



New Method for Assessment of the Drought Climatology - Czech Republic as a Case Study

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The study presents methodology for the analysis of drought climatology within a particular region that enables the definition of drought areas with high spatial resolution. The approach also allows quantifying relative intensity of drought spells, their frequency and length between individual stations or the predefined regional climatological threshold. As part of the drought climatology assessment the study also describes the existing trends in drought spell occurrence in the Central Europe during the second half of 20th century. In addition it provides results of regionalization of climatological stations according to the drought climatology. The methods of drought assessment rely Standardized precipitation index (SPI) at various time scales, Palmer drought severity index (PDSI) and Palmer Z-index (ZIND) that were significantly modified to suit climatological purposes. Combination of these indices was then used to derive Climatological Drought Indicator (CDI) that provides more robust regionalization of drought risk which is easier transferable to stakeholders. Based on the 1961-2000 monthly data from 233 Czech stations the drought indices were calculated and drought prone regions were determined. It has been found that over 3% of the country area belongs to high risk region (over 60% of months influenced by moderate to extreme drought event) and additional 12,3% is faced with 50-60% chance of drought. Interestingly the most drought prone regions are to located in the principal agricultural production areas i.e. on the south-east and north-west of the country. The set of 233 stations can be divided into 6 distinguished groups according to the drought characteristics with three of them representing prevalingly drought prone regions, one cluster of mostly moun-

tainous station with relatively limited probability of drought occurrence and two transitional groups. Interestingly there have been no statistically significant time trends of precipitation anomalies (described by SPI) over 1961-2000 period. However we have found compelling evidence showing decreasing trend in the monthly (ZIND) and long-term water balance (PDSI) at large number of stations notably in eastern part of the country i.e. tendency to more intensive (and/or longer drought spells). In the same time only handful of stations indicated that conditions have become wetter during past 40 years. The main reason behind this development seems to be a significant increase of temperatures towards the end of the 20th century.

We hope that the study might generate discussion about potential use of the proposed methodology over the European region whilst in the same time it provides useful reference to drought vulnerability of the significant part of the Central Europe.

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