



Seasonal Prediction at the Regional Scale: An analysis of Regional Climate Model performance over Central America

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The main goals of seasonal prediction are to predict climatic variables of societal interest over 3 to 9 month lead times in order to alleviate the potential consequences of climatic extremes and to assist in resource planning in fields such as agriculture. The drawback of current global scale seasonal forecasting is their low resolution. Regional models can be used to produce more useful forecasts through their higher resolution response to global phenomena. In tropical regions, large-scale atmospheric circulations are linked to the more slowly evolving Sea Surface Temperatures (SST). Thus tropical regions, such as Central America, are promising areas for seasonal prediction at the regional scale. GCMs have some skill in predicting the response of large scale atmospheric circulations to anomalous SST forcing, whereas RCMs are more adept at reproducing the local and higher resolution response to these atmospheric circulations. This can aid in bringing the GCM seasonal predictions down to the spatial scale required by end-users.

In order to assess the added value of regional scale models in seasonal forecasting, the output of hindcasts using these models must be evaluated and compared to observations. Using prescribed SST and analysed lateral boundary conditions, a number of RCMs have been used to make high resolution simulations of the rainy season (April-November) over Central America for numerous El Nino and La Nina years. Emphasis is put on a comparison of El Nino and La Nina composites to observations and the differences between these two composites. This will determine if RCMs, when given accurate large-scale forcing, are able to reproduce the main regional scale climatic features over Central America and the detailed response in this region to the phase of ENSO.