

Dynamical downscaling approach for wintertime seasonal-scale simulation over the Western Himalayas

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Abstract

The performance of RegCM4 for seasonal-scale simulation of winter circulation and associated precipitation over the Western Himalayas (WH) is examined. The model simulates the circulation features and precipitation in three distinct precipitation years reasonably well. It is found that the RMSE decreases and correlation coefficient increases in the precipitation simulations with the increase of model horizontal resolutions. The ETS and POD for the simulated precipitation also indicate that the performance of model is better at 30 km resolution than at 60 and 90 km resolutions. This improvement comes due to better representation of orography in the high-resolution model in which sharp orography gradient in the domain plays an important role in wintertime precipitation processes. A comparison of model-simulated precipitation with observed precipitation at 17 station locations has been carried out. Overall, the results suggest that 30 km model produced better skill in simulating the precipitation over the WH and this model is a useful tool for further regional downscaling studies.