Wet season evaluation of RegCM3 performance for Eastern Mediterranean

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In this study, we investigate the performance of RegCM3 in simulating the general climate characteristics of the eastern Mediterranean region where various climate conditions take place due to complex topography, land-sea contrast and diversity of landscape. To provide a more quantitative evaluation of the model performance, a ten-year simulation for the wet season months, from October to March, was performed with a 30-km spatial resolution. Initial and boundary conditions were provided by the NCEP/NCAR Reanalysis data available at 6-h intervals with a resolution of 2.5 x 2.5. To assess the model's ability to simulate general climate characteristics in this region, the simulation results were then compared with the NCEP/NCAR Reanalysis data, surface data from various sources and the data from the meteorological stations in Turkey. Overall, the RegCM3 model is capable of reproducing the climate characteristics of the region. Large scale circulation fields in these months are reproduced reasonably well by the model. The results of simulated monthly mean precipitation for the wet season months reveal that the model reproduces the spatial structure of rainfall realistically. However, the model suffers from some persistent biases such as overestimation of precipitation in the southeast Black Sea coasts and interior areas of these coasts. In terms of temperature, spatial distribution of monthly mean surface temperature is generally captured by the model. It generally overestimates the mean surface minimum temperature while a cold bias occurs in the mean surface maximum temperature. Results of model validation reveal that the performance of RegCM3 is well enough to carry out climate studies such as climate sensitivity experiments and climate change scenarios for this region.