

## Lab 12 Change Detection and Radar Polarization Name:

Upload the following files to the instructor:

(2) "Your Name\_chg\_bandmath" jpg

(3) "YourName\_colorCCDM" jpg

(3a) "YourName\_CCDM\_shp" jpg

Question 1: A. What color is healthy vegetation in our enhanced color images (SWIR–Near IR–Green as R-G-B)?

B. September is a hot and dry month around Mt. Diablo, California, and typically follows many dry summer months. Based on our enhanced color images, what features around Mt. Diablo have the healthiest (most vigorous) vegetation?

C. What is the elevation at the top of Mt. Diablo? (DEM in meters)

Question 2: A. Compare the 7 September band 4 to the 23 September band 4. Where geographically do you see the largest difference in brightness?

B. Based on what you see and can interpret, what event has the 23 September image captured on Mt. Diablo?

C. Based on the Landsat imagery, when did this event occur?

D. What Landsat spectral evidence do you have to support your interpretation about the event on Mt. Diablo between 7 and 23 September 2013?

- Question 3: Explain how the band math subtraction of the 23 Sept image from the 7 Sept image results in the area of change having such a significant difference in brightness (DN value) compared to the surrounding area. (Hint: think what happened to the DN value of near IR pixels in the changed area compared to the DN value of near IR pixels in the surrounding area).
- Question 4: Which polarized band carries more information to the untrained eye – HH or HV?
- Question 5: Describe the ratio (HH/HV) image in 10 words or less.
- Question 6: Do you think the color composite (View 4) tells you more information about Death Valley compared with the grayscale HH and HV? YES NO
- Question 7: A. On the radar images there are dark features along the bottom of the valley. What does the dark tone indicate about the roughness of the surface?
- B. On the HH-HV-Ratio color radar image of the valley bottom (ignore the mountains on the left and right) there are bright landforms with colors that grade from yellow to light purple to darker purple. What does gradation in brightness indicate what about the surface roughness of those landforms?

Question 8: Site 1. What different type of information is provided by the radar image versus the Landsat natural color image for the nearshore feature with many large polygonal structures?

Question 9: Site 2: Do you see the green pattern to the northwest of “2” on the Landsat? What could cause this feature – what could it be?

Question 10: Site 3 The bright yellow dots on the radar that cross the river in a line in a WSW-ENE direction are not seen on the Landsat. What is a “corner reflector” in the science of radar?

Question 11: Site 4: A. Why is radar more reliable for visually detecting ponded water compared to images that capture reflected visible light?

B. What are you seeing on the surfaces of the ponds in the Landsat image?

Question 12: Site 5: A. Why are there shadows on the west side and illuminated edges on the east side of the agricultural fields with the “red +” ?

B. Are the fields higher or lower than the surrounding land cover?

Question 13: Site 6: Which image shows the tide is out (low tide): radar or Landsat?

Question 14: Site 7: This is the east-west Interstate 10. What do you think the bright dots are on the radar image?

Question 15: Site 8: Compare the radar and Landsat images of the industrial ponds and surrounding area.

A. Purple-violet on the radar image indicates what type of land cover?

B. Green – yellow green on the radar image indicates what type of land cover?

C. Why are many north-south roads clearly visible on the radar and east-west roads are more difficult to see?