



Estimating daily Land Surface Temperatures in mountainous environments by reconstructed MODIS LST data ^[1]

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Abstract

Continuous monitoring of extreme environments, such as the European Alps, is hampered by the sparse and/or irregular distribution of meteorological stations, the difficulties in performing ground surveys and the complexity of interpolating existing station data. Remotely sensed Land Surface Temperature (LST) is therefore of major interest for a variety of environmental and ecological applications. But while MODIS LST data from the Terra and Aqua satellites are aimed at closing the gap between data demand and availability, clouds and other atmospheric disturbances often obscure parts or even the entirety of these satellite images. A novel algorithm is presented in this paper, which is able to reconstruct incomplete MODIS LST maps. All nine years of the available daily LST data (2000–2008) have been processed, allowing the original LST map resolution of 1,000 m to be improved to 200 m, which means the resulting LST maps can be applied at a regional level. Extracted time series and aggregated data are shown as examples and are compared to meteorological station time series as an indication of the quality obtained.

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