



Towards a soil moisture-based drought index

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Continuous simulations with the LISFLOOD model within the European Flood Alert System produce daily soil moisture maps of Europe. This information provides an instantaneous image of the current situation of the soil water content as modelled by LISFLOOD. The soil water content is represented as soil suction (pF), its normalized value and the seven days trend maps, as well as time series for some selected regions are updated on a daily basis on the <http://natural-hazards.jrc.it> website.

In order to understand if it is possible to obtain valuable information for drought detection purposes, we evaluated the temporal behaviour of the soil moisture series and the relations with well known drought indices.

First we assessed the possibility of adapting any statistical probability distribution to the pF series for the two modelled soil layers for standardization purposes. We considered the Gamma, Normal and Log-Normal probability distributions.

Then we calculated from the input rainfall data the Standardized Precipitation Index (SPI) for different time scales (averaging periods) and we investigated its relations with the standardized pF series. The correlation coefficients between the standardized pF series for the two modelled soil layers and the SPI at different time scales have shown on average higher values for the four months (layer one) and eleven months (layer two) time scales.

The relations between the maximum correlation time scales and basic information on soils and climate have been investigated.

The soil moisture development for selected drought events is presented.