Links between circulation types and high precipitation over Prut River Basin

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In this study, we assess the high precipitation days for the Prut River Basin related to atmospheric circulations derived from cost733cat software. The Prut River Basin is situated in the Eastern Europe, having an approximate area of 28 518 km2, being one of the largest river catchments of Danube River before draining into the Black Sea. We chose four different classification methods, based on criteria such as threshold based methods, principal component analysis, leader and optimization algorithms. In order to construct the classifications, mean sea level pressure and the height of 500 mb field were extracted from ECMWF ERA-Interim reanalysis and used as input. Daily precipitation data from multiple weather stations located in the Prut River basin along with precipitation data from E-OBS were used for the period 1981-2016. The threshold for a day with a high precipitation record was established as having at least 10 mm. We calculated the conditional probabilities for each type in order to assess the links between high precipitation and atmospheric circulations. Also, several statistical metrics were performed in order to check in terms of separability and within-type variability the purpose of performance comparison between classifications