Triagency Forecast Discussion for September 13, 2010

Created 1600 UTC September 13, 2010

GRIP Forecast Team: Cerese Inglish, Dave Zelinsky, Richard Maliawco, Dave Kofron

Summary: Today will be an interesting investigation by all three agencies into the ever-elusive PGI-44L/AL92. The system has had a development and regeneration of convection each morning for the last few days followed by a collapse of the convection in the evenings and no definitive evidence of a lasting circulation. The DC-8, NOAA P3s, and the PREDICT GV all have scheduled flights into the invest today and it remains to be seen if the system will finally begin to organize or undergo true genesis as many of the models have been suggesting. Elsewhere, Hurricane Igor is a very intense category 4 hurricane that underwent rapid intensification yesterday, yet the storm is not a current flight target for a variety of reasons. Just behind Igor are Tropical Storm Julia and PGI-45L over West Africa, and these possible targets will continue to be monitored closely.

Forecast for 1600 UTC 9/13/2010:

Synoptic Overview:

In the Gulf of Mexico and Caribbean regions near the surface there are several interesting features. A stationary front over the Gulf is associated with a 1013 hPa low over NW Florida (**S1**). Another frontal system is off the east coast of the United States, and has separated from the Gulf portion. This front and other troughs that will emerge from the US east coast will serve to weaken the subtropical ridge, forcing it to retreat east and providing a means for Igor to recurve north. In the Caribbean, PGI-44L/AL92 has a surface low pressure center of about 1008 hPa and a trough extends SW to the ITCZ (**S1, S4**). Convection associated with this system is widespread between 70*W and 80*W (**S2**). Wind shear in the region is low to moderate (**C2**). At upper levels, the CIMSS Water Vapor and Mid-Upper level winds diagram shows a broad upper level anticyclone centered over the NW Gulf coast bordered to the north by the jet and extending along the frontal boundary out into the West Atlantic (**C1**). There are upper level troughs in the SW Gulf of Mexico, and stretching between western Cuba and points southwest to Honduras (**C1, C3**). Divergence is also low to moderate over AL92.

Over the central Atlantic there is a small surface trough to the NE of the Windward Islands producing a few isolated bursts of convection this morning (**S1, S2**). This is ahead of Category 4 Hurricane Igor, which looks highly impressive today. Julia is behind Igor, separated by a slot of relatively drier air (**S3**). Dust is present in MODIS imagery to the north of Igor and to the NE of Julia as well (**S4**).

At upper levels over the East Atlantic and West Africa, there is an upper level cold low to the NNW of Julia at about 27N, 34W, and a powerful westerly jet extending from north of Julia back to the NE (**C5**). There is also an indication of upper level easterlies diverging over PGI-45L. Low level winds indicate monsoonal moisture is flowing up into West Africa behind and into PGI-45L (**45L_2, C7**). The southern extent of the winds around the Azores high is also evident, keeping Julia and PGI-45L on a westward track.

Features of Interest:

PGI-44L/AL92:

AL92/PGI-44L continues to exist only as an invest with an obscured and uncertain future today. Once again, a sloppy-looking bimodal signature of convection is evident in satellite imagery (**44L_1**), echoing previous days where the convection flares during the morning and dies every evening. While some of the convection appears to be trying to better organize today, there is every indication from dropsondes on the P3 and GV flights recently that a circulation, or two circulations at one point, are becoming less impressive with height over the last 24 hours. However, today on the radar imagery out of Jamaica, a possible low level cyclonic swirl is showing up in the convection to the south of Jamaica (**44L_2**). One better feature today compared to previous days is the increased vorticity near the pouch center. Today's CIMSS analysis of low level vorticity (**C4, 44L_5**) is looking slightly stronger than yesterday, and the environmental shear continues to be low to moderate in the vicinity of the system (**C2**). No ASCAT pass is currently available for the system, but microwave imagery from SSMIS-85Ghz PCT at 1300 UTC today showed precipitation in a bimodal form without much environmental connection yet (**44L_3)**. One thing that has consistently been occurring each day with this system is highly electrified convection (**44L_4**), and overshooting tops have been seen while monitoring the storm during the DC-8 investigations into this system. These typically indicate a strengthening event could be imminent, yet each day this storm has so far failed to organize into a tropical depression, and instead a collapse of the convection in the evening occurs.

Despite this daily trend, the models continue to suggest that the system will begin to organize into a depression (**44L_6, 44L_7**) and become a Tropical Storm within 24 hours, before making landfall on the Yucatan Peninsula in 48 hours, and then regaining strength as a Tropical Storm in the Bay of Campeche (**44L_8**). Most of the models have a 48 hour forecast track and intensity consensus, but around the time of the system's expected emergence into the Bay of Campeche occurs, there is a good degree of spread in the model track and intensity forecast. Currently the models are seeing an environment of low wind shear, very conducive SSTs, high TPW values and upper level moisture coincident with the approximate low level center, and are forecasting the system to develop as a result. So far it has been unclear why this invest has not formed into a depression, but more aircraft observations may be needed to tell the full story. The convection also needs to better organize compared to what has been seen over the past few days, especially with regard to this strange offset diurnal waxing and waning trend that has been seen.

Based on all available information, the forecast track positions for AL92 are:
Initialized at 1200 UTC Sept 13: 16.5N, 77.0W
12 hours: 0000 UTC Sept 14: 17.0N, 80.0W
24 hours: 1200 UTC Sept 14: 17.5N, 82.5W
48 hours: 1200 UTC Sept 15: 18.5N, 87.5W (making landfall on Yucatan Peninsula)
72 hours: 1200 UTC Sept 16: 20.5N, 91.0W

PGI-42L/Hurricane Igor:

Hurricane Igor has become a very strong category 4 hurricane. Maximum sustained winds are 130 kts at 0800 UTC. Igor underwent rapid intensification yesterday, and the minimum central pressure dropped 57 hPa over the 24 hour period between 0300 UTC yesterday and 0300 UTC today. Igor's core has a very symmetric appearance on IR and microwave imagery, and has well established outflow (**I1, I2, and C1**). Igor is in a very favorable environment. The 1200 UTC SHIPS forecast indicates that the vortex removed shear analyzed by the GFS is only 3 kts (**S3**). SSTs are around 28.5 C and climbing as the system moves west.

The main focus of the forecast for Igor rests on the track of the system. Igor has not yet begun to turn to the north, however based on the 0600 UTC surface analysis (**S1**), it has reached the southeastern extent of the subtropical high. Therefore, Igor should begin to turn towards the north in the next 6-12 hours. The extent of this turn is still somewhat uncertain and will depend highly on how quickly the mid latitude trough lifts out and allows the subtropical ridge to build back (**I4**). The ECMWF has continuously produced good track forecasts for Igor, so preference is given to that track rather than others. In the ECMWF, the ridge builds relatively quickly (in comparison to the GFS and NOGAPS), allowing the storm to progress relatively far west. The 144-hr forecast within the 0000 UTC run has the storm at 27N,65W**.** This is left of the model consensus track, however a model consensus still brings the system to around 62W.

Given the favorable environment and the high initial intensity, the intensity change is likely to be dictated primarily by internal dynamics. Once an eyewall replacement cycle begins, the intensity will fluctuate somewhat, however all indications are that Igor will remain a strong major hurricane for at least the next 3-4 days. After that, a combination of cooler SSTs and higher shear should begin to weaken Igor.

PGI-43L/Tropical Storm Julia:

At 1315 UTC Tropical Storm Julia is located at 14.9 N, 26.1 W with movement to the WNW at 12 kt, and a minimum central pressure of 1004 hPa and maximum sustained winds of 35 kt. The ridge in place over the eastern Atlantic is largely controlling the movement of Julia, and therefore the forecast track is largely dependent upon the forecast strength of the ridge. The short term forecast track for Julia is in relatively good consensus that the storm will remain on its current west-northwest heading with little change in speed. Overnight, some reorganization of the convection has caused some deviation of the exact position, but Julia remains as a weak tropical storm. Throughout the day of the 13th, the storm should gain some intensity as the convection continues to organize in the low shear environment (J1), and the official forecast is for Julia to become a moderate tropical storm over the next 24 hours. The model forecast intensity is in general agreement with this forecast. After 24 hours of slow strengthening and movement to the west-northwest, the model forecasts begin to deviate with some forecasting Julia to turn to the north and some continuing the track on its current heading, which indicates that the models cannot agree on the strength of the ridge to the north of Julia (**J2**). The official forecast is in between with a slight turn to the northwest. The intensity forecasts also show considerable spread, but in general they all intensify Julia to either a strong tropical storm or category 1 hurricane by 72 hours.

Looking ahead 3-5 days, many of the models that forecast Julia to turn slightly more to the northwest in the day 1-3 forecast begin have Julia shifting back to the west during days 3-5 while the other forecast models continue Julia on its west-northwest track (**J2**). The difficulty with this forecast continues to be determining the strength of the ridge. If the ridge builds back in and strengthens, Julia will make the slight turn to the west. However, if the ridge continues to have a weakness along the west side, Julia will likely continue along a more northerly track (**I4**). The official forecast track still remains somewhere in between, but may favor a slight re-strengthening of the ridge. There is also some disagreement in the amount of shear that will be present over and around Julia, but the models are actually in quite good agreement that the intensity of Julia will level off as either a strong tropical storm or weak category 1 hurricane (**J2**). It is interesting to note that the deviation in both forecast location and intensity is greater for the day 1-3 forecast than for the day 3-5 forecast. By day 5, Julia will begin to recurve around the western side of the ridge, but at this time, the location with respect to Hurricane Igor could play a role in the track of Julia. Conversely, Julia could have an impact on the forecast track of Igor, as well. If the ridge strengthens and keeps Julia along a more westward track, Julia could play a role in pushing Igor further off to the west as well. However, if Julia remains relatively small and weak in comparison to Igor, the track could have no impact on Igor at all.

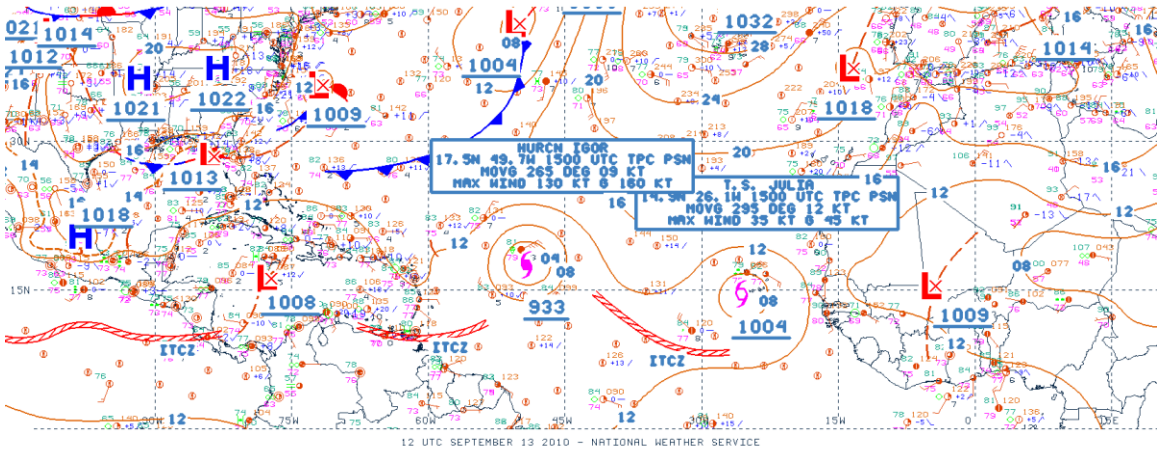
PGI-45L:

CIMSS analysis places the center of PGI-45L at 7.9°N and 5.4°W at 1000 UTC today. The GFS 850 hPa absolute vorticity shows a well-defined vorticity maxima associated with this system and appears similar in position and magnitude to the vorticity maxima associated with the system that eventually became Julia, except slightly further south (**45L_1**). Current IR imagery shows an organized mass of convection, especially to the north of the pouch position estimate (**45L_2**). The water vapor imagery shows abundant moisture associated with this system (**45L_3)** and current SAL analysis also suggests that dry air is not presently a factor to consider (**45L_4)**. MIMIC TPW shows that the eastern Atlantic has very deep, rich moisture as the system emerges off of Africa (**S3**). Current SST analysis shows a -1 °C anomaly south of the Cape Verde islands over the eastern Atlantic. Further to the north and to the west, there exists a positive SST anomaly (**45L_5**). The 200-900-hPa wind shear analysis shows that there is light easterly shear over the system presently at around 10-kt. Over the eastern Atlantic, moderate 20-30-kt northeasterly wind shear presently exists (**45L_6**).

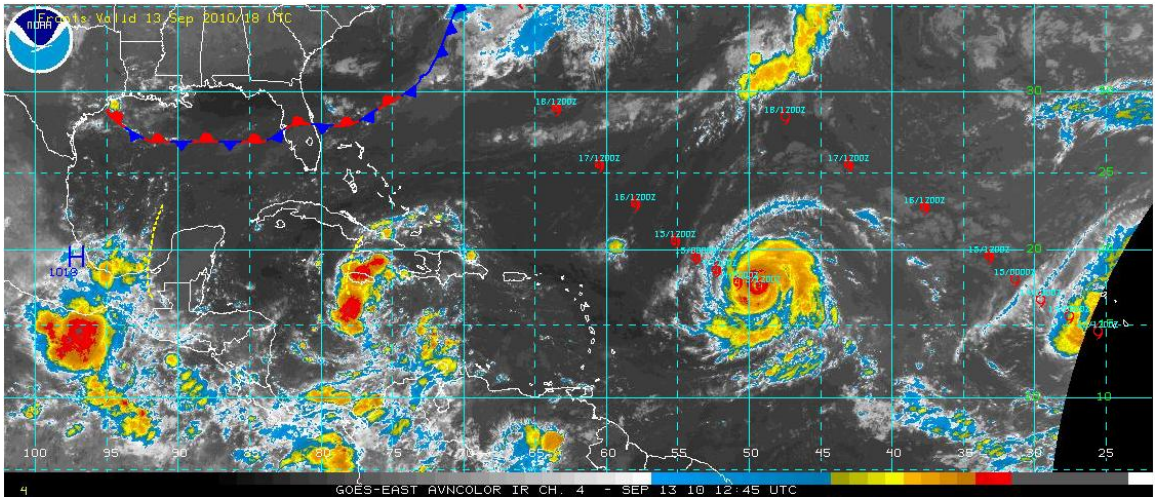
Model guidance is not aggressive with the future of PGI-45L at this time. Only the CMC model develops the system over the next 2-3 days and tracks it westward but there is no evidence of the system developing in the ECMWF, GFS, or the NOGAPS models. In the short term, the pouch will be entering an environment with slightly negative SST anomalies and moderate wind shear. Over the next couple of days, as the pouch traverses warmer SSTs, conditions may become more favorable for development if wind shear remains relatively low over the system.

Images used in discussion:

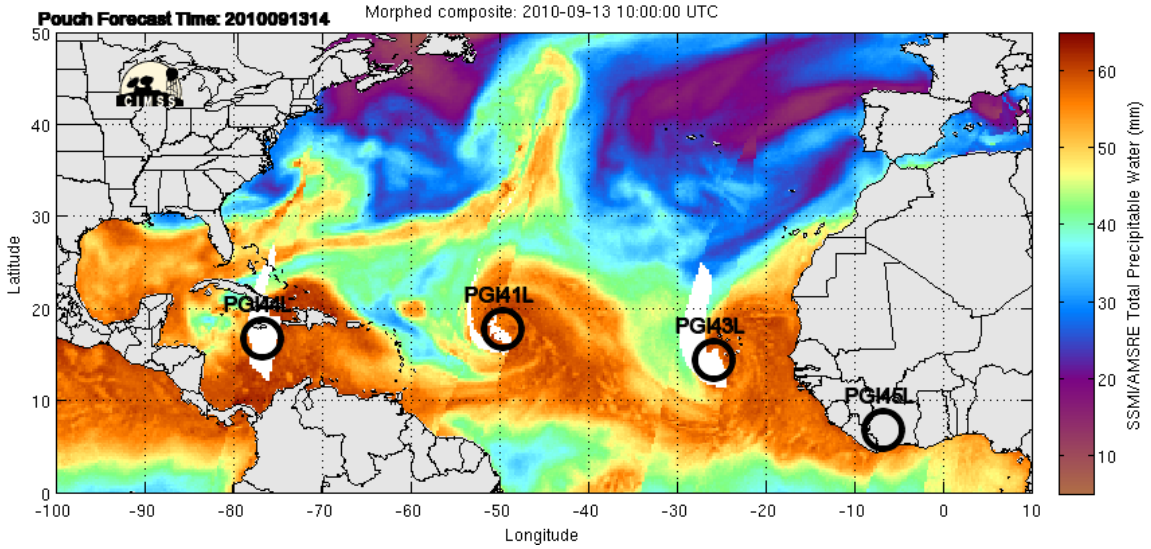
S1



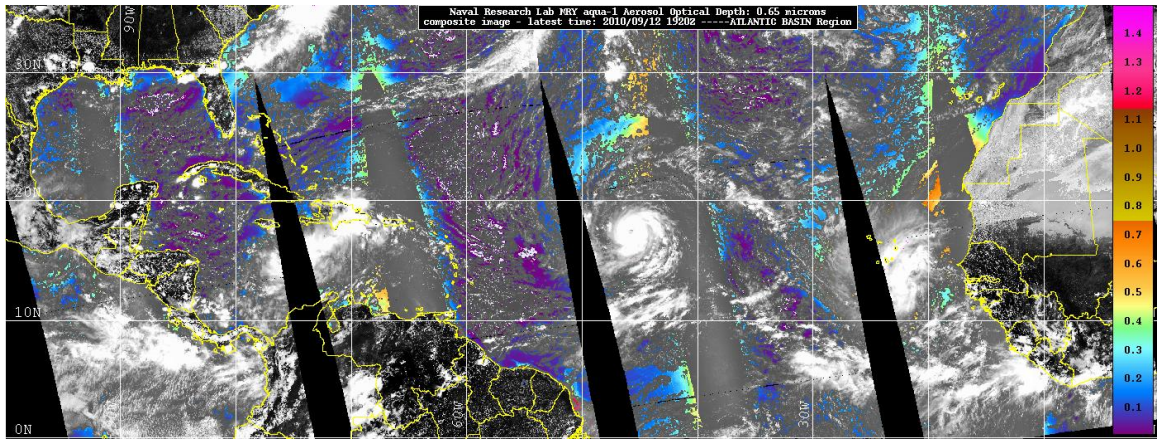
S2



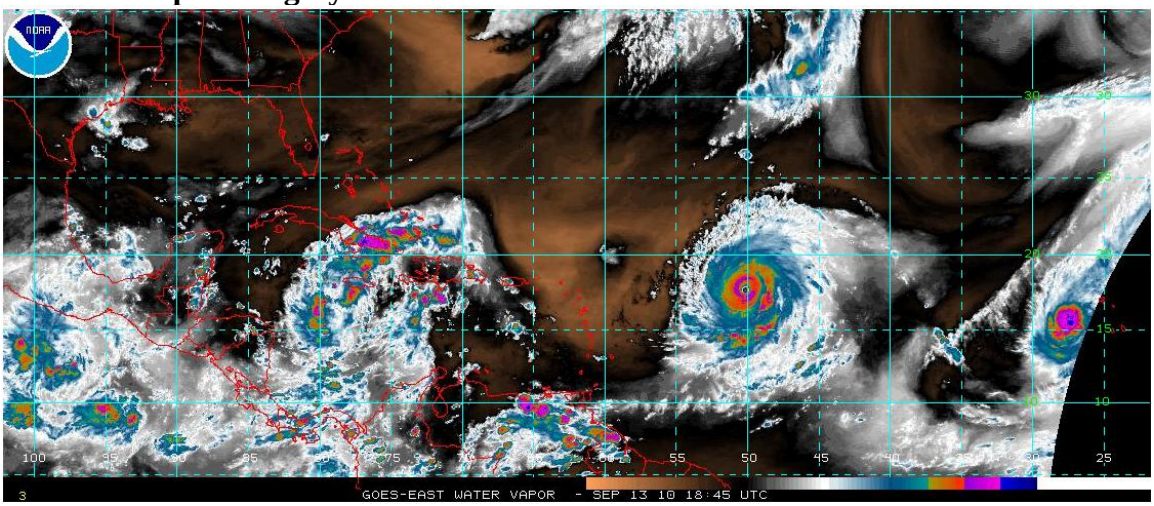
S3



S4 AOT from MODIS

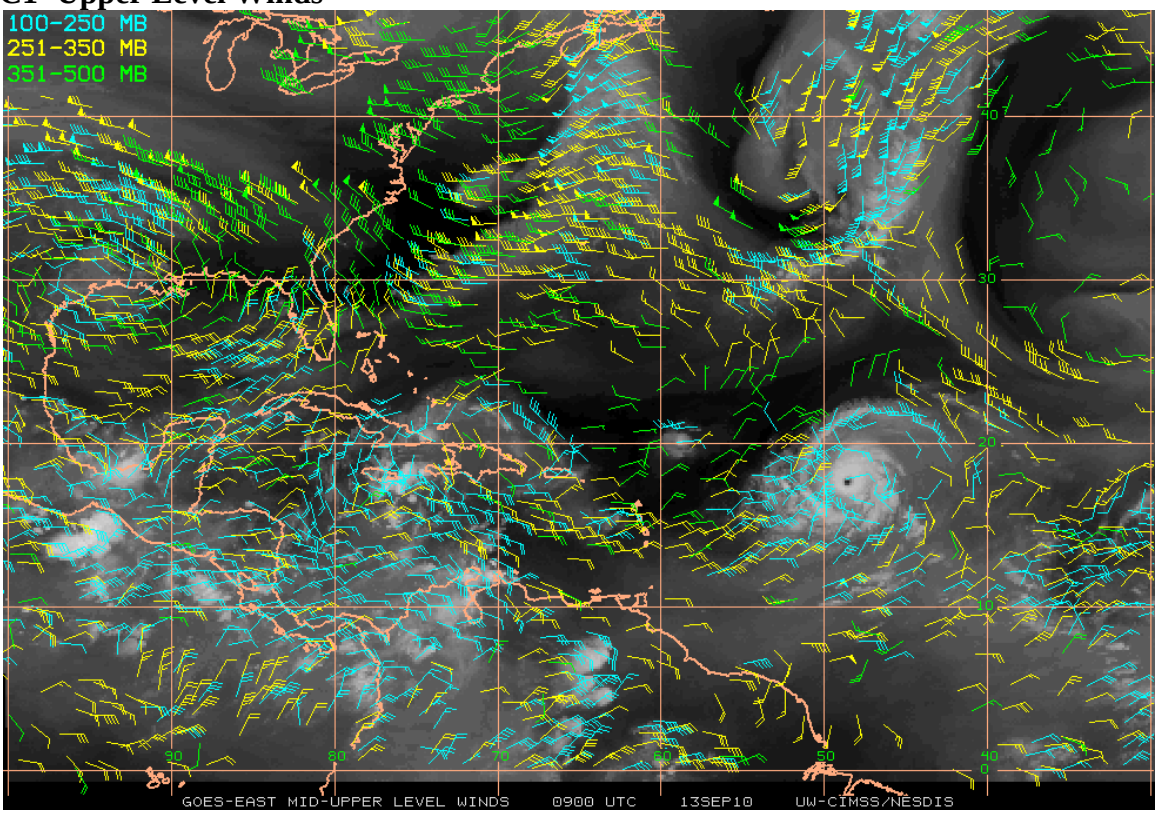


S5 Water Vapor Imagery

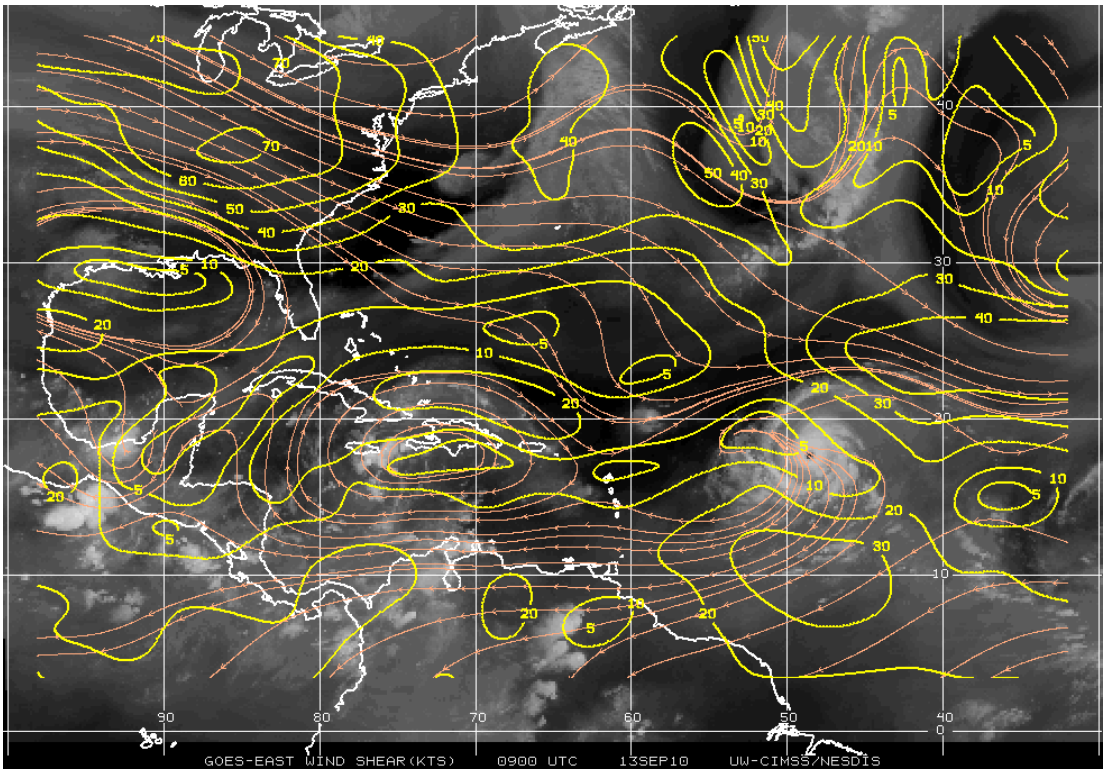


CIMSS Analyses:

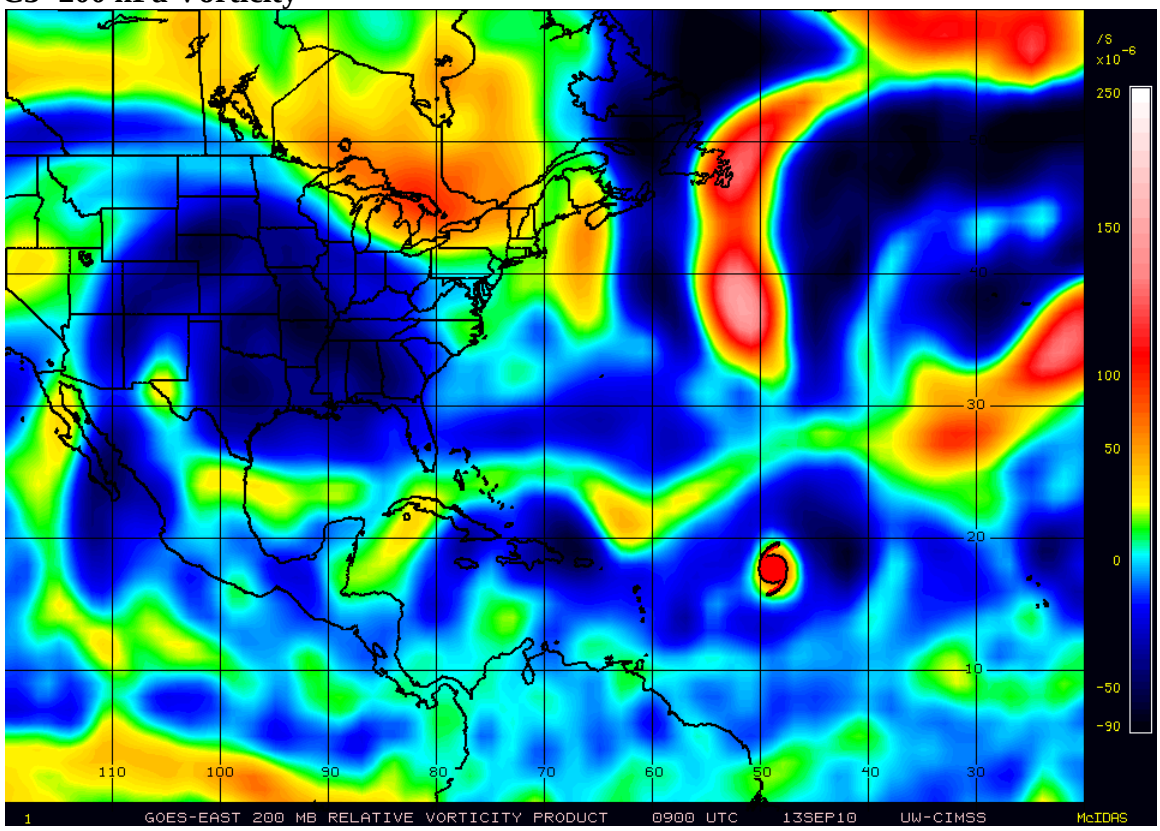
C1- Upper Level Winds



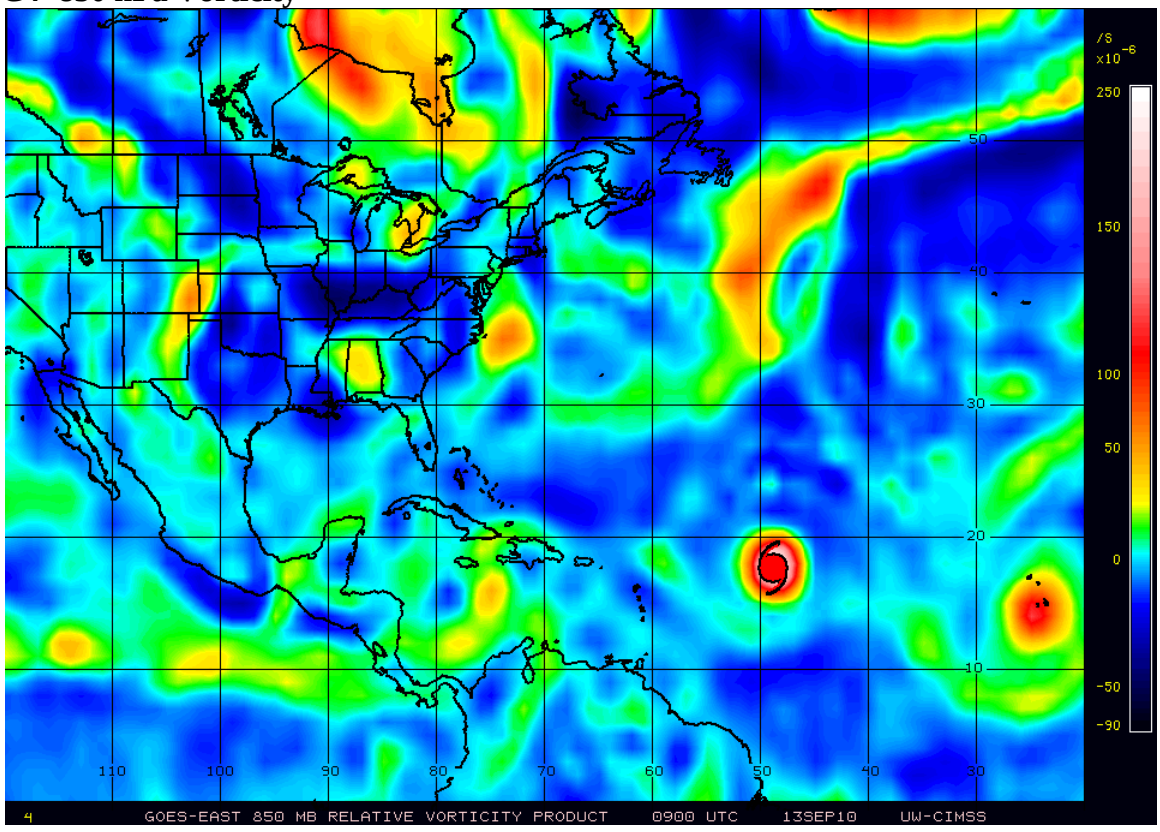
C2- Wind Shear



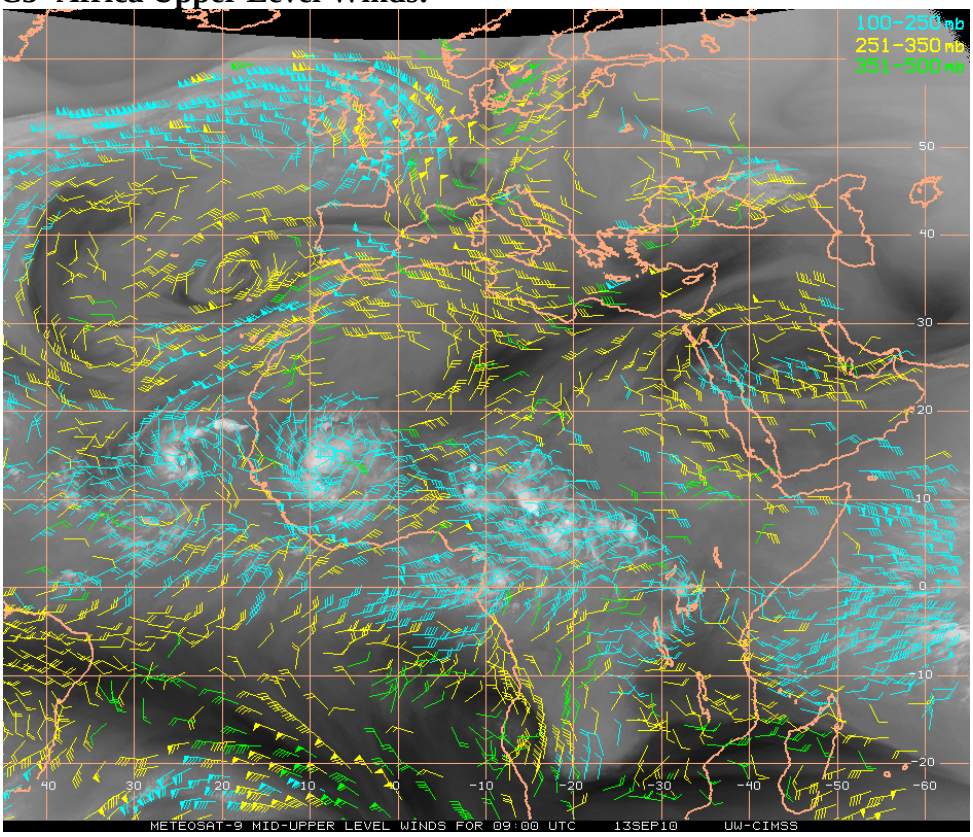
C3- 200 hPa Vorticity



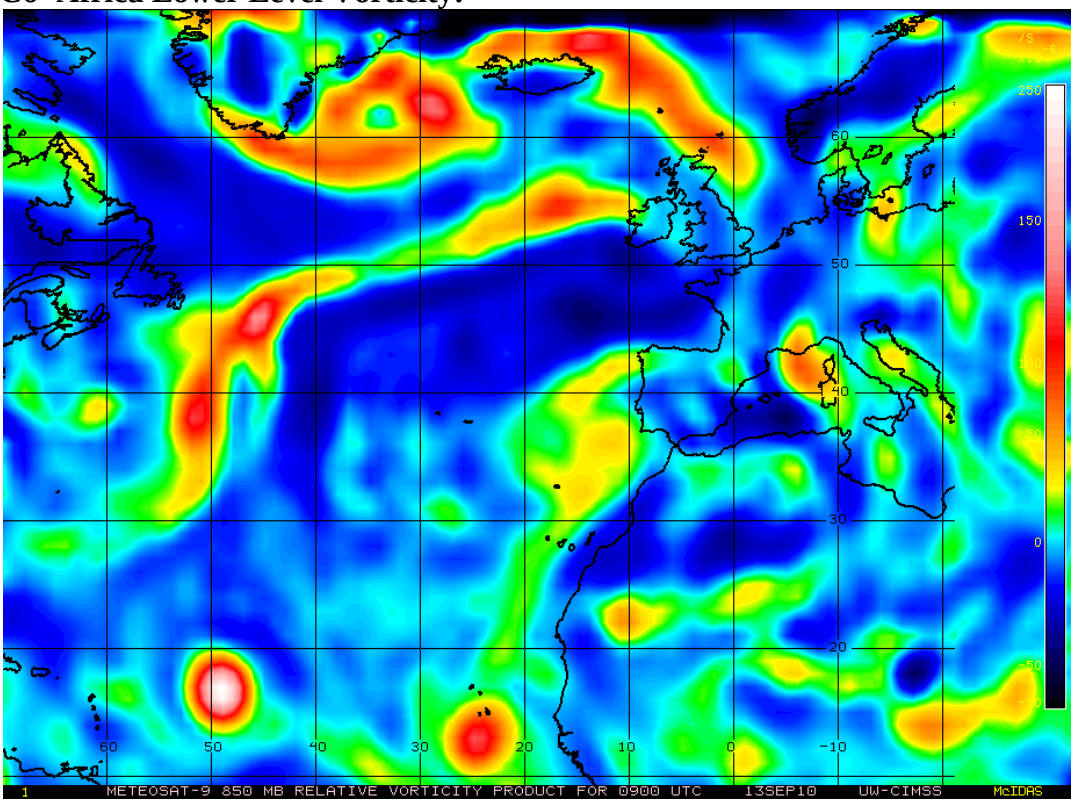
C4- 850 hPa Vorticity



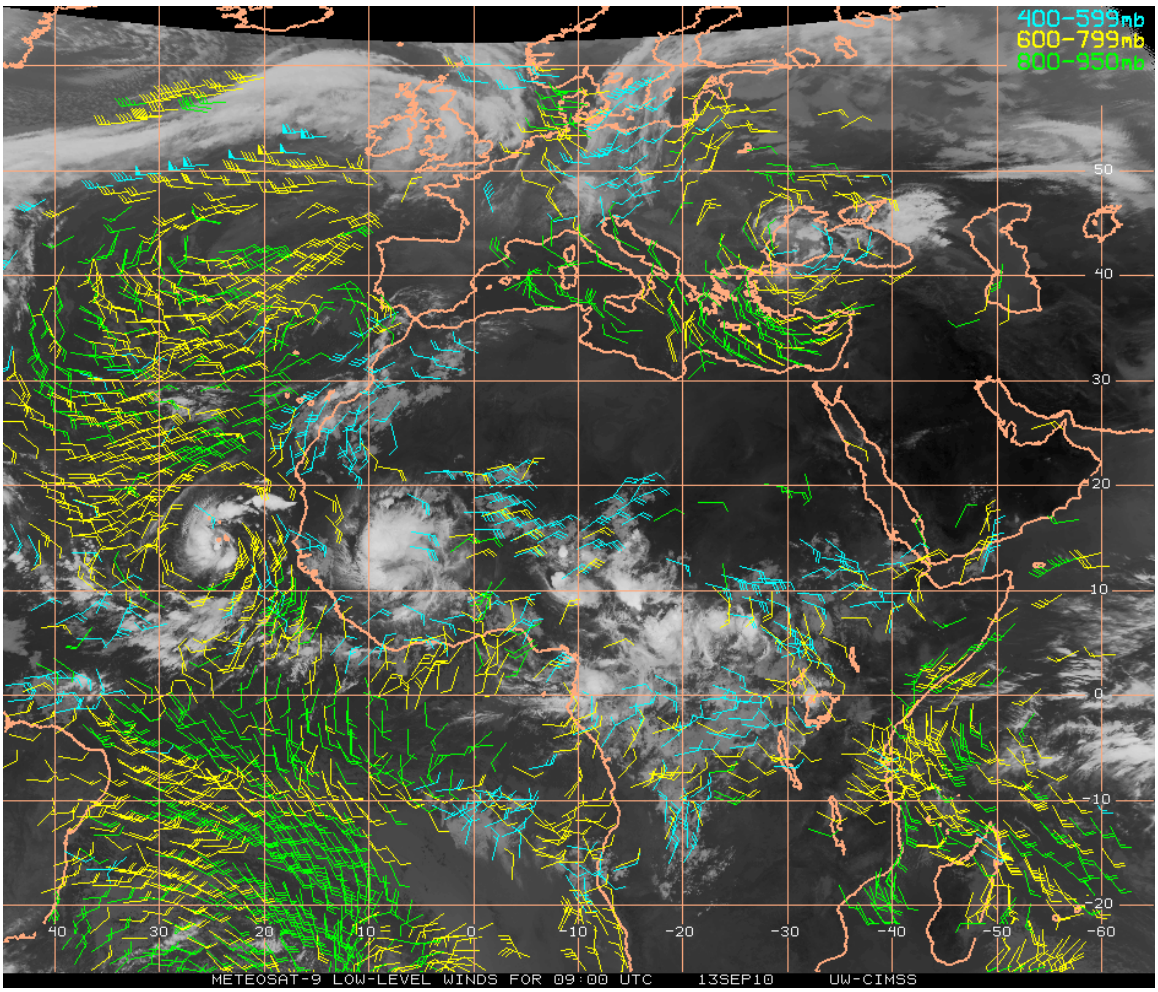
C5- Africa Upper Level Winds:



C6- Africa Lower Level Vorticity:



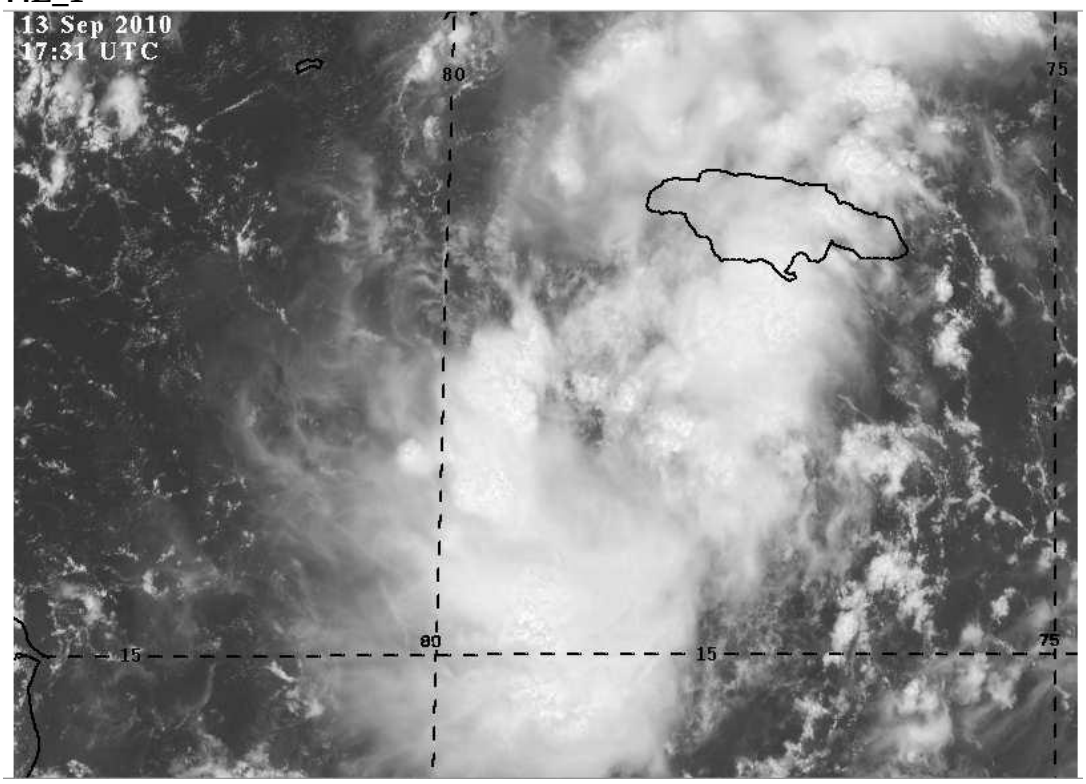
C7- Lower level winds over Africa:



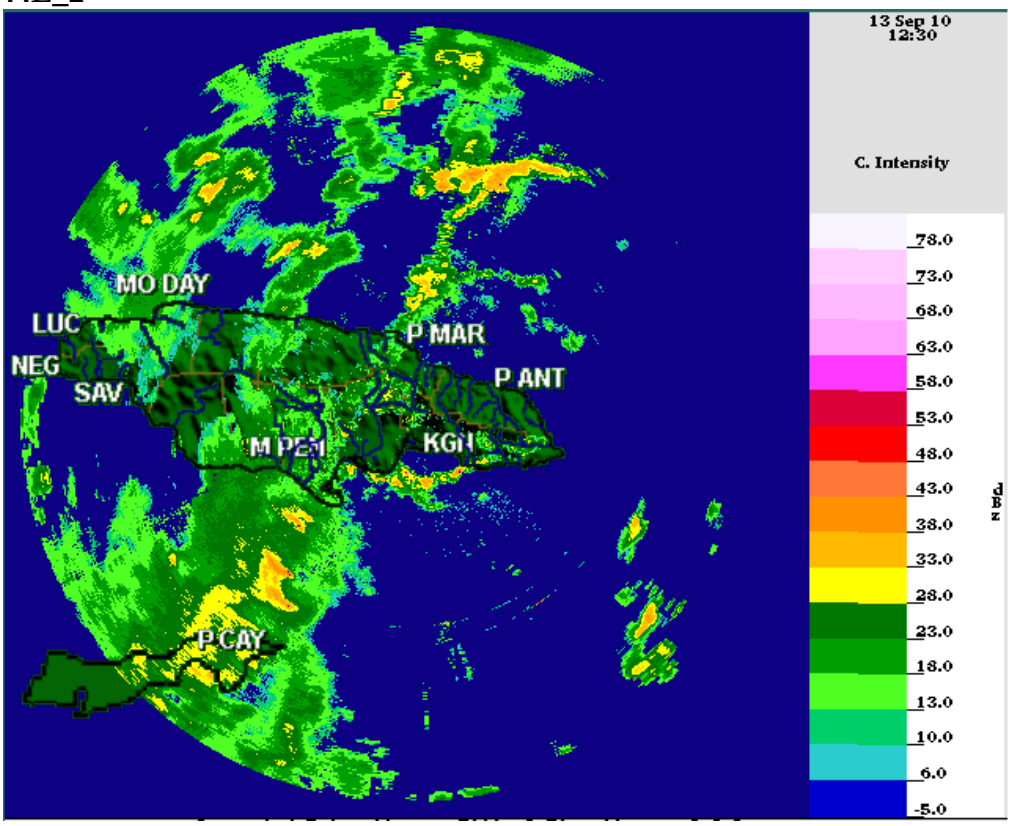
Features of Interest:

AL92/PGI-44L:

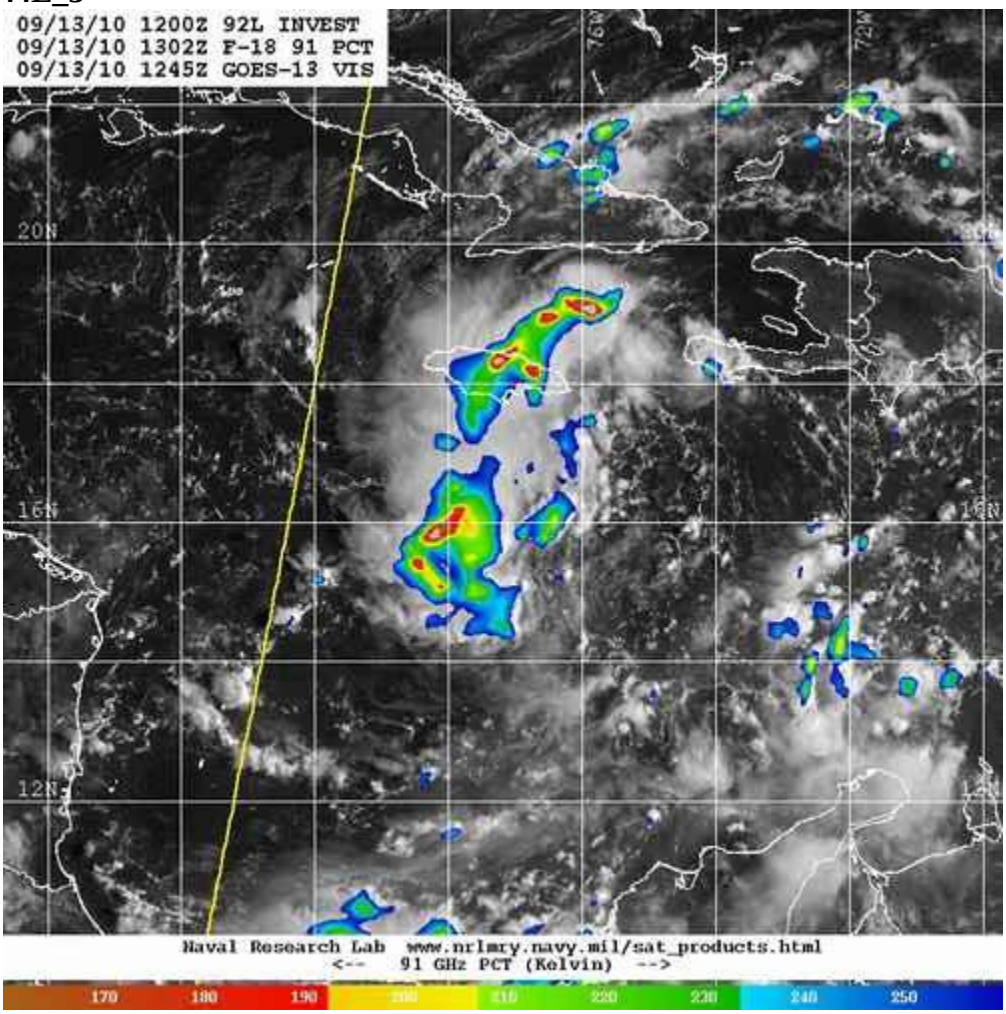
44L_1


13 Sep 2010
17:31 UTC
80
75
15
80
15
75

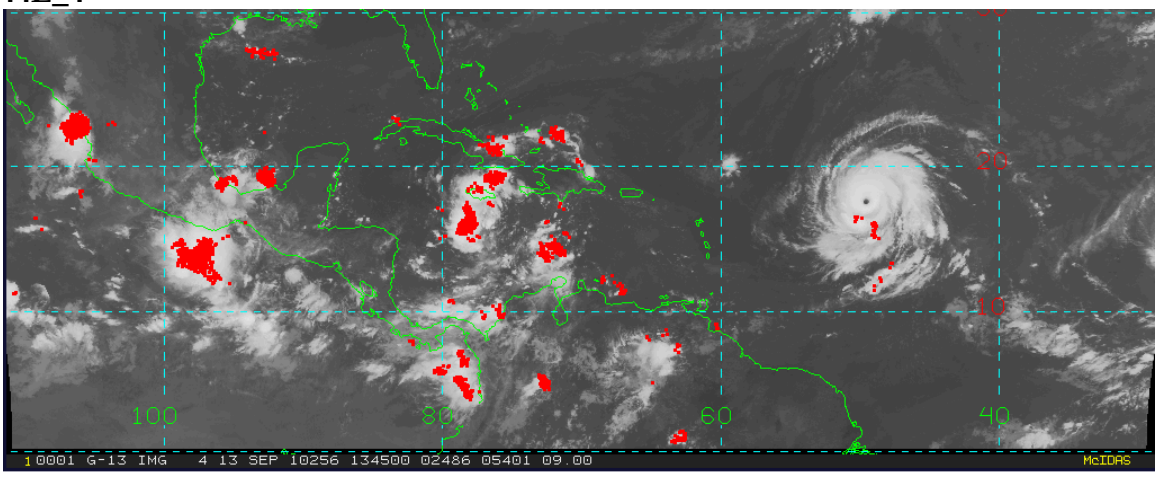
44L_2


13 Sep 10
12:30
C. Intensity
78.0
73.0
68.0
63.0
58.0
53.0
48.0
43.0
38.0
33.0
28.0
23.0
18.0
13.0
10.0
6.0
-5.0
MO DAY
LUC
NEG
SAV
P MAR
P ANT
KGI
P CAY

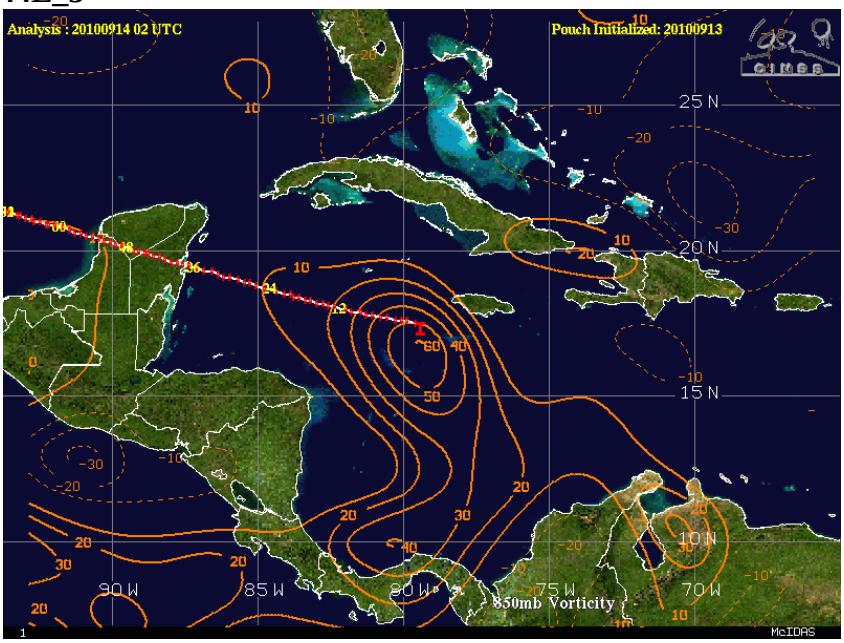
44L_3


09/13/10 1200Z 92L INVEST
09/13/10 1302Z F-18 91 PCT
09/13/10 1245Z GOES-13 VIS
20N
16N
12N
Naval Research Lab www.nrlmry.navy.mil/sat_products.html
<-- 91 GHz PCT (Kelvin) -->
170
180
190
250

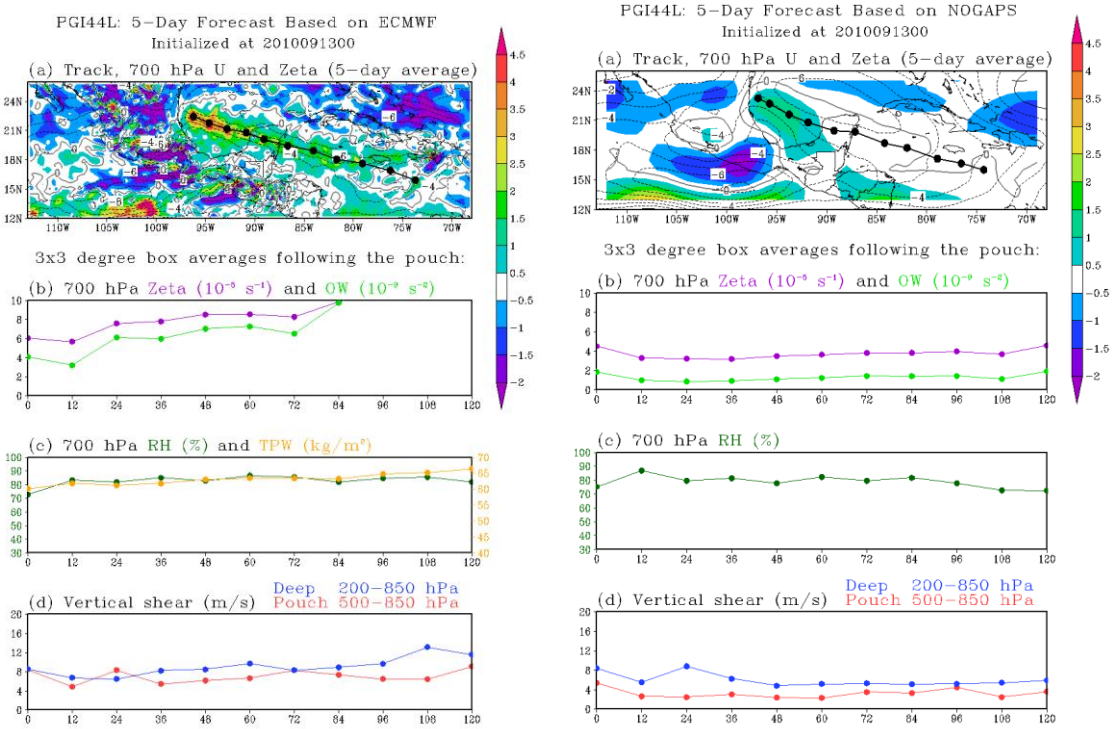
44L_4


100
80
60
40
20
10
1 0001 G-13 IMG 4 13 SEP 10256 134500 02486 05401 09.00
McIDAS

44L_5


Analysis : 20100914 02 UTC
Pouch Initialized: 20100913
CIMSS
25 N
20 N
15 N
10 N
90 W
85 W
80 W
75 W
70 W
850mb Vorticity
McIDAS

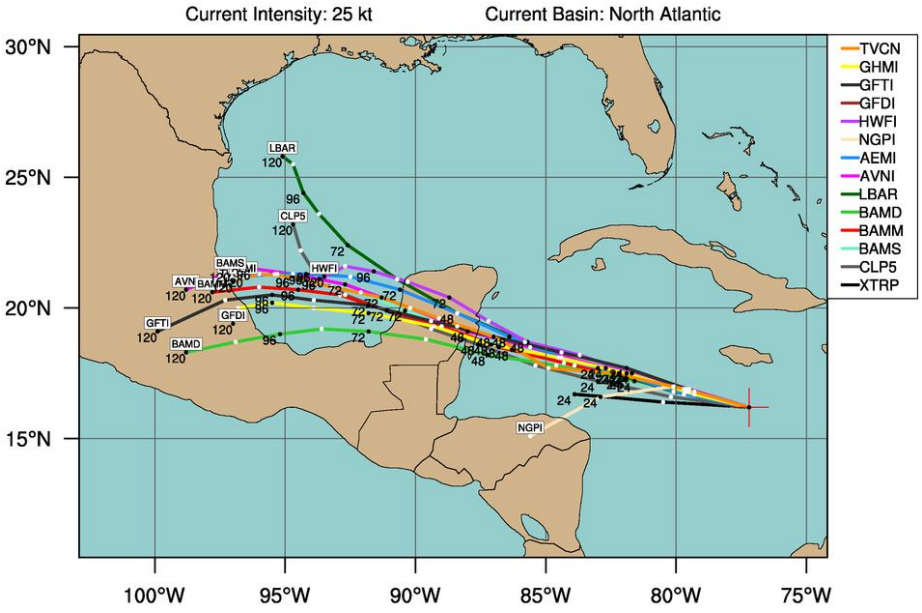
44L_6


PGI44L: 5-Day Forecast Based on ECMWF
Initialized at 2010091300
(a) Track, 700 hPa U and Zeta (5-day average)
3x3 degree box averages following the pouch:
(b) 700 hPa Zeta (10⁻⁵ s⁻¹) and OW (10⁻⁹ s⁻²)
(c) 700 hPa RH (%) and TPW (kg/m²)
(d) Vertical shear (m/s)
Deep 200-850 hPa
Pouch 500-850 hPa
PGI44L: 5-Day Forecast Based on NOGAPS
Initialized at 2010091300
(a) Track, 700 hPa U and Zeta (5-day average)
3x3 degree box averages following the pouch:
(b) 700 hPa Zeta (10⁻⁵ s⁻¹) and OW (10⁻⁹ s⁻²)
(c) 700 hPa RH (%)
(d) Vertical shear (m/s)
Deep 200-850 hPa
Pouch 500-850 hPa

44L_7

DISTURBANCE INVEST (AL92)

Early-cycle track guidance valid 1200 UTC, 13 September 2010

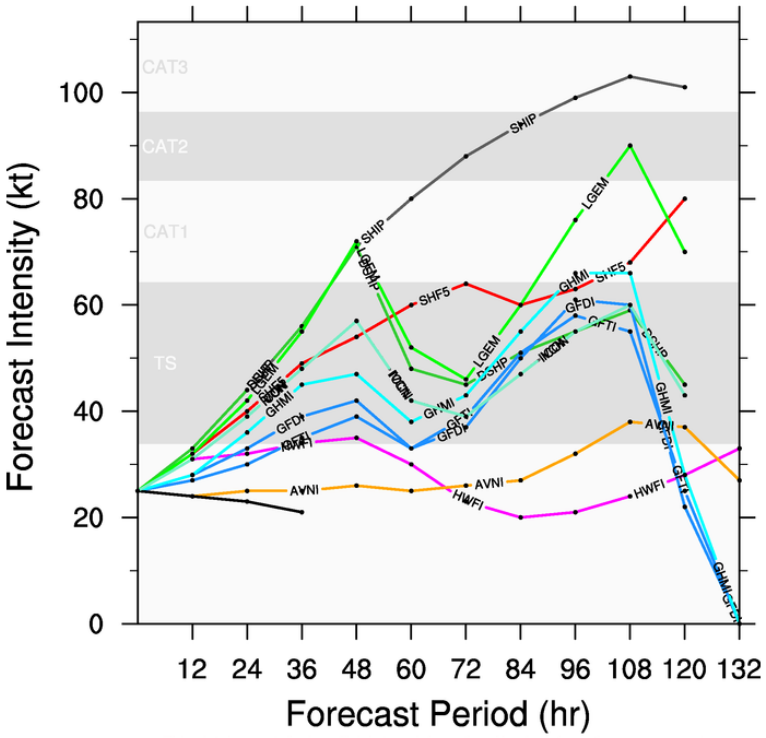


This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

DISTURBANCE INVEST (AL92)

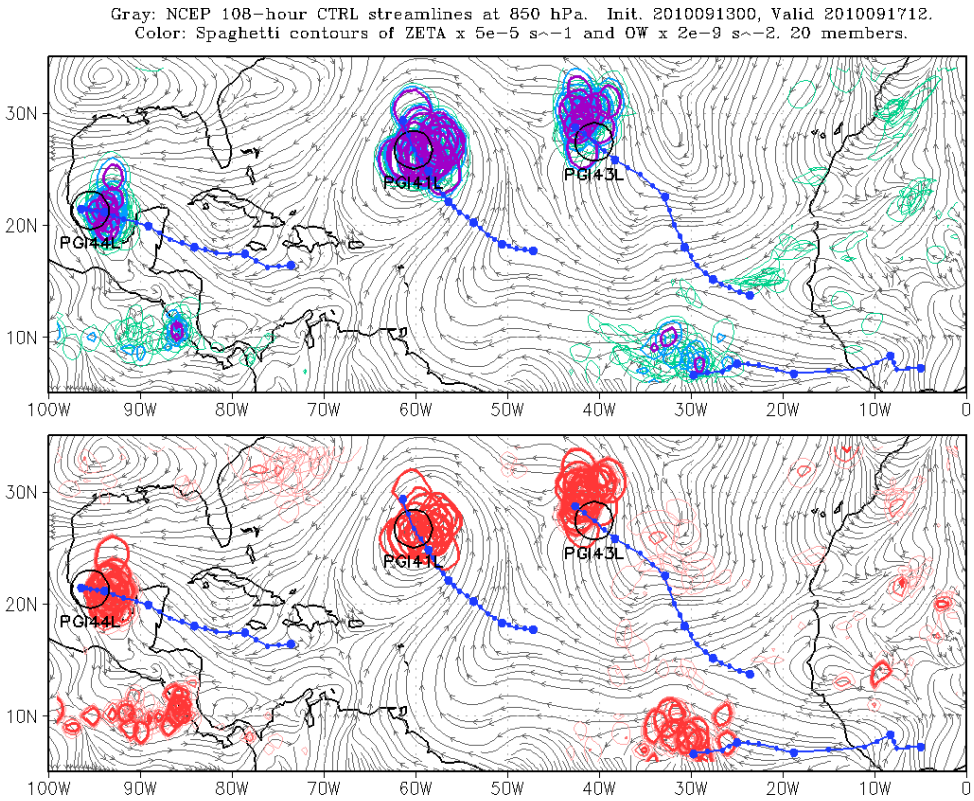
Early-cycle intensity guidance

valid 1200 UTC, 13 September 2010



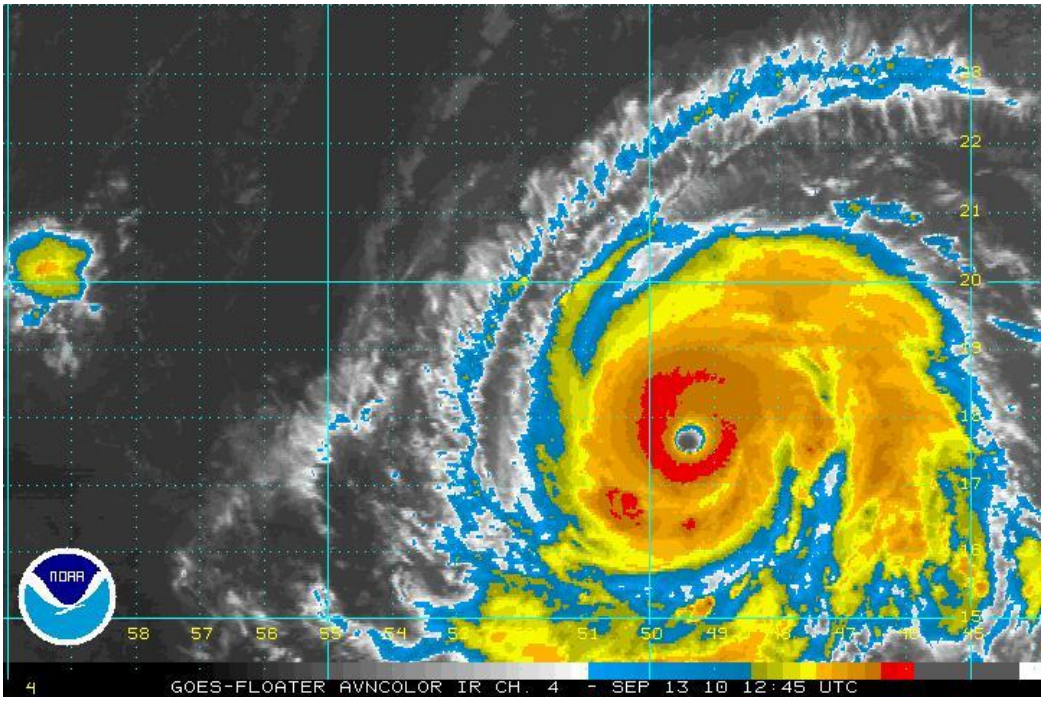
This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

44L_8

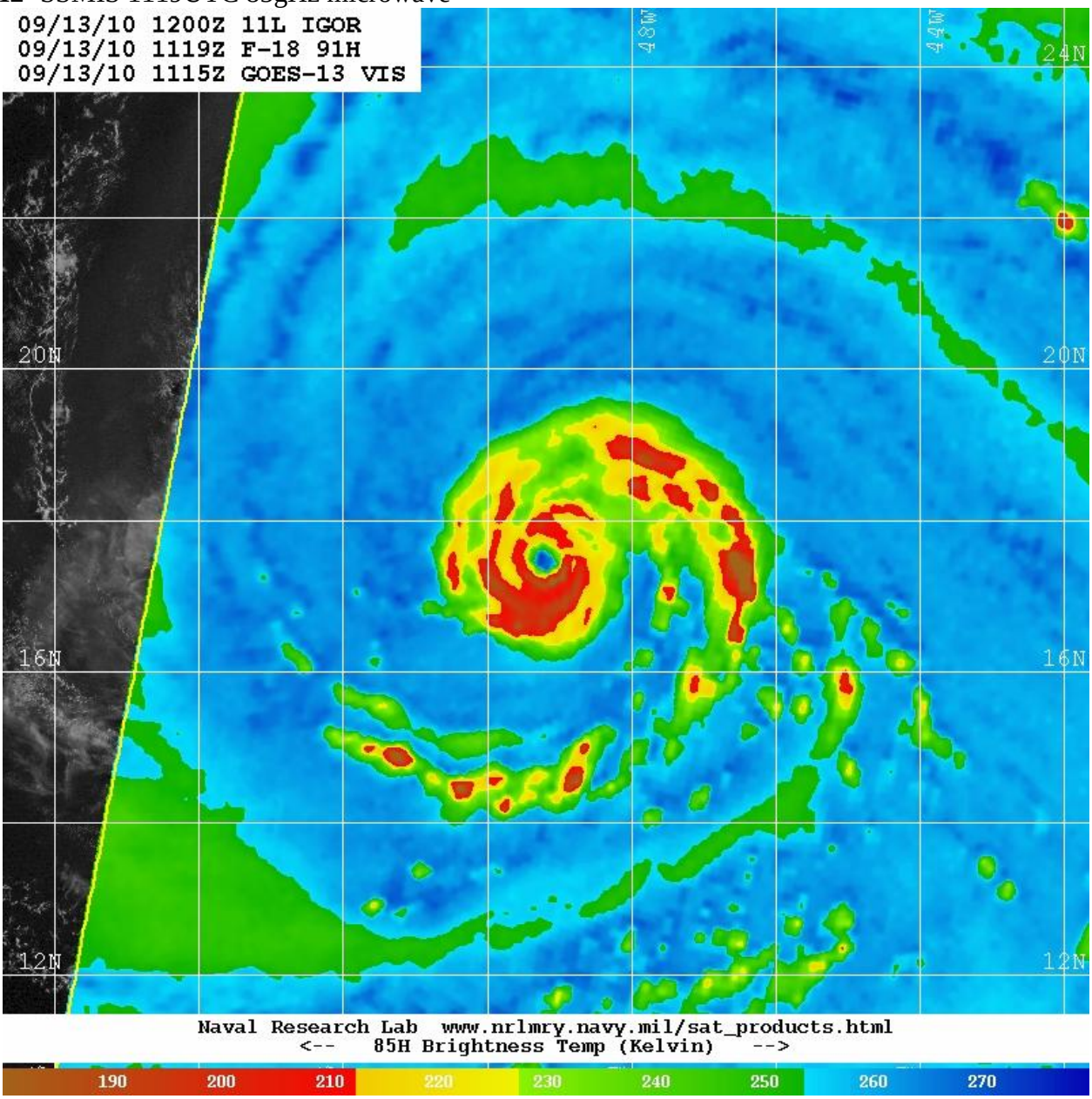


<u>Hurricane Igor:</u>

I1-1245UTC GOES IR



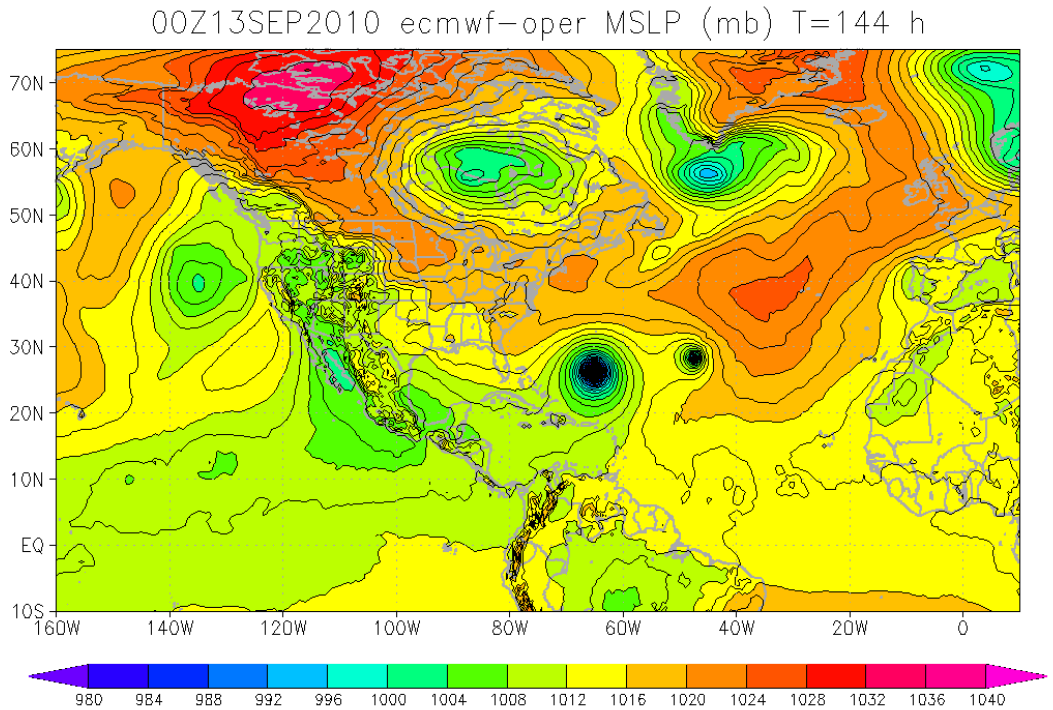
I2- SSMIS 1119UTC 85gHz microwave



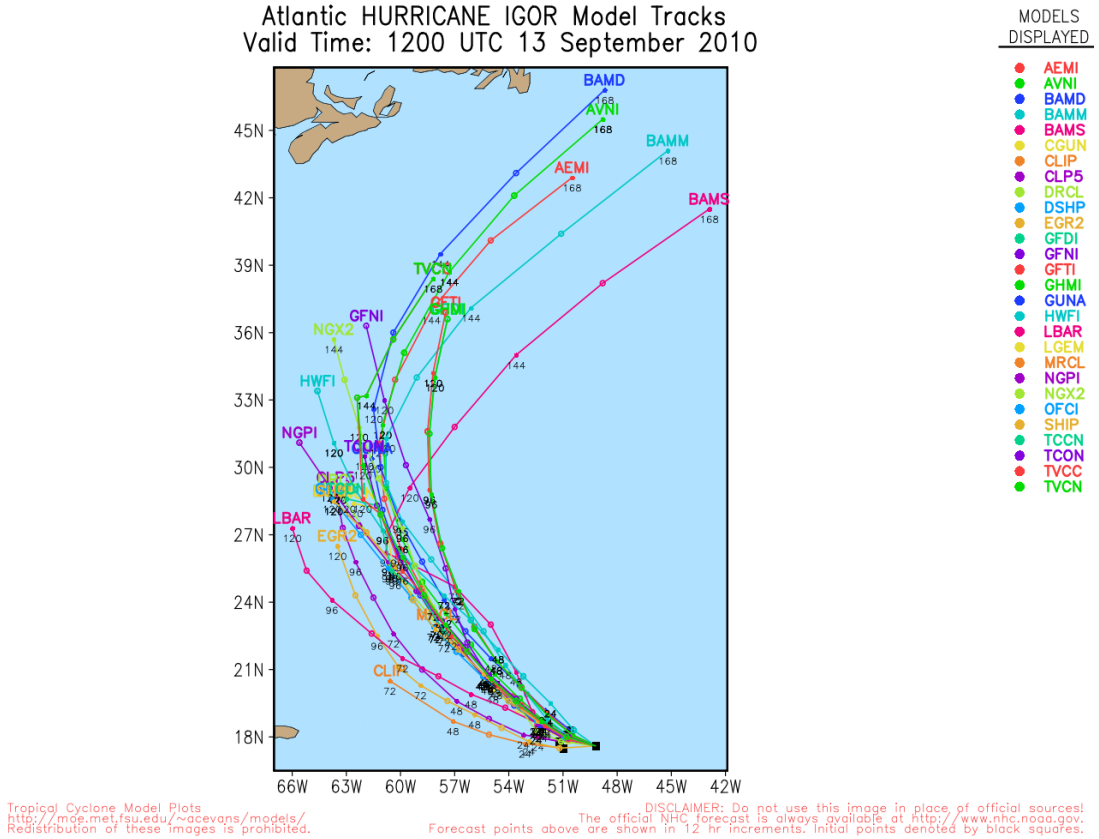
I3

```
                    *   ATLANTIC SHIPS INTENSITY FORECAST       *
                    *      GOES DATA AVAILABLE                  *
                    *      OHC  DATA AVAILABLE                  *
                    *        IGOR  AL112010  09/13/10  12 UTC   *

TIME (HR)          0     6     12    18    24    36    48    60    72    84    96   108   120
V (KT) NO LAND   130   129   128   130   130   130   127   121   116   115   108   101    93
V (KT) LAND      130   129   128   130   130   130   127   121   116   115   108   101    93
V (KT) LGE mod   130   126   122   119   116   114   116   116   114   110   105    99    93

SHEAR (KT)         3     7     7     2     5     5     5     4     6     2    11    13    25
SHEAR ADJ (KT)     2     1     2     1     0     0     3     1     2     3     0     1     0
SHEAR DIR        307   261   112   230    72    96    52   211   269   191   272   230   207
SST (C)         28.5  28.6  28.6  28.7  28.7  28.9  29.0  29.0  29.0  29.0  28.8  28.3  28.3
POT. INT. (KT)   143   144   145   146   146   150   151   151   151   151   148   141   141
ADJ. POT. INT.   134   135   135   136   136   139   139   137   135   135   132   125   124
200 MB T (C)   -51.0 -49.9 -50.1 -50.2 -49.8 -49.3 -49.4 -48.7 -48.9 -47.7 -47.3 -47.6 -47.6
TH_E DEV (C)      11    12    12    13    11    13    12    11    10    10     9     9     9
700-500 MB RH     59    59    54    53    58    54    53    55    57    54    54    52    40
GFS VTEX (KT)     35    34    35    37    38    39    40    39    41    46    45    44    44
850 MB ENV VOR    61    68    67    70    77    96   105   130   155   172   165   178   176
200 MB DIV        84   109     7    28    61    68    79    57    58    95    30     3    40
LAND (KM)       1421  1413  1358  1313  1274  1232  1113  1011   935   924   983  1043  1135
LAT (DEG N)     17.6  17.8  18.0  18.4  18.7  19.6  20.8  21.9  22.8  24.1  25.6  27.1  28.5
LONG(DEG W)     49.2  50.0  50.8  51.6  52.4  54.0  55.4  56.8  58.1  59.3  60.3  61.9  63.7
STM SPEED (KT)     8     8     8     8     9     9     9     8     8     9    10    10    11
HEAT CONTENT      52    57    63    59    62    66    71    63    62    51    32    20    18

  FORECAST TRACK FROM OFCI      INITIAL HEADING/SPEED (DEG/KT):265/  9      CX,CY:  -8/  0
  T-12 MAX WIND: 130            PRESSURE OF STEERING LEVEL (MB):  577  (MEAN=624)
  GOES IR BRIGHTNESS TEMP. STD DEV.  50-200 KM RAD:   7.3 (MEAN=14.5)
  % GOES IR PIXELS WITH T < -20 C    50-200 KM RAD:  99.0 (MEAN=65.0)
```

I4

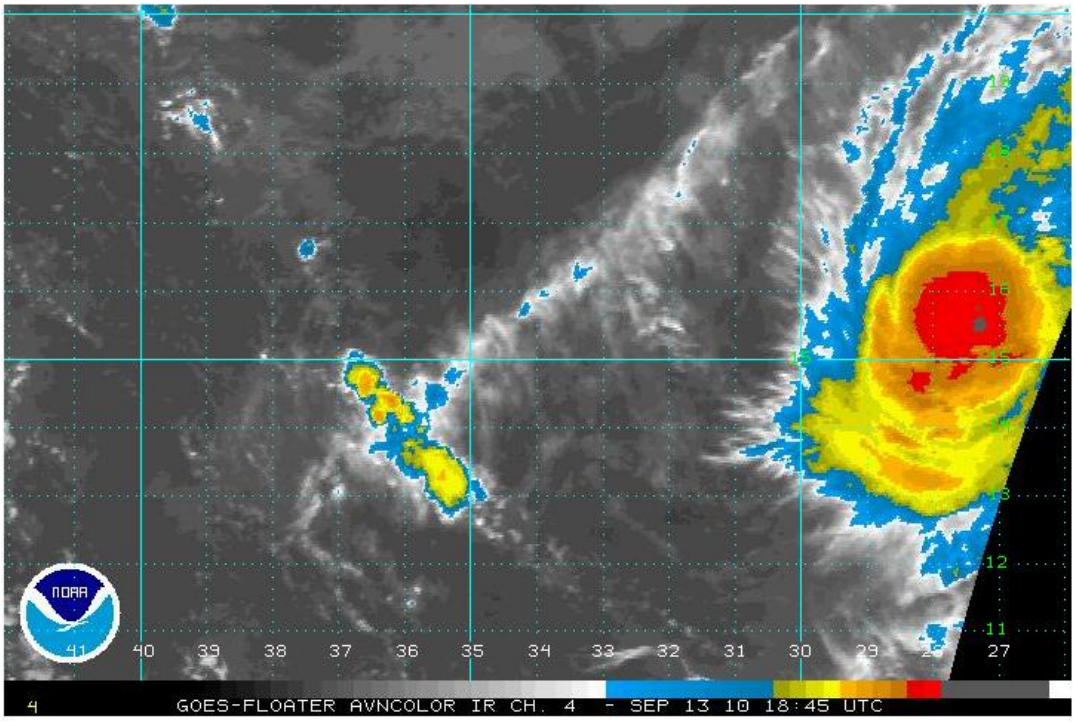


I5



Tropical Storm Julia:

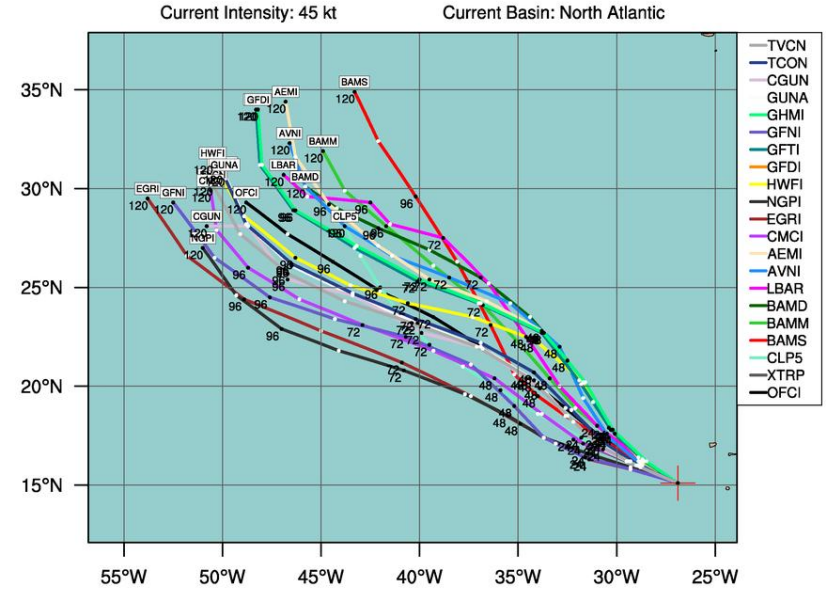
J1



J2

TROPICAL STORM JULIA (AL12)

Early-cycle track guidance valid 1800 UTC, 13 September 2010

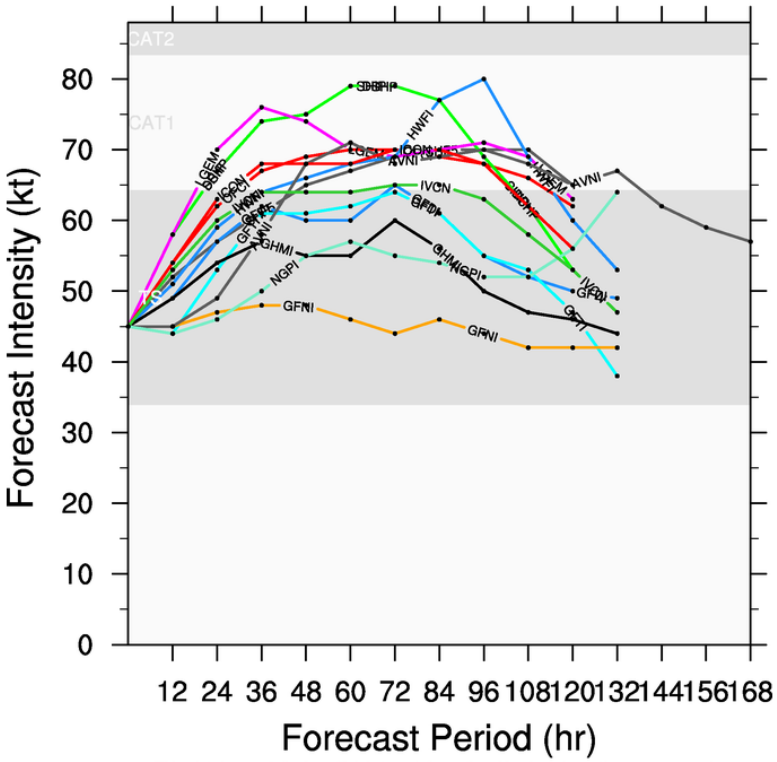


This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

TROPICAL STORM JULIA (AL12)

Early-cycle intensity guidance

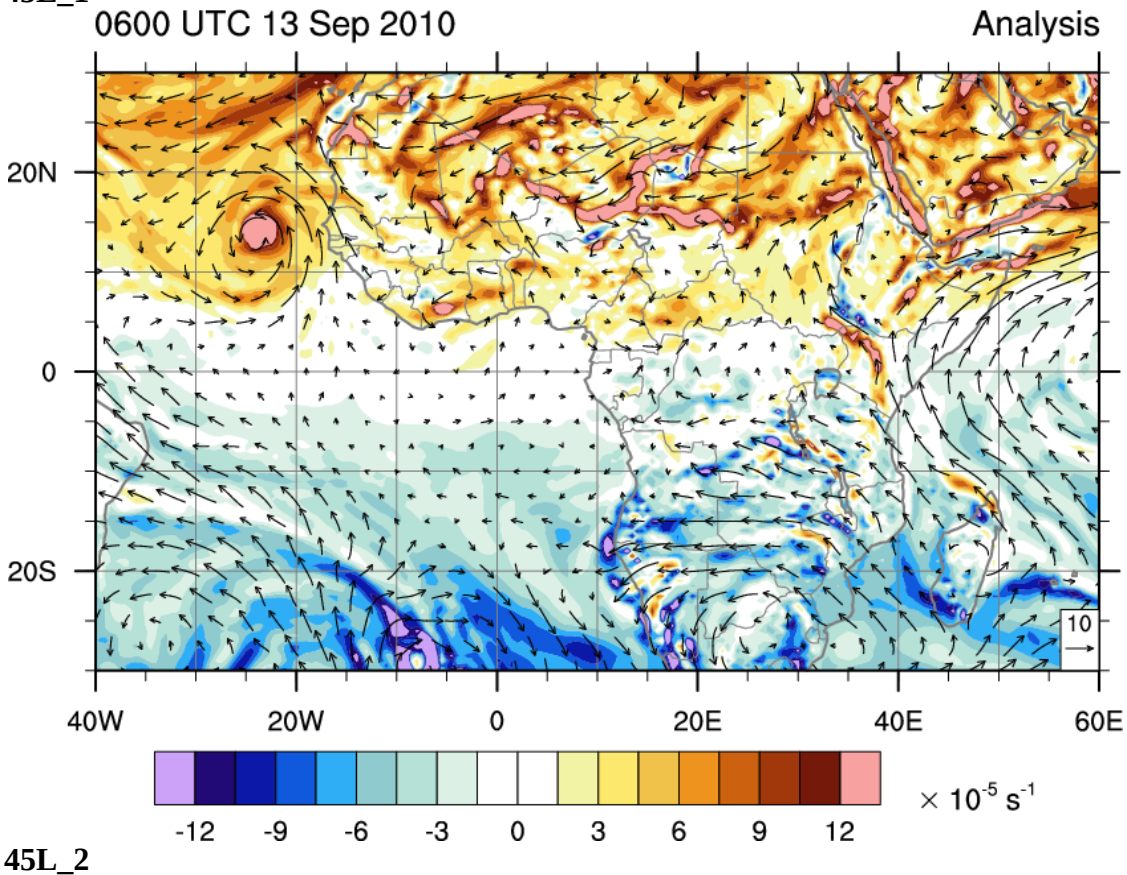
valid 1800 UTC, 13 September 2010



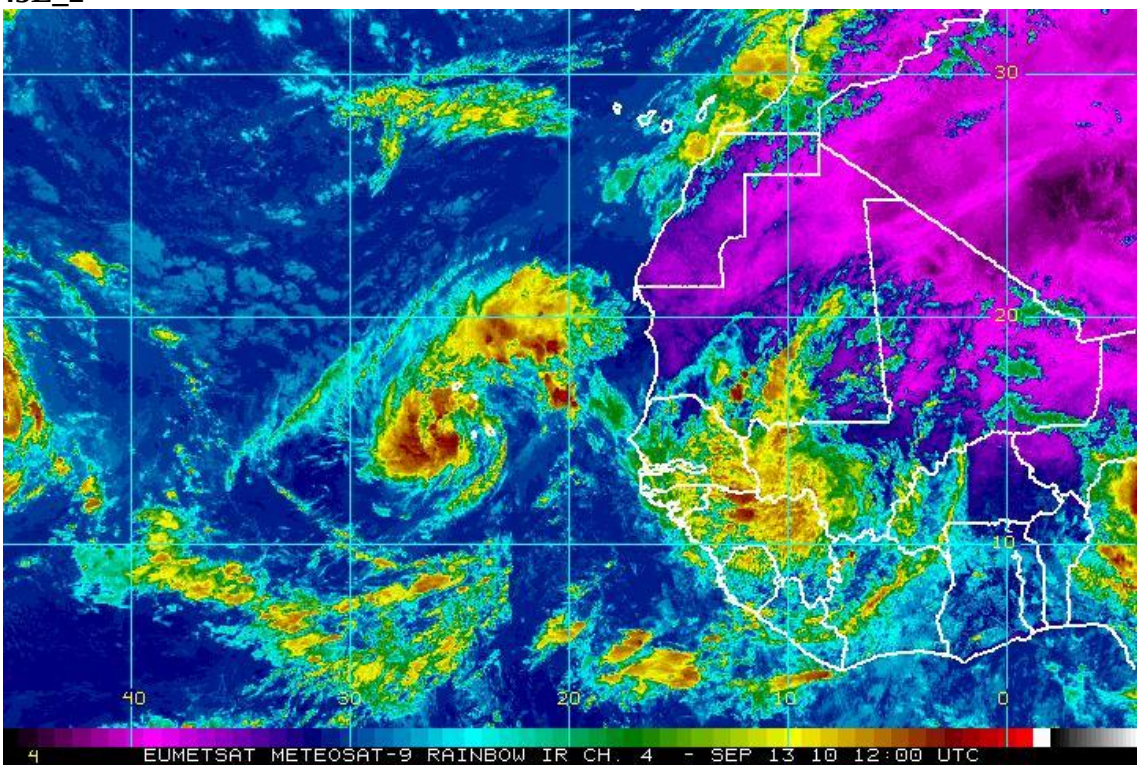
This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

PGI-45L:

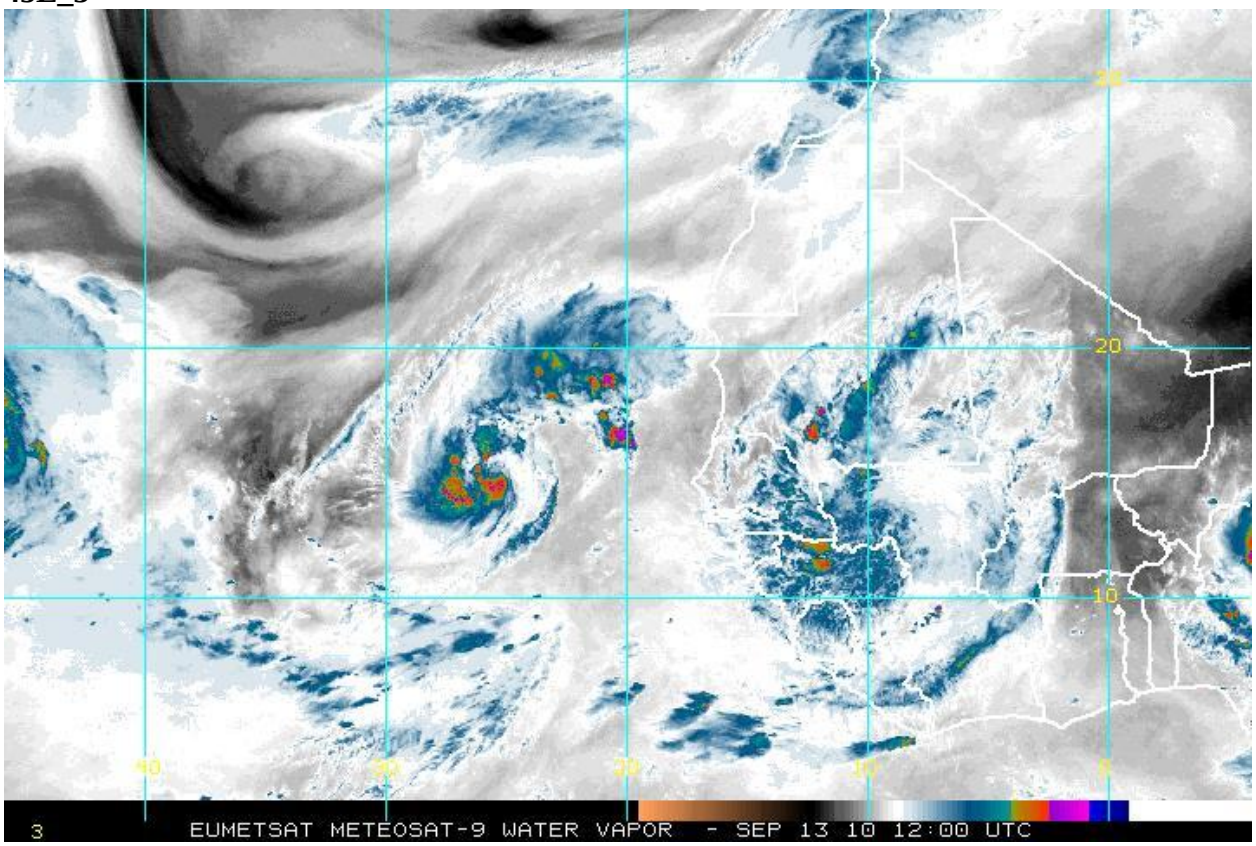
45L_1



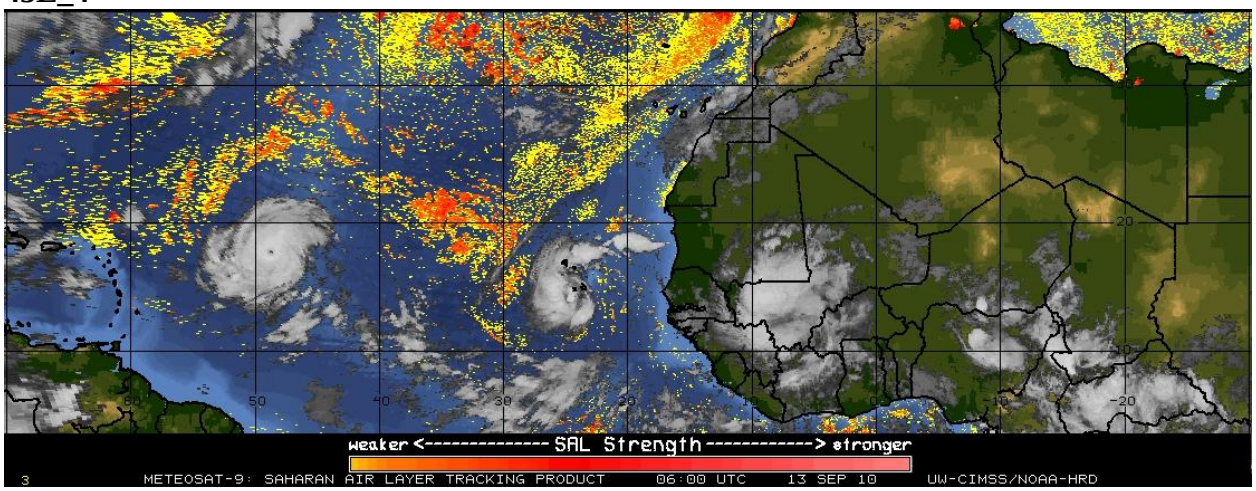
45L_2



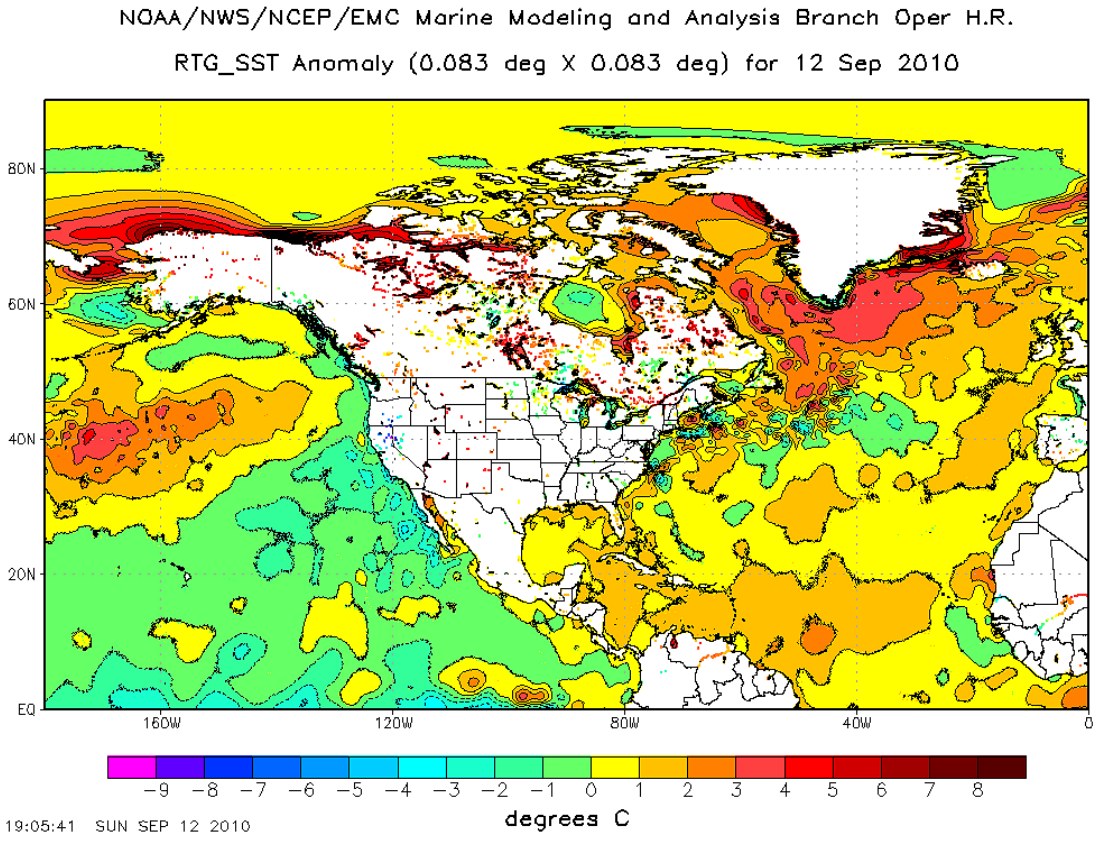
45L_3


30
20
10
40
30
20
10
0
3
EUMETSAT METEOSAT-9 WATER VAPOR - SEP 13 10 12:00 UTC

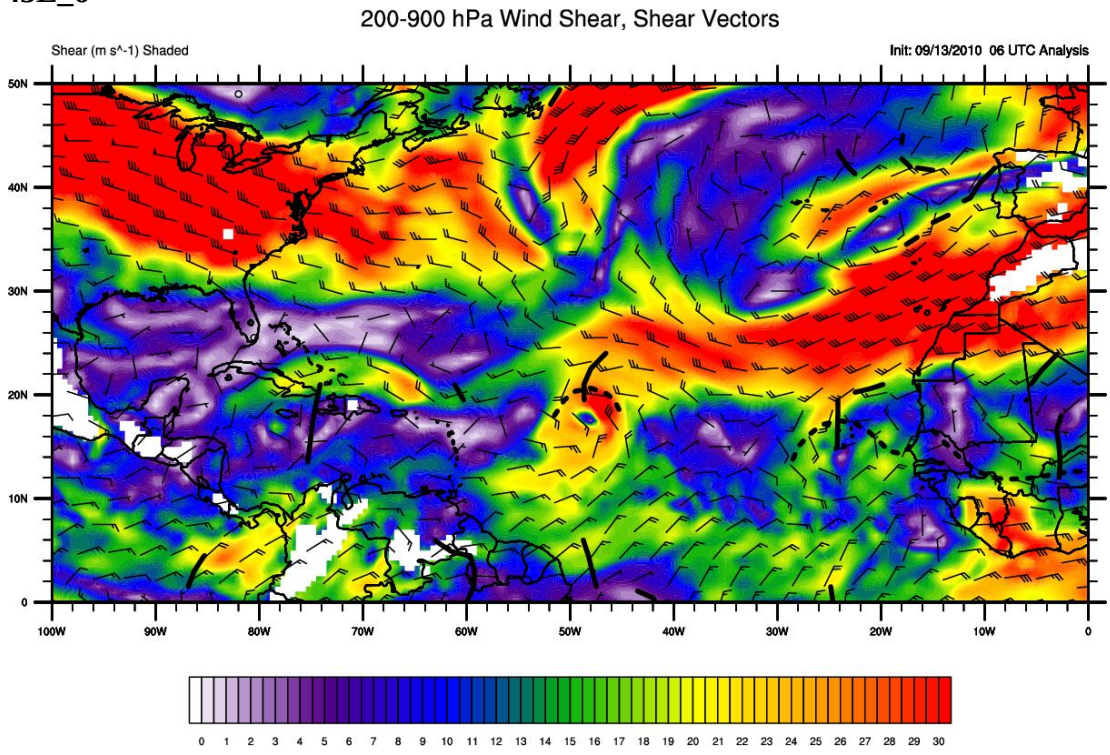
45L_4


weaker <---------- SAL Strength ----------> stronger
3
METEOSAT-9: SAHARAN AIR LAYER TRACKING PRODUCT
06:00 UTC 13 SEP 10
UW-CIMSS/NOAA-HRD

45L_5


NOAA/NWS/NCEP/EMC Marine Modeling and Analysis Branch Oper H.R.
RTG_SST Anomaly (0.083 deg X 0.083 deg) for 12 Sep 2010
80N
60N
40N
20N
EQ
160W
120W
80W
40W
0
−9 −8 −7 −6 −5 −4 −3 −2 −1 0 1 2 3 4 5 6 7 8
degrees C
19:05:41 SUN SEP 12 2010

45L_6


200-900 hPa Wind Shear, Shear Vectors
Shear (m s^-1) Shaded
Init: 09/13/2010 06 UTC Analysis
50N
40N
30N
20N
10N
0
100W
90W
80W
70W
60W
50W
40W
30W
20W
10W
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30