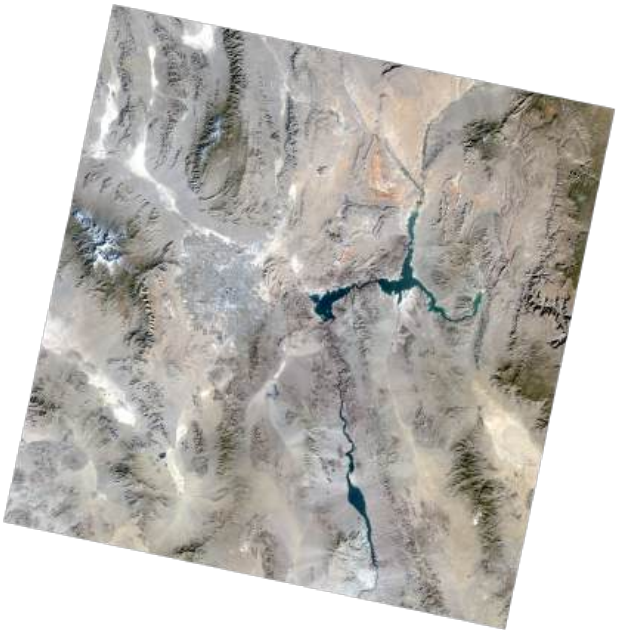
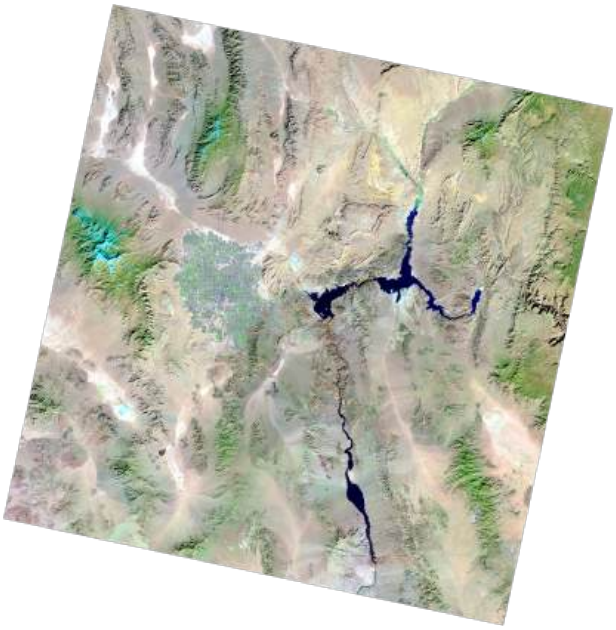
My dataset depicts Collection 2 Level-1 data captured by the Landsat 9 OLI TIS satellite. The images were captured on November 24th, 2022 between 18:15:45 and 18:16:17 Greenwich time. The spatial resolution of the panchromatic band is 15 x15 m, and the spatial resolution of every other band is 30 x 30 m. Landsat 9 captures raw data with a 14-bit radiometric resolution, however the Collection 2 Level-1 data is scaled to a 16-bit radiometric resolution. The images display WPS Path 039 and WPS Row 035. When I was picking an image for this analysis, I wanted to choose something I was unfamiliar with, and initially, I wanted to focus on a National Park. After cycling through a few locations, I landed on the Grand Canyon. I thought that the Grand Canyon would be interesting because of its topography. Once I had settled on the feature I wanted, I had to pick which WPS Path/Row I wanted to work with. Although Path 037 Row 035 covered a majority of the grand canyon, I ended up choosing WPS Path 039 and WPS Row 035 because the large city of Las Vegas caught my eye and drew my attention. It stood out quite vividly against the dry barren landscape and made me question why anyone would want to live in the desert. This study area covers portions of Arizona, California, and Nevada, including the Western end of the Grand Canyon, Lake Mead, the Colorado river, the Mojave Desert, Mount Charleston, Bullhead City, the Hoover Dam, and Las Vegas. There are a few questions that these images bring to mind:

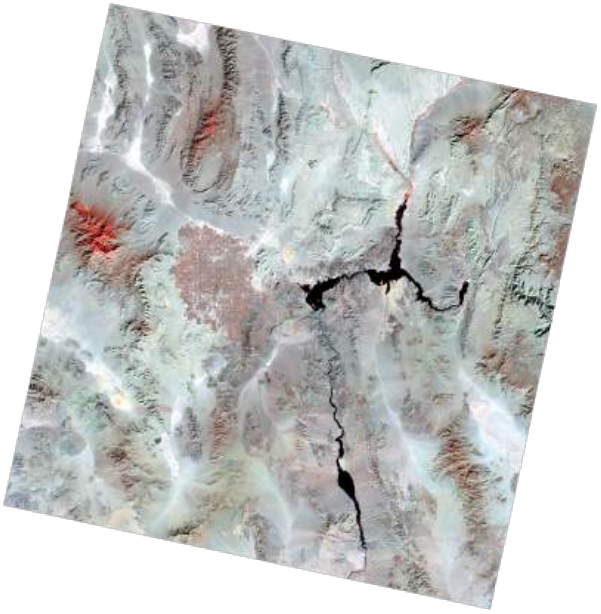
- How does the environment influence where people decide to live?
    - This question is best answered by map #2 because the topography is well defined, infrastructure is easy to identify and human settlements stand out from the arid surroundings due to the artificial vegetation. From these images it is very clear that settlements tend to stick close to prominent water features.
- What kind of plants grow in the desert? Can they be identified using remote sensing? How can we expect plant life to respond to extreme heat waves like those recently seen in the region?
    - This can best be answered by using map #4, because vegetation shows up as red and stands out against the surroundings. Assuming that different plant species will result in different DN values, this could help discriminate between plant types. Also, by comparing images over time we would be able to see how different plant types are affected by weather extremes.
- How is water transported around the region? Where does the water released from mountain snow melts end up? Can it be collected and stored as a way to alleviate droughts brought on by extreme heat?
    - This can best be answered with map #1. The natural color image makes topographic features stand out, making it easier to track channels in the mountain wash and determine where water will end up. This could be important in determining the pathway flash floods or landslides may take assuming that these paths would typically follow the standard wash patterns.



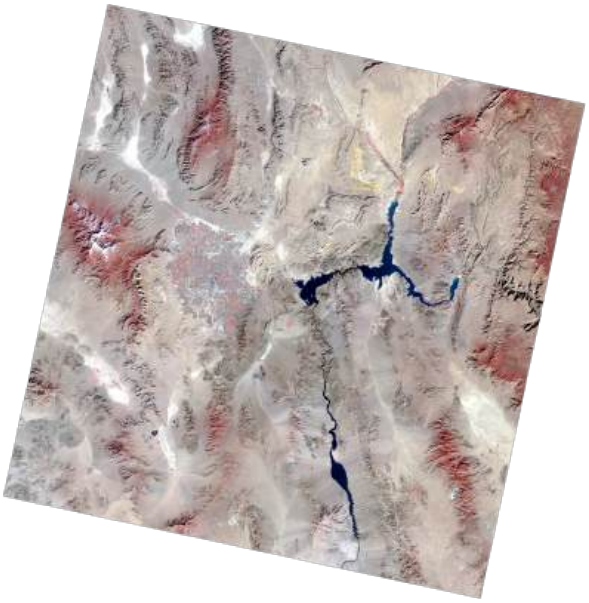
Map #1 Natural color



Map #2 Enhanced Natural Color



Map #3 Total Infrared



Map #4 Color Infrared