

SHRINKING LAKE MEAD



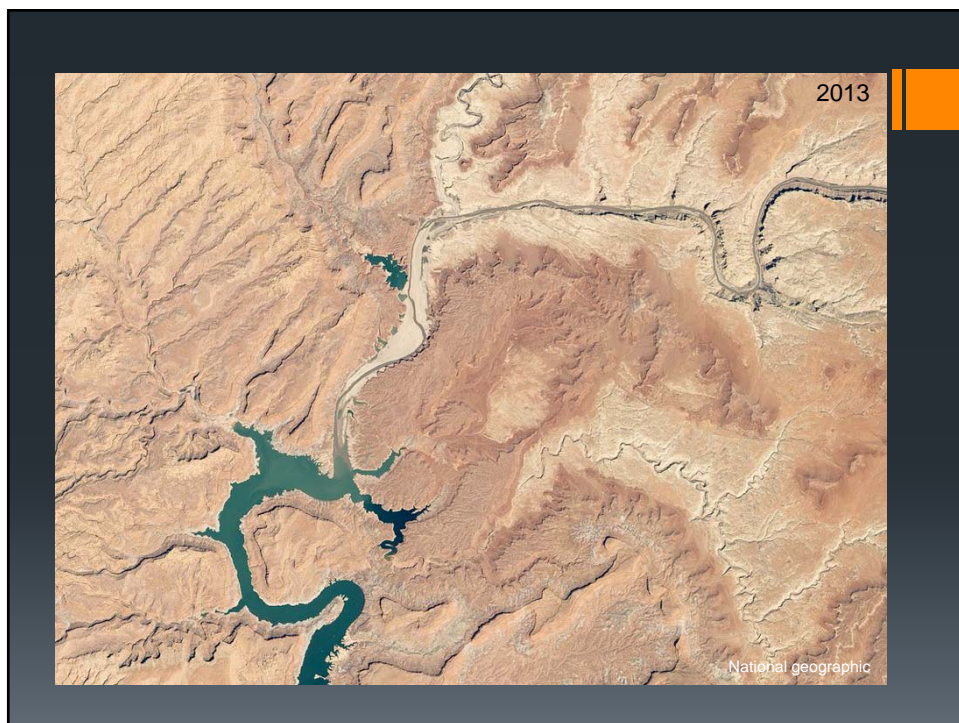
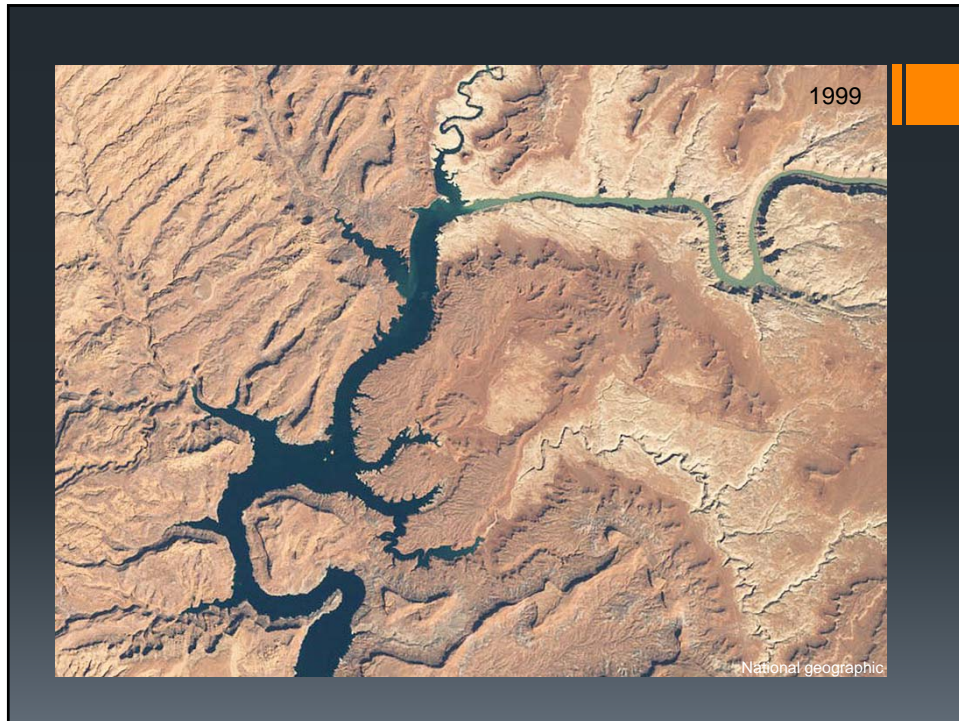
NRS533 Final Project



SHRINKING LAKE MEAD



- Largest reservoir in USA
- Located in the states of Nevada and Arizona
- Elevation 1,221.4 feet above sea level
- 112 miles long and can hold 28 million acre-feet of water when lake is full
- Supply water to 36 million people in AZ, CA, CO, NM, NV, WY, and UT
- Majority of water comes from snow melt on the CO, WY, and UT Rocky mountains
- Hoover Dam provides power to NV, AZ and CA



For Analysis*Data :*

- Landsat 4-5 data on March 1991
- Bands 2,3,4,5
- Landsat 8 data on November 2013
- Bands 2,3,4,5

Methods:

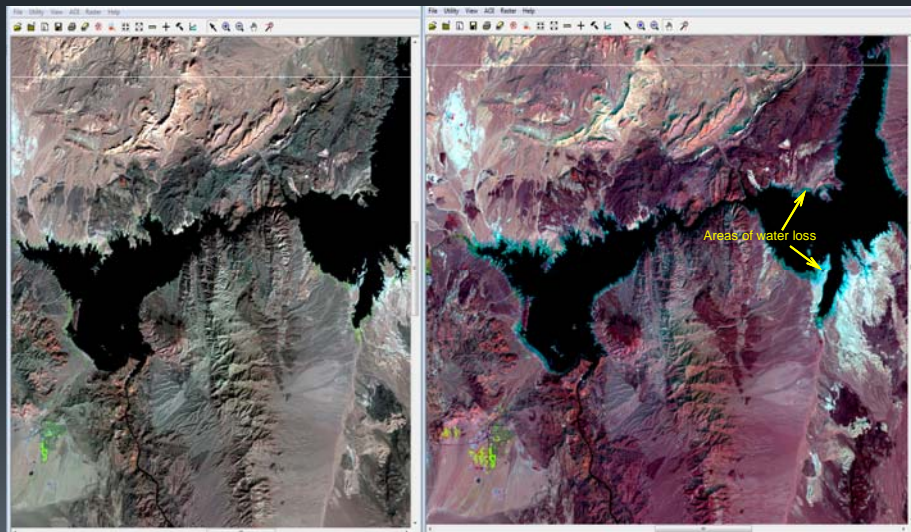
ERDAS 9.3

- Eight bands composite
- Supervised classification (Minimum distance rule)
- Unsupervised classification
- Multiple date composite image change detection

Eight band composite

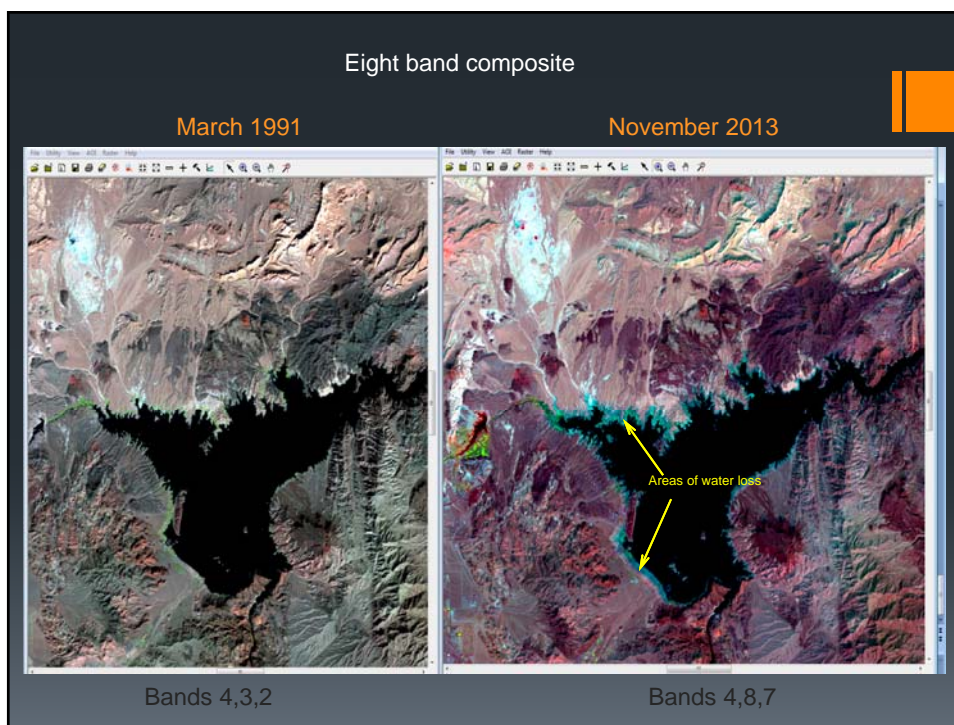
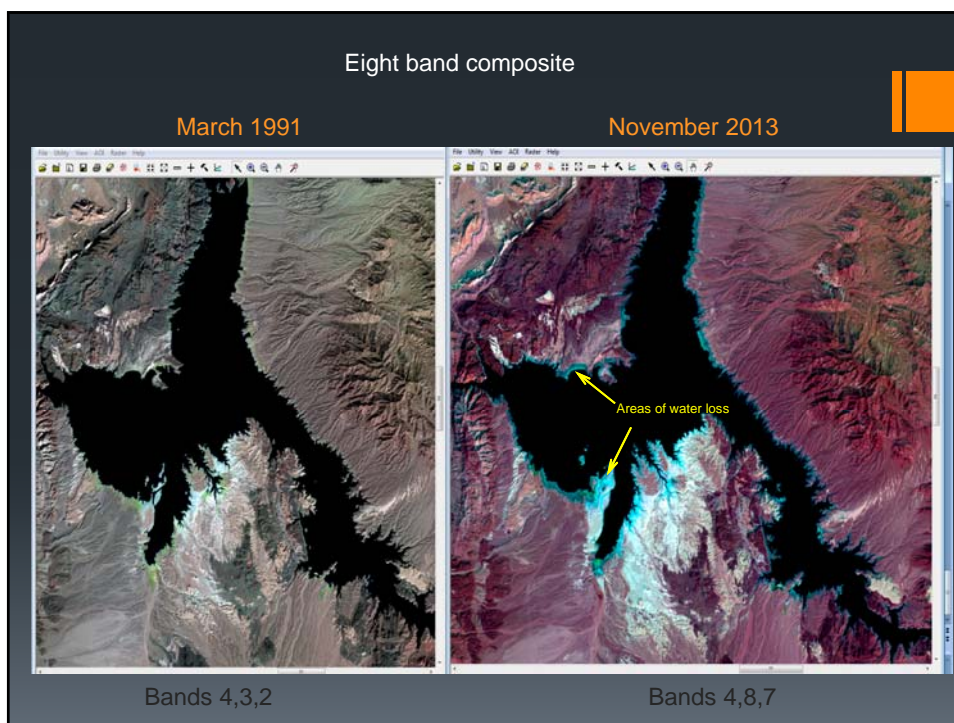
March 1991

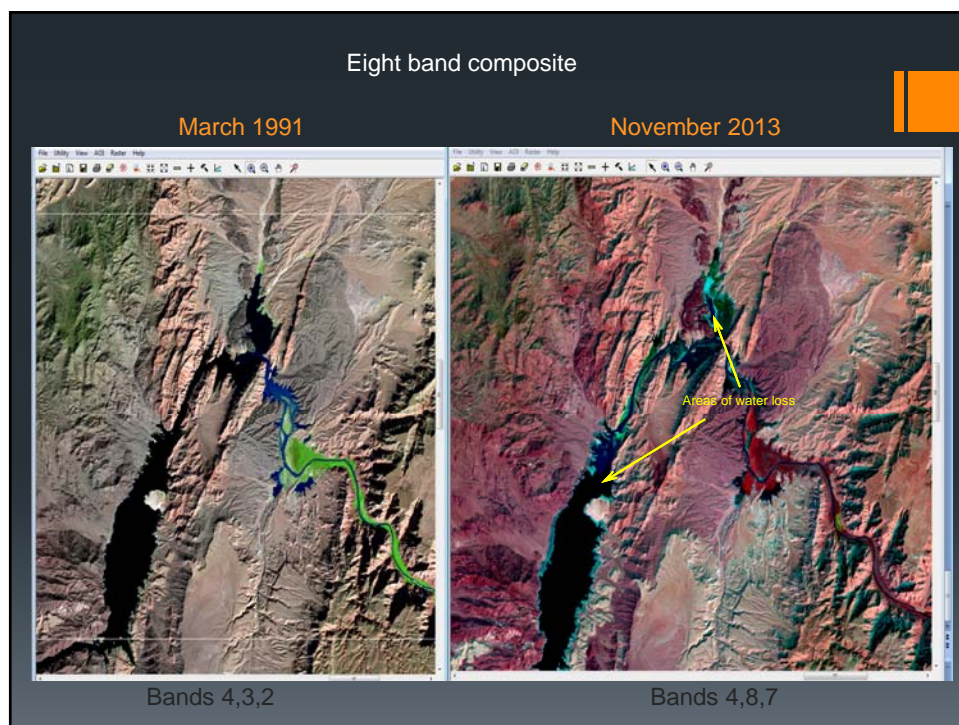
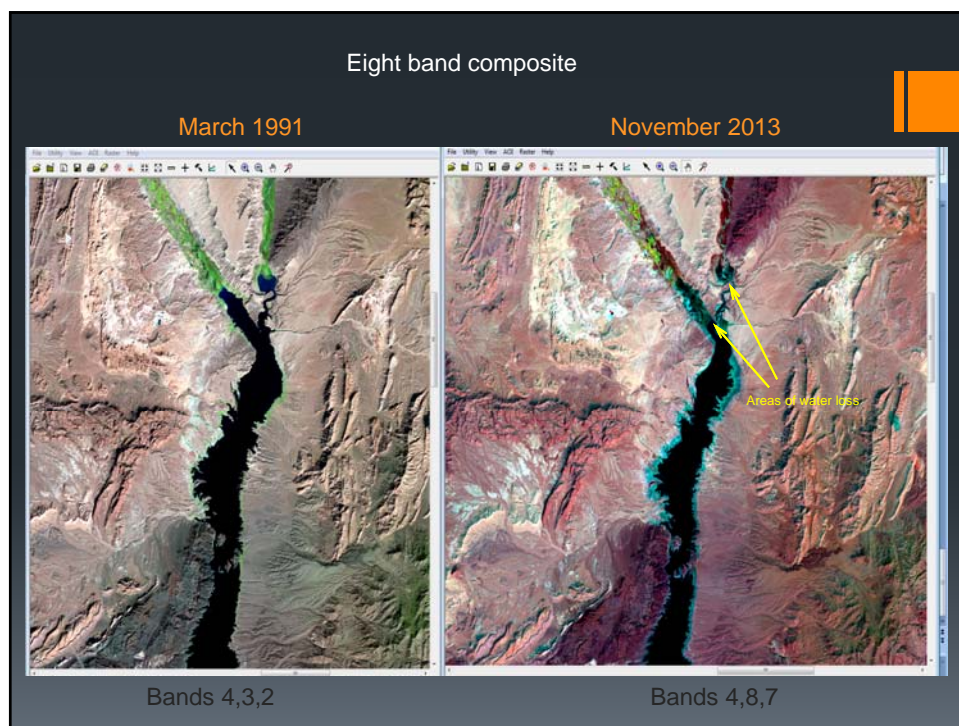
November 2013

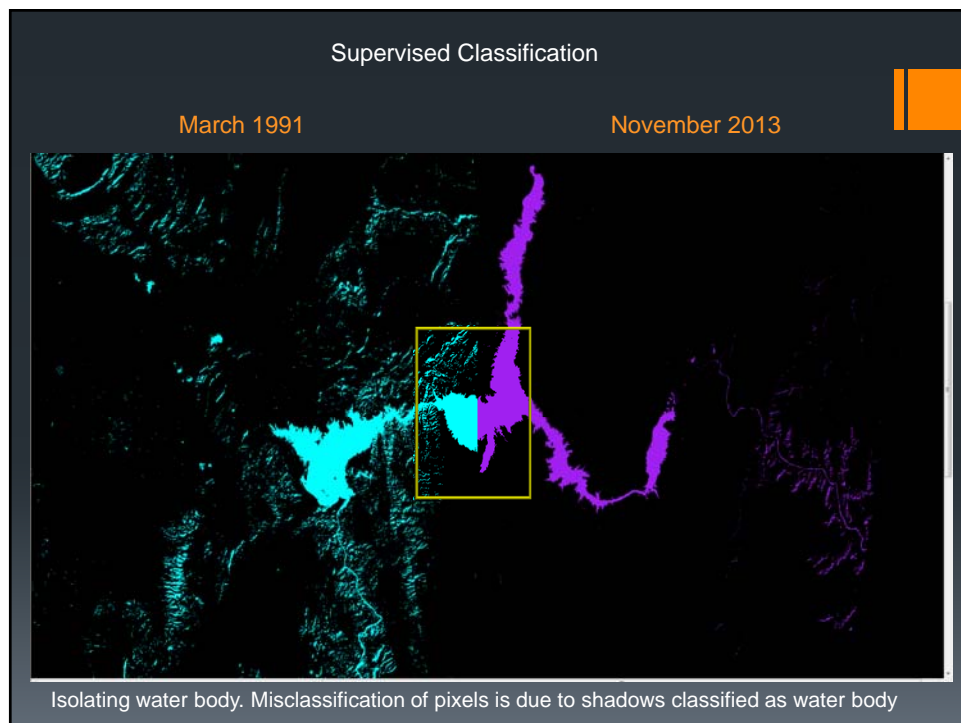
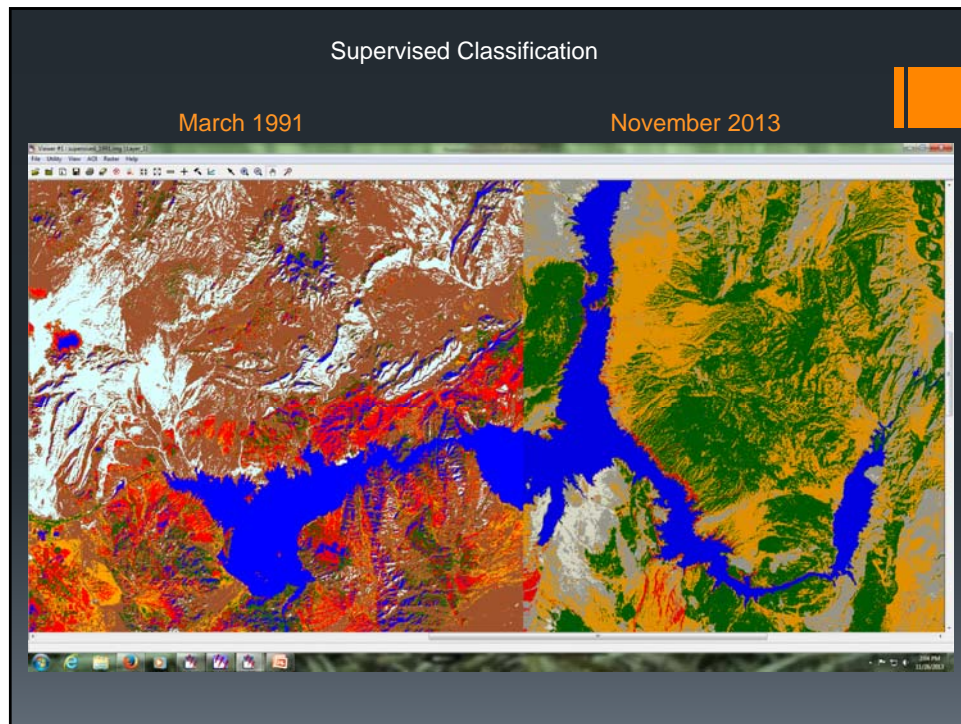


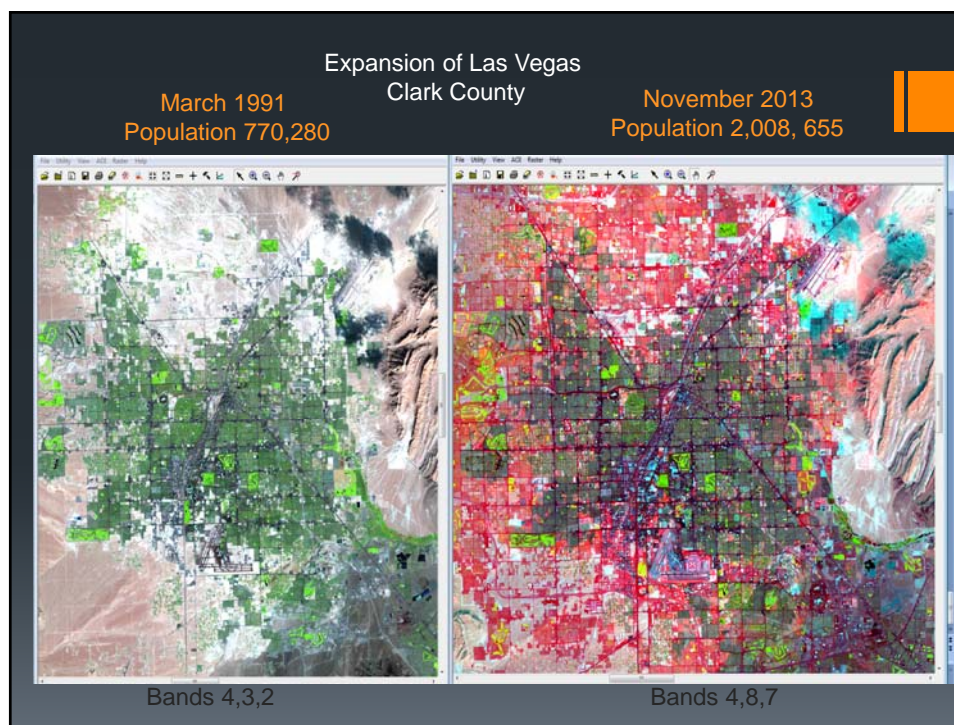
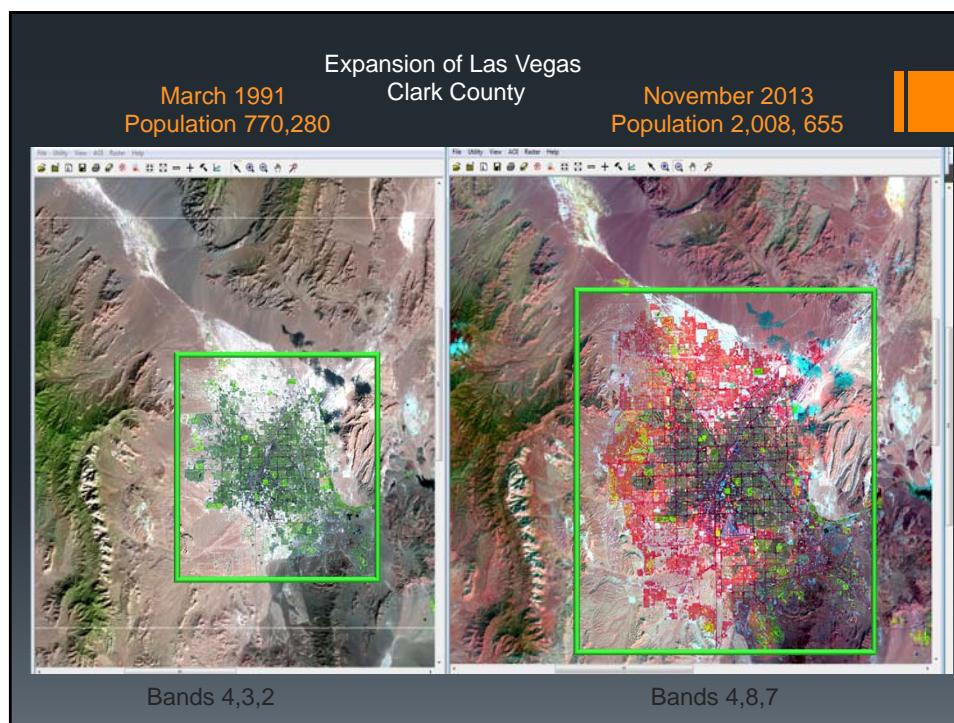
Bands 4,3,2

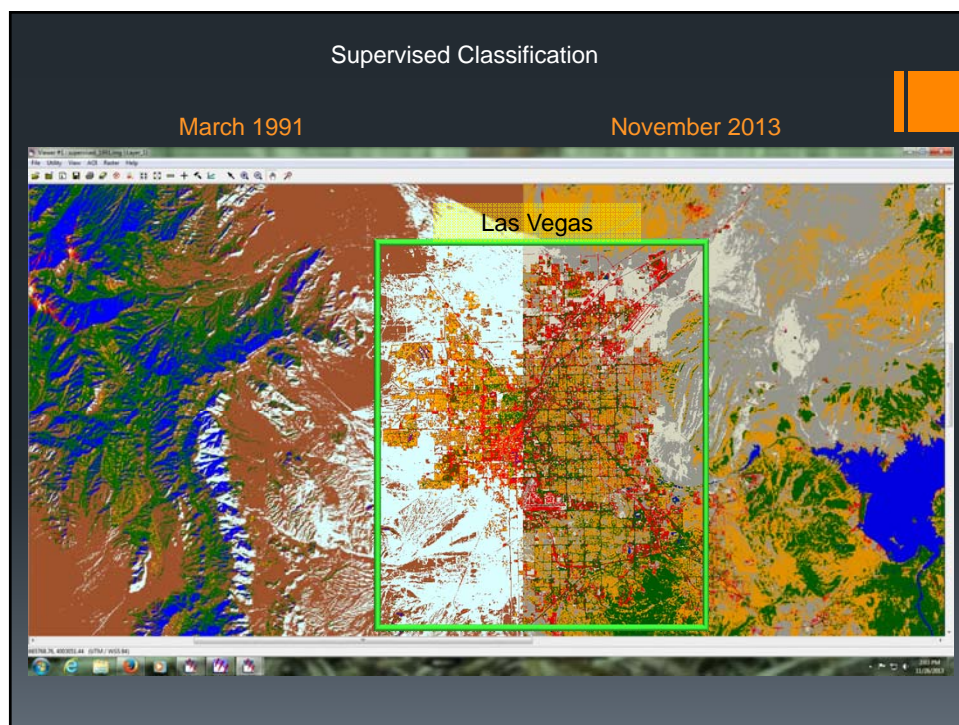
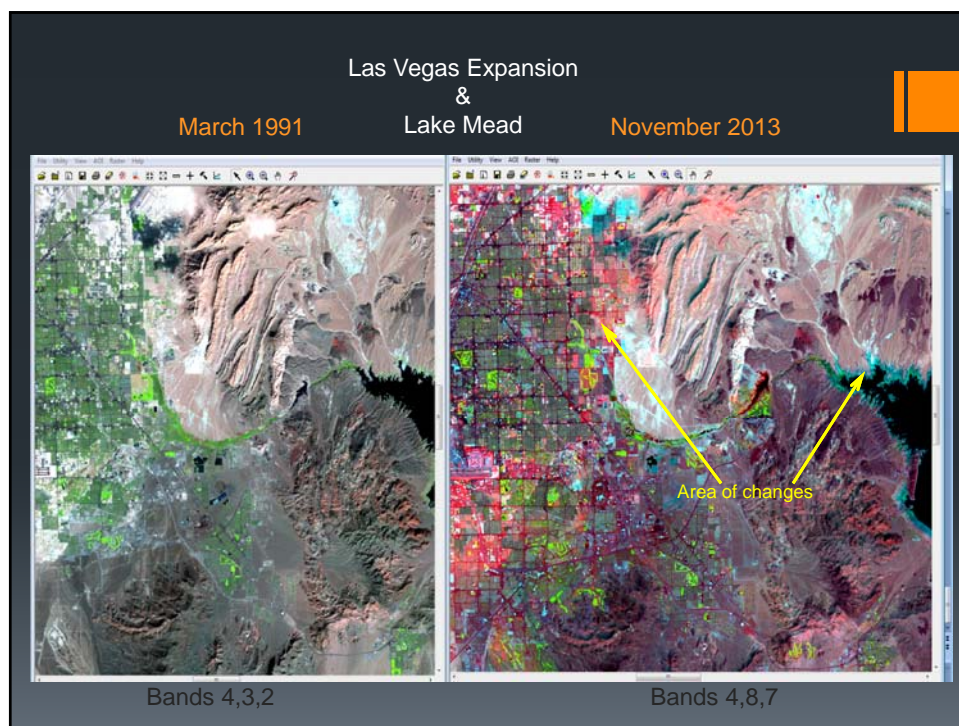
Bands 4,8,7



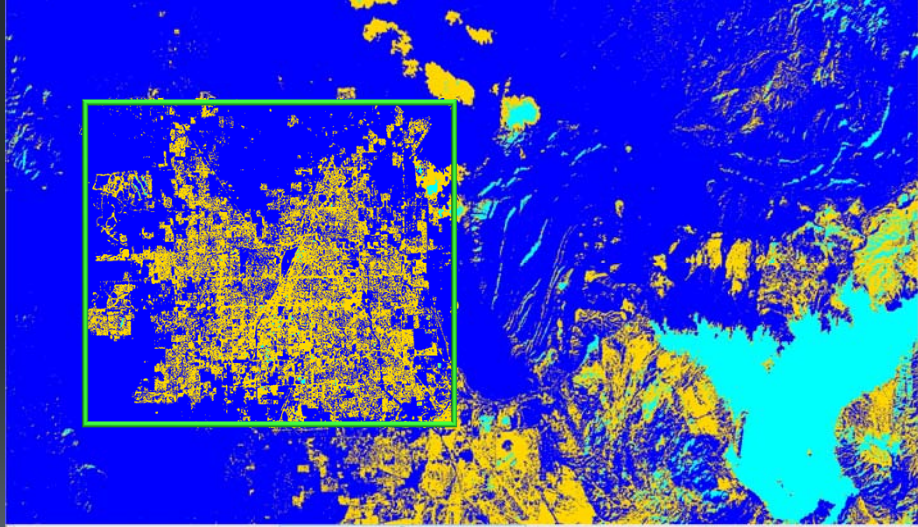




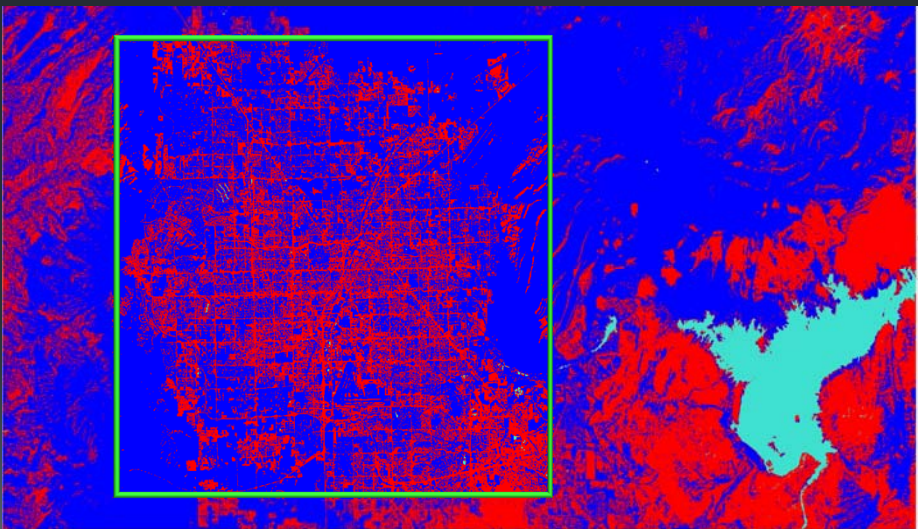




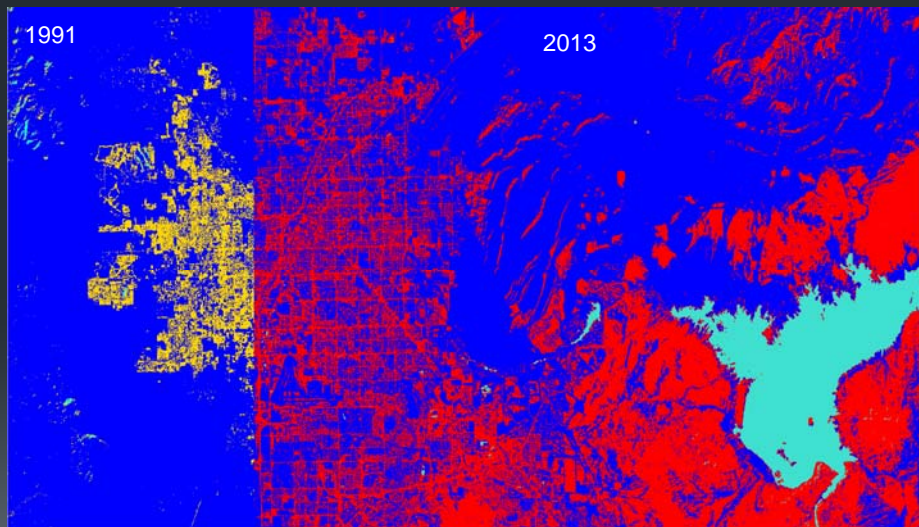
Las Vegas in 1991



Las Vegas in 2013



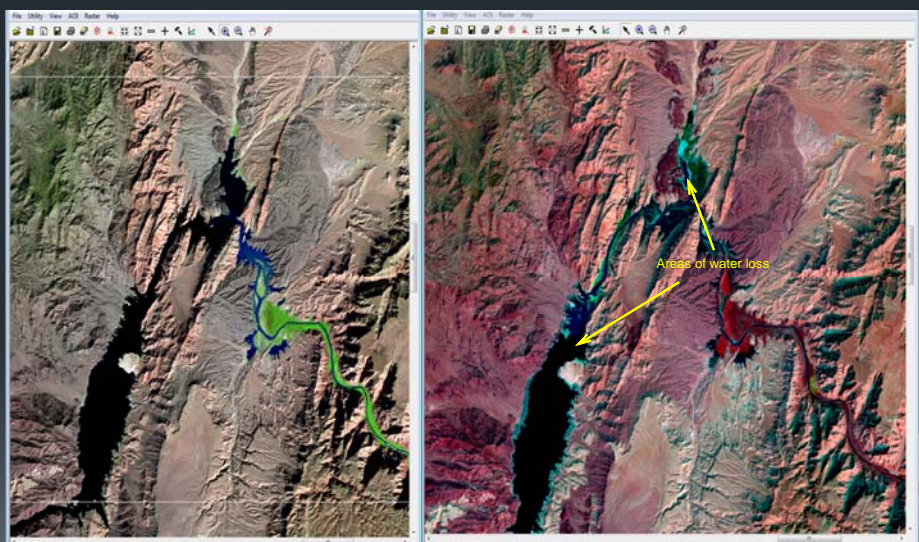
Las Vegas in 1991 & 2013



Eight band composite

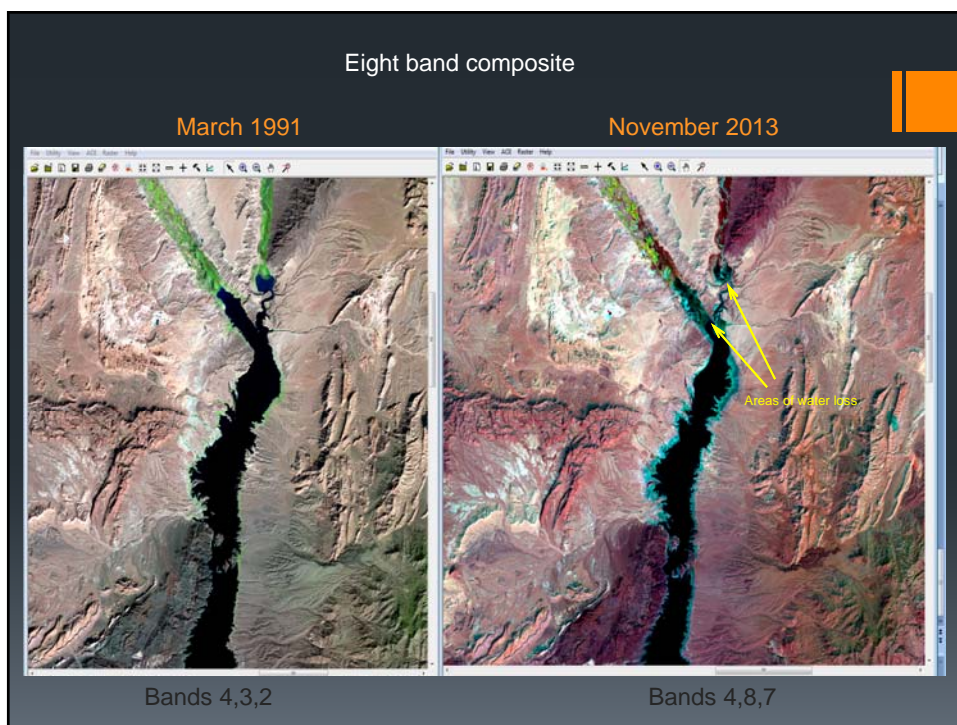
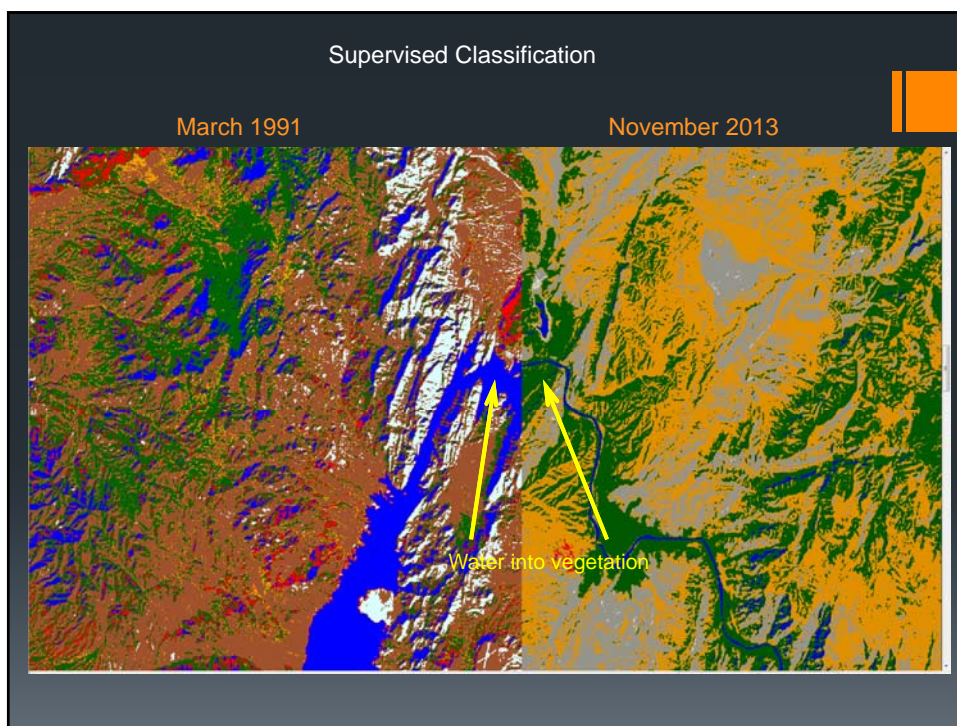
March 1991

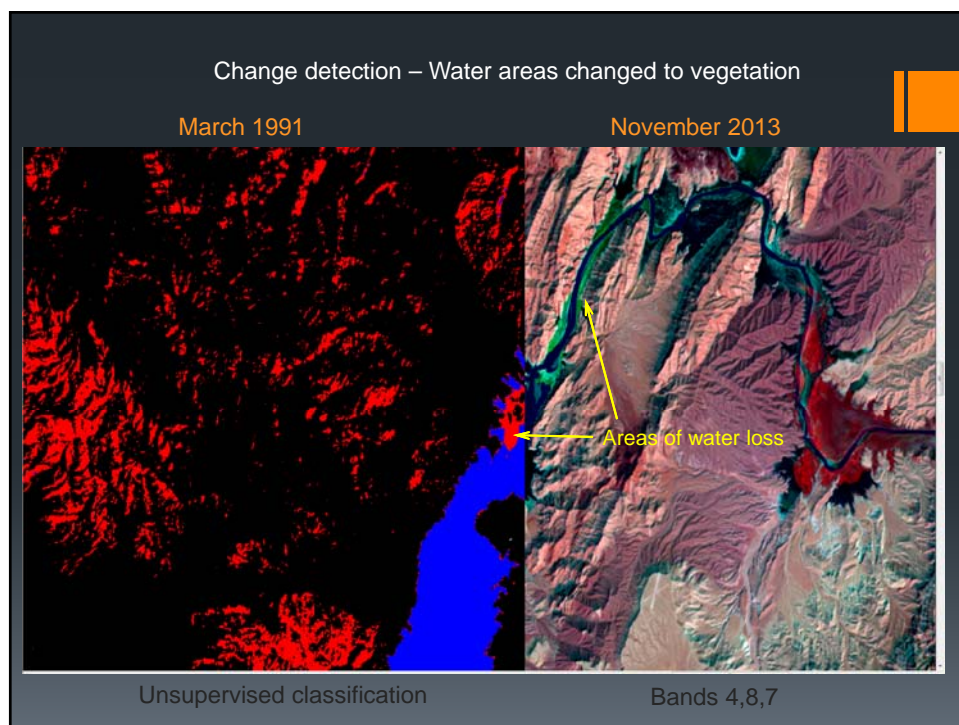
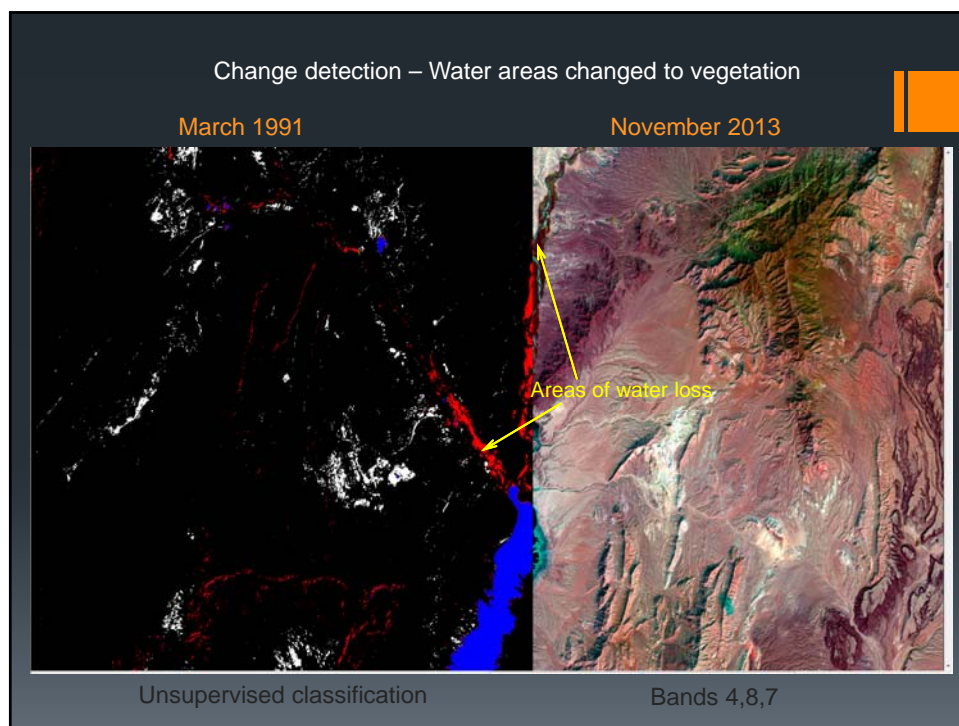
November 2013



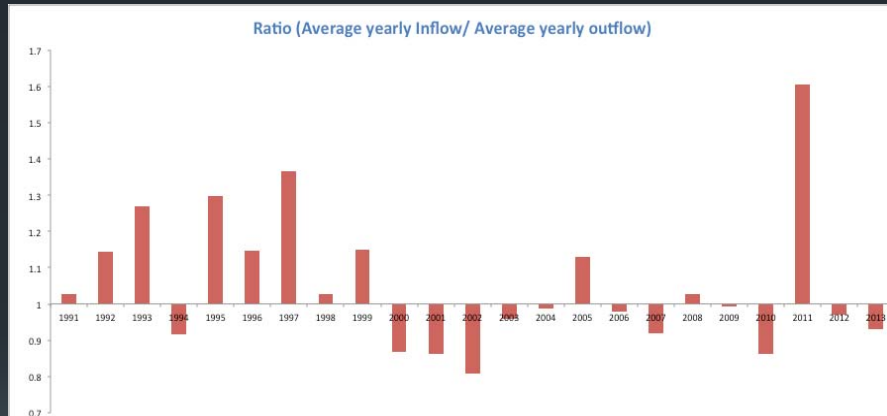
Bands 4,3,2

Bands 4,8,7





Ratio of Average yearly inflow/ Average yearly outflow



The graph shows ratio of average yearly inflow over average yearly outflow of water in lake Mead.
General trend suggests outflow levels have exceeded inflow levels since the year 2000 explaining the decreasing water levels in Lake Mead.

Lake Mead Is Shrinking



Conclusion

- Lake Mead's water level is decreasing rapidly for more than a decade. Using remote sensing technology we have confirmed that Lake Mead is shrinking at a very fast rate. Datasets from 1991 and 2013 show how the landscape consisting Lake Mead has changed with time. Two major changes noted were increase in areas of water loss and expansion of Las Vegas. Current water level is 1,175 feet while 1,075 feet is the critical limit leading to drastic restrictions on water supply
- Causes for water loss
 - Extreme Drought
 - Colorado river runoff is far below normal
 - More outflow than inflow of water
 - Expanding rural or urban area and their water demands
- Result of water loss
 - Impacting the wildlife and endangered species
 - Effects on generation of hydropower
 - Loss in agricultural production
 - Impacting water services in the cities etc.