



Ministério de Ciência e Tecnologia
Instituto Nacional de Pesquisas Espaciais
Centro de Previsão de Tempo e Estudos Climáticos

Studies on intraseasonal, seasonal, interannual, and interdecadal climate variability in the La Plata River basin

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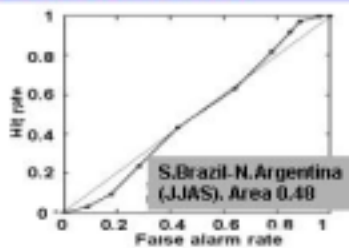
1) Seasonal to interannual climate variability: Simulations and model validation, Predictability assessments and studies in southern Brazil-La Plata River Basin

- Feasible to do at CPTEC/INPE, using the CPTEC AGCM→some results for major basins in South America, and other regions (Northeast Brazil).
- Initial results based on 10 years (1982-91), 9 members, new developments at CPTEC include 25 years (1975-2000) with 25 members.
- Boundary conditions: Observed and forecasted SST anomalies.
- Regional modeling experiences: Eta (CPTEC) and RAMS (USP) for seasonal and interannual climate simulation and prediction.
- Modelling surface runoff of the Amazonia and Parana-La Plata River Basin.

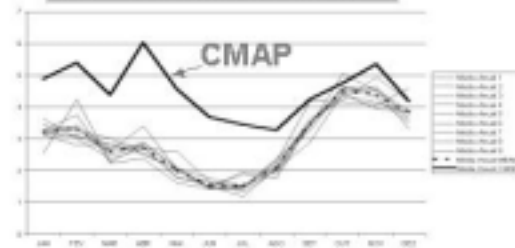
1) Seasonal to interannual climate variability: Simulations and model validation, Predictability assessments and studies in southern Brazil-La Plata River Basin (CPTEC, USP, University of Buenos Aires..)

Medium-lower predictability of Rainfall and runoff in the Parana La Plata Basin. Sensitive to strong warming due to El Niño while in Normal years predictability is lower. Need for river routing scheme in the CPTEC/COLA AGCM.

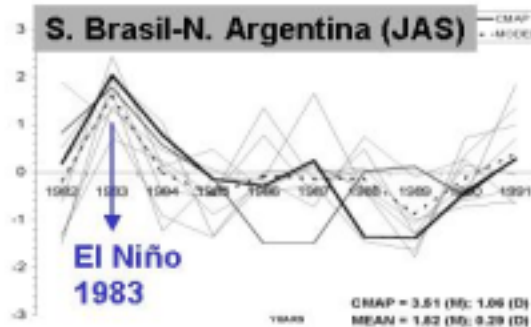
For a Good skill..!, area below the curve should be 1.00



S. Brasil-N. Argentina

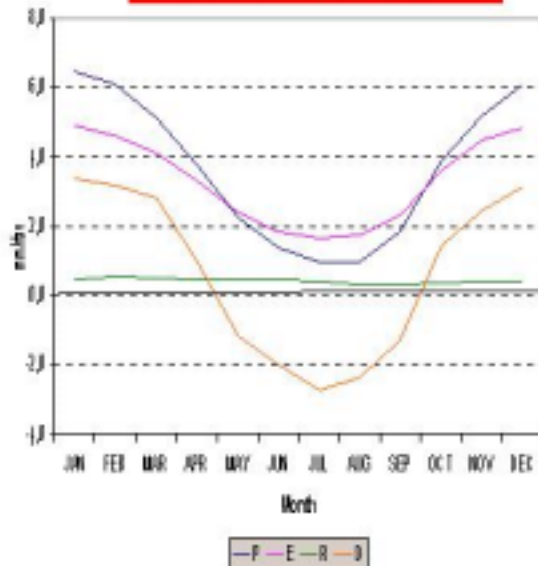


S. Brasil-N. Argentina (JAS)

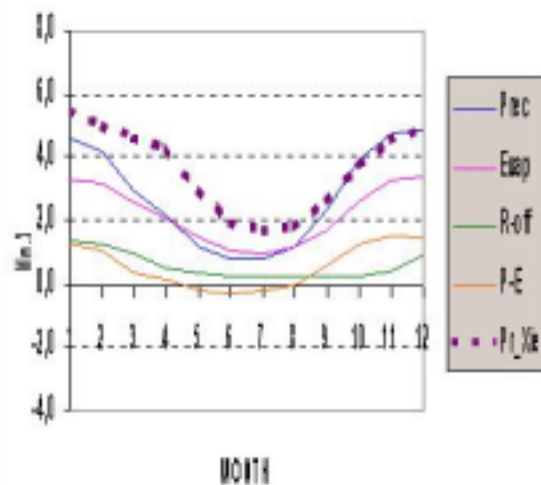


Parana-La Plata River Basin-Water Balance

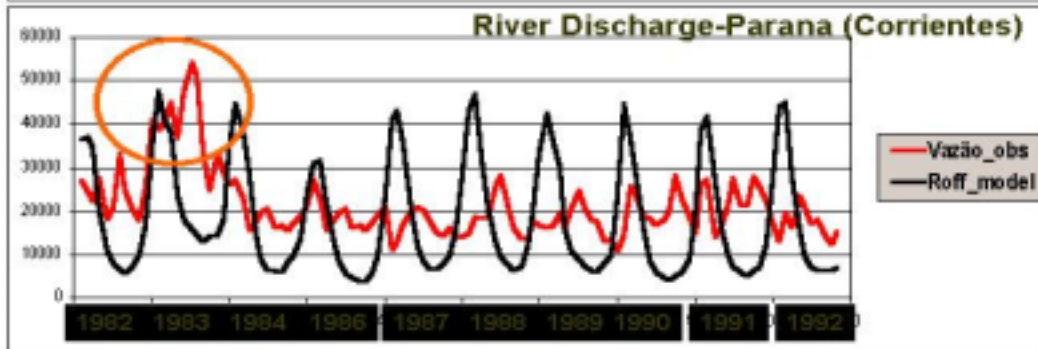
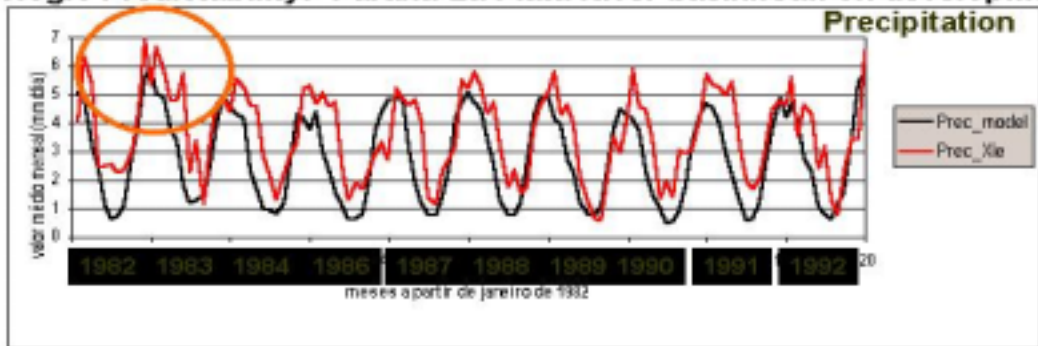
Observations (NCEP, CMAP, streamflow)



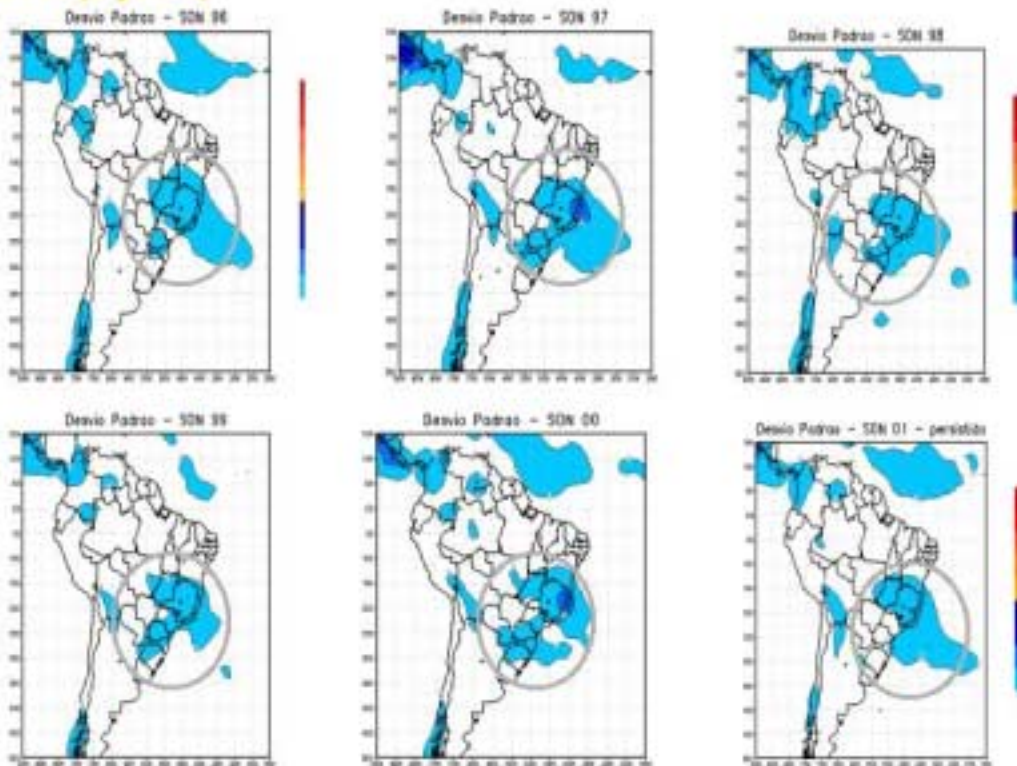
CPTEC AGGM (1982-91)



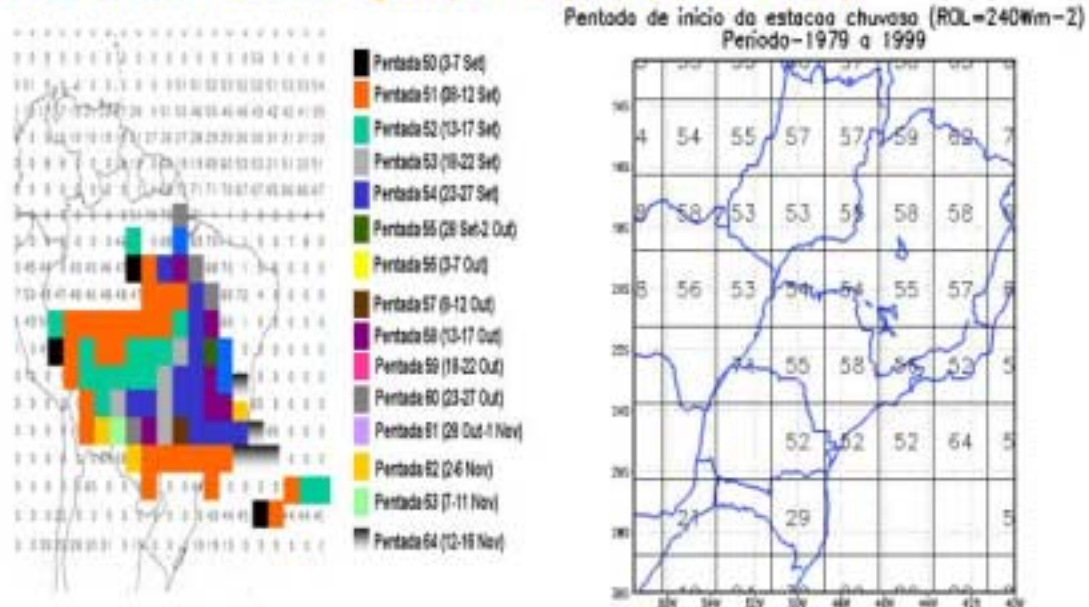
Hydrologic Predictability: Parana-La Plata River basin..Still on development



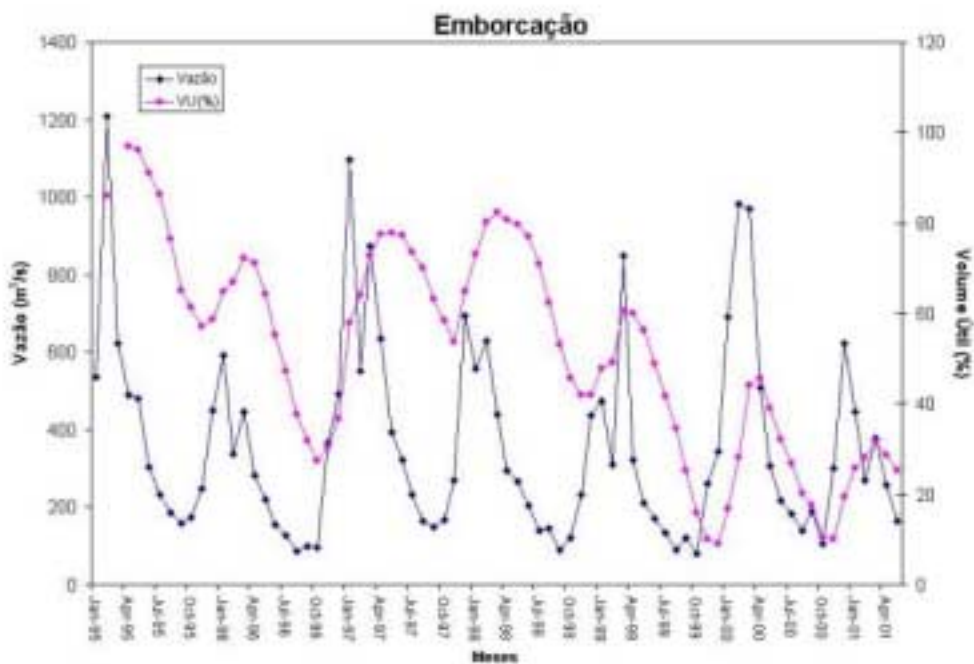
Maximum deviations (in STD) of the dispersion of members of the ensemble (5 years)



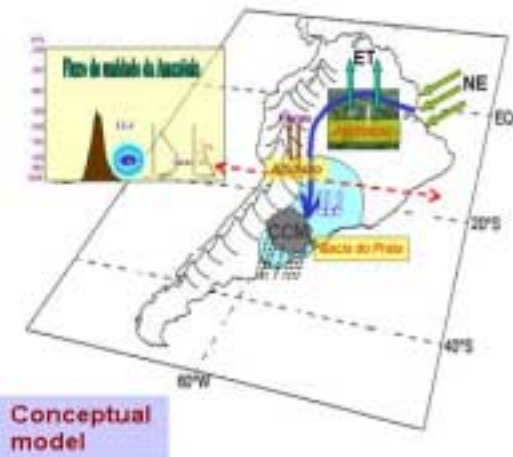
2) Intraseasonal variability studies : Pentads of the onset of the rainy season in the PROSUR region (CPTEC, USP, SIMEPAR...)



Limitations in the ROL threshold. Need for a rainfall threshold for the PROSUR region. Rainfall thresholds should be established in the region, following same methodology as our previous work in Amazonia.



3) The South American Low Level Jet (SALLJ): Mesoscale and interactions between the Amazon and the Parana-La Plata River basins: Field experiment and other studies (CPTEC, USP, SIMEPAR, Univ. Buenos Aires, NCEP-NOAA...)

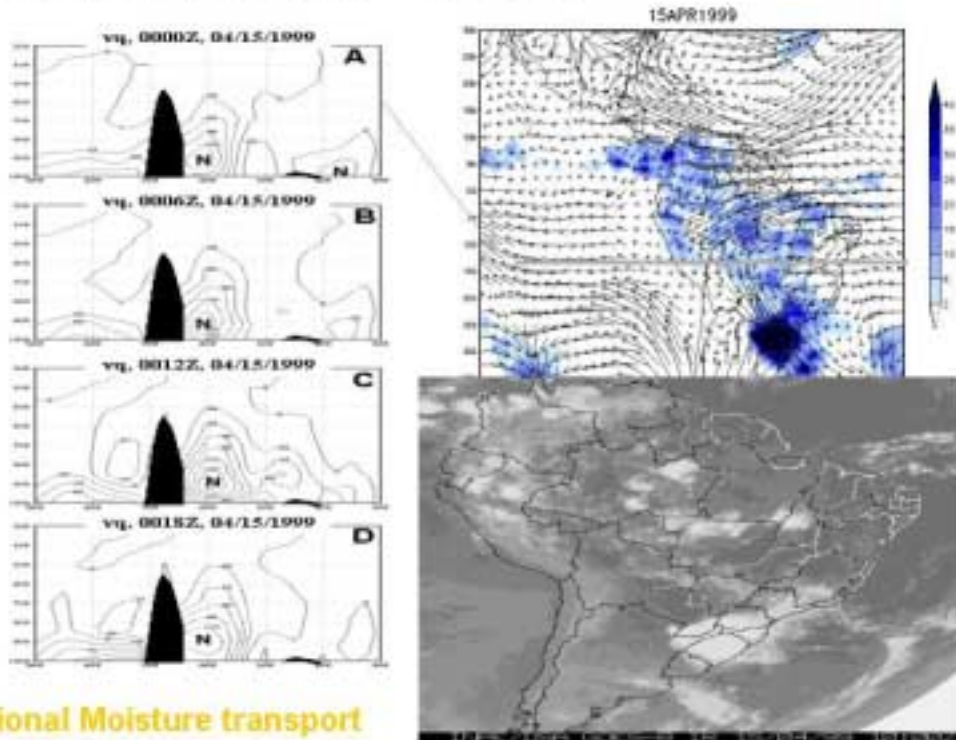


Conceptual model



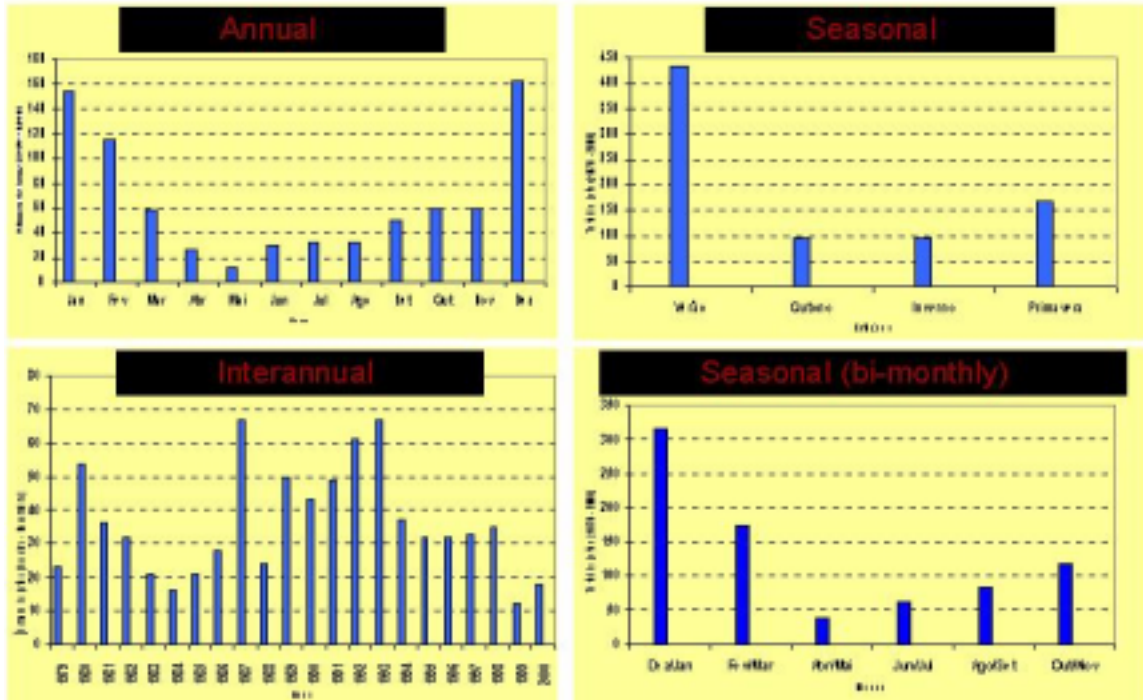
Strategy of the SALLJ field experiment

LLJ episode 14-15 April 1999: Abundant rainfall in SE and S Brazil due to an intense LLJ episode (Marengo and Soares 2001)



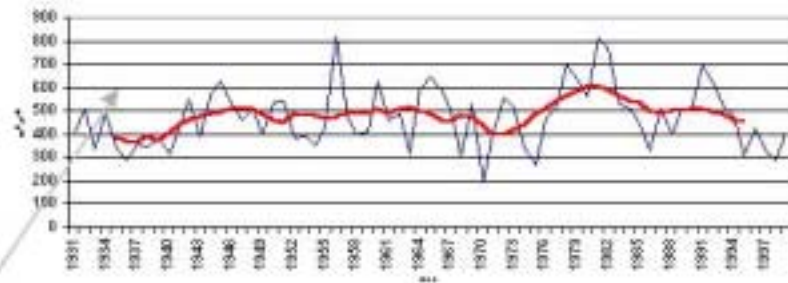
Meridional Moisture transport (15 April 1999)

Variability of LLJ (NCEP derived-Bonner criterion 1)-Grid point nearby Santa Cruz, Bolivia.

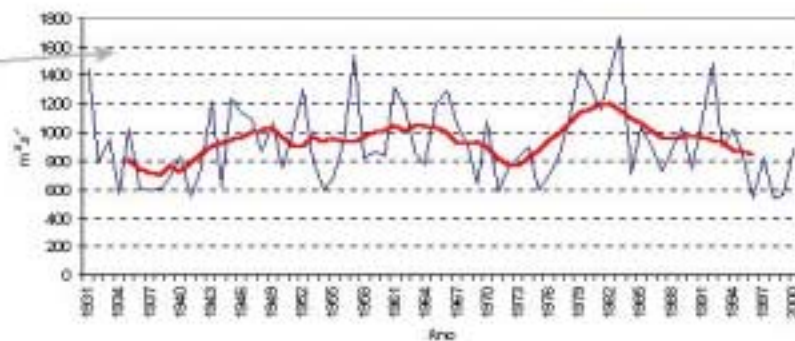


Decadal scale variations in the hydrometeorology of the Parana-La Plata basin: Paranaíba River basin at Emborcação (SE Brazil)

Emborcação-Hydrologic Year Set-Aug



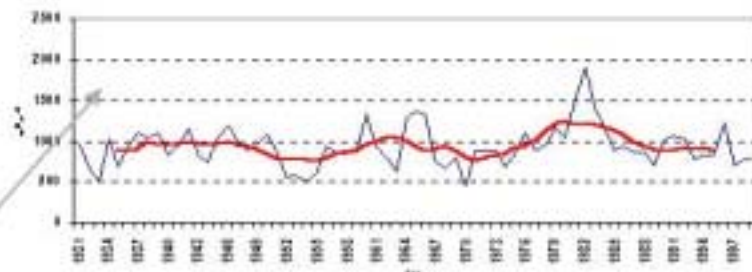
EMBORCAÇÃO - Maximum discharge season



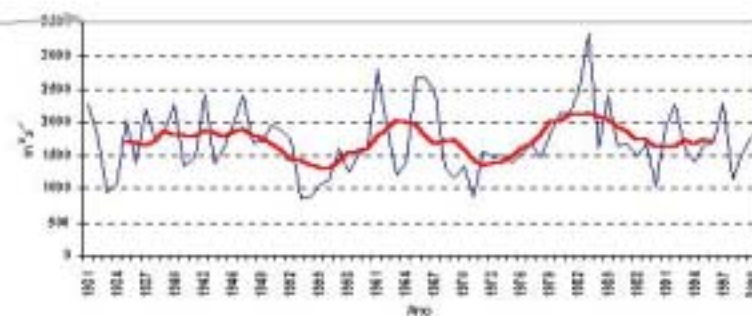
Decadal scale variations in the hydrometeorology of the Parana-La Plata basin: Rio Grande basin at Furnas (SE Brazil)



Furnas -Hydrologic year Set-Aug



FURNAS - Maximum discharge season



Suggestions of future studies and collaboration

-Intraseasonal studies: onset of the rainy season in the PROSUR region (OLR and rainfall thresholds).

-Close collaboration in the field campaign (data collection, processing, modeling activities) and studies related to SALLJ (November 2002-February 2003). Partners: Argentina-Bolivia-Paraguay-Uruguay-Brazil-USA-

-Moisture transport from the Amazon basin to the Parana-La Plata river basin (functioning, and time-space variability). Model and observations.

-Need for climate and hydrology predictability studies in the PROSUR region (interactions with GEWEX and CLIVAR). CPTEC/COLA AGCM runs available for PROSUR scientists. Model development: river runoff routing scheme.

-Implementation of studies on decadal and multidecadal variations in rainfall and river discharges in the Parana-La Plata river basin. Associations with SST and circulation changes in the Pacific and Atlantic.

-Downscaling of IPCC GHG climate change scenarios for South America