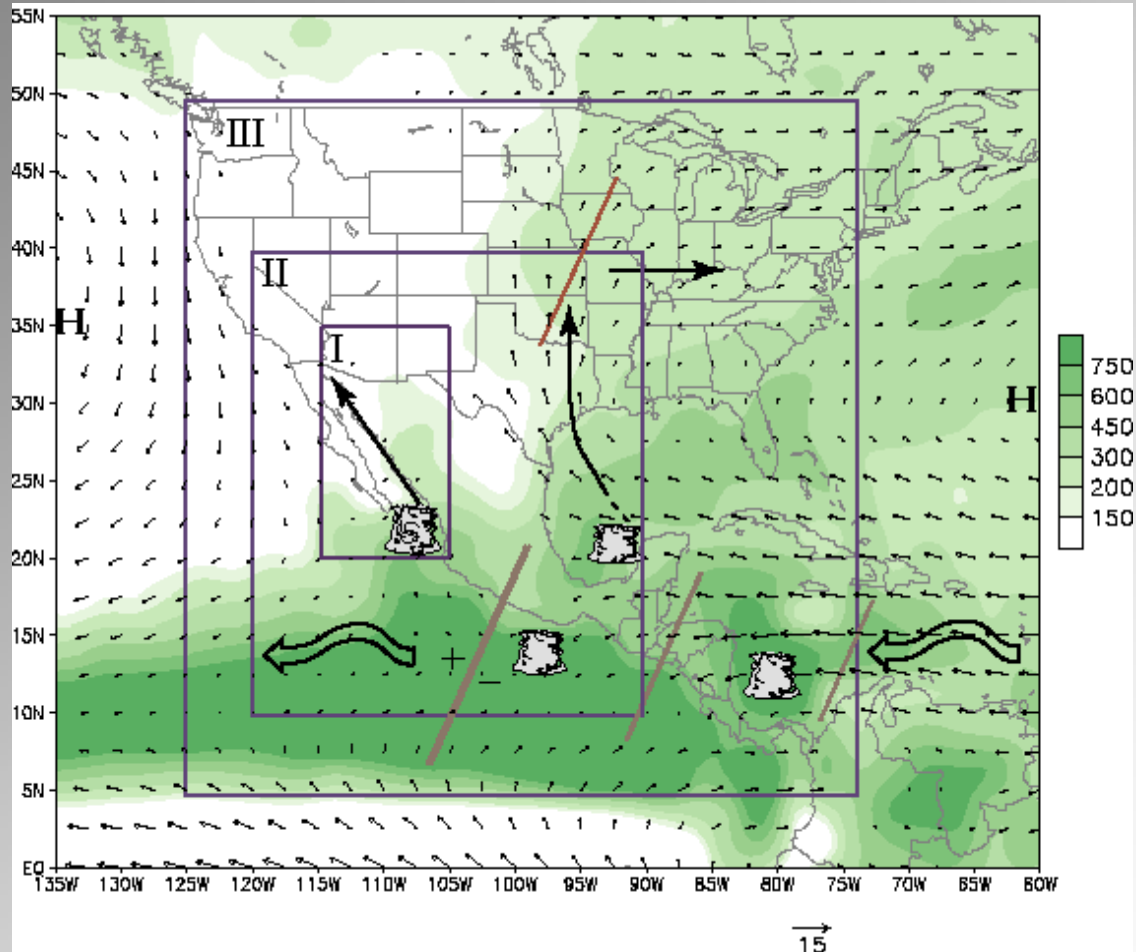


National Center for Atmospheric Research¹
and the Colorado State University²

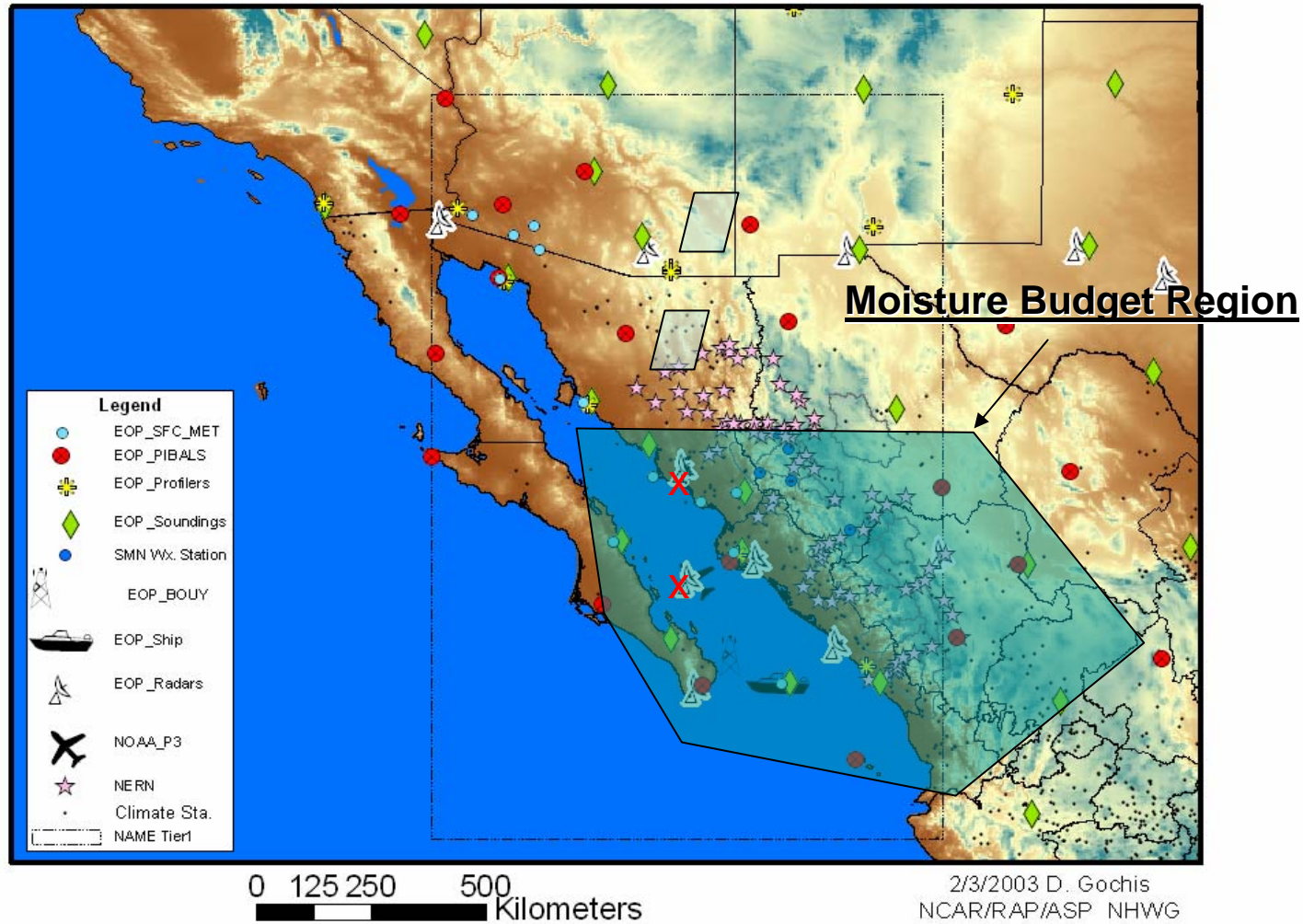
Diurnal and Intra- seasonal Variability of Precipitation in the North American Monsoon Region

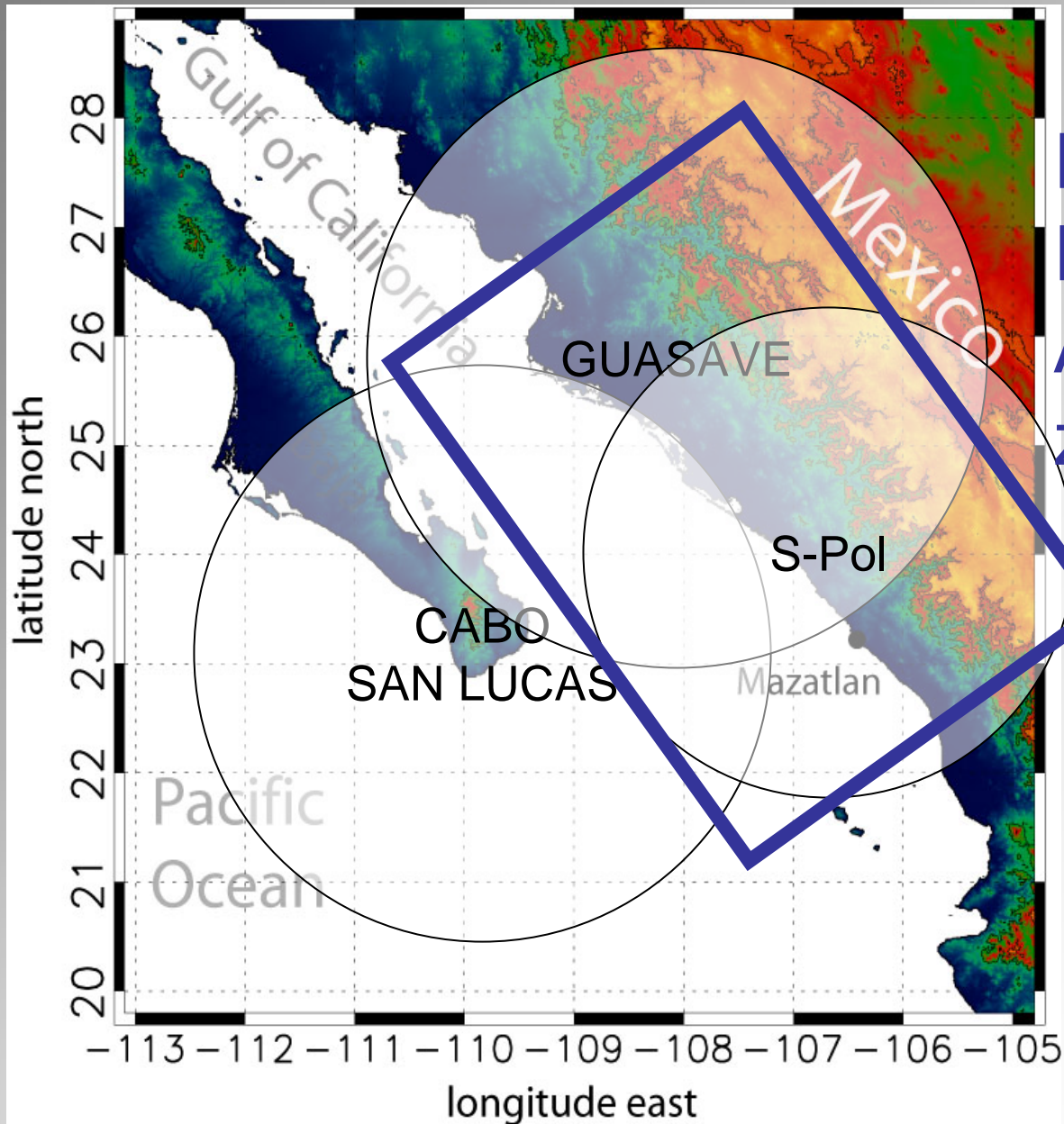
Rit Carbone¹, Tim Lang², Dave
Ahijevych¹, Steve Nesbitt², Dave
Gochis¹, Steve Rutledge², Rob Cifelli²

Tiers of Enhanced Observation



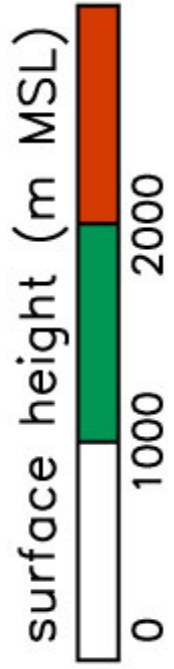
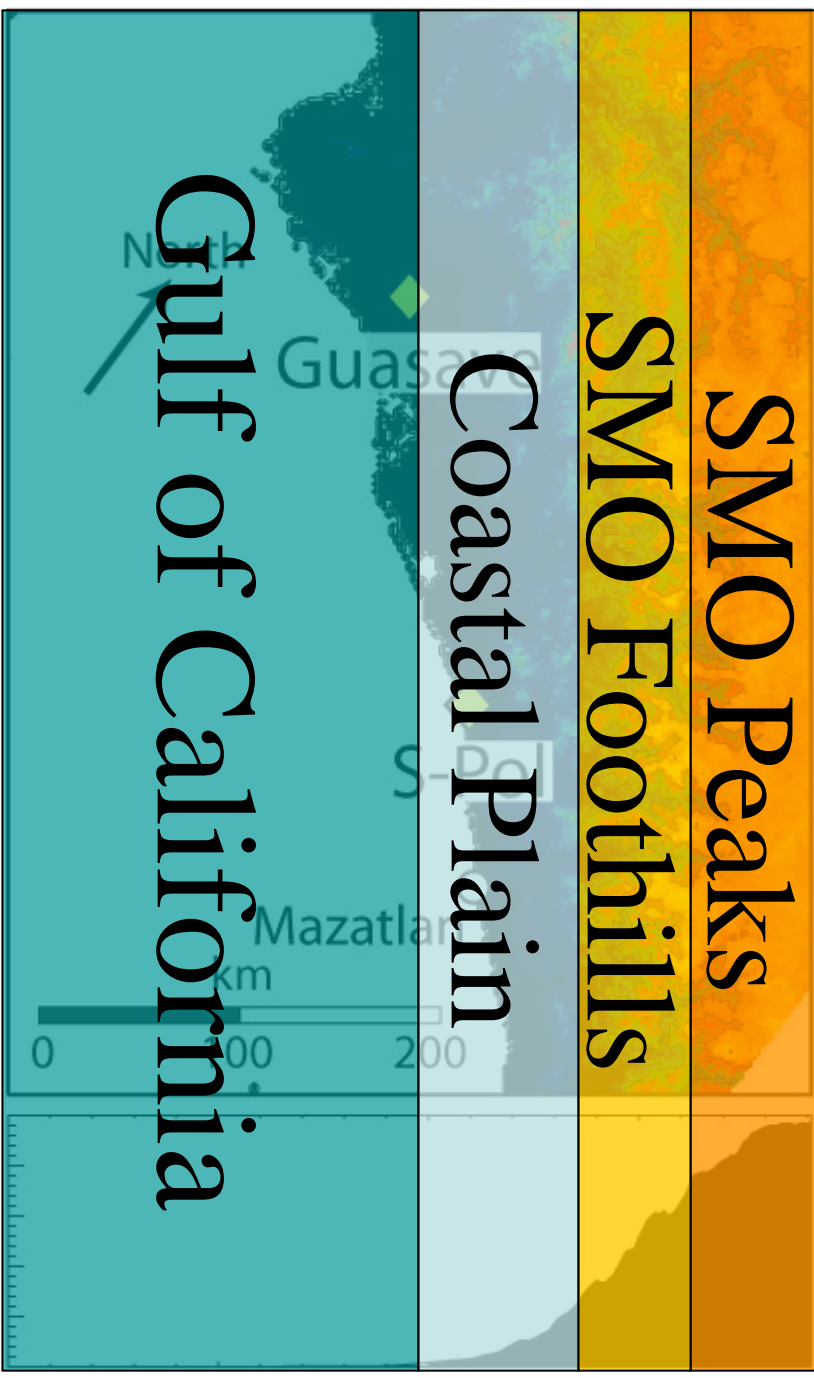
2004 NAME EOP Instrumentation Platforms



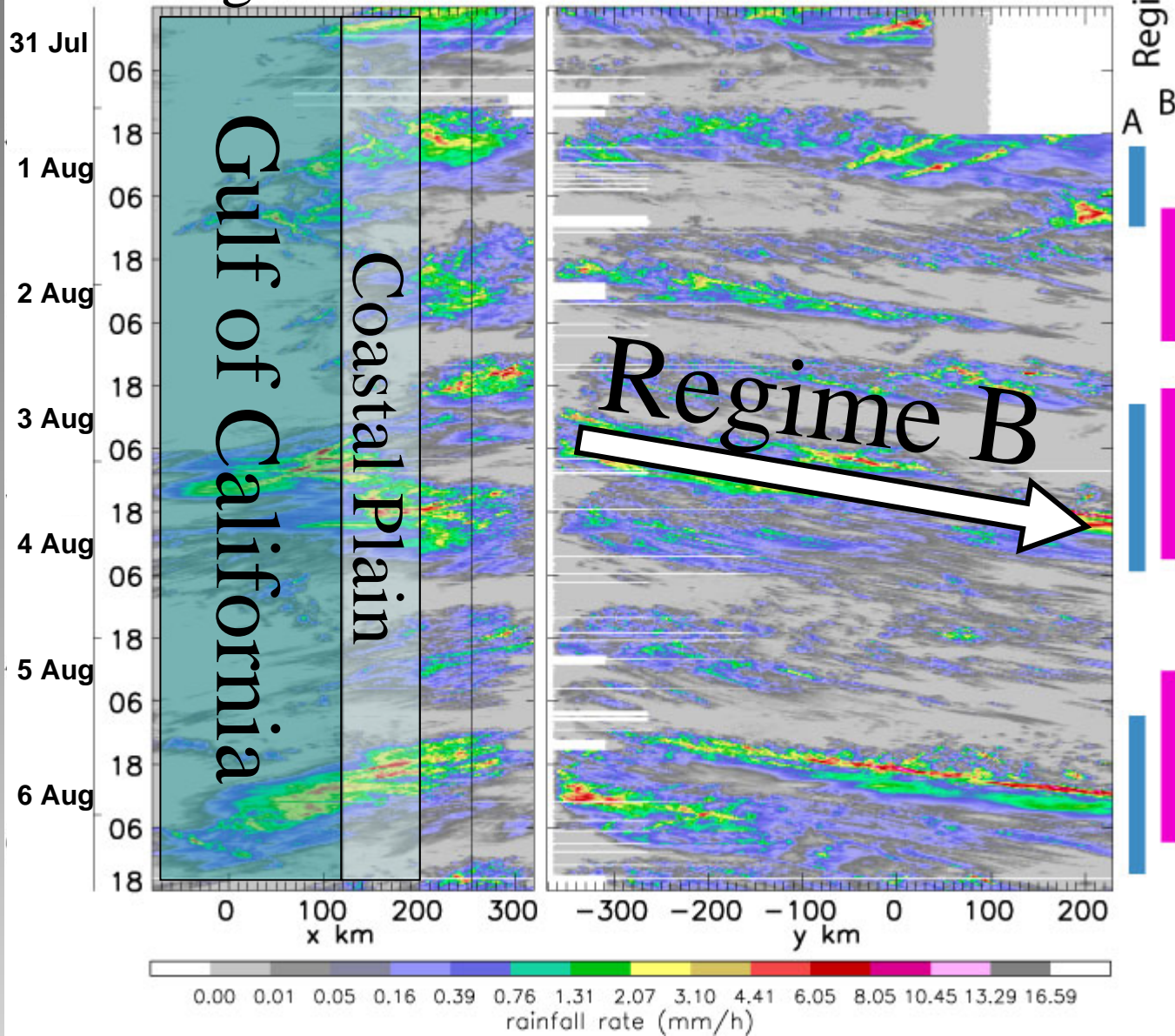


Reduced
Dimension
Analysis
zone

0m 1000

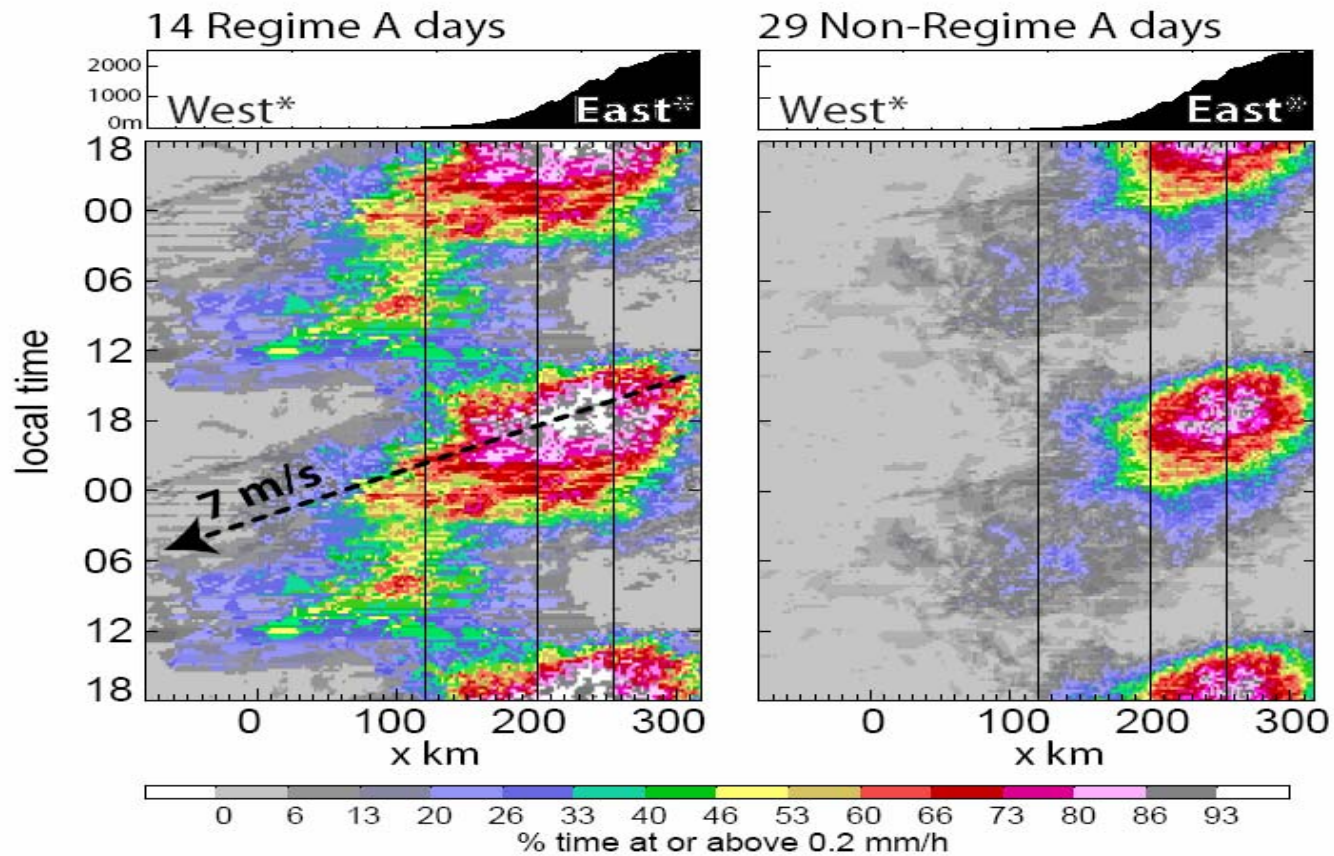


Regime A



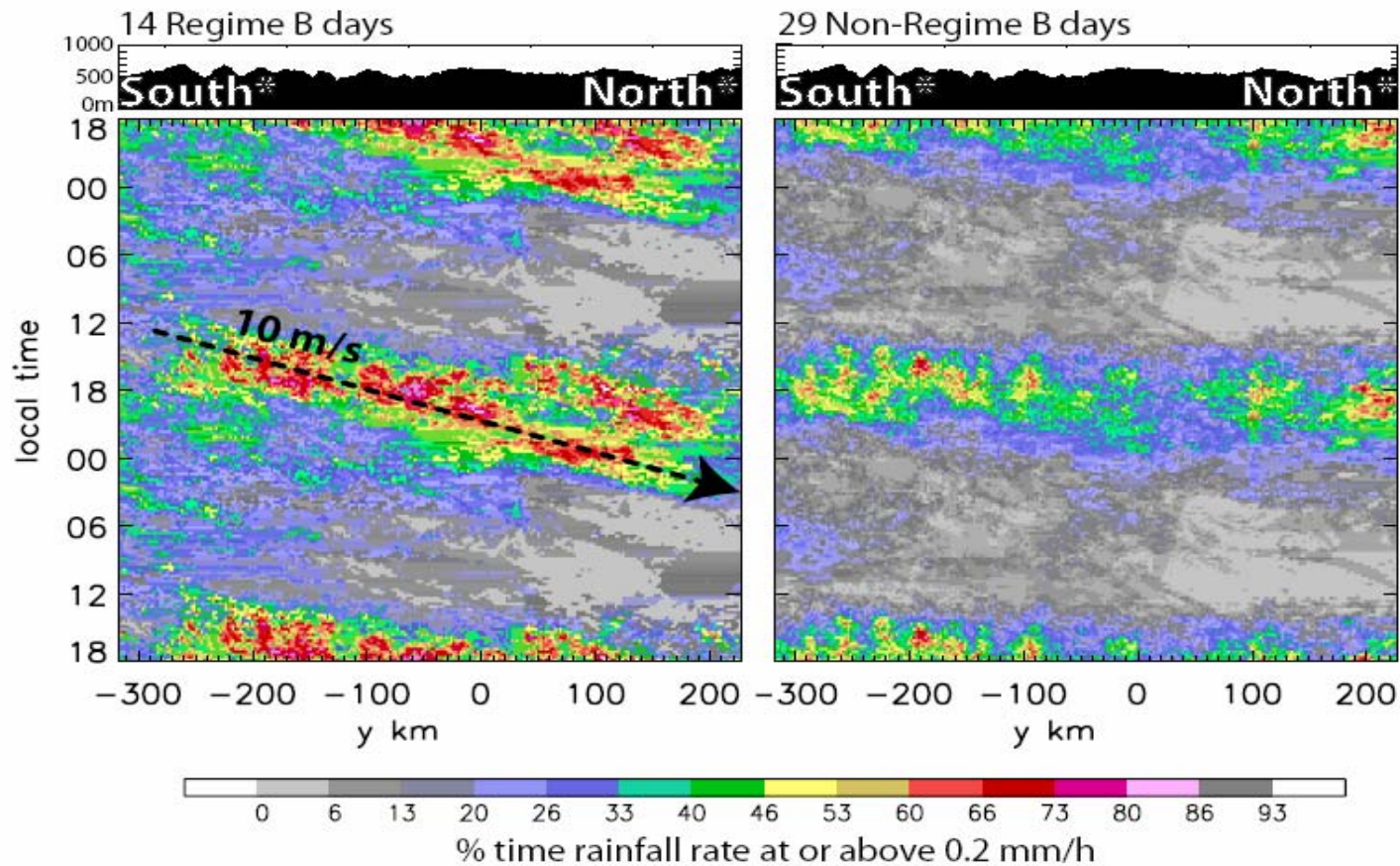
Diurnal Cycle

Regime A (14) vs Other Days (29)



Diurnal Cycle

Regime B (14) vs Other Days (29)

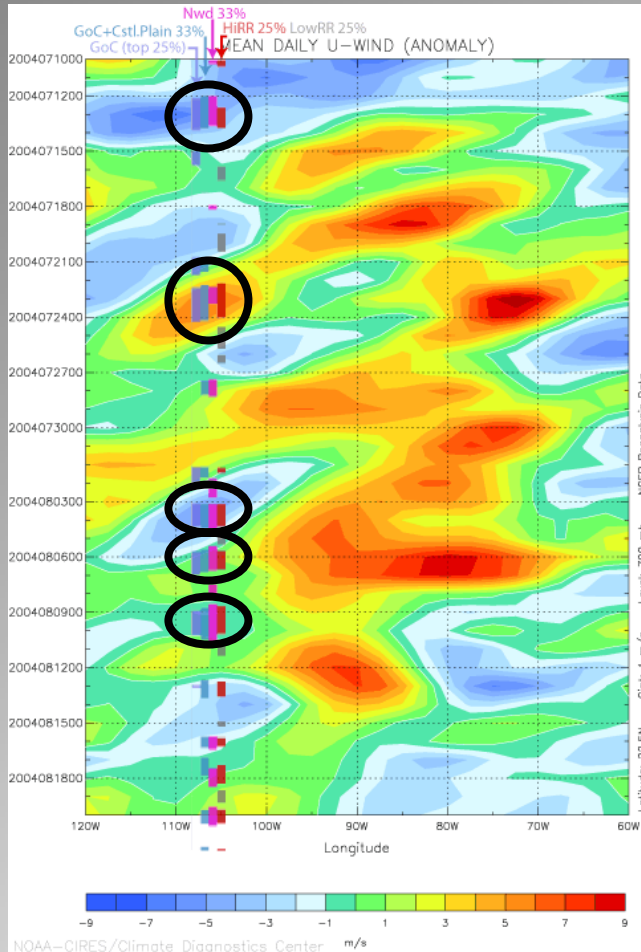


70 kPa Wind Anomalies

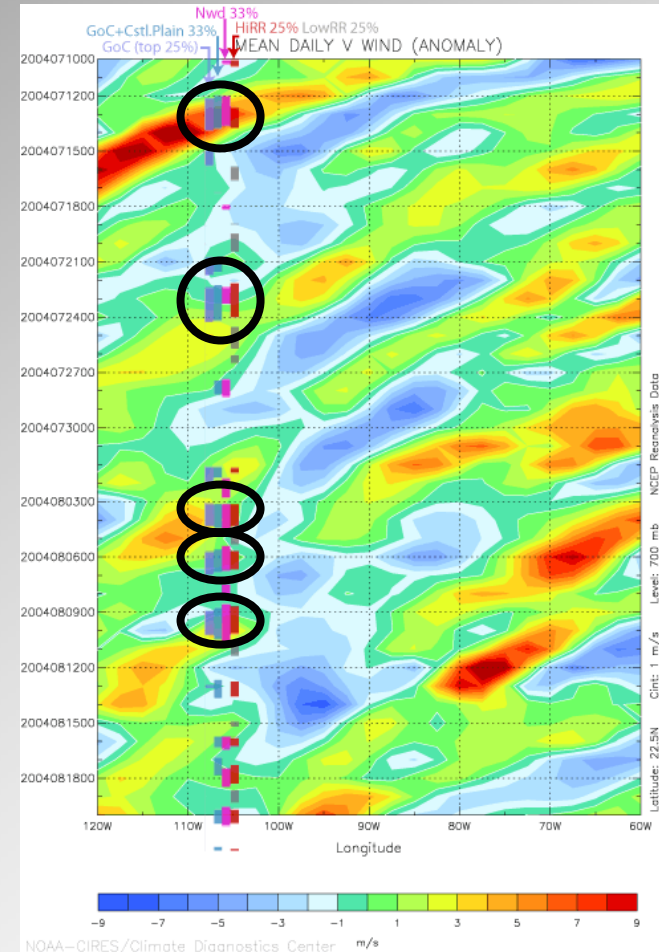
U

V

10 July



1 August



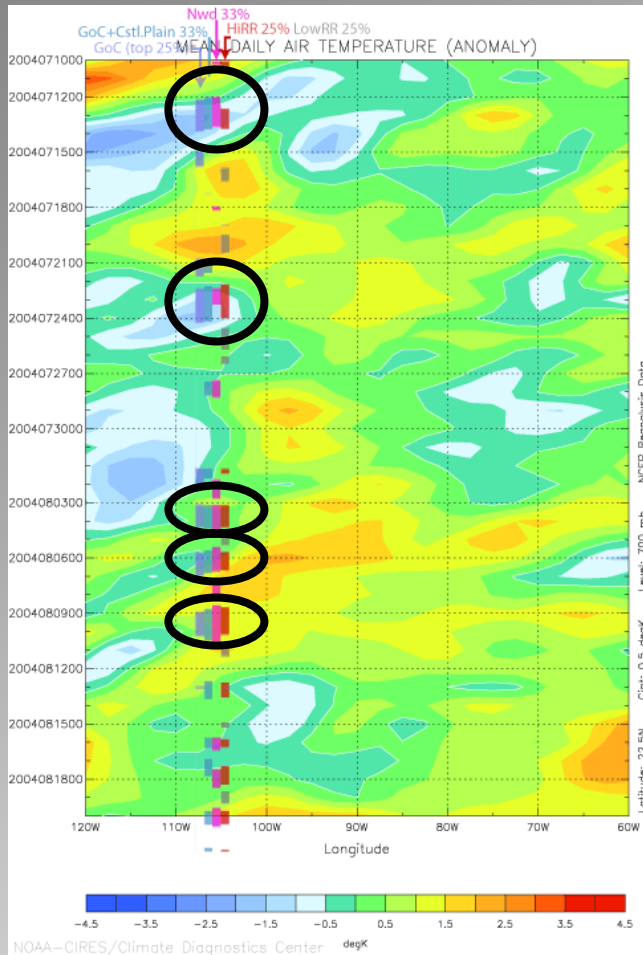
20 August

70 kPA Temp. and Humidity Anomalies

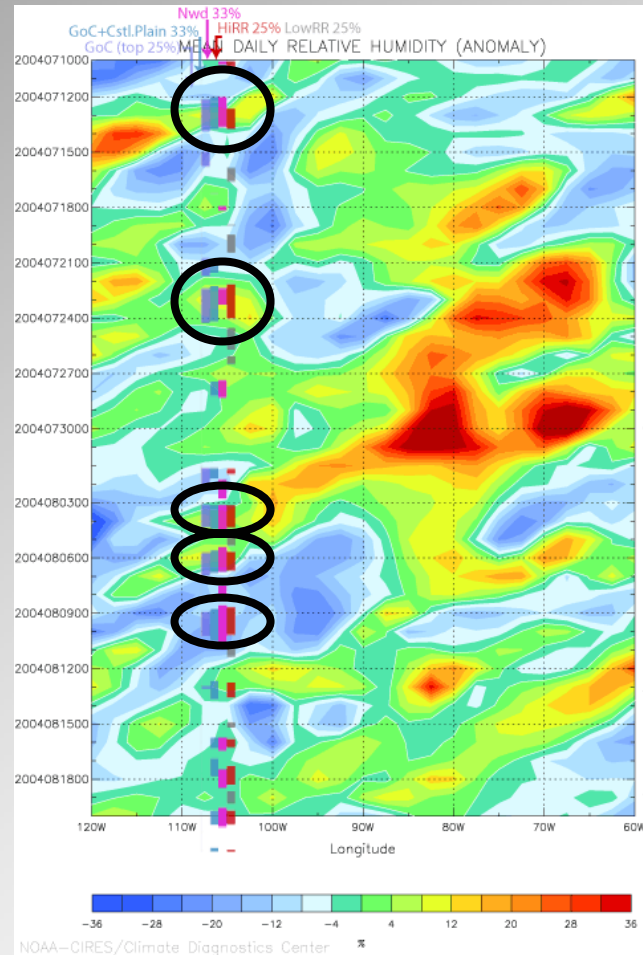
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RH

10 July



1 August

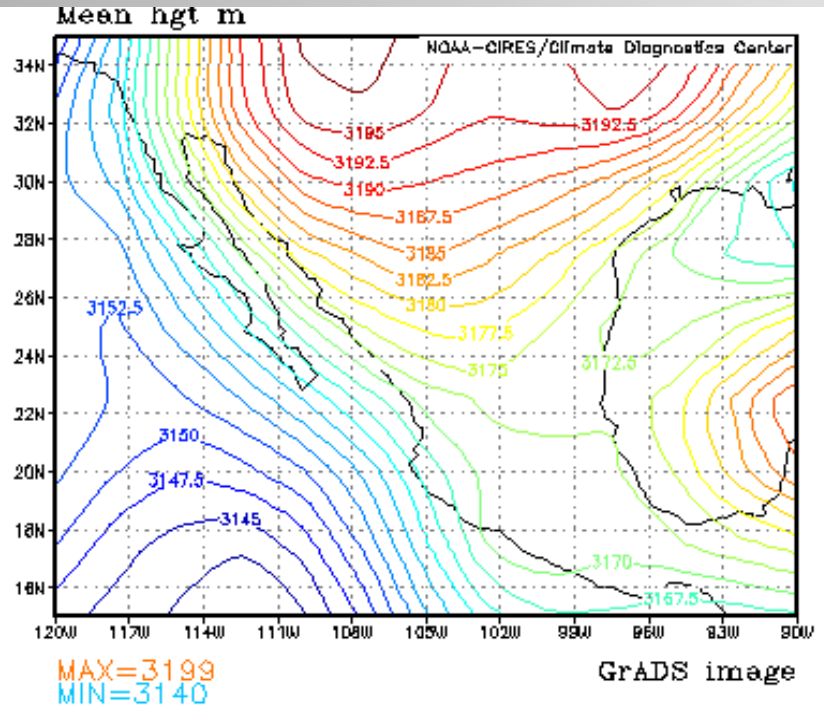
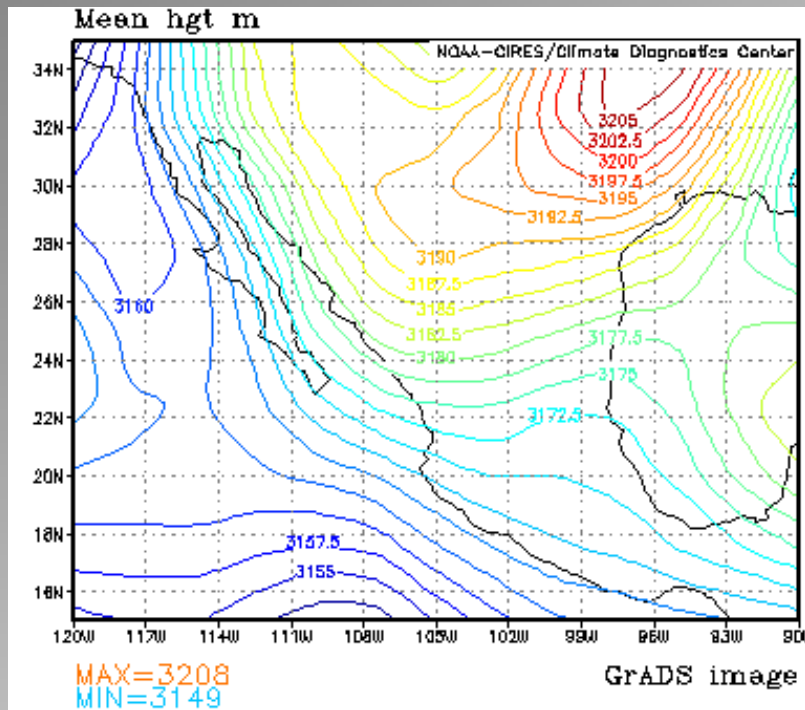


20 August

AB-3 70 hPa

3 August 2004

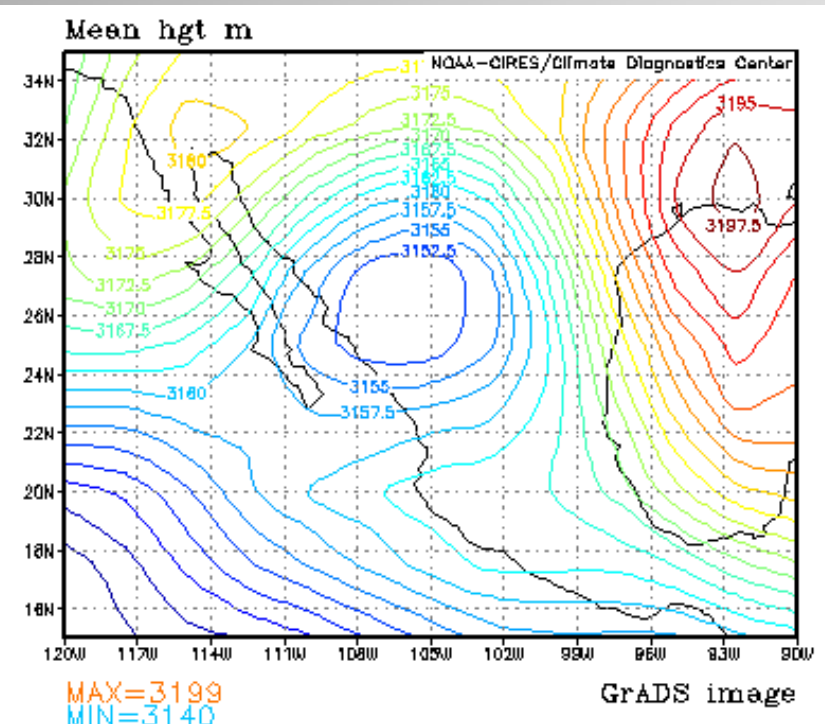
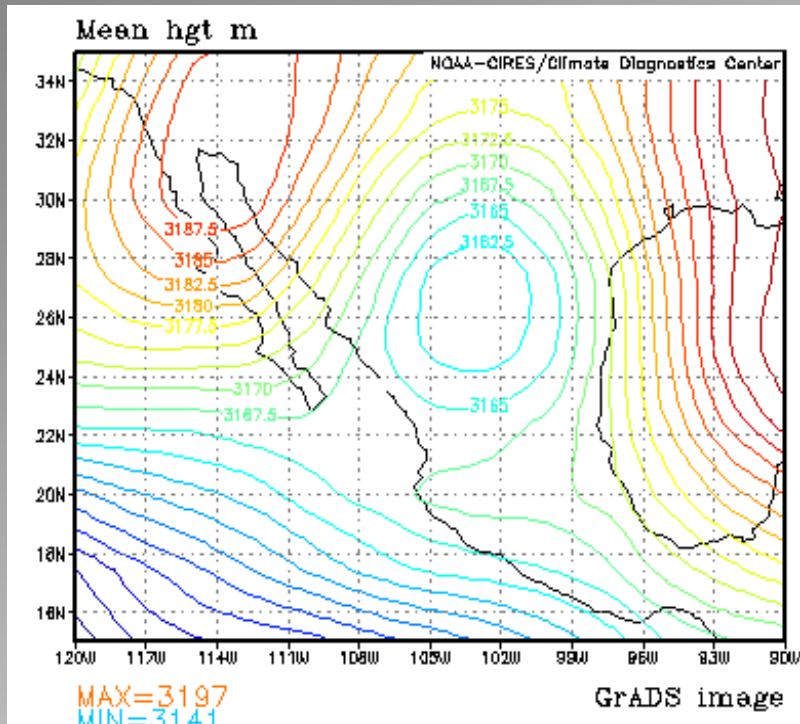
4 August 2004



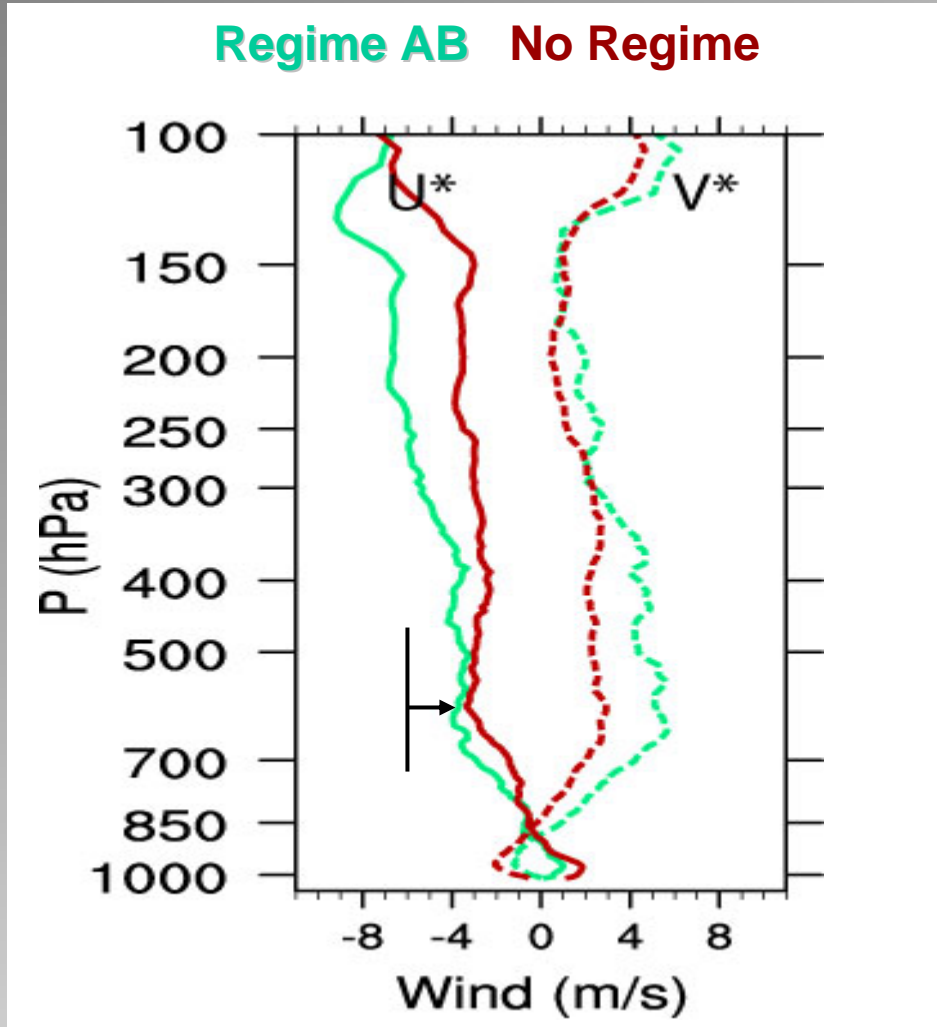
AB-2 70 HPa

22 July 2004

23 July 2004



Shear, Steering Winds, CAPE/CIN



0 – 4km shear
2.6 ms⁻¹, 0.65 x 10⁻³
6.7 ms⁻¹, 1.7 x 10⁻³

CAPE - CIN
1687 - 44
1560 - 79

These are the strongest discriminators revealed so far.

Conclusions

- Most rainfall is triggered by the SMO heat source and sea breeze.
- Intra-seasonal variability appears systematic.
- The A, B, and AB Regimes are associated with the capacity for convection to organize, scale upwards and propagate.
- Regime days have enhanced shear, larger CIN, and good steering winds.
- The organized convection produces more rainfall, and propagates with respect to the local forcings and the steering winds ($\sim 6 \text{ ms}^{-1}$).
- Propagation, combined with triggering by the elevated heat source, leads to a well defined pattern of the diurnal cycle (“globally phase locked”).
- Rainfall patterns are also consistent with the GoC acting as a nocturnal heat source and the land breeze front as “triggering topography”.

THANKS !