

Keynotes Climate Monitoring and Prediction in LAC

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Climate Monitoring and Prediction in South America requires special attention to the some aspects of modeling that are particularly relevant to in this part of the world. From the numerical point of view, the steep orography in the Andes still poses challenges to models. In spite of the higher resolution of the climate models, most models still present unreasonable precipitation estimates in the vicinity of the steep orography. The complexity of the cloud microphysics in warm clouds has also been shown to be a major challenge for cloud parameterizations in South America. Another important process for improving the quality of climate modeling in South American is the land/atmosphere interaction through the biosphere. The partition of energy between sensible and latent heat still varies a lot among models and the ability to reproduce observations (quite limited in terms of the coverage of the various ecosystems) is a major challenge. Recent climate model results also tend to indicate that the dynamic treatment of the biosphere system feeds back in the climate. Special attention should also be given to the possible climate changes that are likely to occur due to the intensification of the natural greenhouse effect associated with anthropic actions, including land use change. In this context, carbon dioxide has become the focus of numerous studies, but there many questions about the carbon balance are still unanswered. One of them is the contribution of the Amazon region, since the Amazon rainforest stores large amounts of carbon in its biomass. The concern has gained attention over the past decades due anthropogenic land use changes and large emissions of pollutant gases and aerosol particles. Role of aerosols (biogenic and pollution) also exert a significant impact in cloud microphysics and in the radiative transfer. The complexities associated with the role of biosphere/atmosphere interaction in South America poses an additional problem: data assimilation of land data. This is an important issue for climate monitoring in South America because of the need for long term measurements of vegetation properties, gases and aerosols from the point of view of local measurements and remote sensing. This presentation indicates that it is important to develop integrated environmental models for the scientific community dedicated to climate modeling in South America.