Tri-Agency Forecast Discussion- September 1, 2010

Large-scale features: The primary features of interest in the Atlantic basin are Hurricane Earl, Tropical Storm Fiona and TD09 as are shown on this morning's NHC Graphical Tropical Weather Outlook page (Fig. 1). These features are also evident as areas of high total precipitable water (TPW) as depicted on CIMSS TPW image valid for 0800 UTC 1 September (Figure 2). This figure shows the TPW associated with 4 pouches: PGI34L (Hurricane Earl), PGI36L (Tropical Storm Fiona), PGI38 (TD09), and PGI39L. Although most of the aforementioned systems appear to be presently situated in regions of fairly high TPW, regions of relatively low TPW are presently located to the west –southwest of both PGI34L (Hurricane Earl) and PGI38L (TD09). The aforementioned regions of lower TPW can also be seen in the CIMMS Saharan Air-Layer imagery from this 1200 UTC this morning (Fig. 3). Three distinct regions of relatively high positive vorticity associated with Hurricane Earl (near 24 N and 72 W), Tropical Storm Fiona (near 18 N and 62 W), TD09 (11 N and 32 W) can be seen in CIMMS 850 mb vorticity analysis from 1200 UTC this morning (Fig. 4). Another more elongated region of positive vorticity can be seen along a line that stretches from 5-15 W at ~11 N. The primary upper-level feature depicted in the CIMMS upper-level wind analysis (Fig. 5) from this morning is a large anti-cyclone to the east of Hurricane Earl that is producing relatively strong northeasterly flow over Tropical Storm Fiona which appears to be inhibiting this systems development. The upper-level flow over TD09 is relatively weak and somewhat diffluent and appears relatively conducive for additional development.

Hurricane Earl:

At 2 PM EDT Hurricane Earl was located near 25.7 N 72.7 W with 110 kt maximum sustained winds and was moving northwest at 15 kt. The early model track guidance from 1200 UTC this morning are in fairly good agreement and show a northwest and then northward motion for the next 48 h followed by a northeast motion with an increase in forward speed beyond that time frame (Fig. 6). The intensity guidance (Fig. 7) are also in fairly good agreement indicating that Earl will likely maintain its current intensity for the next day or two before starting to weaken when it moves northeastward into regions of lower SSTs, lower instability and higher vertical shear. This morning's official NHC forecast brings Earl very close to the outer banks of North Carolina by early Friday morning as a Category 3 Hurricane before heading northeast and passing just east of Cape Cod by early morning with an intensity somewhere between 70 and 100 kt.

Tropical Storm Fiona:

At 2 PM EDT Tropical Fiona was located near 19.3 N and 62.2 W with maximum sustained winds of 50 kt and was moving northwest at 15 kt. Nearly all of the track guidance (Fig. 8) show Fiona continuing on a northwest track for about 48-72 h before turning more to the north and northeast with an increase in forward motion beyond about 72. There are a few models that take Fiona more toward the west or even southwest after 48 h but this does not seem to be a likely scenario. The intensity guidance (Fig. 9) indicate that Fiona could briefly attain hurricane intensity within the next 24h before weakening and back to tropical storm strength before perhaps re-intensifying near the end of the forecast period. The LGEM and SHIPS models show Fiona attaining near Hurricane intensity in about the 24-36 h time frame before weakening back to a tropical storm. At 1200 UTC this morning, the SHIPS RI index indicated that the probability of Fiona undergoing RI (30 kt increase in maximum wind over the next 24 h) was only about 11% or about 1.4 times the climatological mean. The official NHC forecast calls for Fiona to move northwestward and intensify slightly (but not to hurricane intensity) before moving more northward and weakening to a tropical depression by 120 h.

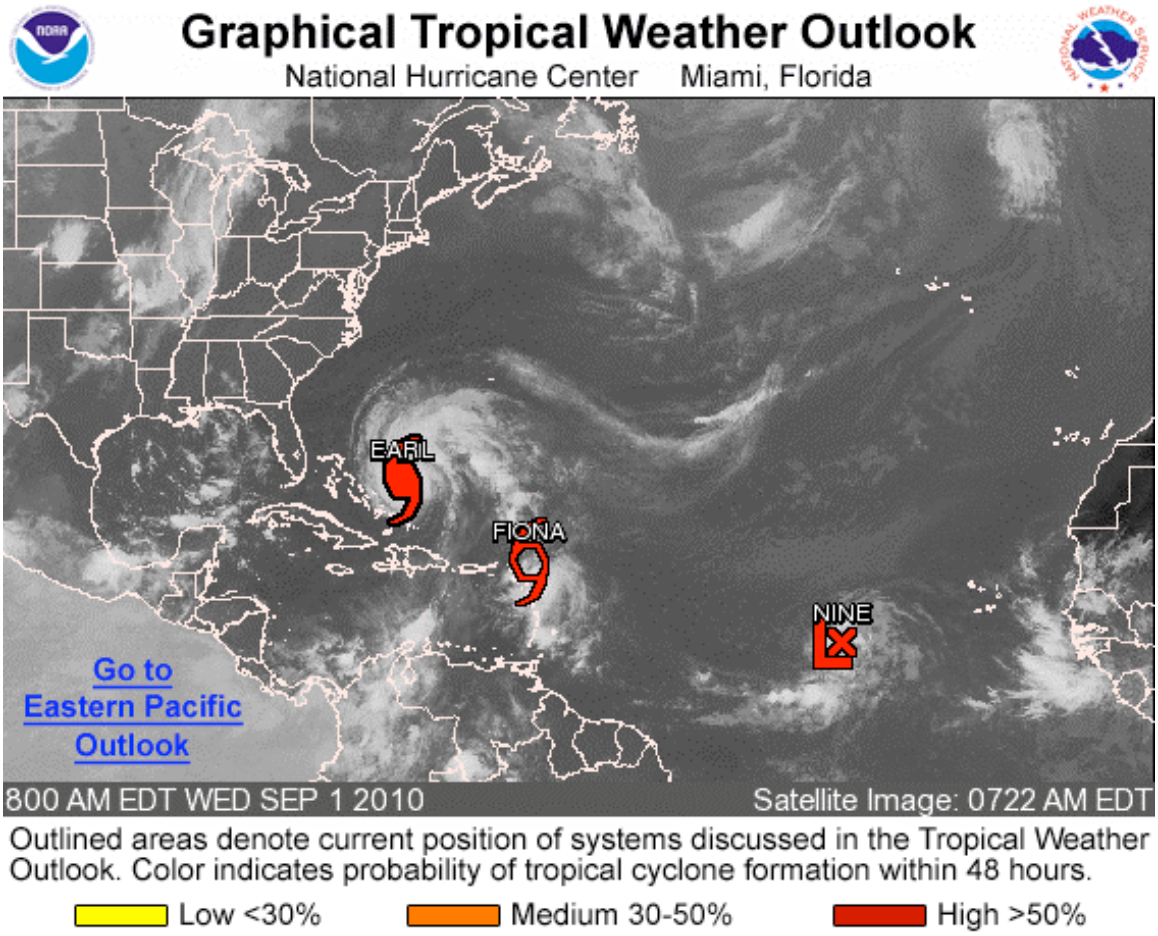
Tropical Depression 9

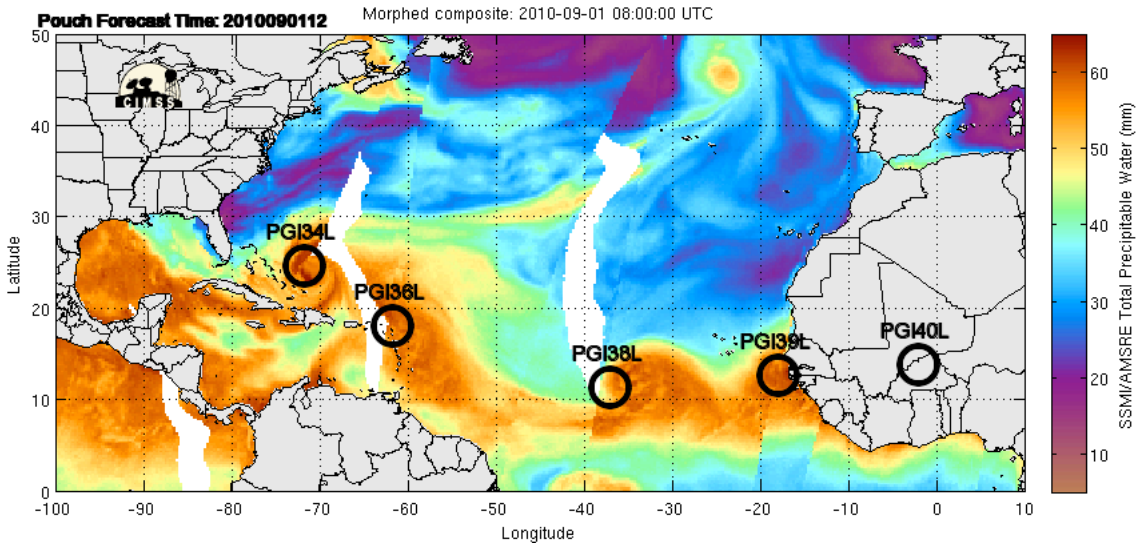
At 11 AM EDT TD09 was located near 12.4 N and 35. 8 W with maximum sustained winds of 30 kt and was moving to the west at 13 kt. Most of the 1200 UTC early model track guidance (Fig. 10) show TD09 moving to the west or west-northwest over the next 120 h. The intensity guidance (Fig. 11) generally show TD09 strengthening to only a tropical storm during the 120 h forecast period; however, the LGEM and SHIPS models suggest that TD09 could attain minimal hurricane intensity near the end of the forecast period. It is worth noting that the SHIPS model guidance indicates that while the oceanic conditions should become increasingly favorable and the shear should remain relatively low throughout the forecast period (between 6 and 15 kt) the atmospheric thermodynamic conditions will likely not be particularly favorable for intensification with relatively dry stable air surrounding the system for the entire forecast period. The official NHC forecast indicates that TD09 should move generally westward over the next few days while strengthening only slightly to a moderate tropical storm with 50 kt winds by 120 h when it is forecast to be located near 17.0 N and 53 W.

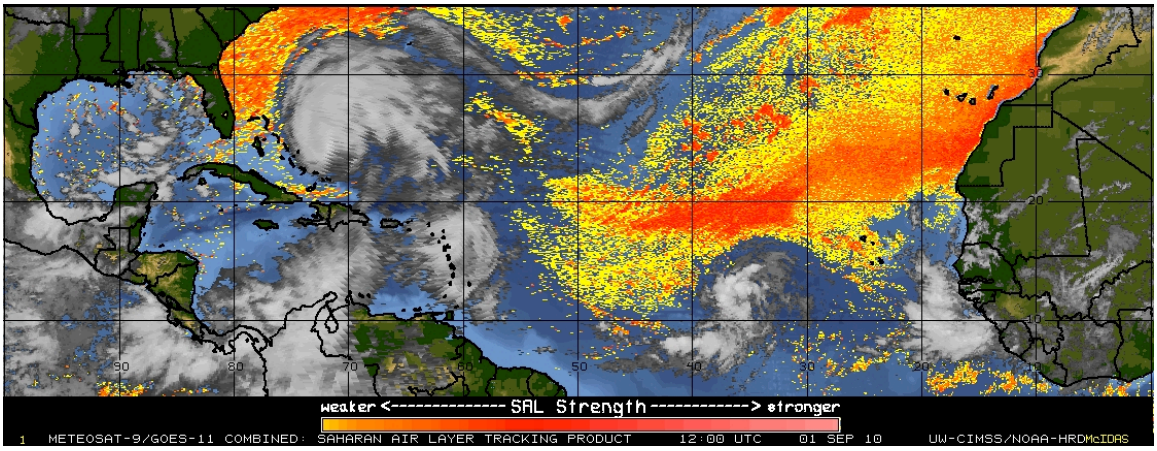
PGI39L

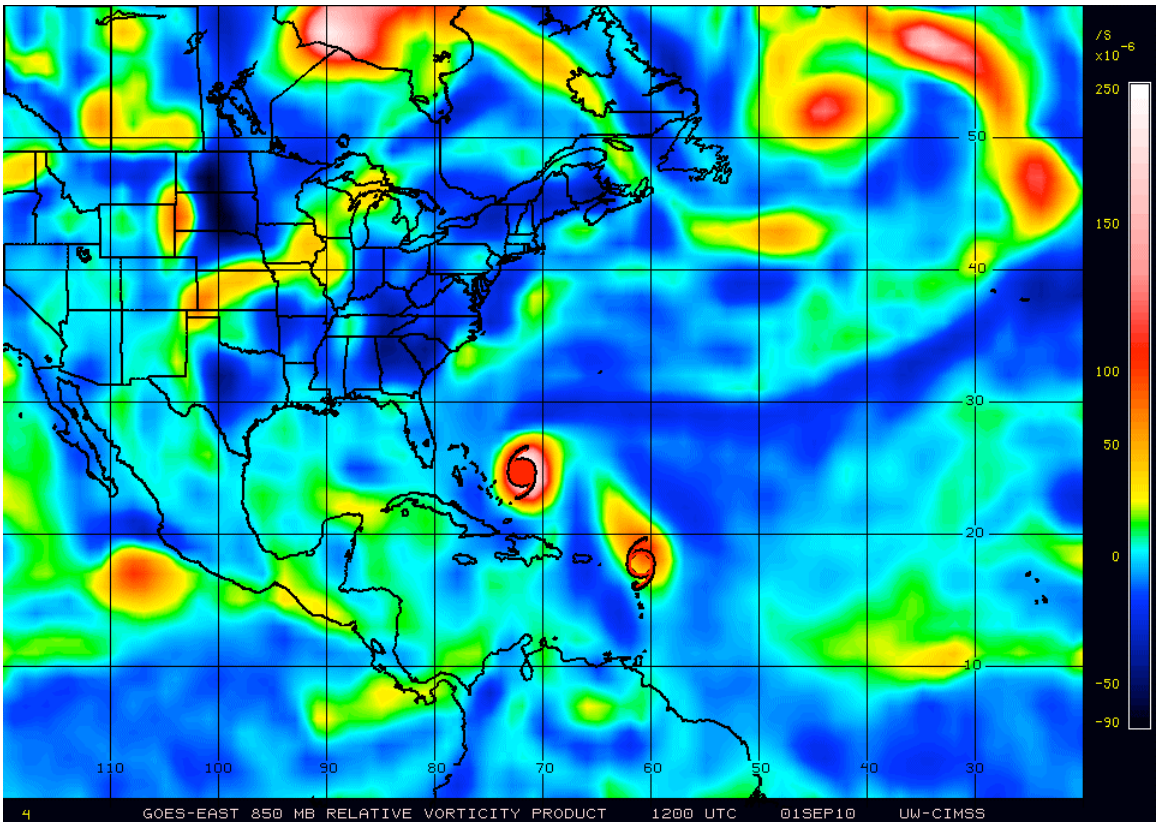
According to this morning's pouch products, PGI39 was centered near 10 N and 20 W (Fig. 2). The vorticity associated with PGI39 is rather elongated (Fig. 4) and the system is currently embedded in a region of fairly high shear (30 kt), which suggest that

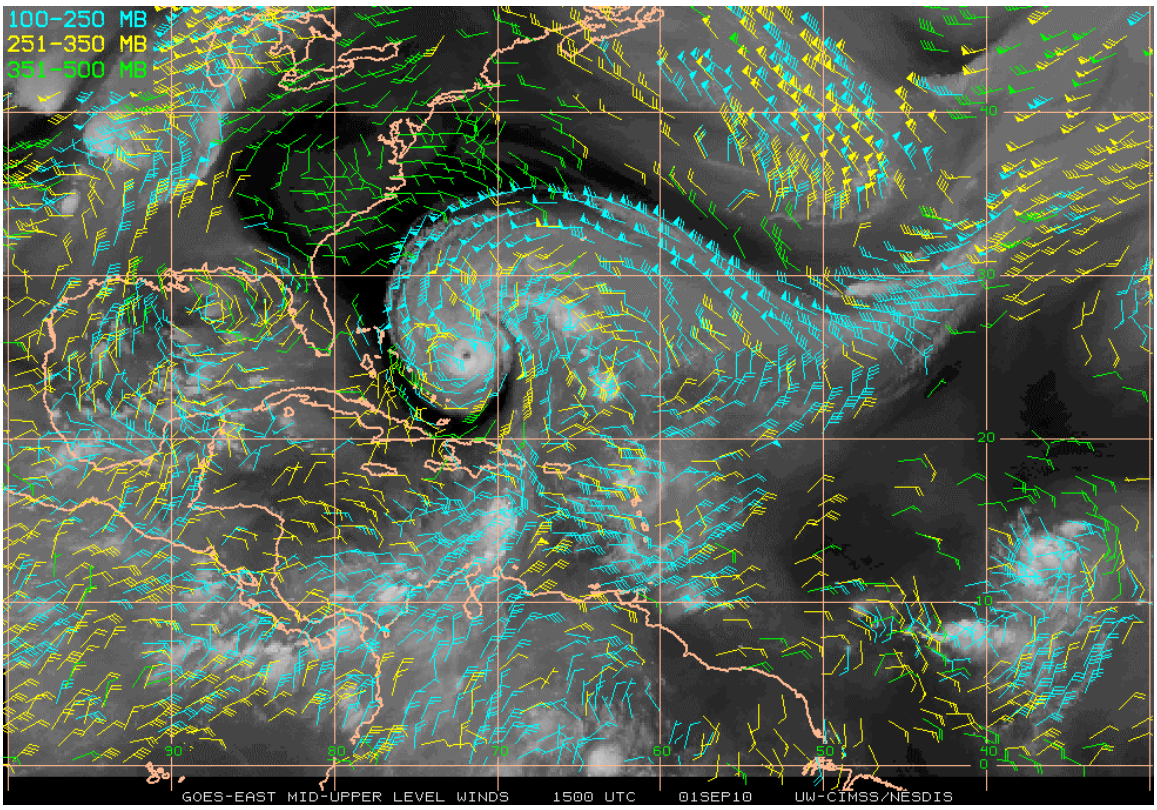
development of this system is likely in the near future. However, the pouch product output indicates that the GFS is able to track the system out to 120 h (Fig. 12) at which time it is located near 10 N and 35 W so it is possible that this system could be viable target for research flights sometime early next week.

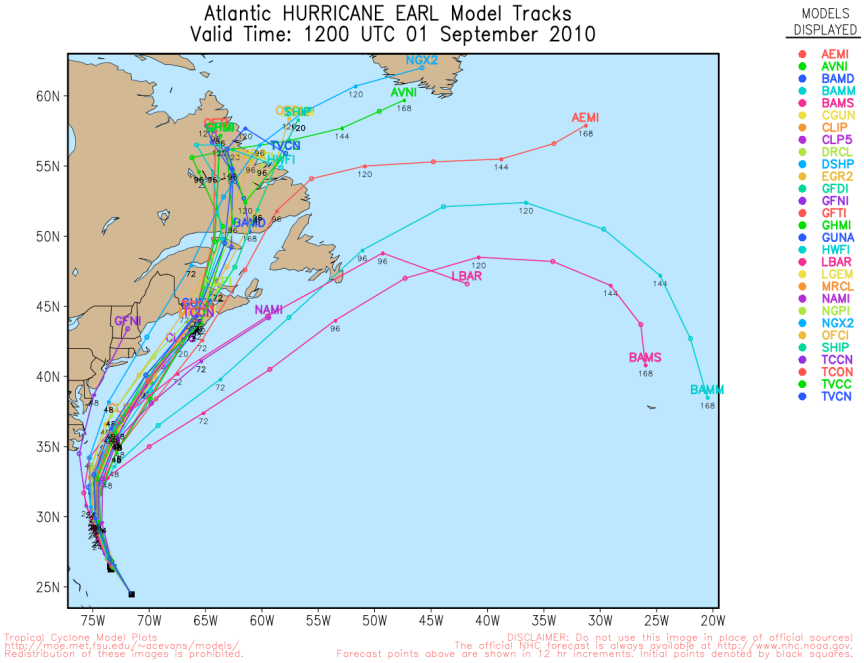



Pouch Forecast Time: 2010090112
Morphed composite: 2010-09-01 08:00:00 UTC
PGI34L
PGI36L
PGI38L
PGI39L
PGI40L
Latitude
Longitude
SSMI/AMSRE Total Precipitable Water (mm)


Weaker <---------- SAL Strength ----------> stronger
1 METEOSAT-9/GOES-11 COMBINED: SAHARAN AIR LAYER TRACKING PRODUCT 12:00 UTC 01 SEP 10 UW-CIMSS/NOAA-HRDMcIDAS


/S
x10 -6
250
150
100
50
0
-50
-90
50
40
30
20
10
110
100
90
80
70
60
50
40
30
9
9
4
GOES-EAST 850 MB RELATIVE VORTICITY PRODUCT
1200 UTC
01SEP10
UW-CIMSS


100-250 MB
251-350 MB
351-500 MB
GOES-EAST MID-UPPER LEVEL WINDS 1500 UTC 01SEP10 UW-CIMSS/NESDIS


Atlantic HURRICANE EARL Model Tracks
Valid Time: 1200 UTC 01 September 2010
MODELS DISPLAYED
AEMI
AVNI
BAMD
BAMM
BAMS
CGUN
CLIP
CLP5
DRCL
DSHP
EGR2
GFDI
GFNI
GFTI
GHMI
GUNA
HWFI
LBAR
LGEM
MRCL
NAMI
NGPI
NGX2
OFCI
SHIP
TCCN
TCON
TVCC
TVCN
60N
55N
50N
45N
40N
35N
30N
25N
75W
70W
65W
60W
55W
50W
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Tropical Cyclone Model Plots
http://moe.met.fsu.edu/~acevans/models/
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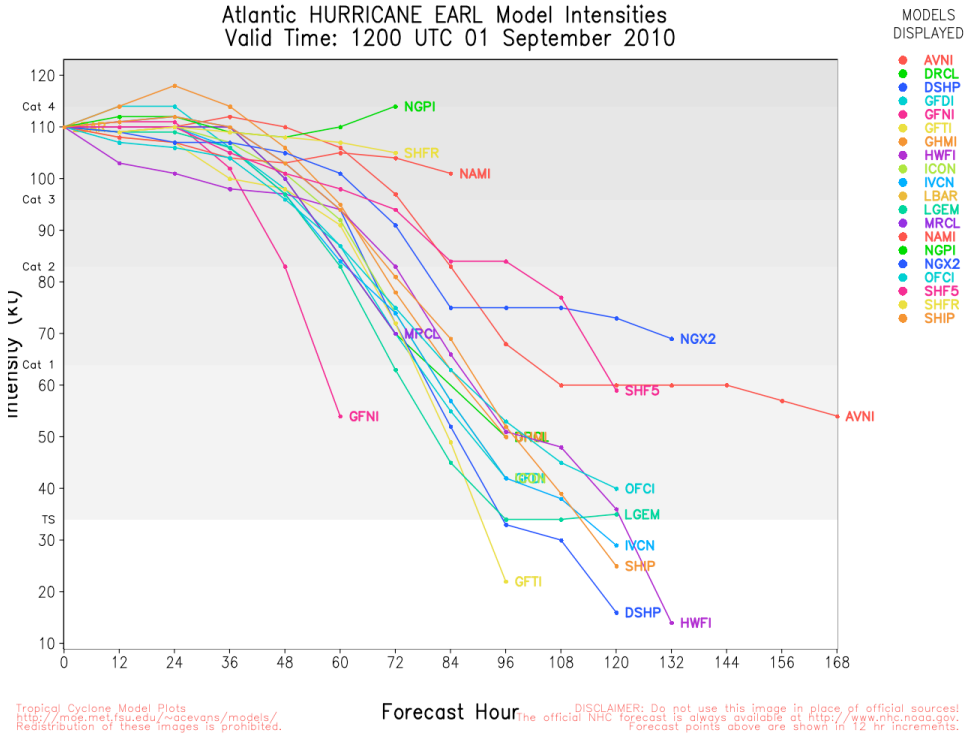
DISCLAIMER: Do not use this image in place of official sources!
The official NHC forecast is always available at http://www.nhc.noaa.gov.
Forecast points above are shown in 12 hr increments. Initial points denoted by black squares.



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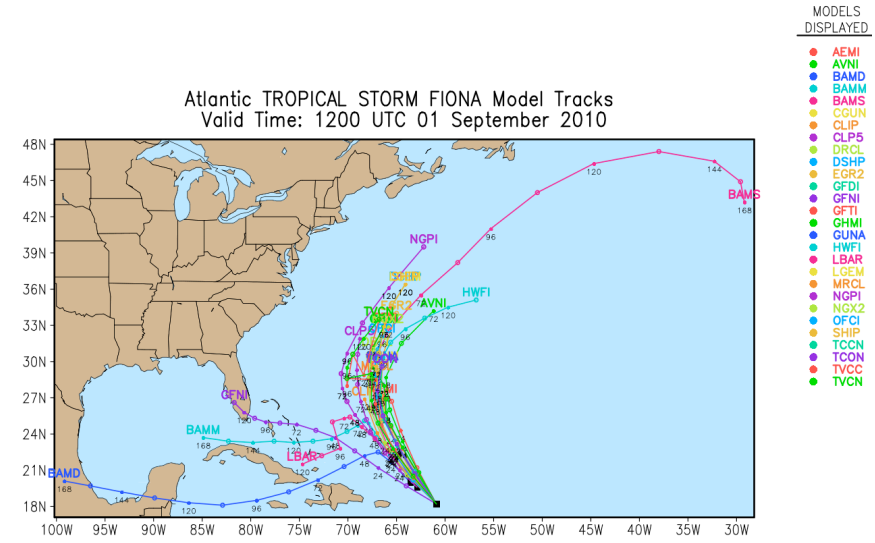

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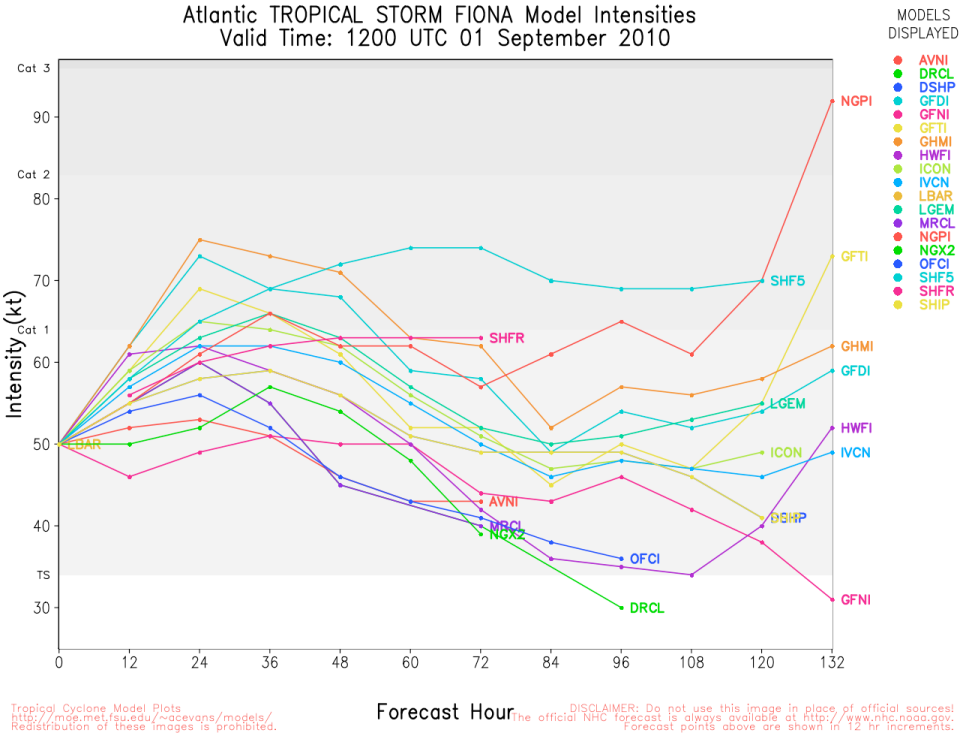

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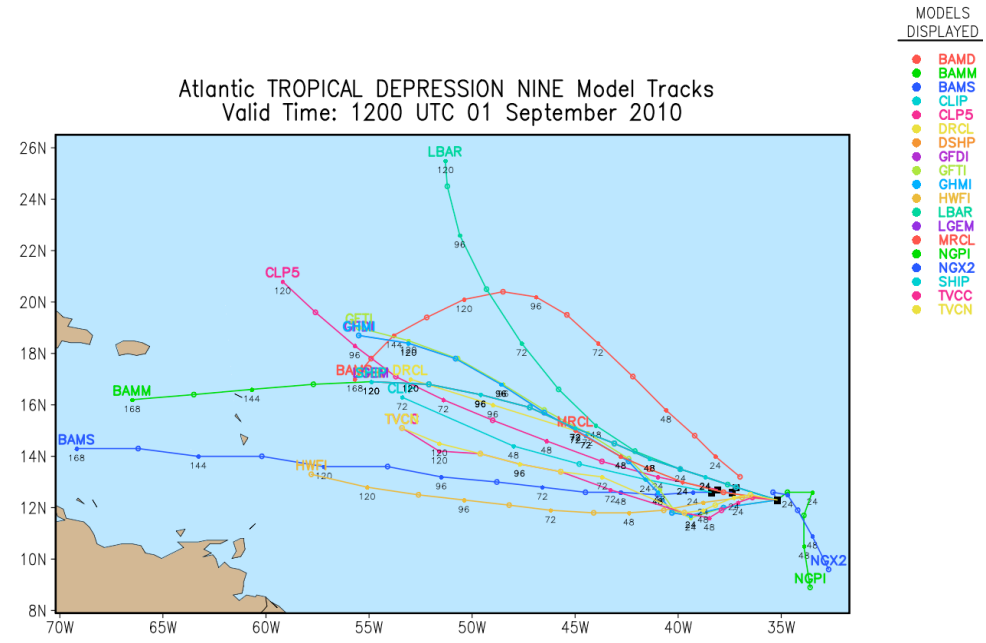

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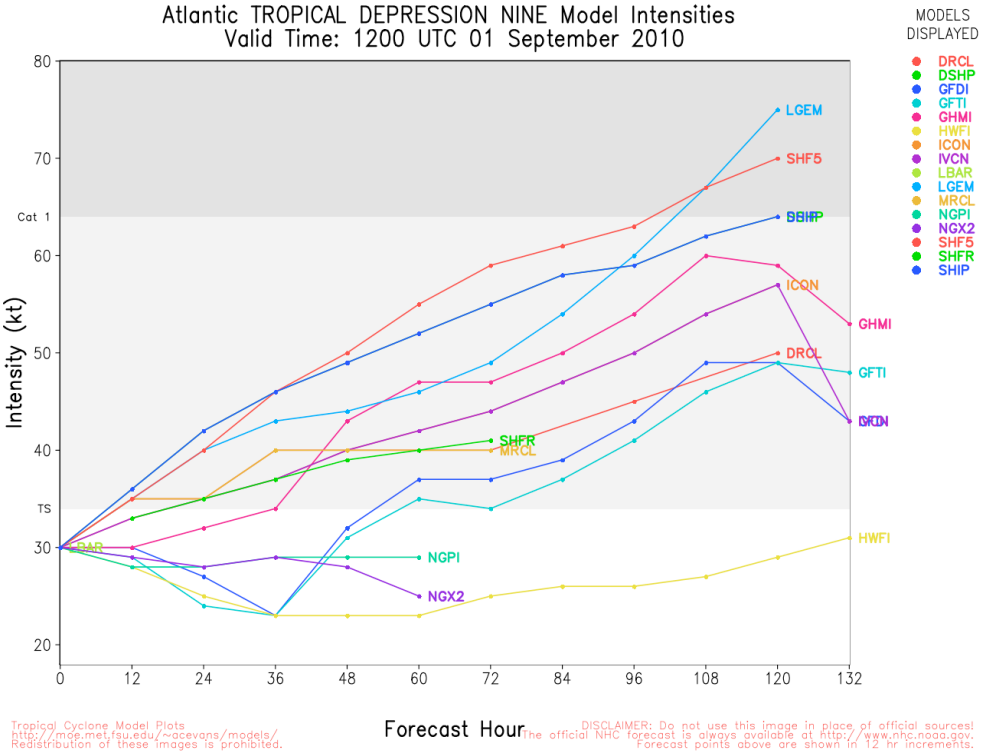

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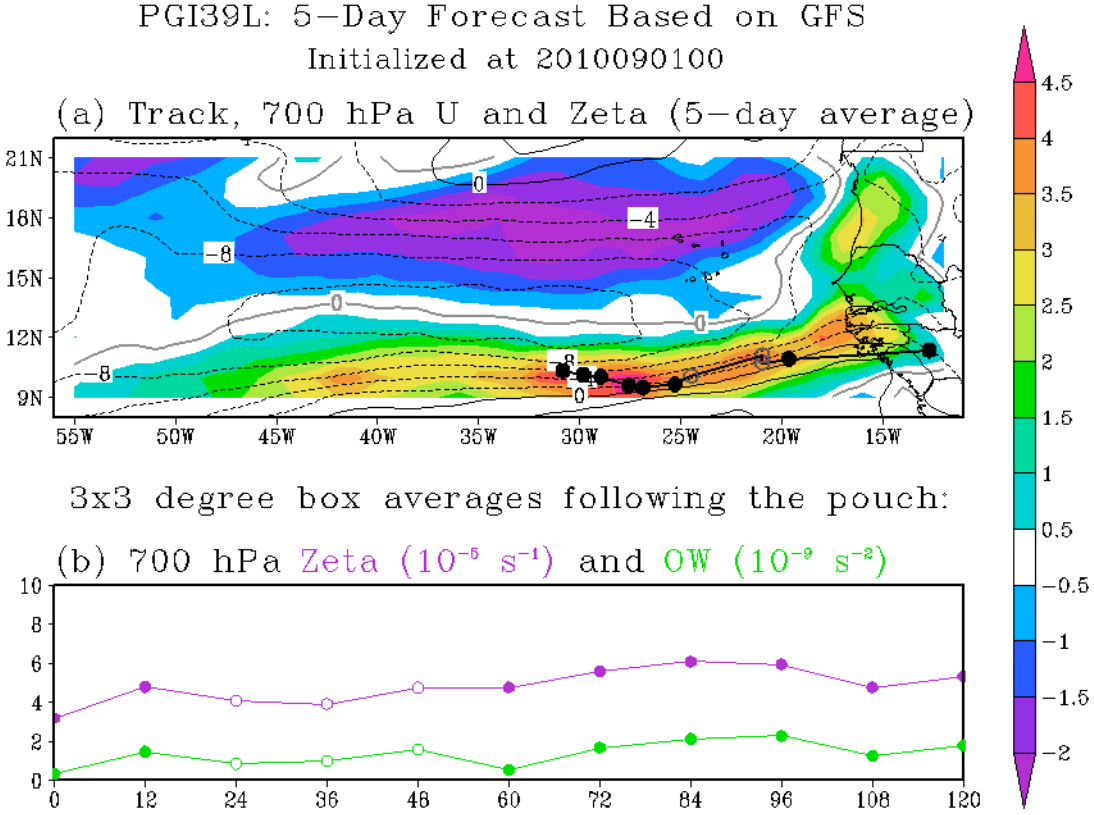
PGI39L: 5-Day Forecast Based on GFS

Initialized at 2010090100

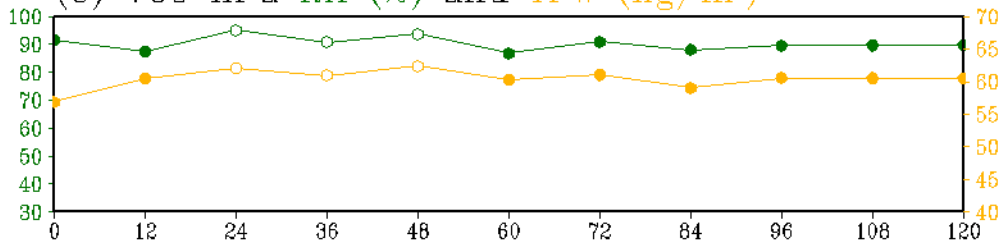
(a) Track, 700 hPa U and Zeta (5-day average)



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/m^2)



(d) Vertical shear (m/s)

Deep 200-850 hPa

Pouch 500-850 hPa