Resolution

Spatial Resolution – *How Small?*
Spectral Resolution – *How Many Colors?*
Temporal Resolution – *How Often?*

In theory, resolution is determined by *sampling frequency* (or, equivalently, sample spacing).

The minimum sampling frequency necessary to resolve a feature is called the *Nyquist Frequency*.

The *Sampling Theorem* states that the minimum sampling frequency is twice the smallest frequency of interest.

Undersampling results in *aliasing*.

In practice, resolutions are determined by trade-offs between dwell time, IFOV and spectral bandwidth.

Instrument response determines spatial and spectral sensitivity to targets in the sensor IFOV.

Spatial response of a sensor is given by its *Line Spread Function* (1D) and *Point Spread Function* (2D).

*Broadband* sensors *undersample* reflectance spectra. *Hyperspectral* sensors *oversample* reflectance spectra.