# Projection of extreme climate over South-Korea with simulation results of RegCM4 in the CORDEX-East Asia domain based on RCP scenarios

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Recently, we reproduced regional climate over CORDEX East Asia for 72 years from 1979 to 2050 with a 50-km resolution using the latest regional climate model version 4, RegCM4, driven by HadGEM2-AO with about 135-km resolution under IPCC RCPs 8.5/4.5 scenarios. This study focused on the projection of extreme climate in South-Korea during the forthcoming 21st century using the RegCM4. The present and future period defined by the latest 20-yr (1986-2005), and furthermost 20-yr (2031-2050), respectively. The extreme climate was defined by a percentile method (PR5%, TX5%, TN5%, ETR5%) and an absolute threshold method (frost, hot, wet, dry, tropical night). For the validation of RegCM4 for the extreme climate simulations over South Korea, daily observation data (precipitation, daily max./min. temperature) of 50 stations from KMA were used. Considering the 50 km horizontal resolution, RegCM4 simulated the spatial distribution well in South Korea in comparison with observation. However, the RegCM4 systematically underestimated the intensity and frequency of extreme climate events. This seems to be related to the low horizontal resolution and limitation of regional climate models. Regardless of RCP scenarios, the number of extreme events, PR5%, TX5%, TN5%, hot day, and wet day (ETR5%, frost day, dry day) are expected to increase (decrease) compared to the present climate (1989-2005) by the mid of the 21st century. And the intensity of extreme climate events, such as PR5%, TX5%, TN5%, hot day, are expected to be more intensified in RCP8.5 than RCP4.5 scenario.