Geophysical Research Abstracts
Vol. 13, EGU2011-9578, 2011
EGU General Assembly 2011

CLM Coupled in the RegCM3 Model: a Sensitivity Analysis for the Amazon Rainforest

Marta Llopart, Rosmeri da Rocha, and Luiz Kruger
University of São Paulo - Brazil (marta@model.iag.usp.br)

Studies with climate models have showed that the atmosphere exhibits sensitivity to the formulation adopted in the surface-atmosphere interaction (Steiner et al. 2005; Steiner et al. 2009). The goal of this work was to analyze the impact of using dynamic vegetation in the annual cycle of temperature, precipitation, sensible and latent fluxes over the Amazon region.
In this work we used the Regional Climate Model (RegCM3) with parameterizations described in Pal et al. (2007) and two different land surface schemes: BATS (RegBATS) described in Dickinson et al. (1993) and CLM3.5 (RegCLM3.5) described in Oleson et al. (2008). The simulation period ranges from 1989 to 1996. Initial and boundary conditions to drive the atmospheric dynamics are taken from Era-Interim analysis (Berrisford et al. 2009). The annual cycle of near surface variables (temperature, precipitation, and latent and sensible fluxes) compared to observed values of the km 83 micrometeorological tower.
Both simulations showed good sensible heat flux (H) seasonality, with a peak in dry season (August-September) and a minimal during the rainy season (April), which is consistent with the observations. The values of H simulated by RegBATS were overestimated, that explain the higher temperature simulated in this experiment. RegCLM3.5 simulated H values similar of the observations during the dry season, and for rainy season they are lower than observed, what explain the RegCLM3.5 underestimation of air temperature during the rainy season.
RegCLM3.5 and RegBATS overestimated the latent heat flux (LE) observed in the micrometeorological tower. The RegBATS shows two peaks of maximum for LE during the transition from dry to rainy season and in a few months of the rainy season, which can explain larger than observed precipitation. In the RegCLM3.5 the LE seasonality is similar to the observed, but the higher values of LE should explain rainfall overestimation during the January to April and October to December.
The use of RegCLM3.5 showed improvements in the LE representation, resulting in the annual cycle of precipitation similar to the observations of km 85 in the Amazon.