



## Regional climate change projections over South America based on the CLARIS-LPB RCM ensemble

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CLARIS-LPB was an EU FP7 financed Europe-South America Network for Climate Change Assessment and Impact Studies in La Plata Basin. CLARIS-LPB has created the first ensemble ever of RCM downscalings over South America. Here we present the climate change scenarios for a near future period (2011-2040) and for a far future period (2071-2100). The ensemble is based on seven RCMs driven by three CMIP3 GCMs for emission scenario SRES A1B. The RCM model domains cover all of South America, with a horizontal resolution of approximately 50 km, but project focus has been on results over the La Plata Basin.

The ensemble mean for temperature change shows more warming over tropical South America than over the southern part of the continent. During summer (DJF) the Low-Parana and Uruguay regions show less warming than the surrounding regions.

For the ensemble mean of precipitation changes the patterns are almost the same for near and far future but with larger values for far future. Thus overall trends do not change with time. The near future shows in general small changes over large areas (less than  $\pm 10\%$ ). For JJA a dry tendency is seen over eastern Brazil that becomes stronger and extends geographically with time. In near future most models show a drying trend over this area. In far future almost all models agree on the drying. For DJF a wet tendency is seen over the La Plata basin area which becomes stronger with time. In near future almost all downscalings agree on this wet tendency and in far future all downscalings agree on the sign.

The RCM ensemble is unbalanced with respect to forcing GCMs. 6 out of 11(10) simulations use ECHAM5 for the near(far) future period while 4(3) use HadCM3 and only one IPSL. Thus, all ensemble mean values will be tilted towards ECHAM5. It is of course possible to compensate for this imbalance among GCMs by some weighting but no such weighting has been applied for the current analysis.

The north-south gradient in warming is in general stronger in the ECHAM5 downscalings and is also more evident during JJA than during DJF. The HadCM3 and IPSL downscalings give larger warming in near future than ECHAM5 downscalings. This tendency is still present in far future but differences connected to GCMs are then much less evident.

For precipitation the spread in trends and amounts of changes between different downscalings are much larger than for temperature. In contrast to temperature the precipitation patterns are in general more similar for the same RCM than for the same GCM. Thus, the results are sensitive for how precipitation processes are parameterized and/or for how local surface-atmosphere feedback mechanisms are simulated. Looking at a certain RCM and period the patterns for near and far futures are similar but stronger for the far future period.