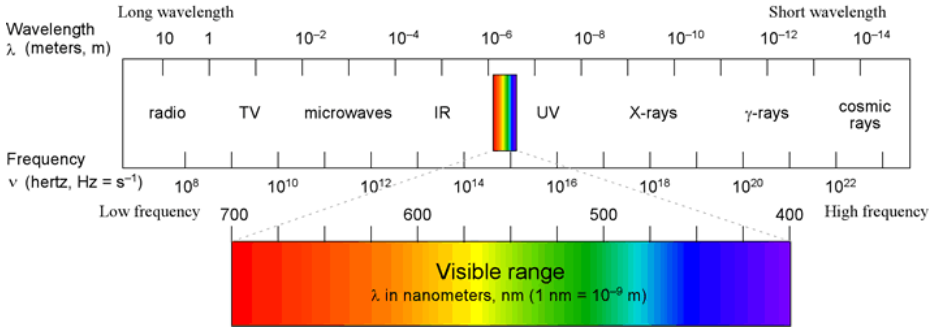
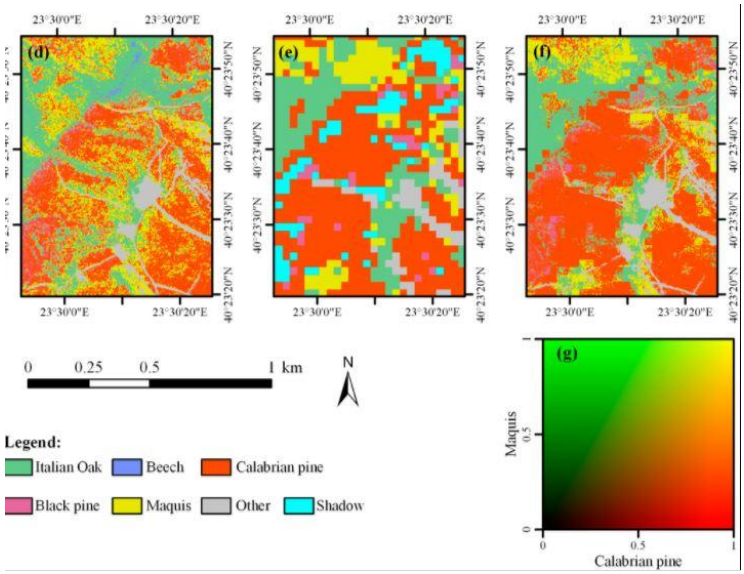
Hyper-spectral Remote Sensing

What is Hyper-spectral Remote Sensing? Hyper-spectral remote sensing is similar to multi-spectral remote sensing in that both detect electromagnetic radiation (EMR) at various wavelengths that is emitted by the sun and reflected off of objects and surfaces. All objects absorb and/or reflect EMR at various wavelengths. The difference between what multi-spectral sensors detect and what hyper-spectral sensors detect lies with the number of wavelengths that are detected. Multi-spectral sensors will detect and analyze several EMR bands such as visible light (blue, green, red), near-infrared, mid-infrared, and thermal-infrared (Jensen, 205). Hyper-spectral remote sensing detects hundreds of much narrower bands of spectral radiation at the same time.



(http://guweb2.gonzaga.edu/faculty/cronk/CHEM101pub/EM-waves.html)

What is it used for? Hyper-spectral remote sensing is used to determine more specific information about objects and surfaces. Multi-spectral remote sensors have the ability to distinguish between features such as urban areas, forests, water, turf areas, and other general surface features. Hyper-spectral sensors take this concept further, and provide much more specific spectral signature information that may be used to classify individual species within a forest rather than the forest as a whole. They could also be used to identify areas of stress within a species caused by pests, drought, or other environmental concerns. One of the most important concepts behind hyper-spectral remote sensing is the idea that no two objects are alike, so no two spectral signatures are alike. These differences in EMR reflectance allow us to determine classifications of objects and features, or in the case of hyper-spectral remote sensing, the difference between the EMR signatures of an oak tree versus a pine tree. This is a growing area of remote sensing as technology costs of hyper-spectral remote sensing are decreasing (Congalton, 13).



(http://www.mdpi.com/2072-4292/6/8/6897/htm)

Works Cited

Congalton, Russell G. 2010. “Remote Sensing: An Overview.” *Giscience & Remote Sensing* 47 (4): 443–59. doi:10.2747/1548-1603.47.4.443.

Jensen, John R. “Remote Sensing of the Environment.” Upper Saddle River: Pearson Prentice Hall, 2007.