



Bias adjustment of EURO-CORDEX and Med-CORDEX simulations over the Carpathian Region using the high resolution gridded observational database: CARPATCLIM

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Under the supervision of the international initiation called the COordinated Regional Downscaling Experiment (CORDEX) numerous regional climate model (RCM) experiments have been accomplished over different sub-regions of the globe. From this framework EURO-CORDEX and Med-CORDEX initiatives provide RCM simulations targeting Europe as a whole or in a part at grid resolutions of 0.44° (~ 50 km) and of 0.11° (~ 12 km). The study represents daily precipitation output bias correction of EURO-CORDEX and Med-CORDEX RCM ensembles (consisting in total eight members at both resolutions) at a common $0.11^\circ \times 0.11^\circ$ horizontal grid resolution based on the high-resolution, high-quality observational dataset: CARPATCLIM. The region covered by the CARPATCLIM dataset can be considered as the Carpathian Region for which all RCM simulations of a historical period (1976-2005) and assuming Representative Concentration Pathway 8.5 (RCP8.5) over two future time slices (2021-2050 and 2070-2099) were assessed. The quantile mapping method was used in order to adjust systematic bias in precipitation fields. The effect of bias correction on precipitation change was evaluated based on all RCM simulations with and without bias correction. The analysis of different climate indices were also included in the assessment of RCM simulations with and without bias correction, such as frequency of rainy days (days with a total rainfall of at least 1 mm), heavy precipitation days (days with a total rainfall of at least 10 mm), daily precipitation intensity, maximum consecutive dry days periods, maximum consecutive rainy days periods. Preliminary results show that both magnitude and spatial distribution of mean changes were not significantly distorted, but generally reserved during the process of bias adjustment. This work is also in favor of providing a high resolution bias-corrected database which can serve as input for climate change impact and adaptation studies for different sectors over the Carpathian Region.