Hyperspectral Imaging Technology for the Non-Scientist

Learning Objectives

After completing this module, you should be able to perform the following:

1. Define the following terms:
    a. Electromagnetic radiation (EMR)
    b. Electromagnetic spectrum
    c. Wavelength
    d. Nanometer
    e. Illumination
    f. Reflectance
    g. Reflection
    h. Spectral signature
    i. Path radiance
    j. Spectral intensity
    k. Hyperspectral
2. State the electromagnetic radiation wavelength range for visible light.
3. Given an electromagnetic radiation wavelength, determine whether or not the wavelength is within the sensing range of ARCHER.
4. For an electromagnetic radiation (EMR) wavelength that is within the sensing range of ARCHER, determine if it is within the visible EMR band or the near infrared EMR band.
5. Describe three ways that electromagnetic radiation interacts with matter.
6. Describe the electromagnetic radiation interactions with matter that determine the color of an object.
7. Describe how various wavelengths of electromagnetic radiation interact with different types of matter.
8. Describe the difference between reflectance and reflection.
9. Describe three ways that the reflectance of an object can be changed.
10. Describe two ways that the reflection from an object can be changed.
11. Describe how solar illumination changes between the sun and an object on the ground.

Learning Objectives

12. Explain how light that is reflected from an object can be influenced by its surroundings.

13. Describe the effect of the surrounding vegetation on the spectral intensity of an object as measured by ARCHER.

14. Given an environmental or temporal effect, describe how it affects the spectral intensity of a target reflection.

15. Describe the differences between a spectral signature and its resulting spectral intensity, and describe the reasons for the differences.