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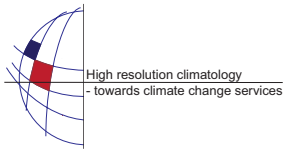

Has the probability of water deficit changed in Central Europe since the middle of the 20th century?

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Daily precipitation totals and daily mean temperature from Central Europe, from the period 1951-2006 have been analyzed. The drought was described using de Martonne, Ped and SPI indices. Aridity index defined by de Martonne Mi (1926) is computed as: Mi= 12Ri/(Ti+10), where Ri is the monthly precipitation amount and Ti is the monthly mean air temperature.
The Ped index is defined as Pi=(Ti-Tm)/σT -(Ri-Rm)/σR , where Tm and Rm are mean monthly (seasonal) temperature and precipitation, respectively, and σT and σR are standard deviations of monthly (seasonal) temperature and precipitation, respectively. According to McKee et al. (1993), the SPI is defined on each of the time scales as the difference between precipitation on the time series (Ri) and the mean value (Rm), divided by the standard deviation (σR). This definition assumes that the data fit the normal distribution, but because it is rarely true for precipitation data the data were usually transformed to standard normal distribution. Different distributions have been used to precipitation time series on monthly and seasonal scale. The Kolmogorov-Smirnov test was used to evaluate the goodness of fit.
The relations between temporal series of different indices were analyzed using Pearson's and Spearman's correlation coefficients. Also the trends were analyzed on the basis of both minimum square fit of polynomials and Mann-Kendall test. Spatial distribution of trends was analyzed.