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Estimating an Evaporative Drought Index (EDI) for southern Italy using satellite and ground-based temperature data

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Drought monitoring and forecasting systems require the choice of appropriate drought indices for a pro-active management of drought phenomena. In the last few years, researchers have focused on satellite-derived drought indices because such indices can be available with a much improved spatial and temporal coverage.
The study presents a methodology for deriving the spatially distributed Evaporative Drought Index (EDI), over wide areas in southern Italy, by using satellite data and ground based meteorological data. EDI uses both the estimated actual evapotranspiration (ET) and potential ET (PET). In this study ET was estimated at a daily scale by following the METRIC (Mapping EvapoTranspiration with High Resolution and Internalized Calibration) algorithm, Landsat images and selected weather data. PET was derived following an improved Hargreaves method using air temperature data. ET estimates provided by METRIC were validated with the ground measured ET, and the PET estimates provided by the modified Hargreaves method were compared with Penman-Monteith estimates at several weather monitoring stations in southern Italy. Finally, a spatially well distributed map showing EDI was produced to assess surface drought conditions in southern Italy.