

TRI-AGENCY FORECAST DISCUSSION FOR JULY 27, 2010

Tropical Areas of Interest Discussion: Created 1800 UTC July 27, 2010

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Summary: The Atlantic Basin continues to be quiet in terms of tropical genesis activity today and all indications still point to a quiet forecast for the next 48-72 hours. The Subtropical High moved west toward the east coast of FL and is inhibiting convection nearby, while the southern extent of a vigorous cold front emerged from near South Carolina this morning with a few convective flare-ups. There are 2 tropical waves in the Atlantic associated with PGI-19L and PGI-20L, and a surface trough over the Bay of Campeche in the Gulf of Mexico extending south over Mexico. An upper level low resides in the Northern Gulf of Mexico and to its west and south there is good convection today, with southerly flow pushing these storms onto the TX/LA coast throughout the rest of the day. A very large region of SAL dry air covers the central Atlantic through the central Caribbean suppressing convection therein, and continues to move westward. Global models are not predicting any systems to undergo genesis in the next 48 hours. The microphysics mission for today was cancelled, and discussions focused on African dust analysis and the possibility of satellite under-flights for verification in the near future.

Forecast for 1800 UTC 7/27/2010:

The NHC continues to have no targets for formation potential in the next 48 hours in the entire MDR (which includes the Caribbean Sea and tropical Atlantic ocean between 9°N-21.5°N; Goldenberg et al. 2001, *see 14*). Most of the GRIP/IFEX/PREDICT domain is dominated by dry air, ridging, and shear, with an upper level low in the northern GOM, the Subtropical High near FL, a surface trough over the Bay of Campeche, two easterly waves associated with PGI-19L and PGI-20L, and a new wave that will emerge off of Africa today into tomorrow (*see 1, 2, 3, 4, and 5*). The surface trough near 94W south of 22N was the previously named PGI-18L (discontinued 5 days ago). This is embedded in a large region of deep layer moisture evident in water vapor imagery (*see 3*) as well as TPW imagery (*see 6*), but the convection seen yesterday has not continued to be present today. A second tropical wave associated with PGI-19L is approaching the Lesser Antilles, located near 58W south of 18N. This system continues to be weak today in that dry, stable SAL air aloft inhibits convection with this wave except for where it is attached to the ITCZ (*see 4*). TPW shows the wave leading a maximum in deep layer moisture, along which the ITCZ is analyzed (*see 6*). The third tropical wave associated with PGI-20L is tilted and located from 18N,28W to 7N, 34W (*see 5*). Although TPW imagery indicates that PGI-20L is associated with a good amount of deep layer moisture, there still does not seem to be deep convection, and this is consistent with its history over the last few days (*see Hovmöller, 8*). The vorticity analysis (*see 7b*) and shear analysis (*see 7a*) show the unfavorable conditions for development for all of these systems.

Elsewhere in the tri-agency domain, the water vapor imagery is useful to show evidence of the upper level lows in the northern GOM with the thunderstorms in the western Gulf on its western edge (*see 3 and 11*). TPW and SAL imagery (*see 6 and 4*) show that the central Atlantic all the way through the Caribbean up to around 85W is being dominated by dry SAL air aloft (*see 3 and 4*). The wind shear analysis of the tri-agency domain shows moderate to strong

northwesterly shear over the western half of the GOM through the western Caribbean, and moderate southwesterly shear stretching from the central Caribbean to central Atlantic (*see 7a*).

The global models (*link 10a*) are not developing anything in the entire Atlantic Basin in the next 72 hours. They also continue to not show any development potential at all for PGI-19L, and the outlook for PGI-20L is not favorable, and some of the models confuse the eventual track of its vorticity to be associated with something coming out of the ITCZ convection toward the end of the model forecasts. All that should be noted here is that the models are trying to say that conditions out toward the end of this week may become more favorable for genesis than they are right now. The North American view of the ECMWF (*link 10b*) which forecasted a broad area of “troughiness” yesterday over the Caribbean to continue to move westward, now discontinues this after 24 hours, and develops nothing else. Pouch tracking is only used for PGI-20L (*see 9 and 12*) and the ECMWF forecasts the pouch to encounter unfavorable deep vertical shear, and dissolves the system over 36 hours with decreasing values of both 700 hPa Okubo-Weiss and vorticity (*see 9*).

As for yesterday’s tentatively scheduled microphysics mission for today, convection mostly formed well west of the FL peninsula and was indeed located closer to the WSR-88D radars along the northern central Gulf coast (*see Lake Charles radar 11*). However, these thunderstorms are steadily moving onshore and were not ultimately determined to be good flight targets for the microphysics mission today, partly due to the ferry distance for the DC-8 which would not have left sufficient residence time in the convection, which was also not ideal for the study anyway. With the steady western progression of the subtropical high and the dry air, subsidence is present over most of FL, and should continue into tomorrow.

For potential dust investigations, the aerosol optical thicknesses shown in Aqua Terra passes overlain on the total precipitable water imagery today (*see 13*) show a few interesting features. PGI20L emerged from the west coast of Africa near Dakar, Senegal early on July 25. Since then, TPW analysis from CIMMS has suggested that the wave is located in a relatively moist environment (*see 6*). Another CIMMS product, the SAL index has suggested over the last 48 hours that the central and east Atlantic near PGI20L is being influenced by Saharan air (*see 4*). These two products can be misleading individually. From an examination of total precipitable water from AMSU and aerosol optical thickness at 550 nm from aqua, a more complete picture concerning PGI20L’s environment emerges. It seems that while there is plenty of water vapor at low levels in the area of the wave, the wave is also in an area of high AOTs on the order of 0.8-1.0 (*see JPL product overlay with AMSU TPW, Terra and Aqua AOT550, 13*). It is likely that the mid to upper levels are dominated by dry dusty air from the Saharan desert, while low levels are remaining moist. This conclusion is also supported by IR imagery from Meteosat (*see 12*) which shows shallow cumulus clouds in the area of PGI20L but no deep convection. While under the dry dusty air, PGI20L is unlikely to develop significant convection. *Forecaster: Cerese English, and last paragraph courtesy of FSU forecaster Andrew Martin.*

Links and resources used in discussion:

1: 1200 UTC TPC analysis http://www.nhc.noaa.gov/tafb/ATSA_12Z.gif

2: GOES-E visible Atlantic wide view: <http://www.ssd.noaa.gov/goes/east/tatl/vis-l.jpg>

3: GOES-E Atlantic Wide view of Water Vapor: <http://www.ssd.noaa.gov/goes/east/tatl/wv-l.jpg>

4: CIMSS SAL analysis: <http://cimss.ssec.wisc.edu/tropic2/real-time/salmain.php?&prod=splitEW&time=>

5: Meteosat IR image of PGI-20L: <http://www.ssd.noaa.gov/eumet/eatl/avn-l.jpg>

6: SSMI/AMSR-E TPW analysis from MIMIC-CIMSS: <http://cimss.ssec.wisc.edu/tropic/real-time/tpw2/natl/main.html>

7a and 7b: CIMSS Wind Shear Analysis and vorticity (850hPa):

<http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=shr&zoom=&time=>

8: Hovmöller 5-day diagram from Meteosat:

http://www.nhc.noaa.gov/tafb_latest/m9hov1latest.gif

9: Montgomery Analysis of PGI-20L in ECMWF at 700hPa:

<http://www.met.nps.edu/~mtmontgo/storms2010.html>

10a and 10b: Global model forecast links: <http://moe.met.fsu.edu/tcgenfigs> (10a) and

http://www.ecmwf.int/products/forecasts/d/charts/medium/deterministic/msl_uv850_z500!Wind%20850%20and%20mslp!48!North%20America!pop!od!oper!public_plots!2010072600!!/ (10b) ECMWF

11: Lake Charles WSR-88D radar image from 1800 UTC July 27:

<http://radar.weather.gov/radar.php?rid=LCH&product=N0Z&overlay=11101111&loop=no>

12: PGI-20L position at 1300 UTC with IR imagery from CIMSS PREDICT support:

<http://cimss.ssec.wisc.edu/tropic2/predict/real-time/storm.php?&basin=atlantic&sname=PGI20L&zoom=4&img=1&vars=00000000000000111&loop=0>

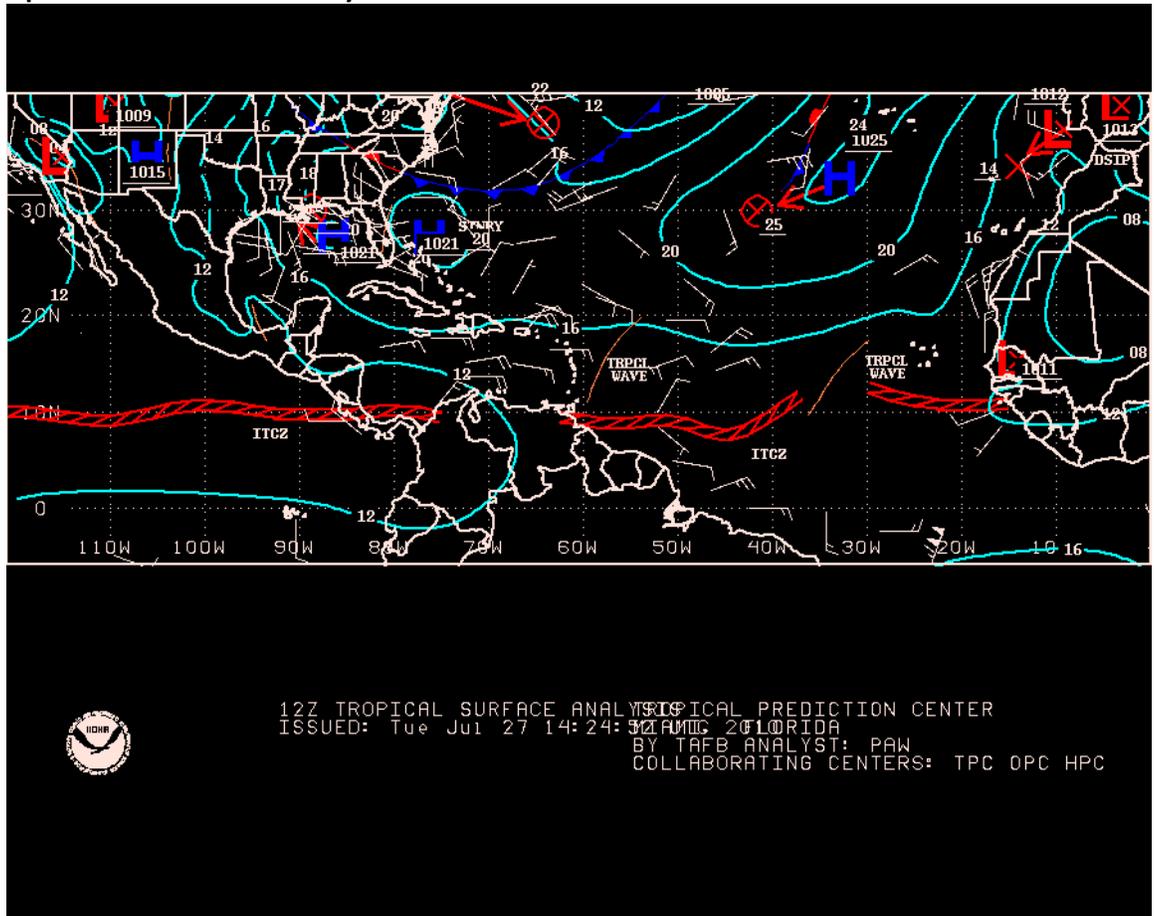
13: JPL site showing Aqua and Terra AOT overpasses on top of AMSU-A TPW for July 27, 2010:

<http://grip.jpl.nasa.gov/grip/>

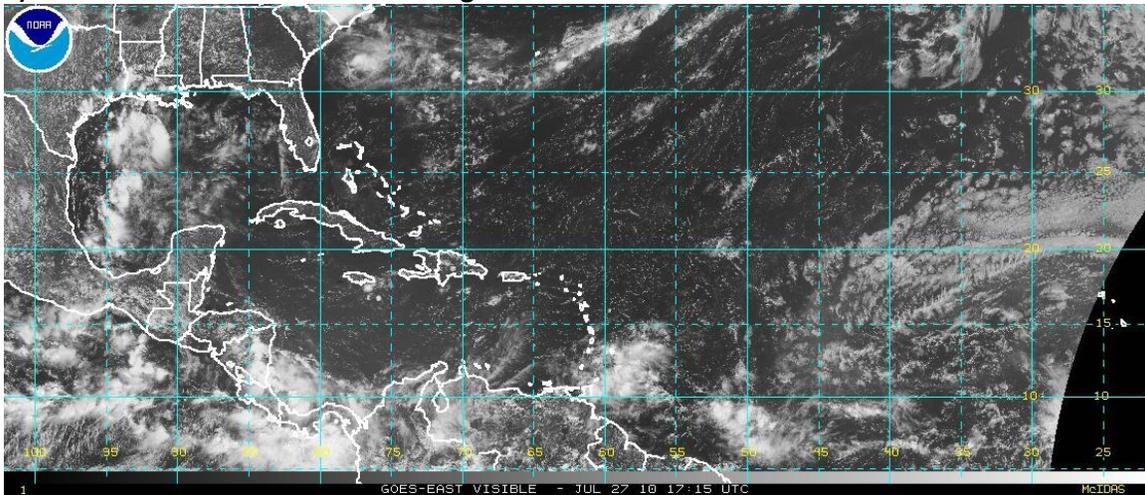
14: Aforementioned paper: Goldenberg, S. B., C. W. Landsea, A. M. Mestas-Nuñez, and W. M. Gray, 2001: The recent increase in Atlantic hurricane activity: Causes and implications. *Science*, **293**, 474-479.

Static Images used in discussion:

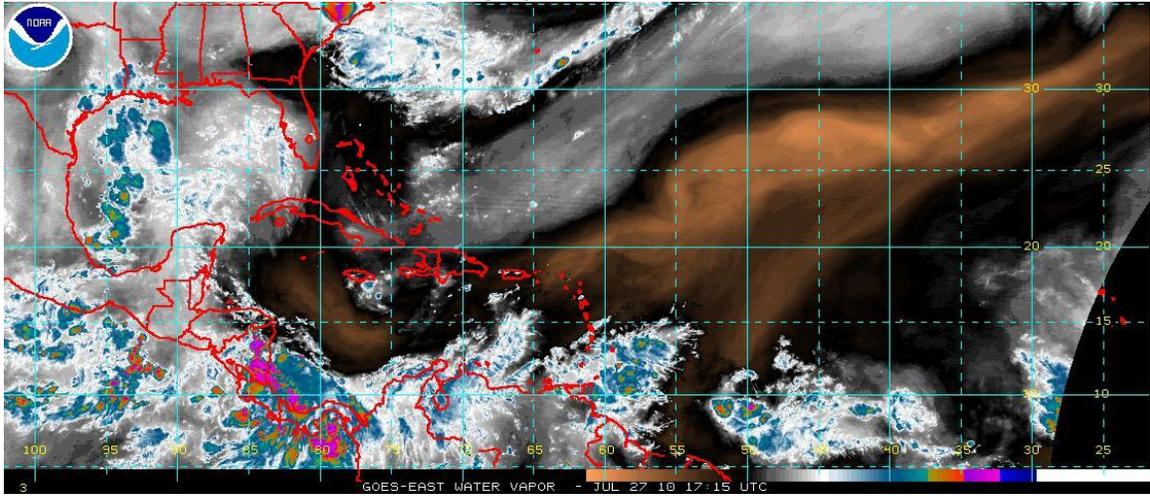
1) Updated 1200 UTC TPC analysis



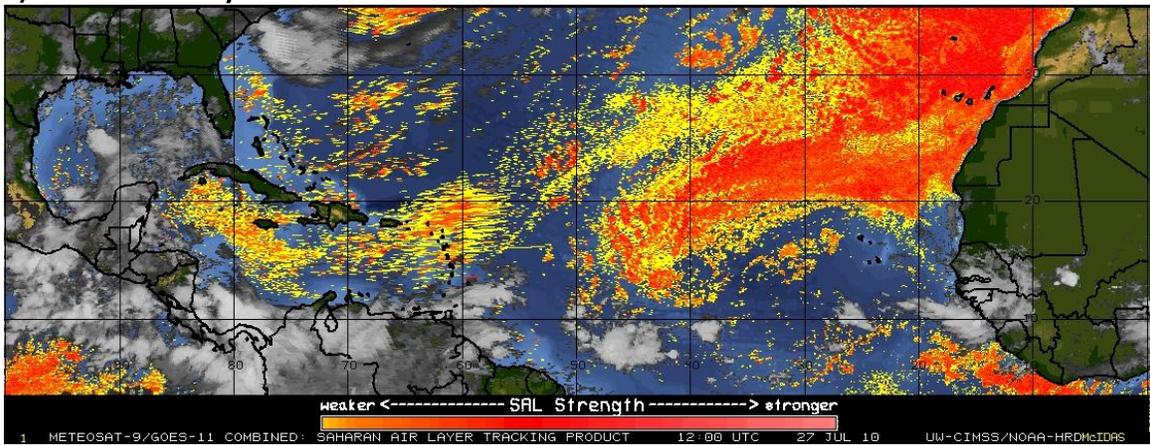
2) GOES-E Atlantic Wide View VIS image:



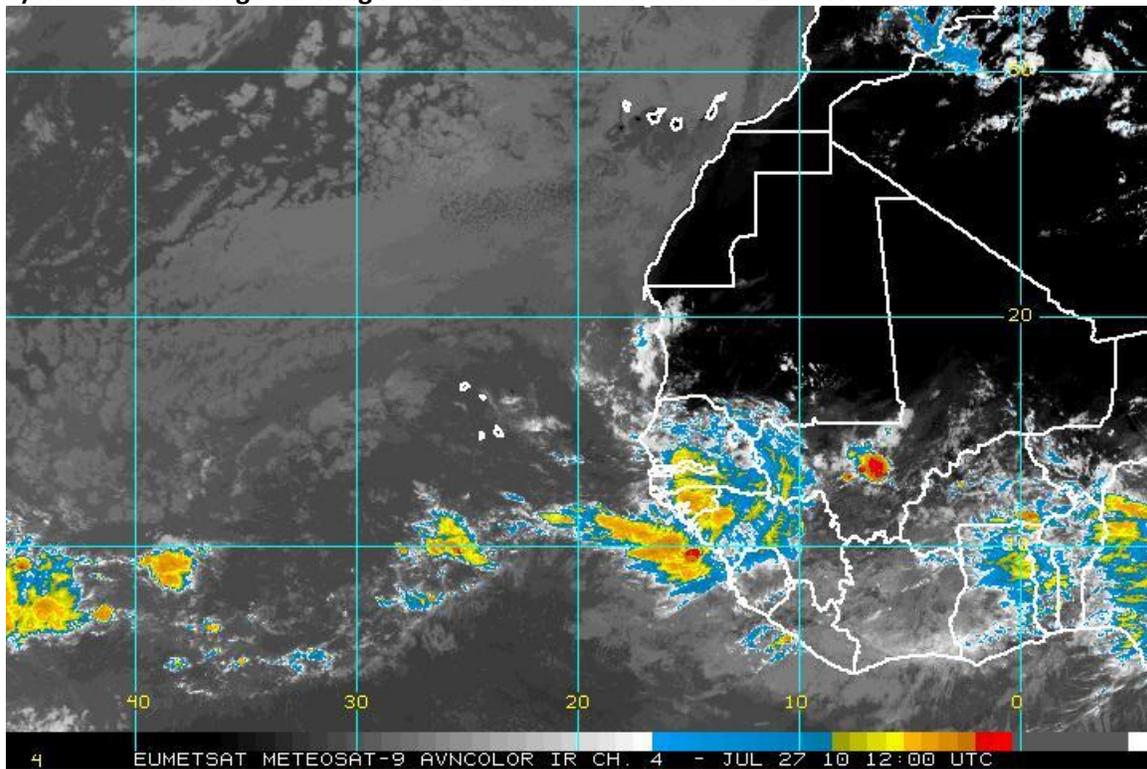
3) Atlantic Wide View Water Vapor Imagery:



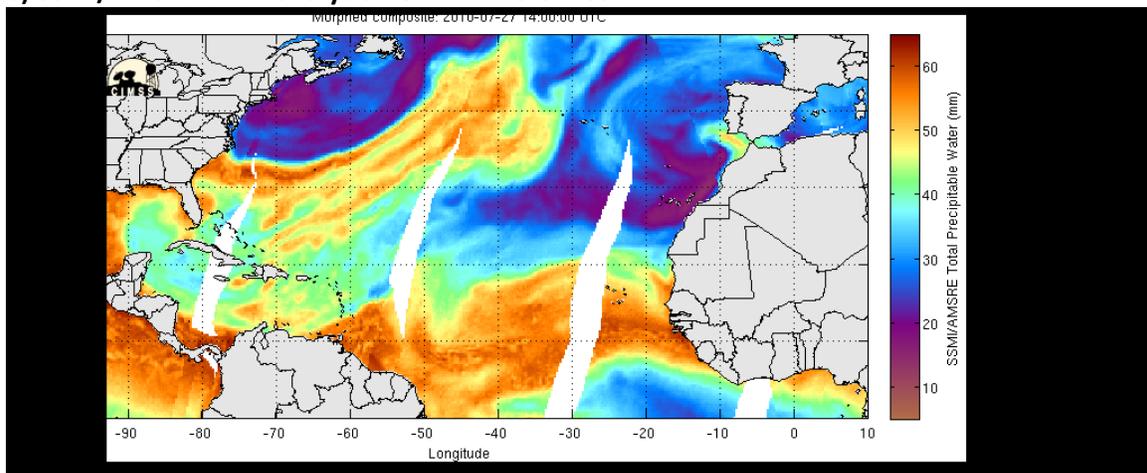
4) CIMSS SAL Analysis:



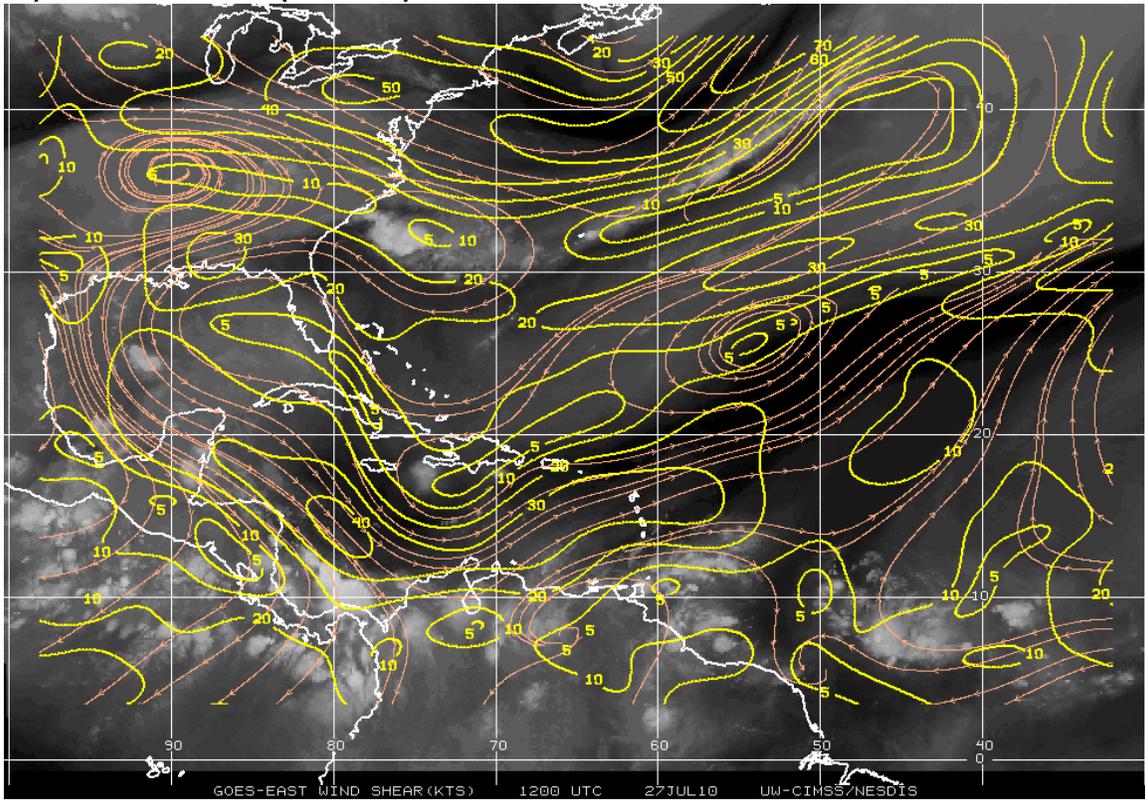
5) Meteosat IR image showing PGI-20L's lack of convection at 28-34W between 7-18N:



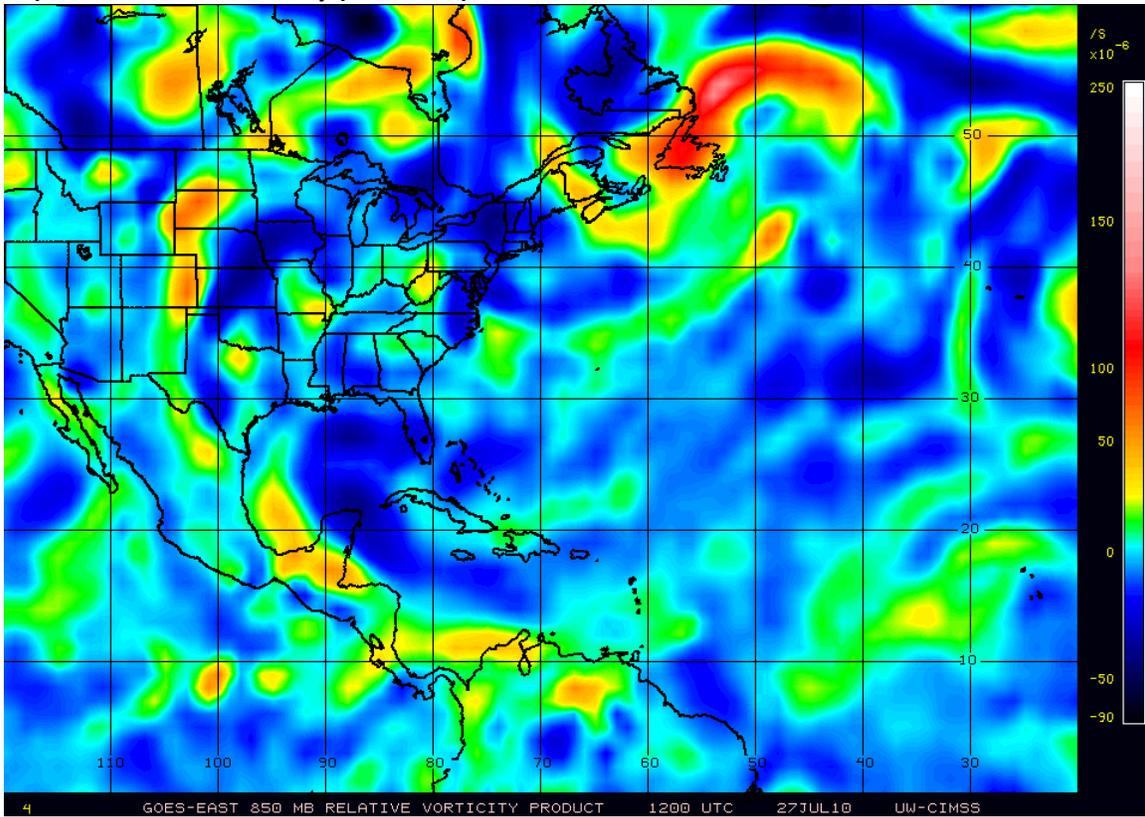
6) SSMI/AMSRE TPW analysis from MIMIC-CIMSS:



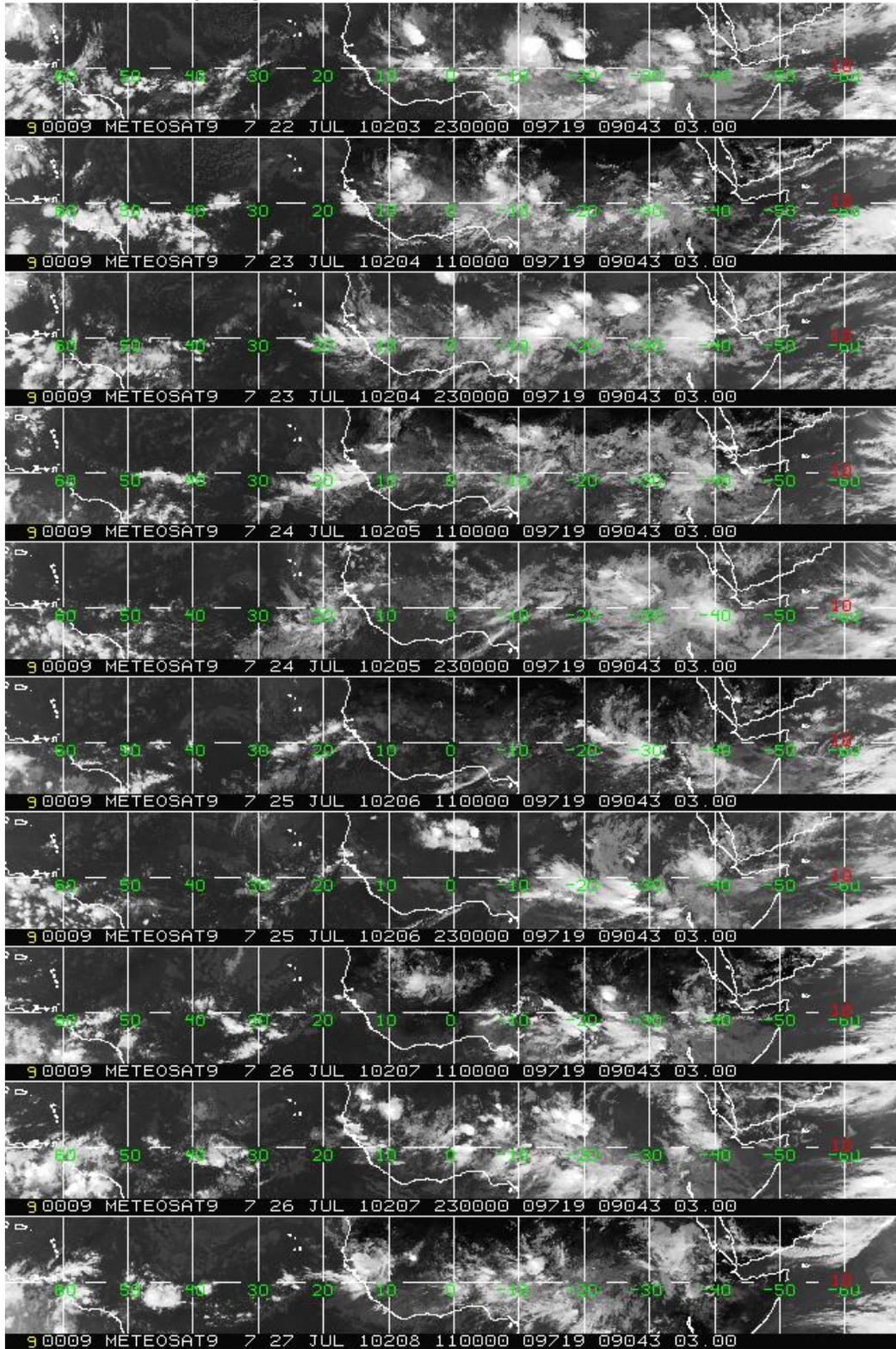
7a) CIMSS Wind Shear (1200 UTC)



7b) CIMSS 850hPa vorticity (1200 UTC)



8) Hovmöller 5-day Diagram from Meteosat:

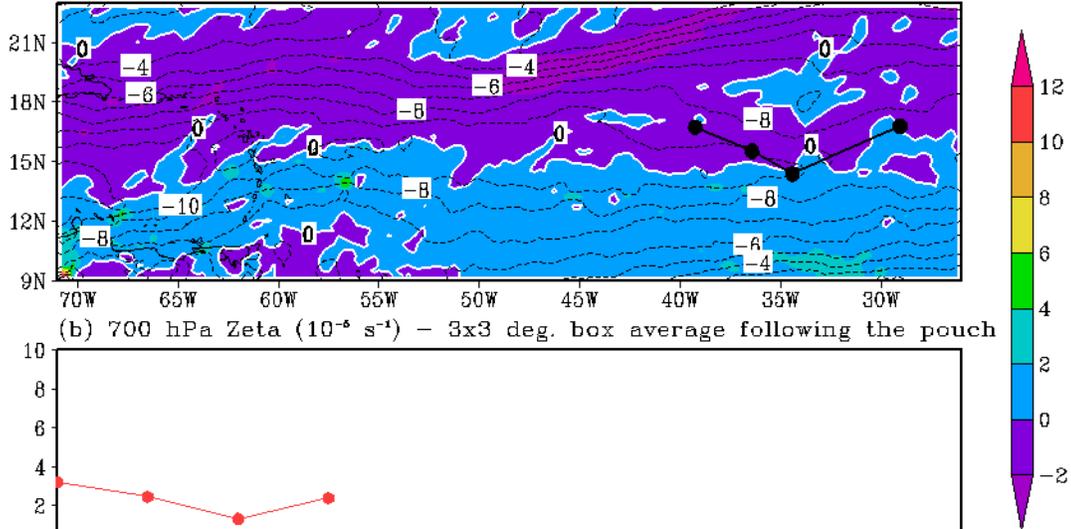


9) Montgomery Analysis of PGI-20L in ECMWF:

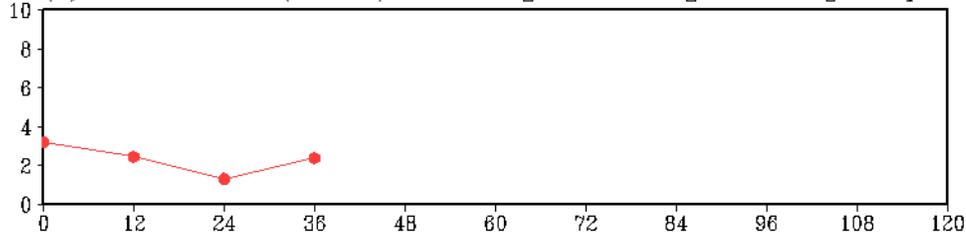
PGI20L: 5-Day Forecast Based on ecmwf

Initialized at 2010072700

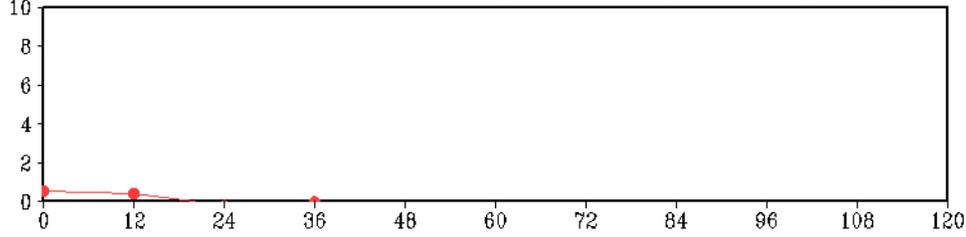
(a) Track of the Pouch, 700 hPa U and Zeta (5-day average)



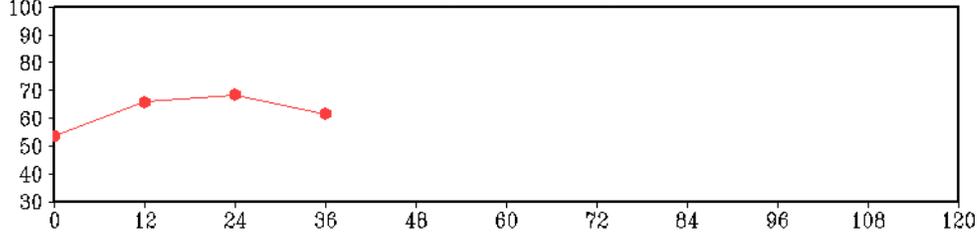
(b) 700 hPa Zeta (10^{-6} s^{-1}) - 3x3 deg. box average following the pouch



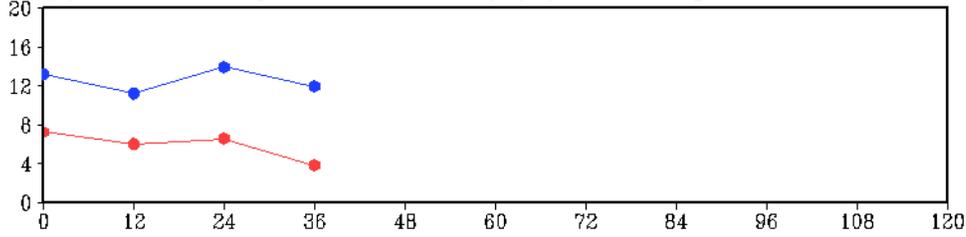
(c) 700 hPa OW (10^{-6} s^{-2}) - 3x3 deg. box average following the pouch



(d) 700 hPa RH (%) - 3x3 deg. box average following the pouch

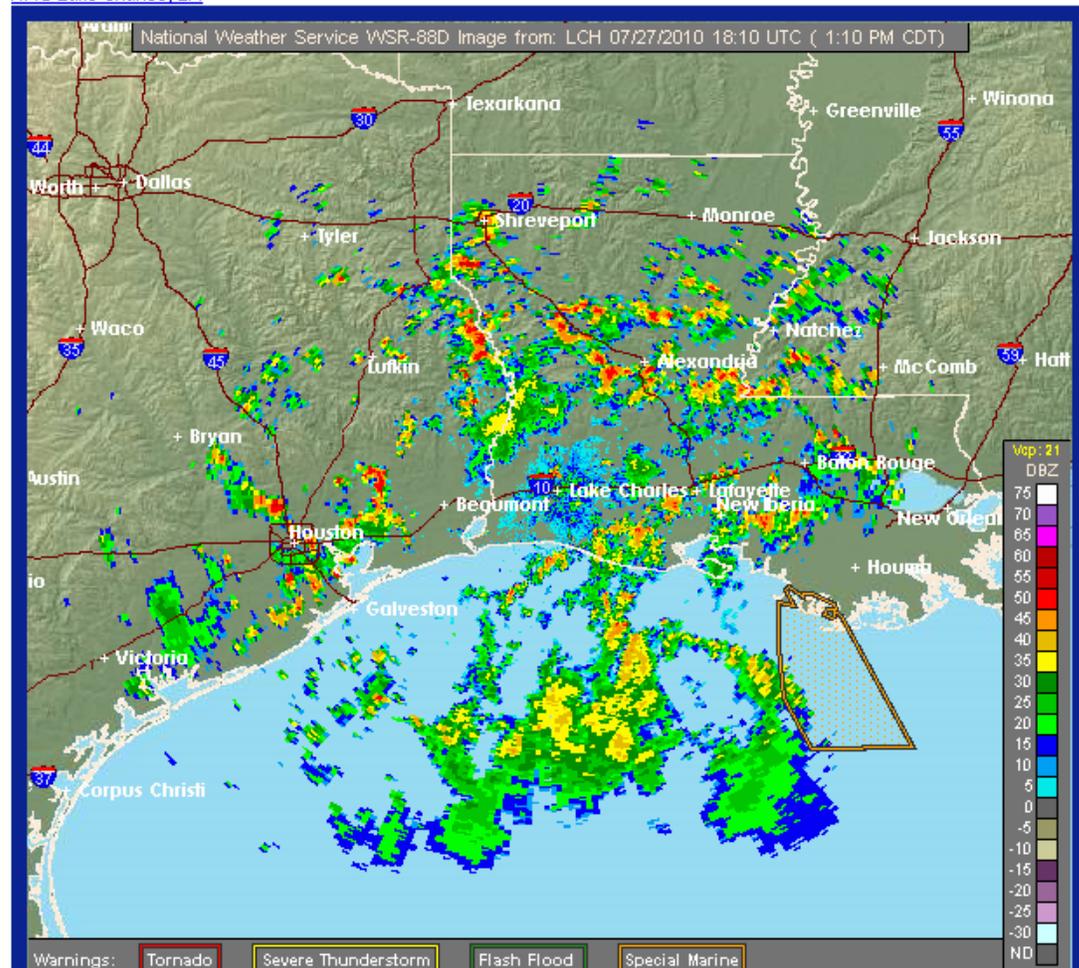


(e) Pouch & Deep Vertical Shear (m/s) - 3x3 deg. box as above

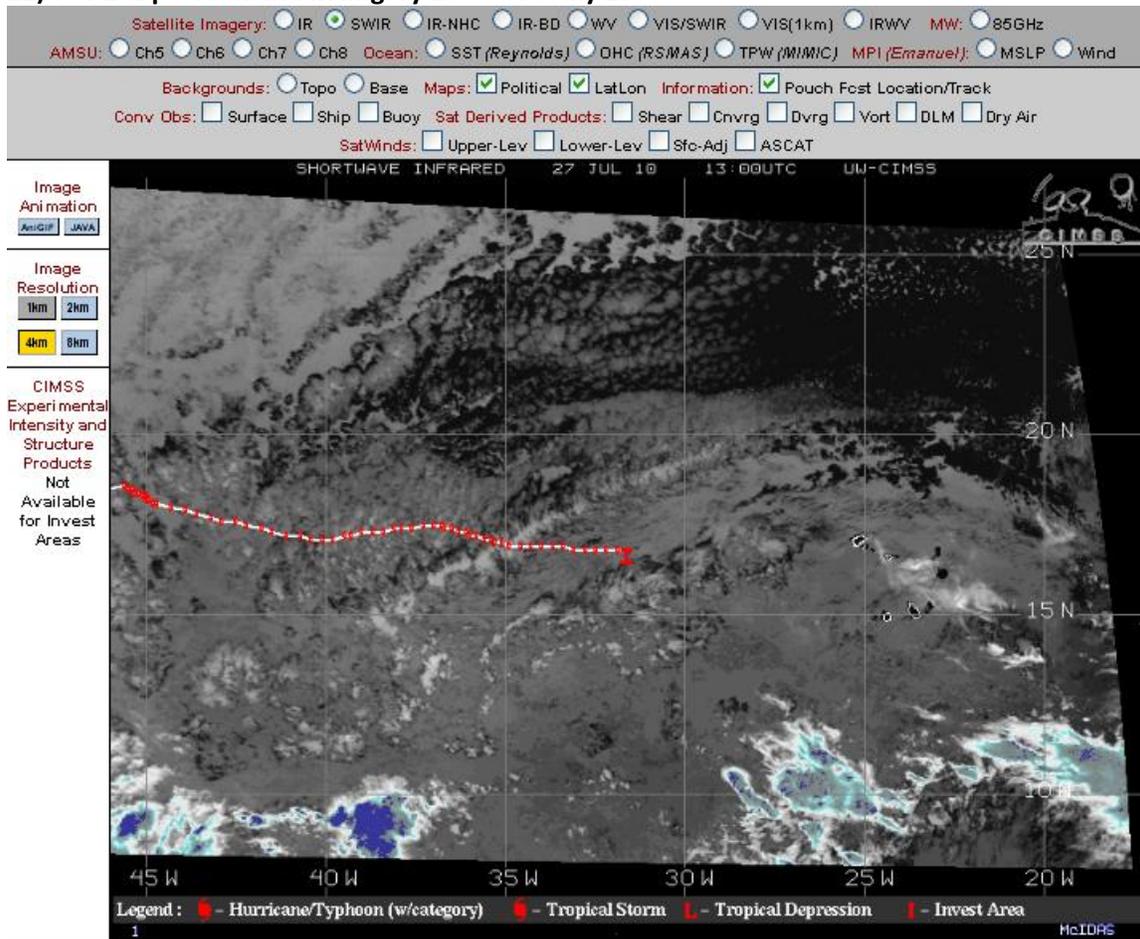


11) Lake Charles WSR-88D radar image from 1800 UTC July 27:

[NWS Lake Charles, LA](http://www.nws.gov)



12) PGI-20L position and IR imrgery 1300 UTC July 27



13) JPL site showing Terra AOT overpasses on top of TPW for July 27, 2010:

