



Contrasting spectral changes limit albedo impact on land-atmosphere coupling during the 2003 European heat wave

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Soil moisture related changes in the Earth's reflectance have been suggested to impact warm season climate variability through their direct impact on surface short-wave radiative forcing. Here we investigate the potential contribution of albedo to land-atmosphere coupling during the 2003 European heat wave. MODIS land surface albedo data for the years 2000–2004 are utilized to identify visible, near-infrared, and total shortwave anomalies for 2003. Changes in vegetation structure result in significant but contrasting albedo anomalies in the visible and near-infrared broadbands for most ecosystem types. Although locally the associated total shortwave radiative forcing can be significant (-10 W m^{-2}) especially over cropland areas, the effects almost cancel out at the sub-continental scale (-1 W m^{-2}). The net effect is too small to support the hypothesis that albedo impacts large-scale land-atmosphere coupling.