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Validation of the fifth-generation of the Canadian Regional Climate Model (CRCM5) over West-Asia CORDEX domain

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Validation of the fifth generation of the Canadian Regional Climate Model (CRCM5) in reproducing the main climatic characteristics of West Asia, particularly the SW Indian summer monsoon circulation and associated precipitation will be presented in this paper. Main climatic features simulated by CRCM5 driven by ERA40/ERA-Interim for the 1971–2000 period are compared with available observations and reanalysis products (CRU, ERA40, daily precipitation from Indian Meteorological Department (IMD), Asian Precipitation - Highly-Resolved Observational Data Integration Towards Evaluation (APHRODITE) data) for this purpose. Results show that, during the monsoon period (JJAS), CRCM5 is able to capture relatively well the spatial pattern of precipitation for south-central India and coastal Myanmar but underestimates the precipitation in the central and northeastern parts of India and the Himalayas. Study also shows that CRCM5 has a warm bias in northern India in comparison to reanalysis and CRU TS 3.1 data. The model successfully captures the patterns as well as the strength of the winds at different pressure levels with slight overestimation of lower level wind in the Arabian Sea and the Bay of Bengal and upper level westerly in northern India. CRCM5 also reproduces well the planetary-scale variations associated with the Indian summer monsoon while it shows some difficulties in reproducing the strength of the monsoon. The simulated timing of the monsoon onset is in good agreement with observed data over central and southern part of India (peninsular), whereas over the east cost of India, the onset is somewhat delayed. CRCM5 has difficulties in reproducing observed monsoon withdrawals.