

An empirical-dynamical South America seasonal precipitation prediction system

Caio COELHO

Centro de Previsão de Tempo e Estudos Climáticos (CPTEC), Instituto Nacional de Pesquisas Espaciais (INPE), Brazil, caio.coelho@cptec.inpe.br

South American seasonal precipitation predictions have been produced since around the mid-nineties using both empirical (statistical) models and physically based dynamical models. Empirical models are entirely based on past climate observations, are simpler to build and much faster to run than dynamical models, which are based on physical principals and therefore have the potential advantage of reproducing climate conditions never previously observed. Given the availability of both empirical and dynamical model predictions one could question the feasibility of producing a single calibrated prediction by combining the best predictive information produced by these two modelling approaches. This talk will illustrate advances in South America seasonal precipitation predictions achieved within the context of EUROBRISA: A EURO Brazilian Initiative for improving South American seasonal forecasts (<http://eurobrisa.cptec.inpe.br>). As part of this initiative a novel hybrid (empirical-dynamical) seasonal forecasting system for South America was developed by combining and calibrating precipitation predictions produced by a simple empirical model and four coupled ocean-atmosphere dynamical models. The empirical model uses sea surface temperatures over the Pacific and Atlantic oceans in the previous month as predictor for precipitation over South America in the following season. The four coupled models are operational versions of the European Centre for Medium-Range Weather Forecasts (ECMWF, System 4), the United Kingdom Met Office (UKMO, GloSea 4), Météo-France and the Centre for Weather Forecasts and Climate Studies (CPTEC). State-of-the-art statistical post-processing based on a simple Bayesian approach know as forecast assimilation is used for combining and calibrating the predictions of these five models to produce the so-called integrated predictions. The performance of integrated predictions produced by the EUROBRISA hybrid system for selected events will be presented.