TRI-AGENCY FORECAST DISCUSSION FOR JULY 21, 2010

Tropical Areas of Interest Discussion: Created 1800 UTC July 21, 2010

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Summary: There are three tropical waves in the Atlantic and Caribbean areas being monitored by PREDICT/GRIP/IFEX. Consistent with yesterday's operations, the PREDICT/GRIP/IFEX teams are focused on PGI17L/AL97 for potential missions. PGI17L (hereafter referred to as AL97) carries a 50% probability for development into a tropical cyclone within the next 48 hours according to the National Hurricane Center. Since yesterday, an interesting shift in the environmental conditions for PGI17L/AL97 has occurred, resulting in a slower forecast for development of the system. The environment is not conducive for development within the next 24 hours due to a cold core upper level low pressure system causing high shear to the north and east of the approximate location of AL97. Model intensity forecasts for AL97 have decreased since yesterday afternoon with the developing storm not expected to intensify beyond tropical storm strength. Track guidance still takes the resulting system on a northwest heading before landfall anywhere between Key West and Port St Lucie, FL. Some models take the system into the FL straights and then on into the Gulf of Mexico, whereas others track it further north over Florida and do not redevelop the system due to a very brief stint in the Gulf. In any case, PGI17L will have to be monitored closely, as well its dominant influencer: the upper level low to the NW, which has been causing a large region of high shear. GRIP and IFEX are planning flight operations into AL97 for both this afternoon and tomorrow morning.

Forecast: 1800 UTC July 21, 2010

In the GRIP/IFEX/PREDICT domains today there are several noticeable features, including the invest we have been following for several days, PGI17L (see A.). The bulk of this discussion will focus on invest AL97/PGI17L.

As of the 12Z unified surface analysis from the Tropical Prediction Center (see A.), the easternmost wave is located near 34W from 15N to 7N. This wave is known as PGI18L and has been producing widespread shower activity embedded within the ITCZ. PGI18L has produced convection since emerging from Africa, and continues to show good organization evident in the stratocumulus organized in a classical easterly wave pattern. PGI18L could eventually become a system of interest as it moves into the mission domain in several days. PGI17L was once associated with one of two tropical waves in the Caribbean, but has since separated from the westernmost wave. The westernmost wave is located near 74W from 19N to 8N. This wave used to contain PGI17L which was later named Invest AL97 by NHC. This wave is no longer producing much convective activity and except for a thin band of showers near Jamaica is located within a very dry sector of the north and central Caribbean. This can be seen in satellite imagery (see first image in B.) There are two upper-level low pressure systems of note in the Western Atlantic and Gulf of Mexico. The first is located over the western Gulf near 95W/25N according to CIMSS satellite winds analysis (see D.). The second is located over 73W/25N near the Bahamas. This intense upper-level low is of particular interest to mission activities due to its interaction with AL97 and its associated upper level confluence (see D and F.), which has resulted in sinking motion over Cuba, the Bahamas and S.
Florida (See GOES-E water vapor image). Also of note is a large high-pressure ridge over the north Atlantic which has weakened in intensity slightly from yesterday to a max surface pressure of 1028 hPa (see A.) but has extended further westward toward the US East Coast.

AL97 continues to be a monitored area for TC development by the NHC. The NHC downgraded the potential for TC development for the next 48 hours from 60% to 50% as of 1805 UTC. This system has undergone a transformation since yesterday. The tropical wave which spawned AL97 has since separated from the major convection, moving west while the fledgling system has remained near a surface trough, analyzed at 1200 UTC, running through eastern Hispaniola. Convective activity became less organized overnight, possibly due to the influence of the nearby upper level cold low. In addition, the vorticity analyses from CIMSS (see E.) show that vorticity maxima at various levels are now tilted with height towards the upper low to the northwest of AL97. This is in contrast to 24 hours ago, when vorticity at the mid and low levels was stacked vertically. AL97 is still very near a region of high deep-layer shear, (see D.) and while no closed surface circulation has been observed thus far, it is likely that AL97 is located in the region of high shear gradient near the southeastern tip of the Dominican Republic. The 1200 UTC sounding from the Dominican Republic shows the various directions of winds throughout the layers (see C.). The unfavorable upper level winds, the shear created by its proximity to the upper level low, the system's interaction with the mountainous landmass of Hispaniola, and dry Saharan Air at mid levels to the West and North of the system are all limiting factors for the development potential of AL97 at this time.

Model track guidance for AL97 (See G and H.) has changed slightly over the last 24 hours, with most models trending toward a more southern track. Pouch tracking from the NRL group shows high deep shear, and a steady weakening of AL97's vorticity after 48 hours from both GFS and NOGAPS model forecasts (see I.). Model intensity forecasts have decreased significantly since yesterday as well. The bulk of the models have AL97 briefly gaining tropical storm status, before dissipating beyond 60 hours. Of note is the fact that there is disagreement between the dynamical models, which dissipate AL97 rather quickly, and the statistical and hybrid statistical-dynamical models. Some of the latter models persist AL97 as a tropical storm out to 120 hours. (See H.) The 1200 UTC GFS forecast suggests that the upper-level cold low which is limiting development of AL97 will remain strong and move west-northwestward over the next several days (see G.). If current track guidance for AL97 and the TUTT holds, shear over AL97 may weaken and become southeasterly, which should be more conducive to development. Flights are currently planned to AL97 by the NOAA P3 and GIV, as well as by the NASA DC-8. The system will be closely monitored, but is not expected to develop into a TC within the next 24 hours.

See links to products used in discussion:

A) Tropical Surface Analysis (12 UTC) [http://www.opc.ncep.noaa.gov/UA/Atl_Tropics.gif]

C) 1200 UTC sounding from the Dominican Republic

D) 1500 UTC Shear from CIMSS: [http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=shr&zoom=&time] Also click to see upper level winds, and divergence.

E) 1500 UTC Vorticity (Select 850 hPa and ascend through the levels selecting 700, then 500, then 200): [http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=vor&zoom=&time]

F) Svetla’s JPL Tropical Cyclone webpage still (see image below) of Satellite Winds derived Divergence & GFS 850hPa 24 hr forecast from yesterday with today’s analysis of PGI17L (in yellow box) as defined by pouch tracking.

G) Bob Hart’s TC models page (CMC, GFS, GFDL, NOGAPS, HWRF): [http://moe.met.fsu.edu/tcgengifs/]

H) Colorado State TC guidance for track and intensity at 1200 UTC (except 0600 UTC for the Late Cycle Models): [http://euler.atmos.colostate.edu/~vigh/guidance/]


Static images:
(D. continued) Upper level winds (above) and Upper level Divergence (below) at 1800 UTC.
DISTURBANCE INVEST (AL97)
Early-cycle intensity guidance valid 1200 UTC, 21 July 2010

DISTURBANCE INVEST (AL97)
Early-cycle track guidance valid 1200 UTC, 21 July 2010

DISTURBANCE INVEST (AL97)
Late-cycle track guidance valid 0600 UTC, 21 July 2010

This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!
FG17L: 5-Day Forecast Based on gfs
Initialized at 2010072100

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

(b) 700 hPa Zeta ($10^{-4}$ s$^{-1}$) - 3x3 deg. box average following the pouch

(c) 700 hPa CW ($10^{-4}$ s$^{-1}$) - 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