ONAMET

- JOSE MANUEL MEDINA HIDALGO
- SYNOPTIC METEOROLOGY AND FORECAST OFFICE
- DOMINICAN REPUBLIC
- TROPICAL DESK

MOTIVATION AND OBJECTIVES

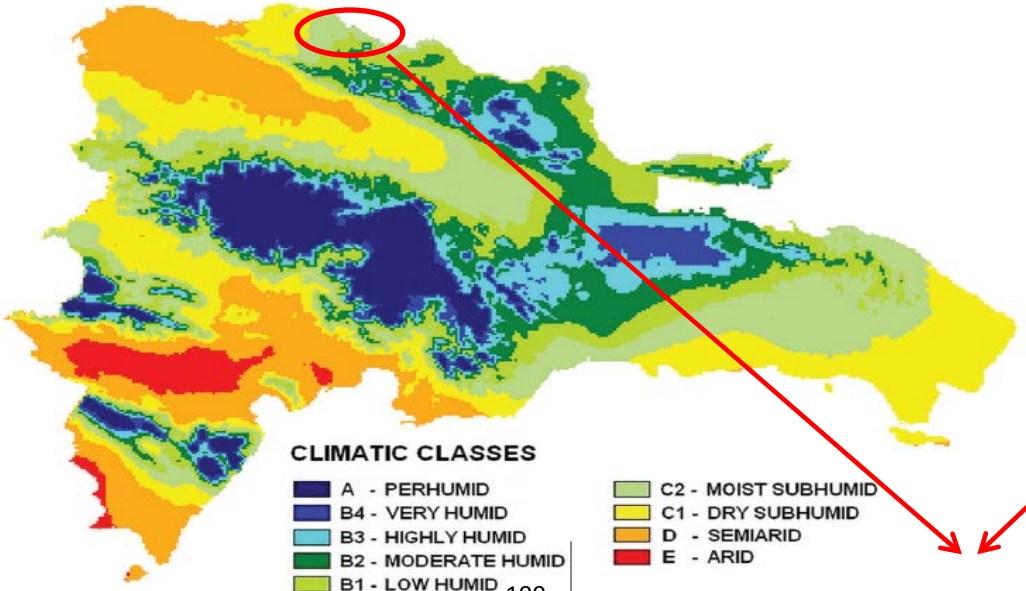
- TO STUDY A CASE OF IMPORTANT HEAVY RAINFALL TYPICAL IN THE TRANSITION MONTHS IN THE DOMINICAN REPUBLIC.

- TO APPLY AND DEVELOP NEW TOOLS TO ANALYZE SIMILAR EVENTS NOT NECESSARILY ASSOCIATED TO THE HURRICANE SEASON.

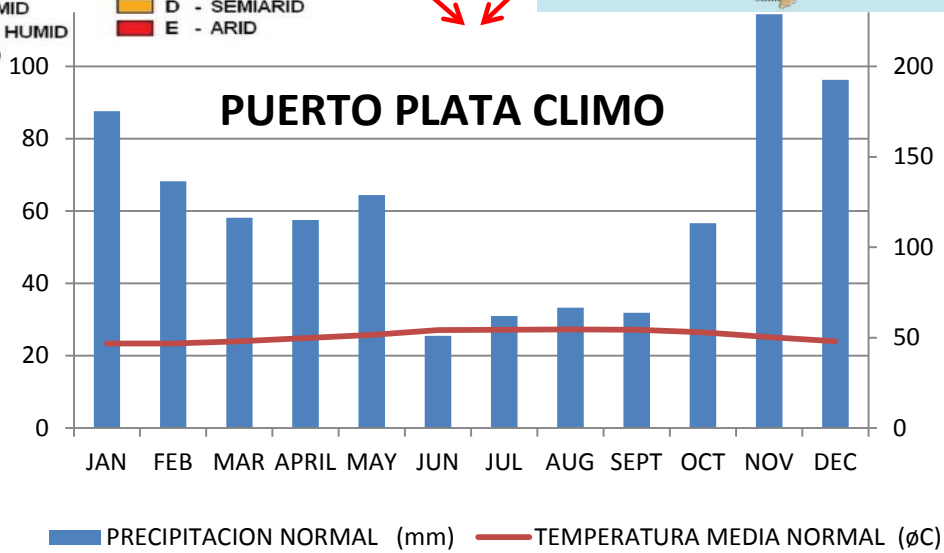
REPUBLICA DOMINICANA

LOCATION


N
O
E
S


CLIMATIC CLASSES
A - PERHUMID
B4 - VERY HUMID
B3 - HIGHLY HUMID
B2 - MODERATE HUMID
B1 - LOW HUMID
C2 - MOIST SUBHUMID
C1 - DRY SUBHUMID
D - SEMIARID
E - ARID


HAITI
SANTIAGO
LA VEGA
SAN JUAN
AZUA
BARORUCO
INDEPENDENCIA
PEDERNALES
BARAHONA
SAN CRISTOBAL
DISTRITO NACIONAL
SANTO DOMINGO
SAN PEDRO DE MACORIS
EL SEIBO
LA ROMANA
ALTAGRACIA
PUERTO PLATA
MONTE CRISTI
DAJABON
SANCHEZ RAMIREZ
MARIA TRINIDAD SANCHEZ
SAMANA
Atlantic Ocean
Caribbean Sea
PORT-AU-PRINCE
DOMINICAN REPUBLIC
International boundary
Provincia boundary
National capital
Provincia capital
Railroad
Road


PUERTO PLATA CLIMO
100
80
60
40
20
0
200
150
100
50
0
JAN
FEB
MAR
APRIL
MAY
JUN
JUL
AUG
SEPT
OCT
NOV
DEC
PRECIPITACION NORMAL (mm)
TEMPERATURA MEDIA NORMAL (øC)

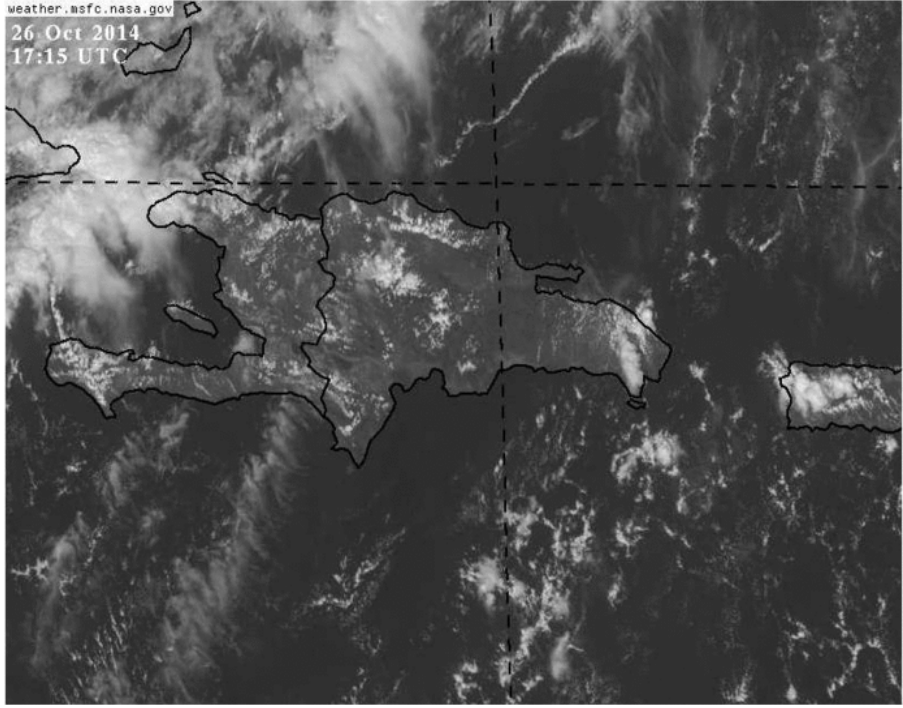
SYNOPTIC CONTEXT

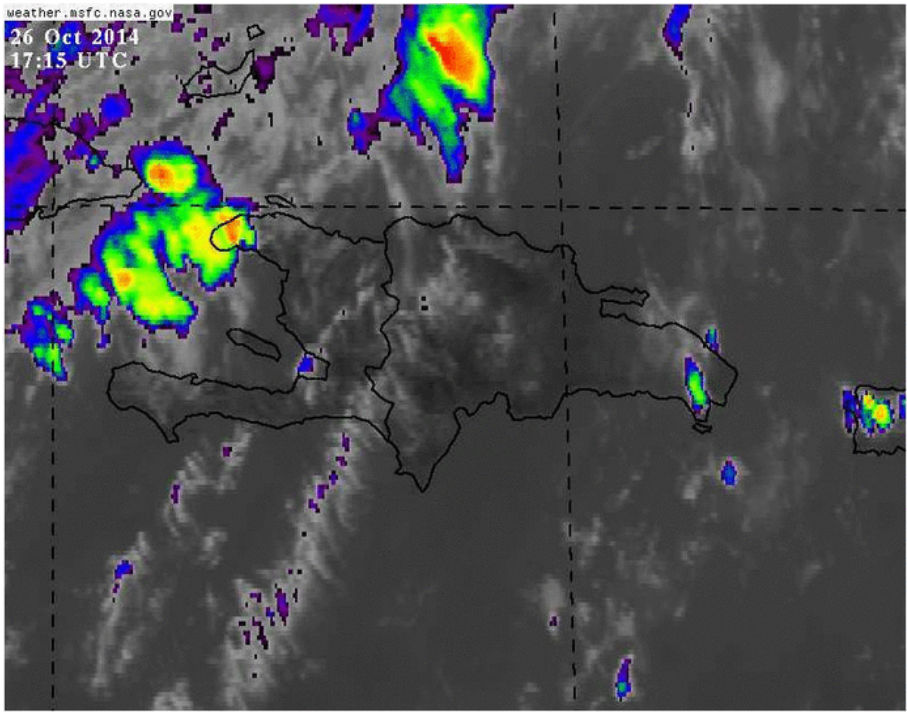
- AFTER ~3 DAYS OF FAIR WEATHER UNDER THE INFLUENCE OF A MID-LEVEL RIDGE, THE NORTHERN PART OF THE DOMINICAN REPUBLIC WAS AFFECTED BY HEAVY RAINFALL.

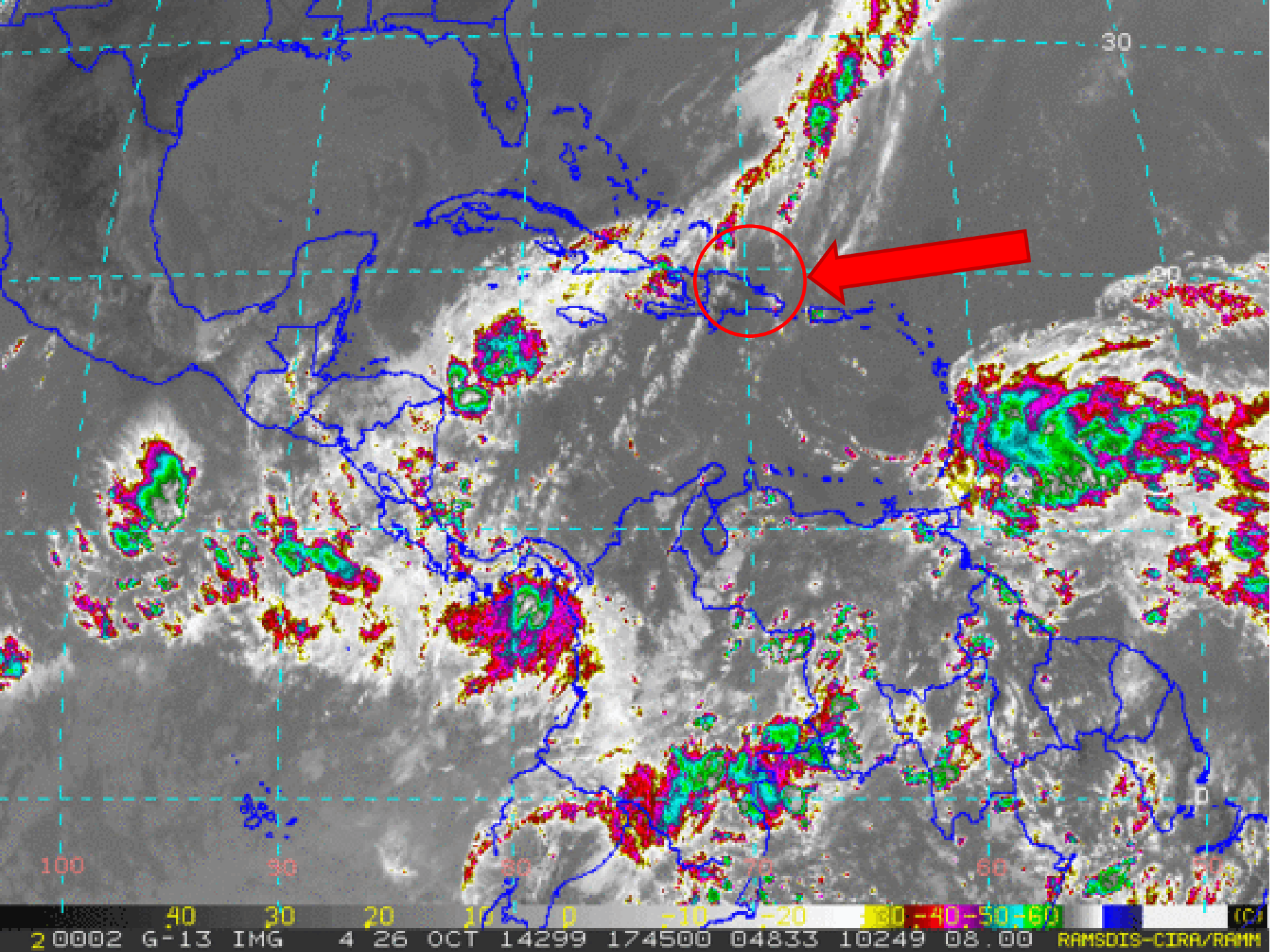
- STRONG T-STORMS OCCURRED IN THE AFTERNOON OF OCT 26 WITH A SHEAR LINE INTERACTING WITH THE NORTHERN MOUNTAINS.

- DEEP CONVECTION FIRST DEVELOPED IN THE CENTRAL VALLEY TRIGGERED BY THE DIURNAL CYCLE

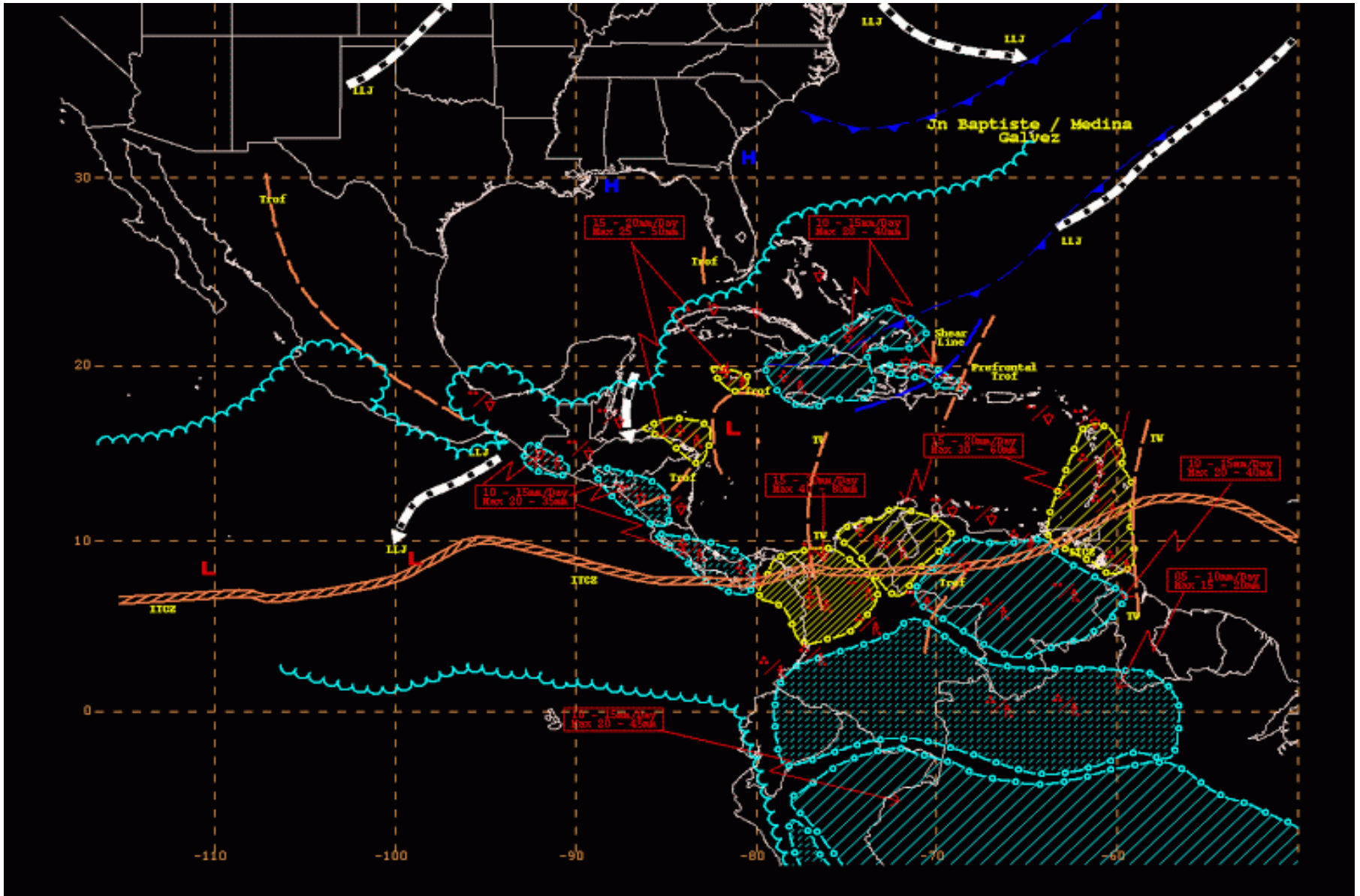
- THEN REFORMED TO THE NORTH IN THE SHEAR LINE CONVERGENCE REGION, AND WHERE SOUTHEASTERLY MID-UPPER SHEAR RELAXED THE RIDGE.



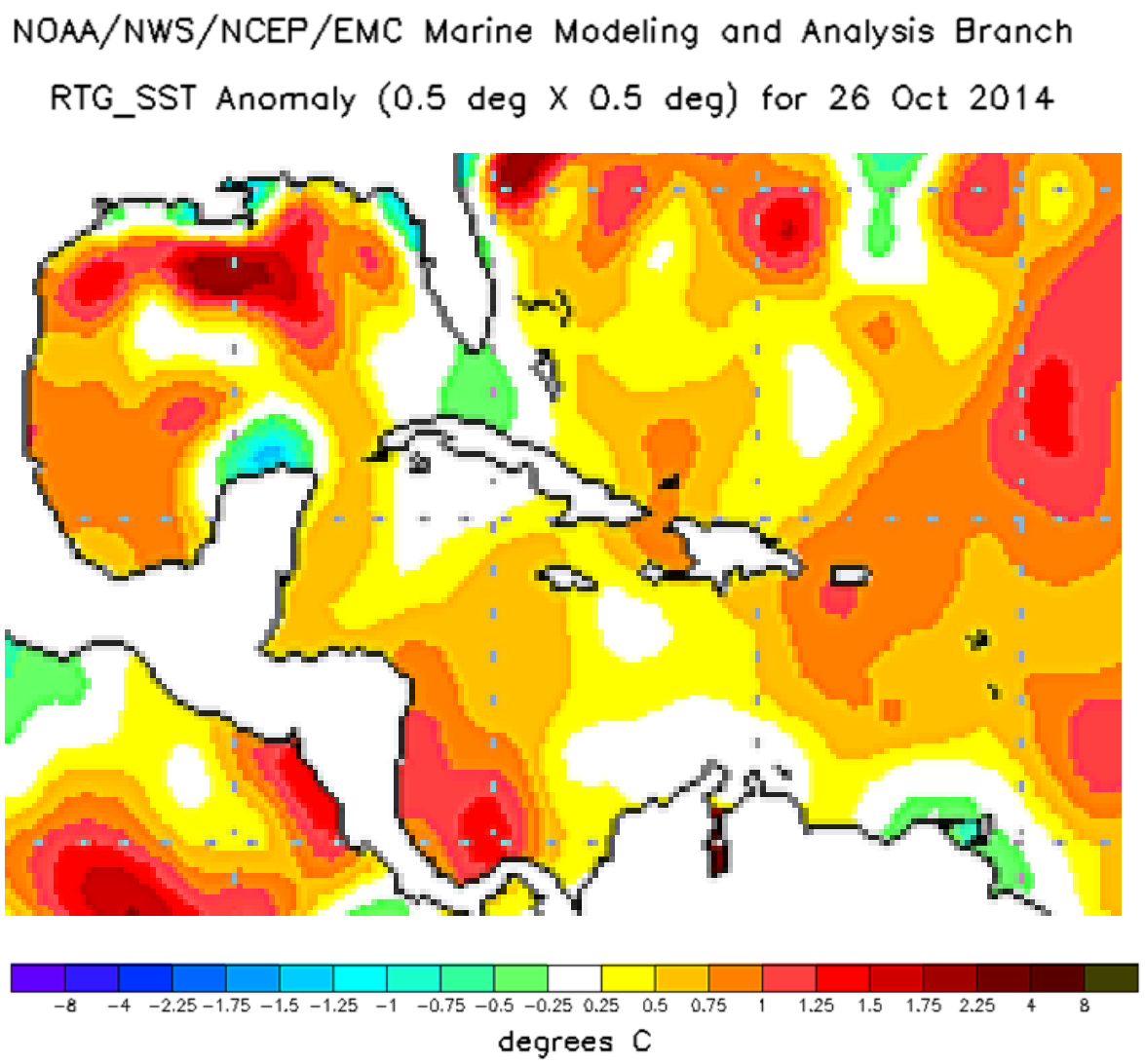



30
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
(C)
20002 G-13 IMG 4 26 OCT 14299 174500 04833 10249 08.00 RAMSDIS-CIRA/RAMM

SYNOPTIC CONTEXT/TROPICAL DESK FORECAST



SST ANOMALIES



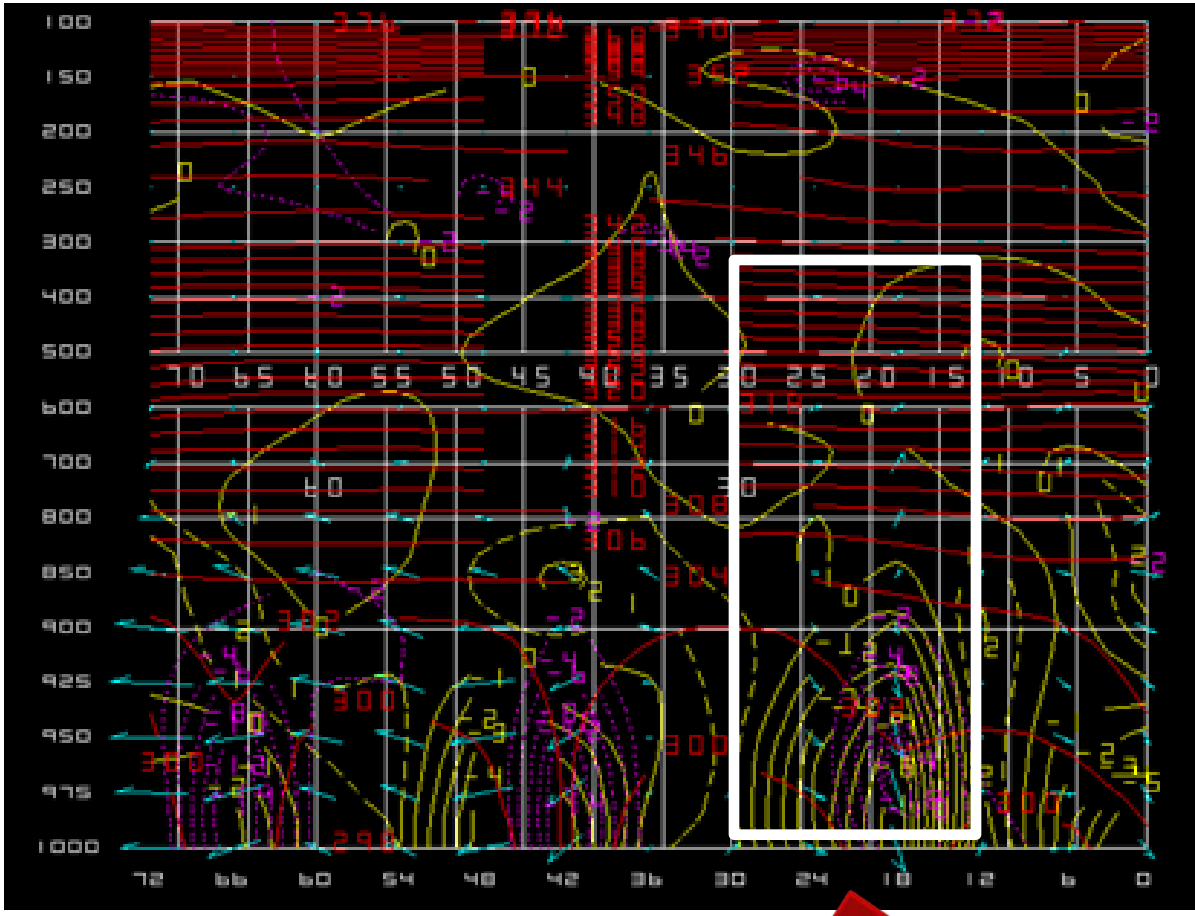
SEA SURFACE TEMPERATURES WERE SLIGHTLY ABOVE CLIMATOLOGY (~0.5C)

TIME SECTION FOR PUERTO PLATA

(GFS DATA OCT-26-2014 0000Z)

STORMS ~F12 - F24.

COLD AIR MASS ADVECTED INTO THE NOTHERN COAST.



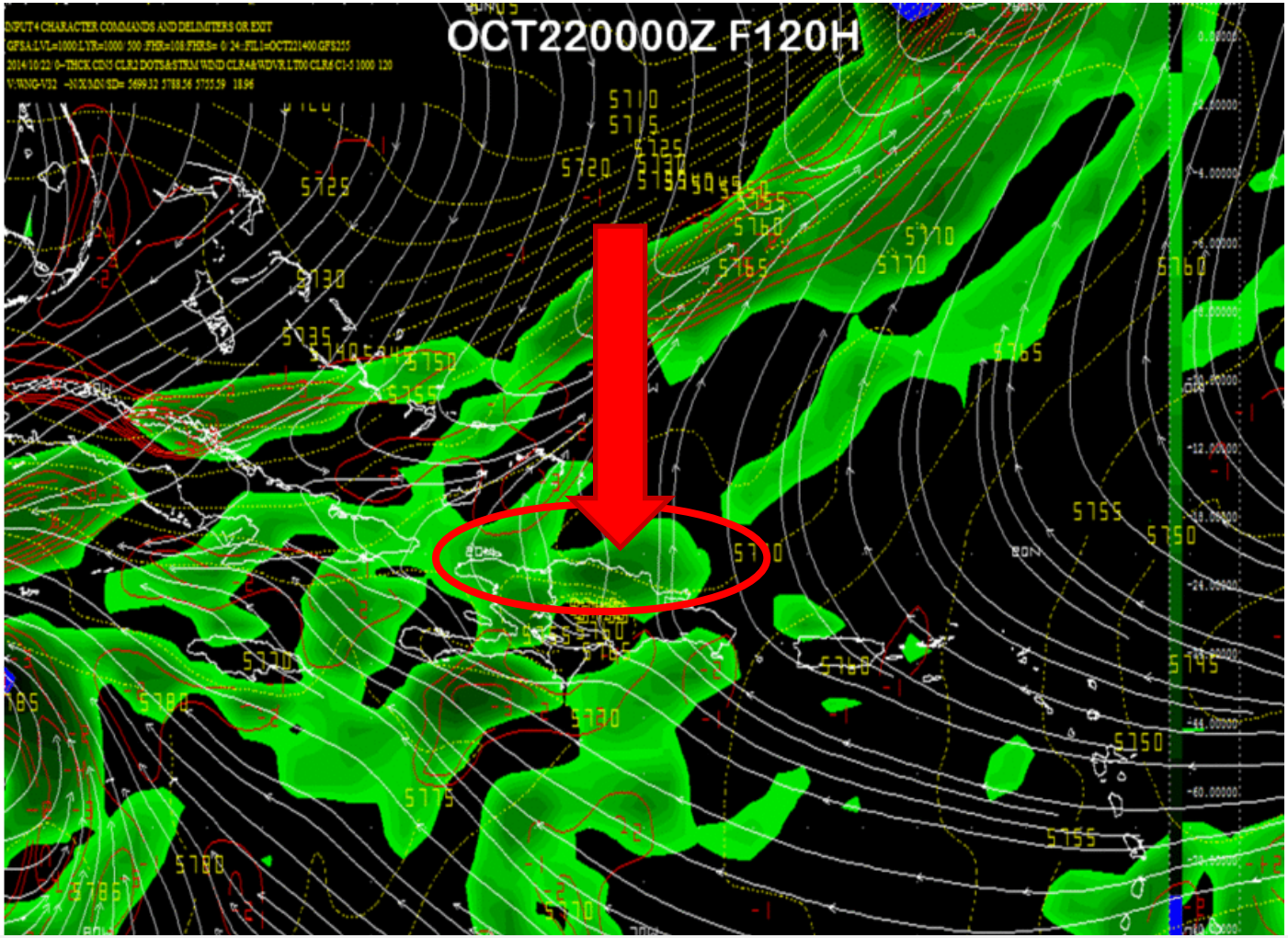
MOISTURE FLUX CONVERGENCE (MFC)

MOISTURE FLUX

POTENTIAL TEMPERATURE

TEMPERATURE ADVECTION

DAILY MOISTURE FLUX CONVERGENCE (MFC) AVERAGED OVER 1000-900 HPA

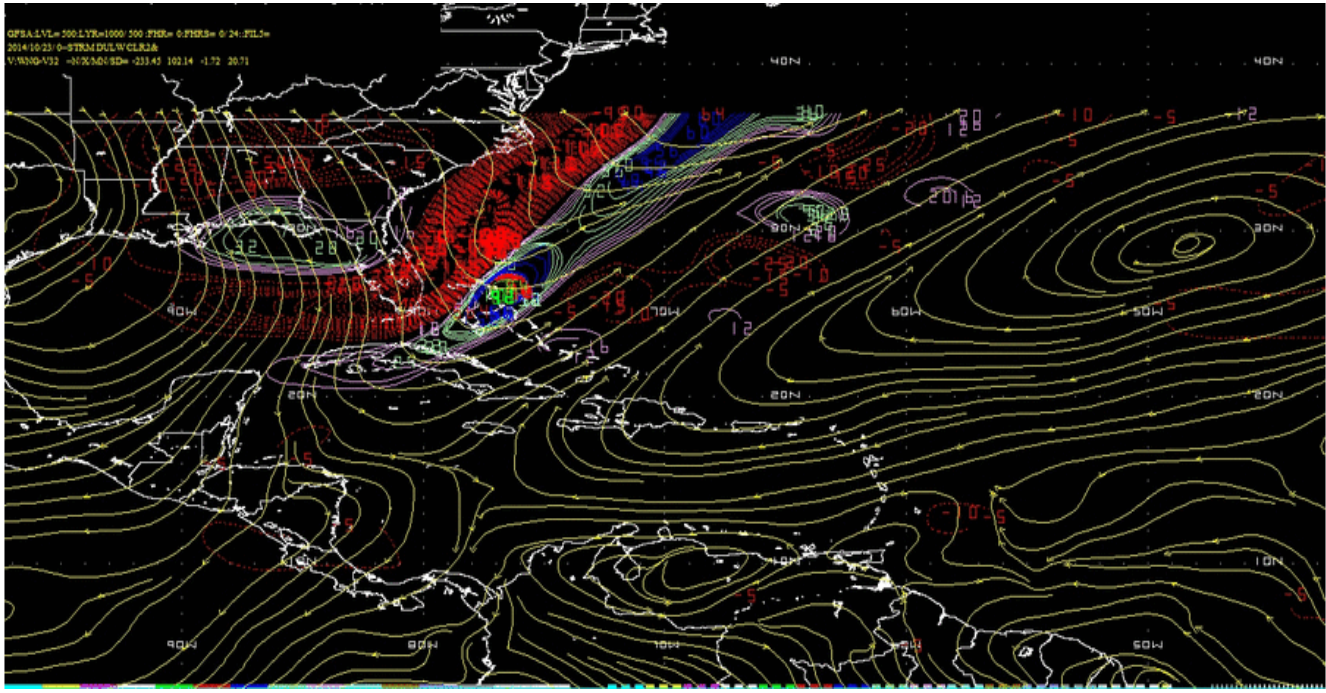


ALL THE RUNS BEFORE THE EVENT WERE CONCISTENT ABOUT SUGESTING SOME VALUES OF MFC OVER THE NORTHERN COAST OF THE ISLAND

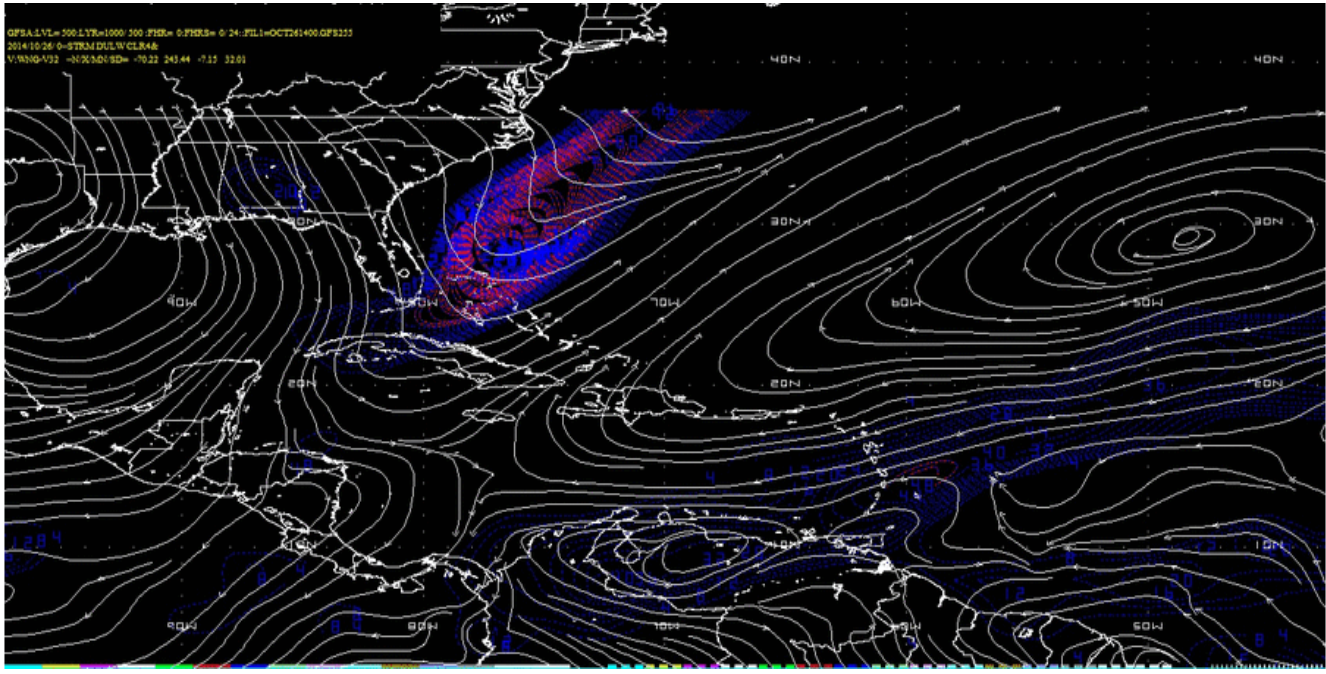
VORTICITY ADVECTION AND FLOW INTEGRATED IN A LAYER FROM 500 HPA TO 200 HPA.

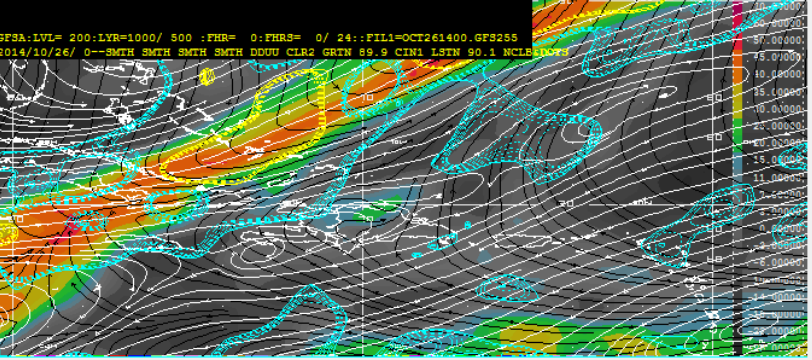
-RED DOTTED LINES ARE NEGATIVE ADVECCION (ANTICYCLONIC)

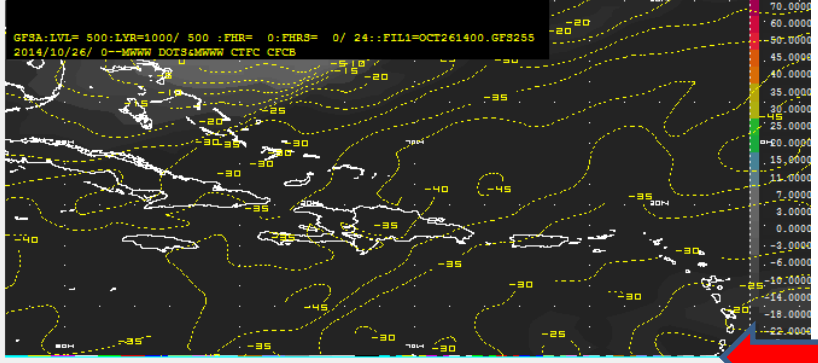
-OTHERS COLORS (SOLID LINES) ARE POSITIVE ADVECTION (CYCLONIC).



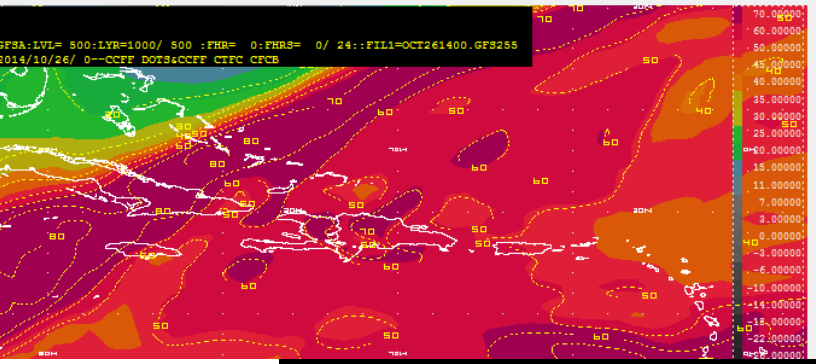
CYCLONIC VORTICITY AND FLOW INTEGRATED IN A LAYER FROM 500 HPA TO 200 HPA.

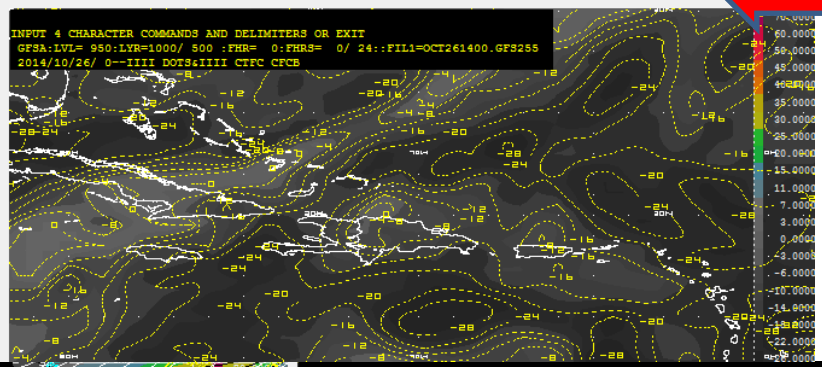


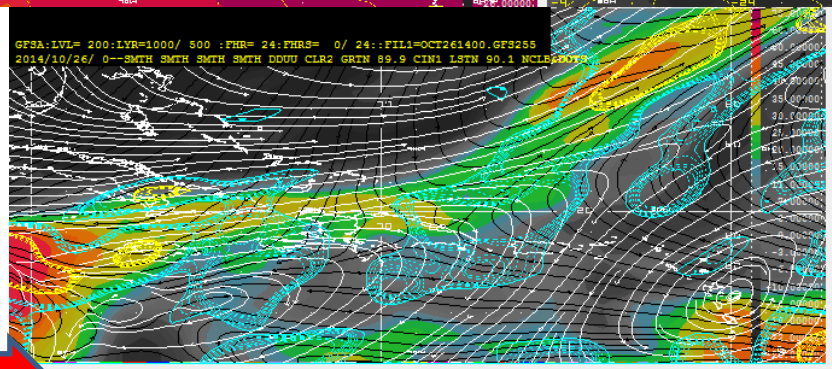


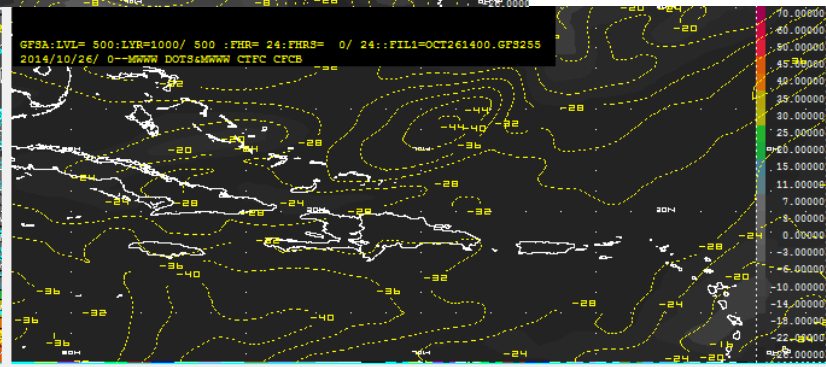


GDI
OCT260
000Z
F00

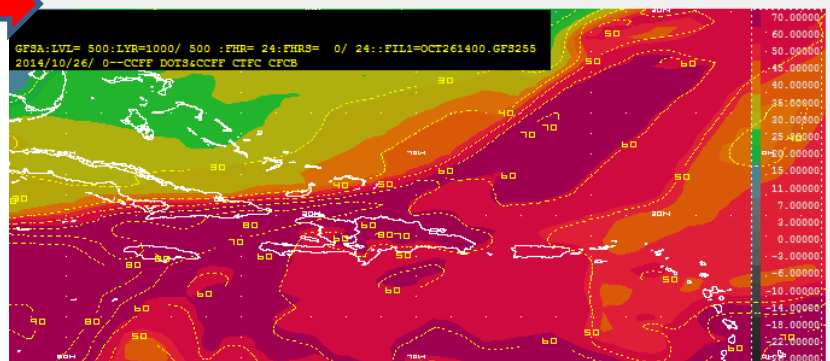


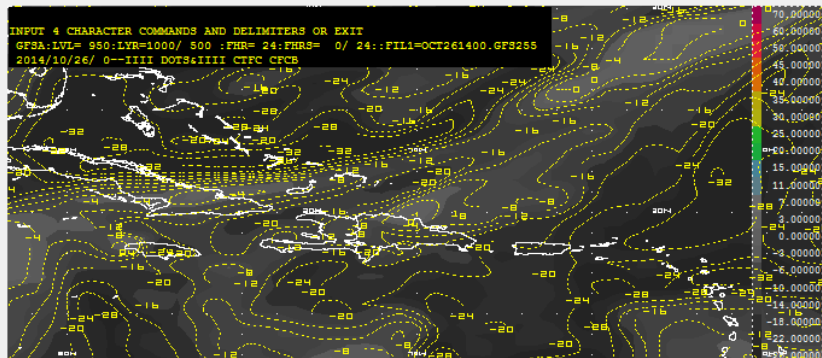




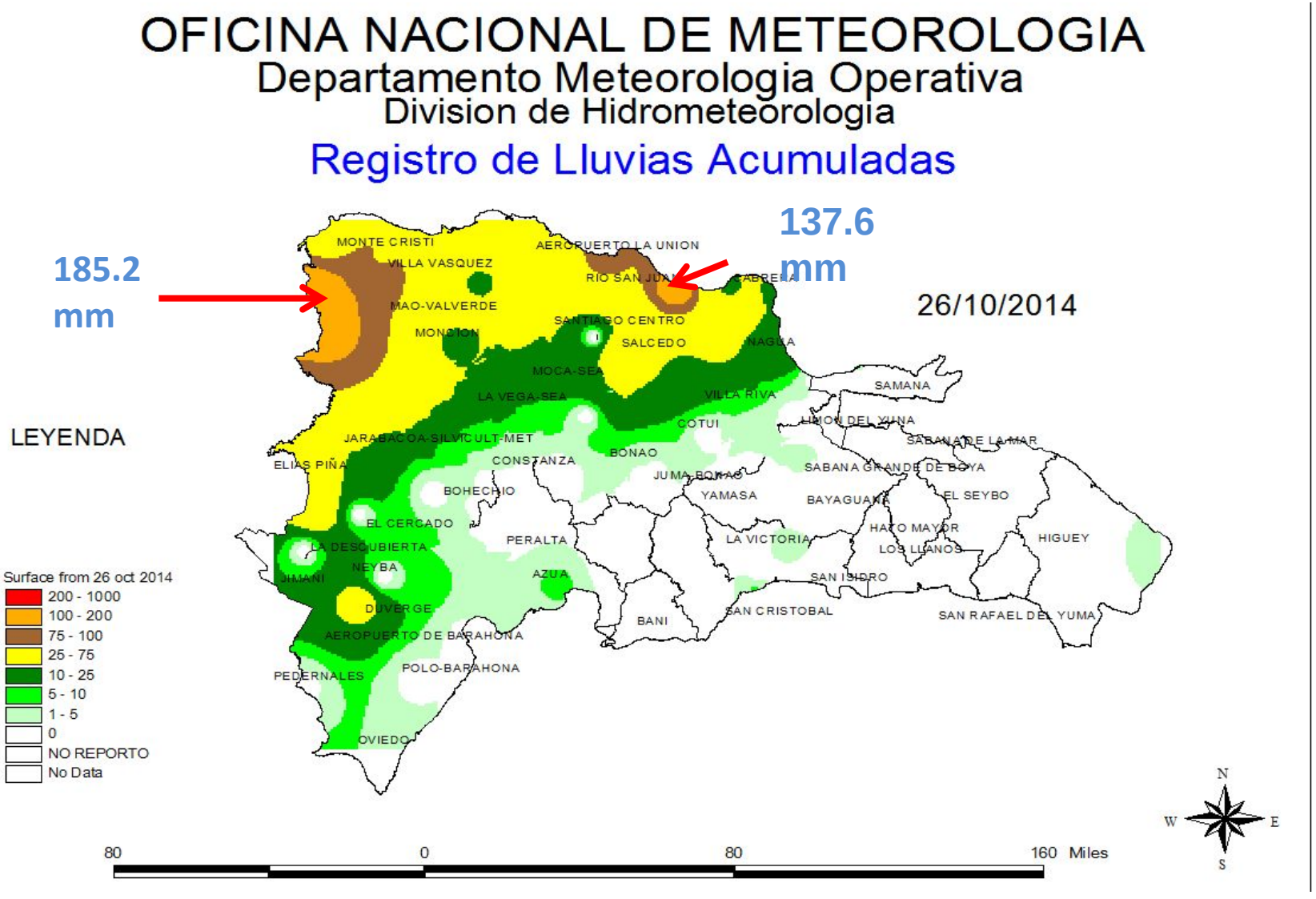


GDI
OCT260
000Z
F24





OBSERVED RAINFALL



CONCLUSIONS

- THE MID LEVEL TROUGH PATTERN PROVIDED VORTICITY ADVECTION THAT RELAXED THE MID-UPPER LEVEL RIDGE AND ASSOCIATED DIVERGENCE ALOFT.

- WARM WATER ANOMALIES IN THE ATLANTIC CAN BE A RELEVANT PARAMETER FOR THIS KIND OF SITUATIONS.

- HIGHER RAINFALL AMOUNTS ARE EXPECTED IN INTERACTION WITH OROGRAPHY.