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On the development of a soil moisture-based drought index

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The soil moisture time series produced by means of simulations with the Lisflood model at the spatial resolution of 5 km in the framework of the European Drought Observatory are evaluated in order to develop a soil moisture drought index (SMI). In this paper we describe the index and provide some insight in its spatiotemporal behaviour. We evaluate the possibility of adapting any statistical probability distribution to the pF series pooled in a daily (all the DOY J of the time series) aggregation. The Normal and Log-Normal probability distributions have been considered, giving similar results.
We evaluate the autocorrelation of the SMI time series and we make comparisons with the Standardized Precipitation Index (SPI) calculated over different time scales (averaging periods). The outcomes of those analyses are compared to model's base maps and meteorological summary maps. We perform geostatistical analyses for characterising the spatial behaviour of the index.
We evaluate some basic at-site and continental drought statistics from the time series and we present some examples of multisource detection of past events.