Site selection

Key parameters
Test site selection

Goal to reduce uncertainties is to understand coupling of the spectral reflectance and atmospheric effects

- Test site selection is the critical choice that can reduce uncertainties the most
- Test site characteristics
  - High, flat spectral reflectance and nearly lambertian
  - Large size with spatial uniformity
  - Low aerosol loading (high elevation)
  - Accessible and historical understanding of site
- Other choices such as radiative transfer code, aerosol model, instrumentation are also important
  - However, consistency of these will give good repeatability
  - Site selection will dramatically impact the effect of these items
Test site selection

Uncertainties are reduced under certain conditions for the atmosphere and surface

- Atmospheric uncertainties are lower for
  - High reflectance surface
  - Low aerosol amounts
- Reflectance uncertainties reduced with
  - Spectrally flat reflectance
  - Spatially homogeneous surface
- Site in an area of clear skies improves probability of successful collections
- Higher altitude reduces the amount of atmosphere and typically the amount of aerosols
- Large test sites reduce atmospheric adjacency effects
Perfect site for radiometric calibration

There is no perfect test site for radiometric calibration

- Large sites used by RSG vary temporally and are a long distance from Tucson
- Smaller sites can suffer from adjacency effects and sensor MTF problems
- High reflectance sites are sensitive to errors in the reflectance due to spectrometer and measurement approaches
- High reflectance sites are sensitive to aerosol absorption which is difficult to characterize
- Low reflectance sites are sensitive to aerosol properties
- Urban sites typically have large range of aerosol types
- Rural sites are difficult to reach
- Best approach is to understand the difficulties with a given site that is well understood and readily accessible
Use the Pima County Fairgrounds as an example

This site was supposed to be located using a rigorous search process
Tucson test site
Example surface reflectance spectra
Results ended up matching well with “perfect” site

- Lesson learned in the process was that the site plays an important role
- But, the non-quantitative aspects will often be the key to locating a successful site