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Temperature and precipitation climatology assessment over South Asia using the regional climate model (RegCM4.3): An evaluation of the model performance

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Climate modeling is a significant tool to reproduce the observed features of present climate changes and can provide reliable estimations for future climate changes at global and regional level. In the present study, latest version of International Center for Theoretical Physics (ICTP) regional climate model (RegCM4.3) was used to examine its ability by analyzing European Community-Hamburg atmospheric model (ECHAM5) and the European Centre for Medium-Range Weather Forecast (ECMWF) 40 years reanalysis data (ERA-40) over South Asia. Seasonal mean climatology and annual cycle are compared with different observation based data sets and also with the reanalysis and driving GCM. Two experiments are conducted for present day simulation (1971-2000) by using ERA-40 reanalysis and ECHAM5 GCM to provide initial and lateral boundary conditions. In spite of complex topography of the domain, RegCM4.3 shows an improved performance in various aspects as compared to the earlier applications of this model over South Asia. Near surface air temperature are reproduced well over the most part of the domain. Indian monsoon precipitation patterns are better captured by RegCM4.3 as compared to ECHAM5 and ERA40. Simulation results show that RegCM4.3 has cold bias in winter and summer over the foothills of the Hindu-Kush_ Himalaya (HKH) region. Simulation with ERA40 and ECHAM5 overestimated the seasonal mean precipitation over some part of the domain which requires further improvement in the physical parameterization scheme of RegCM4.3.

Biography

Mujtaba Hassan is a PhD Scholar in the field of Environmental Science and Engineering at Tsinghua University and has a master's degree in Meteorology from COMSATS University, Pakistan. He is working in the group of Prof. Du Penfei under UoN-IRDC international research project on innovative application of ICT's in addressing water related impact of climate change. He has published one paper in an international reputed journal and presented another paper in an international conference.

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