

PREDICT Science Objectives: Tropical Transition

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NCAR

NESL/MMM

Genesis Pathways: A variety of pathways within range

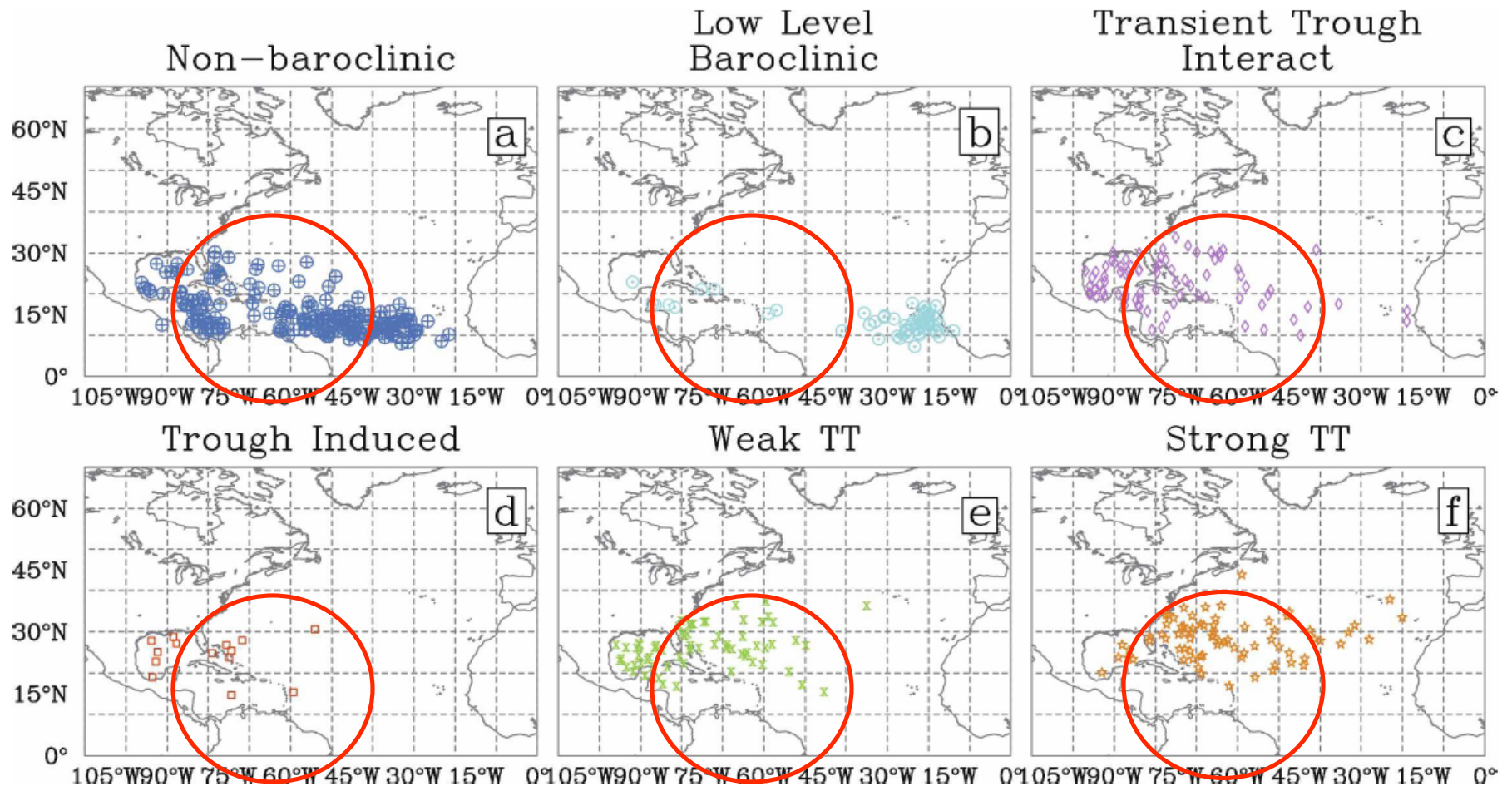
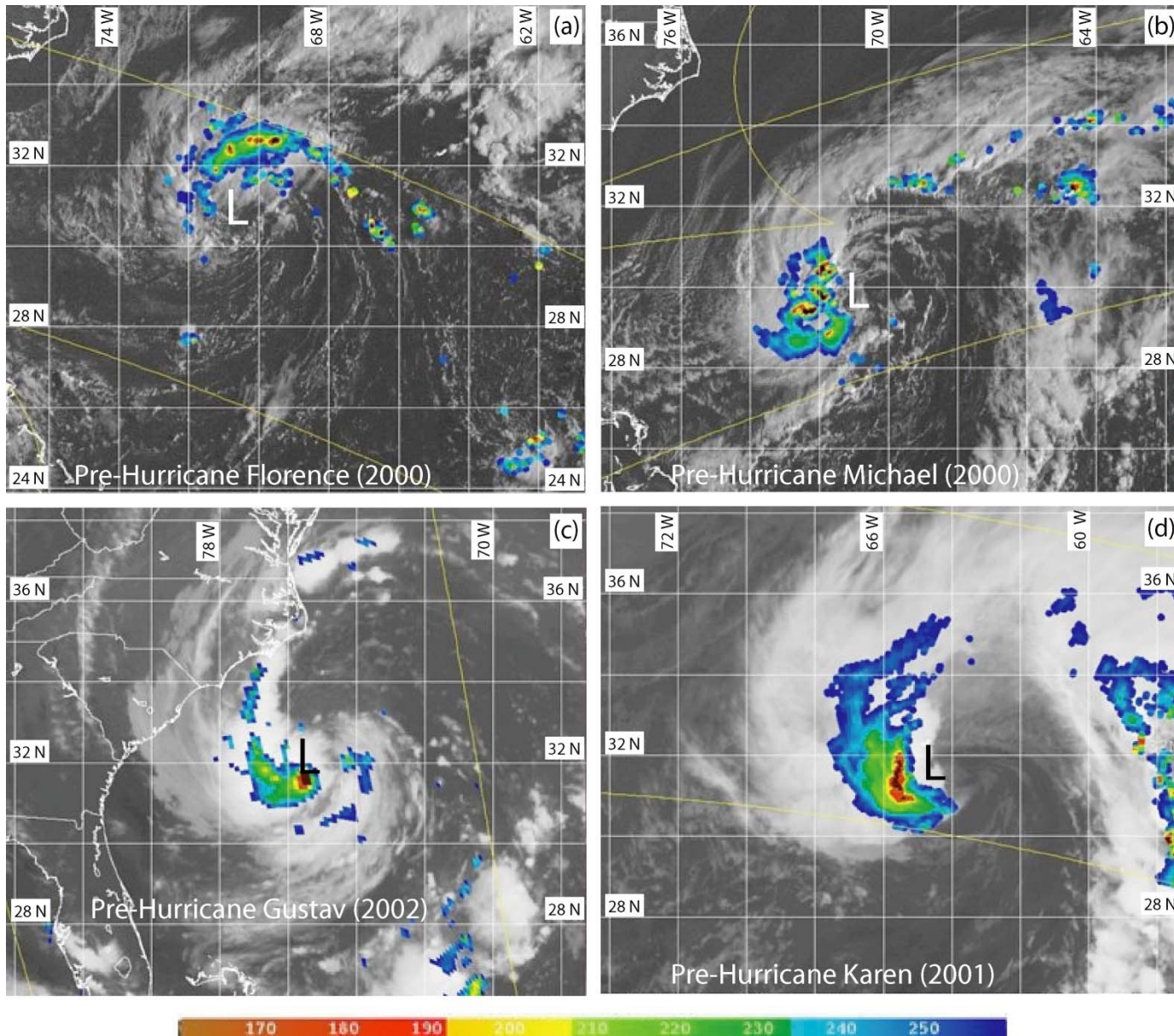


FIG. 10. Spatial distribution of tropical cyclogenesis (T_o) locations for all members of each category, as indicated by the title on the individual panels.

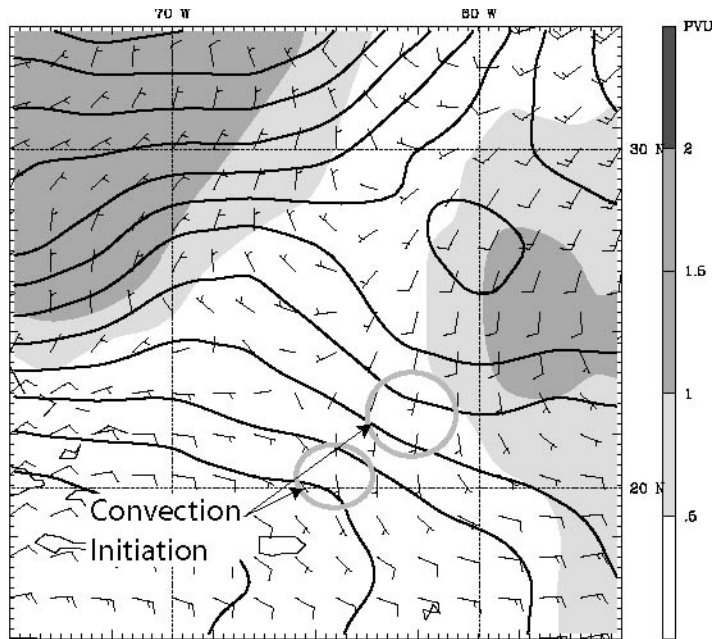
McTaggart-Cowan et al., 2008: MWR

Strong TT

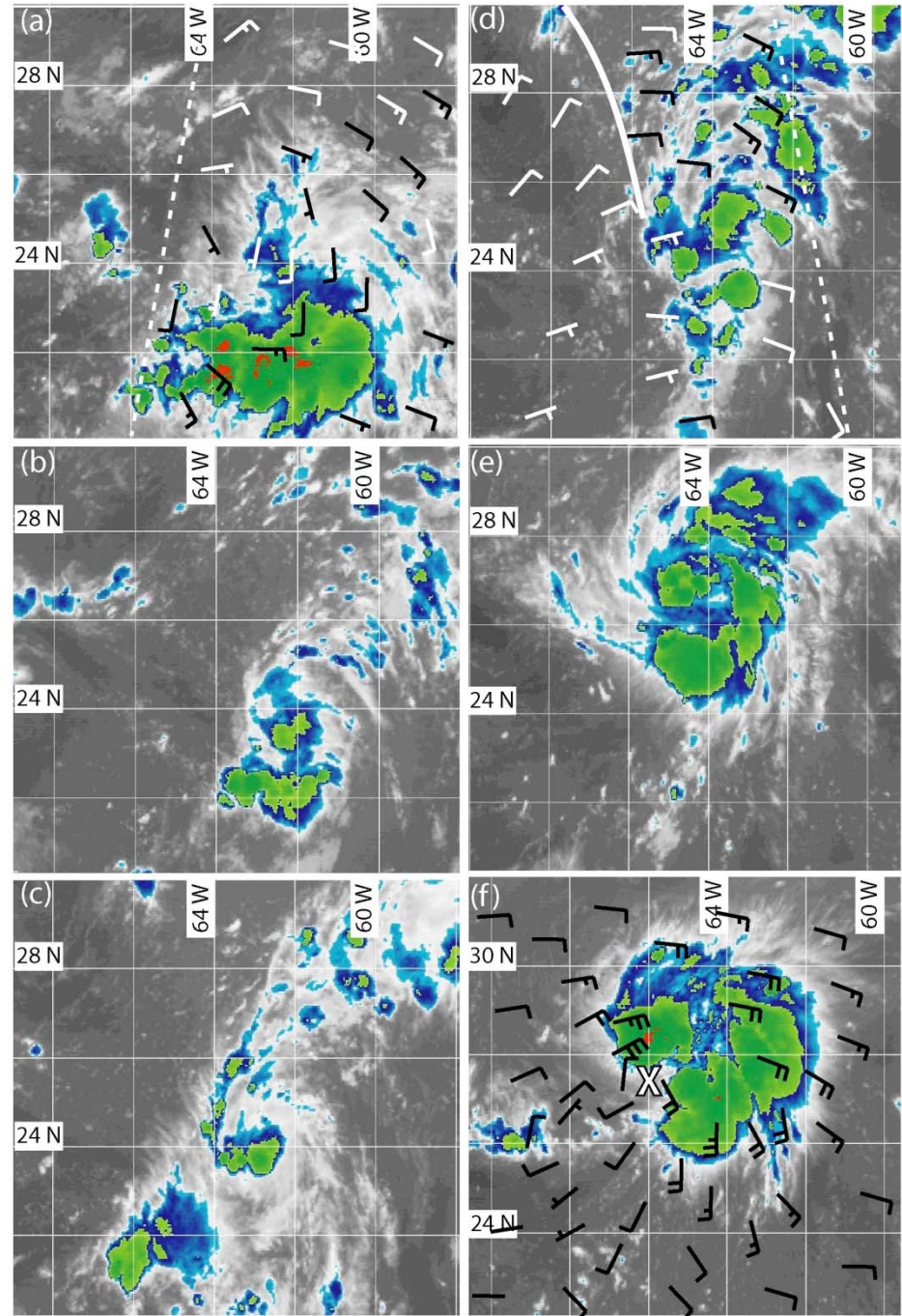


85 GHz Polarized Corrected Temperature (PCT) (K)

Weak TT: Humberto

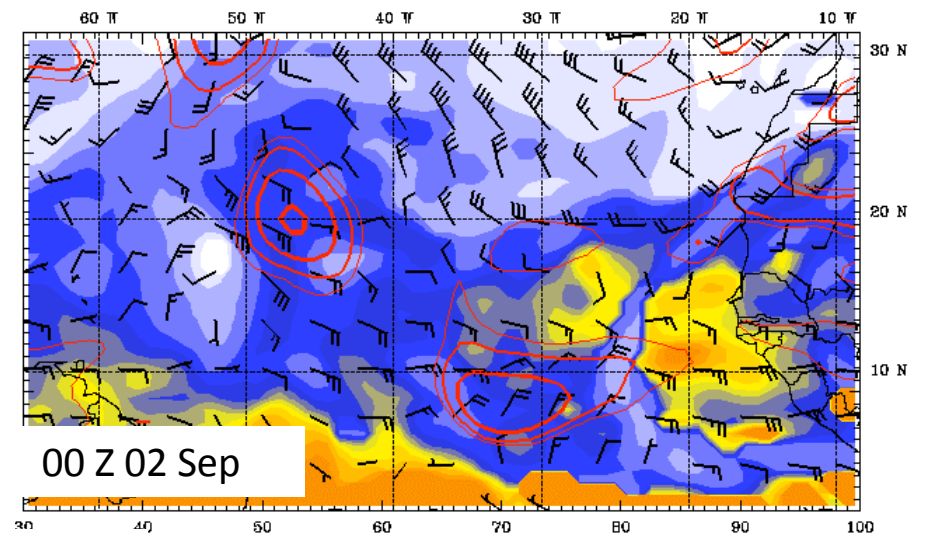
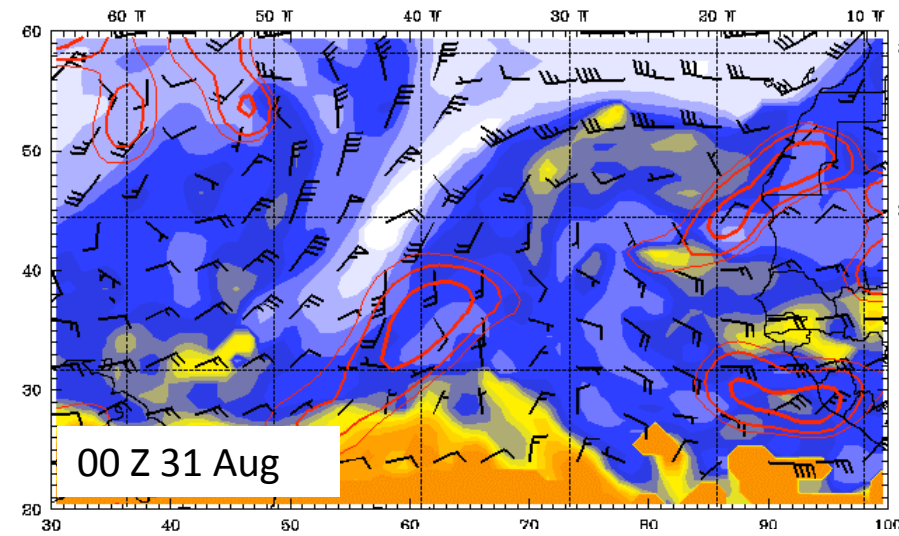
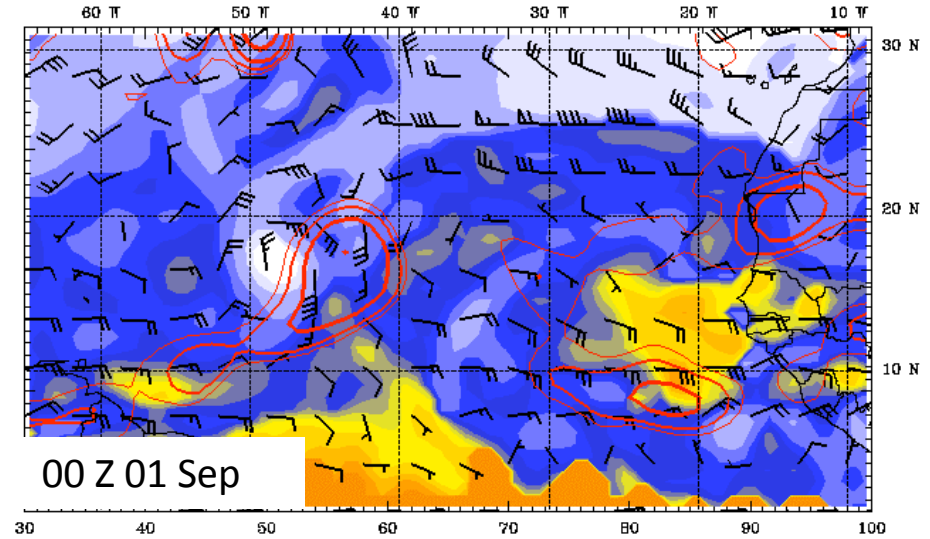
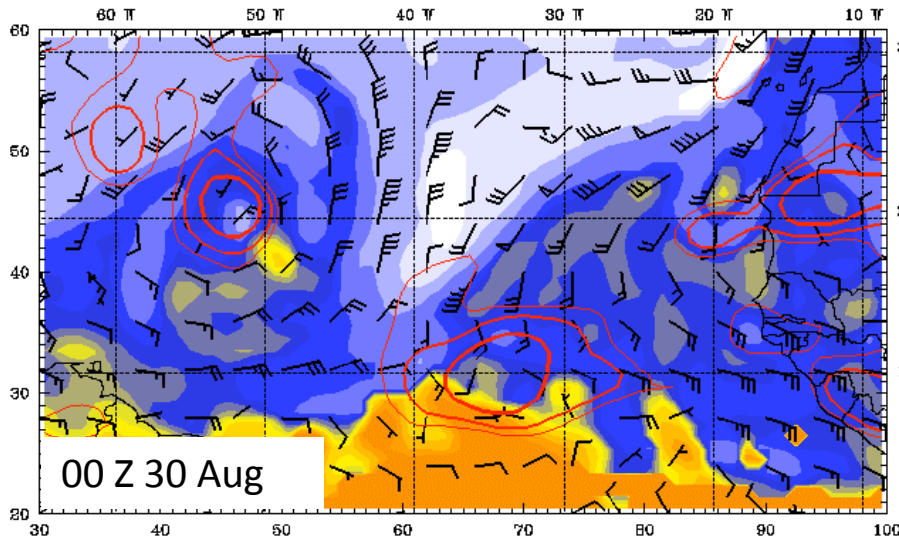


Shaded is 340 K PV, contoured is 900 hPa temperature (0.5°C interval) and wind barbs are at 900 hPa. Valid time is 0000 UTC 19 Sept. Gray circles indicate approximately regions where convection initiates.



Development of Maria

θ , Wind on DT, ζ at 950 hPa



Red Contours = 900 hPa Relative Vorticity (1, 2, 4, and 8x10⁻⁵ s⁻¹)

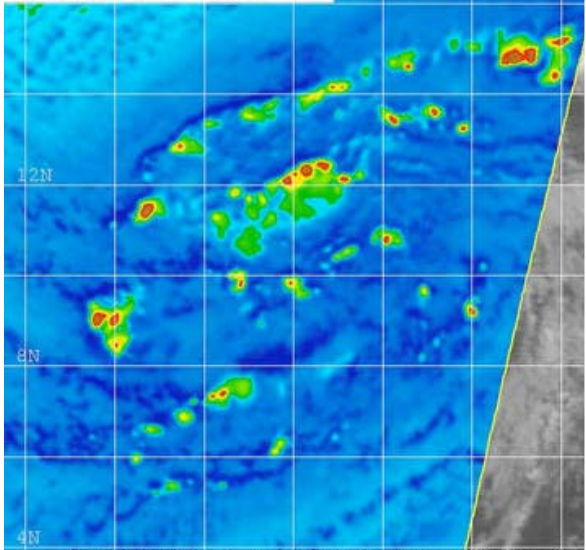
ential Temperature on PV=1.5 PVU



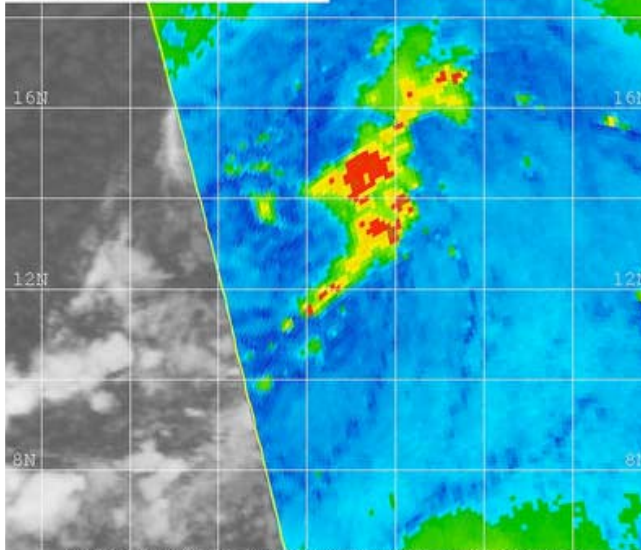
26 April, 2006

Meteorology

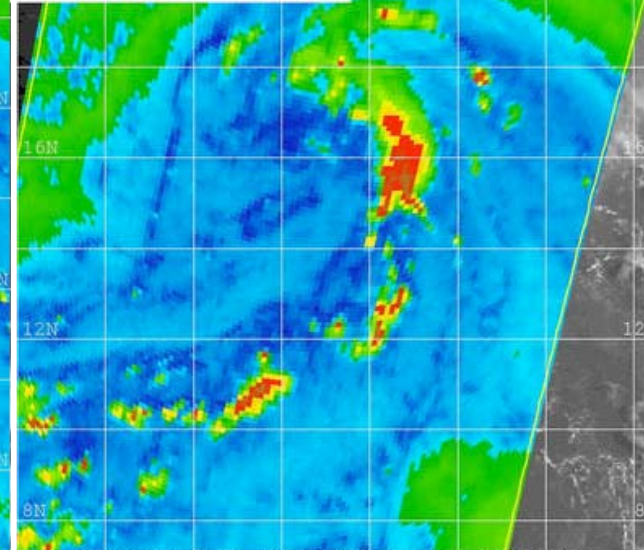
08/30/05 0600Z 91L INVEST
08/30/05 0406Z AQUA-1 89H
08/30/05 0300Z METEO-7 IR



08/30/05 1800Z 91L INVEST
08/30/05 2249Z F-14 85H
08/30/05 2130Z METEO-7 IR



08/31/05 0000Z 91L INVEST
08/31/05 0927Z F-14 85H
08/31/05 0900Z METEO-7 VIS

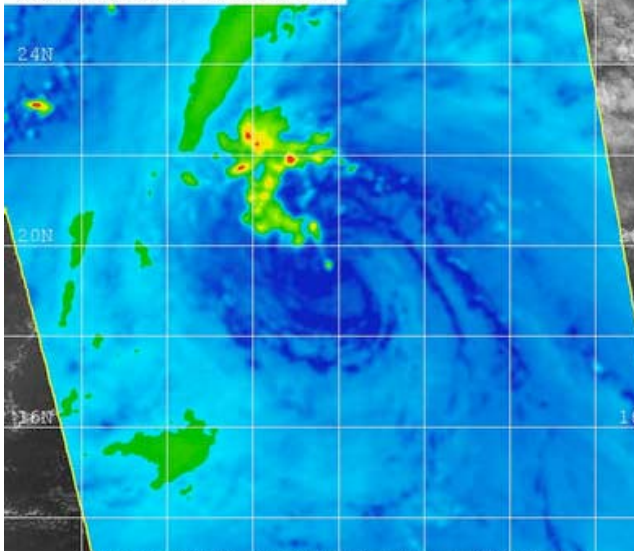


Naval Research Lab www.nrlmry.navy.mil/sat_products.html
<-- 89H Brightness Temp (Kelvin) -->

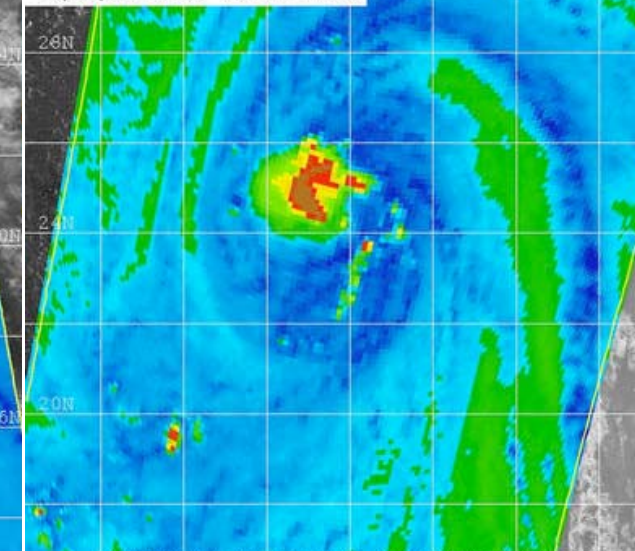
Naval Research Lab www.nrlmry.navy.mil/sat_products.html
<-- 85H Brightness Temp (Kelvin) -->

Naval Research Lab www.nrlmry.navy.mil/sat_products.html
<-- 85H Brightness Temp (Kelvin) -->

09/01/05 1800Z 14L NONAME
09/01/05 1623Z AQUA-1 89H
09/01/05 1515Z GOES-12 VIS



09/03/05 0600Z 14L MARIA
09/03/05 1023Z F-14 85H
09/03/05 1015Z GOES-12 VIS



Naval Research Lab www.nrlmry.navy.mil/sat_products.html
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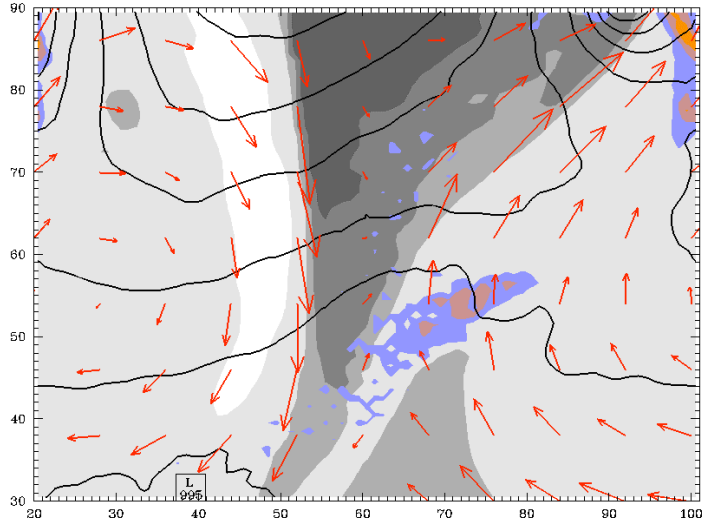
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26 April, 2006

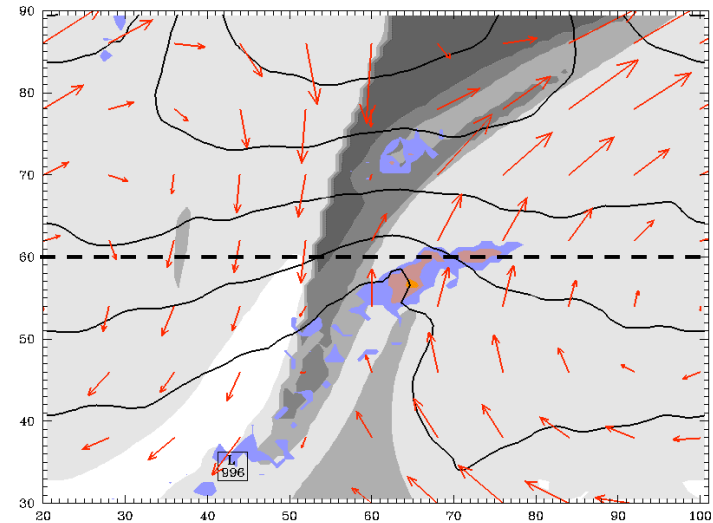
Meteorology

Idealized Simulations

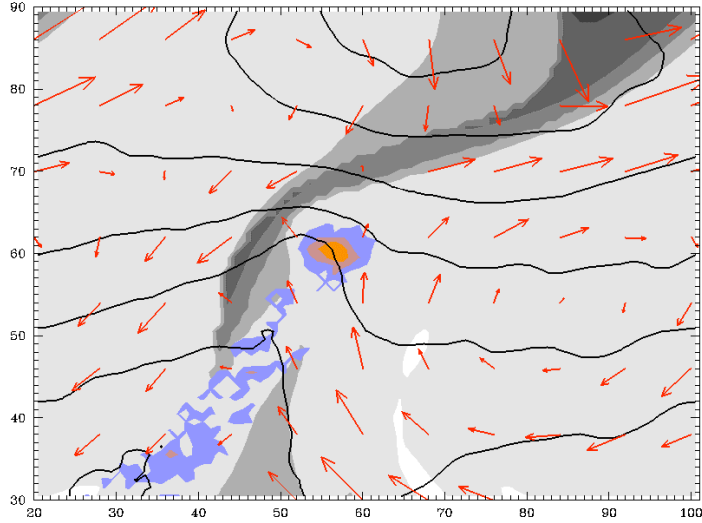
192 h



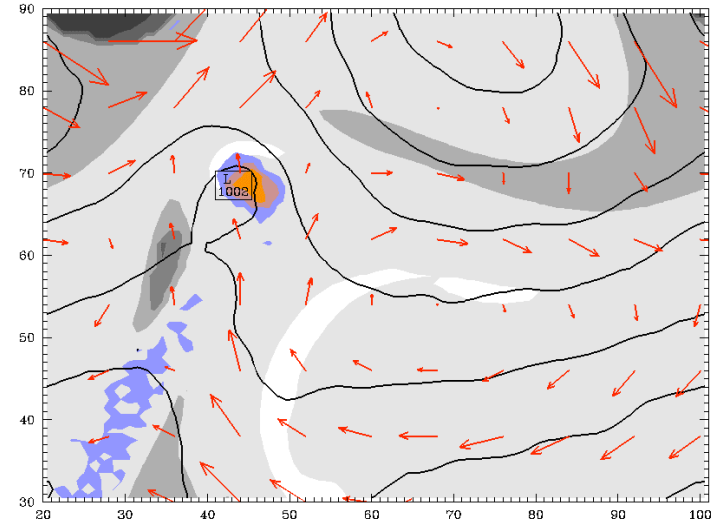
216 h



240 h



264 h



θ_{trop}

360

350

340

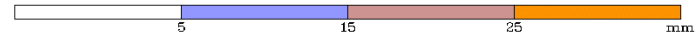
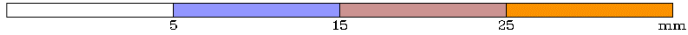
330

320

310

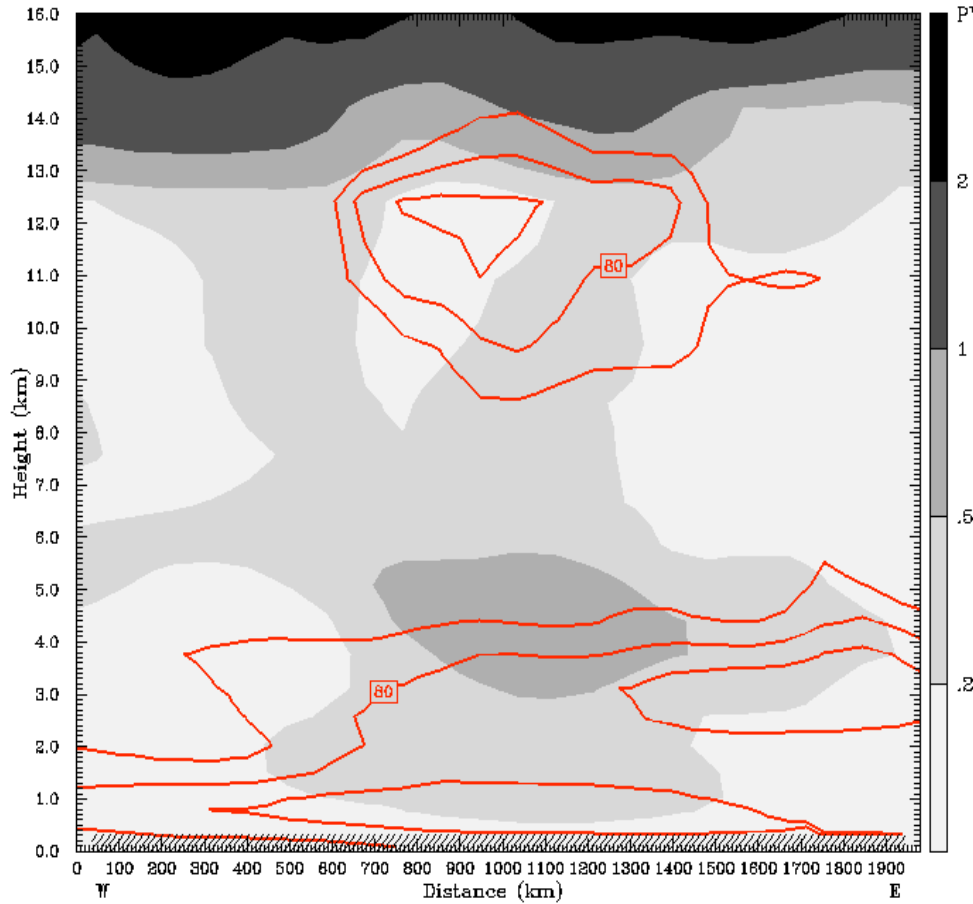
300

290

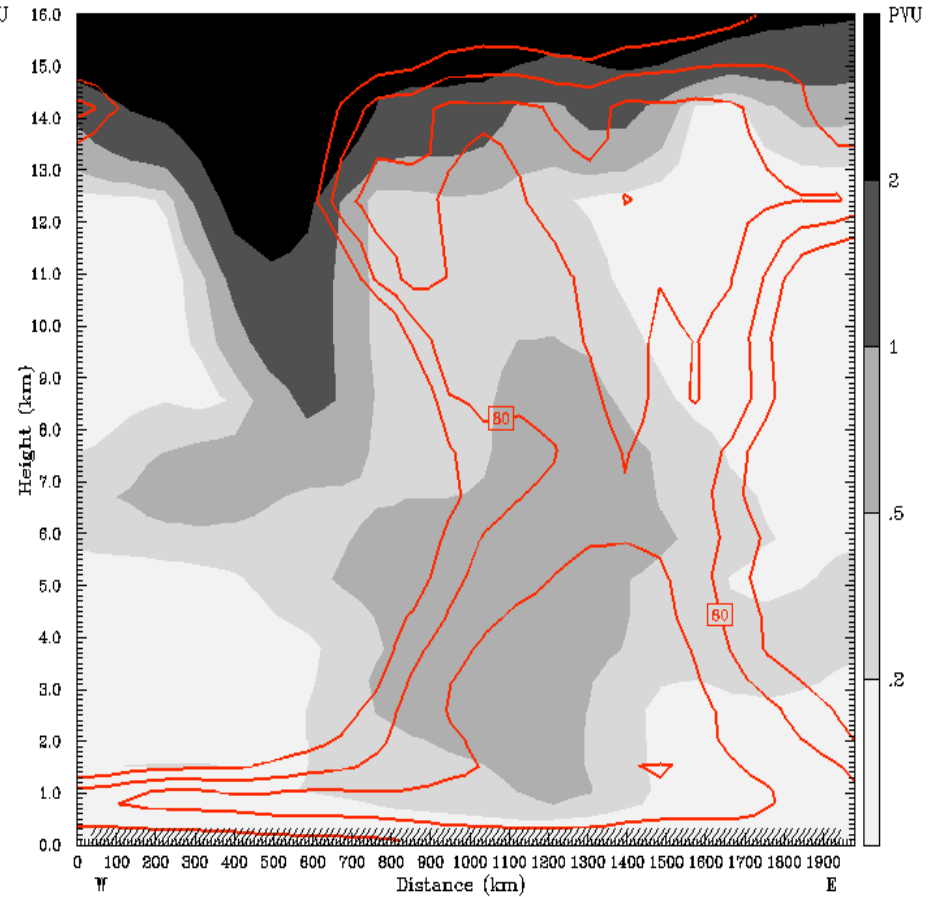


Cross Sections

12 Z 29 Aug



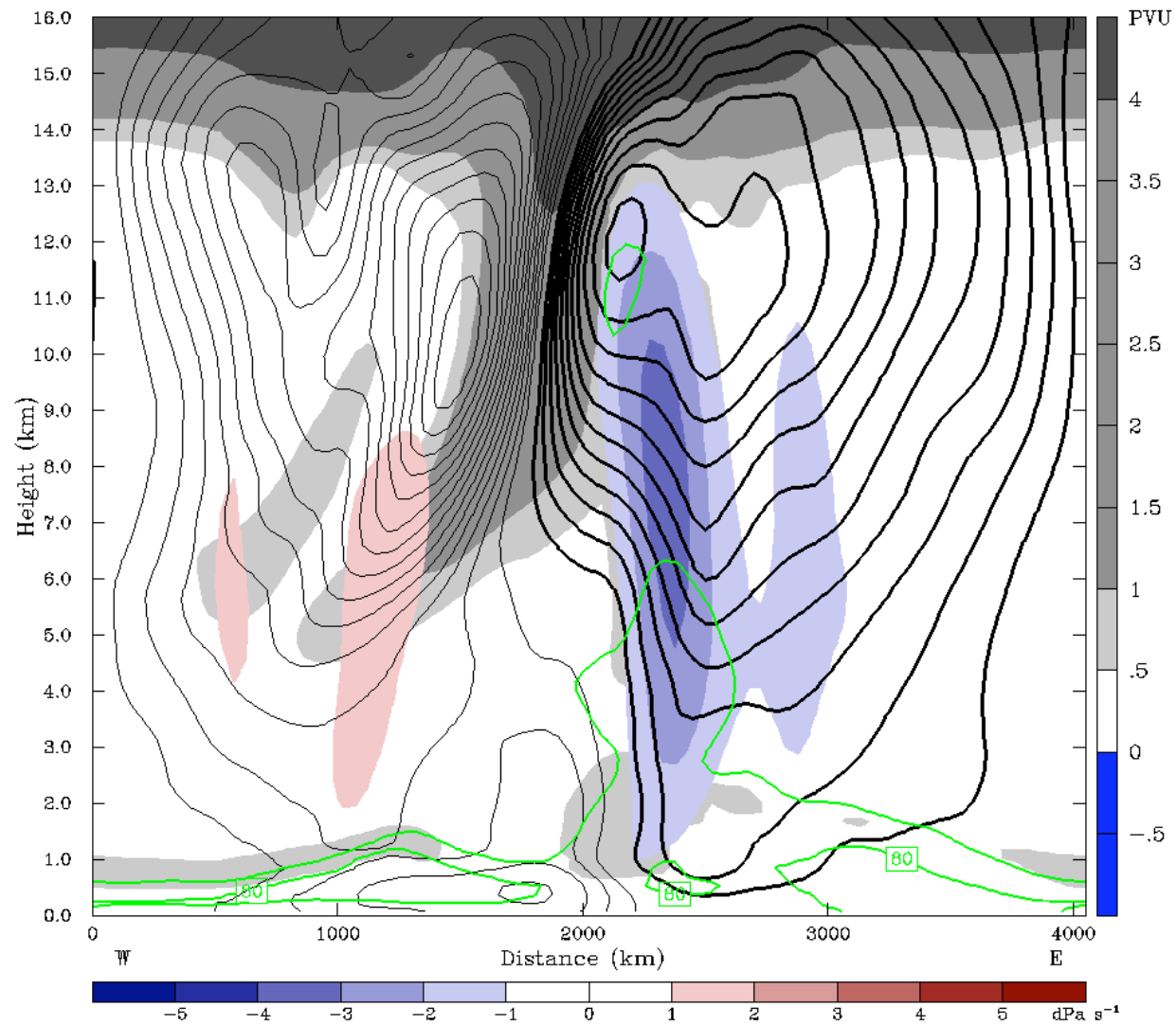
12 Z 31 Aug



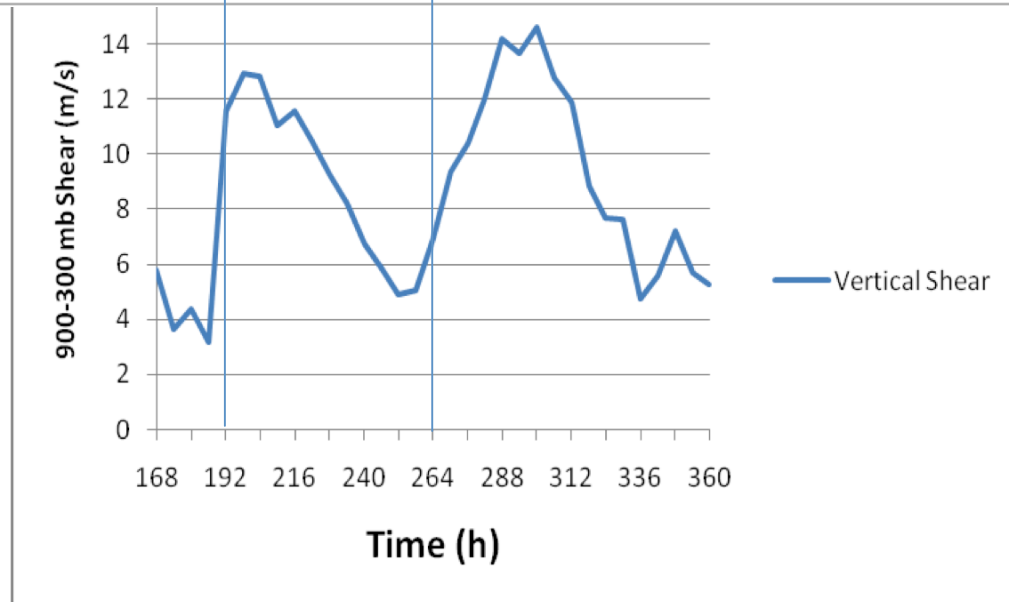
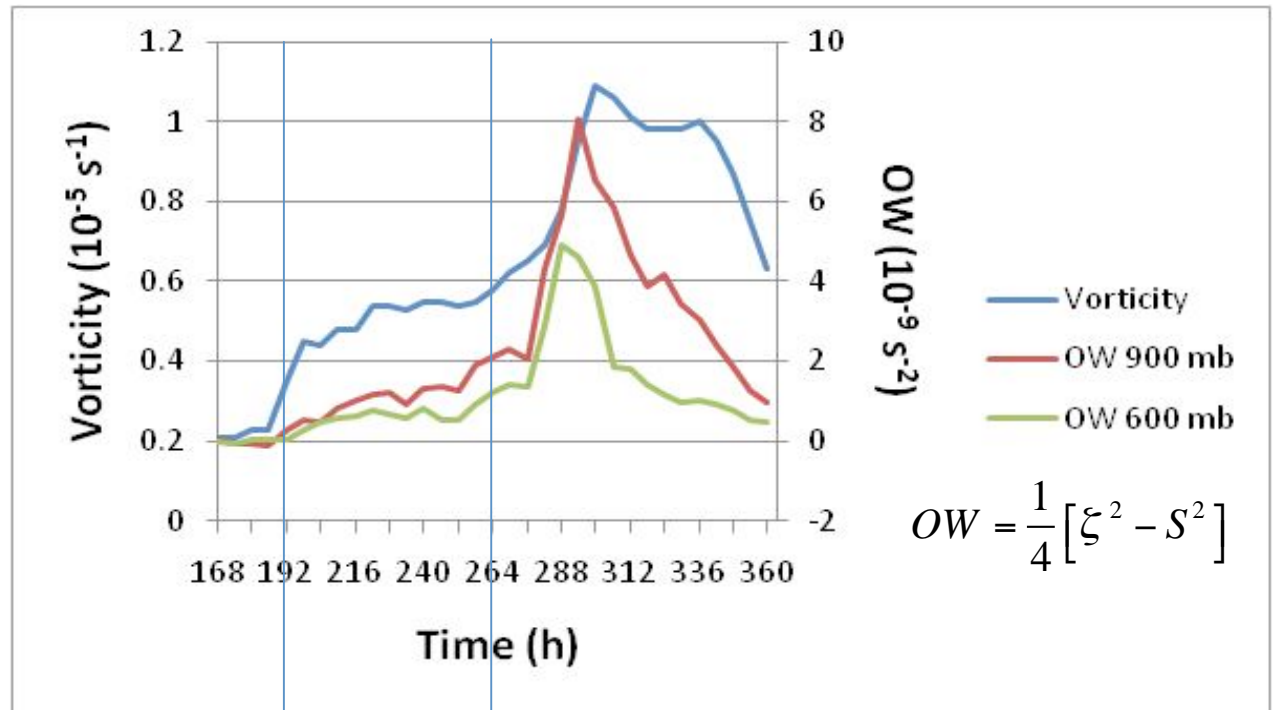
26 April, 2006

27th AMS Hurricanes and Tropical
Meteorology

Cross Section: PV (gray); QG Omega (red/blue); V (c.i.= 2 m/s); RH (green)

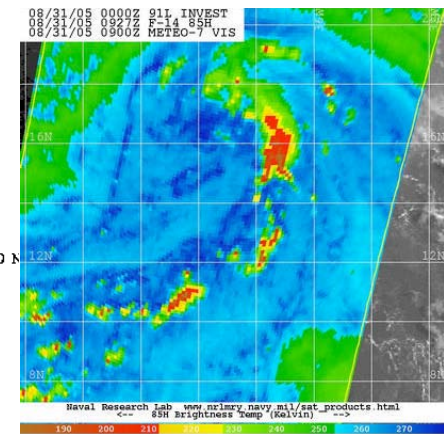
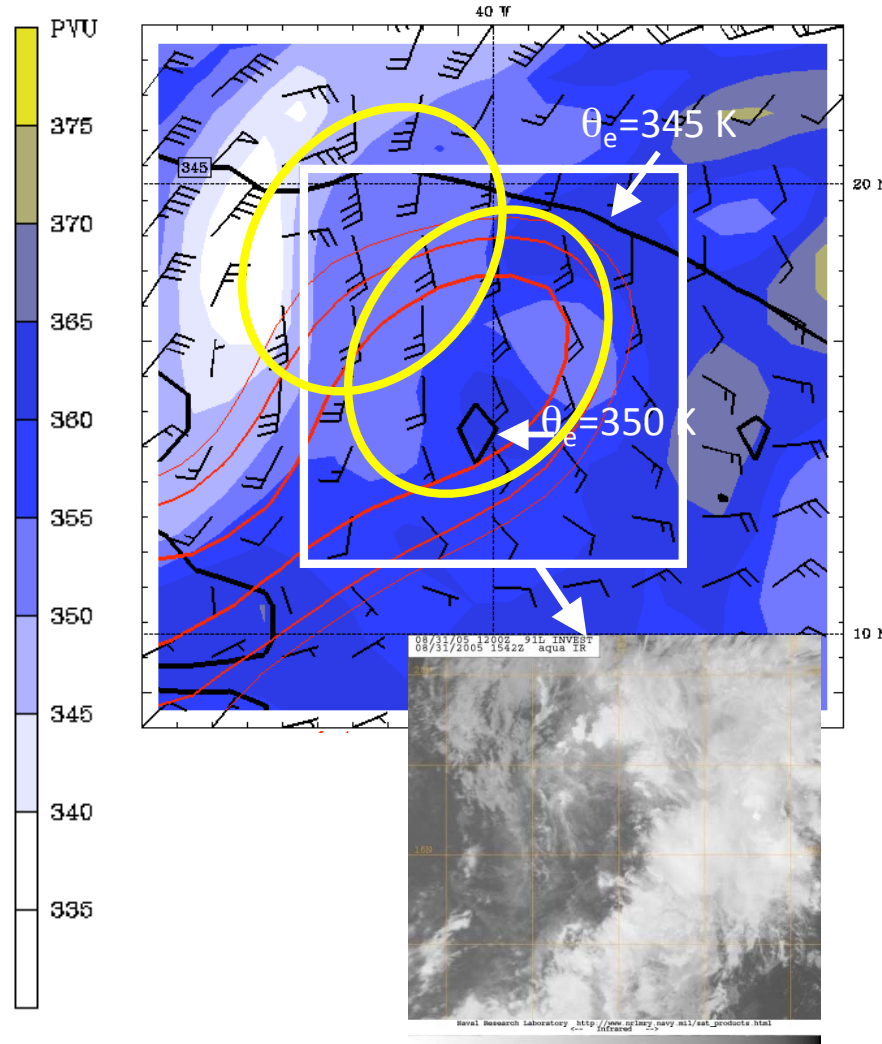


Vortex-following Time Series



Where to Observe?

12 Z 31 Aug



Key Questions

- Mechanisms of shear reduction
 - Reduction of length scale of upper-level features
 - Weakening or elimination of upper-tropospheric features
 - Migration of lower-trop vortex into more favorable location
- Mechanisms of organizing regional ascent
 - DPVA
 - Lower-trop temperature advection
- Thermodynamic consequences of regional ascent
- Are there pouches in TT?