

## **La Plata basin: Modeling of its precipitation regimes and their relation to the Low-level Jet east of the Andes**

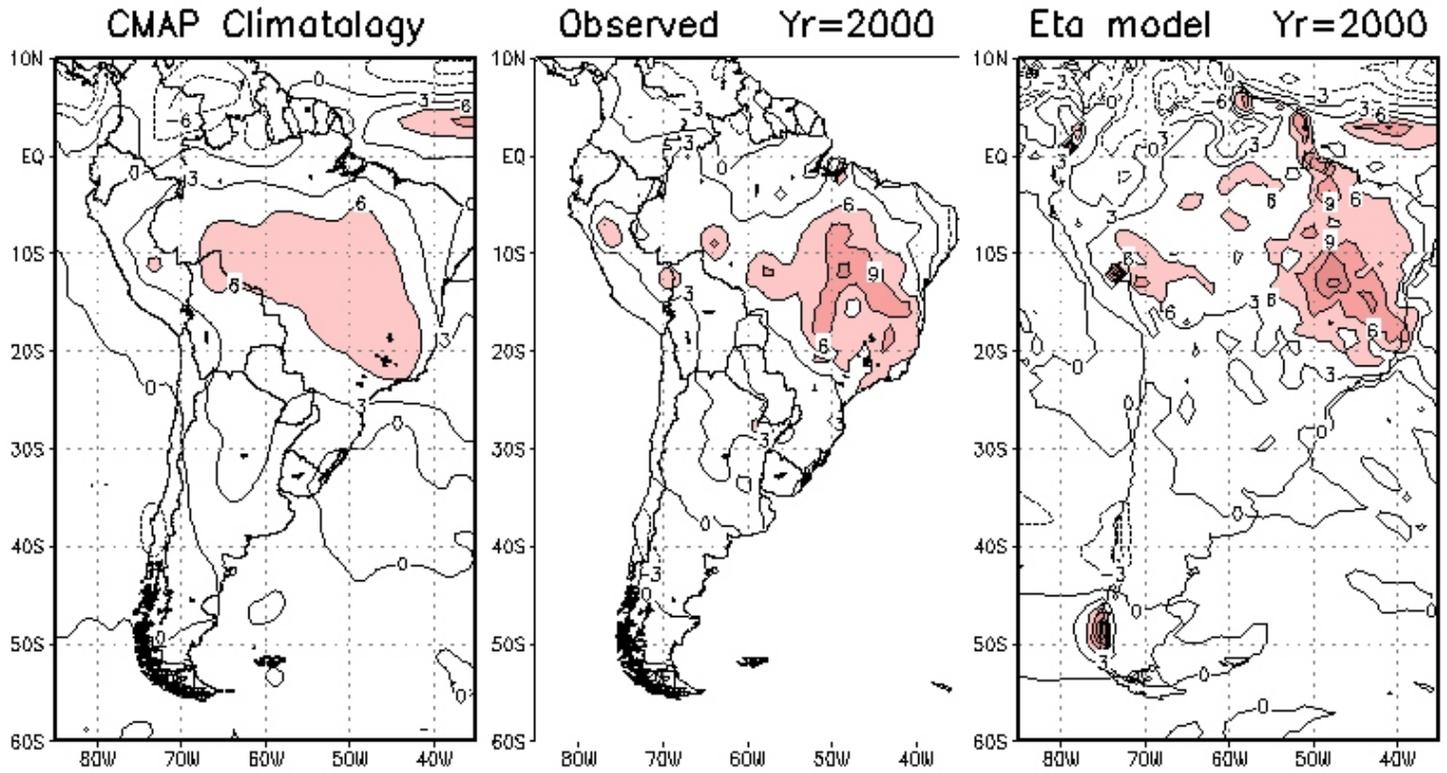
E. Hugo Berbery  
Department of Meteorology  
University of Maryland

The two main precipitation regimes over La Plata basin exhibit distinctive and unique features that are reflected in their annual and diurnal cycles. These regimes are subject to different modes of variability at interannual scales, and research prompts to different forcing origins. The first regime is known as the South American monsoon system that develops in subtropical South America during the austral spring and summer. It affects the northern part of the La Plata basin. The second regime, usually associated with Mesoscale Convective Systems, is found over northeastern Argentina/southern Brazil/Paraguay, and tends to produce precipitation throughout the year. To better understand these regimes and causes of variability, numerical simulations with the regional Eta model were performed in different modes of integration. The Eta model is a mesoscale model whose unique vertical coordinate is particularly apt to represent the sharp slopes of the Andes Mountains.

The first mode of integration consists of daily short-term runs that are routinely run since July 2000. The model products are employed to diagnose the mesoscale circulations associated with the above cited precipitation regimes; in addition, these forecasts are available at <http://atmos.umd.edu/~berbery/etasam>. Figure 1 presents the onset of the summer monsoon during 2000. A large increase of precipitation is observed in subtropical Brazil, affecting the northern part of the La Plata basin. A comparison of the model forecasts and a large scale climatology (CMAP) and raingauge observations shows remarkable similarities. The second mode of integration consists of month-long simulations with global reanalysis as initial and boundary conditions to investigate the effect of lower boundary conditions on the precipitation regimes. In both cases, the simulations are complemented with diagnostic studies using NCEP-NCAR global reanalyses, observations, and satellite products.

The Low-level Jet (LLJ) east of the Andes influences the two precipitation regimes, although in different manners. First, it has been found that the LLJ east of the Andes has an annual cycle whose phasing depends on the latitude (Berbery and Barros 2001). Lower latitudes show a warm season maximum, while all evidence suggests that south of approximately 12-15° S the jet is present throughout the year. Consequently, the LLJ supplies moisture to the precipitation systems over northeastern Argentina/Southern Brazil throughout the year. On the other hand, unlike other monsoon systems, the onset of SAMS seems to be associated with lateral shifts of the LLJ.

Onset of the South American Monsoon: (Dec – Aug) precipitation



Hugo Berbery – University of Maryland