

Figure 2: Color-infrared image of the study area.

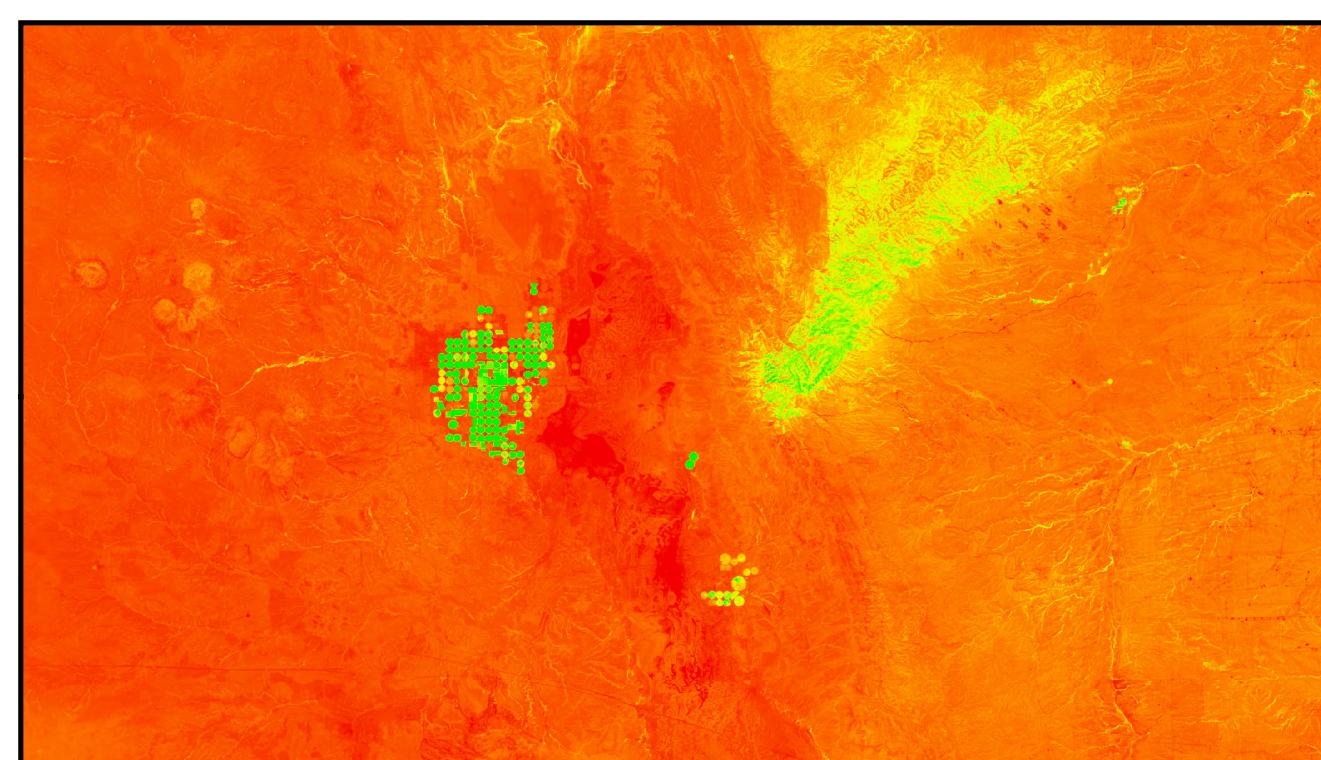


Figure 3: Normalized Difference Vegetation Index that compares areas of high-density vegetation (green) to low-density vegetation (red). This has the potential for isolating areas of exposed rock surface.

0 10 20 40 Miles

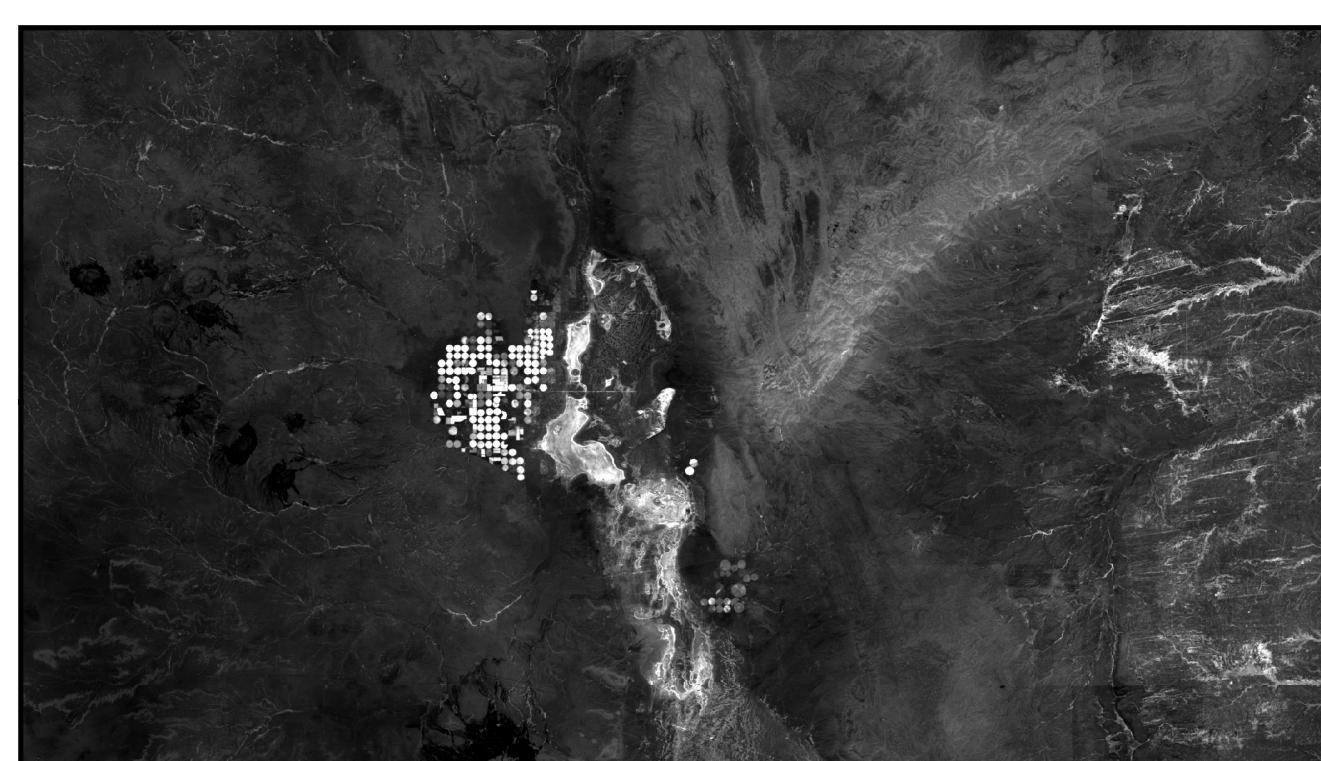


Figure 4: A band ratio image of SWIR1/SWIR2 depicting carbonate-rich areas as light-grey to white. Predominately seen west of Dell City, with the Quaternary deposits, as well as, the Guadalupe Mountains which are primarily composed of carbonate limestone.

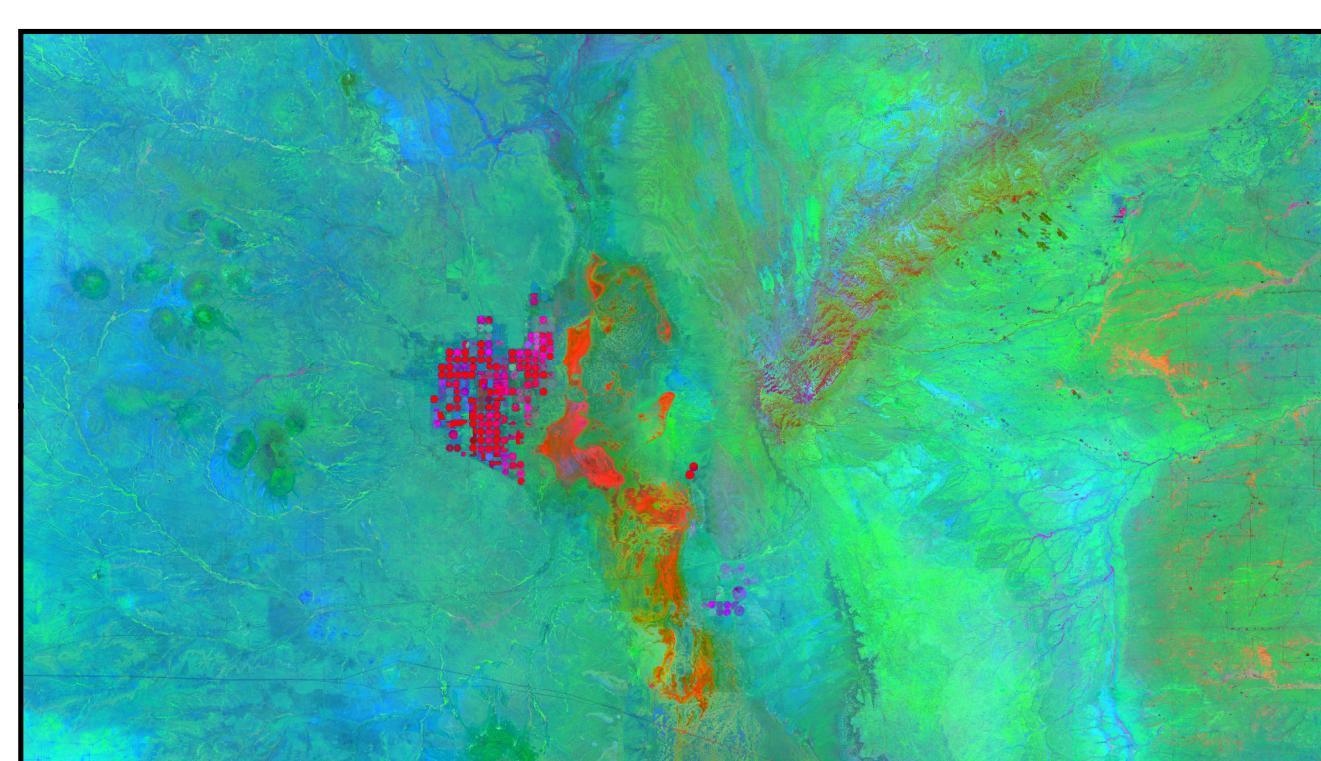


Figure 5: A color-ratio composite (CRC) that isolates areas of rich ferric oxide minerals (orange), as well as, areas rich in clay minerals (green).

Geologic and Land Cover Map of the Chihuahuan Desert

West Texas and Southeastern New Mexico

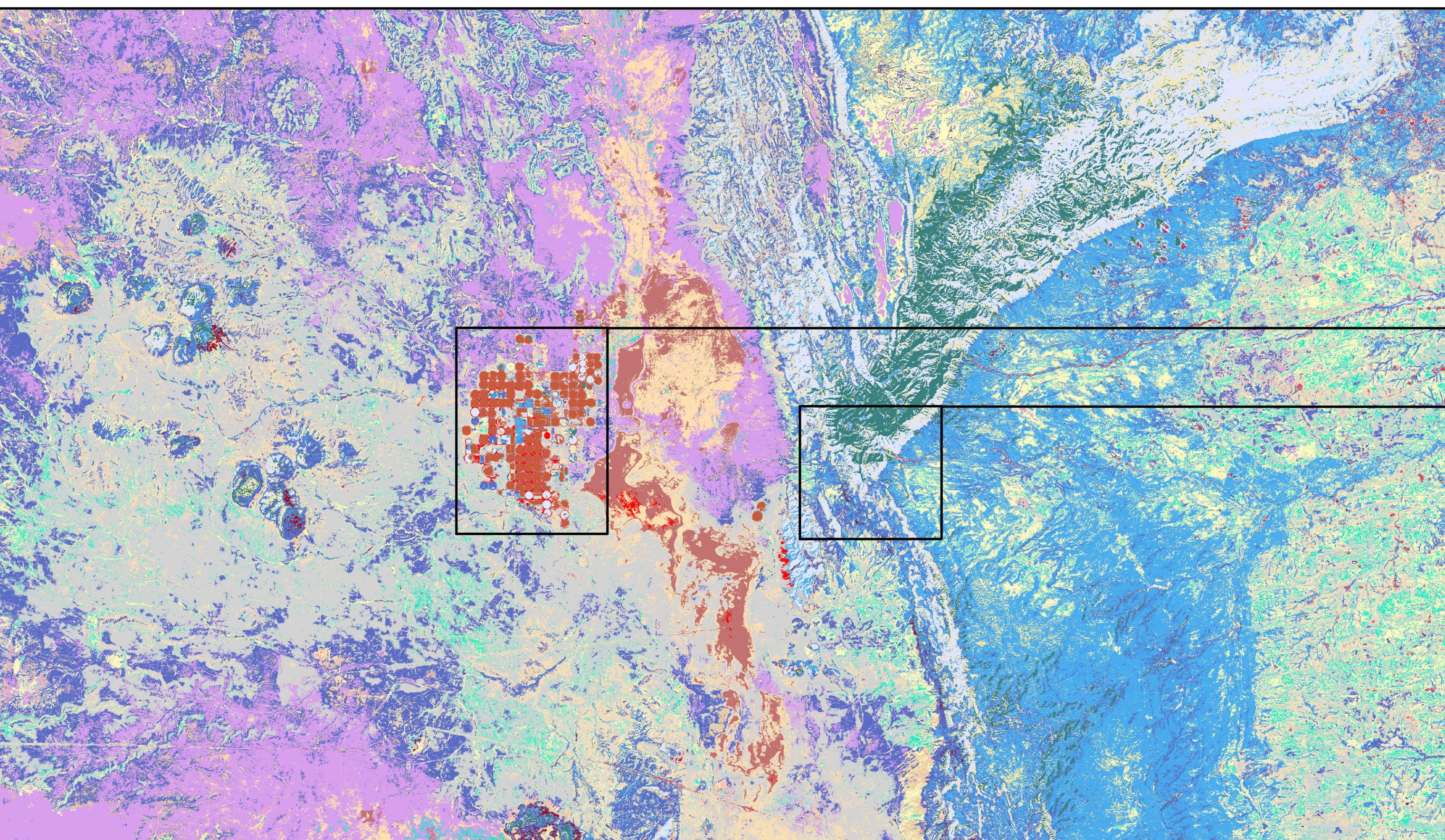
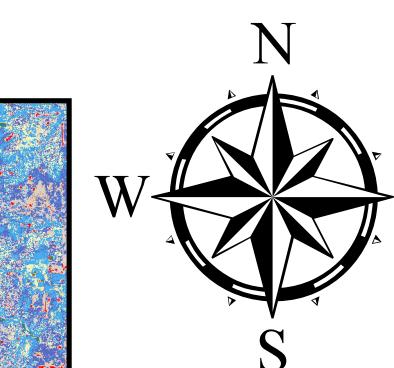


Figure 1: Unsupervised classification map.

1:333,863

0 10 20 40 Miles

Explanation:
This is an unsupervised classification map of the Chihuahuan Desert. The area covers over 270 thousand acres or about 425 square miles. The purpose of the map was to pair image classification with image analysis to identify surface geology. There are 18 unique identification categories that contain seven different Quaternary Alluviums and six different rock identifications. The study area is comprised of almost exclusively Guadalupian and Leonardian aged carbonate rocks, predominately limestone. This is due to the area being affected by regional subsidence and cyclic sea-level fluctuations that were the controlling forces for the carbonate sediment deposition.

Legend

Rock Formations	
Cultivated Crop	Hueco Limestone Ph
Evergreen Forest	Bell Canyon Formation Pbc
Grassland	Seven Rivers Formation Psr
Development	Finlay Formation Kf
Quaternary Alluvium	
Alkali Flat Deposits Qaf	Bone Spring Formations Pbs
Bolson Deposits QTb	Carlsbad Group Pcb
Windblown Sands Qws	Camnchean Rocks Undivided Kcm
Old Quaternary Deposits Qao	
Young Quaternary Deposits	
Qb	Qf
Qf	Qal



Figure 6: Located in the yellow box are center-pivoted irrigation circles located in Dell City, West Texas, and are produced from a method of crop irrigation where large-scale water-sprinklers are rotated around a center point. This allows for the equal distribution of water content at an efficient rate, especially for large scale crops. Photographer: Dennis Dimick



Figure 7: This is the Guadalupe Peak, the highest natural elevation at 8,751 feet and is composed of the Bone Spring Limestone and the Bell Canyon Formation. These formations are partially dolomitized limestone that contains marine fossils from the middle Permian. Its location is indicated with a red box. Image Sourced: USGS