



The climate version of the Eta regional forecast model. 2.Evaluation of the Eta CCS model performance against reanalysis data and surface observations.

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The climate version Eta CCS, prepared from the NCEP Eta forecast model, was integrated over South America for the period from January 1979 to December 1983. The model was driven by the two sets of boundary conditions derived from the reanalysis and outputs of HadAM3P atmospheric global model. The mean output fields of precipitation, precipitation frequency, and near surface air temperature, simulated by the Eta model, were compared with the observational data of the CRU and GPCP projects. The comparison shows that the Eta model reproduces well the main patterns of the summer and winter observed precipitation fields over South America. But the magnitude of precipitation is underestimated by the model in the regions of strong convection activity in summer. This is probably related to the deficiencies in the model convection scheme. The larger underestimation of observed precipitation by the Eta model driven by HadAM3P than by the reanalysis is associated with underestimation of precipitation by HadAM3P. In winter, the Eta model reproduces better than HadAM3P the magnitude of precipitation in the equatorial part of the South American continent and position of ITCZ. The observed number of wet days during summer season is overestimated by HadAM3P. The number of wet days in both runs of the Eta model is closer to observations. During winter, HadAM3P strongly overestimates number of wet days over the continent. The Eta model driven by reanalysis gives this parameter closer to observations. The main summer and winter patterns of near surface air temperature are reproduced well by both HadAM3P and the Eta model. The Eta model overestimates the observed surface temperature over the central part of the continent due to the lack of convective cloudiness in this region. The Eta model captures observed annual cycle of precipitation in six selected regions over South America. But the magnitude of precipitation is underestimated in the regions of strong convection activity in summer. On the whole, these results support the conclusion that the Eta model with some improvements can be used for downscaling of the HadAM3P output fields. The deficiencies of the Eta model in tropics and subtropics are probably associated with its convection and radiation schemes.