

Variability of Spectral Albedo at Table Mountain, Colorado

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We explore the variability of spectral albedo, including the breakdown of the white- and black-sky components, using data collected at the ESRL Global Monitoring Division's Table Mountain Surface Radiation station. The instrumentation used for this study are lamp calibrated Multi-Filter Rotating Shadowband Radiometers. These instruments measure at six narrowband channels: 415, 500, 615, 673, 870, and 940 nm. White-sky albedo is the reflectance of the surface under diffuse-sky conditions. Black-sky albedo, also known as directional hemispherical reflectance, is the reflectance of the surface from direct-beam illumination only. Using the surface albedo measured under overcast conditions, the components of the upwelling signal can be separated under black-sky conditions. The primary assumption for this analysis is that diffuse albedo is comparable under both cloudy and clear-sky conditions.

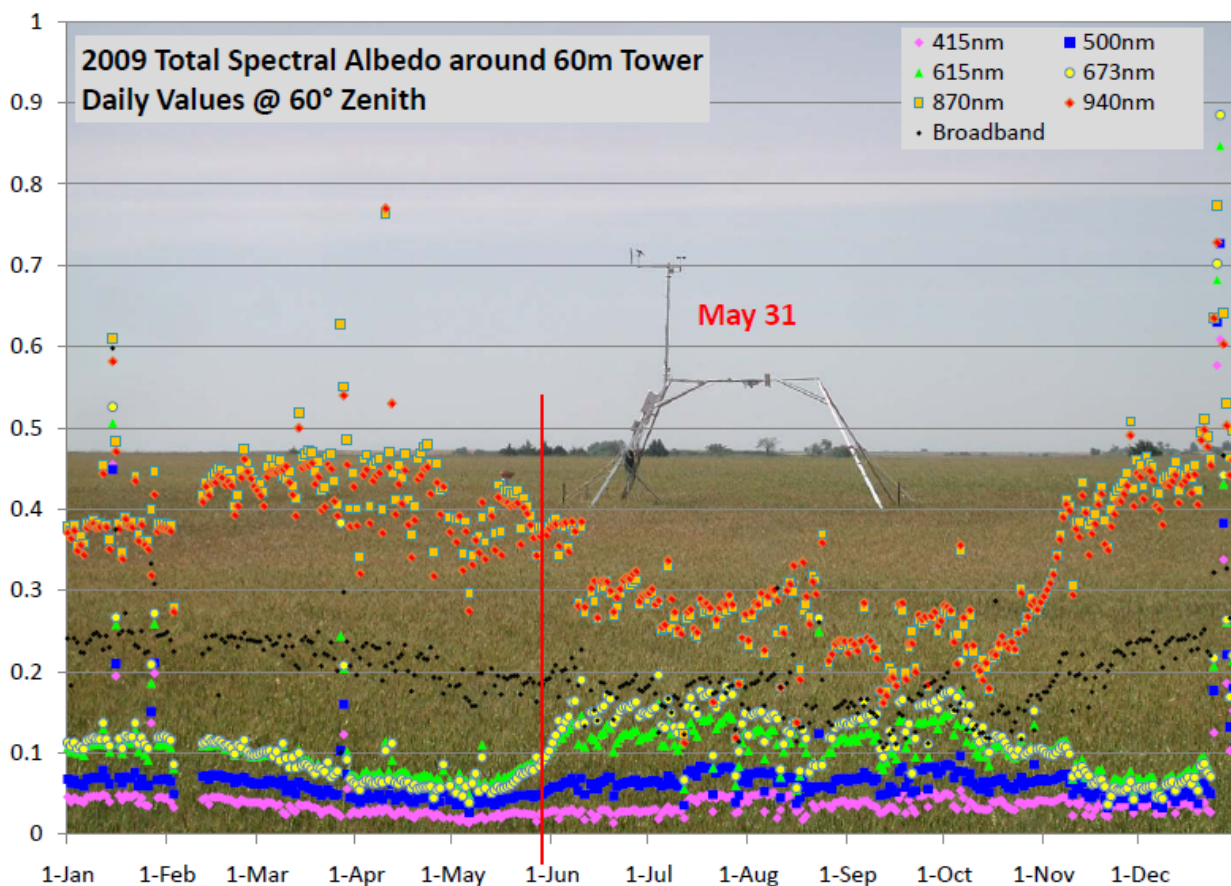


Figure 1. Shown is a plot of spectral albedo vs time. Location is an agricultural field at the Atmospheric System Research (ASR, formerly ARM) facility in north-central Oklahoma. The narrowband data are collected with Multi-Filter Rotating Shadowband Radiometers. The down-pointing unit is located at the 25m level of the ASR 60m tower. The broadband data, shown for reference, are measured with separate instruments. The background image is from May 31, 2009, and is indicated by the red vertical line.