



SIMULATED FUTURE CHANGES IN AIR TEMPERATURE AND PRECIPITATION CLIMATOLOGY IN THE CENTRAL ASIA CORDEX REGION 8 BY USING RegCM 4.3.5

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In this study, projected future changes for the period of 2071-2100 in mean surface air temperature and precipitation climatology and variability over the large Central Asia region with respect to present climate (1971 to 2000) were simulated based on the RCP 4.5 and RCP 8.5 emission scenarios. Regional Climate Model (RegCM4.3) of the International Centre for Theoretical Physics (ICTP) was used for projections of future and present climate conditions. Hadley Global Environment Model 2 (HadGEM2) of the Met Office Hadley Centre was downscaled for the Cordex Region 8. We investigated the seasonal time-scale performance of RegCM4.3.5 in reproducing observed climatology over the domain of Central Asia by using two different emission scenario datasets for three future periods. The regional model is capable of reproducing the observed climate with few exceptions, which are due to the meteorological and physical geographical complexities of the domain. For the future climatology of the domain, the regional model predicts relatively high warming in the warm season and northern part of the domain at cold season with a decrease in precipitation amounts almost all part of the domain. The results of our study showed that surface air temperatures in the region will increase from 3°C up to more than 7°C on average according to the emission scenarios for the period of 2070-2100 with respect to past period of 1970-2000. In the future, a decrease in the amount of precipitation is also predicted for the region. The projected warming and decrease in precipitation for the domain may strongly affect the ecological and socio-economic systems including agriculture, natural biomes, hydrology and water resources of this region, which is already a mostly arid and semi-arid environment.

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