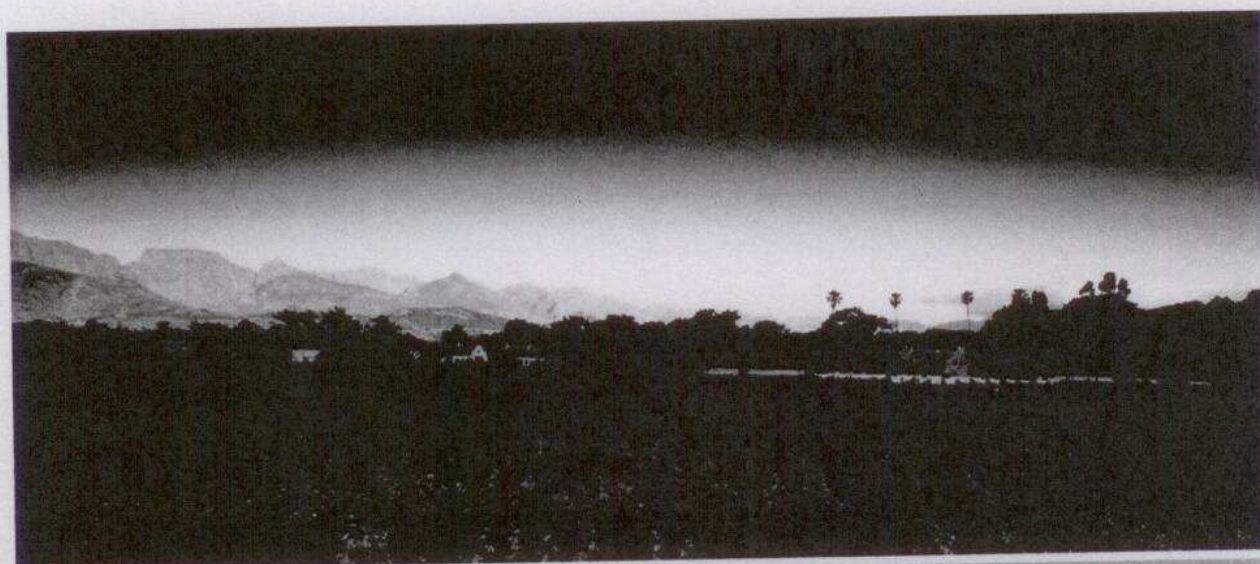


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Application of daily MODIS Land Surface Temperature data in viticulture

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Mapping of temperature over broad areas commonly requires the presence of an expensive and reliable automated network of weather stations, including continuous data transmission, a well structured database, algorithms for quality check and validation of the data and finally for the spatial interpolation. As an alternative source, thermal maps originating from the Aqua and Terra satellites, the MODIS Land Surface Temperature (LST) and Emissivity product, which are intrinsically spatialized can be used after rigorous post-processing in order to obtain a gap-filled time series. The daily LST maps, processed at FEM-PGIS, are the basis for further bioclimatic analysis.

The potential application of MODIS LST in viticulture includes the calculation of bioclimatic indices maps (Average Growing Season Temperature - GST, Winkler Index - WI, Huglin Index - HI, Biologically Effective Degree Days – BEDD, Cool Night Index – CI, Continentality Index - CT), useful for the landscape classification in viticulture regions, as input data for phenological and ripening models, to monitor heat waves and finally to support irrigation scheduling. In this study we will focus on the advantages and pitfalls of the use of gap-filled MODIS LST, in comparison to maps derived from weather station data spatialized by means of a regression with the elevation. We will also show some applications in the viticultural classification of the landscape and suitability of different grapevine varieties, in the calculation of the heat requirements for grape ripening and finally in supporting site and variety selection.

Results show a better capability of MODIS-LST derived maps to define microclimates.