

Tropical GRIP Forecast Discussion for September 7, 2010

Created 1600 UTC September 7, 2010

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Summary:

The DC-8 will be flying a second science mission into ex-Gaston today after maintenance issues are resolved. Take off is still TBD, but a return to FLL around 0400UTC is anticipated. The Global Hawk is not flying, and the WB-57 remains down for the immediate future. Ex-Gaston remains the primary focus for GRIP. Yesterday's flight found little evidence of a closed circulation in an earth relative reference frame. Today, Gaston has continued to weaken, and the NHC has decreased the 48-hr probability of tropical cyclogenesis to 10%. Hermine made landfall at 0130UTC in northern Mexico and has since moved northward into southern Texas. PGI-39L has remained weak and is likely to dissipate within the next few days. PGI-41L and PGI-42L have the potential to develop, perhaps as a single merged system. However, due to the proximity of these systems to Africa, they will not be within GRIP range for at least 5 days.

Forecast for 1600 UTC 9/07/2010:

Synoptic Overview:

The surface analysis shows a large 1025hPa subtropical high centered at 35N/37W which is dominating the low level flow through the Atlantic (**S1**). A second, 1026 hPa, high is located off the N. Carolina coast. Tropical Storm Hermine is located over southern Texas and is moving NE along the boundary of the 1026 hPa high. A low level trough is directly below an upper level cold and is located over eastern Cuba. Ex-Gaston has continued to propagate westward and is now located near 16N/62W. PGI-39L is now being analyzed as a SW-NE oriented surface trough centered at 23N/35W. Finally, PGI-41L is a large N-S oriented wave off the African Coast, while PGI-42L has progressed to 10W, but remains over land.

A stationary front is producing a little convection (**S2**) along a line from the S. Carolina/Georgia/Florida coast to the Central North Atlantic. Convection is present over southern Texas, northeastern Mexico, and the western Gulf of Mexico, associated with Tropical Storm Hermine. The trough over Cuba has very little convection associated with it, while Gaston's convection is also very limited in extent and organization. PGI-39L is also associated with very little convection (**S5**), and is likely continuing to interact with dry air, as indicated by the presence of strato-cumulus (**S3**). However, PGI-41L is in a much moister environment (**S6**) and is associated with a relatively large amount of convection (**S5**). Finally, PGI-42L has limited convection, however it is still well inland.

At mid levels, CIMMS analysis indicates 850mb vorticity maxes associated with Hermine, the Cuba trough/cold low, ex-Gaston, PGI-39L, and PGI-41L (**S10**). Over the

past 12 hours, Gaston's 850mb vorticity center has become slightly less defined, indicating further weakening. There is little evidence of the stationary front off the eastern US coast has very little signature at the 850mb level.

The main feature of note in the upper troposphere continues to be an upper level low, now centered over eastern Cuba (**S7**). Water Vapor imagery and Upper level wind analysis indicate that the low is rather elongated, and a trough extends from 15N to 30N (**S4 and S8**). Vertical wind shear remains relatively high to the west and east of the low, however the largest shear magnitude related to the low is below 30kts. However, it is worth noting that GRIP and PREDICT dropsondes in ex-Gaston have found higher shear than indicated by CIMSS analysis. There is also high shear which may soon impact PGI-39L that is associated with a west-east oriented upper level trough along 28N. Elsewhere in the Atlantic, wind shear is fairly low.

SSTs are high across most of the tropical Atlantic with the exception of a tongue of colder water due north of Cape Verde (**S11**). Ocean Heat Content is also high, especially in the Caribbean (**S12**). However, this is unlikely to impact Gaston given its overall lack of organization.

TPW indicates that ex-Gaston has moved away from the majority of the dry air, and there is substantial moisture to the north, east, and south of the pouch center (**S6**). Aerosol concentrations are very low around ex-Gaston, with the only signature of note being well to the west. (**D2**). Dry air remains in place over the northeastern tropical Atlantic, ahead of PGI-39L, but PGI-41L appears to be in a very moist environment.

Features of Interest:

Ex-Gaston/PGI-38L:

At 1200 UTC the remnants of Gaston were located at 17.7 ° N and 62.2 ° W. The satellite presentation has continued to deteriorate over the last 24 hours and today it is quite difficult to discern a closed center of circulation. While ex-Gaston continues to exhibit an occasional flare up in convection on the visible satellite, there has yet to be any long lasting organized development concentrated around the center of the system (**S3**). The IR loop also shows colder cloud tops associated with the system; however, there is nothing impressive to take note of as of this time (**G1**). The water vapor imagery also suggests that Gaston is surrounded by dry air, especially to the west and south (**S4**). Surface observations over the islands affected by the system have been relatively weak. Across Antigua at Vc Bird International Airport, for instance, surface winds have been reported in the 5-10-kt range.

The probability of ex-Gaston redeveloping is low. The remnants will continue to move westward during the next couple of days, remaining over warm 29-30°C SSTs and increasing ocean heat content. Wind shear for the time being is somewhat less than yesterday; however, there is still 10-15-kt of southerly shear in the vicinity of ex-Gaston and there is stronger shear to the west. Much of the northeastern and north central Caribbean Sea is encompassed by 15-20-kt of southerly shear (**S9**). The 0000 UTC on 09

September 2010, forecasts to indicate that this shear will let up substantially (**G2**). If the remnants of ex-Gaston can hold together through this period, it may find itself in an environment more conducive to redevelopment. Until that time though, ex-Gaston will continue to face a moderate shear environment, and contend with dry air surrounding the system. SAL analysis shows dry air in the vicinity of the system as well, especially on the western side (**D1**). While, ex-Gaston will move into a more favorable environment in a couple of days, the models are not offering much support for the idea of redevelopment. The 1200 UTC global models largely agree that ex-Gaston will not redevelop into a tropical cyclone throughout the next couple of days. Only a few of the statistical models support intensification, and this is largely influenced by the high ocean heat content (**G3**). The 1200 UTC model guidance has also shifted its track slightly further to the south compared with yesterday's forecasts and keeps ex-Gaston on a general westward path moving south of the Dominican Republic and Cuba (**G4**).

PGI-39L... AL99:

PGI-39L as of 1200 UTC is located at 16.8°N, 30.0°W and has much less convective activity than observed yesterday (**S5**) with the main circulation displaced well north of the convection (**39A**). Water vapor (**S4**) and dry air analyses (**39B**) show a hostile environment out ahead of the system, with some dry air possibly making it into the pouch. The system is forecasted to have decreasing vorticity and OW values in addition to being subject to increasing shear through 0000 UTC Thursday, when the GFS is unable to locate the pouch (**39C**), with the ECMWF being unable to track it after 12Z today. The GFS transitions the pouch to an open wave at 1200 UTC Wednesday before picking it back up at 0000 UTC Thursday and then losing it for remainder of the forecast (**39D**). PGI-39L continues to be an unlikely target for GRIP due to its location and forecast weakening.

PGI-41L and PGI-42L:

PGI-41L is located as of 1200 UTC at 13.3°N, 18.8°W or just off the coast of Africa. The convective activity is displaced west of the forecast position with little low level circulation seen (**41A**). The system is embedded in the easterlies with no hint of an anticyclone developing above it (**S8**). Convective activity appears to be currently enhanced by a Kelvin Wave (**41B**) and it remains to be seen if PGI-41 will sustain itself as this feature propagates eastward.

PGI-42L remains over Africa at 12.5°N, 9.0°W as of 1200 UTC and is forecast to enter the Atlantic around 1800 UTC tomorrow. It presently shows little in the way of convective activity (**S5**) with a circulation not evident. The 1200 UTC CIMSS 850 hPa vorticity analysis shows 2 centers removed from the present area of convective activity (**41C**). It appears the Kelvin Wave impacting PGI-41L has not yet enhanced PGI-42L and should be monitored the next few days (**41B**).

Forecast models at 0600 UTC have backed off earlier predictions that PGI-41L and PGI-42L would merge together. The GFS has PGI-41L dissipating by 0000 UTC Thursday while maintaining and intensifying PGI-42L as it exits the African coastline and keeping it on a track that is largely due West through the entirety of the run (**41D**),

with NOGAPS and the CMC supporting this pattern. The ECMWF develops both waves with PGI-41L moving west-northwest and PGI-42L maintaining a westerly track through 0000 UTC on the 13th (**41D**).

It should be noted the 0000 UTC GFS has PGI-41L and PGI-42L merging at 1200 UTC on the 11th of September, so the situation bears monitoring to see which of these widely varied solutions takes place. The 0000 UTC GFS has PGI-41L moving into a region of higher wind shear after 24 hours despite improving Okubo-Weiss and vorticity values through the weekend (**41E**), with a similar picture for PGI-42L although wind shear begins to increase at 48 hours. Dust may be an issue as for PGI-41L, with the GEOS-5 showing SAL activity in its vicinity at 1800 UTC tomorrow (**41F**). Despite the proximity from the operating domain of GRIP, the westward track of these systems and intensification of at least one of these storms consistently forecasted, these systems remain a point of interest.

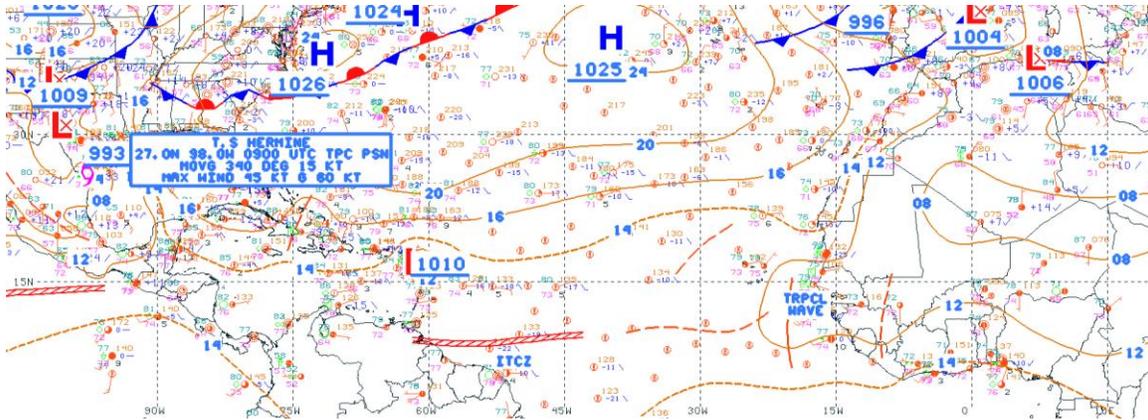
Dust/SAL Discussion:

Analysis of the SAL at 1200 UTC shows that dry air continues to interact with PGI38L and to a lesser extent, on the western side of ex-Gaston. The largest concentrations appear to be to the north and west of PGI38L. (**D1**). Current water vapor imagery also suggests dry air present in the vicinity of these systems (**S4**). The 500-700-hPa layer in the Le Raizet, Guadeloupe 1200 UTC shows the presence of some dry air just to the east of ex-Gaston. At 0600 UTC, dust concentrations at 850-hPa are largest across the eastern Atlantic, but a narrow plume extends westward through the northeastern Caribbean and just shy of the Bahamas (**D2**). Concentrations decrease at 700-hPa and considerably by 500-hPa. There are larger concentrations of dust in the upper atmosphere. The 200-hPa analysis shows a large area of dust across much of the Atlantic. The forecast for dust concentrations across the Atlantic shows that much of the Atlantic will have continuing dust at 200-hPa, but a more considerable plume of dust will be emerging off of the African coast in about 48 hours in 700 and 850-hPa levels (**D3**).

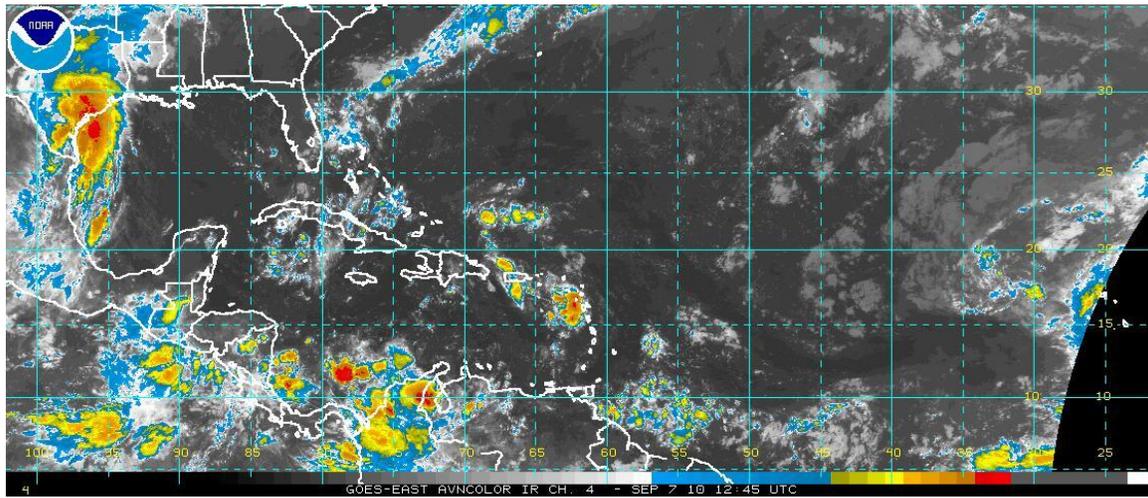
Forecasters: Zelinsky, Maliawco, Harnos

Images used in discussion:

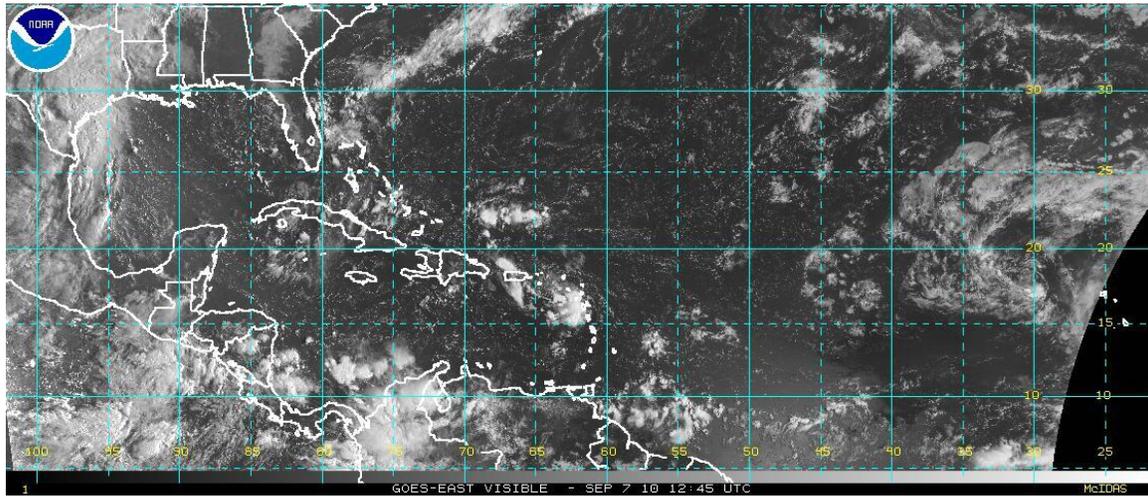
S1-0600UTC OPC Surface Analysis



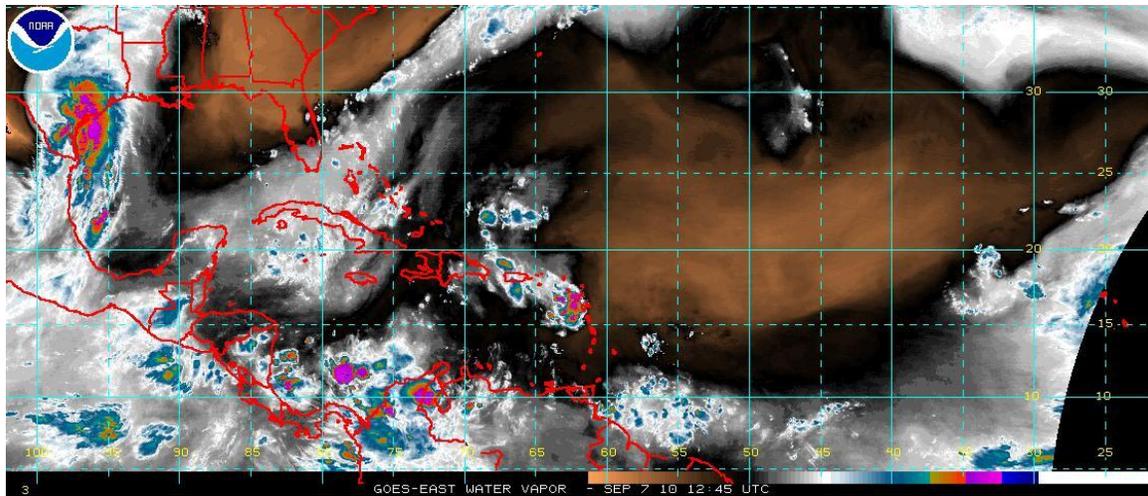
S2-1245UTC GOES IR



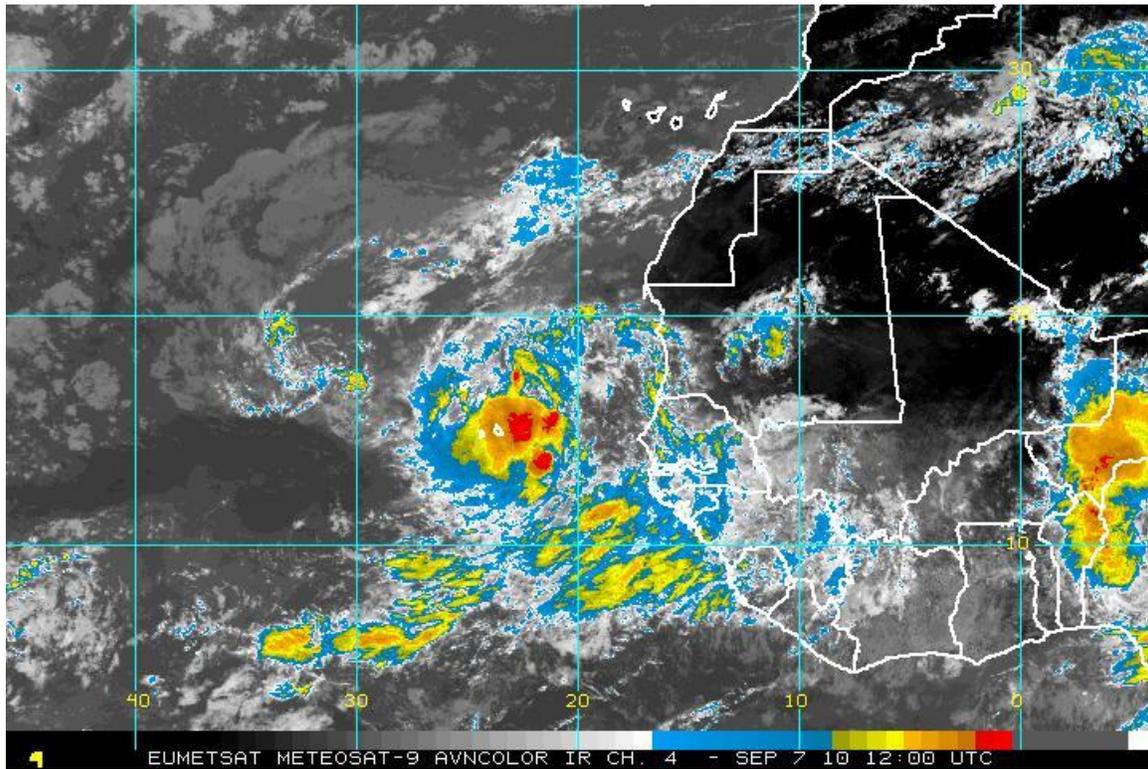
S3-1245UTC GOES Visible



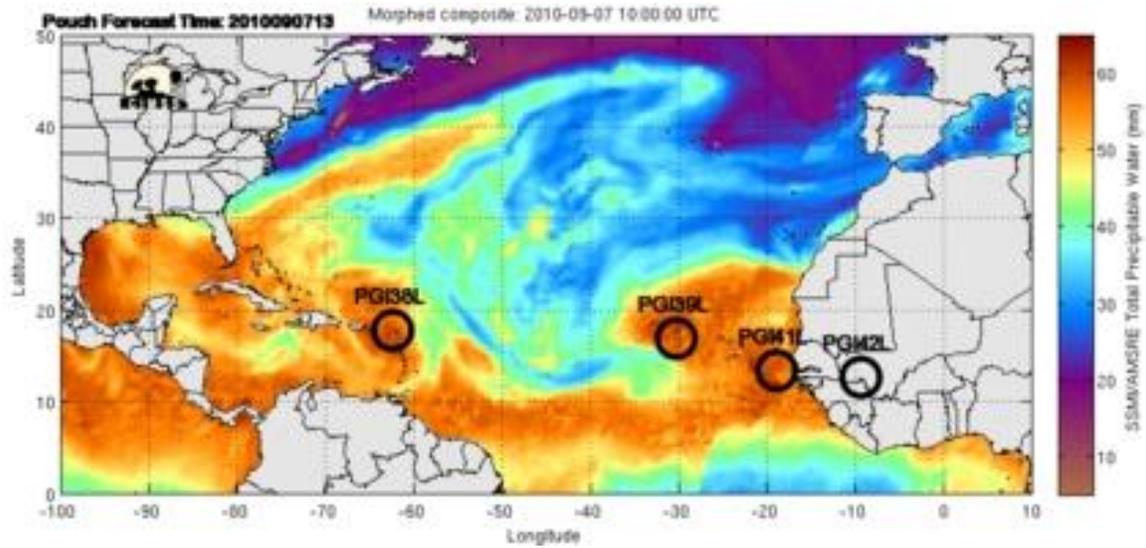
S4-1245UTC GOES Water Vapor



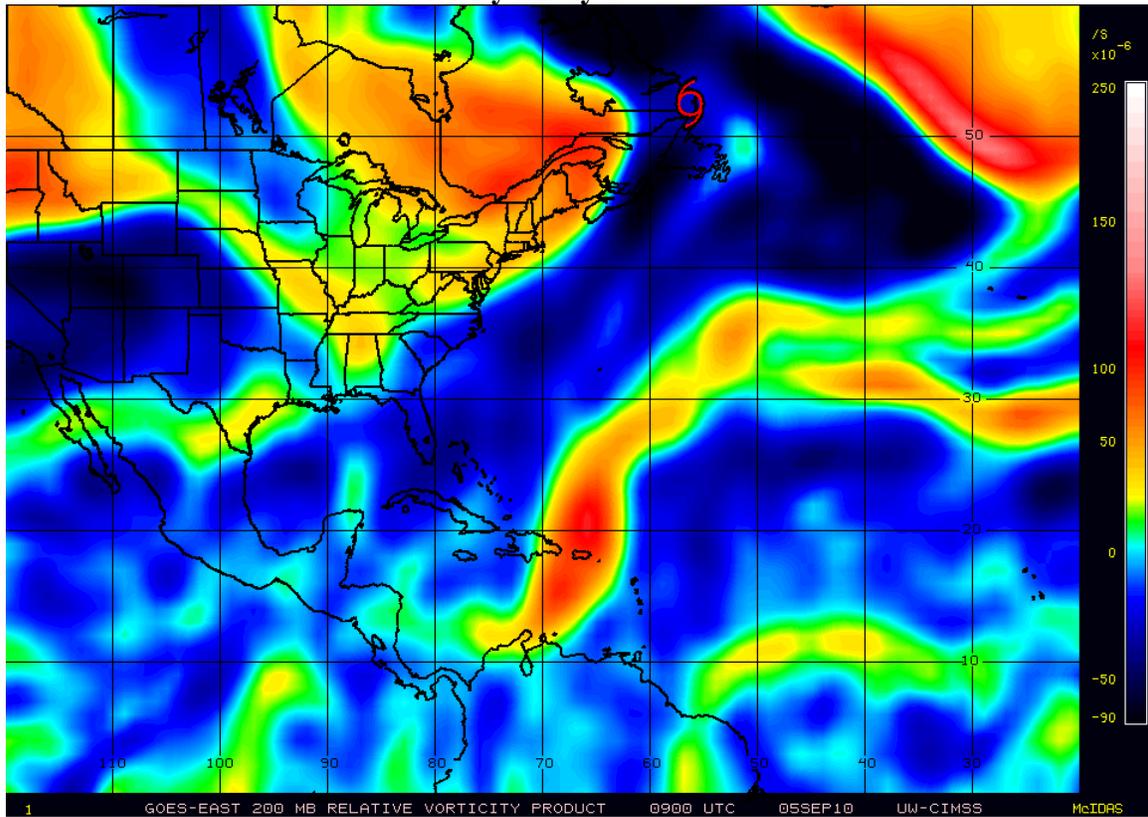
S5-1200UTC METEOSAT IR



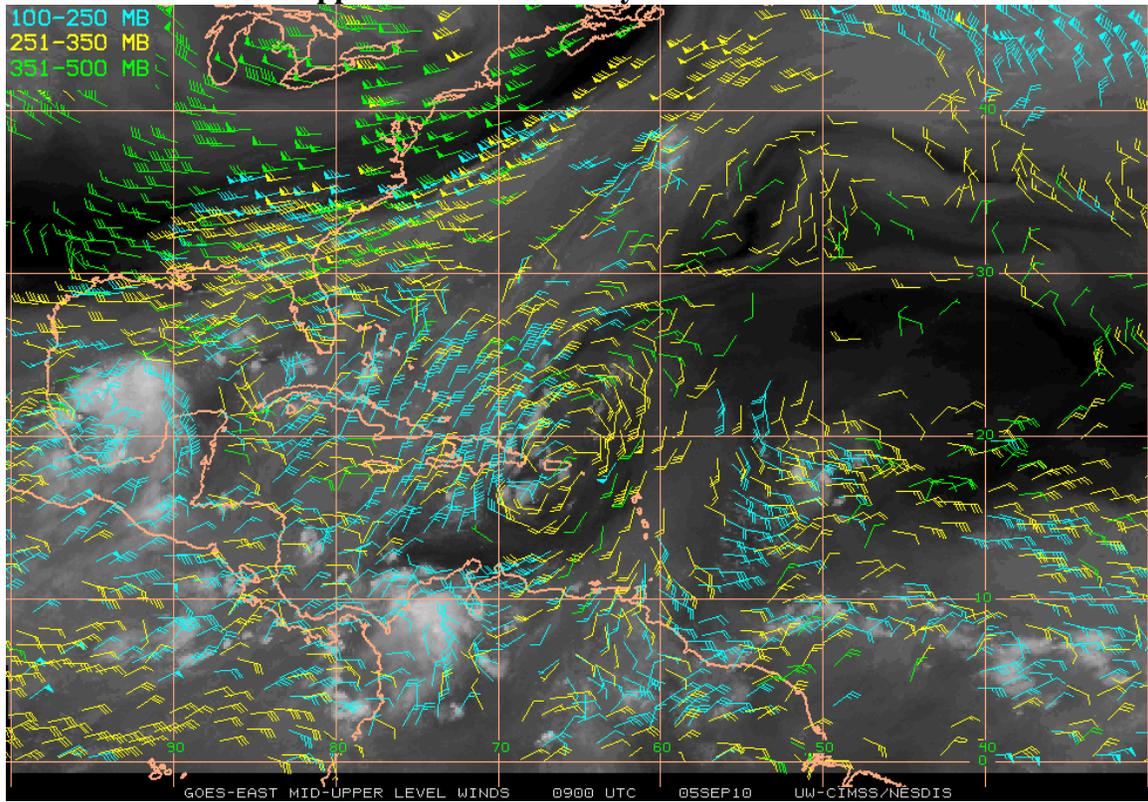
S6-0000UTC TPW and Pouch Locations



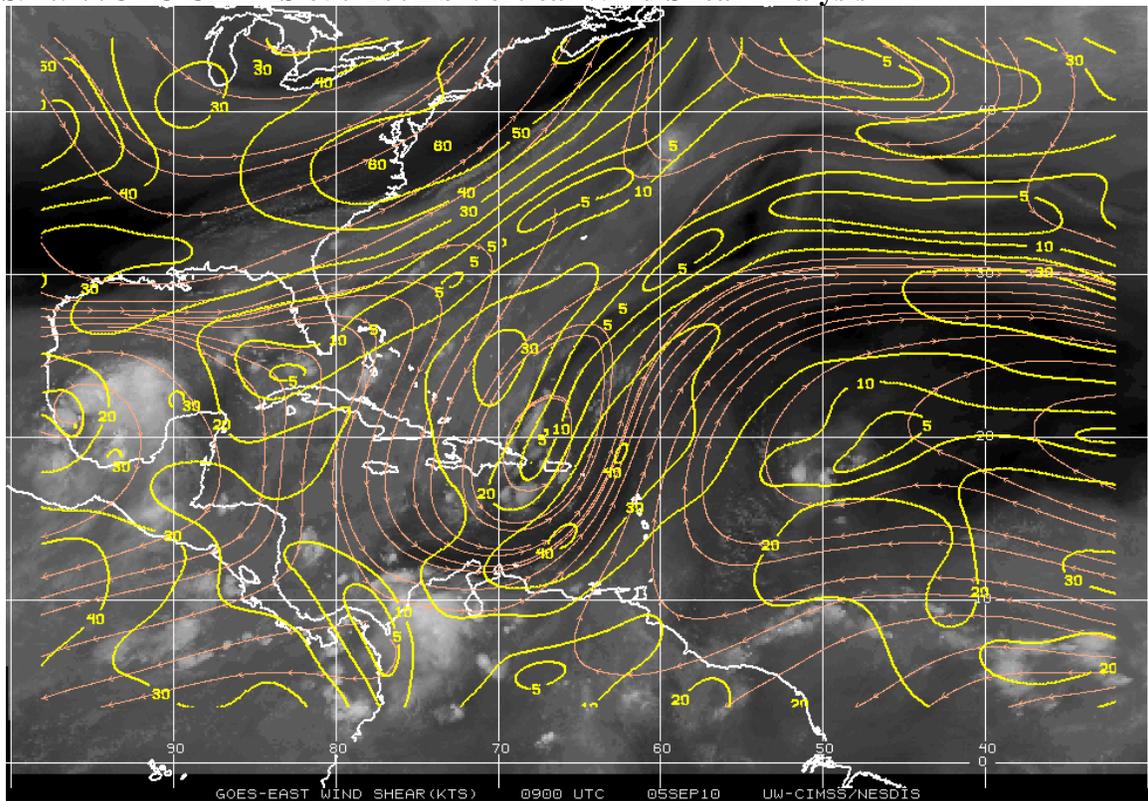
S7-0900UTC CIMSS200mb Vorticity Analysis



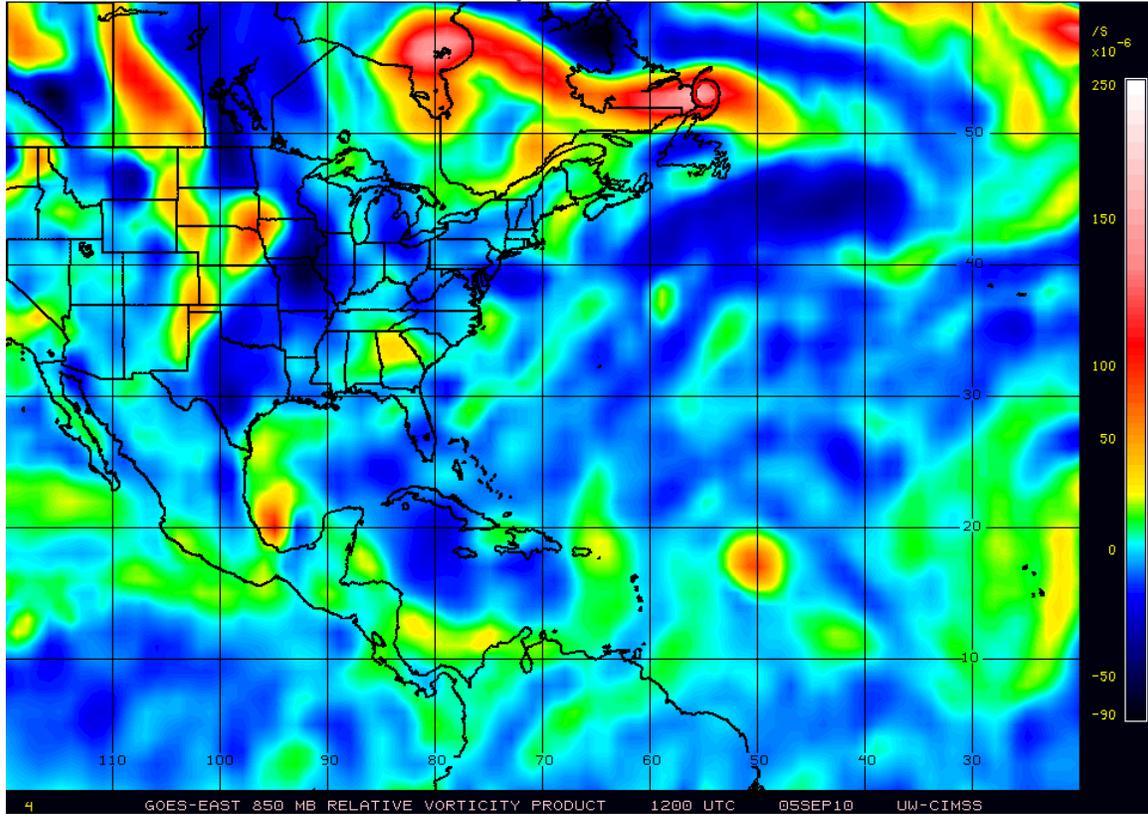
S8-0900UTC CIMSS Upper Level Wind Analysis



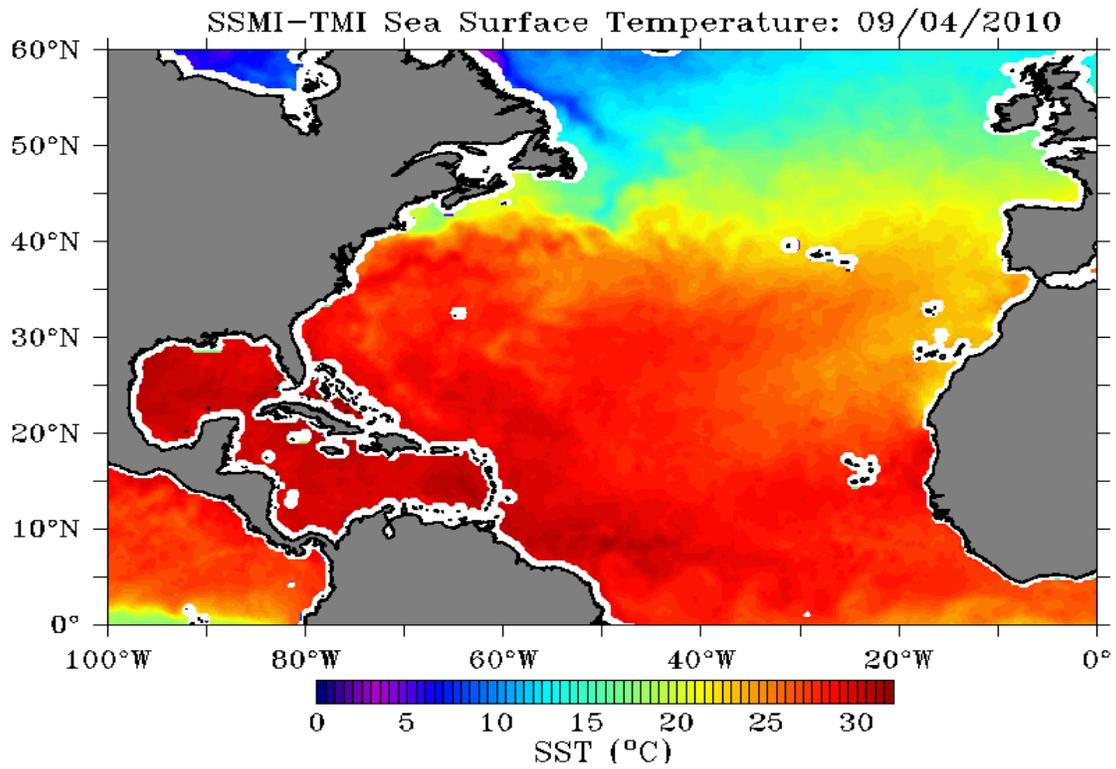
S9-0900UTC CIMMS 850-200mb Vertical Wind Shear Analysis



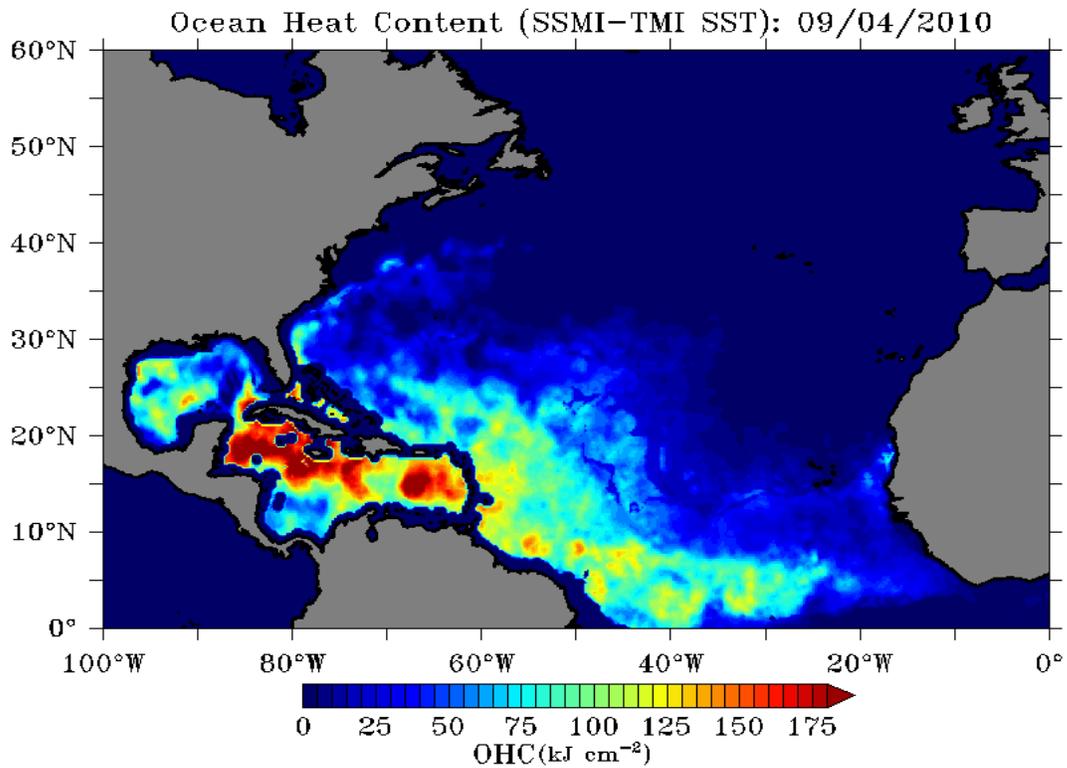
S10-1200UTC CIMSS 850mb Vorticity Analysis



S11

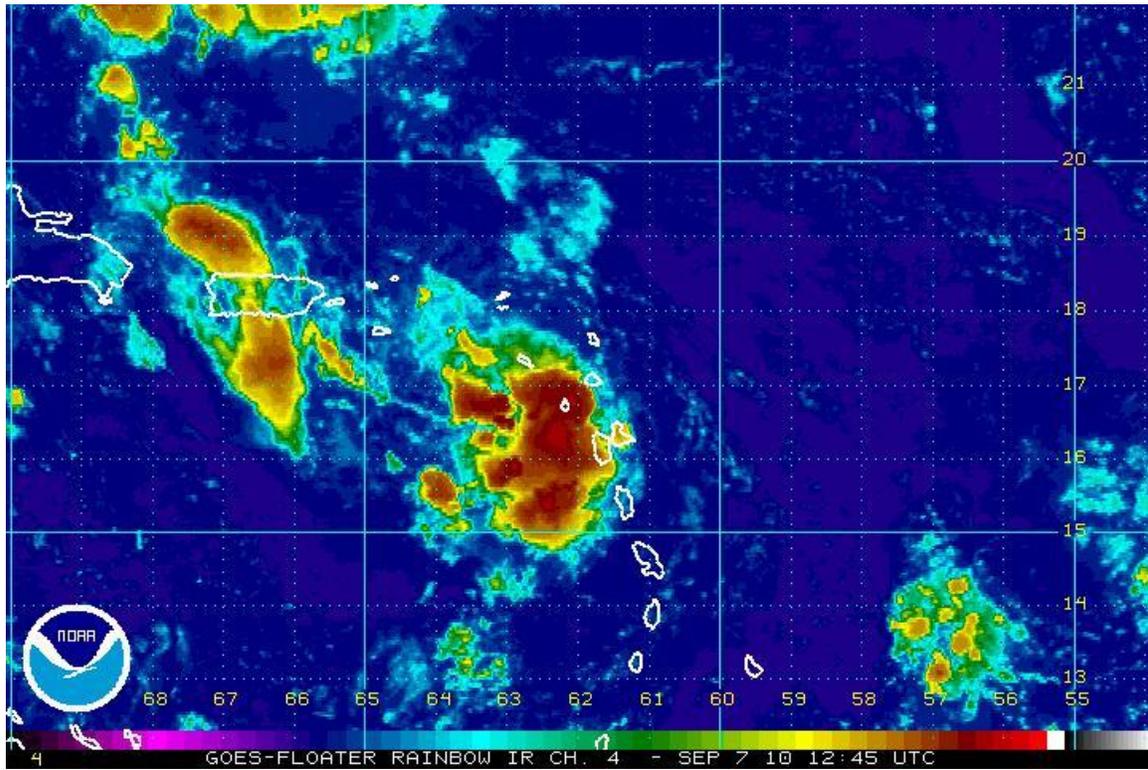


S12



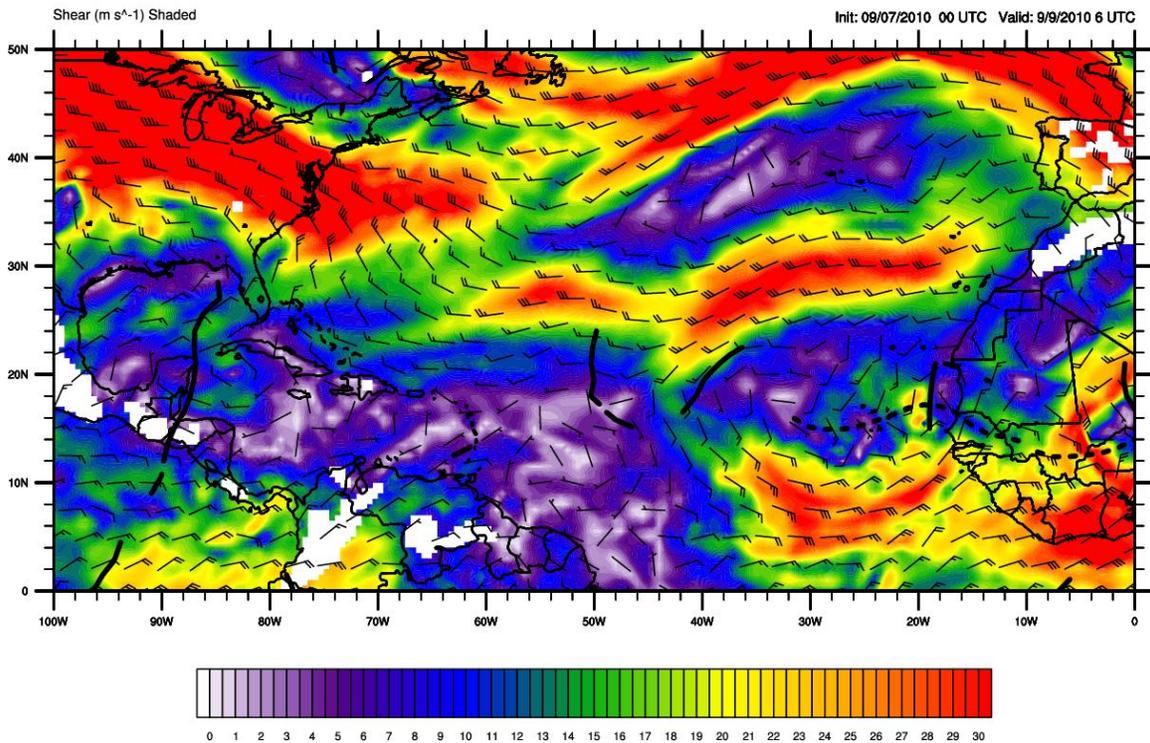
PGI-38L/Ex-Gaston:

G1-1245 UTC GOES IR

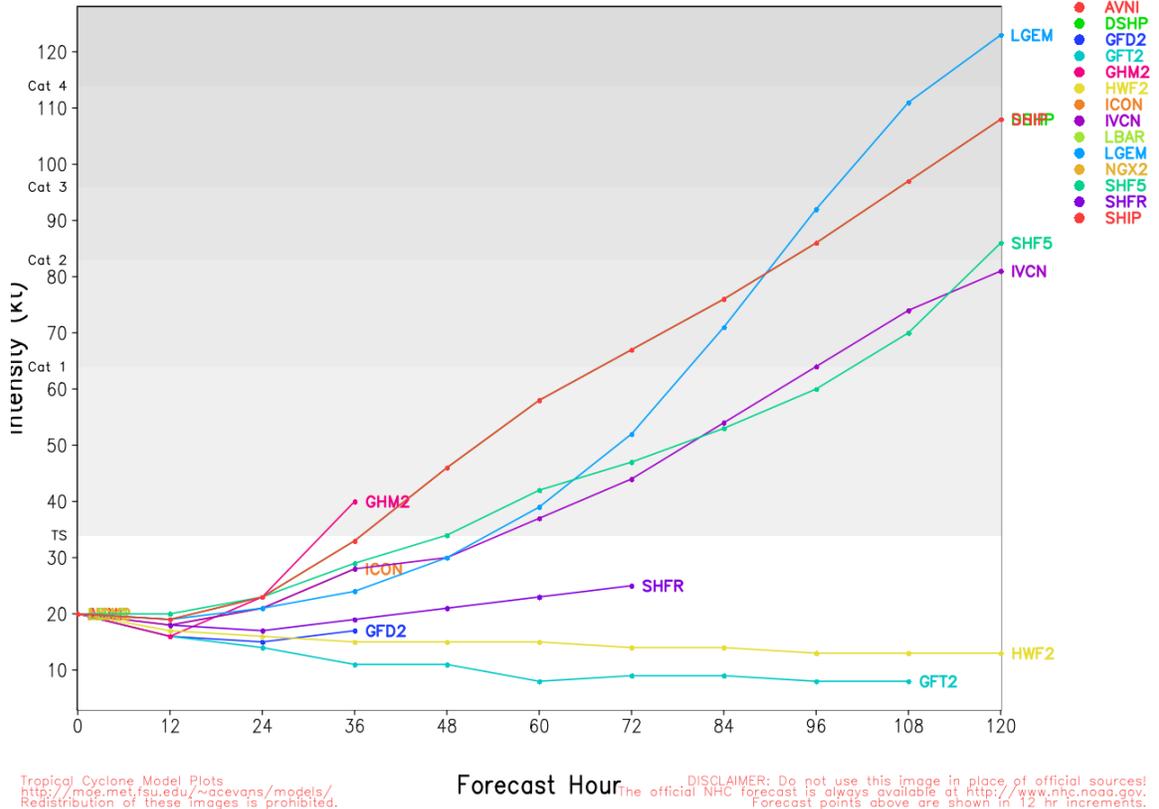


G2

200-900 hPa Wind Shear, Shear Vectors



Atlantic TROPICAL CYCLONE GASTON Model Intensities
Valid Time: 1200 UTC 07 September 2010

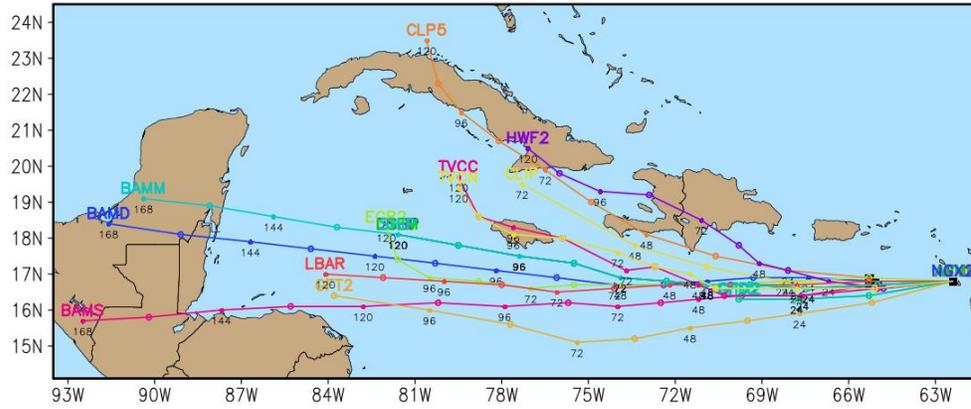


G4

MODELS
DISPLAYED

- AEMI
- AVNI
- BAMD
- BAMM
- BAMS
- CLIP
- CLP5
- DSHP
- EGR2
- GFD2
- GFT2
- GHM2
- HWF2
- LBAR
- LGEM
- NGX2
- SHIP
- TVCC
- TVCN

Atlantic TROPICAL CYCLONE GASTON Model Tracks
Valid Time: 1200 UTC 07 September 2010

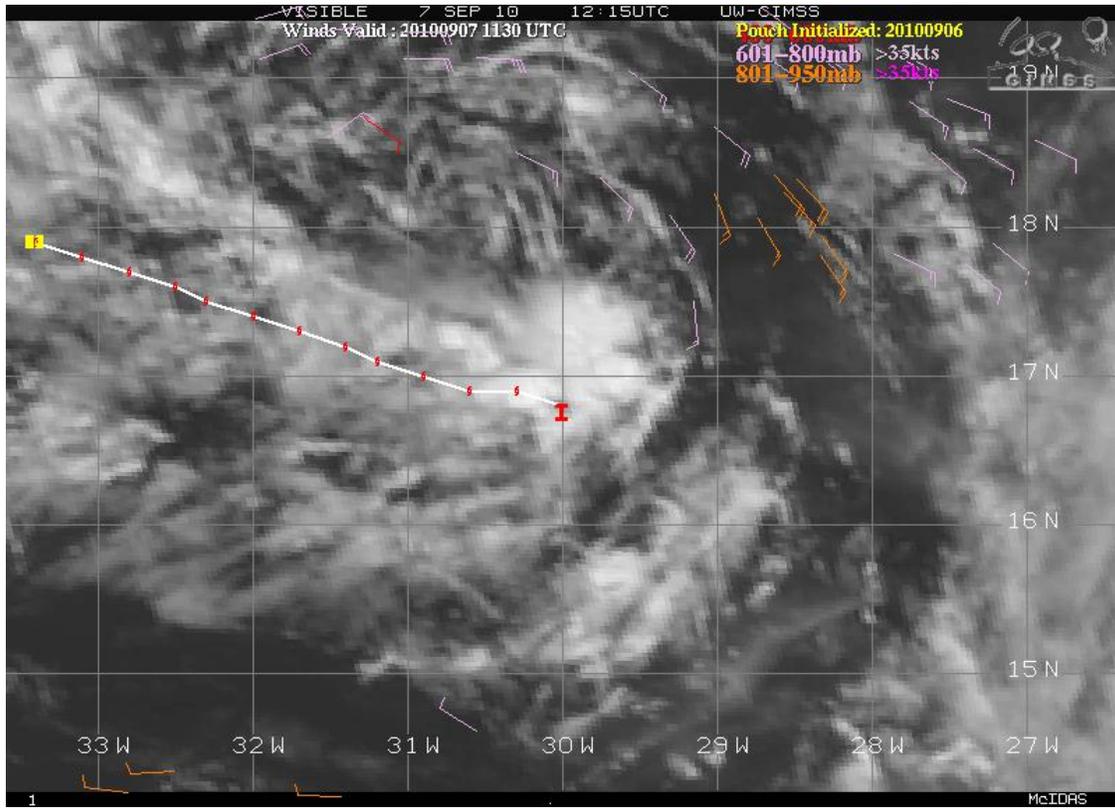


Tropical Cyclone Model Plots
<http://mog.met.fsu.edu/~acevans/models/>
Redistribution of these Images is prohibited.

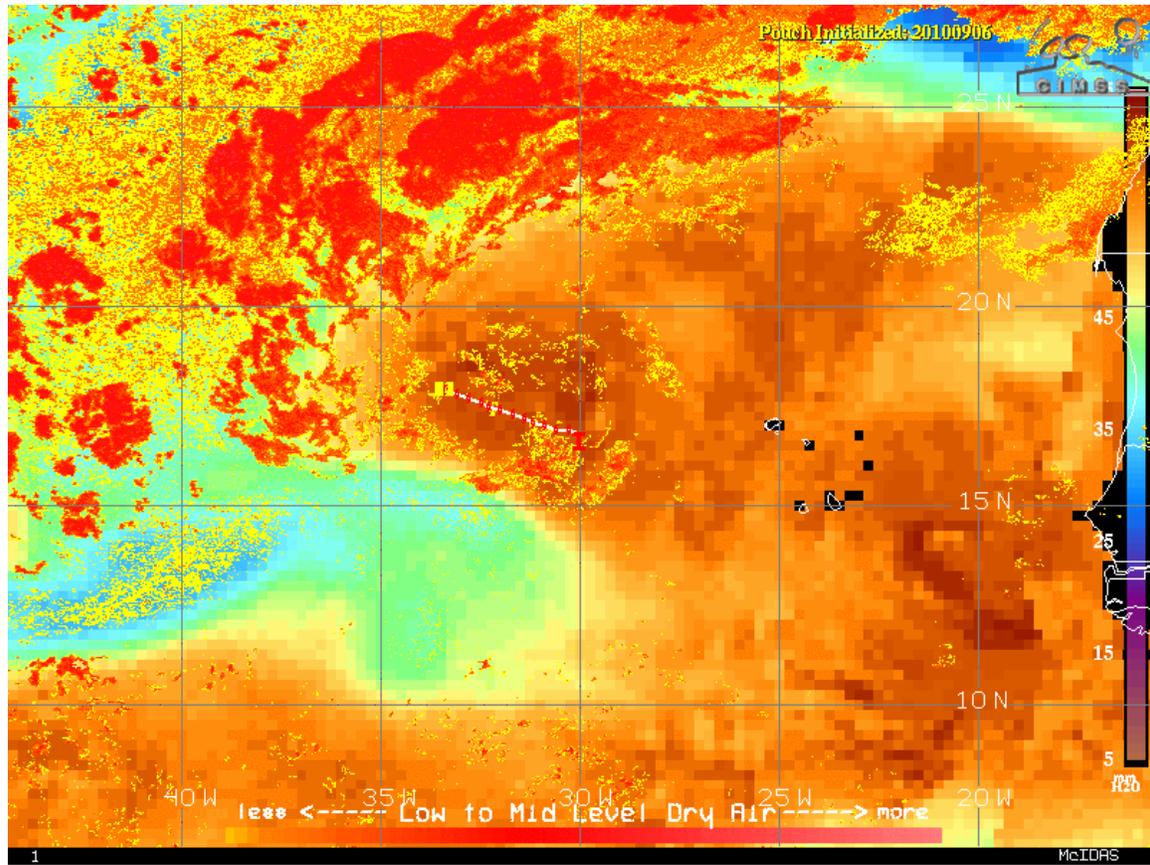
DISCLAIMER: Do not use this image in place of official sources!
The official NHC forecast is always available at <http://www.nhc.noaa.gov>.
Forecast points above are shown in 12 hr increments. Initial points denoted by black squares.

PGL-39L:

39A

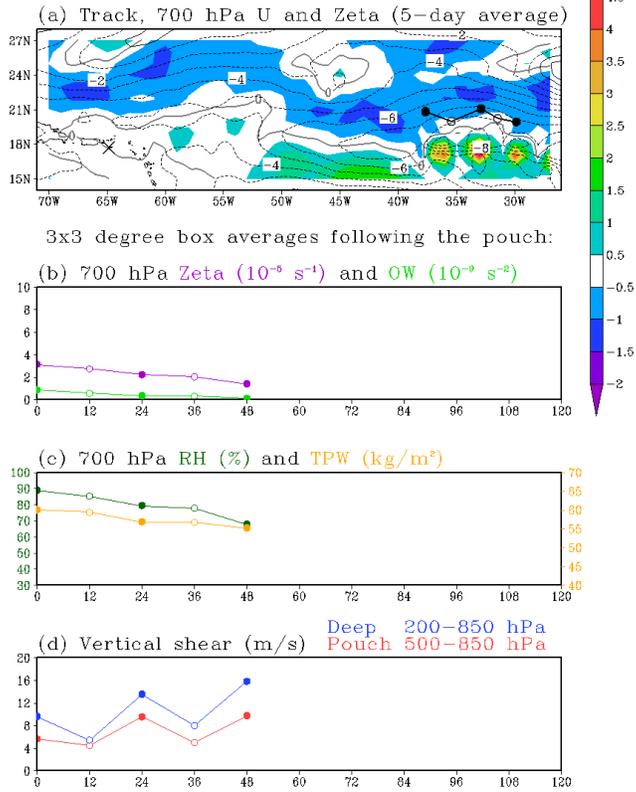


39B



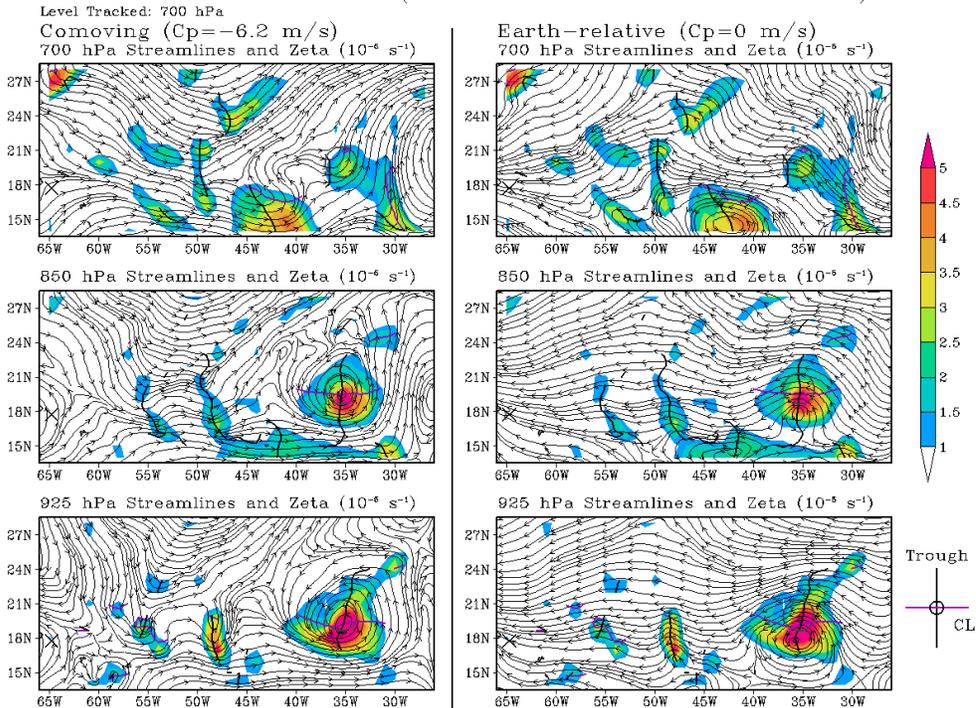
39C

PGI39L: 5-Day Forecast Based on GFS
 Initialized at 2010090700



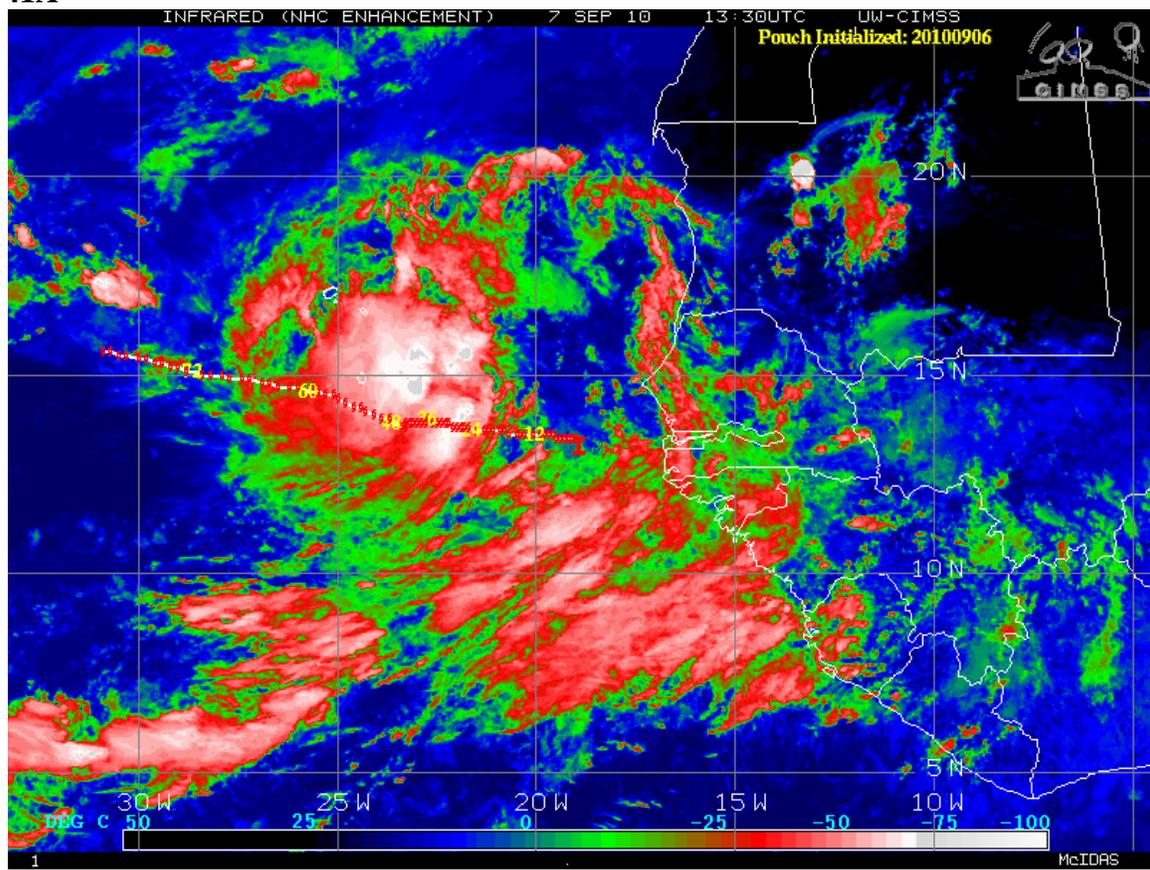
39D

PGI39L: 2010090700 (36h GFS valid at 12Z08SEP2010)

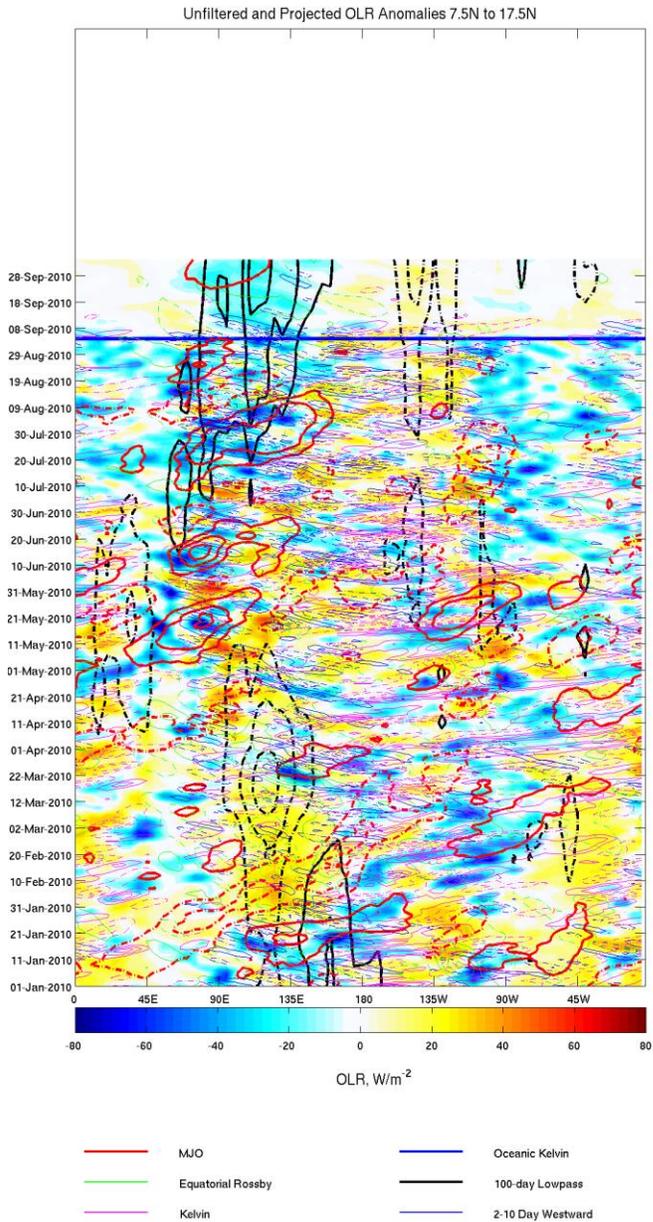


PGI-41 and PGI-42L:

41A



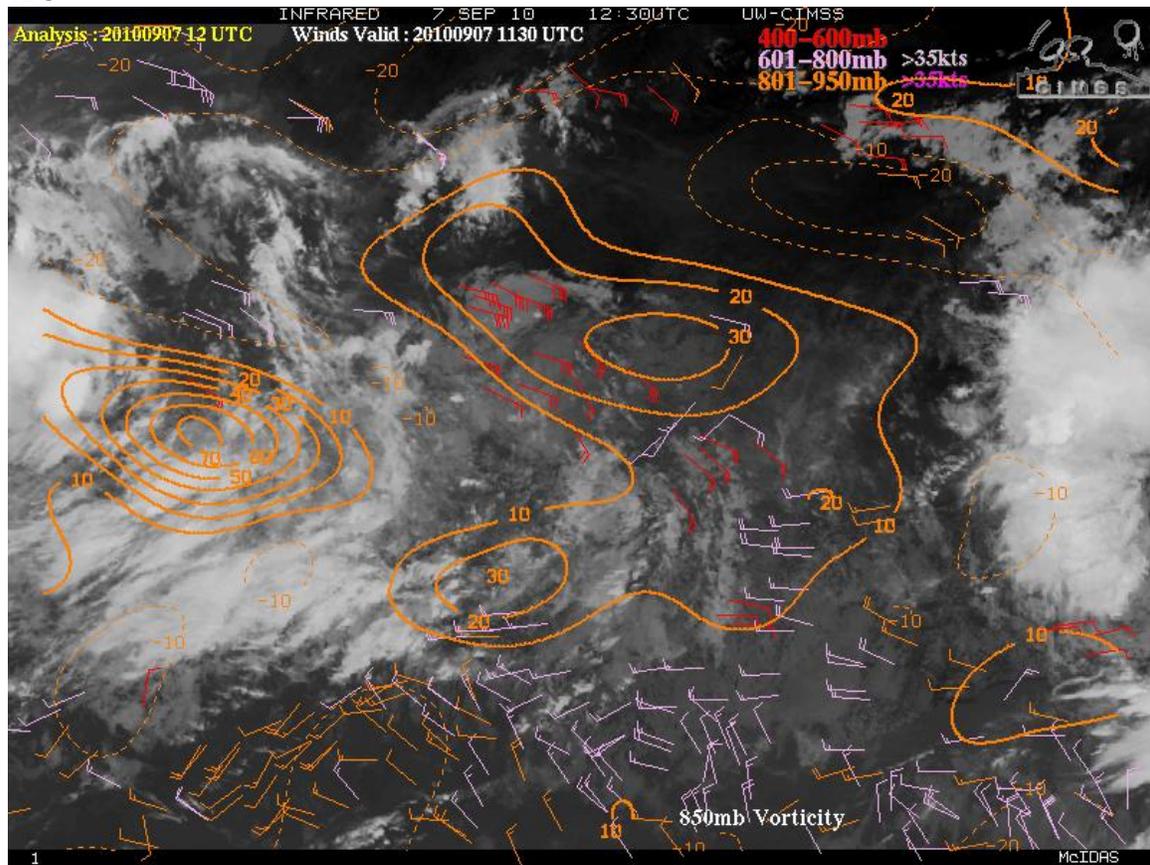
41B



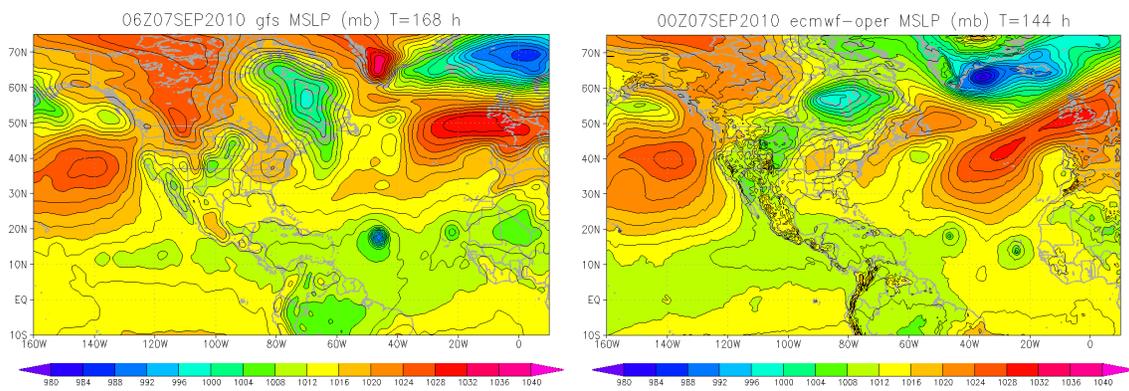
Shading represents OLR anomalies (i.e., the seasonal cycle and its first 3 harmonics have been subtracted). Heavy blue contours represent 10-120 day band dynamic height on the equator from the TAO buoy array (with missing values reconstructed from sea level gauge data). Other contours represent OLR anomalies projected onto a modified version of the time extended EOF modes of Roundy and Schreck (2009, QJRM), Equatorial dynamic height anomalies are plotted only on the diagrams for the 7.5N to 7.5S band, and are not yet available in real time.

Prepared by Paul Roundy, University at Albany.

41C

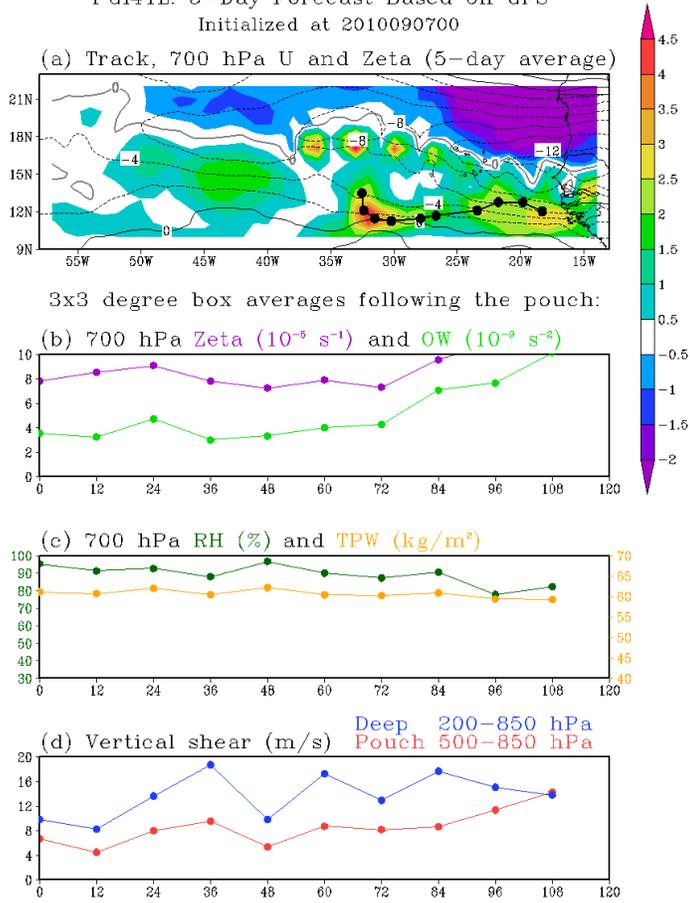


41D



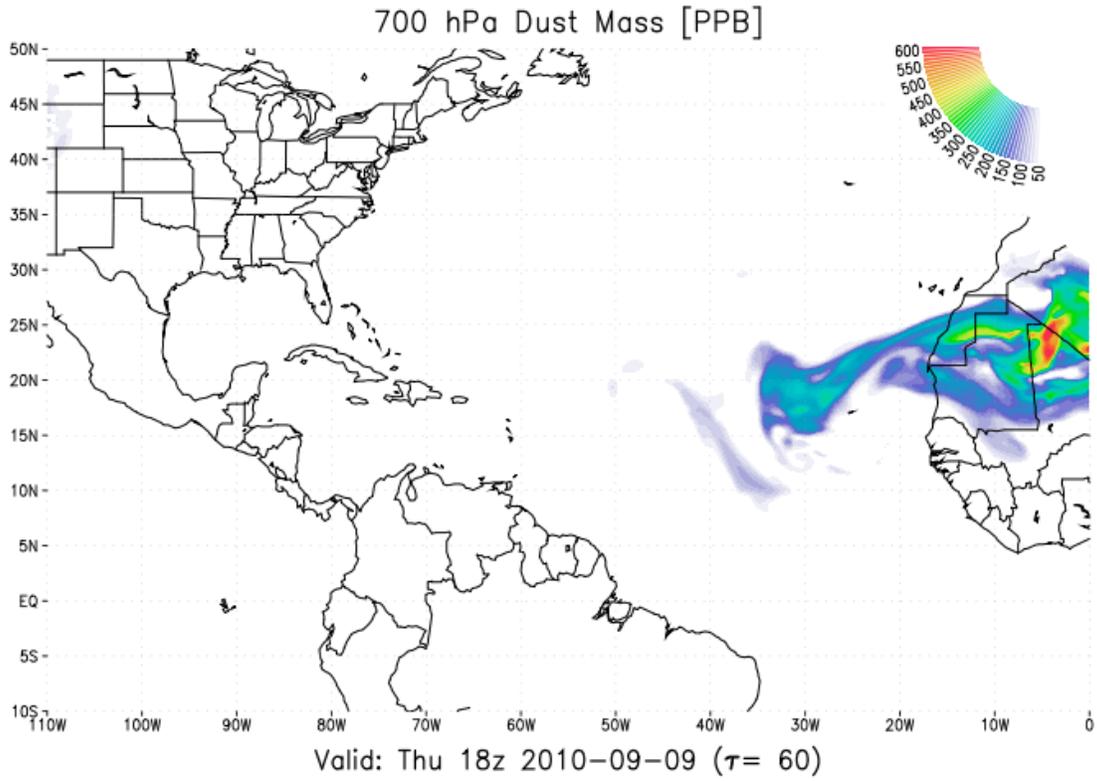
41E

PGI41L: 5-Day Forecast Based on GFS
 Initialized at 2010090700

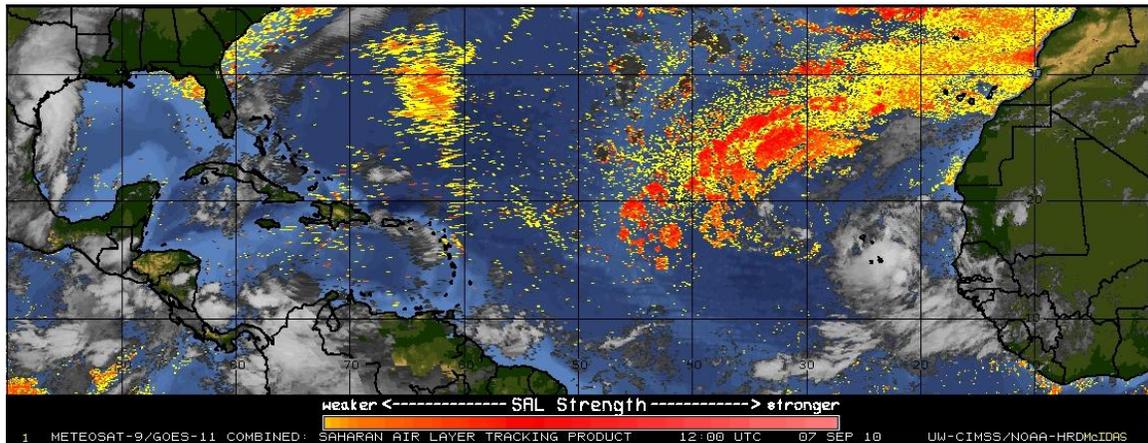


41F

NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-07

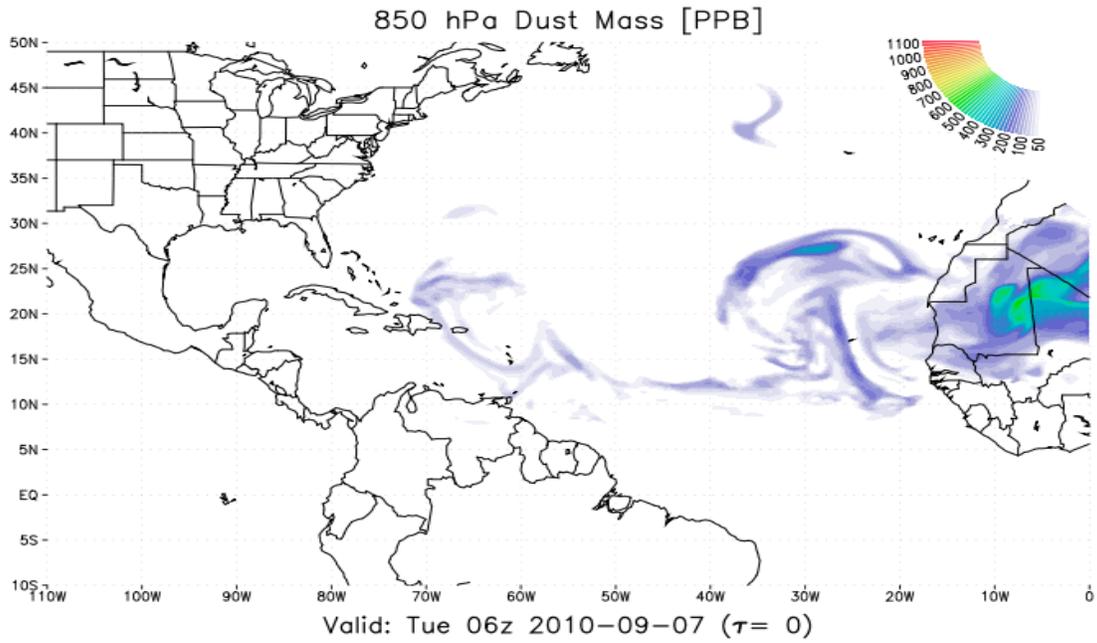


SAL:
D1



D2

NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-07



D3

NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-07

