



Future changes in seasonal extreme precipitation events projected by CMIP5 models

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Extreme precipitation events have a strong impact on societies and economies; it is, therefore, important to accurately describe and characterize their possible changes in the 21st century. Eight CMIP5 Global Climate Models, with resolution higher to 1.5 degrees, have been retrieved for the second half of the twentieth century and the whole 21st century (RCP4.5 and RCP8.5 scenarios). Seasonal extremes over the entire globe are analyzed in the framework of Extreme Value Theory by applying a Peak Over Threshold approach combined with the generalized probability weighted moments for the estimation of the parameters. Three 40-year periods (1966-2005, 2020-2059 and 2060-2099) are selected and statistically analyzed. Further, the goodness-of-fit is assessed by applying a modified Anderson-Darling test. Return levels (50- and 25-year) are estimated and results are presented as changes with respect to the reference 1966-2005 period.

Both scenarios agree on the increasing 50-year return levels for the last four decades of the 21st century over many regions of the earth, with higher intensity for the RCP8.5 scenario. Concerning the 2020-2059 period, a less spatially homogeneous and less intense increase characterizes both scenarios.