

Evaluation of RegCM4 simulation nested in the ERA-Interim reanalysis: climatology and interannual variability over CORDEX-South America domain

Rosmeri da Rocha[†]; Santiago Cuadra; Michelle Reboita

[†] University of São Paulo, Brazil

Leading author: rosmerir@model.iag.usp.br

This work analysis the RegCM4 climatology and interannual variability over South America considering the CORDEX sub-domain. RegCM4 simulation used the ERA-Interim reanalysis from the European Centre for Medium-Range Weather Forecasts (ECMWF) as initial and boundary conditions. Simulation was carried with 50 km of horizontal resolution, 18 vertical levels, and the Grell convective scheme. The domain covers all South America and simulation was integrated for the period from 1989 to 2010. The simulated climatology and interannual variability were compared with CMAP, GPCP, ERA-Interim and CRU datasets. The main observed patterns of low and upper level circulations were coherently simulated by RegCM4 when compared with the ERA-Interim reanalysis. For example, RegCM4 simulates the low level jet east of the Andes Mountain range. Rainfall and air temperature annual cycles over South America were also close to the observed data sets, mainly in the subtropics. For example, typical spatial precipitation patterns, as large precipitation rate in the South Atlantic Convergence Zone during summer and maximum rainfall rate in the southeastern of South America during winter, were well characterized in the simulation. Moreover, over the tropics RegCM4 reduced the air temperature cold biases presented in earlier simulations using RegCM3, while over subtropics RegCM4 presented similar temperature biases. The impacts of El Niño-South Oscillation (ENSO) teleconnections over precipitation and air temperature interannual variability were also analyzed in the RegCM4 simulation.