

## Lab 5 Band Ratios and Principal Component Name:

Upload the following files to the instructor:

- (4) "Your Name\_Iron\_Sites" geotiff
- (5) "Your Name\_Clay\_Sites" geotiff
- (6) "YourName\_color-coded\_NDVI" jpg

Question 1: Put your cursor on the brightest pixel in the Chainman Shale (Red Rose Anticline (see textbook Figure 3-11H if you don't remember where that is).

A. What is the Data value (DN) for the bright pixel on the iron ratio image:

B. What is the Data value (DN) for the same pixel on the clay ratio image:

Question 2: Put your cursor on the brightest pixel in a Wind River agricultural field (see textbook Figure 3-11H if you don't remember where the river is).

A. What is the Data value (DN) for the bright pixel on the clay ratio image:

B. What is the Data value (DN) for the same pixel on the iron ratio image:

Question 3: A. Why do you think the clay ratio image in View 3 is so similar to the NDVI image (vegetation greenness or vigor) image in View 4?

B. Roam around the linked Views. What type of feature has pixels on the clay ratio image that are bright but dark on the NDVI image?

(hint: look also at the color image in view 1 – change the bands to OLI 7-5-2 as R-G-B. Look at the iron band ratio image also).

Question 4: A. What range of NDVI values do you find on your NDVI image?

B. Did you find any negative values?

Question 5: A. What range of DN values (Min and Max) do you find in the metadata for the NDVI image?

B. Is the range of DNs in the image's metadata different than what you found clicking around the image with the Cursor Value tool? YES NO

C. Approximately how many pixels have values greater than +1.0?

D. Approximately how many pixels have values less than -1.0?

E. How many pixels are in this image? (Remember Metadata?)

F. What is your opinion about those pixels in the metadata with DNs outside of the NDVI -1 to 1 range?

Question 6: A. What density slice colors appear on your NDVI image in View 4?

B. Is this NDVI image what you want for a final, color-coded product?

Question 7: A. Does the PC 1 image look very similar to the OLI bands, especially in areas with topographic relief (ridges, cliffs, valleys, etc.)? YES NO

B. What percentage of the variance in the 6-band Landsat data set is in PC1? (Hint: Use the values in the PC Eigenvalues table above)

C. What percentage of the variance in the 6-band Landsat data set is in PC5? (Hint: Use the values in the PC Eigenvalues table above)

Question 8: A. Which PC color image in Views 2, 3, and 4 provides the most information for you about the agricultural fields?

B. The PC color image generated from PC4-PC5-PC6 as R-G-B has what percentage of the total variance in the 6-band Landsat dataset?  
(Hint: refer to Eigenvalue table above and use your calculator)