



## **Drought Variability in Eastern Part of Romania and its Connection with Large-Scale Air Circulation**

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Drought is a phenomenon that appears due to precipitation deficit and it is intensified by strong winds, high temperatures, low relative humidity and high insolation; in fact, all these factors lead to increasing of evapotranspiration processes that contribute to soil water deficit. The Standardized Precipitation Evapotranspiration Index (SPEI) take into account all this factors listed above. The temporal variability of the drought in Eastern part of Romania for 50 years, during the period 1961-2010, is investigated. This study is focused on the drought variability related to large scale air circulation. The gridded dataset with spatial resolution of 0.5° lat/lon of SPEI, (<https://digital.csic.es/handle/10261/72264>) were used to analyze drought periods in connection with large scale air circulation determinate from the two catalogues (GWT – GrossWetter-Typen and WLK - WetterLargenKlassifikation) defined in COST733Action. The GWT catalogue uses at input dataset the sea level pressure and the WLK catalogue uses as input dataset the geopotential field at 925 hPa and 500 hPa, wind at 700 hPa and total water content for entire atmospheric column. In this study we use the GWT catalogue with 18 circulation types and the WLK catalogue with 40 circulation types. The analysis for Barlad Hydrological Basin indicated that the negative values (that means water deficit - drought period) of SPEI are associated with prevailing anticyclonic regime and positive values (that means water excess - rainy period) of SPEI are associated with prevailing cyclonic regime as was expected. In last decade was observed an increase of dry period associated with an increase of anticyclonic activity over Romania. Using GWT18 catalogue the drought are associated with the north-eastern anticyclonic circulation type (NE-A). According to the WLK40 catalogue, the dominant circulation type associated with the drought is north-west-anticyclonic-dry anticyclonic (NW-AAD) type.

keywords: drought, SPEI, large-scale atmospheric circulation