

Estimating foliage clumping index from multi-angular, shortwave infrared satellite data over non-forested areas

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The clumping index, which quantifies the spatial aggregation of foliage elements, is an important structural parameter for determining the radiation regime of vegetation canopies. The relationship between the clumping index and an angular index (normalized difference between hotspot and darkspot, NDHD) has been previously used to estimate clumping from red and near-infrared parts of the spectrum [1], however the retrievals have been unsuccessful over non-forested areas. In this work the suitability of the shortwave-infrared (SWIR) band of MODIS is assessed for clumping retrievals. Firstly, the relationship between the NDHD at 1640 nm and clumping is modelled. The obtained relationship is subsequently used to retrieve clumping from MODIS data and the results are validated against *in situ* measurements. It is shown that SWIR is indeed promising for estimating clumping over non-forested areas, with particularly good results obtained over large homogeneous croplands.

References

- [1] Chen, J.M., Menges, C.H., and Leblanc, S.G. 2005. "Global mapping of foliage clumping index using multi-angular satellite data." *Remote Sensing of Environment*, 97, 447-457.