

## Tropical Forecast Discussion for September 21, 2010

### Synoptic Overview:

At 1500UTC, 21 September, there were a total of 4 tropical cyclones and tropical disturbances in the Atlantic Basin. Hurricane Igor, a long-lived, large hurricane, was in the western North Atlantic and newly formed TS Lisa (PGI45L) was in the south-central Atlantic. Just north of the ITCZ, two invest areas were identified: PGI46L centered just west of Barbados and PGI47L that had emerged from west coast of Africa. (Figs 1 and 2) PGI46L was also identified by NHC as a wave that had potential to undergo genesis and classified it as an invest, AL95. At the time of the forecast discussion, NHC gave AL95 a 20% chance of developing over the next 48 hours but increased that probability to 50% a couple of hours later. Synoptic features included a ridge located over the Mid-Atlantic U.S. and extending westward across the Gulf of Mexico, A broad and moderately-strong ridge of high pressure from the far eastern to mid-Atlantic basin, and a broad trough of low pressure that extended several hundred miles off of the NE U.S. and became a very narrow trough extending to the deep tropics south of Cuba. The trough off of the east

Fig. 1: Surface synoptic analysis of the Atlantic basin at 1500 UTC 21 September.

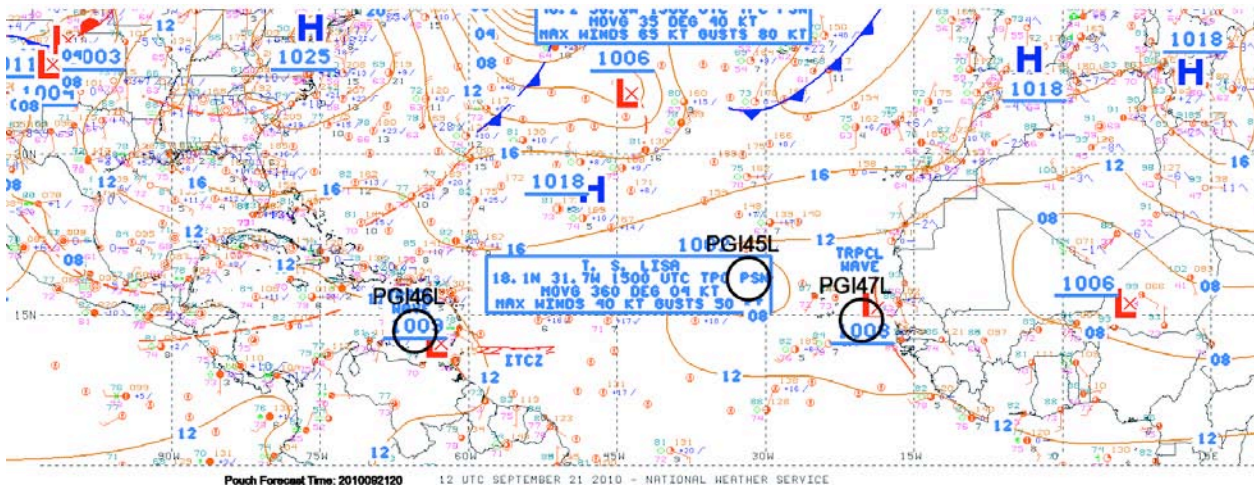
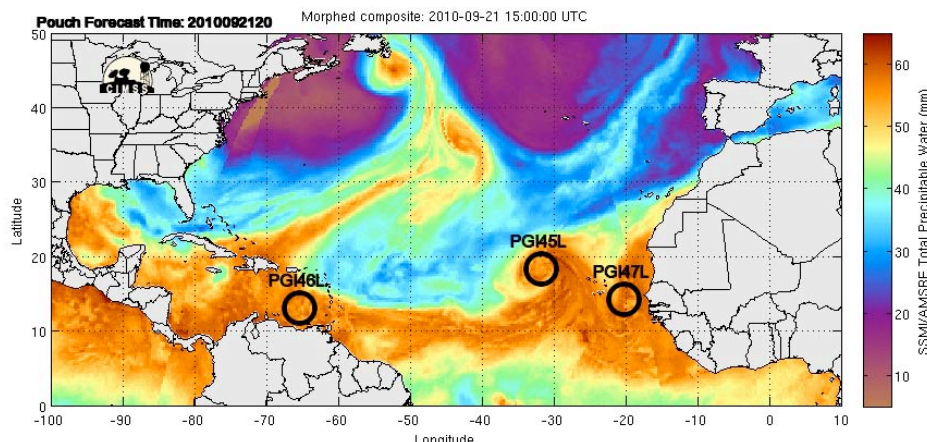


Fig 2: TPW imagery and location of the 3 PREDICT invest areas for 21 September.



coast of U.S. was responsible for steering and accelerating Igor northward while the ridge across most of the rest of the Atlantic caused the invest areas to move to the west or WNW.

The discussion also included newly formed TS Georgette in the EPAC, just south of the Baha Peninsula. As mentioned in the discussion yesterday, Georgette appeared to have formed, at least partially, from the remains of Karl in the Gulf of Mexico after traversing Mexico.

#### Eastern Pacific Tropical Storm Georgette:

The vigorous tropical low that was located very near the southern tip of the Baha peninsula was upgraded to Tropical Storm Georgette at 1200 UTC. Visible satellite imagery (Fig. 3) showed a mesoscale burst of convection near its center. Georgette would be short-lived and probably would not get any stronger as it was moving north and was expected to make landfall on the Baja peninsula within hours (Fig. 4).

Fig. 3: Visible satellite image of EPAC Tropical Storm Georgette.

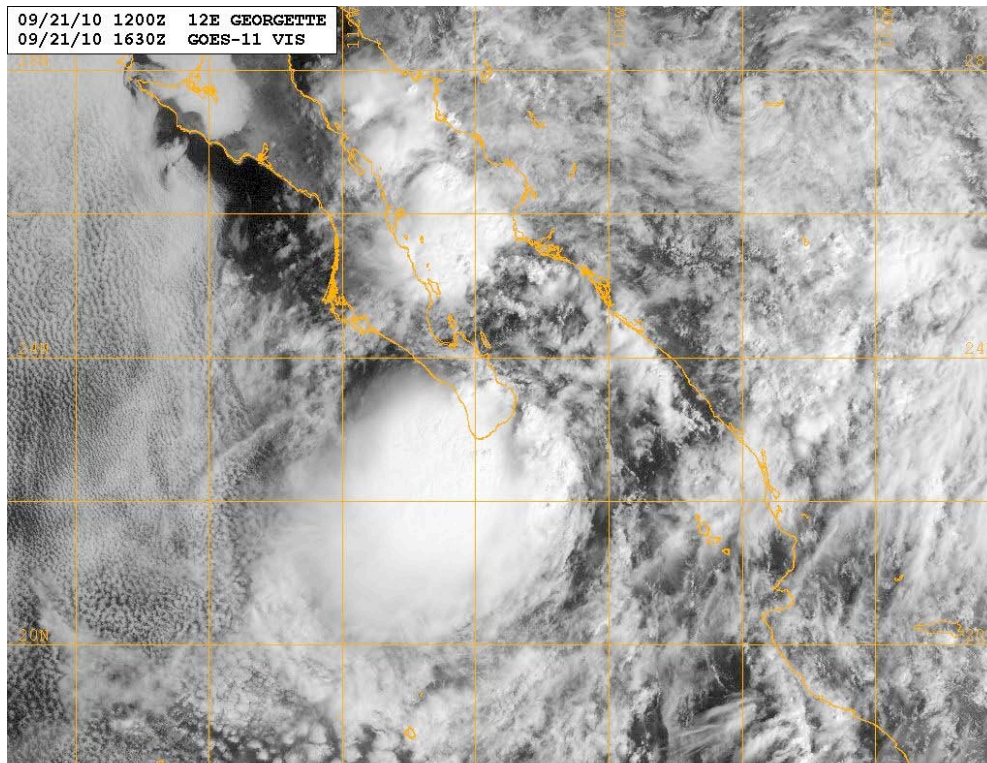
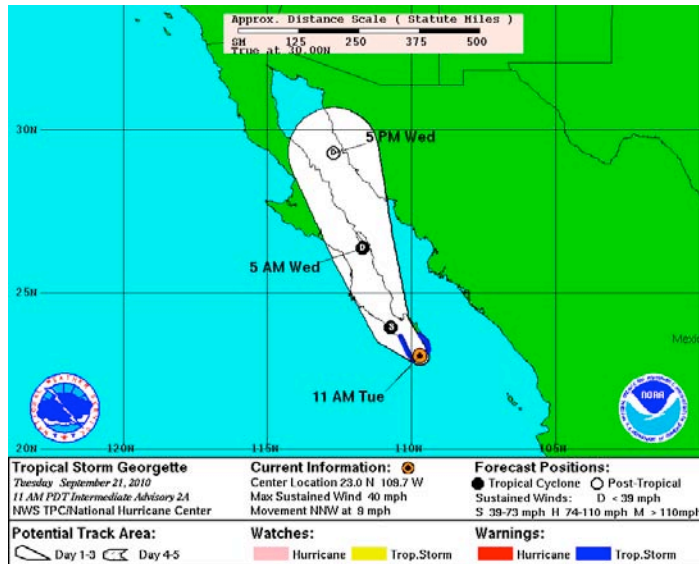


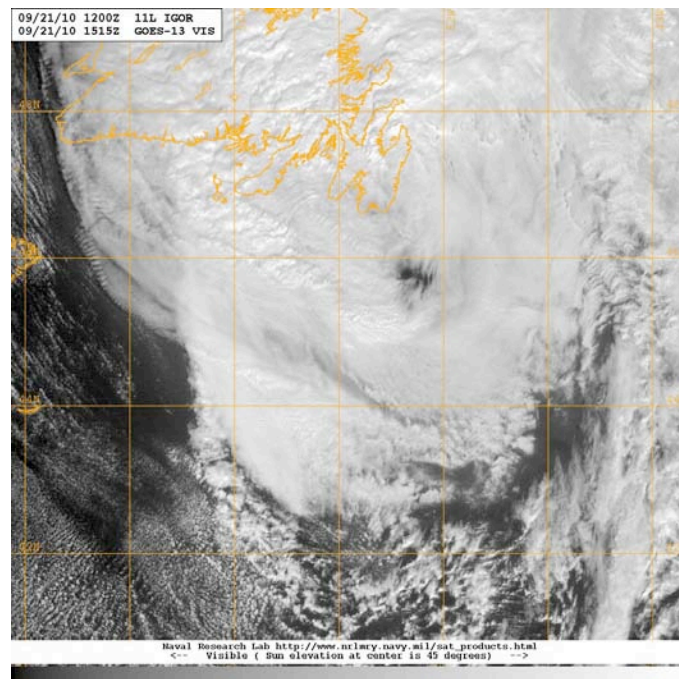
Fig. 4: NHC official forecast track for TS Georgette.



### Hurricane Igor:

NHC has been writing advisories for Hurricane Igor for nearly two weeks, and Igor was a large storm that was a major hurricane for nearly a week as it traversed westward across the Atlantic. The storm recurved ahead of a large mid-latitude trough and was now located in the far NW Atlantic, just south of Newfoundland, and accelerating further northward. Igor's intensity was now down to a Category 1 hurricane and was undergoing extra-tropical transition and would complete that process within about 12 hours.

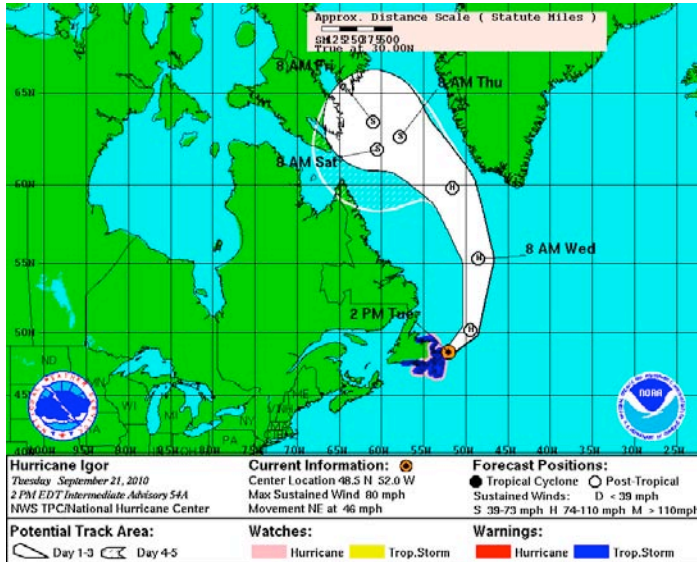
Fig. 5: Visible Satellite image of Hurricane Igor



Although the cloud shield was massive (Fig. 5.), there was very little in the way of deep

convection. Igor was expected to impact Newfoundland with winds up to hurricane force and to track northeastward, northward and, finally, northwestward through the Labrador Sea and Baffin Bay (Fig. 6).

Fig. 6: NHC official 5-day track forecast for Hurricane Igor



Tropical Storm Lisa:

PGI45L, which had a well-defined circulation center on 20 September, was upgraded to a depression at 0300 UTC and to Tropical Storm Lisa at 0900 UTC. Lisa was experiencing some moderate wind shear but was still producing some areas of moderate convection near its center (Fig. 7).

Fig. 7: Visible imagery of Tropical Storm Lisa.

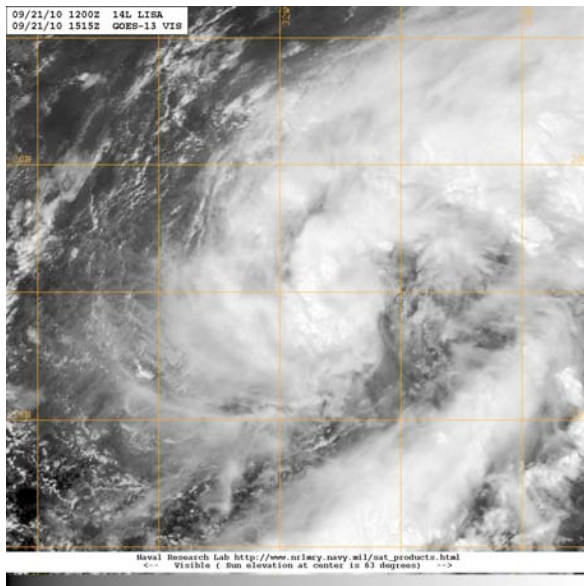
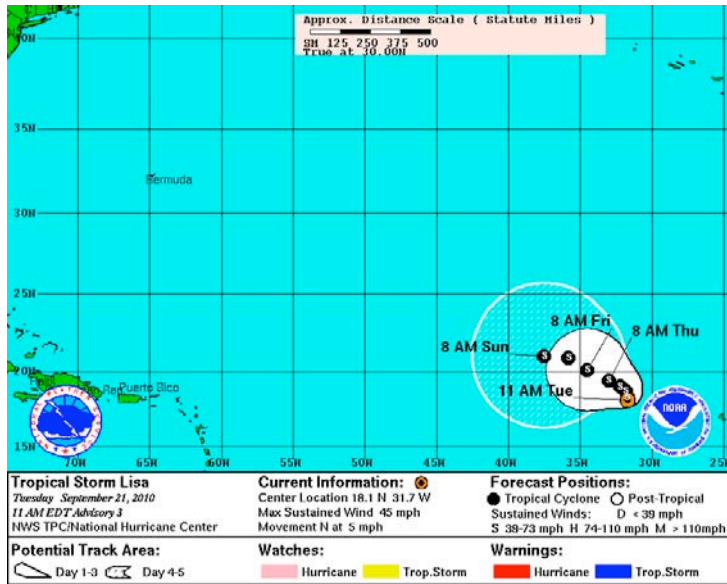


Fig. 8: NHC official 5-day track forecast for TS Lisa.

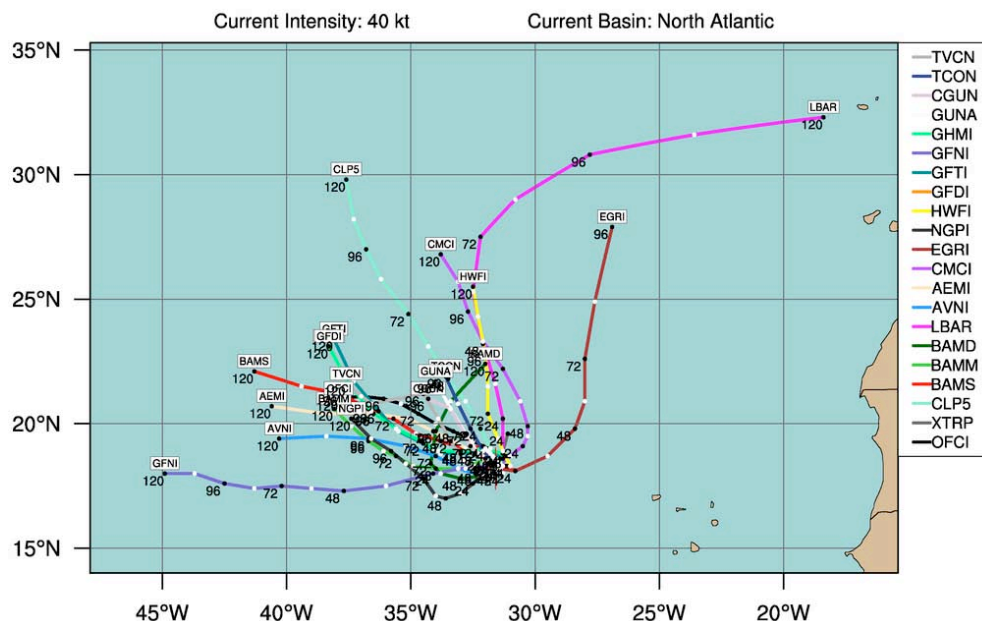


Lisa was imbedded within weak steering currents and was forecast to move slowly WNW or even drift near its current position for several days (Fig.8). The motion in the longer turn was even more uncertain as the model guidance showed a variety of paths that Lisa may take (Fig. 9), depending on the exact timing of approaching troughs and the strength (or lack thereof) of the mid-Atlantic ridge. The NHC official intensity forecast and numerical and statistical intensity guidance (not shown) indicated only moderate strengthening over the next several days to a strong TS or weak hurricane.

Fig. 9: Numerical track guidance for TS Lisa issued at 18000 UTC

## TROPICAL STORM LISA (AL14)

Early-cycle track guidance valid 1800 UTC, 21 September 2010



This plot does not display official storm information. Use for information purposes only.  
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PGI47L:

PGI47L was only briefly mentioned during the webinar as it was split into northern and southern portions both of which were difficult to track in the numerical model fields and, thus it was unlikely that this system would develop over the next several days.

PGI46L:

The main area of interest for the tri-agency field campaigns was PGI46L, located in the Easter Carribean and moving steadily westward. Environmental conditions (warm SST, low shear) favor development of this system, but a lack of organization of this system might preclude any development in the short term. The system originated a few days ago from a “roll-up” of the ITCZ in the central Atlantic. Compared to yesterday, the system was a little more organized but still consisted of scattered clusters of convection that was somewhat evident on visible satellite imagery (Fig. 10) but was much more apparent with microwave satellite imagery (Fig. 11).

Fig. 10 Visible satellite image of PGI46L/AL95

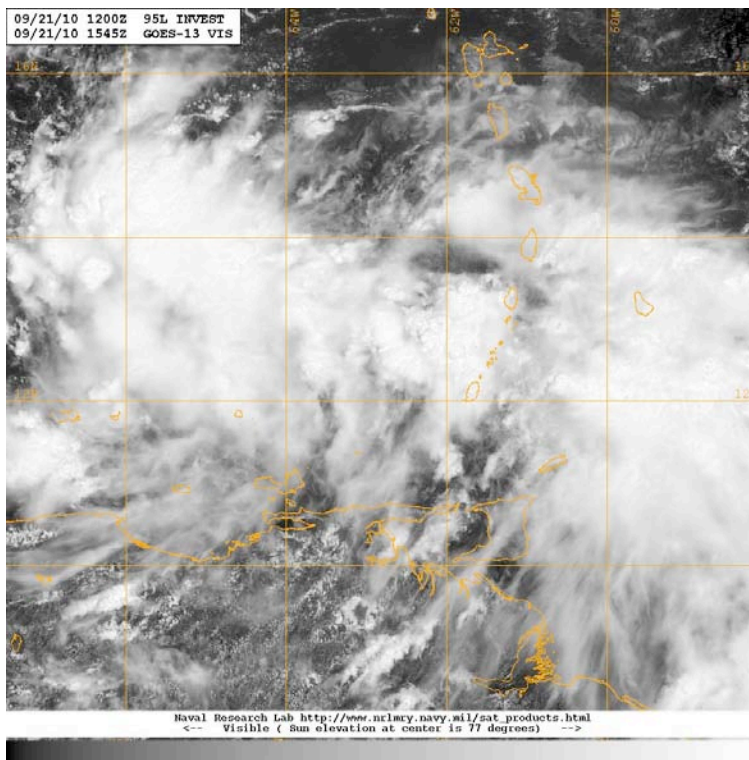
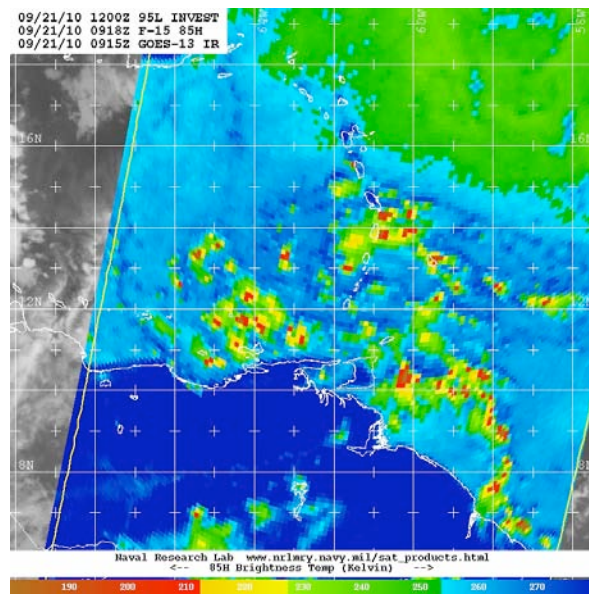


Fig. 11: 85GHz microwave satellite image of PGI46L/AL95

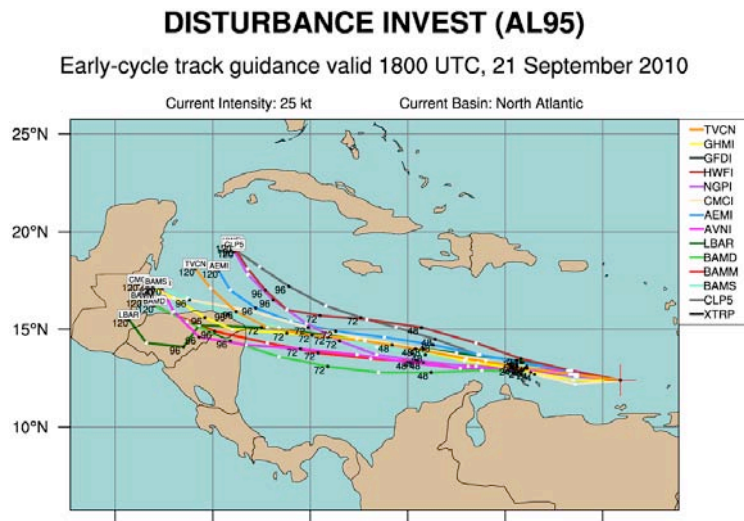


PREDICT conducted a survey pattern within PGI46L on 20 September and were flying another mission today, although the 9/21 flight could not sample the main area of the wave due to air traffic restrictions. The NASA DC8 was also flying a survey pattern today that would cover areas that the GV could not operate in. Dropsonde observations from the 20 Sep flight showed a weak but discernable trough axis located along  $55^{\circ}$  W, weak southerly flow along the southern periphery and stronger easterly flow within the middle portions of the wave (Fig. 12). Individual dropsonde profiles (not shown) were all fairly moist except for a couple in the far NW part of the wave that seemed to be imbedded in SAL air to the north and NE of PGI46L. The profiles also showed that the wind speed and direction was, for the most part fairly unidirectional with height and without any noticeable jet that might hinder development.

Fig.12: GPS dropsonde wind observations at 925 mb from the NCAR GV flight on 20 September.



Fig. 13: Model track forecast guidance for PGI46L/AL95.



Model guidance was uniformly westward over the next several days with the likelihood that AL95 would be located near the NE coast of Honduras in 4 days (Fig.13). Most of the guidance showed that AL95 would begin to slow after 4 days and that the system could either stall in the Western Caribbean or move northward in the Gulf of Mexico. One example of these possibilities is shown by the GFS ensemble track forecasts (Fig. 14)

Fig. 14: GFS ensemble track guidance for PGI46L/AL95

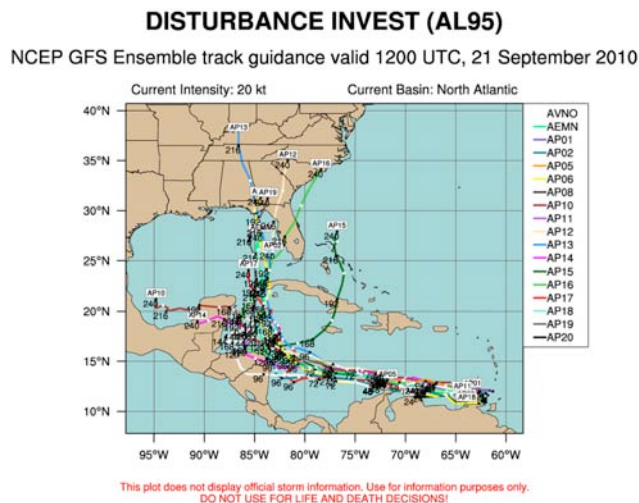
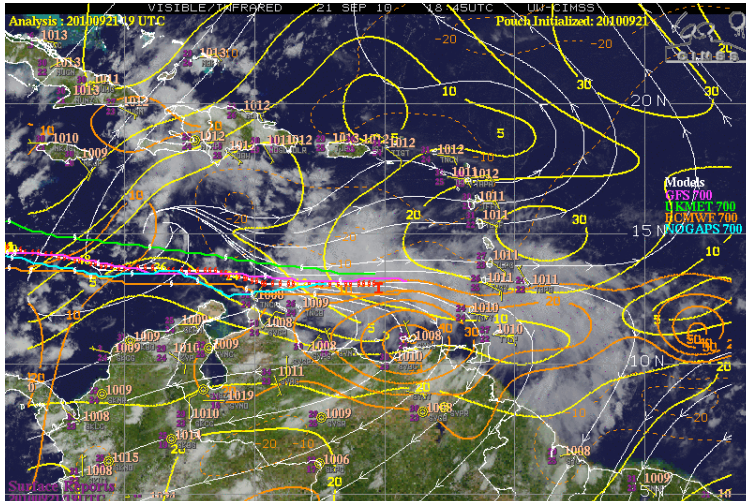


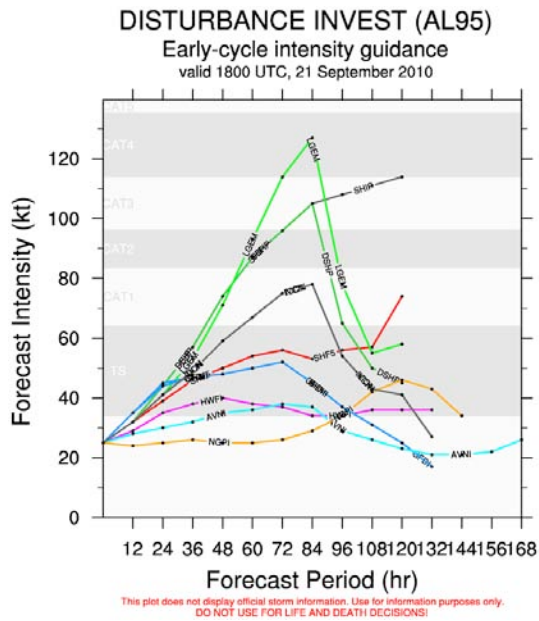


Fig. 15: CIMMS analyses of vorticity, shear, and pouch forecast tracks of PGI46L



Environmental conditions appeared to be favorable for development into a tropical cyclone over the next few days. Vorticity values were higher than the day before and were not as elongated but there were still two distinct areas as analyzed by CIMMS (Fig. 15). Shear values were low-moderate and SSTs, and the upper –level wind field (not shown) were also conducive for development.

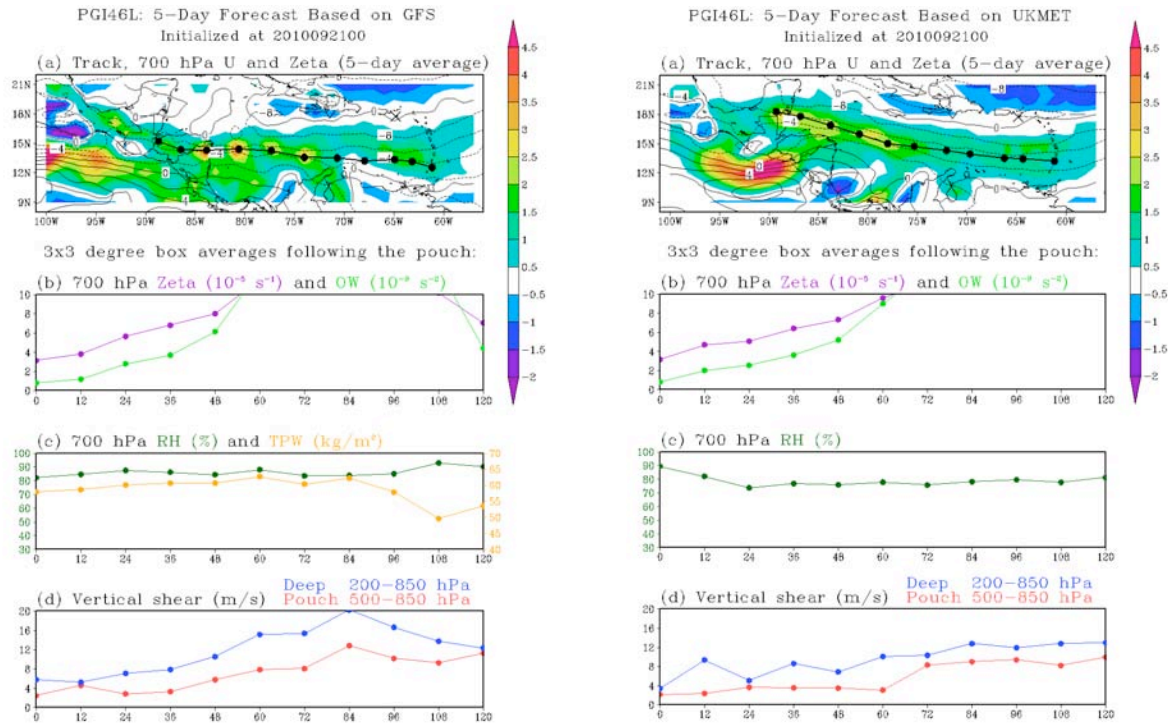
Fig. 16: Intensity forecast guidance for PGI46L/AL95



Intensity guidance, both statistical and dynamical (Fig. 16), was very aggressive with PGI46L/AL95, with SHIPS taking the system up to about 115 kt in 5 days. It should be noted, however, that the statistical guidance assumes that the system is already at depression stage so that the actual high rate of intensification would not likely to occur until the system develops a closed circulation with organized convection.

Fig.17: Pouch diagnostics based on GFS

Pouch diagnostics based on UKMET



Time series of the pouch diagnostics based on the GFS and UKMET global models (Fig. 17) both showed favorable conditions and a likelihood of development within a few days. Vorticity and the OW parameter were increasing steadily and toward very high values with time, moisture remained high throughout the 5-day forecast, and shear remained low to moderate, except for the 60-96 hr forecast time in the GFS product.

The ECMWF and GFS ensemble genesis products (not shown) indicate that genesis is a high probability and that could occur anytime between 36 and 120 hours and anywhere from the central Caribbean to the southern Gulf of Mexico.

The forecast given by the presenter of this discussion believes that PGI46L/AL95 needs more time to become organized and to coalesce the vorticity and convection before genesis occurs. This would most likely happen in the 48-72-hr forecast time. Once developed, however, the system could quickly gain strength into a hurricane, providing it stays over water in the western Caribbean

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