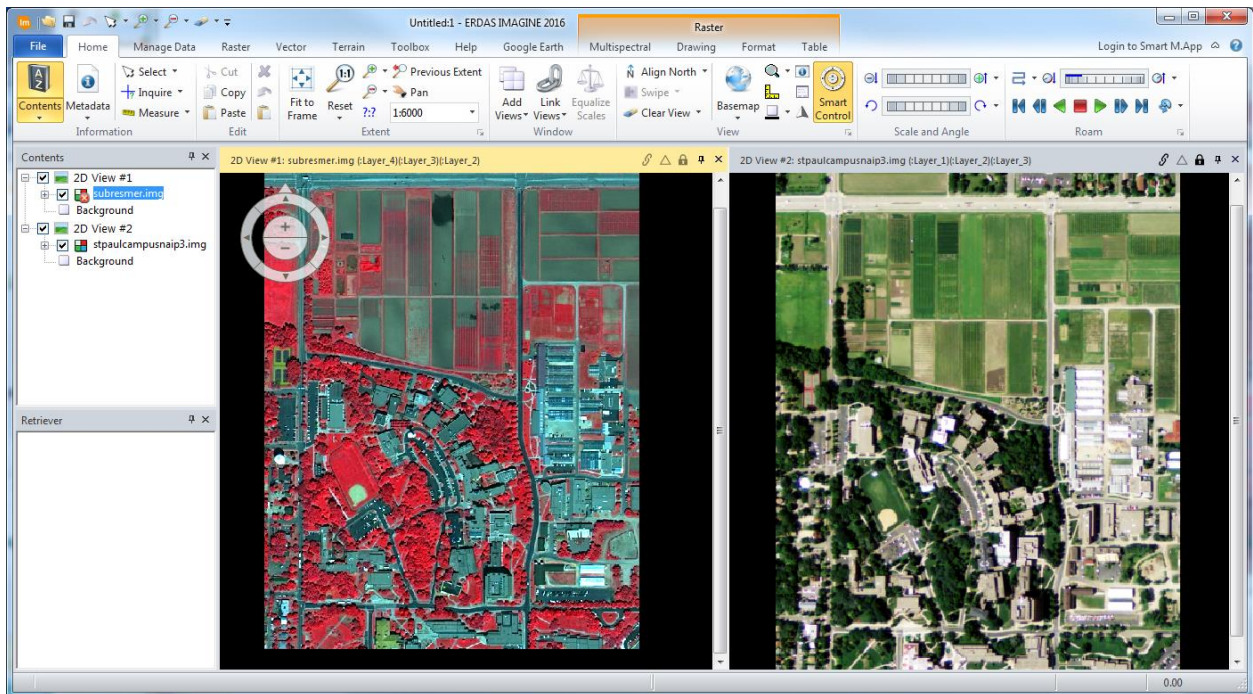
28. You should see the original view and the AOI and your new image side by side. Make a screen shot of this for your lab assignment and discuss the result. Could you use this in your work? What would you have to do to make it better?

Adding an NIR layer to 3 color NAIP

In the NAIP imagery we downloaded from the NRCS Browser in Creating LiDAR and NAIP Imagery lab, we did not have a Near Infra Red layer. We can fuse the layer from the Quickbird used earlier into the NAIP and have a *somewhat* useful addition to our imagery. In order to be significantly useful, the dates of the two imagers would have to be extremely similar as well as atmospheric conditions. Note also that the two images are of different spatial resolution and the Quickbird is a slightly larger extent than was the NAIP. Let's get started and see how it works:

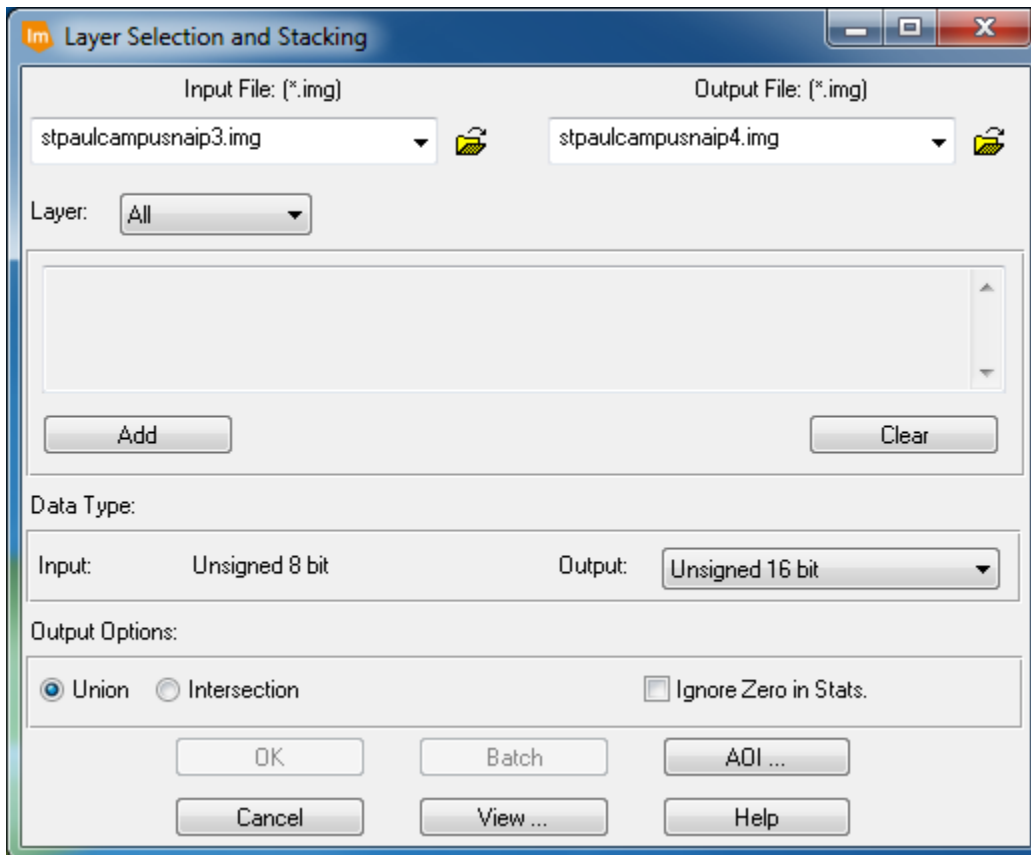
29. Start ERDAS Imagine and open two 2D Viewers

30. Put the Subtractive Resolution pan sharpened output image created above in one view and put the NAIP (StPaulCampusNAIP3.img) into the other. Place the scale of both viewers to 1:6000

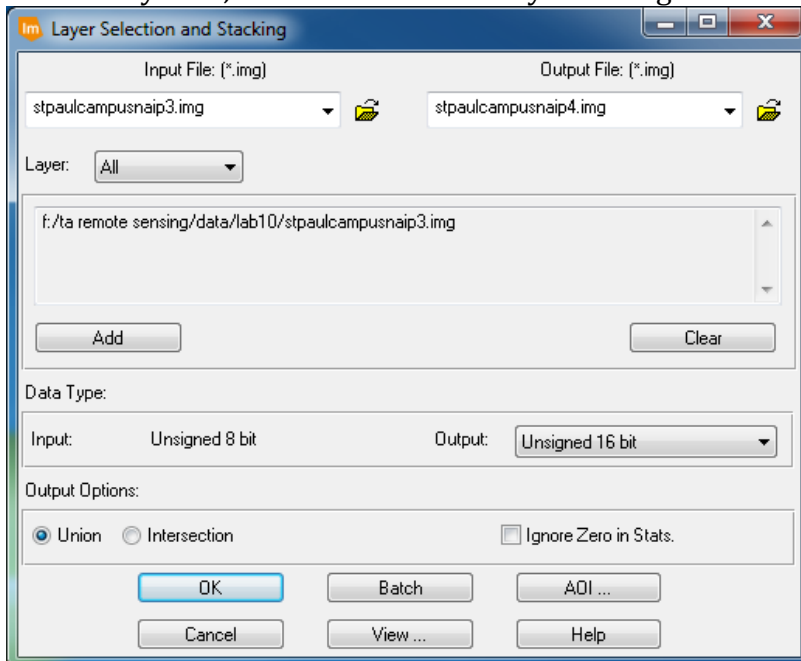


Notice the extents are slightly different

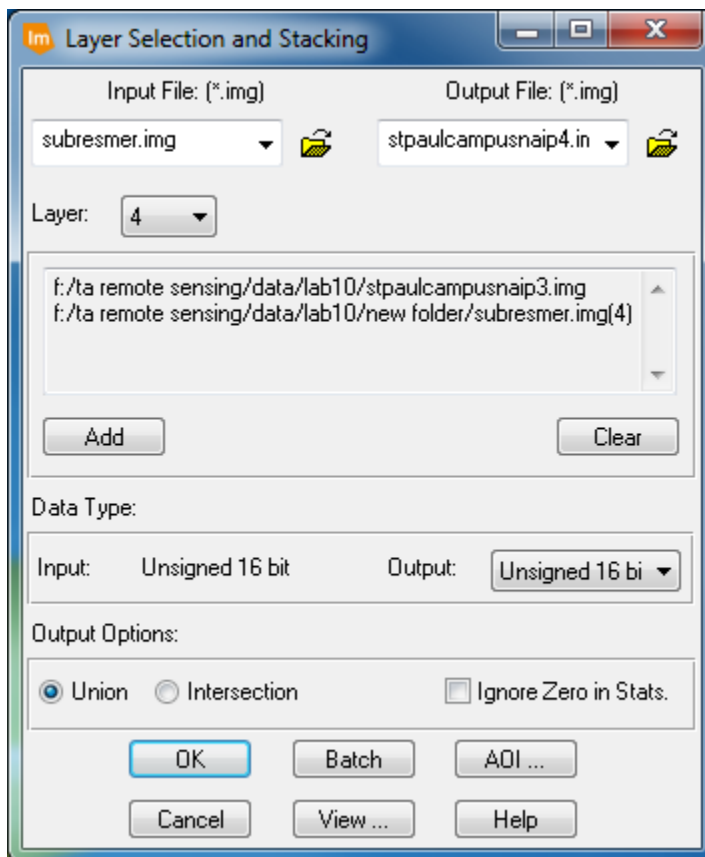
31. Open the Later Stack routine from the **Raster > Spectral** in the Resolution group menu. Find the 3 layer NAIP file from the Lidar Lab and Browse to it as the input file and name your output file.



32. Add layers 1, 2 and 3 to the stack by selecting **All** from the Layer dropdown

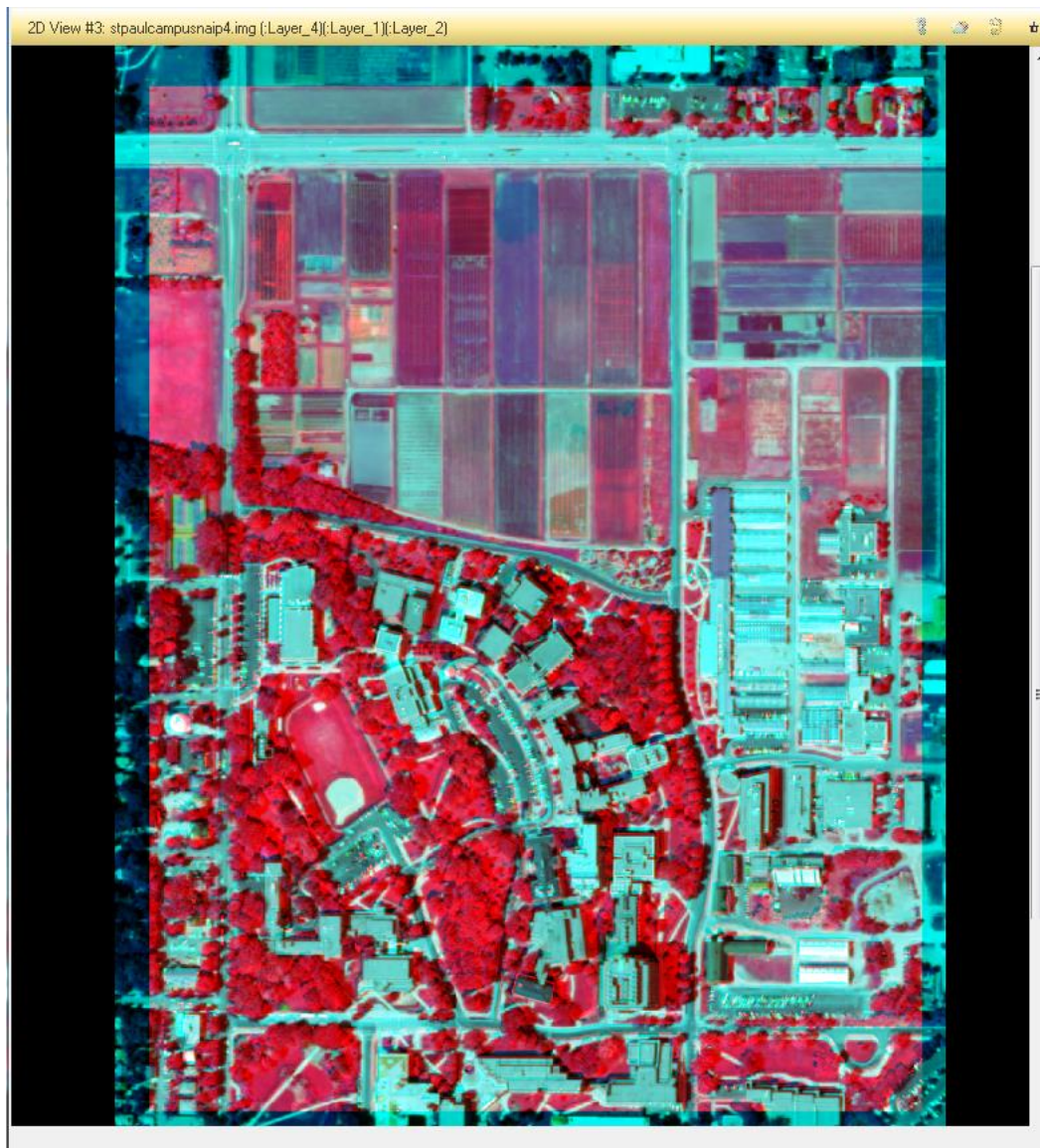


33. Find the Subtractive Resolution output file and Browse to it as the Input file. Point to Layer 4 of the input file and **Add** it to the stack. Your Layer Selection and Stacking window should look something like:



34. Click OK

35. After Pyramids are calculated, open a third 2D Viewer and examine your image using a color scheme of (4,1,2)



In your assignment sheet, record the pixel sizes of the Subtractive Resolution image, the 3 Layer NAIP as downloaded from NRCS and the final image stack. Linking the views, zoom in and examine the images. What issues do you find with the final 4 layer stack compared to the input imagery. Look in the area around the softball diamond. Would you be comfortable using this final stack?