Geophysical Research Abstracts,
Vol. 11, EGU2009-3403, 2009
EGU General Assembly 2009

1961-1990 climate simulations over South America using Eta Model

S.C. Chou (1), J.A. Marengo (1), J.F. Pesquero (1), A.A. Lyra (1), G. Sueiro (1), D.J Chagas (1), L. Alves (1), B. Rajkovic (2), and V. Djurdjevic (2)

(1) INPE (National Institute for Space Research), Cachoeira Paulista, SP, Brazil (chou@cptec.inpe.br), (2) Institute of Meteorology, Belgrade University

Global models are used to generate Climate Change scenarios. For computation efficiency these models have rather coarse resolution. Model grid sizes smaller than 100 km is generally required for producing climate change impact studies. To prepare the Regional Eta Model for Climate Change studies over South America, the model was initially modified and was run for the present climate period from 1961-1990. The objective of this work is to evaluate the climate simulations using the Eta Model driven by two Coupled Atmosphere-Ocean General Circulation Models: the HadCM and SINTEX-G (INGV- ECHAM/OPA/LIM). The HadCM conditions were provided at 3.75 o and 2.75o grid sizes in zonal and meridional directions, respectively, and at 6-hour frequency. The SINTEX-G conditions were provided at the approximate grid size of 1.125o in both directions and at 12-hour frequency. Both conditions refer to anthropogenic, 1961-1990 period. The Regional Eta Model nested in these conditions was configured with 40-km grid sizes and 38 layers in the vertical. The model was altered to take in the 360-day year calendar of the global climate model runs. Vegetation greenness was modified to vary along the year, as it used to be fixed to the initial value in the weather forecast mode. Sea surface temperatures were taken from the global models monthly mean values and daily updated in the Eta Model. It is expected that after one year of integration, the regional conditions has reached a climate state of equilibrium with the lateral boundaries, therefore the runs started in 1960 and the first year of adjustment was discarded from the analysis. Results are based on the comparison of the two runs, Eta-HadCM and Eta-ECHAM (INGV), against CRU data. The better represented topography clearly improved the simulated surface temperature and precipitation patterns. The nested runs produced stronger ITCZ and more precipitation in the Amazon region when compared with each driver conditions. The simulated annual cycles of temperature and precipitation for different sectors of South America are shown in comparison against the drivers. Both nested runs show large improvement especially over the Amazon region.