



Simulation of the Holocene climate over South America and impacts on the vegetation

Jelena Maksic (1), Marilia Shimizu (2), Gilvan Sampaio de Oliveira (2), Igor Martins Venancio (2), Manoel Cardoso (1), and Felipe Alexandre Ferreira (1)

(1) Instituto Nacional de Pesquisas Espaciais, CCST, Cachoeira Paulista, Brazil , (2) Instituto Nacional de Pesquisas Espaciais, CPTEC, Cachoeira Paulista, Brazil

Holocene climate over South America has been studied through numerical simulations and paleoclimate proxies. However, temporal and spatial coverages of these studies are limited in general to the Last Millennium and 6 ka for the numerical simulations, and few locations for the proxies. Hypotheses about Holocene climate and distribution of rainforest varying from alternate dry and wet episodes to stable climate with undisturbed rainforest. We provided a comprehensive analysis of the Holocene climate and vegetation changes over South America. Several Holocene periods (8 ka, 6 ka, 4 ka, 2 ka and present 0 ka) were simulated by an CPTEC-AGCM, forced with orbital parameters, different CO₂ concentrations and SSTs. The analysis of the biome distribution was made with the CPTEC-PVM2 which was used as a tool for understanding the Holocene vegetation change in South America as well as for filling the gaps between local and regional(global) scale in paleoclimate studies. The CPTEC-PVM2 projections are shown to be consistent with paleodata proxies which suggest fluctuations between dry (grassland) and wet(forest) episodes, in spite of the fact that ages of dry(wet), grassland(forest) indicators are not synchronous over large areas of the Amazonian ecosystem. The projections suggest existence of rainforest in western Amazonia and the expansion of open savana and seasonal forest in the eastern Amazon, with shifts in plant community compositions and fragmentation located mostly in ecotone regions. The simulations show that during Holocene Amazonian tropical forest was smaller in area than today. However, western Amazonia persisted as a tropical forest throughout the Holocene.