On the stability of Ground Calibration Targets: implications for the repeatability of RS methodologies

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Thorney Island test site

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CASl data from Thorney Island

Data provided by NERC ARSF
Ground spectra collected with a dual field-of-view GER1500 spectroradiometer and single beam ASD FieldSpec Pro.

Measuring aerosol optical thickness using a Microtots sunphotometer.
Roles of ground calibration targets

- Validate reflectance retrieval after atmospheric correction.
- Constrain atmospheric correction algorithms.
- Vicarious calibration.

How stable is the reflectance of such surfaces?
Reflectance of concrete calibration target

- High precision dual-beam mobile spectroradiometer
- Two matched GER1500 spectroradiometers
Long-term change in reflectance of bright target
Afternoon spectra significantly lower reflectance, esp. in the visible region.
Each sequence shows a small variation with solar zenith angle. Not large enough to account for the difference between am and pm.

Neither is the spatial uncertainty of location...
First clue to what we think is affecting the concrete reflectance is found in the met. data...
Onset of sea breeze in late morning is confirmed by wind direction measurements from a buoy in Chichester harbour.
But how can a change in wind direction cause a statistically significant change in reflectance?

Cutting a long story short ...
Next steps…

- Towards a model relating concrete reflectance to meteorological data.

Meteorological data
- Precipitation
- Wind
- Air temp.
- Rel humidity
- D:G ratio

Surface properties
- Biotic factors
- Surface Moisture
- Surface temperature
- Surface composition

Nadir Reflectance
The reflectance of weathered bare surfaces may be a lot more dynamic than we thought, especially in humid temperate environments. However, the change in reflectance may be predictable over a number of time scales: seasonal (biotic factors), diurnal (sza) and episodic (meteorological events). These results have wider implications, especially in relation to vicarious calibration sites.