

39) POSTER

Towards a South American Land Data Assimilation System (SALDAS): Investigating Potential Precipitation Forcing Data

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The overall goal of this research is to provide better understanding and documentation of soil moisture and surface-atmosphere processes and to improve the initialization of the land-surface variables in the CPTEC SSiB-ETA coupled model across South America in general, and the Amazon Region in particular. This will be done by creating and using a South American Land Data Assimilation System (SALDAS) consisting of a two-dimensional array of uncoupled SSiB models, calibrated using appropriate field data from LBA and earlier studies. This array of land surface models will be forced by near-surface variables derived from the assimilation fields of the ETA model supplemented by real surface-based and remotely sensed observations of precipitation and radiation to the extent possible. In due course, observations gathered under the LBA program will be used for validation of the SALDAS modeled fields, where available. An initial priority in this study is to evaluate alternative sources of precipitation forcing data. This paper reports our early studies that are concerned with investigating the relative value of three alternative sets of precipitation forcing data, specifically, the precipitation fields used as initial condition in the CPTEC/ETA model (derived from the NCEP global model), the precipitation fields derived using the PERSIANN system (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks) at the University of Arizona, and experimental NOAA/NESDIS precipitation estimates. These data are evaluated relative to daily rain gauge data from South America provided by several Brazilian agencies (CMCD/INPE, INMET, FUNCEME, LMRS/PB, ARN, DMRH/PE, SRHBA, CEPES and NMRH/AL) and compiled by CPTEC/INPE. Comparative statistics are reported for the three sets of potential forcing data relative to the rain gauge observations for the calendar year 2000. Email Address of Corresponding Author: gustavo@hwr.arizona.edu