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PROVE SURFACE ALBEDO OF JORNADA EXPERIMENTAL RANGE, NEW MEXICO, 1997

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Summary:

The objective of this study was to determine the spatial variations in field measurements of broadband albedo as related to the ground cover and under a range of solar conditions during the Prototype Validation Exercise (PROVE) at the Jornada Experimental Range in New Mexico on May 20-30, 1997. The surface albedo was sampled as described in Barnsley et al. (2000) at intervals along transects radiating north, south, east, and west from the main instrumentation tower at the transitional vegetation site. Several of these transects were sampled on more than one occasion, under a range of solar illumination conditions. At the grassland site, albedo measurements were taken along a single transect, sampled at 10-m intervals, at three different times of day (i.e., at different solar zenith angles). In addition to the albedo data, hemispherical photographs were taken at each of the sample sites to provide a visual record, and the images were classified to estimate the proportion of bare soil, live vegetation, and woody ground cover.

Global data sets on land surface albedo will be one of the core products to be derived from data acquired by the Moderate Resolution Imaging Spectroradiometer (MODIS) sensor of NASA's Earth Observing System. Widespread acceptance of this product by the user communities is dependent, in part, on a comprehensive and rigorous program of calibration and validation. Because the MODIS albedo product will be produced at a spatial resolution of 1 km while measurements obtained from field instruments typically relate to areas of only a few tens of meters, this requires an understanding of the spatial variability of land surface albedo and a robust means of scaling up from field to satellite measurements. These issues were investigated for the semi-arid field sites at the Jornada Experimental Range on May 20-30, 1997. Spatial variations in field measurements of broadband albedo were related to the fractional ground cover of different scene elements (live and senescent vegetation, soil and shadow) by means of a simple linear mixture model. This approach offers considerable potential for the validation of MODIS-derived albedo values through the use of spectral mixture modeling applied to fine spatial resolution satellite sensor images.

More information and links to other PROVE data can be found at <http://www.daac.ornl.gov/PROVE/prove.html>.

Data Citation:

Cite this data set as follows:

Hyman, A., W. Lucht, and A. Strahler. 2003. PROVE Surface albedo of Jornada Experimental Range, New Mexico, 1997. ORNL DAAC, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/667>.

References:

Barnsley, M. J., P. D. Hobson, A. H. Hyman, W. Lucht, J. P. Muller, and A. H. Strahler. 2000. Characterizing the spatial variability of broadband albedo in a semidesert environment for MODIS validation. *Remote Sensing of the Environment* 74(1):58-68.

Havstad, K. M., W. P. Kustas, A. Rango, J. C. Ritchie, and T. J. Schmugge. 2000. Jornada Experimental Range: A unique arid land location for experiments to validate satellite systems. *Remote Sensing of the Environment* 74(1):13-25.

Hyman, A. H. 1998. Characterizing the spatial variability of albedo in a semi-desert landscape for the validation of satellite data. Master's Thesis, Boston University, unpublished [http://daac.ornl.gov/daacdata/prove/jornada/ground_based/albedo/comp/Hyman_Jornada_albedo_thesis.pdf].

Privette, J. L., G. P. Asner, J. Conel, K. F. Huemmrich, R. Olson, A. Rango, A. F. Rahman, K. Thome, and E. A. Walter-Shea. 2000. The EOS Prototype Validation Exercise (PROVE) at Jornada: Overview and lessons learned. *Remote Sensing of the Environment* 74(1):1-12.

Data Format:

Albedo measurement data file format and variable descriptions and hemispherical photo image formats and descriptions are given in the companion file [albedo_new_reame.pdf](#). Additional companion files include the thesis by A. H. Hyman and three pairs of color/classified photographs in PDF format.

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