Tri-Agency Weather Discussion: Forecast for Tropical Area of Interest
Forecast synopsis 1600 UTC 22 August 2010
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Summary:
There are currently three features over the North Atlantic: the remnants of PGI30L over the central Atlantic, PGI31L as TD6 over the central-east Atlantic, and PGI34L over central-west Africa (Fig. 1).

1. PGI30L: Currently located at 20N/55W and moving to the west with scattered convection collocated with a low-level 925-hPa closed circulation in a moving frame. The system is expected to dissipate over the next 24–36 hours as the environment becomes more hostile. High TPW values near the center of PGI30L are expected to meridionally elongate between dry midlatitude air to the west and SAL air to the east.

2. PGI31L/TD-6: The center of circulation of the TD was located by the NHC at 1500 UTC 12.1N/34.7W with convection limited to the western portions of the circulation. Convection has been increasing near the center of the system, but other nearby convective systems have hindered much in the way of organization. Model forecasts continue to look favorably upon future development of the system, with some recent runs also giving a nod to the slower organization that is apparent in satellite imagery this morning. Forecast tracks are generally to the west-northwest through the next three days and turning more to the northwest afterward. Trends in the global models, most notably in the ECMWF, suggest a more southerly/westerly track than prior forecast cycles and perhaps more reachable by NOAA and GRIP aircraft during this extended time period. However, uncertainty in the tracks during this time period (F120hr and beyond) has greatly increased with recent model runs and this should be taken into consideration as well.

3. PGI34L: A broad vorticity maximum embedded within the ITCZ near 9N/12W this morning is forecast to migrate off the coast of Guinea in the next 12-24 hours and quickly organize, perhaps becoming an identifiable TC in the next 48 hours. Its motion, while initially westward with the trades, is likely to be influenced in a more northwesterly direction in a couple of days due to an exiting mid-latitude trough and associated PV streamer. As this extratropical system continues eastward, the forecast of PGI34L again takes on a more westerly component and travels in the wake or just to the north of the track of PGI31L/TD-6.

Discussion:
a. Synoptic
The upper-level low in the West Atlantic continues to move westward and weaken. The current location of this feature is to the north of eastern Cuba (Fig. 2a). For the time being, subtropical anticyclones dominate a majority of the North Atlantic with deep layer tropical easterlies directing PGI30L, PGI33L, and PGI34L on general west-northwest headings (Fig. 2b).

The National Hurricane Center determined PGI31L contained characteristics of a tropical depression yesterday around 5pm. A snippet from their discussion is added below

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NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL   AL062010
500 PM EDT SAT AUG 21 2010
SATELLITE IMAGES INDICATE THAT THE AREA OF LOW PRESSURE SOUTHWEST OF THE CAPE VERDE
ISLANDS HAS BECOME CONSIDERABLY BETTER ORGANIZED DURING THE PAST SEVERAL HOURS. THE LOW
APPEARS TO HAVE BECOME MORE SEPARATED FROM THE LARGE AREA OF SOUTHWESTERLY FLOW WHICH HAS
BEEN PRESENT OVER THE TROPICAL ATLANTIC FOR THE PAST SEVERAL DAYS....THOUGH IT IS STILL A
BIT ELONGATED TO THE NORTHEAST. A LONG CURVED BAND OF CONVECTION ALSO WRAPS AROUND THE
SOUTHERN AND WESTERN SEMICIRCLE. THE INITIAL INTENSITY WILL BE 25 KT...WHICH AGREES WITH
DVORAK CLASSIFICATIONS FROM TAFB/SAB OF T1.5...25 KT...AND A 25 KT ASCAT PASS FROM THIS
MORNING.
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b. PGI30L: (Fig. 3)

Computer guidance from yesterday suggested that PGI30L would continue to weaken as the environment supporting scattered convection began to become meridionally elongated between midlatitude dry air to its west and SAL air to its east. PGI30L is the Rocky Balboa of tropical wave-pouch disturbances with continued scattered convection collocated with either a) the low-level pouch or b) weak convergence along the leading edge of SAL at 14Z/22. The presence of scattered convection in the vicinity of PGI30L may suggest the presence of a low-level closed circulation in the moving frame… perhaps indicating why PGI30L remains present this morning in such a hostile environment. PGI30 continues to move westward on the northern portion of a tropical wave characterized by a northwest-to-southeast elongated a low-level relative vorticity maximum. The counter-clockwise rotation of this "wave axis" is reminiscent of an Orr mechanism, as noted by Mike Montgomery in previous discussions.

c. PGI31L:

Convective trends this morning, particularly a large burst of convection over the system's center of circulation, initially hinted that there was a respectable chance that the NHC could upgrade the system to a tropical storm later in the day. However, it did not take long for a quick burst of easterly shear to hit the new convection and expose the now-naked low-level circulation (Fig 4). This enhanced shear can be attributed to the continued convective activity associated with the vorticity that remains from PGI31L's long-dead brother, PGI33L. This MCS not far to the northeast of the system continues to inhibit the development of TD-6. Today, this disruption was also helped by outflow from a fast-moving MCS spawned by vorticity in the vicinity of PGI34L yesterday around 18Z. Because of these new inhibiting factors that were/are most likely not handled well by the models, short-term track and intensity forecasts may prove to be too far to the north and east and/or too intense. Once consolidation finishes during the next 36 or so hours and the system leaves the monsoonal-type environment, a higher degree of confidence can be placed in the NWP guidance. As of present, the main difference in the first five days between the 00Z cycles of the ECMWF and GFS resides in the differences in how the multiple monsoonal vortices are consolidated (Figs 5a,b). The ECMWF, keeping a stronger representation of 33L's vorticity, takes longer to consolidate the features and results in a weaker and more northward circulation for the first 48 hours of the forecast. By the 84 hour forecast (Figs 6a,b), both systems have the system around 20N/50W. Beyond this point, the stronger GFS vortex is more prone to recurvature and

takes a much more northerly track, far out of the range of any aircraft beyond Day 5. The still-weaker ECMWF solution contains a mid-latitude pattern that is allows the system to miss the mid-latitude feature the GFS eventually ETs the TC into and instead creates a slowly intensifying vortex that is also drifting west-northwest through the end of the forecast. While these are two perfectly plausible scenarios, not much weight can be given to them beyond five days due to the dramatic increase in ensemble spread at this forecast range (Fig 8). As previously mentioned, one can hope that this spread is reduced by the consolidation of the system during the next 24-48 hours.

d. PGI34L:

Currently located somewhere near the border of Mali and Guinea, a large area of relative vorticity is expected to continue eastward and reach the sea by tomorrow morning, where most of the NWP guidance continue it out to sea with a large region of low-level vorticity and well-established outflow channels (Fig 9). As such, both the GFS ad ECMWF consolidate the system with relative haste and develop what appears to be a TC that moves parallel to the African coast past Dakar and continues northwest during the day Tuesday. While the GFS is very quickly to develop gale-force winds with the system, the ECMWF is again a bit slower with the development and this appears the more likely solution as the recent evolution of PGI31L has shown. Regardless, the tracks are remarkably similar through Day 8 (00Z/30) and the positions are never more than about 150km apart (near or just north of 20N/50W by 00Z/30) (Figs 7a,b, and Fig 10). If this wave proves to be less developed it could be of interest to and within range of PREDICT, and will likely be of interest to NOAA during their deployment to Barbados if current forecasts hold steady or trend southward.

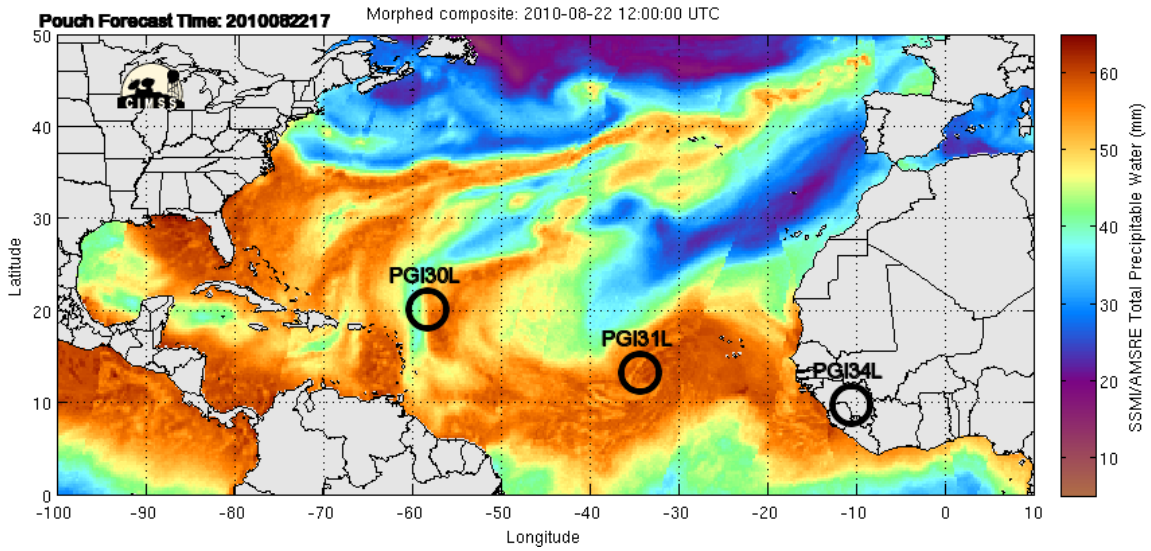


Fig. 1

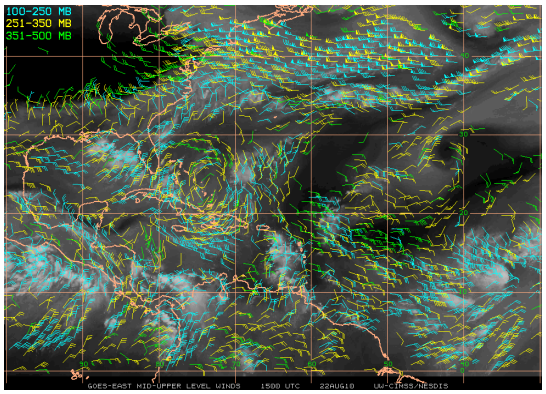


Fig. 2a

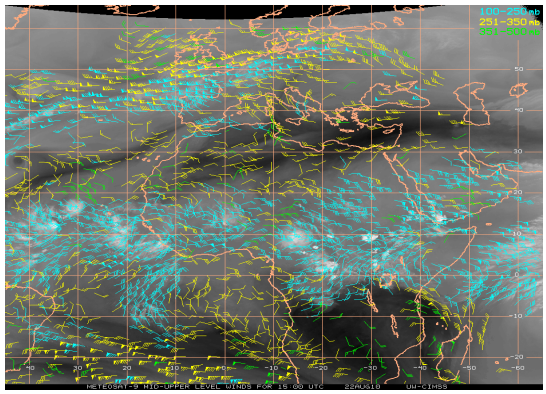


Fig. 2b

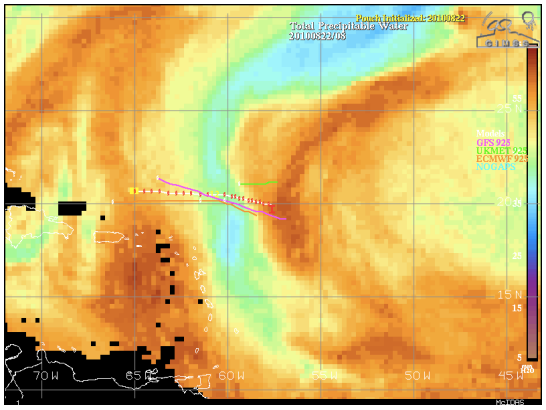


Fig. 3a. TPW and Tracks.

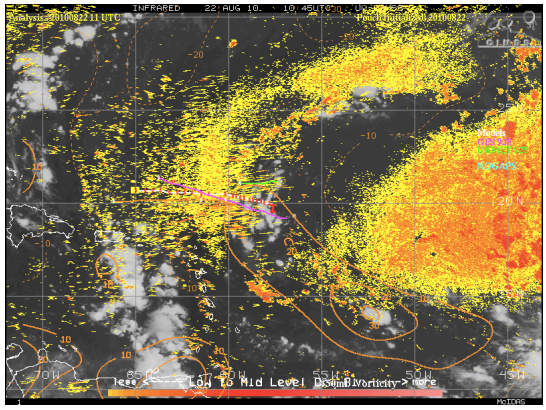


Fig. 3b. SAL, low-level relative vort, IR

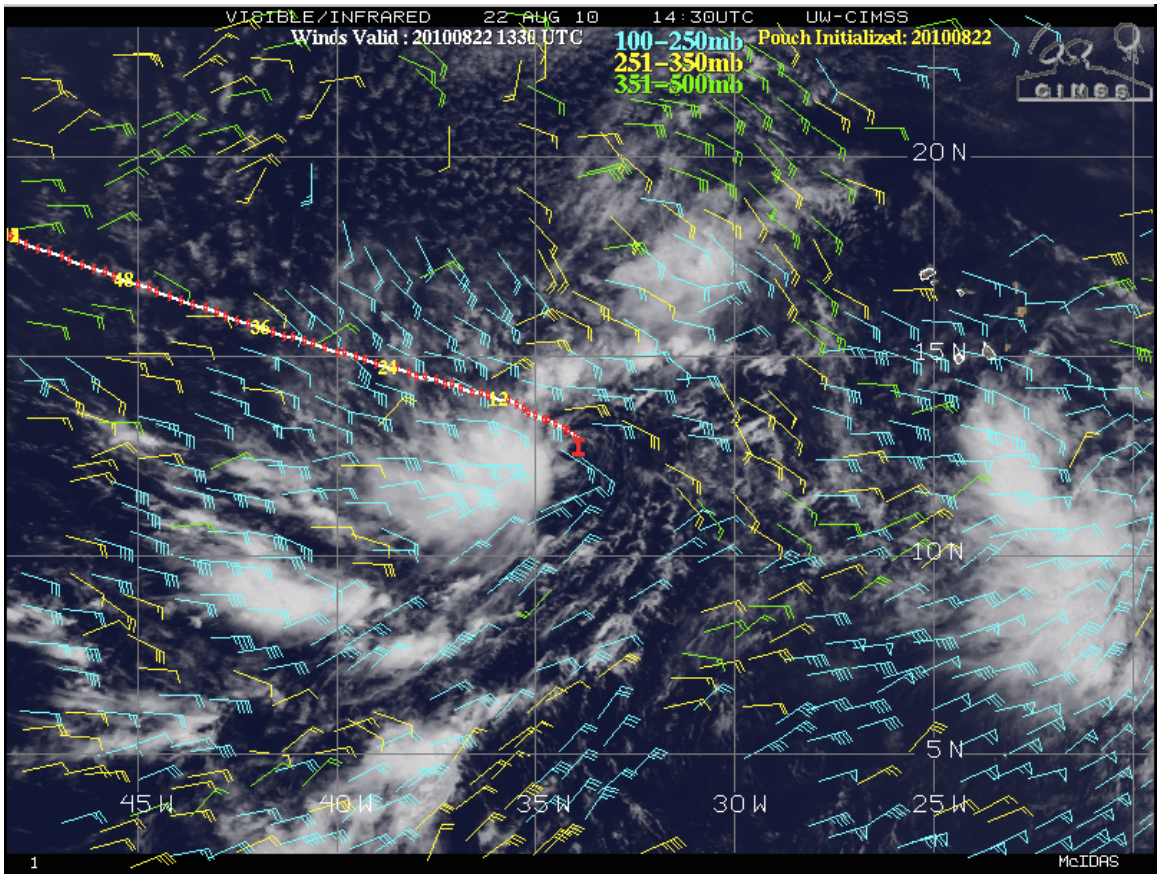
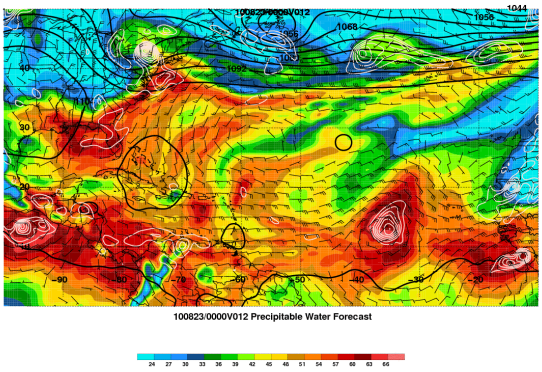


Fig. 4: *Visible imagery from 1430 UTC with CIMSS derived upper-level winds with pouch position and consensus forecast track*



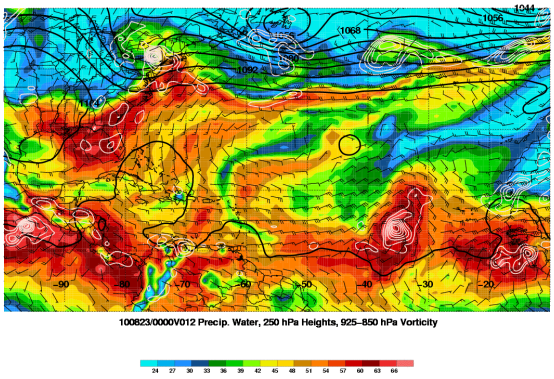


Fig 5a: *GFS 12hr forecast of PW, 700 winds* Fig 5b: *As in 5a, from the ECMWF 250 heights, 925-850 rel. vorticity*

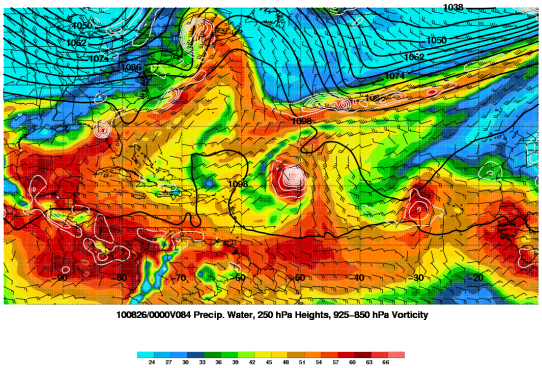


Fig 6a: *As in Fig 5a, from GFS 84hr forecast*

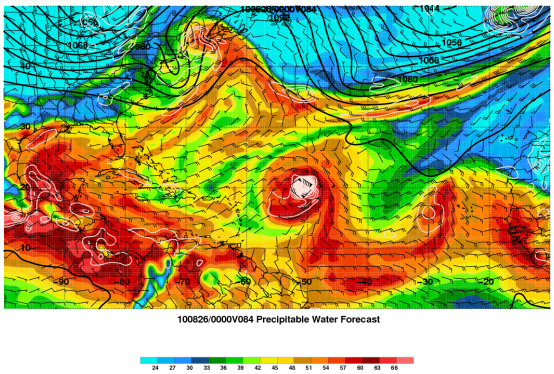


Fig 6b: *As in 6a, from the ECMWF*

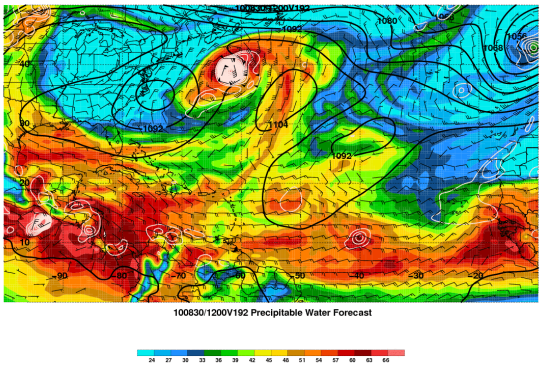


Fig 7a: *As in Fig 5a, from GFS 192hr forecast*

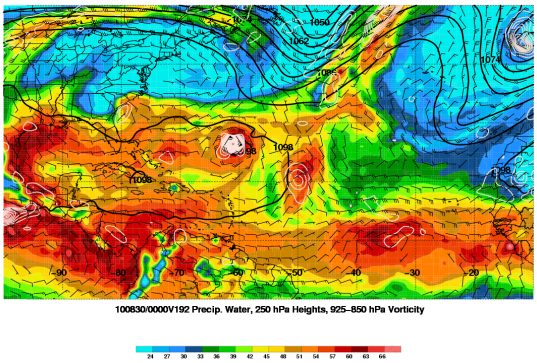


Fig 7b: *As in 7a, from the ECMWF*

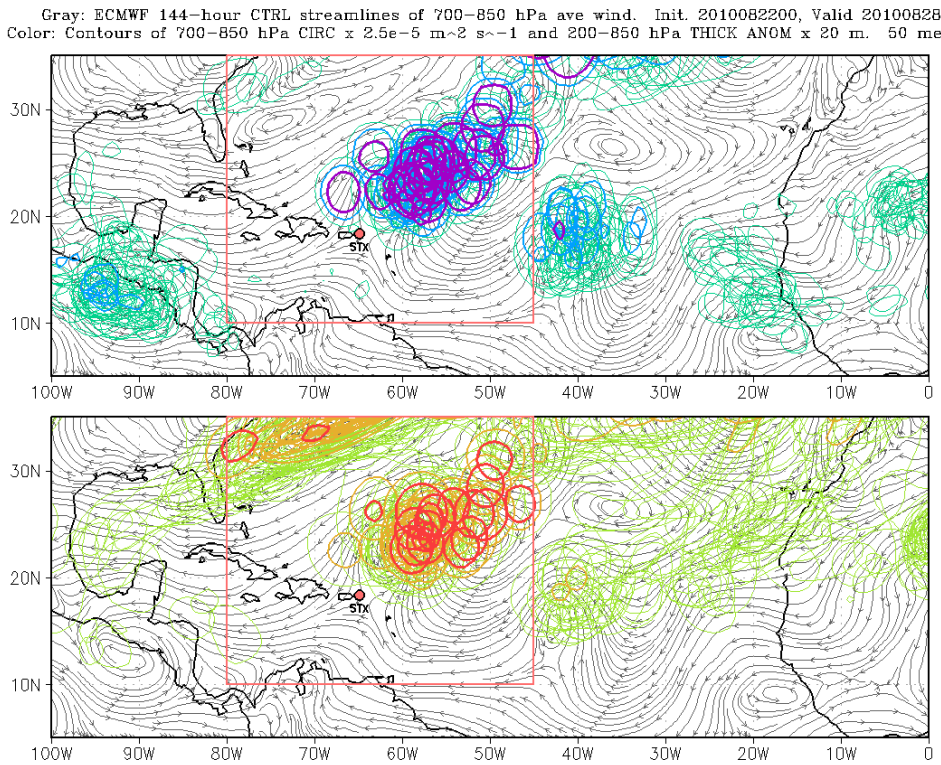


Fig. 8: *00Z ECMWF Ensembles Circulation (top) and Thickness Anamoly (bottom), for forecast hour F144*

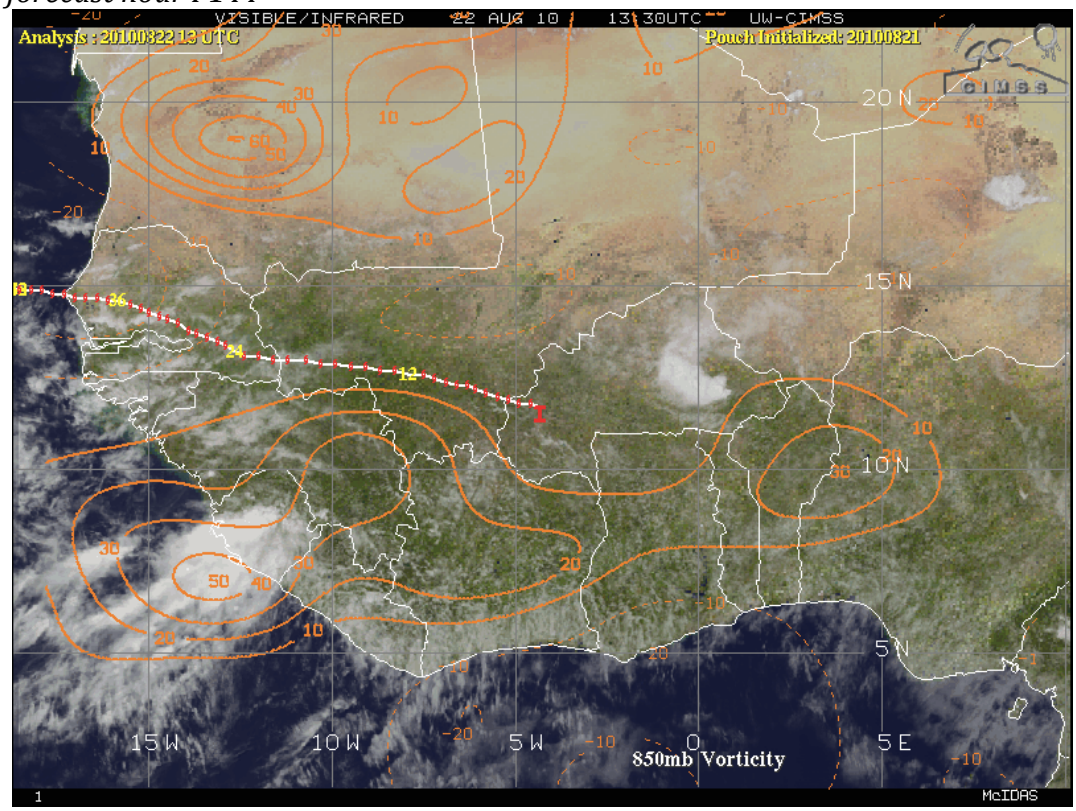


Fig 9: *Visible imagery for PGI34L with overlaid low-level relative vorticity. Pouch location and track are from previous day (21 Aug) and are not accurate.*

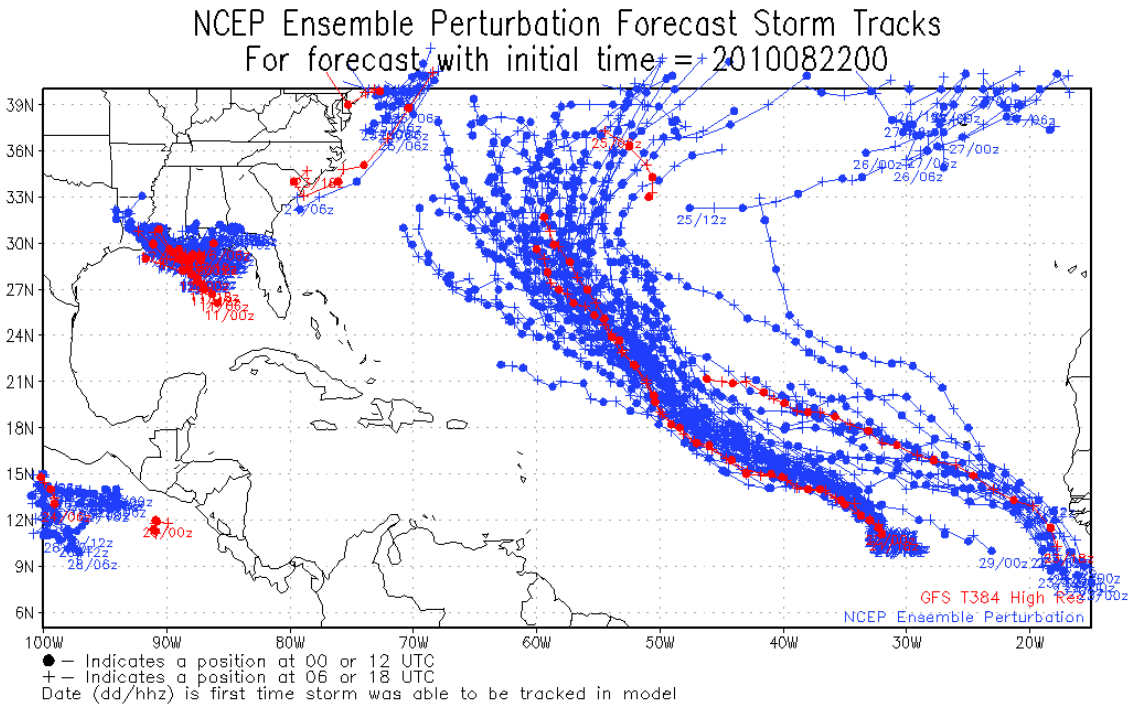


Fig 10. *00Z GFS Ensemble storm tracks, showing both the tracks of PGI31L/TD-6 and the storm forecast to form from PGI34L (farther right/east set of tracks)*