

Preliminary results of RegCM3 nested in the Hadley Center Model over South America:
the actual climate

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This work presents an analysis of a ten-year simulation of present-day climate (1961-1970) over South America by using RegCM3 model nested within the HadAM3 global atmospheric model. The objective is to analyze the simulated climatology and interannual variability over some regional areas over South America. The RegCM3 simulation domain includes practically all South America and has 60 km of horizontal resolution with 23 vertical sigma levels. The main interest is to compare the RegCM3 results of air temperature and precipitation with observational data set. The mean circulation at lower and high levels simulated by the model was also compared with NCEP reanalysis and HadAM3 climatologies. The preliminary results show that the climatology of the air temperature and precipitation from the HadAM3 and RegCM3 presents considerable differences. Both models simulated the main characteristics of the observed annual precipitation climatology. However, the RegCM3 results show some additional information in relation to the coarse HadAM3 field and revealed important features of the regional climate such as: the delimitation of the minimum precipitation over Northeast of Brazil; intense precipitation in the mouth of the Amazon River; and a sensible improvement in the rainfall distribution at the central and western parts of Colombia. On the other hand, the RegCM3 seems to not be able to correct simulate the precipitation intensity over the SACZ which is a climatic characteristic of the austral summer monsoon. The RegCM3 represent better than HadAM3 the annual mean air temperature over regions of elevated topography. The precipitation annual cycle over Amazon simulated by the HadAM3 and RegCM3 models is very similar to the observation but both models present negative bias in the first 9 months. For the air temperature the RegCM3 generates a systematic negative bias during the rainy season while the HadAM3 overestimate the temperature along of the year. HadAM3 and RegCM3 simulate a well-defined annual precipitation cycle, with dry winter and wet summer, over the Southeast Brazil. However, the RegCM3 fails to indicate the beginning of the rainy season between October-November.