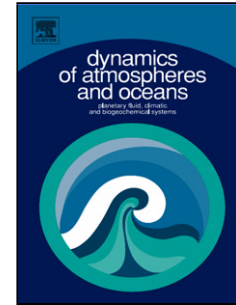


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Evaluation of Regional Climate Models Performance in Simulating Rainfall Climatology of Jemma Sub-basin, Upper Blue Nile Basin, Ethiopia

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Highlights

- Regional Climate models are more significant than the initial boundary condition (Global Climate Models) in capturing the rainfall of Jemma sub-basin.
- Global Climate models downscaled using RCA4 regional model showed poorest performance in most of the criteria used than GCMs downscaled using CCLM4 and REMO RCMs models in this study.
- GCMs downscaled by RCA4 models are characterized by higher overestimation of rainfall in the higher altitudes and higher underestimation in the lower altitude areas of the sub-basin.

Abstract

This study examines the performance of 10 Regional Climate Model (RCM) outputs which are dynamically downscaled from the fifth phase of Coupled Model Inter-comparison Project (CMIP5) GCMs using different RCMs parameterization approaches. The RCMs are evaluated based on their ability to reproduce the magnitude and pattern of monthly and annual rainfall, characteristics of rainfall events and variability related to Sea Surface Temperature (SST) for the period 1981-2005. The outputs of all RCMs showed wet bias, particularly in the higher elevation areas of the sub-basin. Wet bias of annual rainfall ranges from 9.60% in CCLM4 (HadGEM2-ES) model to 110.9% in RCA4 (EC-

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