Tropical GRIP Forecast Discussion for September 5, 2010

Created 1600 UTC September 5, 2010

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Summary:

Today, the DC-8 is ferrying to St Croix, the Global Hawk has a hard down day, and the WB57 is not flying. Ex-Gaston is the primary focus of GRIP right now. It is likely that the system could reform into a tropical depression within the next 48 hours, and DC-8 science missions focused on genesis are scheduled for Monday and Tuesday. Elsewhere in the Atlantic, a broad area of low pressure in the Bay of Campeche has the potential to develop into a depression in the next 48 hours before it moves inland. PGI-39L appears unlikely to organize and is in the process of dissipating while PGI-40L has dissipated and is no longer being tracked. However PGI-41L and PGI-42L, both still over Africa, have the potential to develop within the next week. That said, there is still a large amount of uncertainty associated with the potential development of those two systems.

Forecast for 1600 UTC 9/05/2010:

Synoptic Overview:

The surface analysis shows a large 1021hPa subtropical high, centered at 33N/44W, dominating much of the Atlantic basin (**S1**). A small surface low associated with the remnants of Fiona is located on the western edge of the ridge. The cold front that was approaching the eastern US now extends from the panhandle of Florida, NE into the Atlantic, however the models are not predicting much propagation further to the west, which should allow the ridge to remain in place. A broad area of low pressure is located in the SW Bay of Campeche. The remnants of PGI-38/Gaston have continued to propagate westward and are now located near 10N/50W. A long SW-NE oriented trough associated with PGI-39L extends from ITCZ at 35W to the coast of Africa, and a tropical wave, PGI-41L, is located over Liberia.

A large amount of convection is present n the western Gulf of Mexico and Bay of Campeche which is associated with a broad low pressure system (**S2**) Convection associated with the cold front extends across the remainder of the Gulf of Mexico and up the Eastern US coast. Ex-Gaston continues to be associated with some convection, however it is mostly displaced from the center. A large area of strato-cumulus is present in the northeastern tropical Atlantic, indicating the presence of dry air and potentially dust (**S3**). Convection is also present with the elongated trough associated with PGI-39L (**S4**). Additional convection is visible ahead of PGI-41L, although it is displaced westward from the pouch center. Finally, convection is located near the pouch center of PGI-42L.

The main feature of note in the upper troposphere is an elongated upper level low (**S7**). While upper level winds indicate the low is centered over Puerto Rico (**S8**), the

200mb vorticity analysis shows that trough extends far beyond the center, from northern Venezuela through the central Atlantic (**S9**). Due to the influence of this trough, there is high vertical wind shear to the NW and SE of the low, but shear is low over most of the remainder of the tropical Atlantic. At mid levels, there are vorticity maxes associated with ex-Gaston and the Bay of Campeche disturbance, as well as the cold front, and the cold low over Puerto Rico (**S10**)

SSTs are high across most of the tropical Atlantic with the exception of a tongue of colder water due north of Cape Verde (**S11**). The cold wake of Earl is also visible in the SSTs, however the water in the wake was initially so warm, that it has only cooled to 26-28 degrees C. Ocean Heat Content is very high through the Caribbean and Gulf of Mexico (**S12**). This should bode well for ex-Gaston as it enters the Caribbean in the next few days.

TPW indicates that dry air continues to wrap around ex-Gaston, however it is moving towards a moister environment (**S6**). At the same time, aerosol concentrations have decreased ahead of ex-Gaston, indicating that it may be escaping the influence of some of the SAL which was surrounding the system yesterday (**D1**). Dry air also remains in place over the northeastern tropical Atlantic, ahead of PGI-39L.

Features of Interest:

Bay of Campeche disturbance:

Microwave imagery reveals a loss of the banding structure found yesterday as TD 11-E was approaching the Bay of Campeche **(B1)**. An overall disorganization has been observed over the last 24 hours. However, DSHIPS still has TD11-E reaching Tropical Storm status within the next 36 hours **(B2)**. That said, no other models forecast intensification of this magnitude, and SHIPS/DSHIPS has a high bias in forecasts of systems below tropical depression classification. TD 11-E is also forecasted by all models except CLPR-5, a purely climatology based statistical model, to move inland through Mexico in the next 24 hours **(B3).** With disorganization present and the possibility of landfall within the next 24 hours, the system will not be over the warm SSTs of the Bay of Campeche long enough to favor development into a major system. CIMSS shear analysis diagnoses moderate shear values in the vicinity of TD 11-E creating a less favorable environment for development **(S9)**. Any deviation in track resulting in an extended period in the warm SSTs of the Bay of Campeche could result in organization and development. For this reason, the system will continue to be monitored.

Ex-Gaston/PGI-38L:

The remnants of Gaston as of 12Z are centered at 16.4°N, 49.9°E and displaying a flare up of convection on the western and southern periphery this morning (**G1**) while under continued easterly shear (**S9**). The immediate environment for Gaston has improved, with water vapor imagery suggesting that upper level air ahead of the system not as dry as the past few days (**S5**) and MODIS showing low aerosol levels west of the system (**D1**). Some dry air has wrapped around to the south threatening to cut off the system from being tapped into tropical moisture (**S6**), however models do not predict this actually taking place.

The system is forecast to move into an increasingly favorable environment with decreasing shear and higher OHC (**S12**) over the next few days. As the system moves away from the SAL plume the GEOS-5 depicts some dust finding its way towards the center of Gaston by 0Z Monday (**G2**) which may inhibit development to some extent. Global models show little in the way of re-development of Gaston, however the 6Z HWRF has the system regaining tropical storm status at 6Z Tuesday (**G3**) and becoming a hurricane at 6Z Friday. Model consensus has Gaston returning to Tropical Storm status around 0Z Thursday with an intensification period following this point consistently seen (**G4**). Track forecasts bring the system towards St. Croix, with the island being impacted by the storm by 0Z Wednesday (**G5**).

PGI-39L… AL99:

PGI-39L was located at 17.5N/25W, or just north of the Cape Verde Islands. Satellite derived low-level winds show broad cyclonic flow near the pouch, but that and low vertical wind shear are just about the only things the system has going for it. The winds are less than 25 kts, and there is no apparent closed circulation based on satellite animations (**39A**). Additionally, there is almost no convection in the immediate vicinity of the pouch, and widespread SAL air was analyzed to the north of the system (**39C**). SSTs are marginal right now, but the pouch is forecast to move over cooler SSTs in about 24 hours (**39B**). NHC is no longer calling it an invest, and the GFS does not develop it (GFS drops the pouch at 60 hours) (**39D**). Based on the increasingly unfavorable environmental conditions, there is little chance for this system to develop into a TC. Even if it were to develop, its NW track would keep it out of range for GRIP aircraft.

PGI-41L and PGI-42L:

PGI-41L was located near 8N/10W, or over extreme western Africa. There is broad cyclonic flow associated with the pouch as indicated by the satellite-derived low level winds. IR animations also suggest some weak rotation (**41A**). Convection is suppressed in the immediate vicinity of the pouch, possibly due to some dry air intrusion in this area. It is likely that convection in the area will pulsate over the next few days as the system moves offshore. In the long term, the GFS indicates that newly designated PGI-42L will get caught up and merge with PGI-41L, and the resulting system will become a tropical cyclone as it tracks WNW in the eastern Atlantic (**41B**). The ECMWF, however, does not develop PGI-41L (or PGI-42L for that matter). At this time, PGI-41L certainly bears watching, but we have plenty of time to do so because it will be at least 7-9 days before it comes close to the range of the GRIP aircraft.

Dust/SAL Discussion:

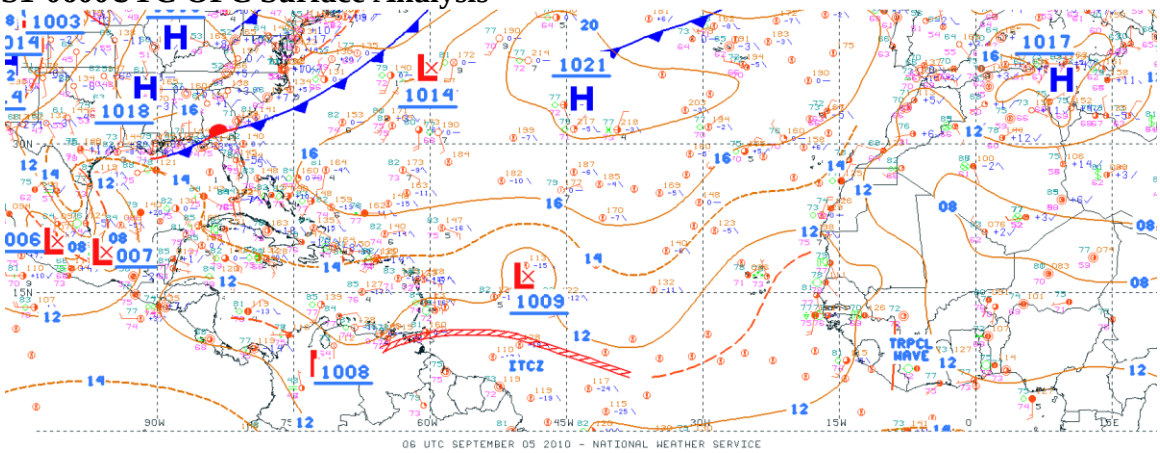
Dry air continues to extend over much of the Atlantic. Water vapor imagery reveals dry air completely wrapped around ex-Gaston/PGI38L/AL09 **(S4)**. A vast area of dry air is also found between ex-Gaston and PGI39L as well as the Caribbean. A substantial amount of dry air is found off the western coast of Africa into the eastern Atlantic (**D2**). The GOES-5 00Z dry air analysis indicates a small area of aerosols and dry air in the Caribbean and most profoundly in the Atlantic around 55W extending to the western coast of Africa **(D3)**. This Saharan layer continues to interact with ex-Gaston as well as PGI-39L. The GOES-5 forecast from yesterday and the previous day was very

accurate for today's forecast which yields a relatively high degree of confidence in its forecast today for the extended outlook. The forecast indicates the dust in the Caribbean and the Atlantic will become less prevalent with another outbreak approaching the Atlantic by Wednesday afternoon **(D4)**.

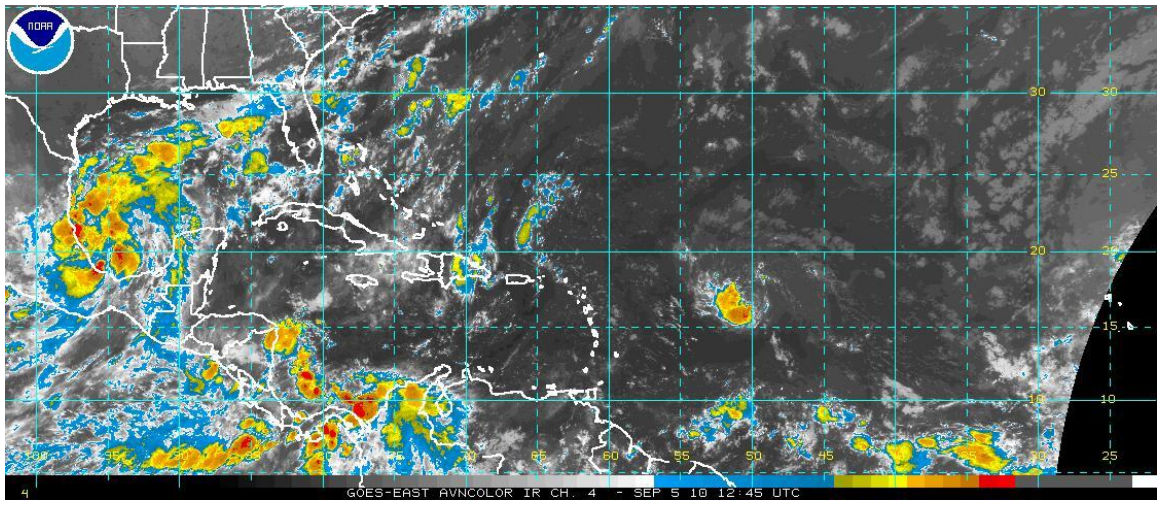
Forecasters: Zelinsky, Halperin, Thomas, Maliawco, Harnos

Images used in discussion:

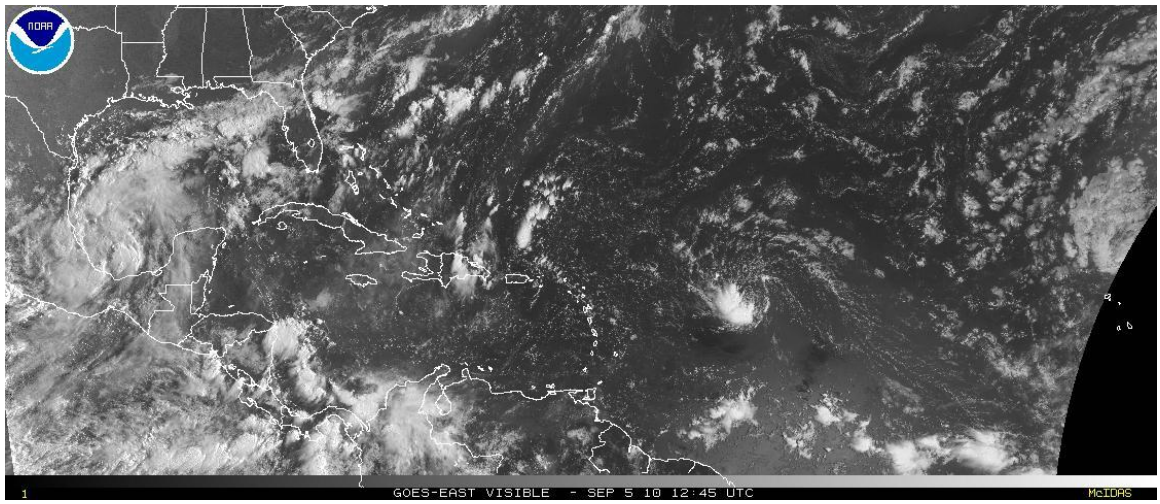
S1-0600UTC OPC Surface Analysis



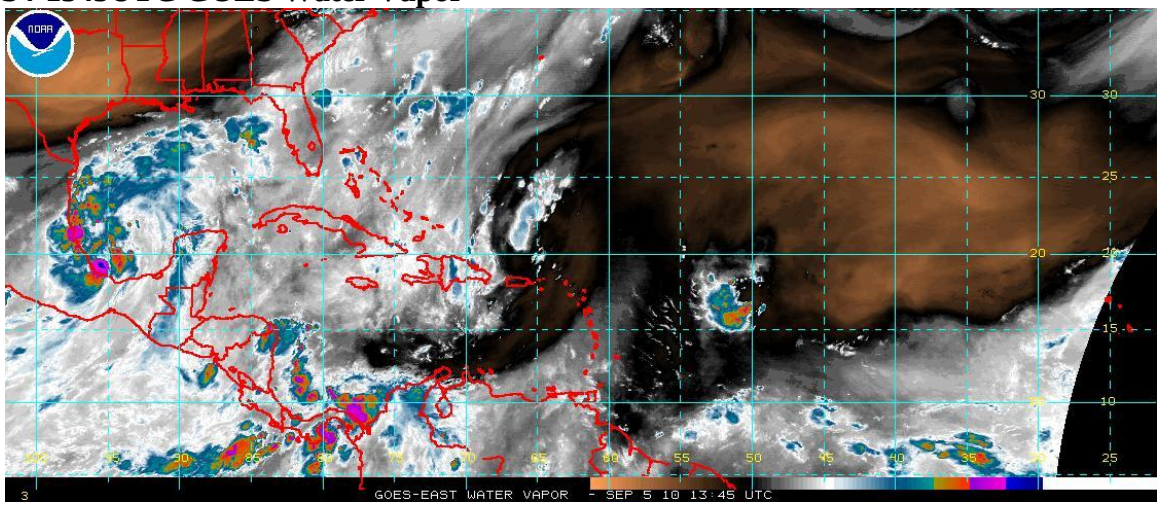
S2-1245UTC GOES IR



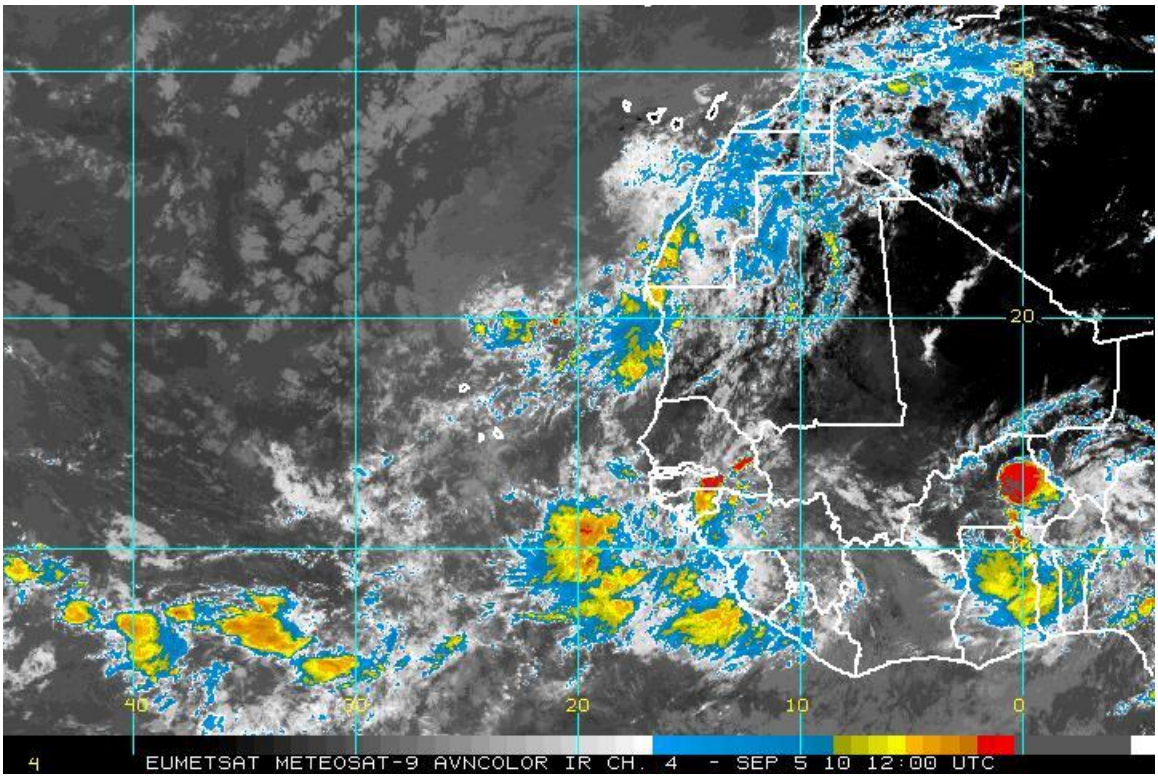
S3-1245UTC GOES Visible



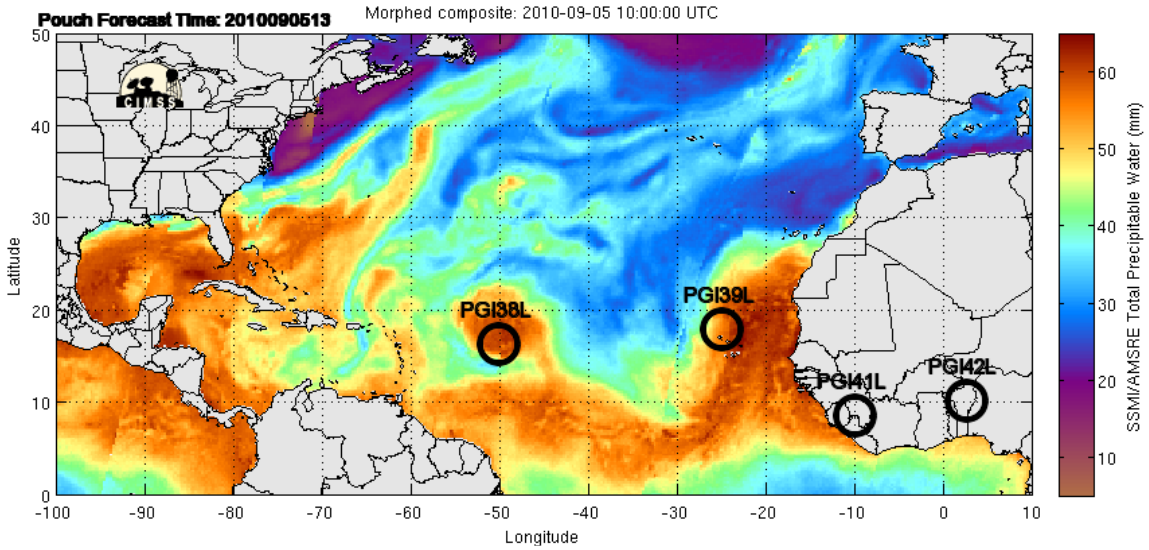
S4-1345UTC GOES Water Vapor



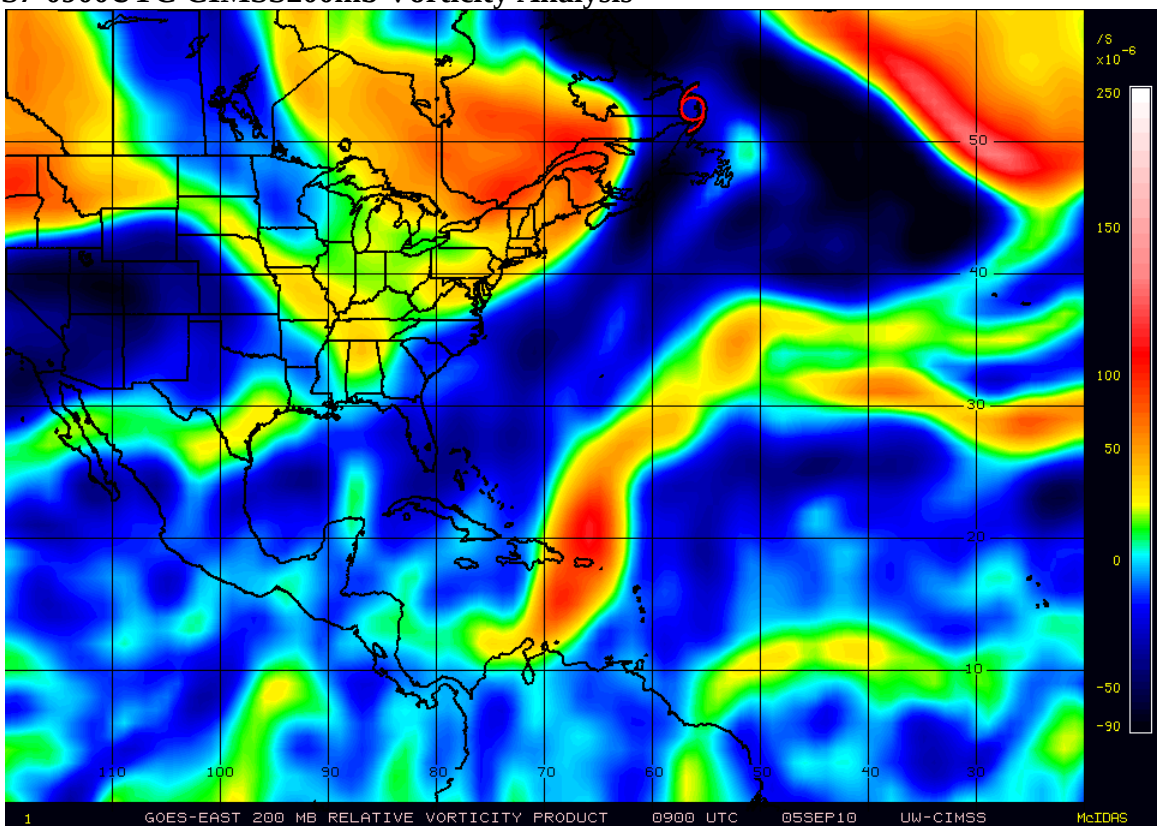
S5-1200UTC METEOSAT IR



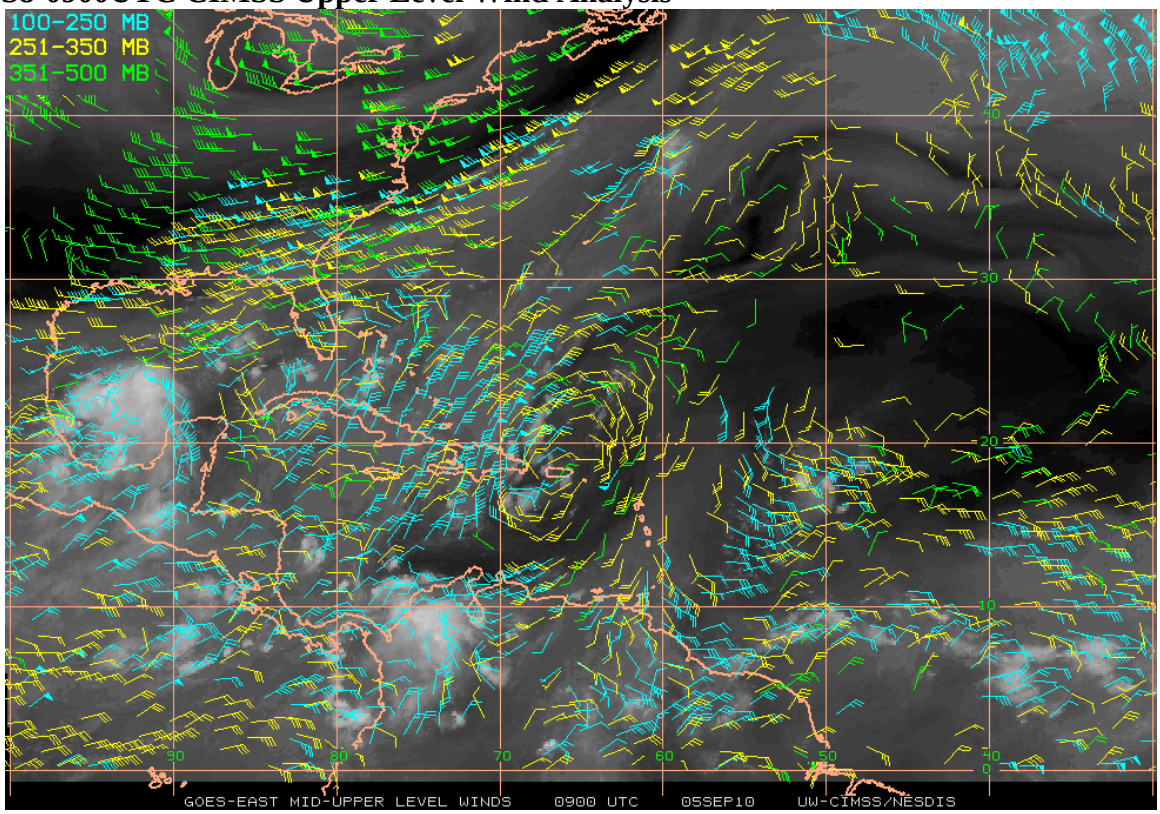
S6-1000UTC TPW and Pouch Locations



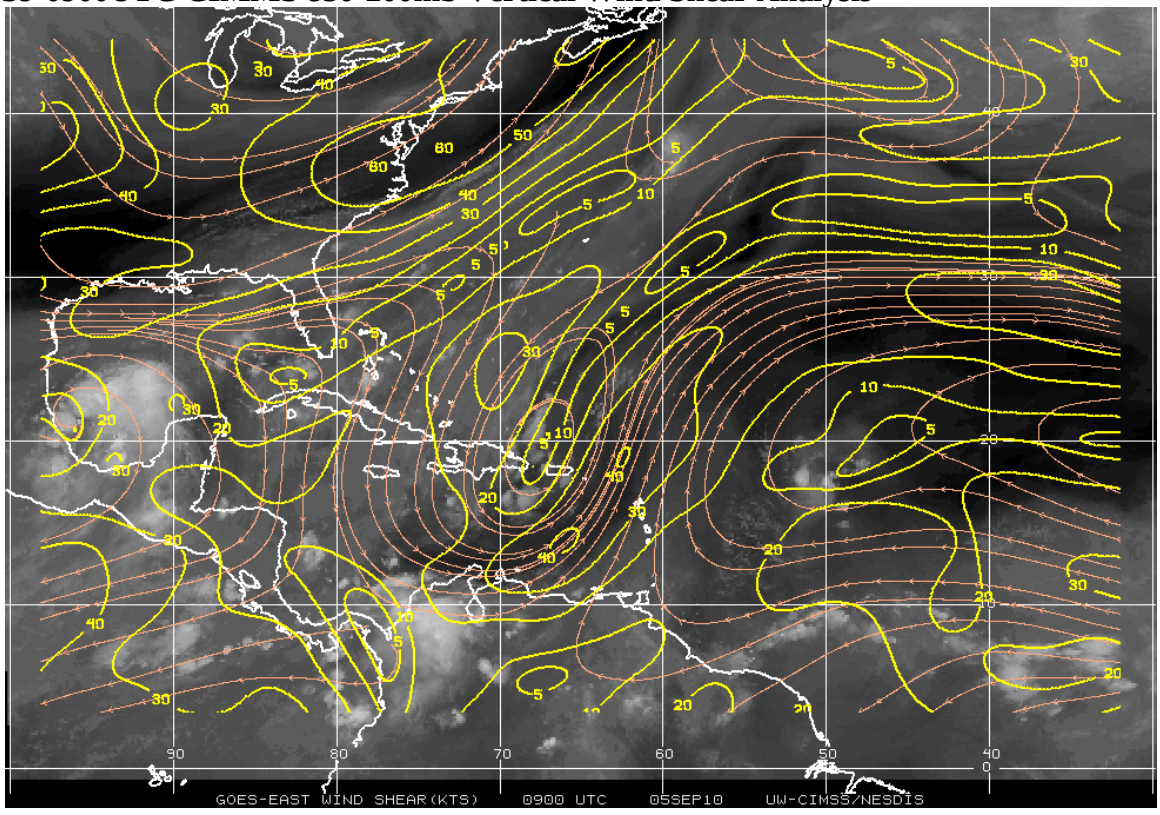
S7-0900UTC CIMSS200mb Vorticity Analysis



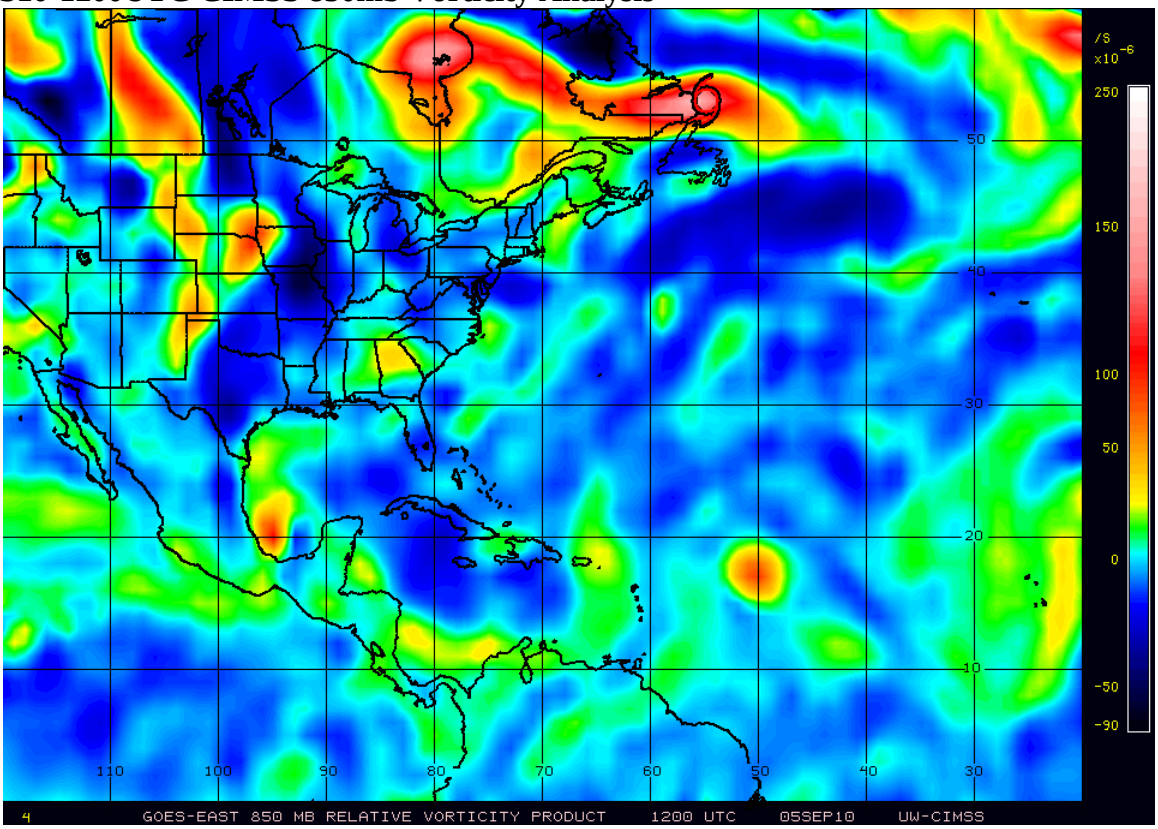
S8-0900UTC CIMSS Upper Level Wind Analysis



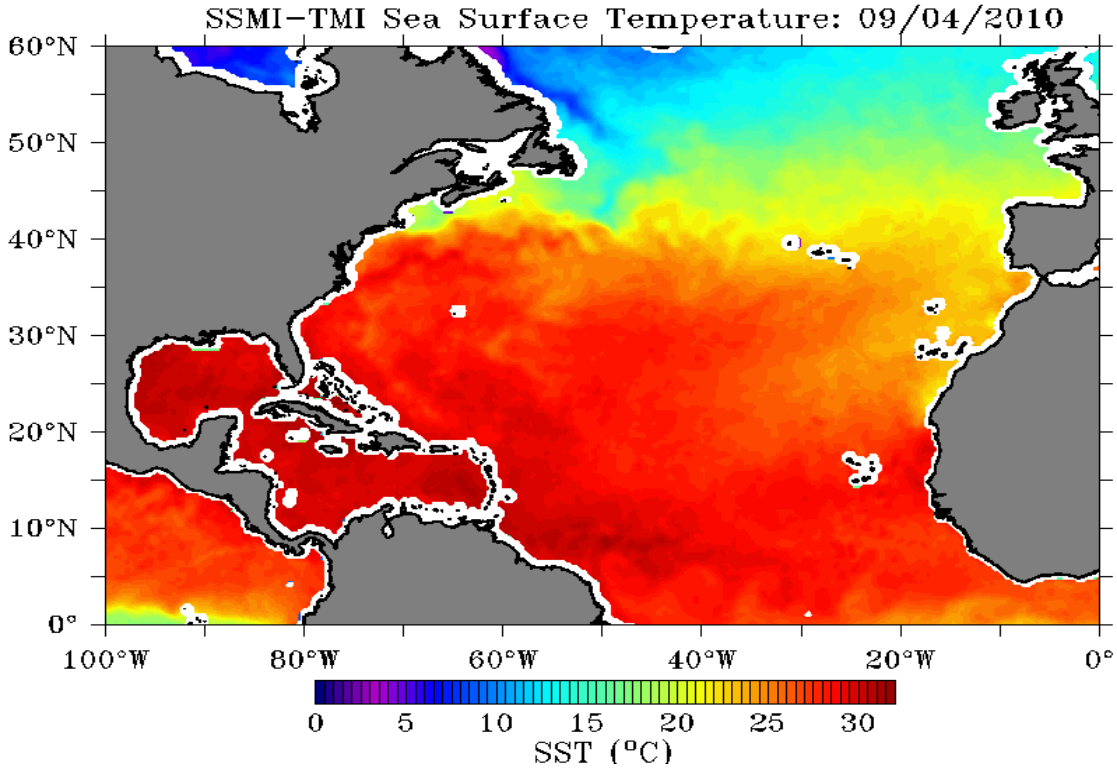
S9-0900UTC CIMMS 850-200mb Vertical Wind Shear Analysis



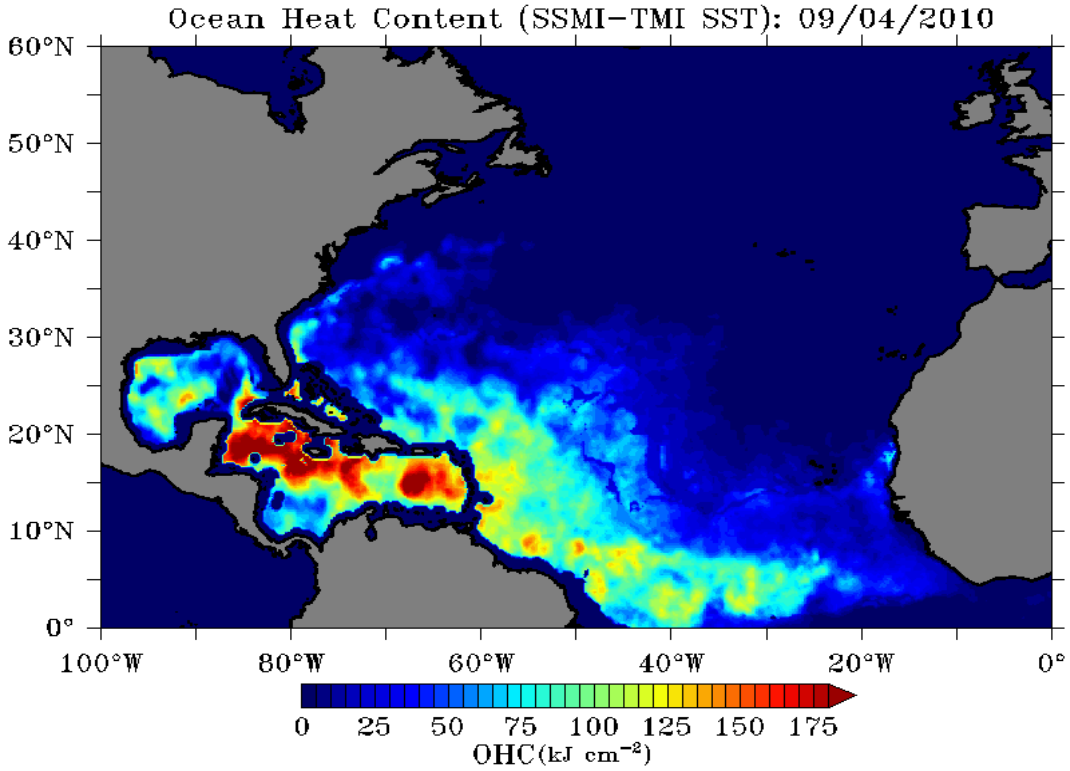
S10-1200UTC CIMSS 850mb Vorticity Analysis



S11

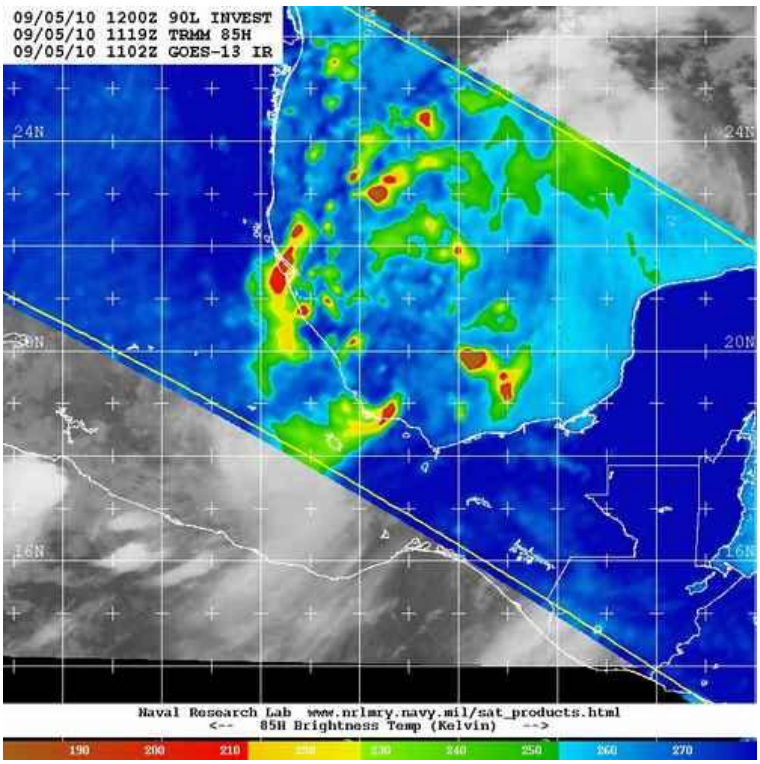

SSMI−TMI Sea Surface Temperature: 09/04/2010
60°N
50°N
40°N
30°N
20°N
10°N
0°
100°W
80°W
60°W
40°W
20°W
0°
0
5
10
15
20
25
30
SST (°C)

S12

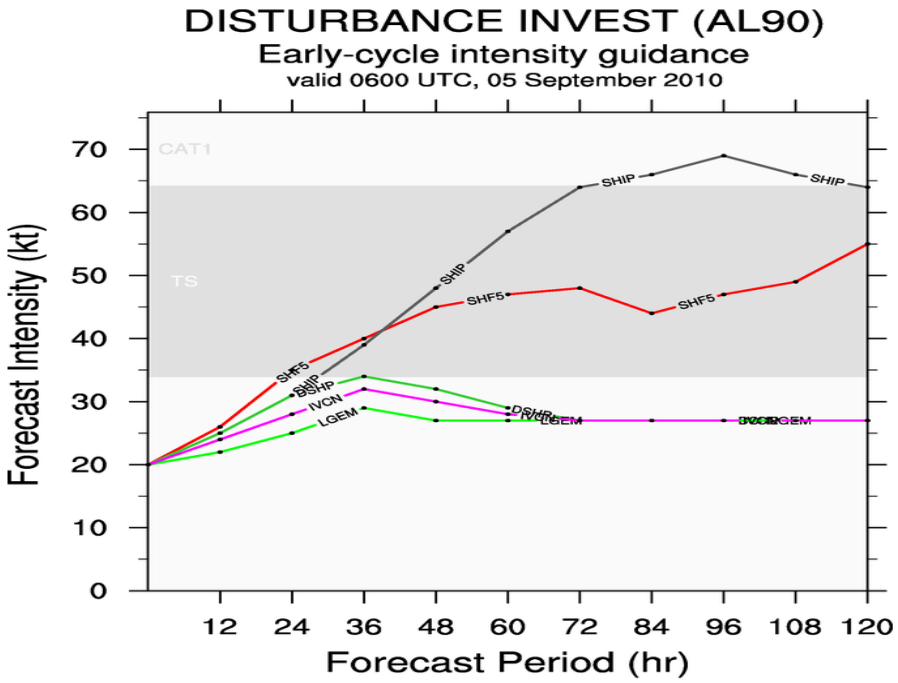

Ocean Heat Content (SSMI−TMI SST): 09/04/2010
60°N
50°N
40°N
30°N
20°N
10°N
0°
100°W
80°W
60°W
40°W
20°W
0°
0
25
50
75
100
125
150
175
OHC(kJ cm⁻²)

Bay of Campeche disturbance/TD 11-E:

B1-1100UTC TRMM Microwave



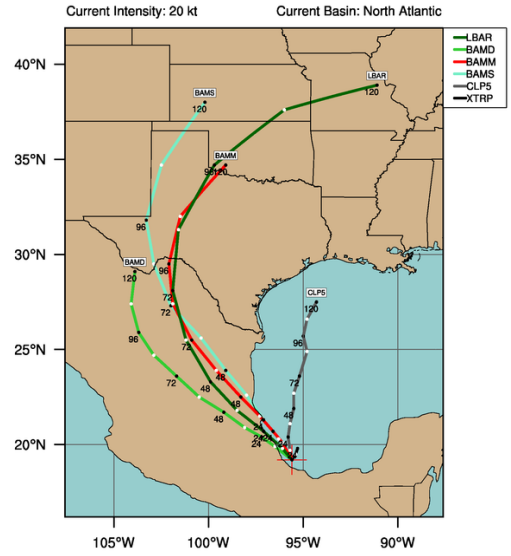
B2



B3

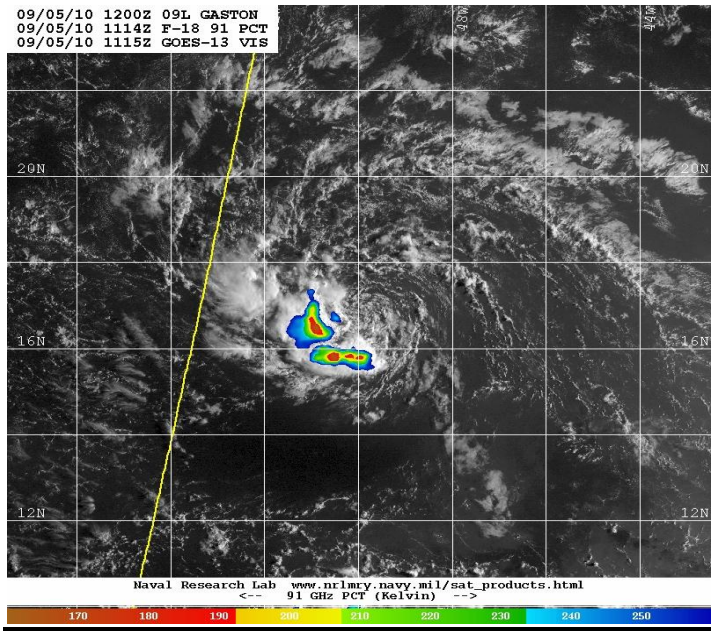
DISTURBANCE INVEST (AL90)

Early-cycle track guidance valid 0600 UTC, 05 September 2010

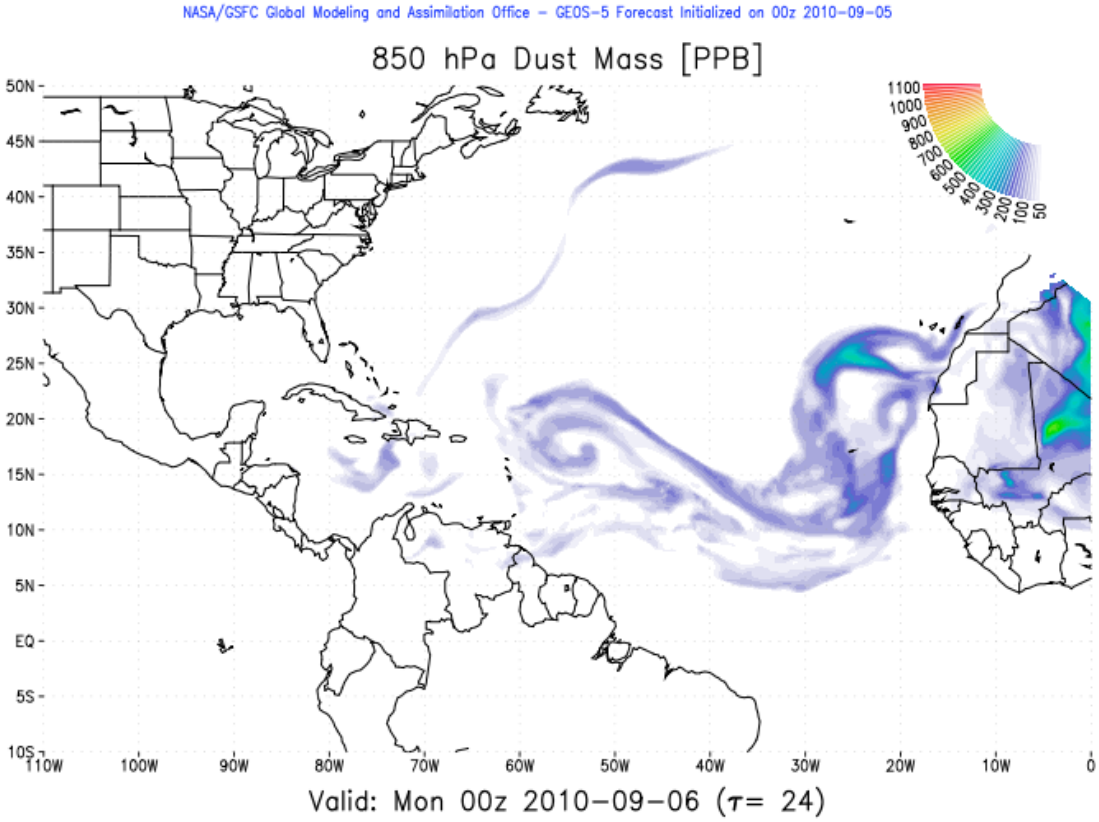


PGI-38L/Ex-Gaston:

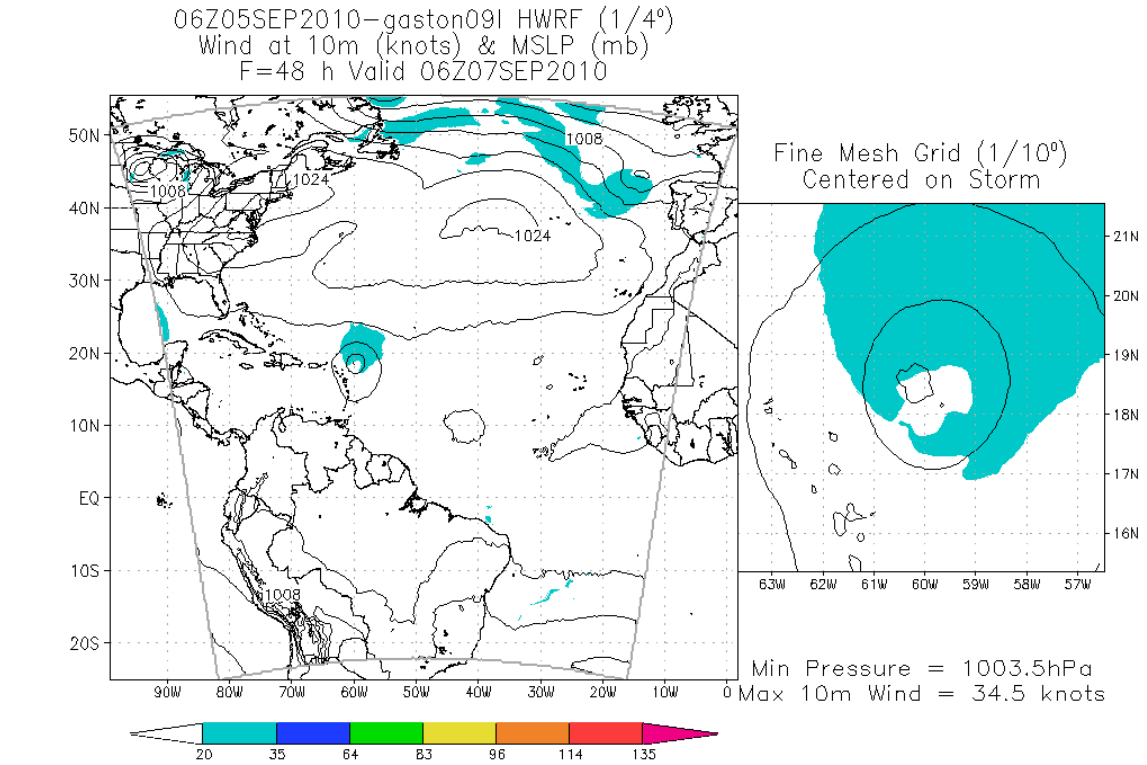
G1- SSMIS 1200UTC Microwave



G2- 0000UTC GEOS-5 850hPa Dust Mass 24-hour Forecast

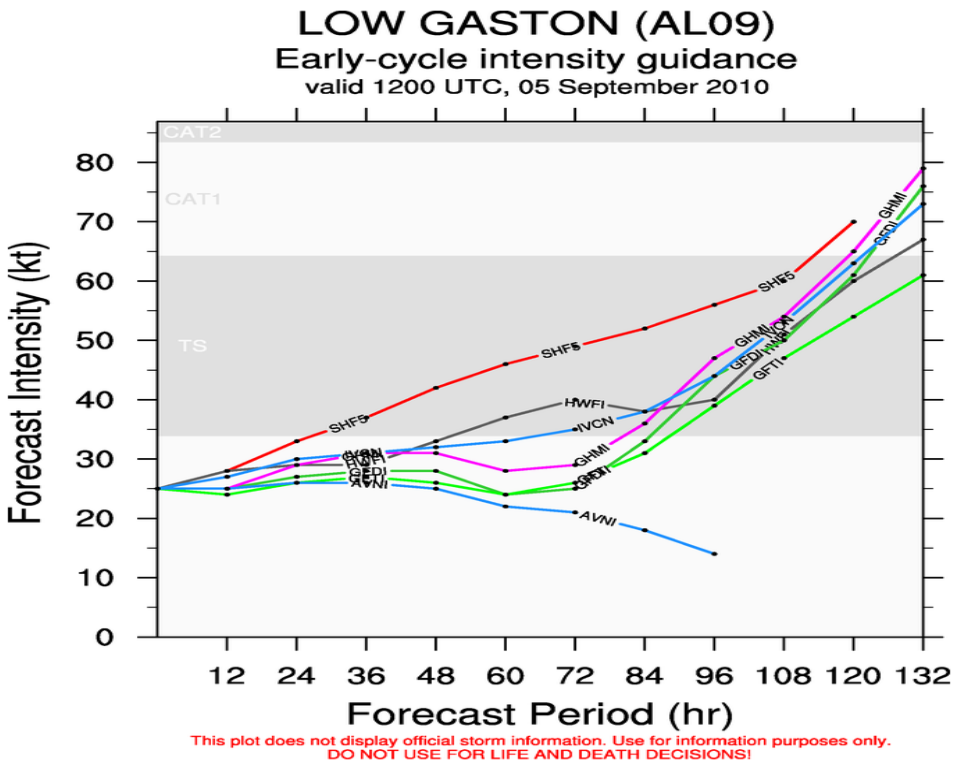


G3



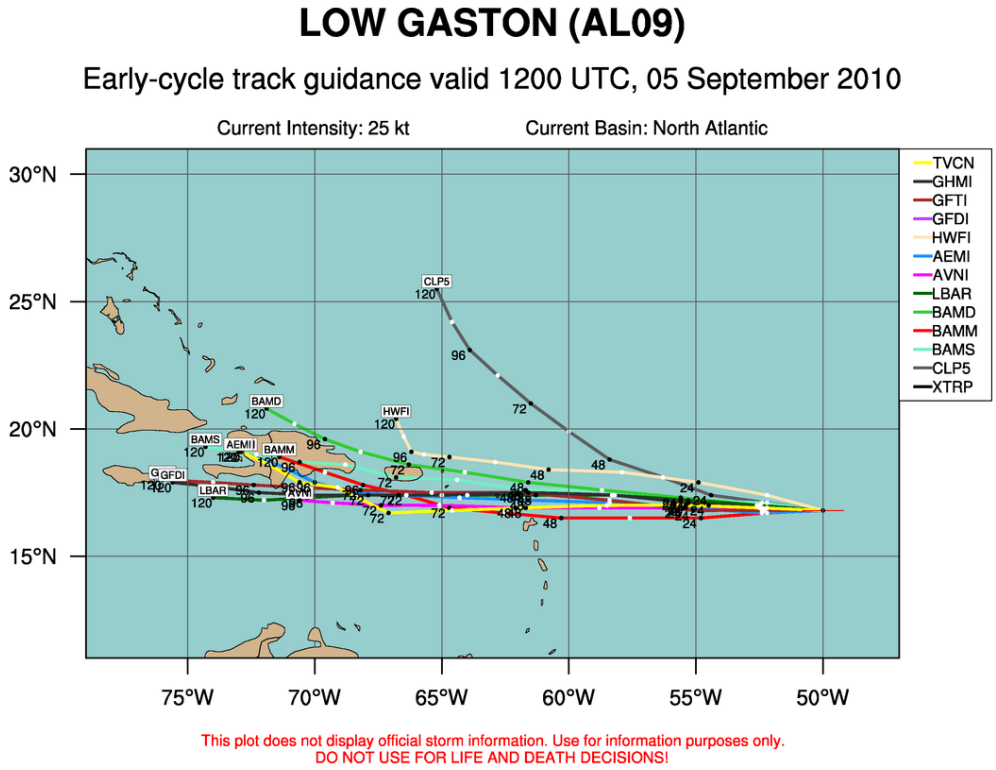
The winds shown here are guidance, and NOT official NHC forecasts.

G4



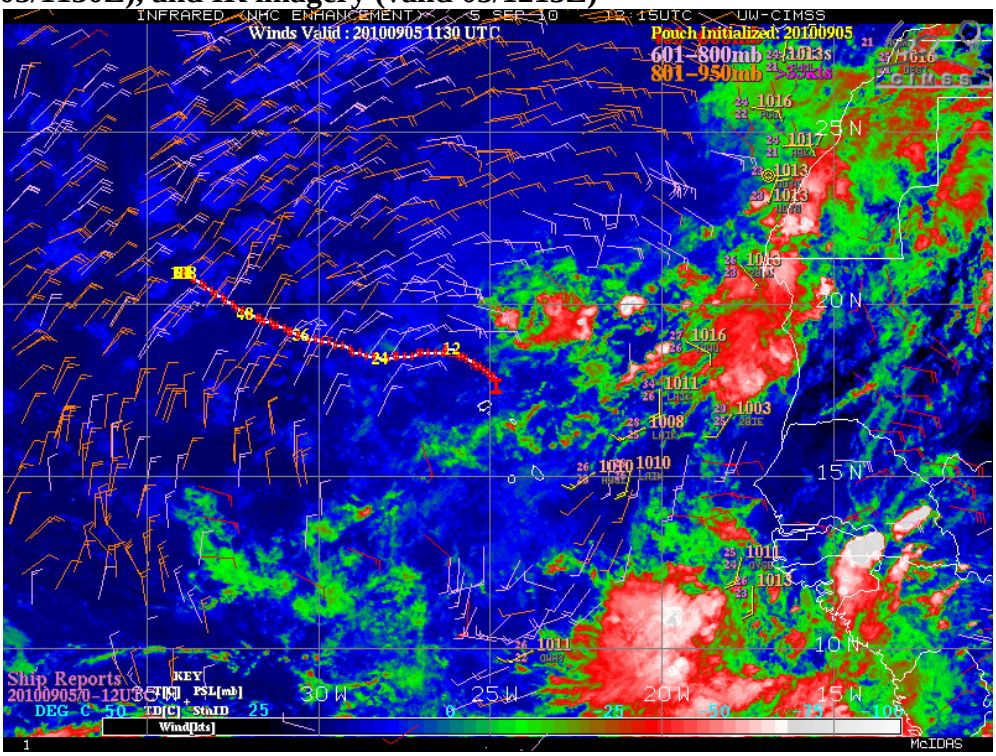
This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

G5

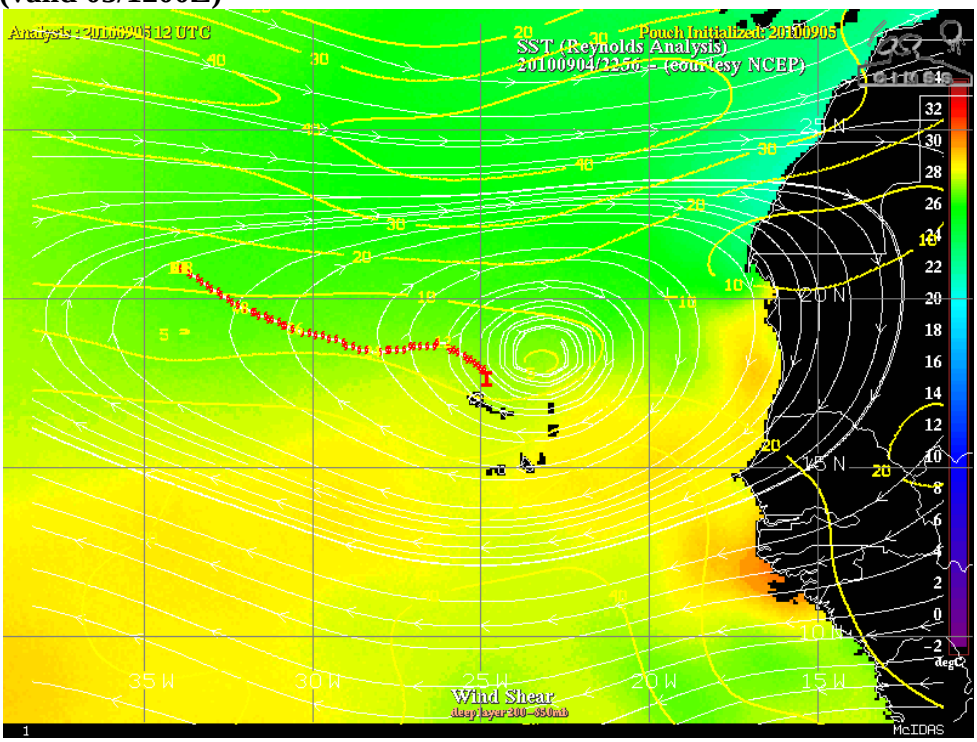


<u>PGI-39L:</u>

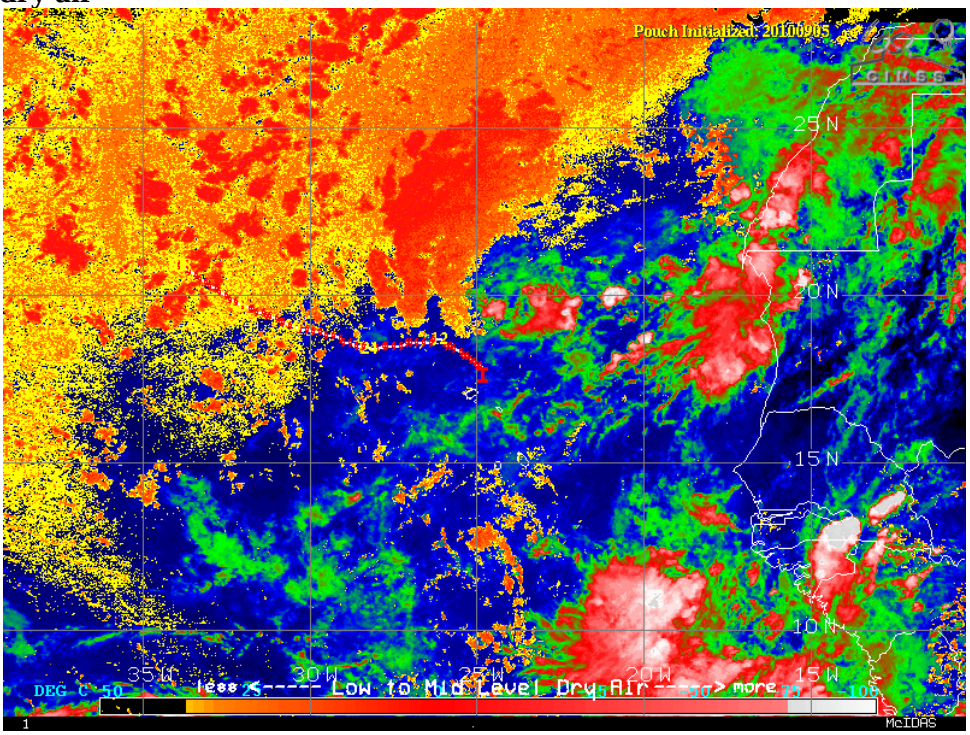
39A- CIMSS analysis with PGI-39L, satellite derived lower level winds (valid 05/1130Z), and IR imagery (valid 05/1215Z)



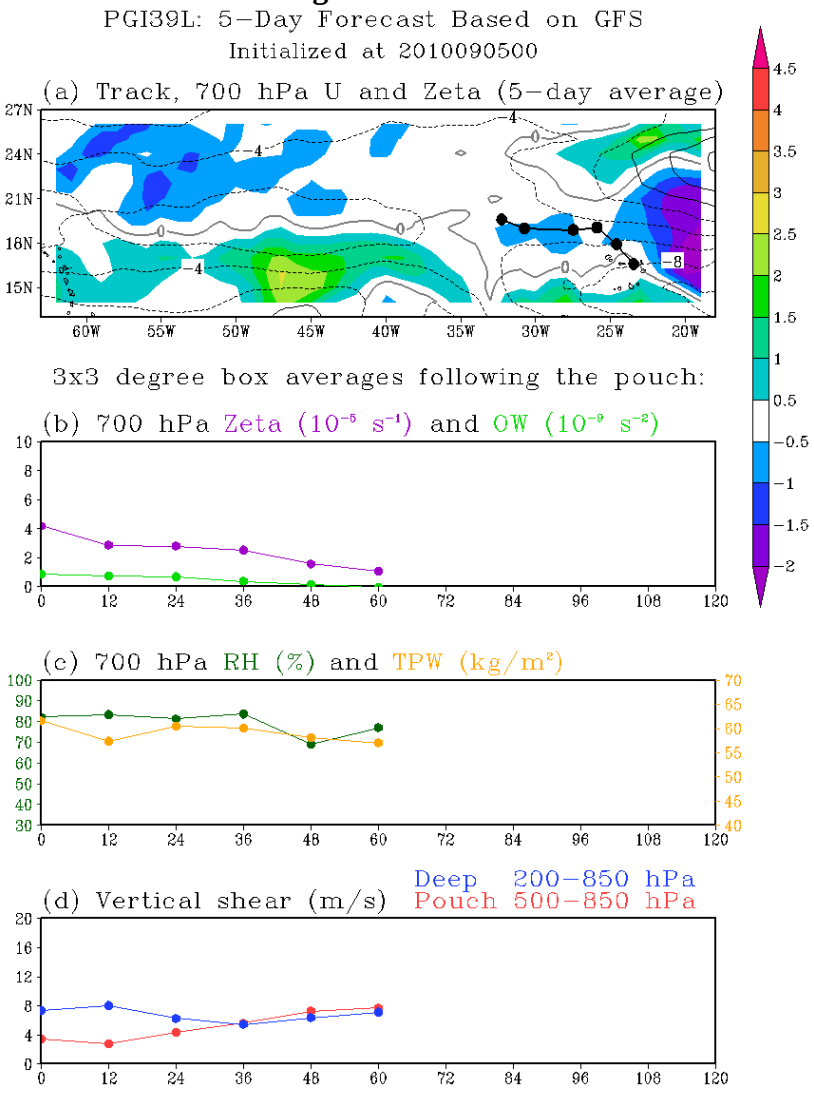
39B-CIMSS analysis of PGI-39L, SSTs (valid 04/2256Z), and vertical wind shear (valid 05/1200Z)



39C-CIMSS analysis of PGI-39L, IR imagery (valid 05/1215Z) and low to mid level dry air

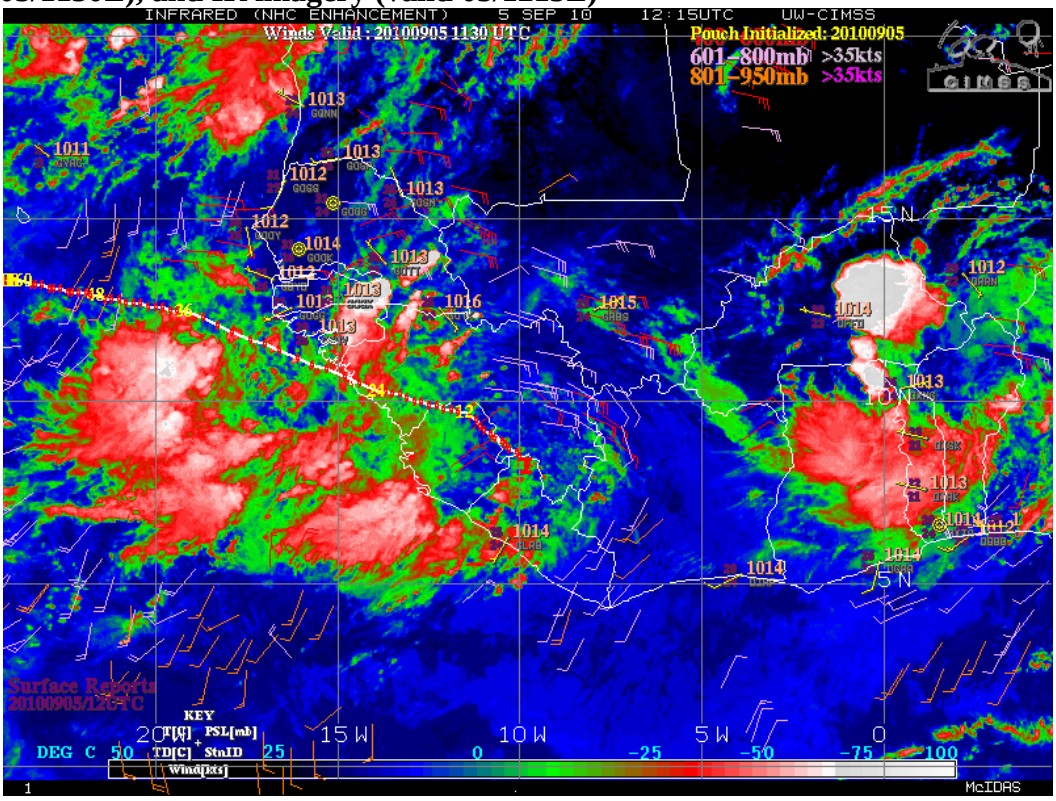


39D 09/05 GFS Pouch Diagnostics

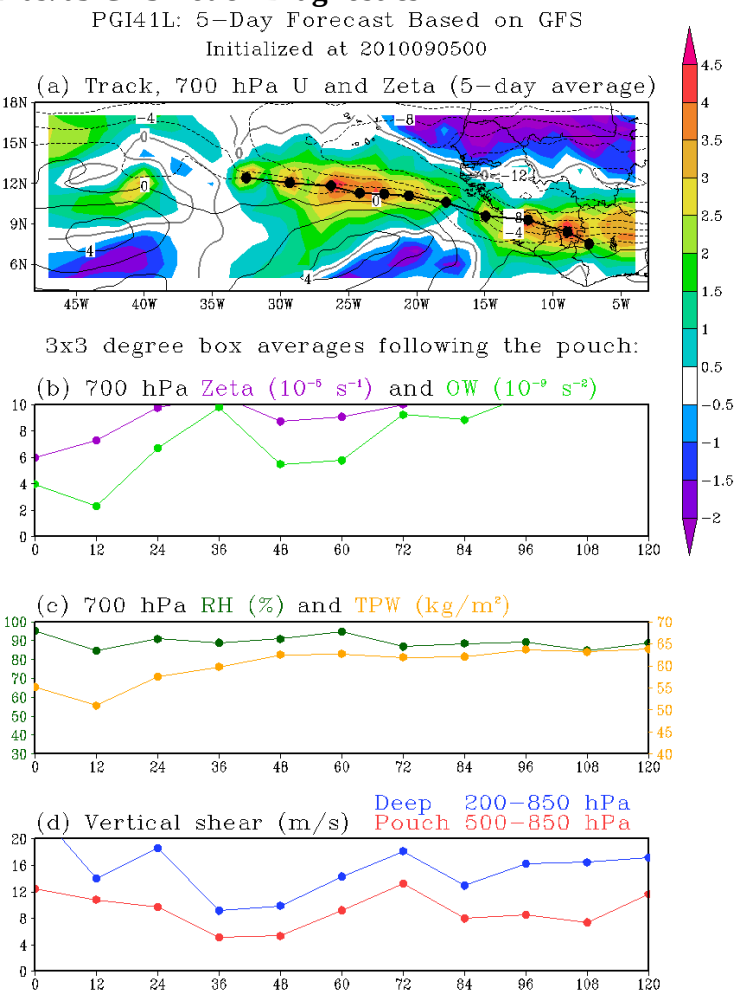


PGI-41 and PGI-42L:

41A-CIMSS analysis with PGI-41L, satellite derived lower level winds (valid 05/1130Z), and IR imagery (valid 05/1215Z)

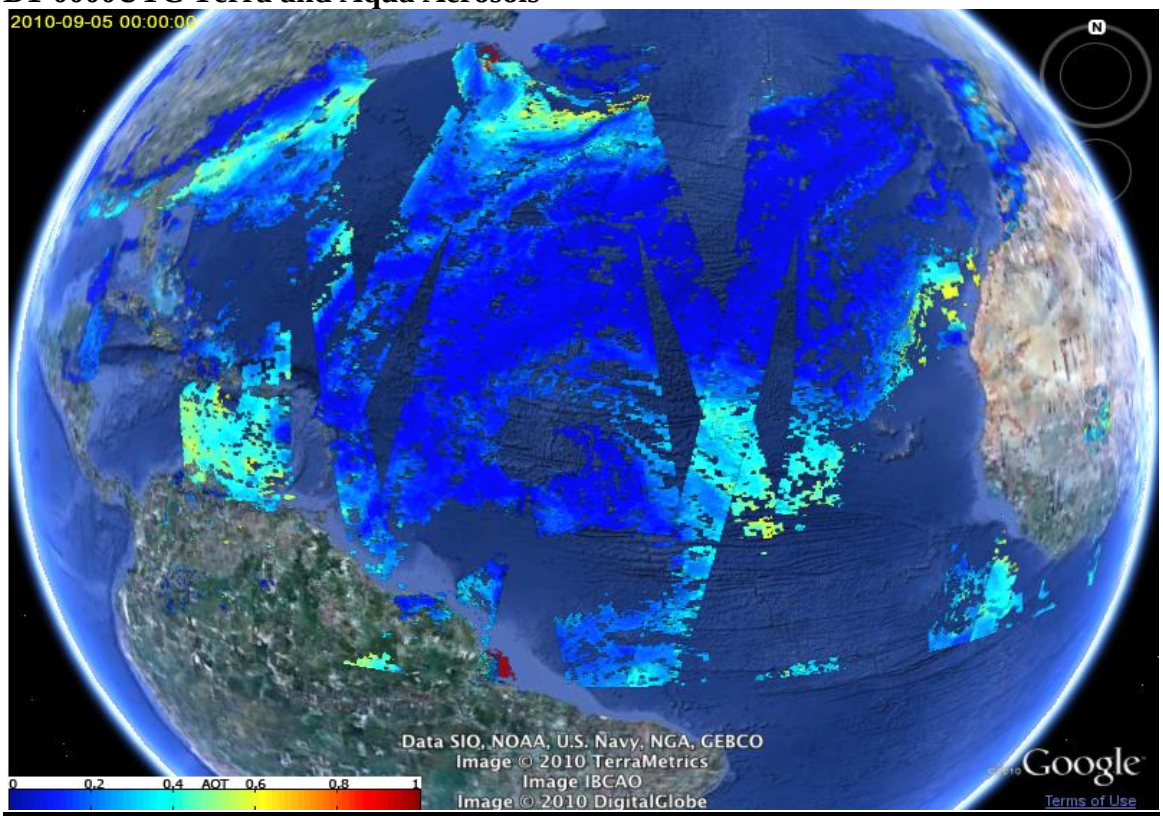


41B 09/05 GFS Pouch Diagnostics

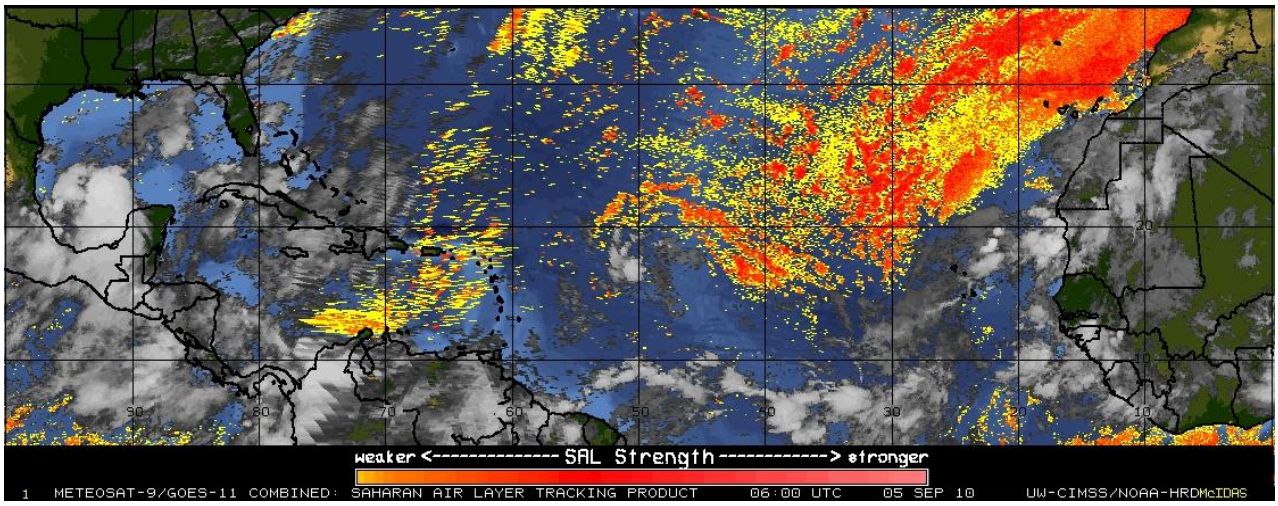


SAL:

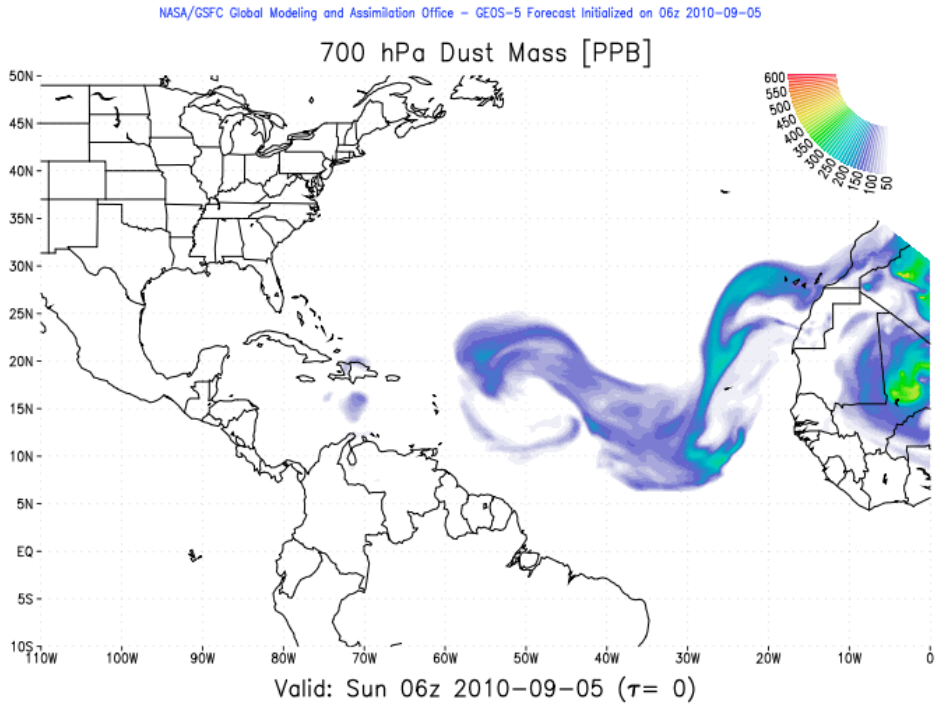
D1-0000UTC Terra and Aqua Aerosols



D2 CIMMS 0600UTC Dry Air Analysis



D3-0600UTC GOES-5 700hPa Dust Mass Analysis



D4- 0600UTC GOES-5 700hPa Dust Mass 114-hour Forecast