



Climatology of Low-Level Jet East of the Andes as derived from the NCEP reanalyses. Temporal and spatial variability

Jose A. Marengo, Wagner R. Soares
CPTEC/INPE. São Paulo, Brazil

Celeste Saulo, Matilde Nicolini
CIMA/UBA, Buenos Aires, Argentina



Centro de Previsão de Tempo e Estudos Climáticos (CPTEC)

São Paulo, Brazil

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The LLJ east of the Andes

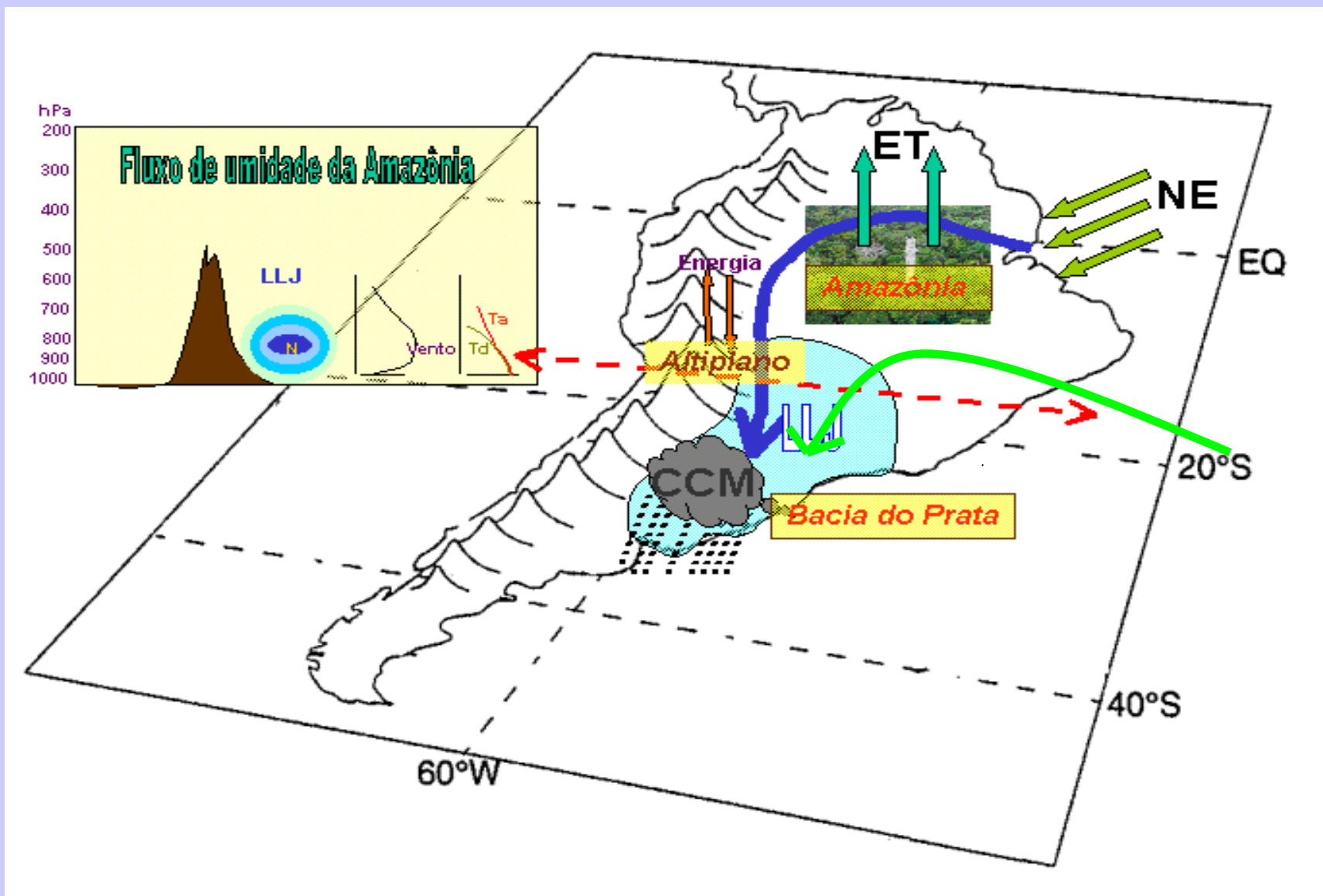
- A “river of atmospheric moisture” at lower levels of the atmosphere east of the Andes (1000-1600 magl) that transports moisture from the Amazon to higher latitudes.
- This moisture feeds convective systems responsible for rain in S/SE Brazil-Paraguay-Uruguay-N. Argentina.
- In addition it also transport smoke and aerosols.
- It is important for weather and climate forecast
- Issue: Would long term change in regional circulation affect LLJ and the moisture transport, and thus meridional moisture transport would affect climate in Amazonia and Southeastern South America?

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Conceptual model of the SALLJ physical environment during the wet season
(Marengo et al. 2002)

Methodology

-NCEP reanalyses

-PACS-SONET Pilot balloons in Bolivia and Paraguay

Conditions that must be met to detect a LLJ, and that are applied to a NCEP reanalyses grid box during all observation times (000, 0600, 1200 and 1800 UTC)

1- $v < 0$ – Northerly flow

2- $v > u$ – Meridional winds more predominant than zonal winds

3- $V(850) \geq 12 \text{ m/s}$ – Wind speed equal or higher than 12 m/s at 850 hPa (Bonner criterion 1);

4- $V(850) - V(700) \geq 6 \text{ m/s}$ – Wind speed above the jet must decrease at a rate of at least 6 m/s per km. Also, the level of maximum wind should be at or below the 3 km level (Bonner criterion 1).

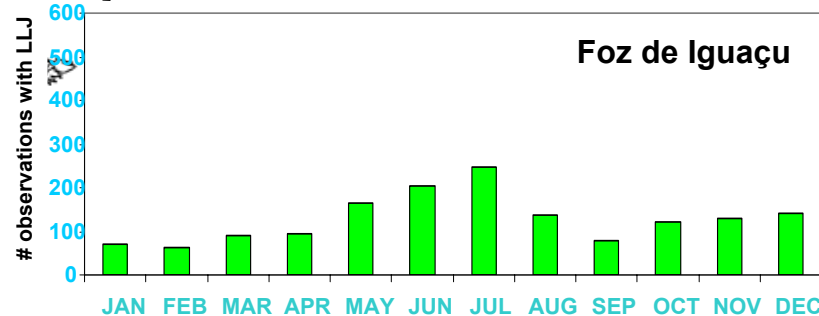
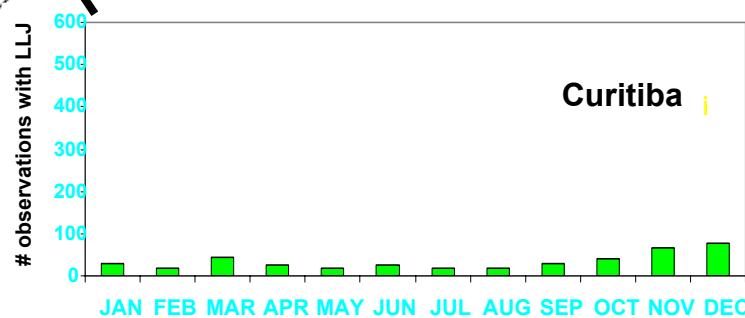
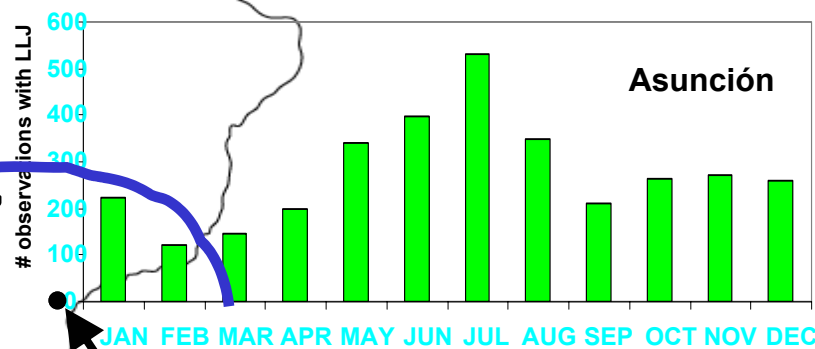
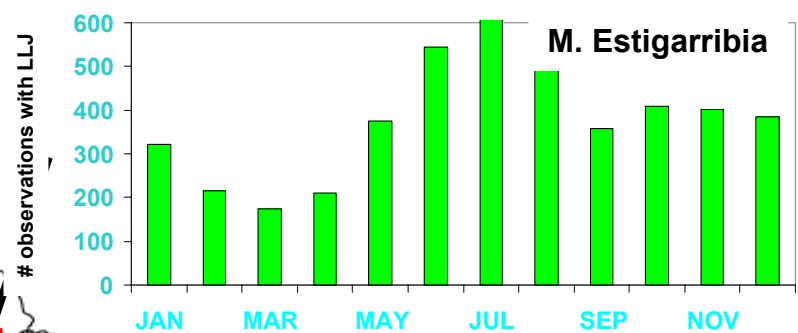
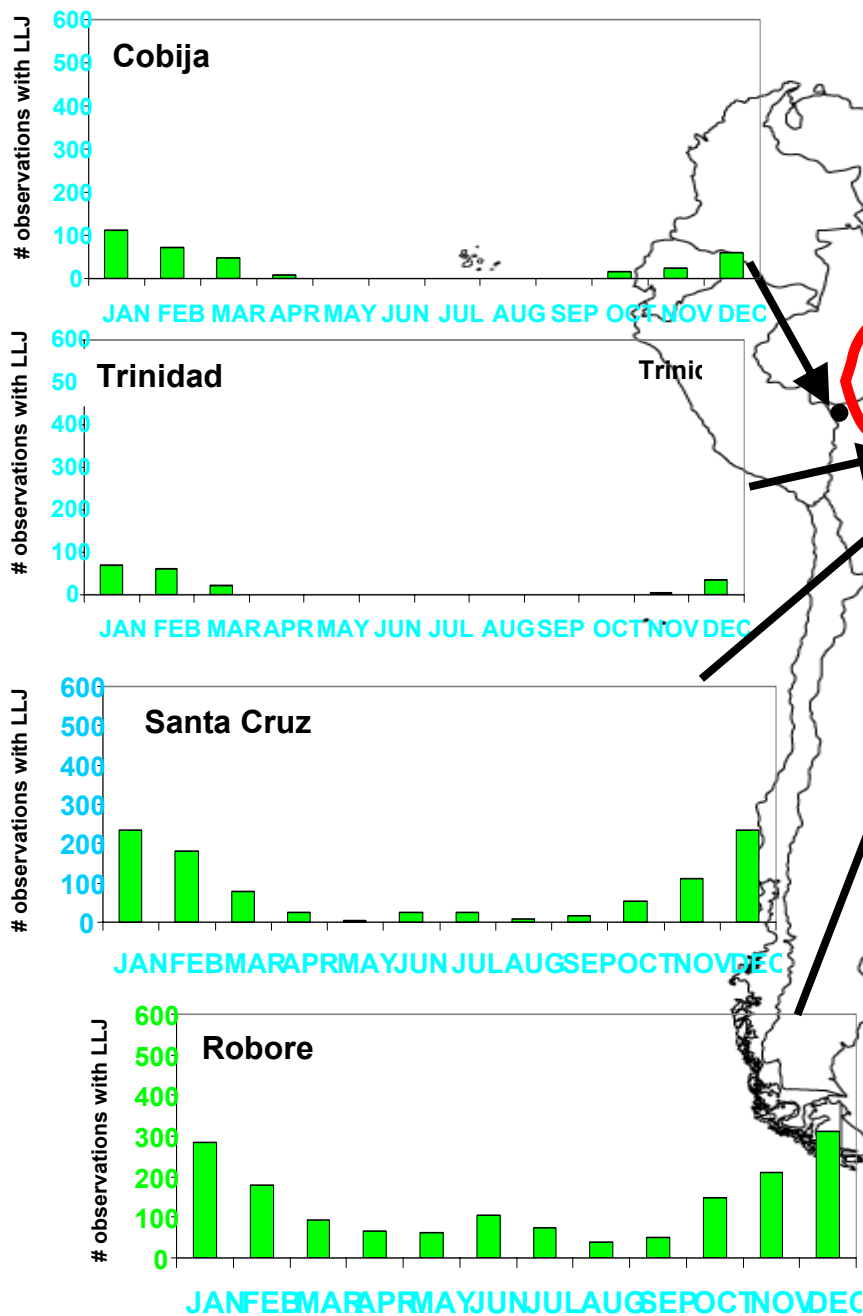
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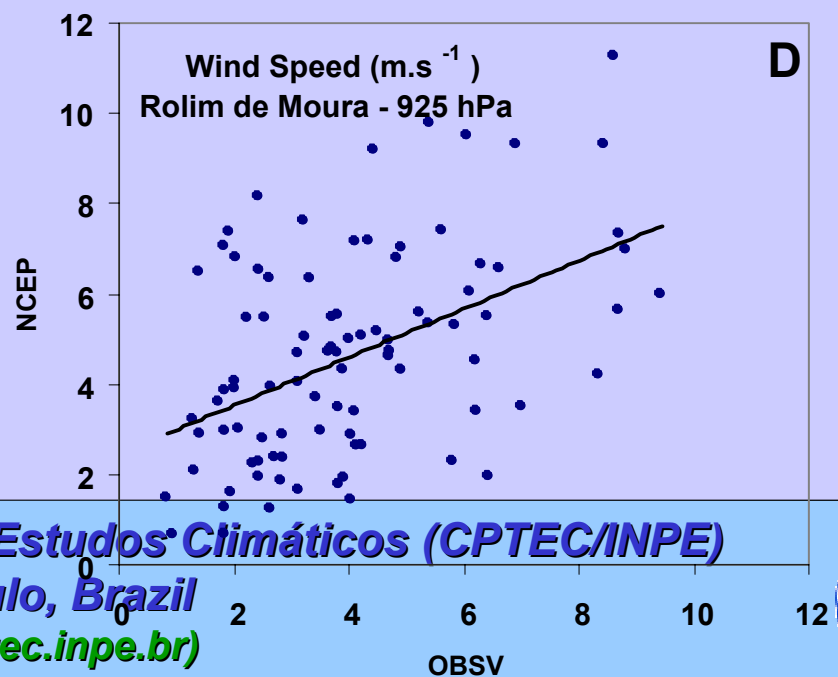
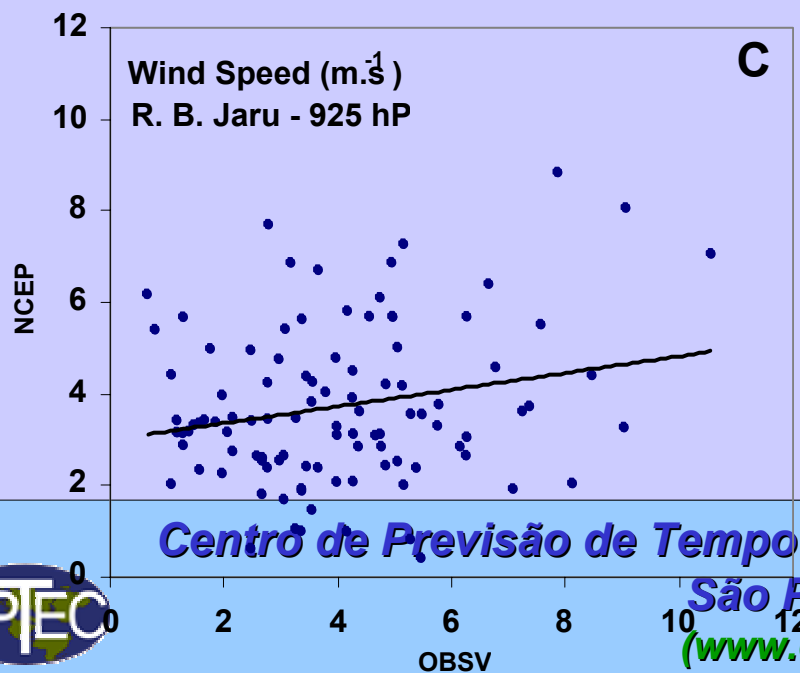
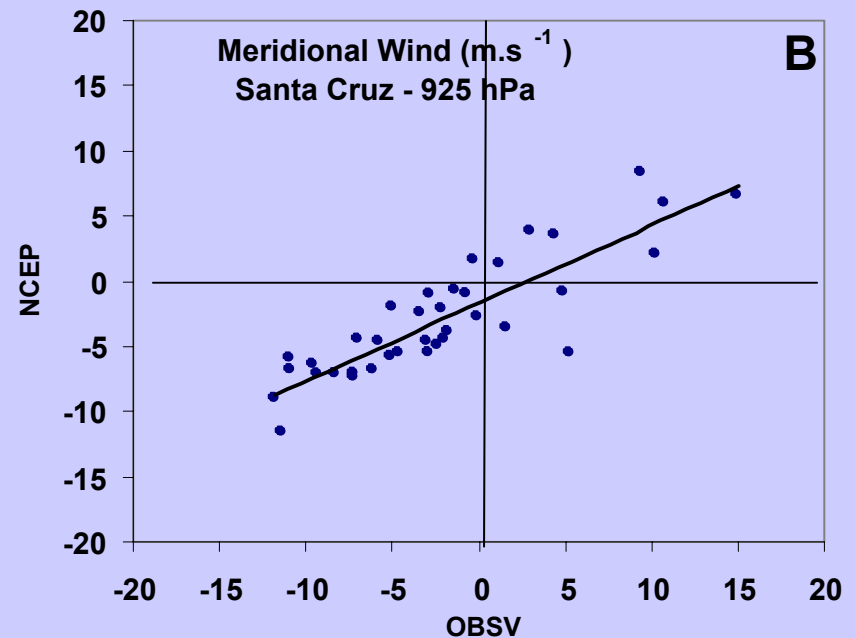
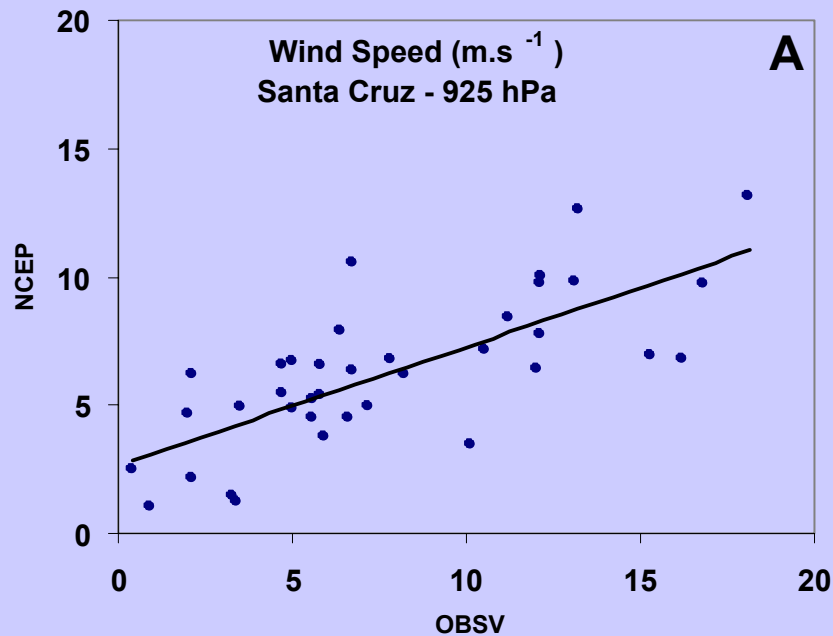
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Annual cycle of the SALLJ



LLJ in Santa Cruz and in Rondonia



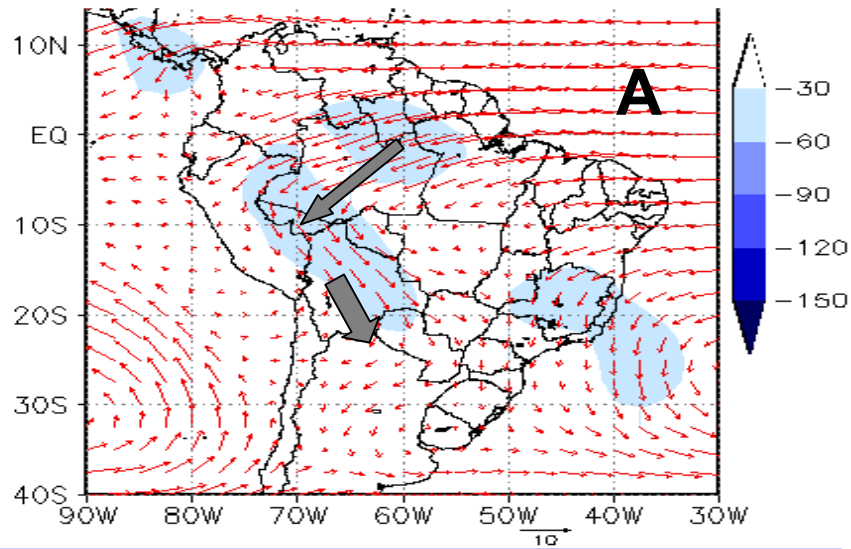
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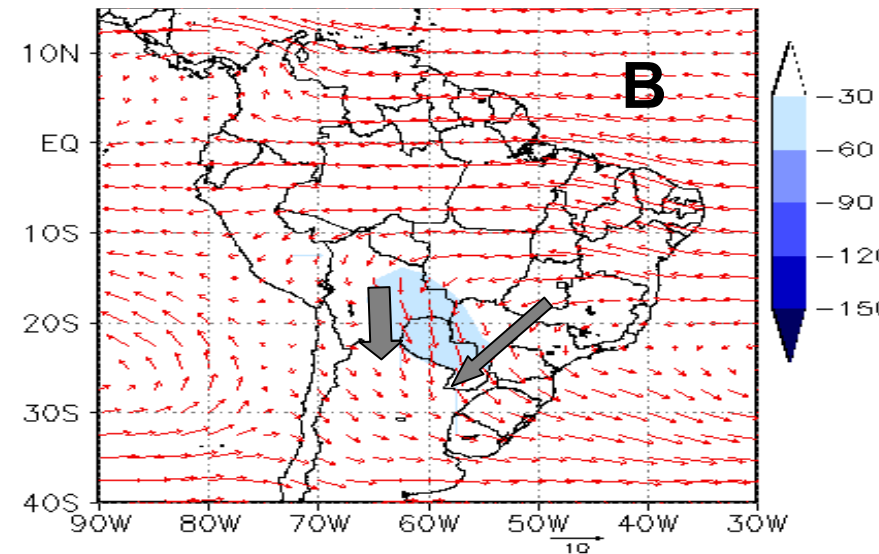


Warm season- 850 hPa wind and integrated moisture transport during LLJ episodes in Santa Cruz-Bolivia

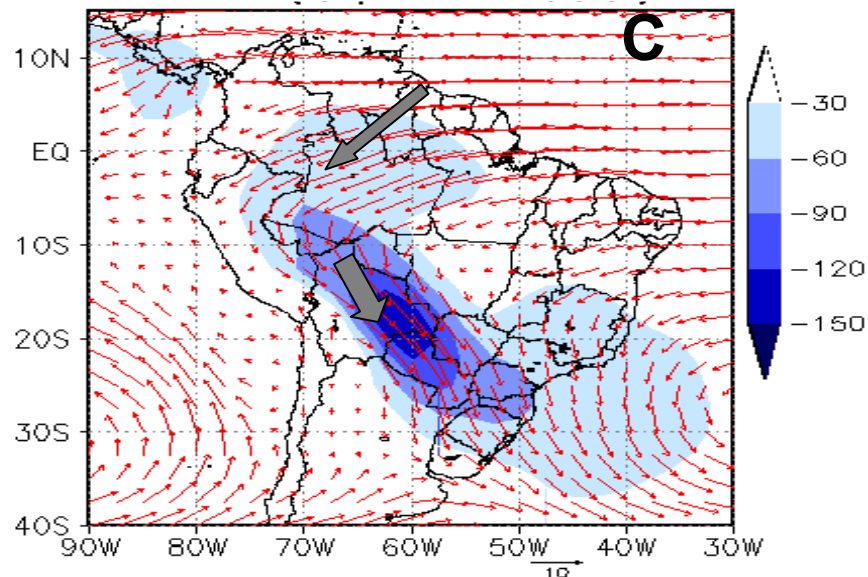
NDJF-Mean



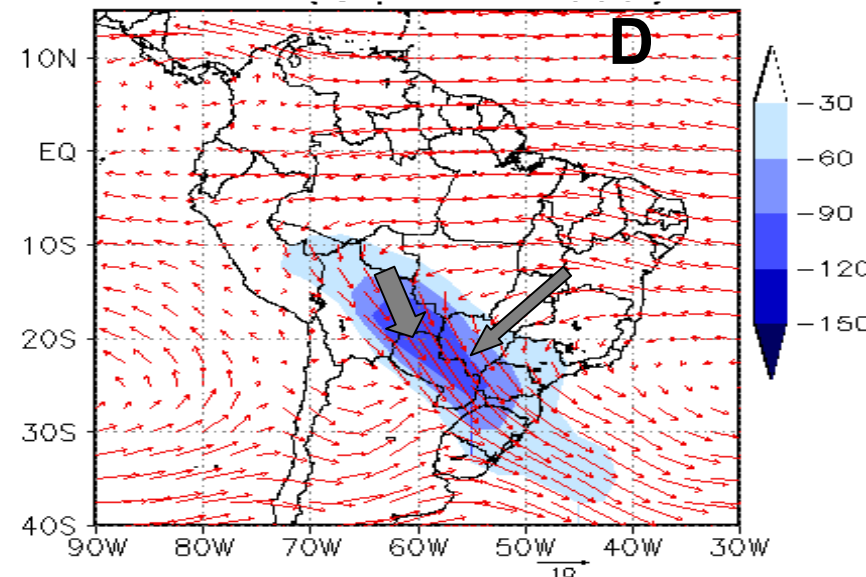
MJJA-Mean



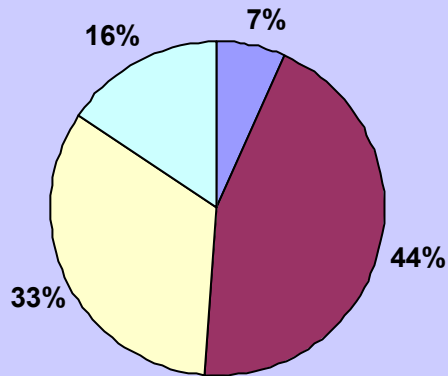
NDJF- LLJ Composite



MJJA- LLJ Composite



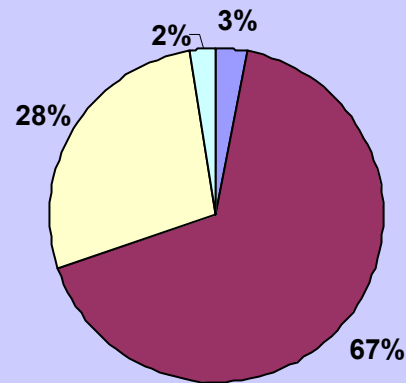
Cobija - Summer



00Z 06Z 12Z 18Z

Mar. Est. - Summer

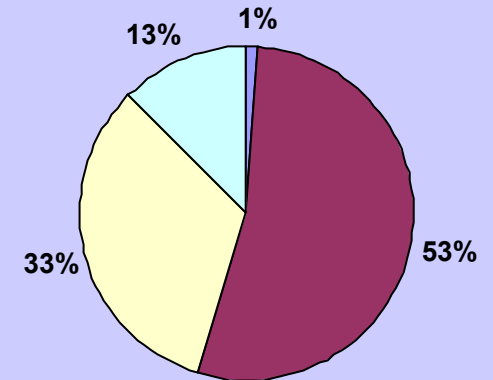
Santa Cruz - Summer



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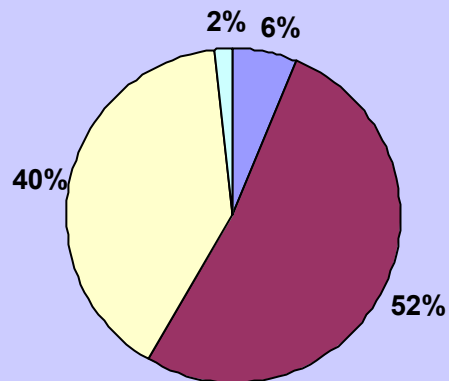
Assuncion - Summer

Trinidad - Summer

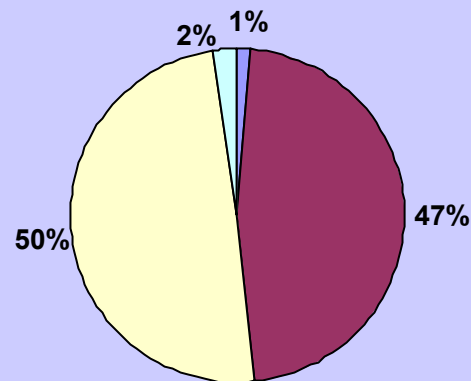


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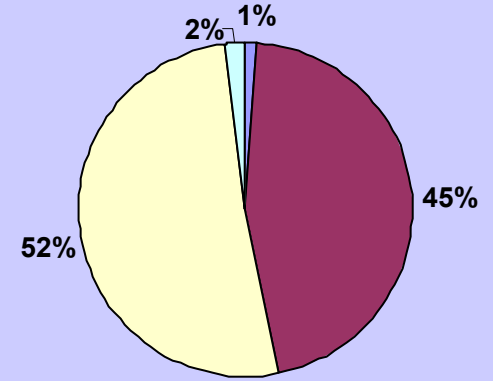
Foz do Iguaçu - Summer



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