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PARALLEL SESSION A : BENEFITS OF DOWNSCALING
A1: ADDED VALUE OF DOWNSCALLING

Multiscale analysis of precipitation variability over South America: A preliminar analysis of the added value of RCMs.

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Multiscale temporal variability of rainfall over South America as depicted by a high-resolution Regional Climate Model (RCM) and its driving low-resolution Global Coupled Model (GCM) is evaluated in this study with the aim of identifying the added value of downscaling. Rainfall over South America is characterized by significant variability patterns at different temporal scales. At the interannual timescales, the variability signal is mainly associated with the El Niño-Southern Oscillation (ENSO) and is characterized by either positive or negative precipitation anomalies over La Plata Basin (LPB) during the warm season. At the intraseasonal timescales the variability pattern is characterized by a seesaw between the South Atlantic Convergence Zone (SACS) and south-eastern South America. At the higher frequencies, the synoptic-scale variability is much associated with the passage of frontal systems and its largest signal is located over the LPB region. The richness of the precipitation variability patterns over the South American continent and the well documented studies identifying the main characteristics and drivers of these patterns offer an excellent opportunity in evaluating the added value of high-resolution RCMs in reproducing these features.

In this preliminary analysis the REMO RCM from the CLARIS-LPB ensemble and the driving EC5OM GCM from the CMIP3 dataset have been evaluated for the period 1979-1990 against several observational datasets. The spatial resolution of the RCM and GCM are approximately 0.5º and 1.875º, respectively. Gridded precipitation data from monthly and daily datasets were used. The analysis is carried out for two extended seasons: from October to March and from April to September. For he interannual timescales, the standard deviation of the monthly timeseries of rainfall anomalies was computed. For the intraseasonal and high-frequency timescales, the daily timeseries of rainfall anomalies were filtered using the Lanczos filter retaining periods of 10 to 90 days, and 4 to 10 days, respectively.

Overall, it was found that the REMO RCM is able of better reproducing the main features of rainfall variability compared with the driving EC5OM GCM in terms of its spatial scale and magnitude at the interannual, intraseasonal and higher frequency timescales, suggesting the added value of the RCM compared with the driving GCM.