

## **NORMALIZATION OF GLOBAL LONG TERM LANDSAT DATA TO STANDARD SUN-TARGET-SENSOR GEOMETRY USING MODIS BRDF PARAMETER CLIMATOLOGY**

H. K. Zhang, D. Roy\*, V. Kovalsky

Geospatial Sciences Center of Excellence, South Dakota State University, Wecota Hall, Box 506B, Brookings, SD 57007, USA

**Commission VI, WG VI/4**

**KEY WORDS:** MODIS, Landsat, BRDF, sun-target-sensor geometry, climatology

### **ABSTRACT:**

The NASA funded Web-enabled Landsat Data (WELD) project has systematically generated 30m composited Landsat mosaics of the conterminous United States (CONUS) and Alaska for 10+ years. New global WELD products that will provide Landsat 30m information for any terrestrial non-Antarctic location for six 3-year epochs spaced every 5 years from 1985 to 2010 are being developed. One outstanding need is to correct for reflectance variations caused by different illumination and observation angles, usually described by the Bi-directional Reflectance Distribution Function (BRDF), that are particularly evident in large area Landsat mosaics. Previous research has demonstrated that MODIS BRDF parameters can be used to normalize Landsat BRDF effects. However, missing MODIS observations preclude reliable normalization and MODIS data were not available prior to 2000. An automated global method that provides a first-order Landsat BRDF normalization for any land location and any time is presented. A climatology of BRDF model parameters is generated from 12 years of MODIS 500m BRDF parameters weighting the parameters by their retrieval quality and by temporally smoothing the weighted results. The climatology is used in a semi-physical way to adjust Landsat reflectance to at nadir view and local solar noon geometry. Results are demonstrated for all of the CONUS Landsat 5 and 7 observations sensed in one year. The efficacy of the methodology with respect to land cover changes, disturbances and snow are presented, and the magnitude of Landsat BRDF effects are quantified for different spectral bands in a comprehensive manner.

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\* Corresponding author.