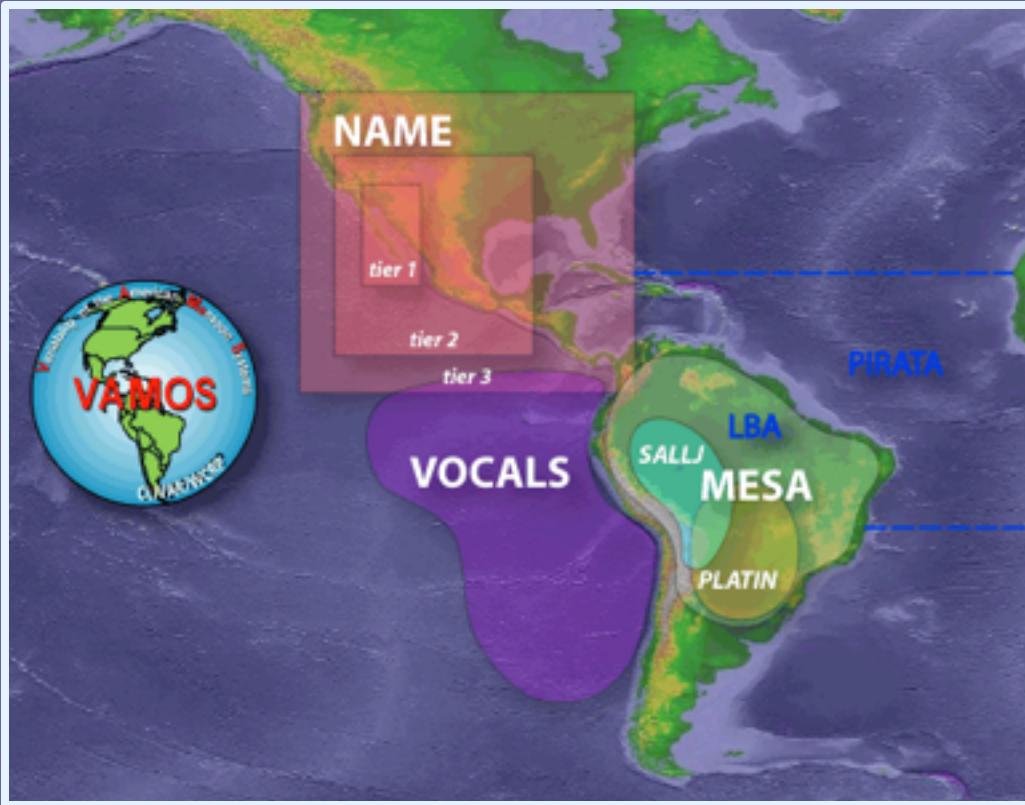


Variability of the American Monsoon Systems



- An internationally coordinated WCRP/CLIVAR activity to investigate the variability and predictability of the American Monsoon Systems in the context of global climate variability and predictability.
- Now in its implementation phase
- Panel Co-Chairs:
 - C. Vera (Univ. of Buenos Aires)
 - W. Higgins (NOAA/NCEP/CPC)



CLIVAR Organization



Scientific Steering Group

Crosscutting (global) Panels

Observations & Data

CLIVAR Synthesis & Observations Panel*

PAGES/CLIVAR Working Group

Working Group on Seasonal to Interannual Prediction

JSC/CLIVAR Working Group on Coupled Modelling

CCI/CLIVAR Expert Team on Climate Change Detection (A2)

WGCM/CLIVAR Working Group on Ocean Model Development

Modelling

Regional or PRA¹ related Panels

Asian-Australian Monsoon Panel (G2)

Atlantic Implementation Panel (D1-D3)

Southern Ocean Implementation Panel (D5)

Variability of the American Monsoon Systems (VAMOS) (G3)

Pacific Implementation Panel (G1 & D4)

CLIVAR/IOC Indian Ocean Implementation Panel

Variability of the African Climate System Panel (G4)

¹ Principal Research Areas

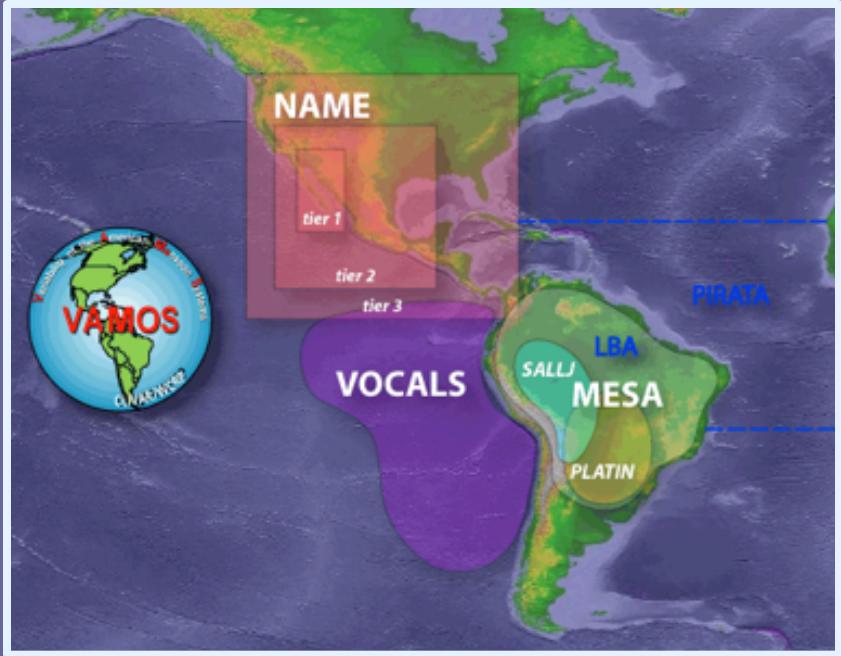
*to be established

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International CLIVAR Project Office

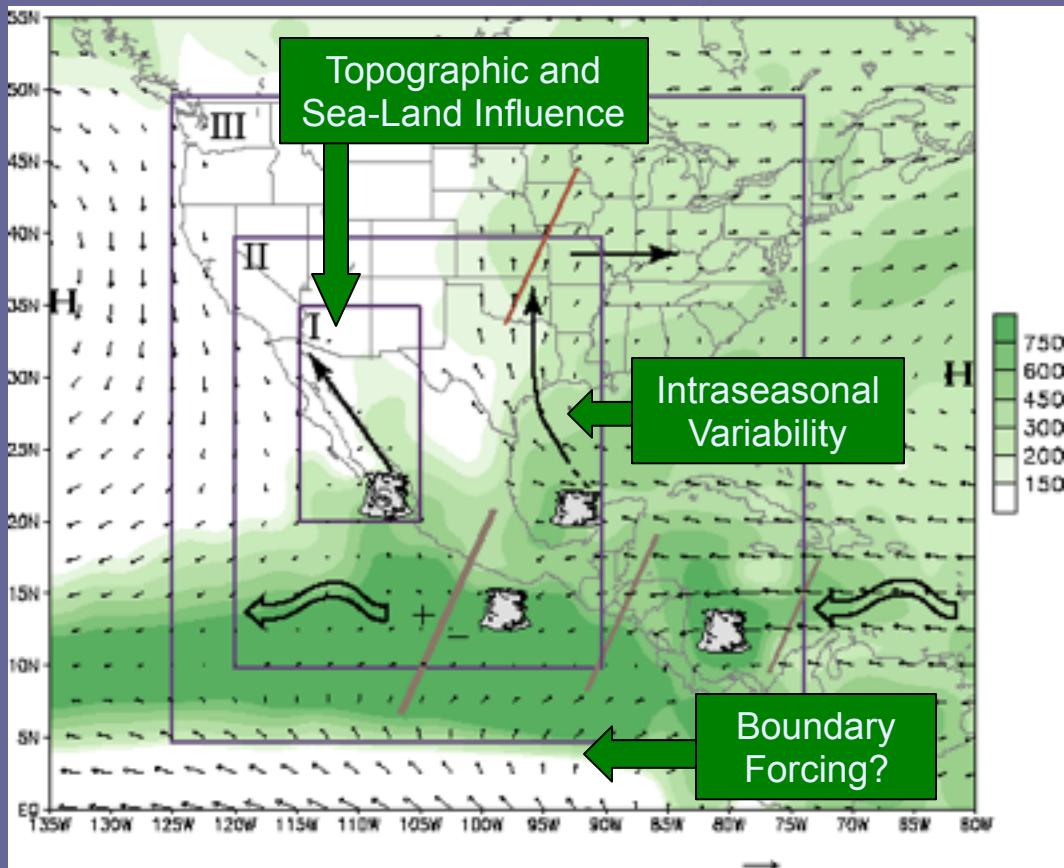
CLIVAR, a WCRP component, aims to understand natural climate variability, detect and attribute human influences, determine the extent to which climate is predictable, and develop predictive capabilities.

Why is VAMOS important?



The VAMOS Program coordinates and promotes interactions among meteorologists, oceanographers and hydrologists throughout the Americas to describe and understand the physical processes responsible for climate variability and predictability in the American Monsoon Systems

What is the North American Monsoon Experiment (NAME)?



It is joint CLIVAR-GEWEX program, aimed at providing an improved understanding of the North American Monsoon System and its variability, a better understanding of the role of that system in the global water cycle, improved observational data sets and improved simulation and monthly-to-seasonal prediction of the monsoon and regional water resources.

The NAME 2004 Field Campaign scheduled during June-September 2004, is an unprecedented opportunity to gather extensive atmospheric, oceanic, and land-surface observations in the core region of the North American Monsoon over NW Mexico, SW United States, and adjacent oceanic areas.

NAME 2004 involves more than 30 universities, government labs and federal agencies in the United States, Mexico, Belize and Costa Rica.

SALLJ Science goal

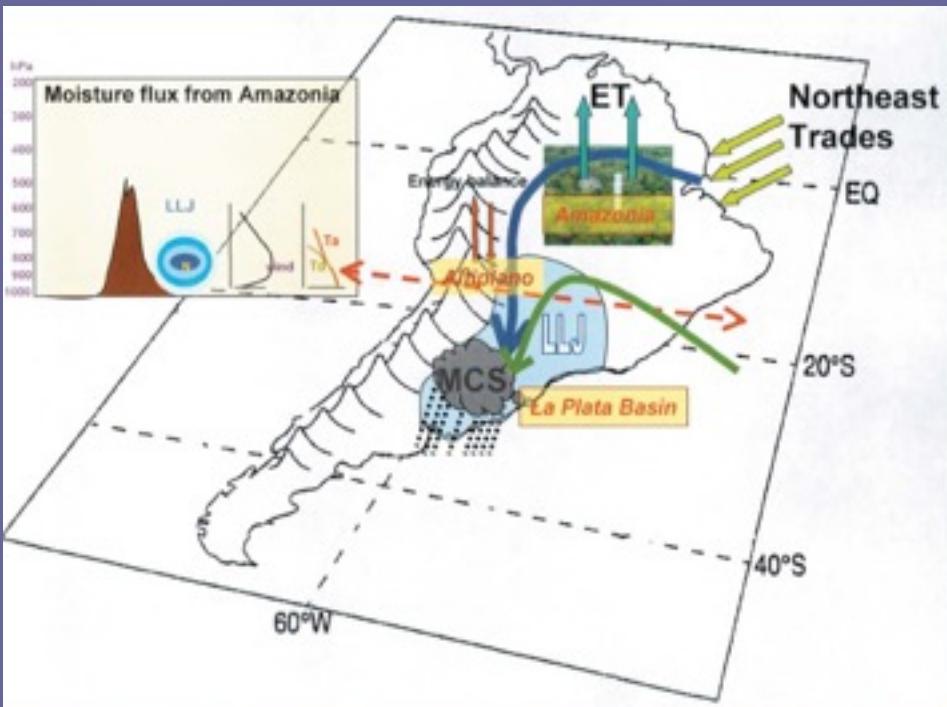
To understand the role of the South American low-level jet in moisture and energy exchange between the tropics and extratropics and related aspects of regional hydrology, climate and climate variability



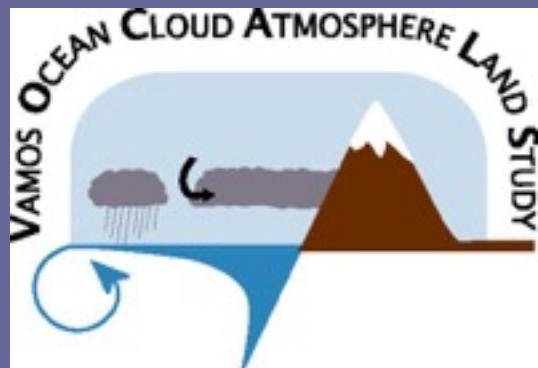
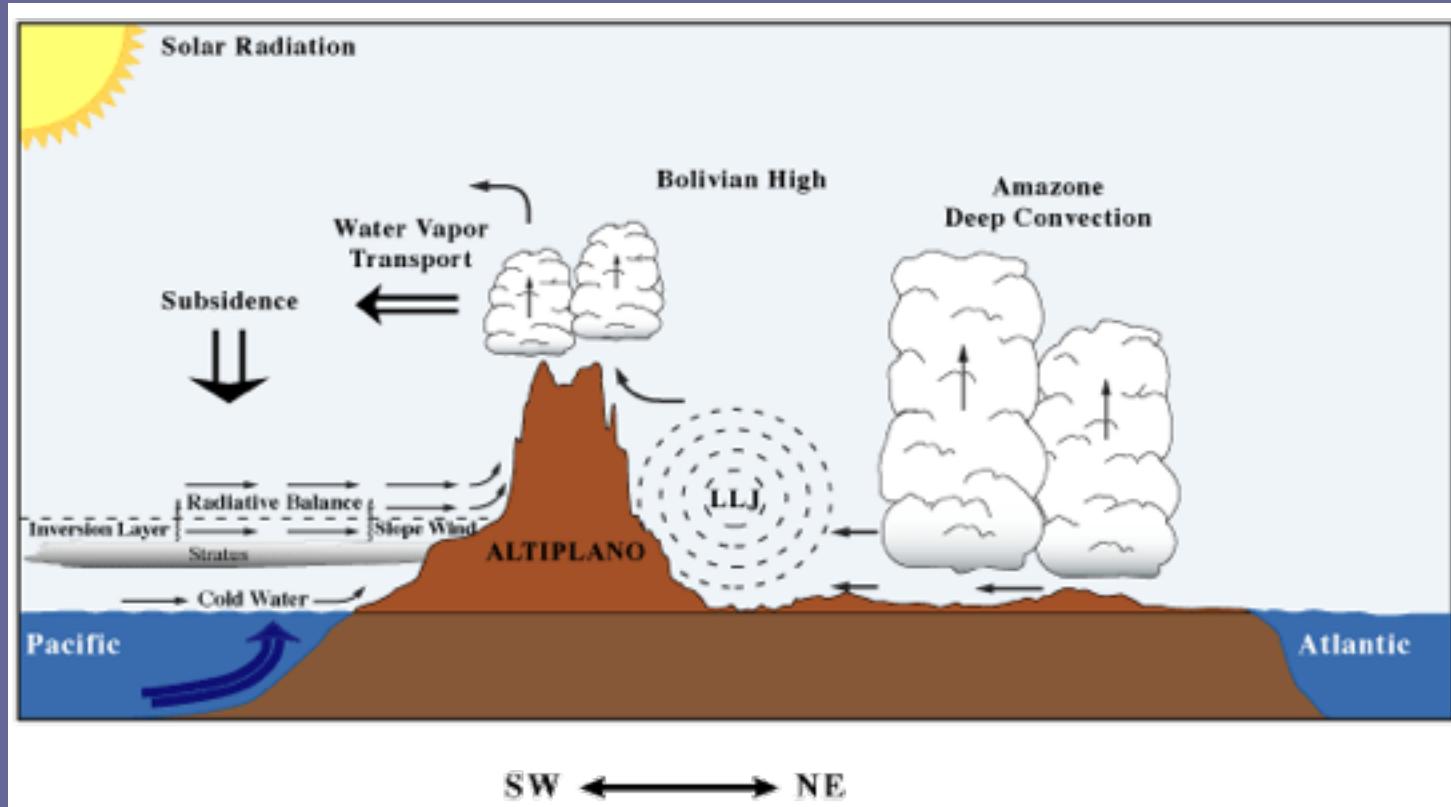
MESA carried out the South American Low Level Jet Experiment (SALLJEX) between 15 November 2002 and 15 February 2003. This was the first CLIVAR field experiment in South America.

Participant countries: Argentina, Bolivia, Brazil, Chile, Estados Unidos, Paraguay, Perú

Main participant institutions: AASANA - Bolivia, CIMA - Argentina, CPTEC - INPE - Brasil, DINAC - DNM - Paraguay, NCAR - JOSS - USA, NSF(ATM) - USA, NSF(IAI/GEO) - USA, NOAA (PACS/OGP)- USA, NOAA(NSSL/ERL), SENAMHI - Perú, Servicio Meteorológico Nacional - Argentina, Universidad of Buenos Aires - Argentina, University of Chile - Chile, University of São Paulo - Brasil, University of Utah - USA

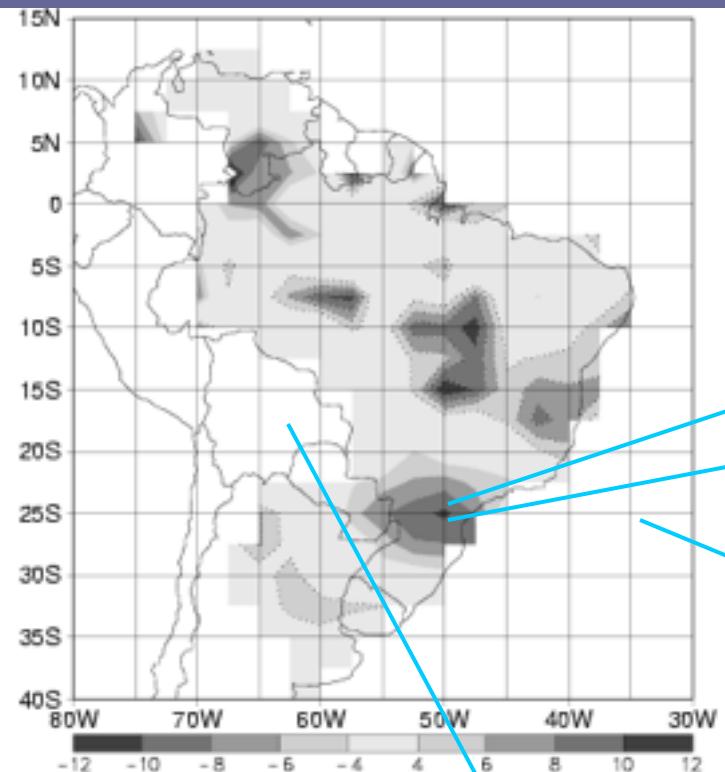


What is VOCALS ?

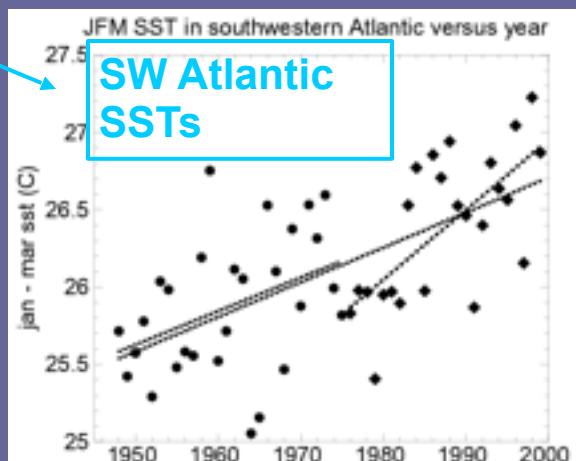
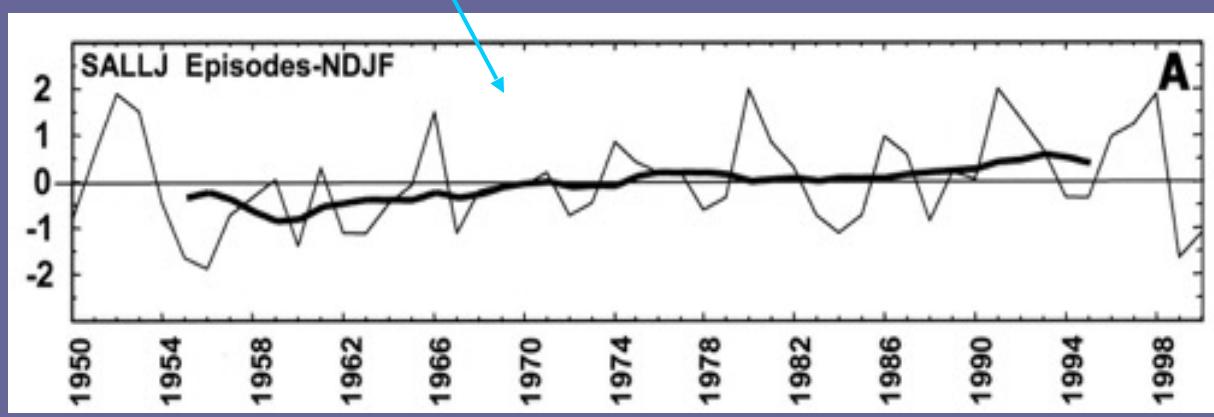
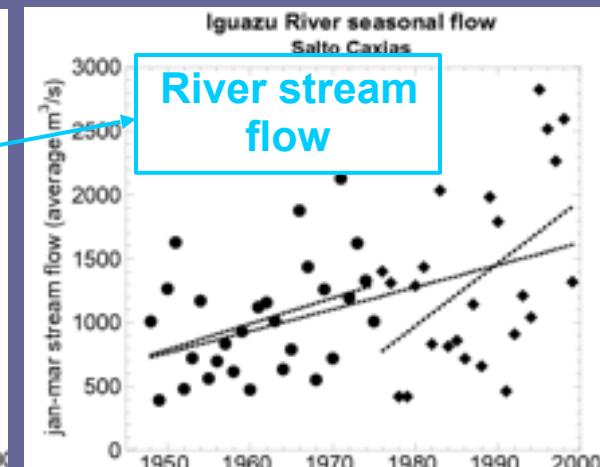
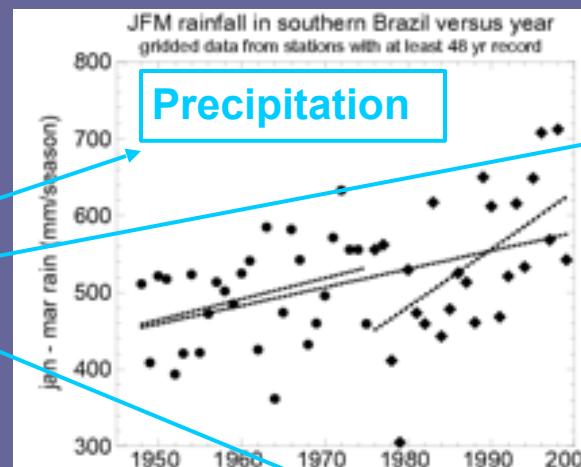


The focus of VOCALS is to better understand and simulate how marine boundary layer cloud systems surrounding the Americas interact with the coupled ocean-atmosphere-land system on diurnal to interannual timescales.

Trends

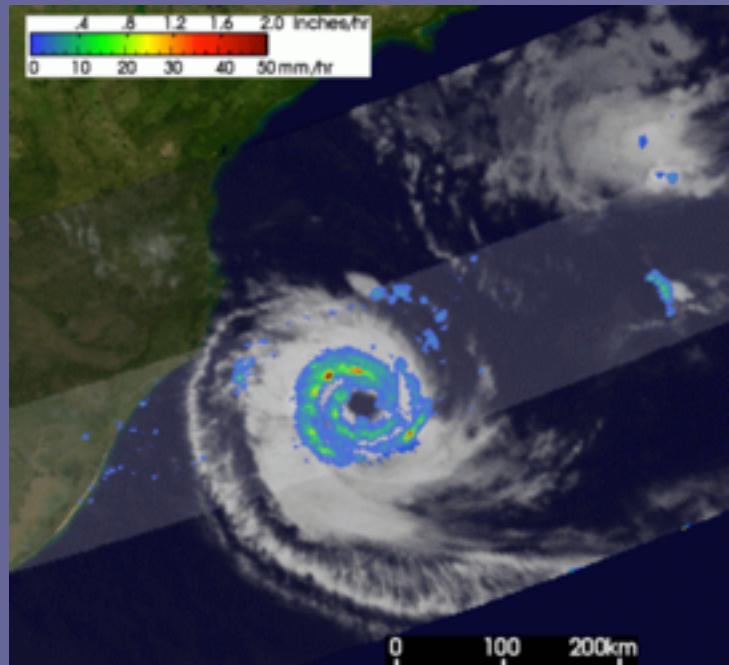
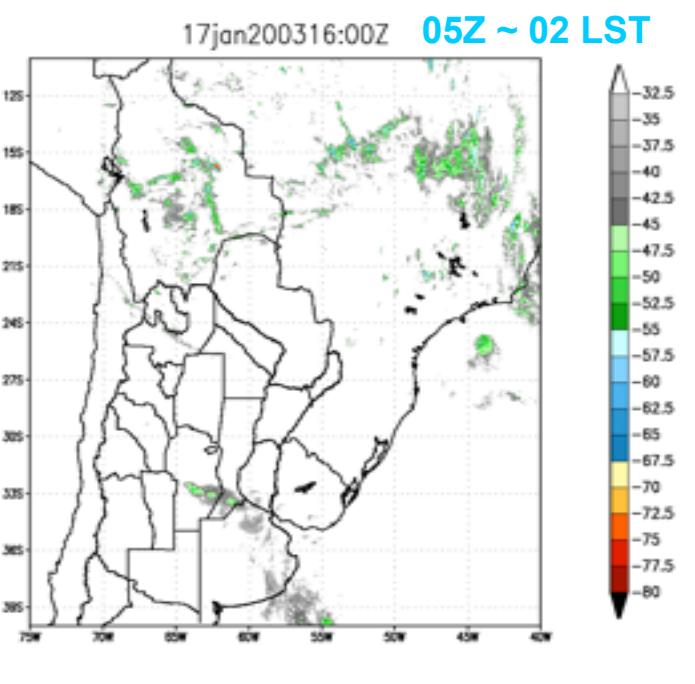


JFM precipitation
trends
(Liebmann
et al. 2004)

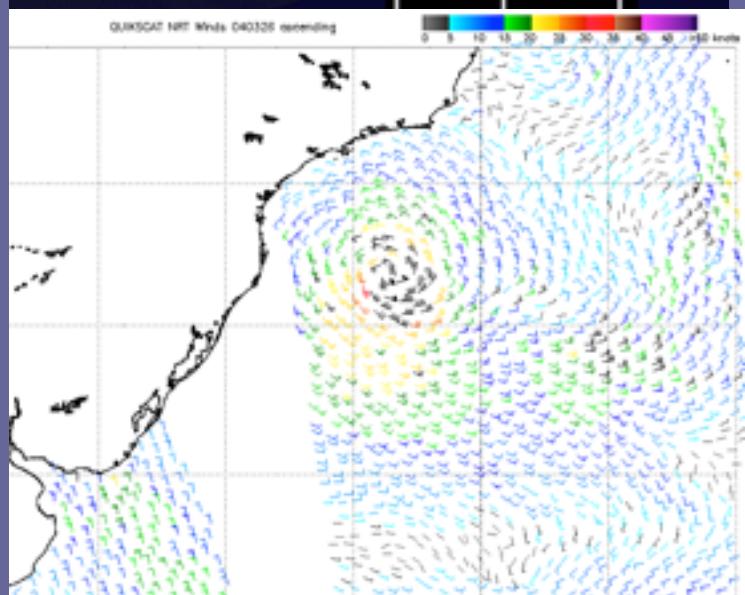
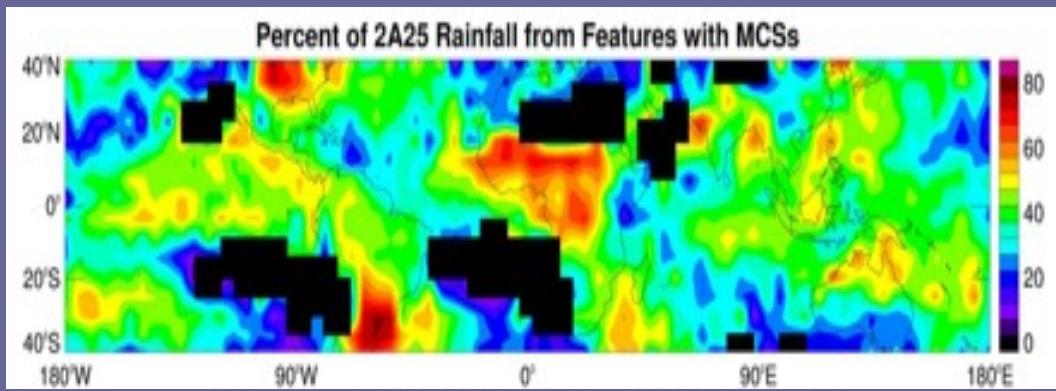


Normalized annual departures of SALLJ-event annual counts

Short-time scale events

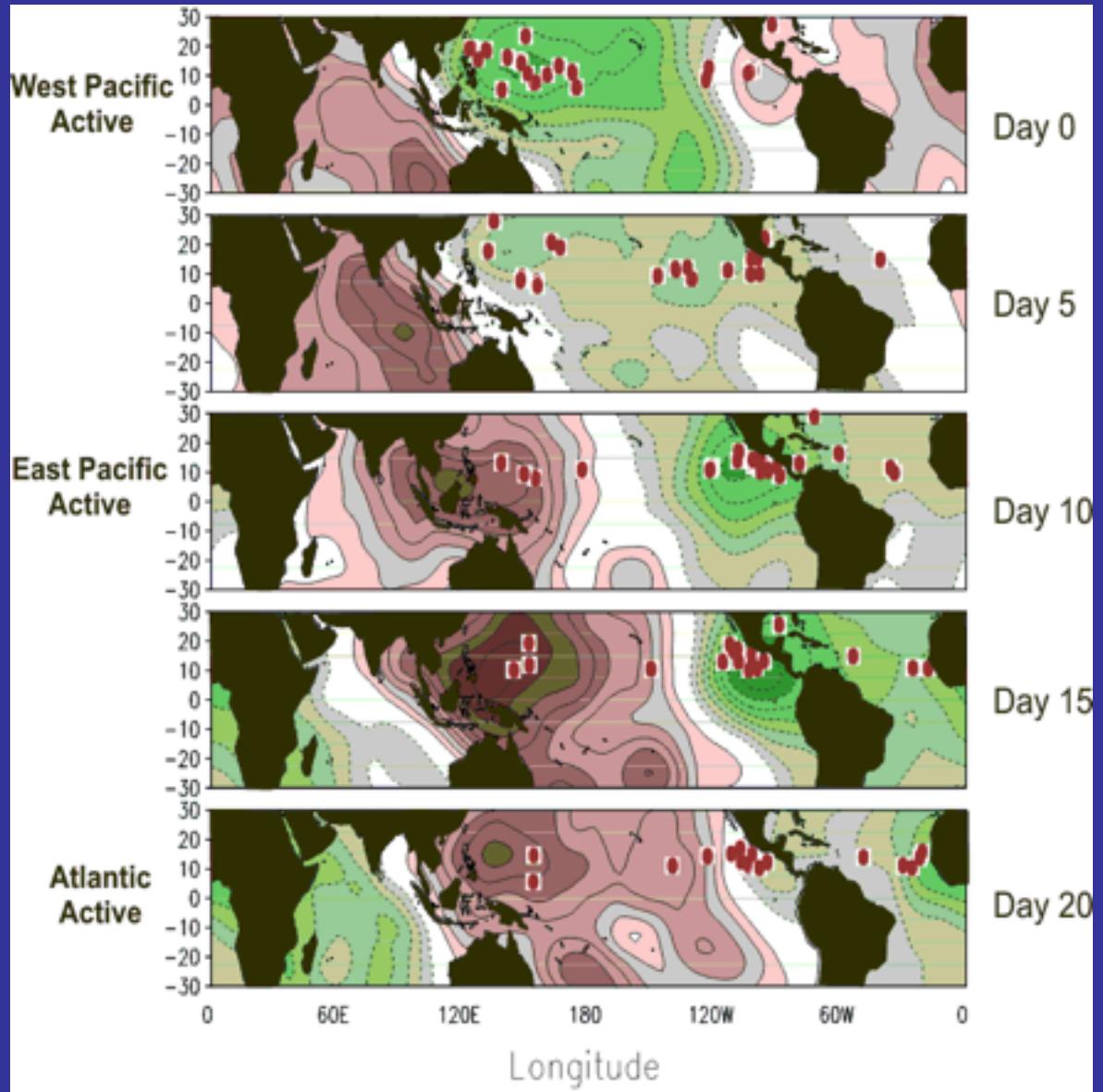


Subtropical South America has the largest fractional contribution of PFs with MCSs to rainfall of anywhere on earth between 36 N and 36 S (Courtesy Nesbitt & Zipser)



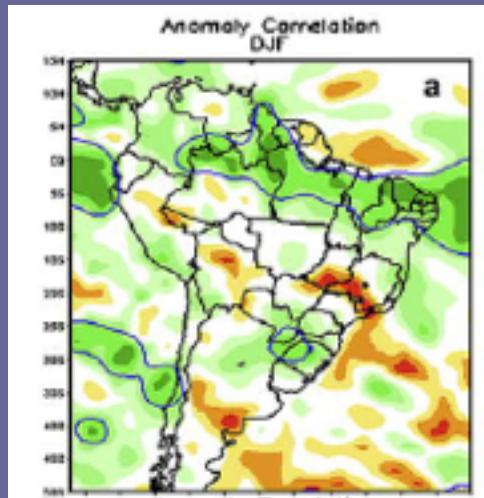
Intraseasonal Variability (MJO) & Tropical Cyclones

Composite evolution of 200-hPa velocity potential anomalies associated with MJO events and points of origin of tropical disturbances that developed into hurricanes or typhoons.



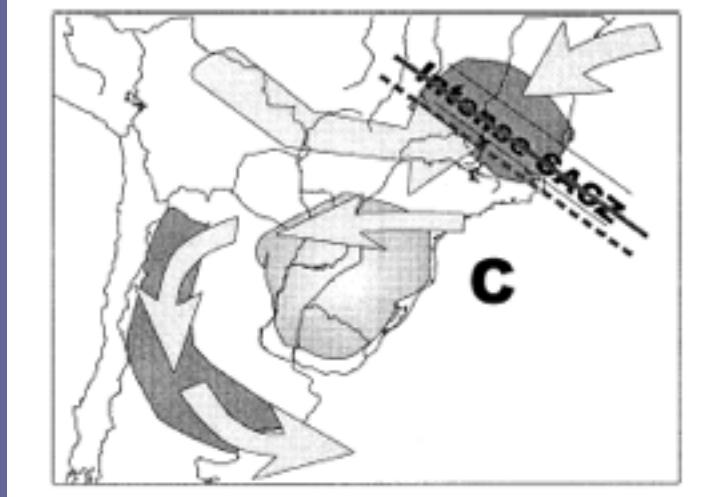
Interannual Variability

Role of land surface conditions

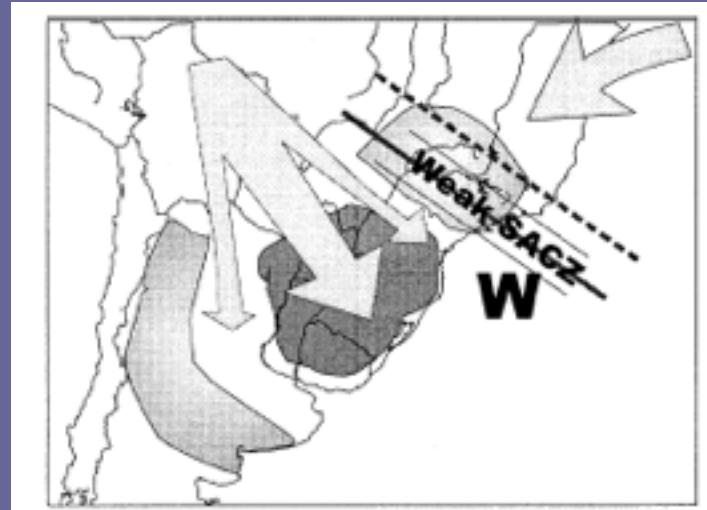
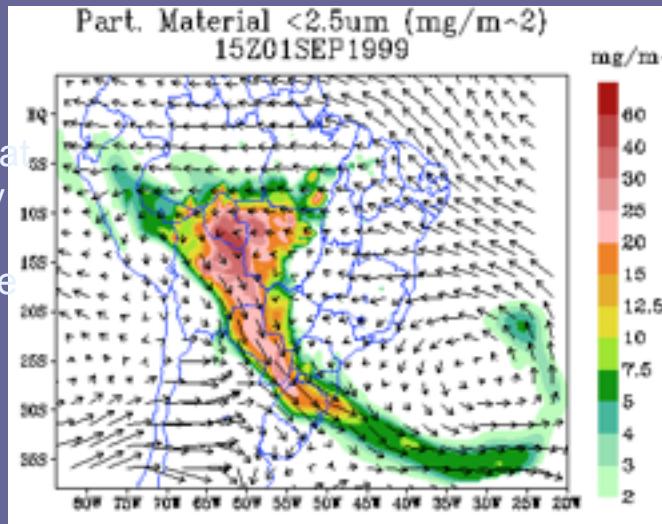


Correlation coefficients between CPTEC model anomalies and observed anomalies of rainfall (Marengo et al. 2003)

Role of SST anomalies (Doyle & Barros 2002)



Aerosol plume produced by biomass burning at the end of the dry season and transported to the south (Freitas et al. 2004)



VAMOS and IAI

- **IAI Projects (CRN, small grants, etc.):**
 - have promoted a better integration of the scientists,
 - have encouraged the investigation of the human dimension of the climate issues
 - have contributed to enhance the regional capacity building,
 - Aspects that has positively facilitated the implementation of the VAMOS scientific programs in the regions (SALLJEX, PLATIN)
- **IAI has contributed to various CLIVAR-related meeting (SACOS, CLIVAR Science Conference, etc.)**
- **VAMOS scientific activities that have gathered many scientist related with IAI have contributed to a better specification of the scientific objectives related with climate variability and change as well as to integrate individual projects in a common framework**
- **Great synergism between VAMOS subprograms and IAI Projects!**
- **WCRP/CLIVAR/VAMOS strongly acknowledges the role of IAI in the Americas and looks forward to strength the interaction**

Suggestions for IAI future activities

- **Discussion of the IAI Scientific Agenda in order to better focus the scientific themes in more specific scientific objectives**
- **Continuation and strengthening of the CRN structure:**
 - Improve the scientific monitoring of the CRNs (workshops based on IAI science agenda)
 - Promote the integration in the CRNs of countries with different capacities in terms of human and financial resources
- **Strengthening of IAI links with national scientific programs (Global Change issues should be prioritized in the national scientific agendas!)**
- **Strengthening of IAI links with global programs like WCRP, IGBP, IHDP and DIVERSITAS in order to promote joint actions in:**
 - The definition of main scientific objectives
 - The enhancement of the regional capacity building
 - The improvement of the observational system and the databases related with global change issues