

Role of air-sea interactions in the simulation of southern Africa summer climate

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The importance of air-sea interactions in the simulation of southern Africa summer climate is studied by coupling Advanced Research Weather Research and Forecasting (WRF) regional model to a simple mixed layer Price-Weller-Pinkel Ocean model. The coupled model was run for twelve austral summer seasons, DJF 1998/99 to DJF 2009-10 using the boundary conditions derived from the NCEP reanalysis data. Analysis shows the coupled WRF model to have smaller biases in the spatial distribution of precipitation over southern Africa landmass compared to the standalone WRF. Also, an improvement in the simulation of number of wet and dry days is seen in the coupled model. The improvement in the simulation of precipitation in the coupled WRF model is mainly due to improvement in the representation of moisture fluxes compared to WRF model. Experiments with boundary conditions derived from SINTEX-F forecasts also showed similar improvements in the coupled WRF forecasts compared to standalone WRF model, showing that air-sea interactions play an important role in the simulation/forecast of austral summer climate of southern Africa.

Keywords: WRF model, southern Africa, PWP mixed layer Ocean model