

Generating Week-2 Real Time Forecasts,
Valid 11 – 17 October 2019
Eastern Caribbean

First WMO RCC-Washington Training Workshop
Washington DC, USA,
30 September 2019 – 4 October 2019

Run the Script

1. On your Cygwin/Linux terminal, change your directory to the **subseason** folder:

```
cd subseason
```

2. Run the script for the area of interest of your group:

```
bash plot_all.sh 'west' 'east' 'south' 'north'
```

Where **'west'** and **'east'** are the western and eastern extent of **your area of interest in your group** (in degrees) respectively, while **'south'** and **'north'** are the southern and northern extent.

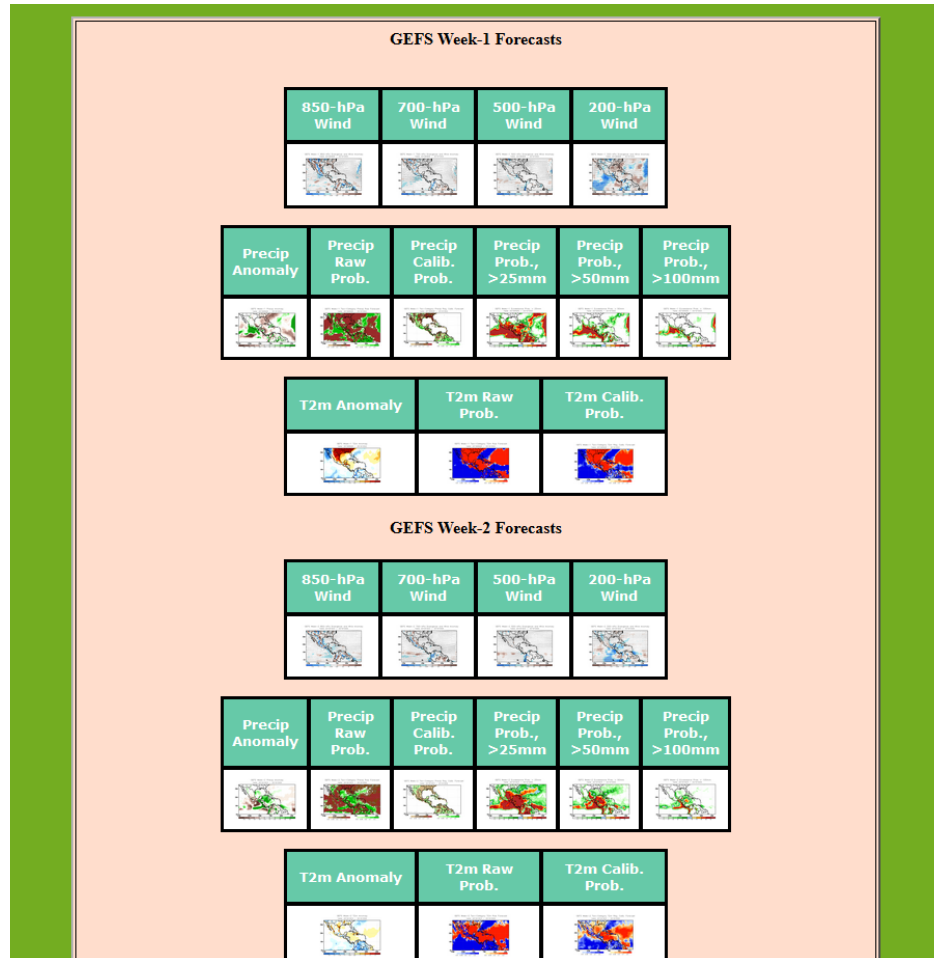
e.g, a test run for Central America and the Caribbean Region:

```
bash plot_all.sh -120 -40 0 35 (example)
```

Note: **longitudes** in the **western hemisphere** and **latitudes** in the **southern hemisphere** have negative values.

Run Output

Depending on your Internet browser security setting, a webpage with your test run output should popup automatically:



You will use figures from the web page, later during the exercise

Generate a Blank Country Map

- Use the command below to generate a blank country map.

```
bash blank_map.sh 'west' 'east' 'south' 'north'
```

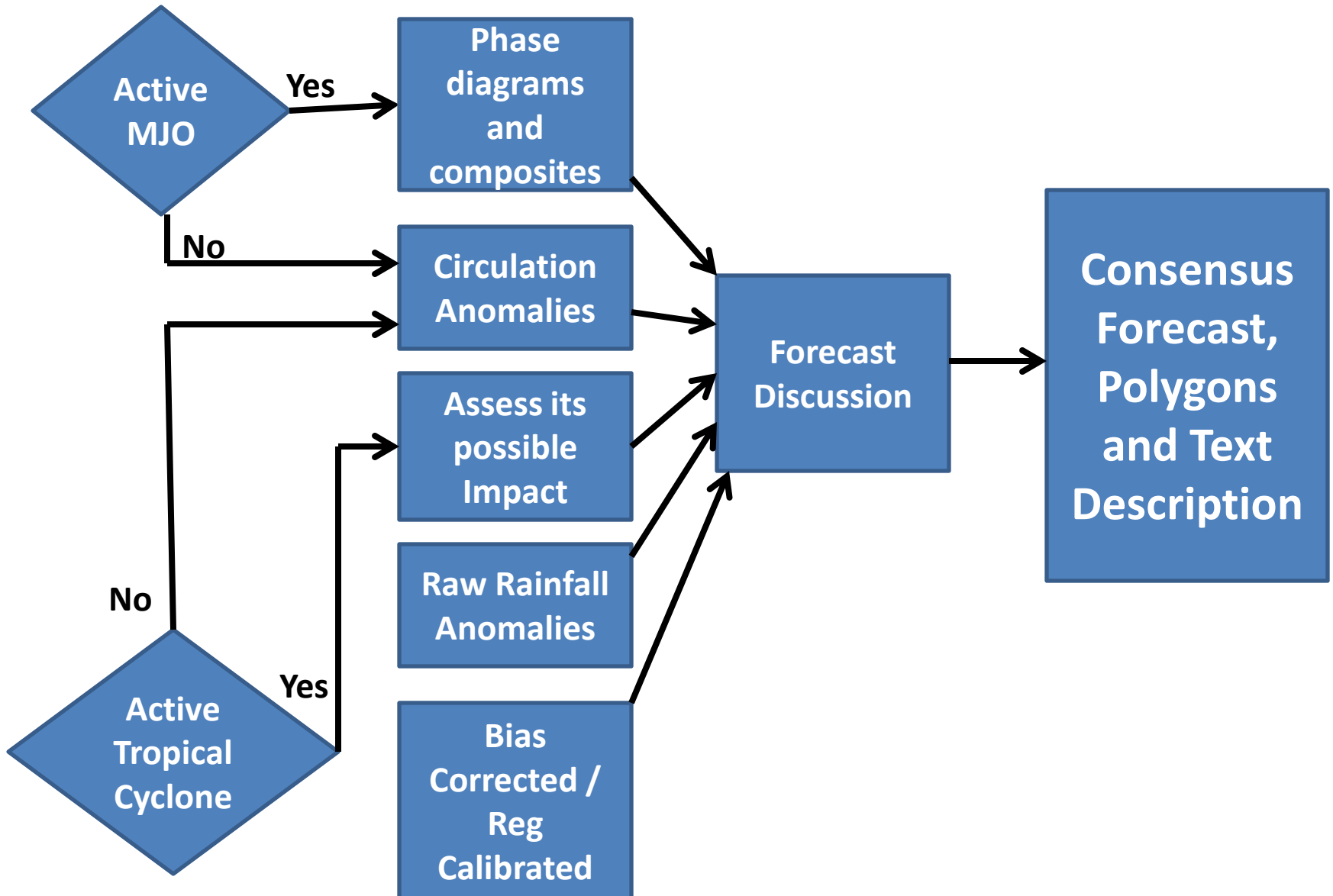
Where **'west'** and **'east'** are the western and eastern extent of **your area of interest in your group** (in degrees) respectively, while **'south'** and **'north'** are the southern and northern extent.

- You may use your file explorer to locate the blank country map
 - For Cygwin users, under

```
C:/cygwin64/home/your_user_name/subseason/blank_map.png
```

- You will use this map to draw forecast polygons, later during the exercise

Week-1/2 Forecast Process

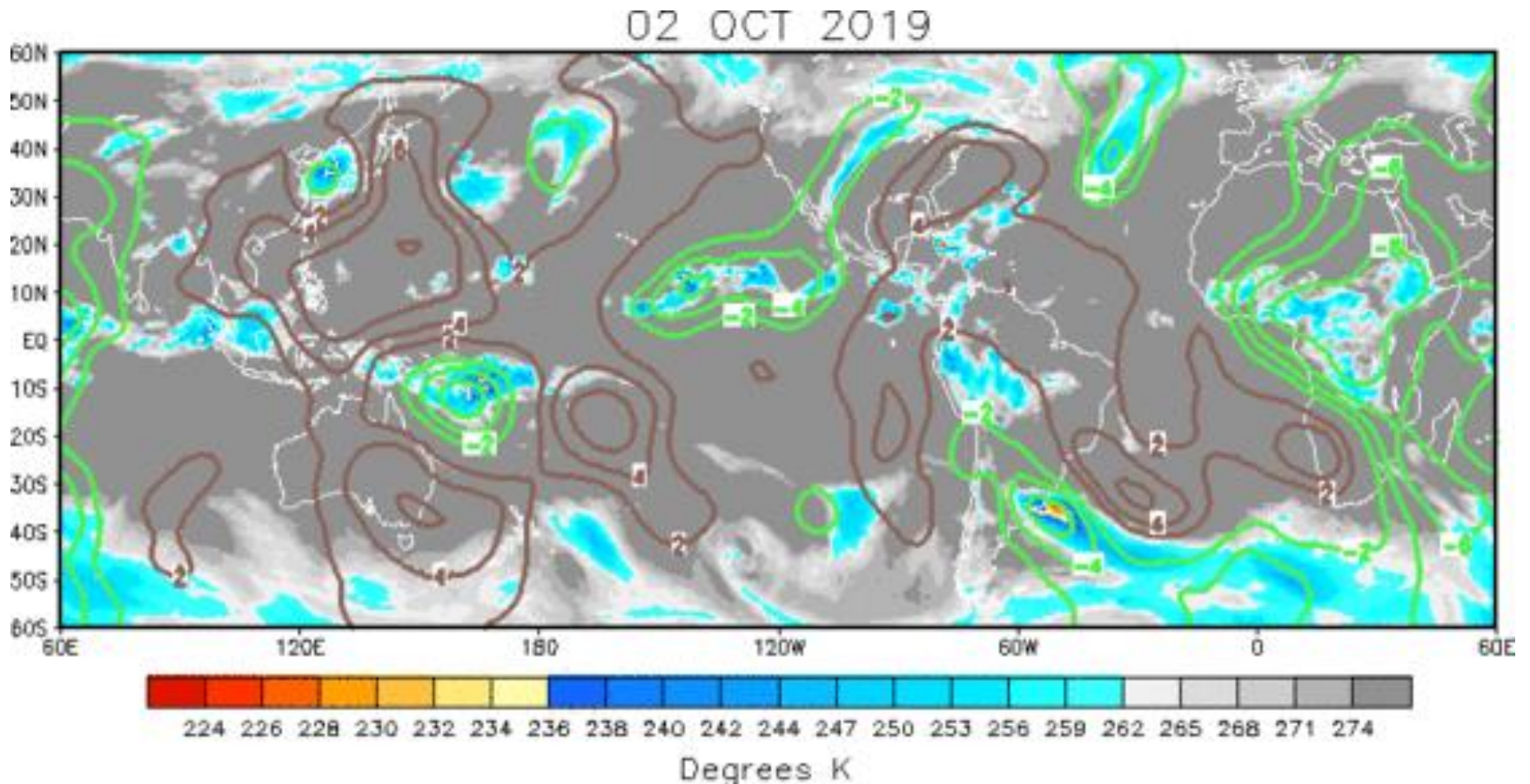


Week-1/2 Forecast Tools

- Active MJO?
- Active tropical cyclone/Hurricane/typhoon activity?
- Significant SST and circulation anomaly patterns?

200-hPa Velocity Potential Anomaly

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ir_anim_monthly.shtml

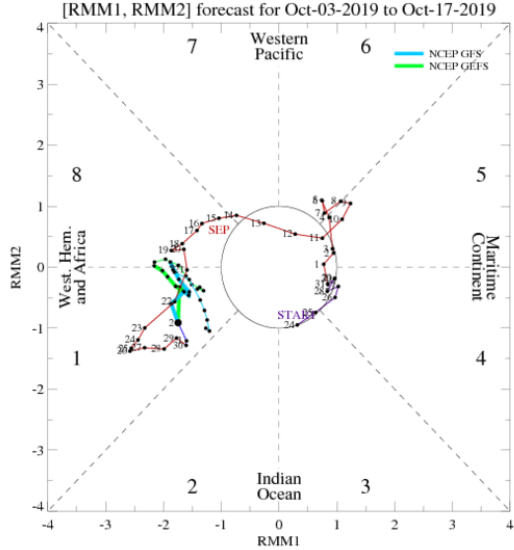


- Green shade indicates areas of upper level divergence and convection or precipitation at surface. Brown contours indicate areas of upper level convergence or subsidence and suppressed precipitation at surface.

Wheeler-Hendon Index - Forecasts

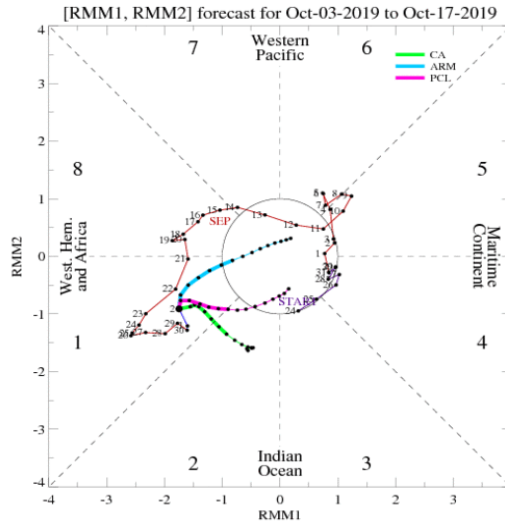
GFS/GEFS

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/combphase_noCFSfull.gif



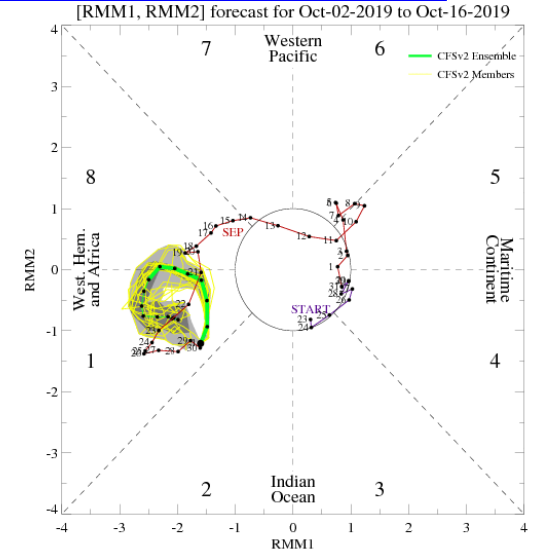
Statistical

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/statphase_full.gif



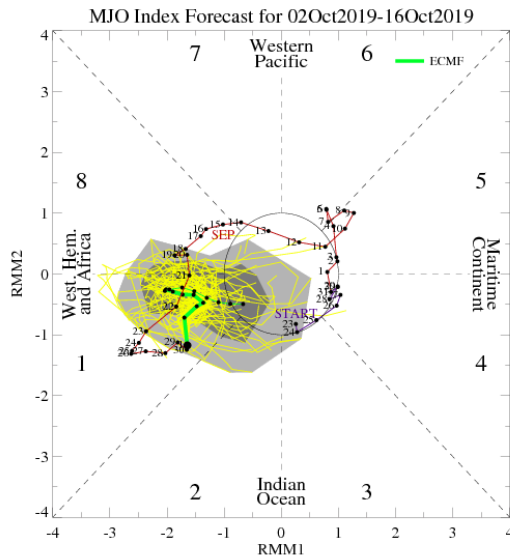
CFSv2

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/CFSv2_phase_small.gif



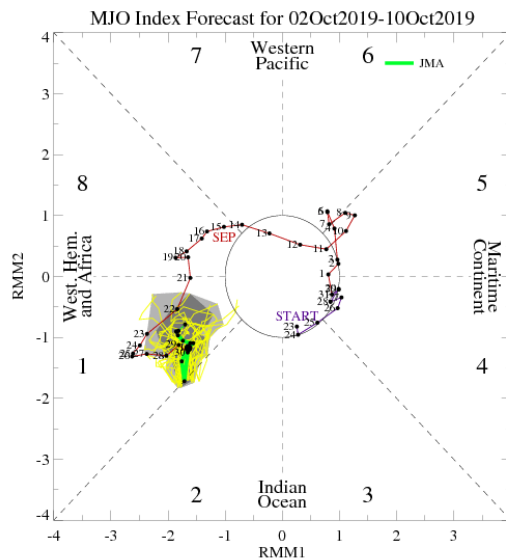
ECMWF

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/ECMF_phase_MANOM_51m_small.gif



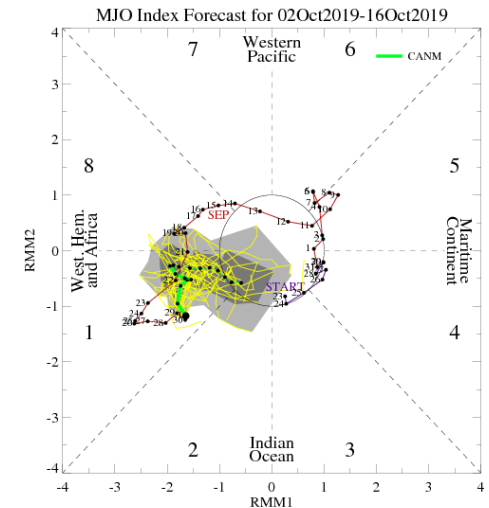
JMAN

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/JMAN_phase_51m_small.gif



CMET

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/CANM_phase_20m_small.gif



Evolution of MJO-related anomalies

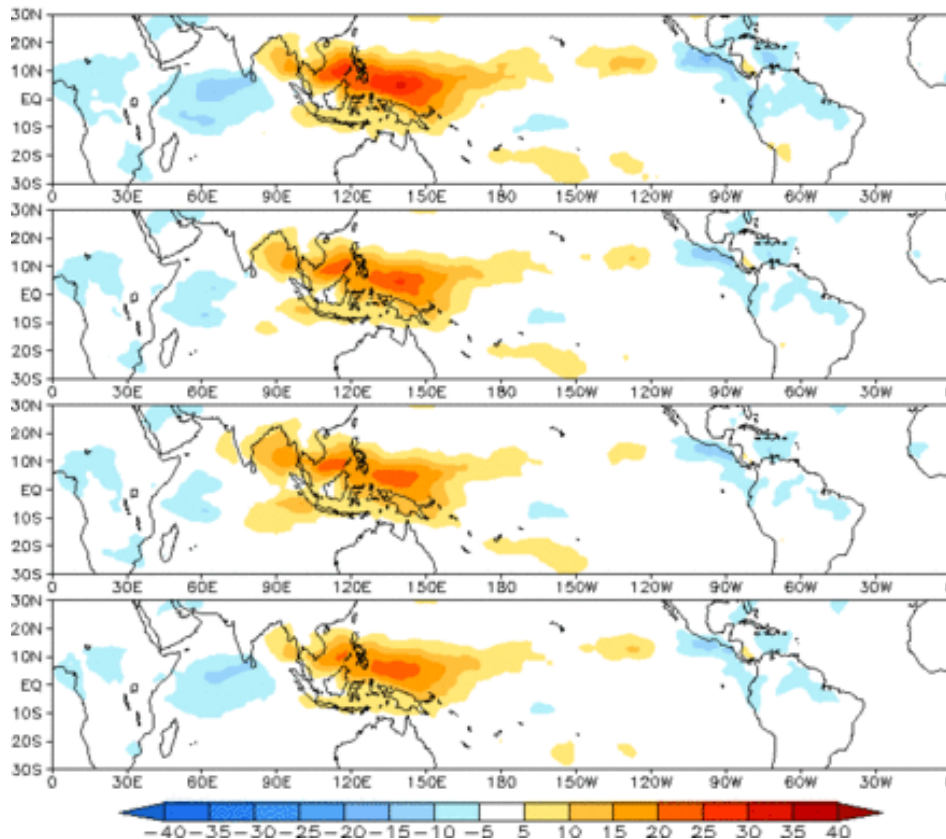
Initial date: 2 October 2019

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/spatial_olrmap_full.gif

Red shade indicate areas of suppressed convection

Blue shade indicate areas of enhanced convection

Prediction of MJO-related anomalies using GEFS operational forecast
Initial date: 02 Oct 2019
OLR



Initial Date
(02 Oct 2019)

1 - 5 days ave. Forecast

Days 1-5 Ave
Forecast

6-10 days ave. Forecast

Days 6-10 Ave
Forecast

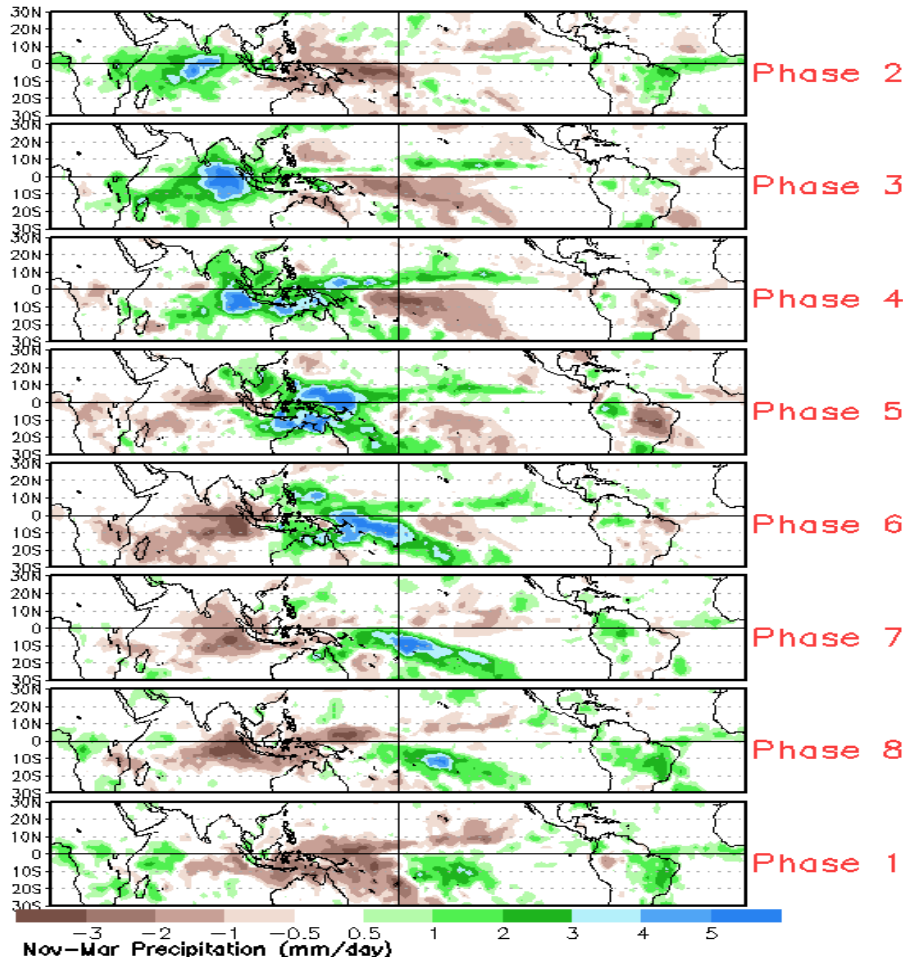
11-15 days ave. Forecast

Days 11-15 Ave
Forecast

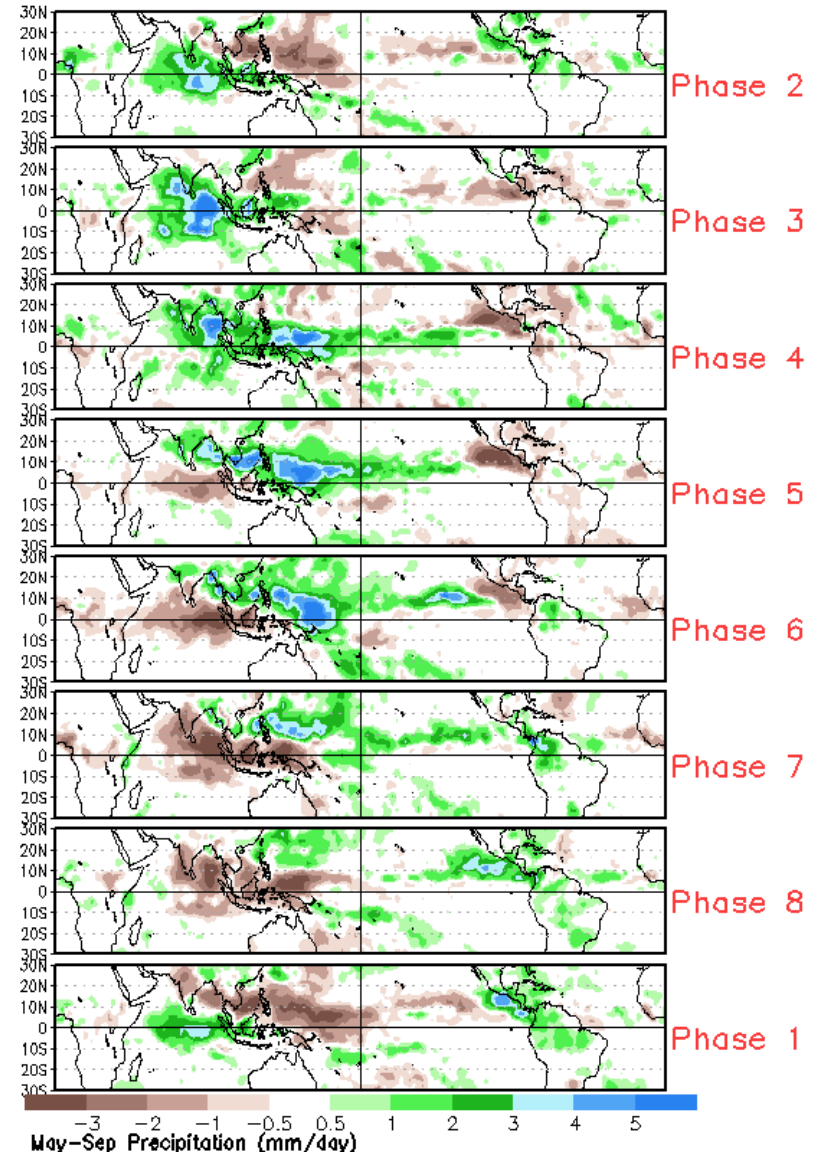
MJO Rainfall Composites - Global Tropics

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/plot_pcp_tvalue_8pan_maysep.gif (May - Sep Season)

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/plot_pcp_tvalue_8pan_novmar.gif (Nov - Mar Season)



Precipitation Anomalies (May - Sep)



Week2, MJO Contribution?

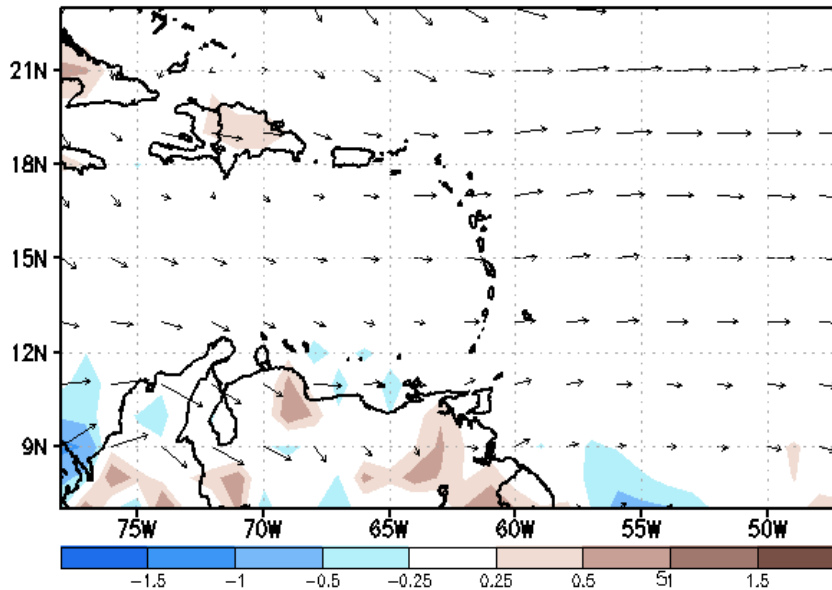
- Do the MJO predictions suggest enhanced/suppressed rainfall over your country?
- The MJO suggest suppressed convection over the Lesser Antilles.

NCEP GEFS Wind and Divergence Anomaly Forecast Week-2, Valid: 11 - 17 October, 2019

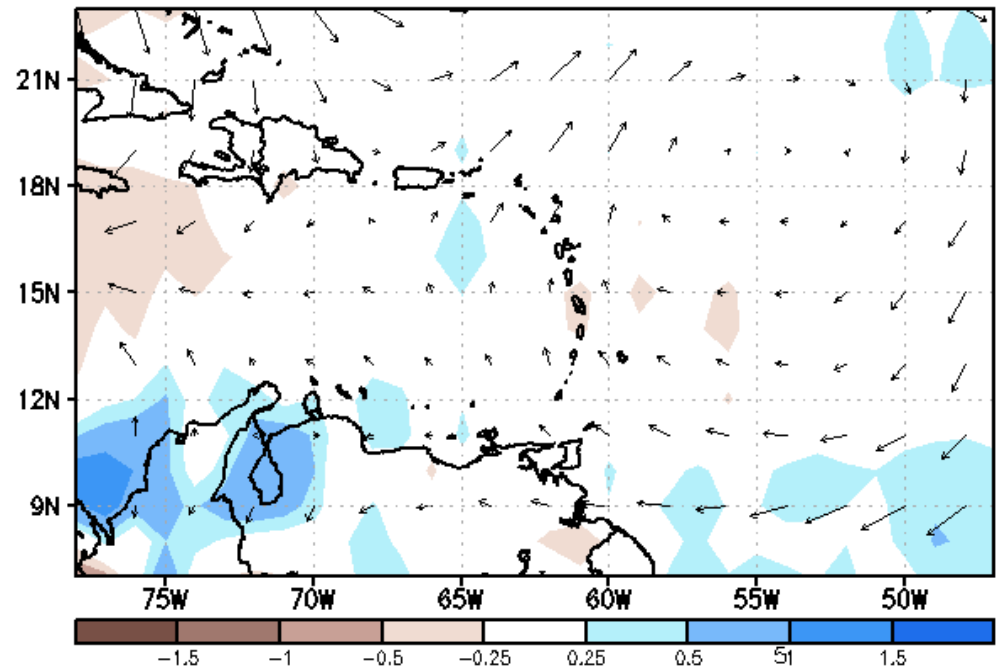
850-hPa or 700-hPa

200-hPa

GEFS Week-2 850-hPa Divergence and Wind Anomomc
Valid: 20191011 - 20191017



GEFS Week-2 200-hPa Divergence and Wind Anomaly
Valid: 20191011 - 20191017

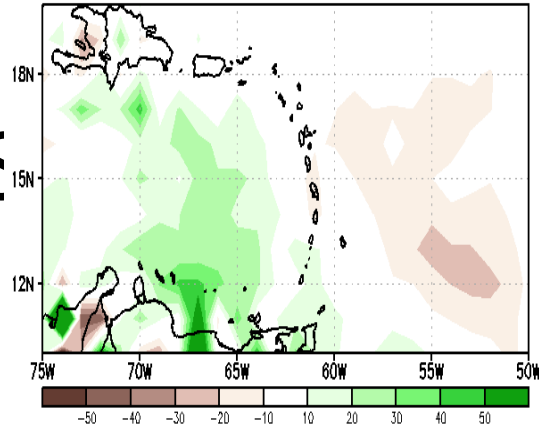


NCEP GEFS/CFSv2, Precip forecasts for Week-2, Valid: 11 - 17 October, 2019

GEFS

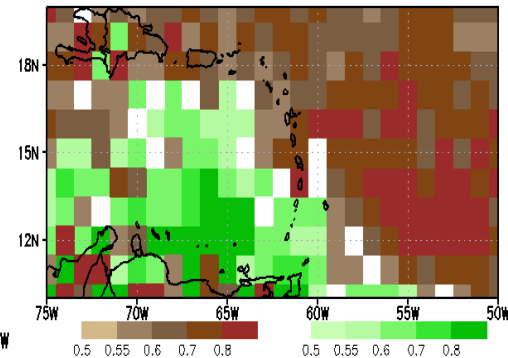
Ensemble Mean Anomaly

GEFS Week-2 Precip Anomaly
Valid: 20191011 - 20191017



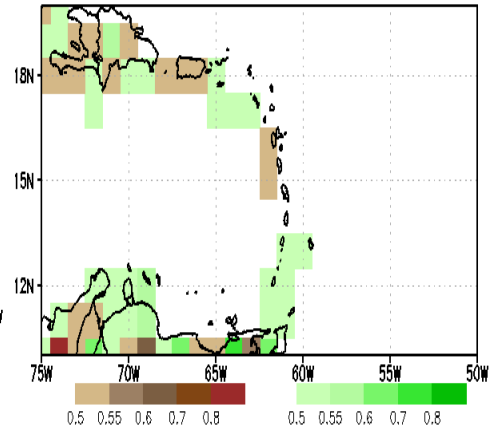
Two-category Probabilistic Forecast - Raw

GEFS Week-2 Two-Category Precip Raw Forecast
Valid: 20191011 - 20191017

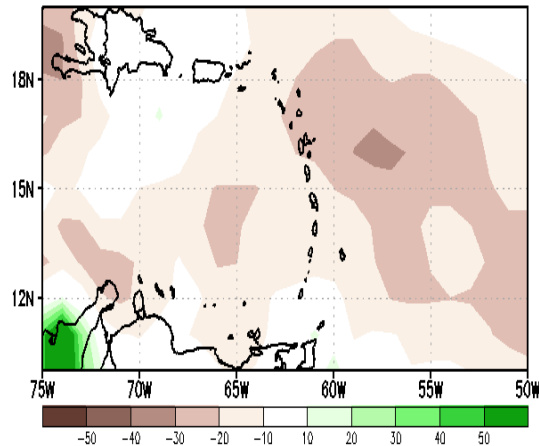


Two-category Probabilistic Forecast - Reg - Calibrated

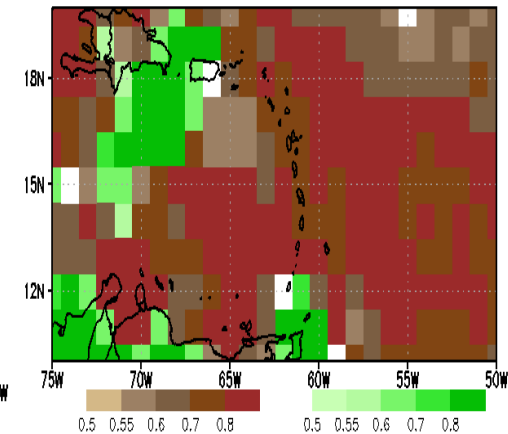
GEFS Week-2 Two-Category Precip Reg. Calib. Forecast
Valid: 20191011 - 20191017



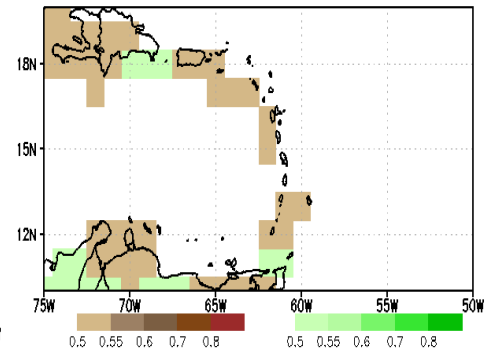
CFSv2 Week-2 Precip Anomaly
Valid: 20191011 - 20191017



CFSv2 Week-2 Two-Category Precip Raw Forecast
Valid: 20191011 - 20191017



CFSv2 Week-2 Two-Category Precip Reg. Calib. Forecast
Valid: 20191011 - 20191017



CFSv

NCEP GEFS/CFSv2, 2m Temp. forecasts for Week-2, Valid: 11 - 17 October, 2019

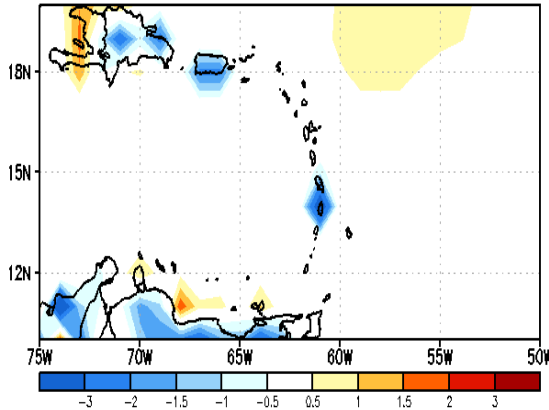
Ensemble Mean Anomaly

Two-category Probabilistic
Forecast - Raw

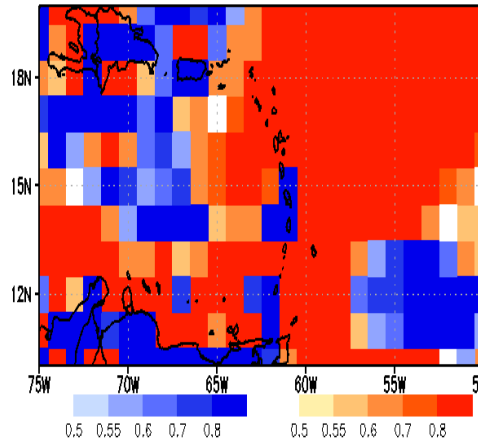
Two-category Probabilistic
Forecast - Reg - Calibrated

GEFS

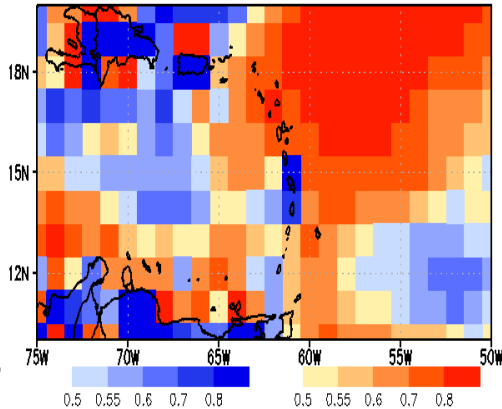
GEFS Week-2 T2m Anomaly
Valid: 20191011 - 20191017



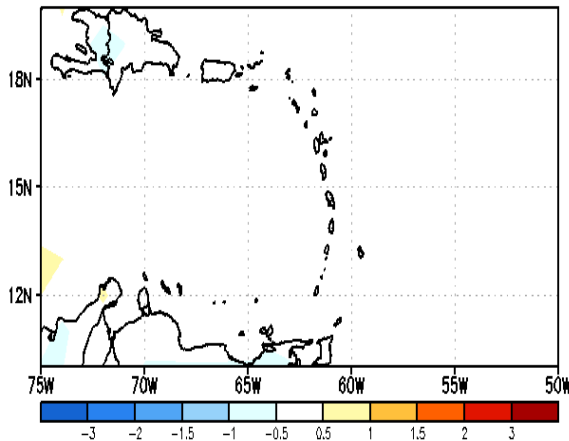
GEFS Week-2 Two-Category T2m Raw Forecast
Valid: 20191011 - 20191017



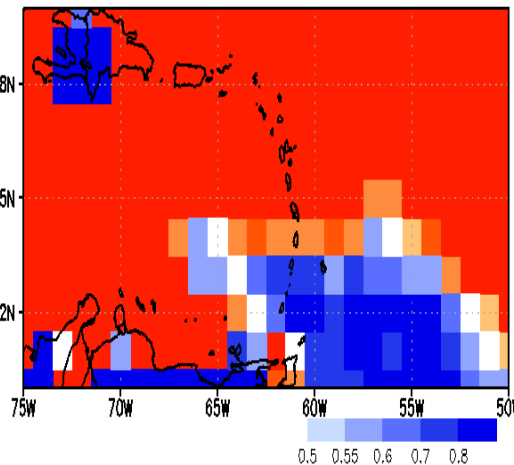
GEFS Week-2 Two-Category T2m Reg. Calib. Forecast
Valid: 20191011 - 20191017



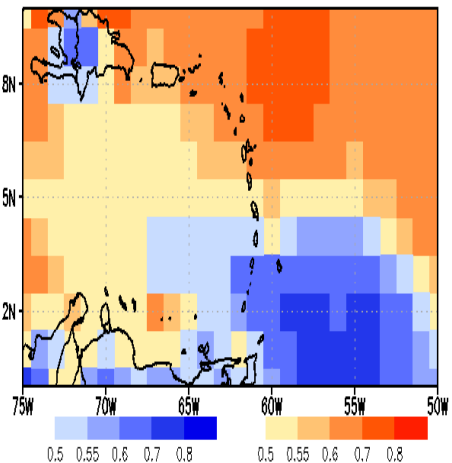
CFSv2 Week-2 T2m Anomaly
Valid: 20191011 - 20191017



CFSv2 Week-2 Two-Category T2m Raw Forecast
Valid: 20191011 - 20191017



CFSv2 Week-2 Two-Category T2m Reg. Calib. Forecast
Valid: 20191011 - 20191017



CFSv2

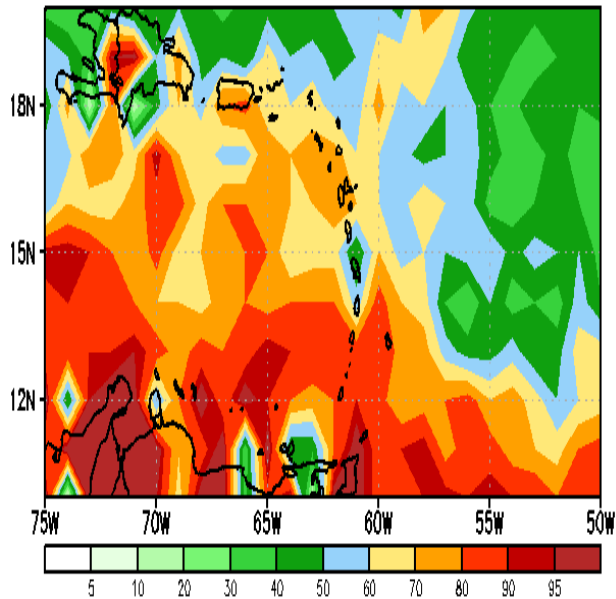
GEFS Week-2 Exceedance Probability, Valid: 11 - 17 October, 2019

>25mm

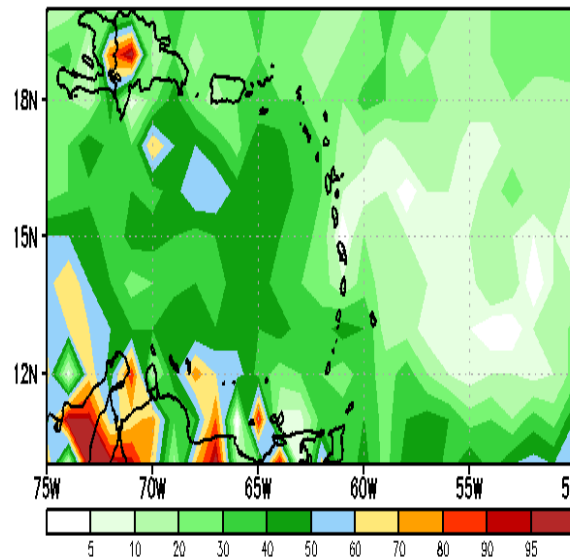
>50mm

>100mm

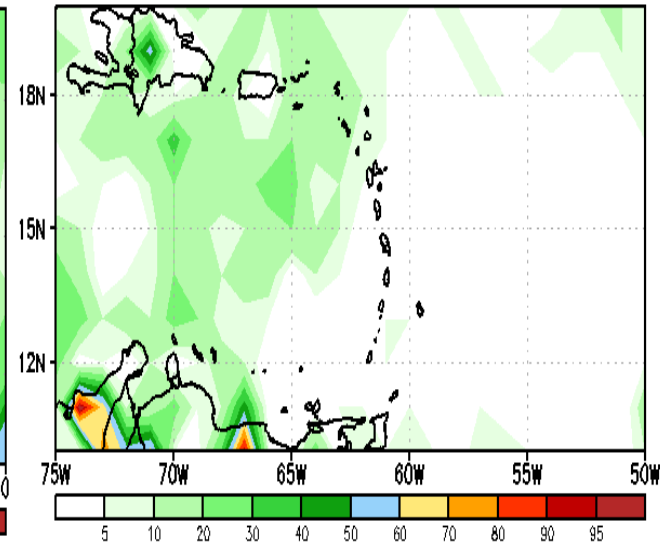
GEFS Week-2 Exceedance Prob. > 25mm
Valid: 20191011 - 20191017



GEFS Week-2 Exceedance Prob. > 50mm
Valid: 20191011 - 20191017



GEFS Week-2 Exceedance Prob. > 100mm
Valid: 20191011 - 20191017



Week-2 MJO

- 1. Broad suppression of convection across the region.
- 2. Models agreed to a weakening of MJO from Phase 1 to 2
- 3. Currently there is some slight wetness seen over the extreme northern EC but drying out going into week 2 (Evolution of MJO)
- 4. Observed MJO confirmed drying out of NE Caribbean by end September.

Lower/upper-level wind/divergence anomalies

- 1. No significant forcing at low level (850mb); However there is evidence of divergence over northwestern portion of the forecast area as well as speed divergence over the northern Leeward Islands.
- Across the Windwards evidence of upper level divergence and directional diffluence.

Rainfall Model Guidance

- Both models suggested that slightly drier than average conditions across the central windwards
- There was conflicted expectation for the northern and southern islands in the forecast area from the models.

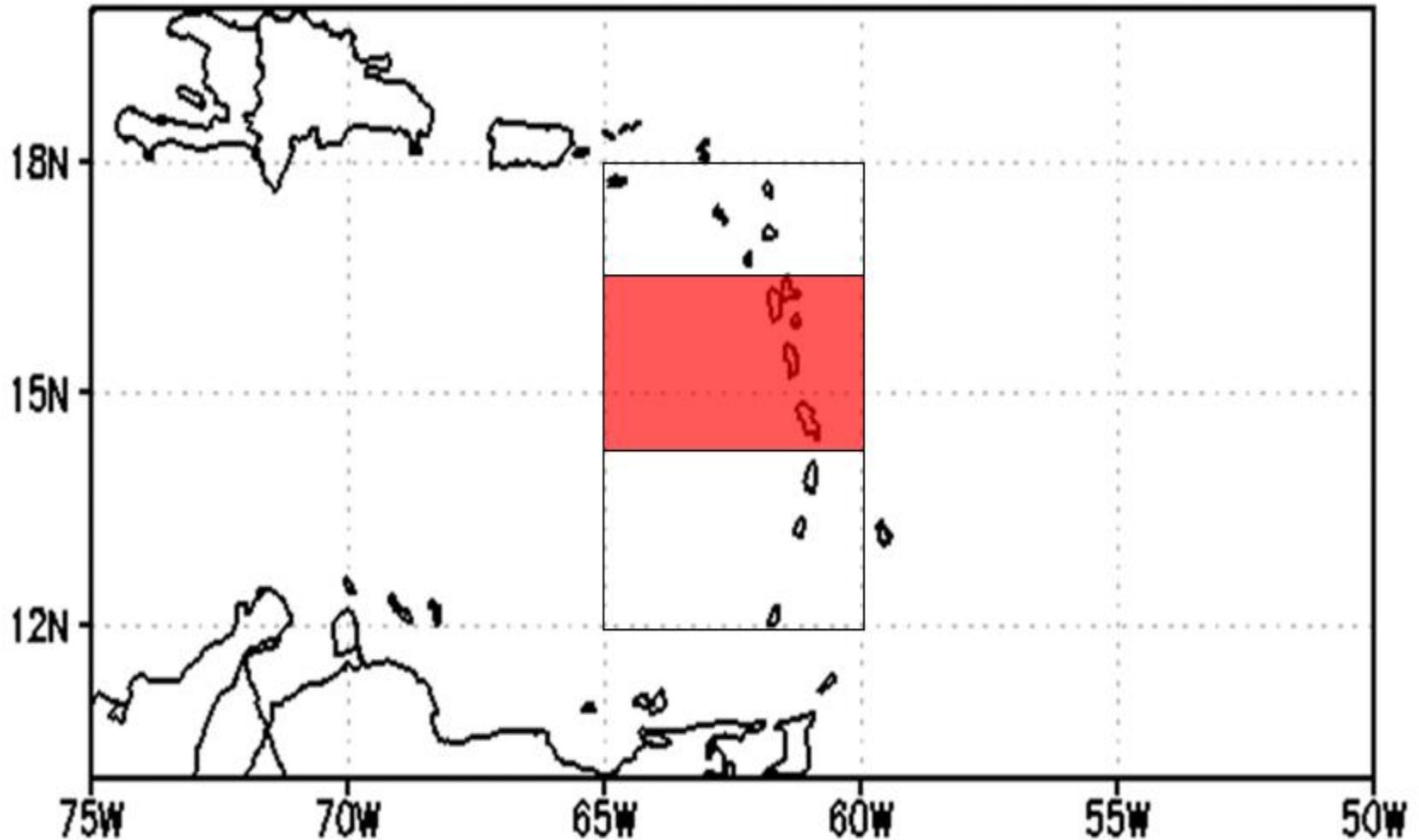
Rainfall exceedance

- The models all showed high probability of rainfall in excess of 25mm over the northern and southern island but moderate probability across the central windwards.
- The models all showed moderate probability of rainfall in excess of 50mm over the northern and southern island but low probability across the central windwards.
- The models all showed a very low probability of rainfall in excess of 100mm over the northern and southern island only.

Temperature

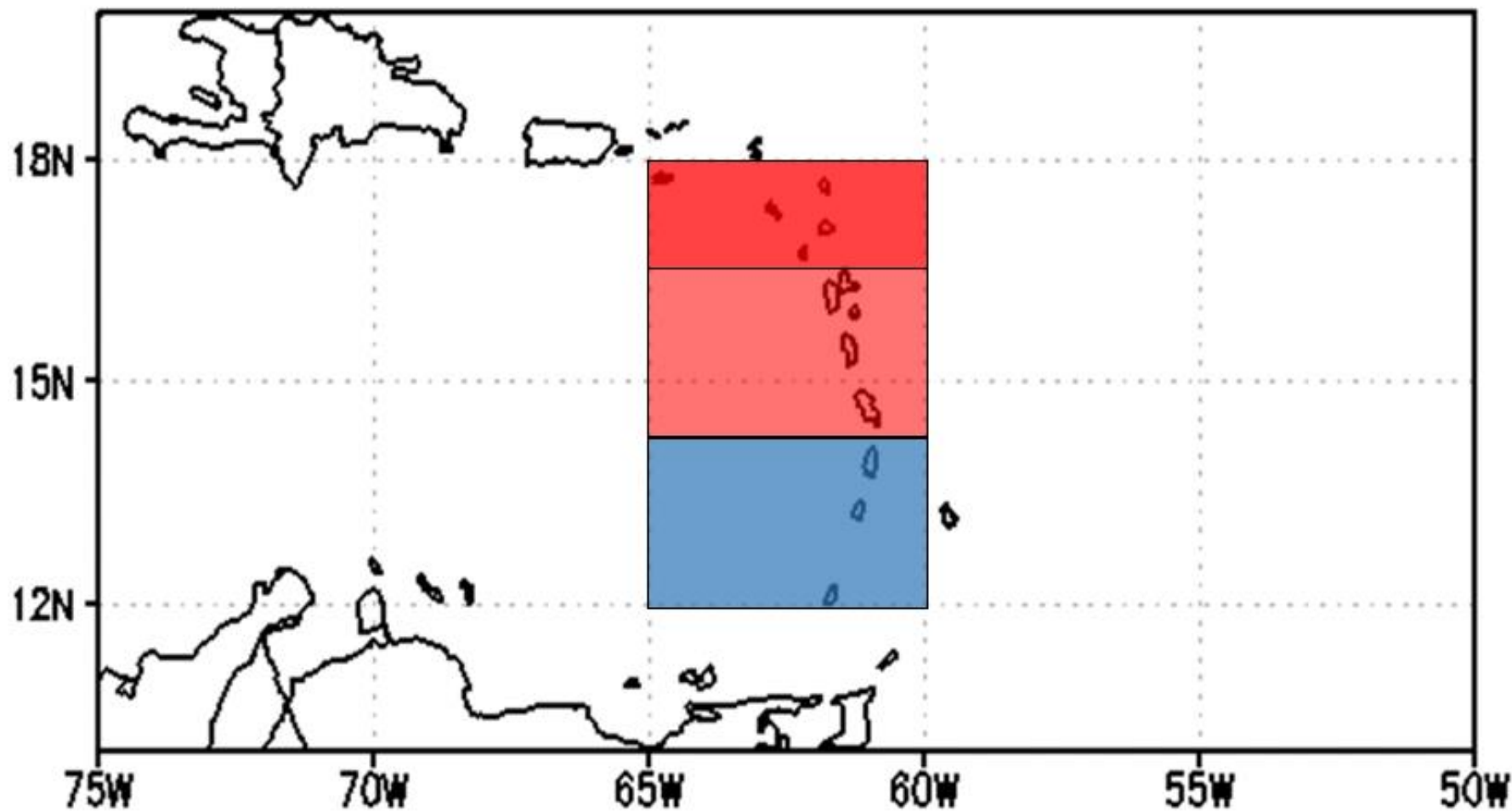
- Suppression of air over the forecast area resulting in possible warming
- Climatologically this is peak of the season (Sept-Oct) for Eastern Caribbean
- Based on both models northern and central islands would experience warmer than average temperatures while the extreme southern would experience below average temps

Week-2 Rainfall Outlook, 11 – 17 October 2019



- **Blue**, for above-average rainfall ,
- **No Fill Climatology**
- **Red** for below-average rainfall

Week-2 **2m Temp** Outlook, 11 – 17 October 2019



- **Red**, for above-average Temp ,
- **No Fill Climatology**
- **Blue** for below-average Temp