



Simulations of Future Drought Conditions in Central Asia CORDEX Region 8 by Using RegCM4.3.5

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In this work, projected future changes in mean surface air temperature and precipitation climatology, inter-annual and seasonal variability and climatic aridity/humidity conditions for the period 2070-2100 over the large Central Asia region with respect to present climate (from 1970 to 2000) were simulated based on the RCP4.5 and RCP8.5 emission scenarios. Regional Climate Model (RegCM4.3.5) of the International Centre for Theoretical Physics (ICTP) was used for projections of future and present climate conditions. HadGEM2 global climate model of the Met Office Hadley Centre and MPI-ESM-MR global climate model of the Max Planck Institute for Meteorology were downscaled to 50 km 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 2 different global climate model outputs. 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 almost all part of the domain. The results of our study show that surface 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 2070-2100 with respect to past period 1970-2000. Therefore, the projected warming and decrease in precipitation and also resultant or associated increased aridity and more frequent and severe drought events very likely adversely affect the ecological and socio-economic systems of this region, which is already characterised with mostly arid and semi-arid climate and ecosystems.