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Analysis of extreme precipitation indices for the Carpathian Basin using bias corrected ENSEMBLES-outputs

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In order to build regional adaptation and mitigation strategies, climate simulation results must be downscaled for local analysis, which can better serve end-users' needs. This is especially important in case of precipitation due to the large temporal and spatial variability. Furthermore, the high potential risks of drought events on agricultural production and the possible flood events in the area also highlight the importance of this issue.
On the base of evaluating raw RCM precipitation outputs of ENSEMBLES model experiments for 1951-2000, simulated values usually significantly overestimate the observations in the Carpathian Basin, except in summer when mostly underestimations were found. These biases of the raw RCM outputs are corrected using the monthly empirical distribution functions by fitting to the observed distribution. Then, the calculated bias correcting factors are applied to the outputs of RCM experiments for the future 2000-2100 period taking into account the SRES A1B emission scenario, according to which CO_2 concentration by 2100 is estimated to exceed 700 ppm (more than twice of the preindustrial level).
In order to assess extreme precipitation tendencies, several precipitation-related indices (including the number of wet days using several threshold values defining extremes, CDD - the maximum number of consecutive dry days, RX1 - the highest 1-day precipitation amount, RX5 - the greatest 5-day rainfall total, etc.) are analyzed both on annual and seasonal scales. The results clearly suggest that consecutive dry periods in the region are likely to lengthen in the future, especially in summer.