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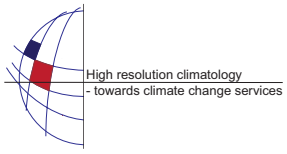

Mapping of SPI drought index in South-Eastern Europe, theory and practice

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In recent decades drought has a major impact on the economy in South-Eastern Europe (SEE). The annual precipitation has decreased from the beginning of 20th century. Additional problem is that the intensity of precipitation increases in average. The part of runoff became larger, and greater part of the precipitation runs to the rivers, streamlets, and less part infiltrates into the soil. Therefore, the available water reduces for vegetation. Summarized, the drought tendency increases in the region. The Drought Management Centre for South East Europe was established to deal with these events and try to improve drought management and policy.
One method to calculate the extent of a drought event is the application of drought indices. Several indices are used for this purpose, one of them is the Standard Precipitation Index (SPI) developed by McKee et al.
The SPI is based only on precipitation and can be used to monitor conditions on a variety of time scales. The SPI calculation for any location is based on long-term precipitation record for a desired period. This long-term record is fitted to a gamma probability distribution, which is then transformed into the standard normal distribution. In the practice SPI is calculated mainly for 1, 3, 6 months. The SPI calculator which is offered on the project page of DMCSEE is applied for SPI calculations in this study.
For the interpolation of SPI we use the MISH interpolation method developed at Hungarian Meteorological Service (Meteorological Interpolation based on Surface Homogenized Data Basis; Szentimrey, Bihari, 2007). The interpolation can be realized in to ways:
1. The SPI values are calculated in grid points after gridding (by gridding part of MISH) the station precipitation data series
2. The station based SPI values are interpolated by method MISH
One of the main feature of MISH is that it use longtime data series for modelling of the necessary climate statistical parameters while the SPI calculations are also based on long time data records because of the estimation of gamma distribution parameters. Moreover a spatial neighbourhood modelling can be performed by MISH for the covariance (correlation) structure and in this case the spatial trend modelling is not necessary as a consequence of the standardization.
In recent study we show the spatial distributions of SPI for different time scales in the years with most severe droughts. The examined territory is the border area between Hungary, Slovenia and Croatia (45°30'- 47° and 15°30'-19°).

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