

Second WMO RCC-Washington International Training Workshop

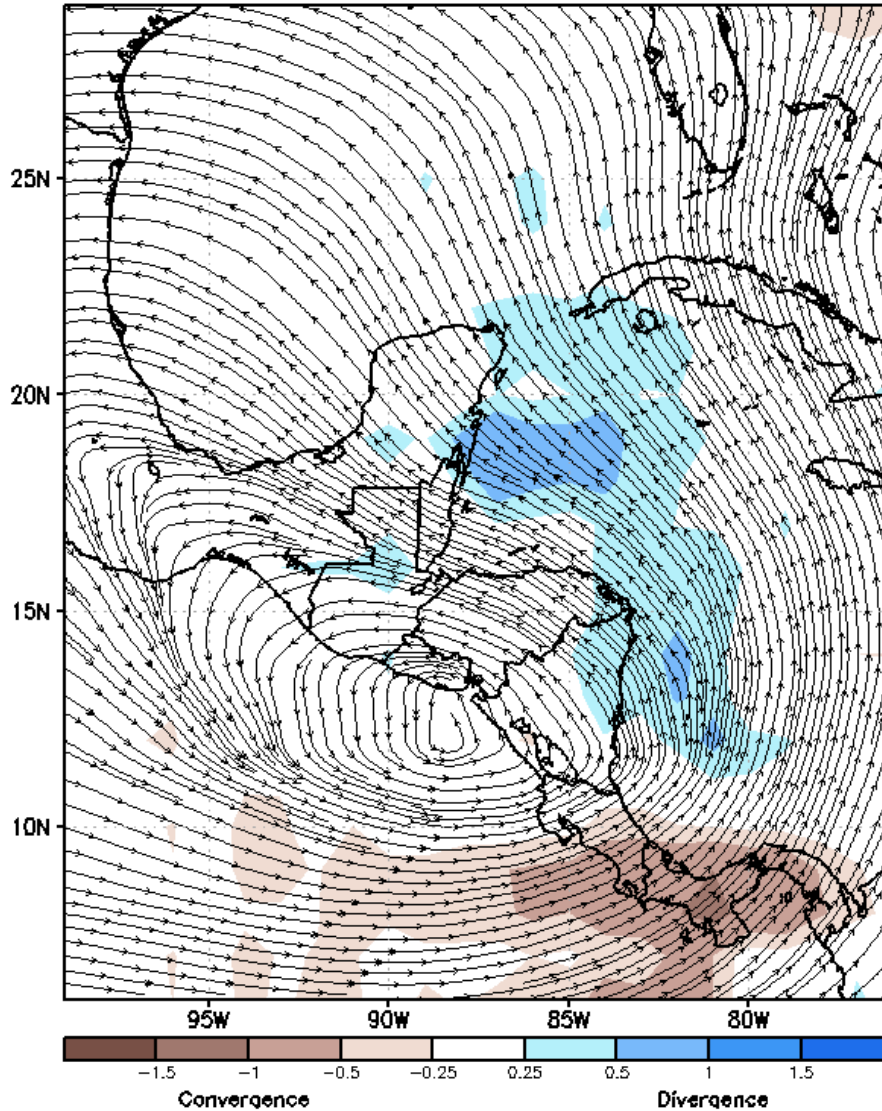
Real-time week-2 extreme precipitation outlook

Belize- Shanea Young

8 – 10 November 2021

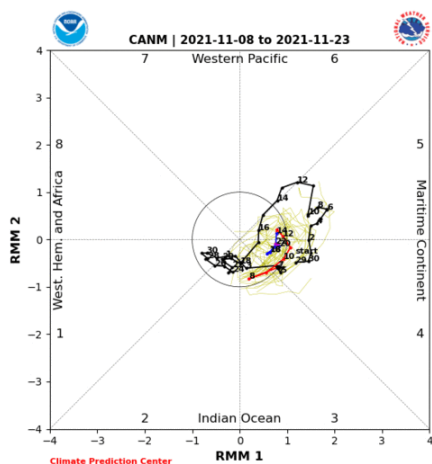
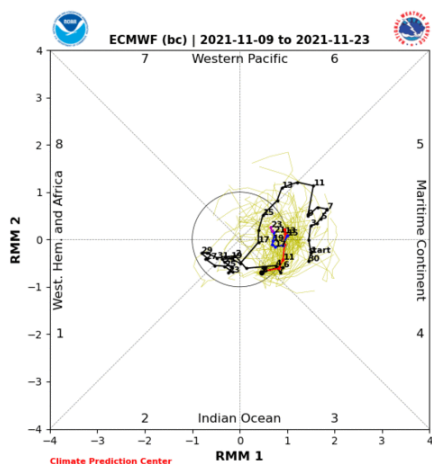
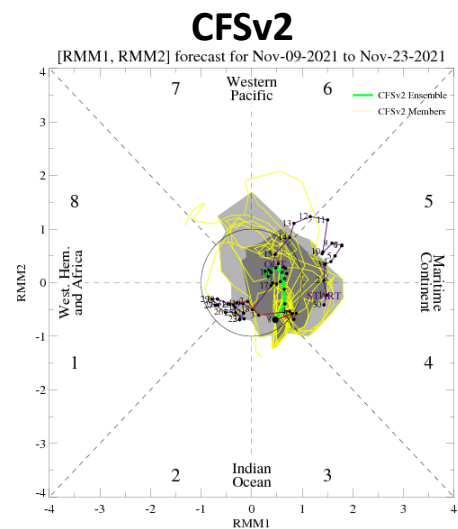
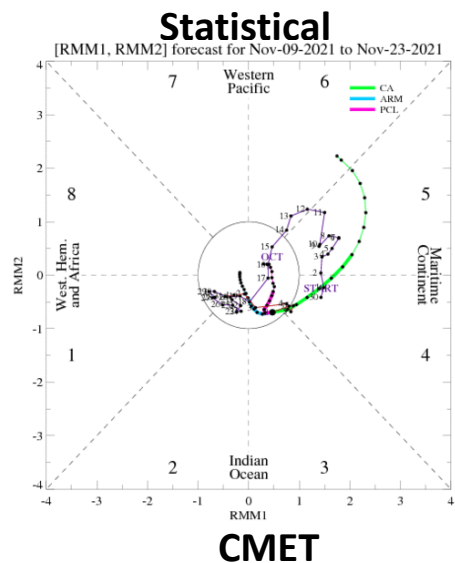
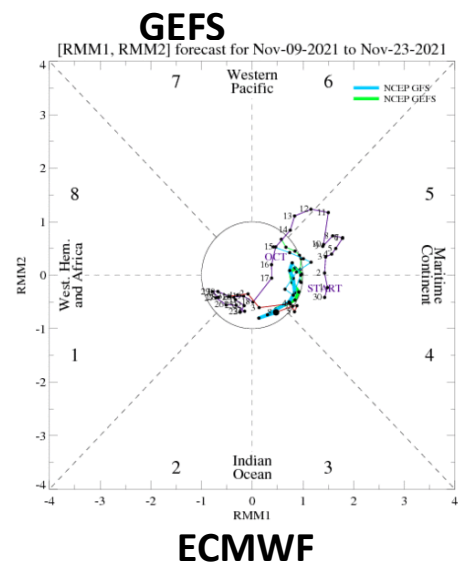
200-hPa Velocity Potential Anomaly

GEFS Week-2 200-hPa Divergence and Wind Anomaly
Valid: 20211117 - 20211123



Upper Level Div. over
NW Carib, Diffluence
(Northern Belize).
Cyclonic Flow over S'RN
Cntrl America.

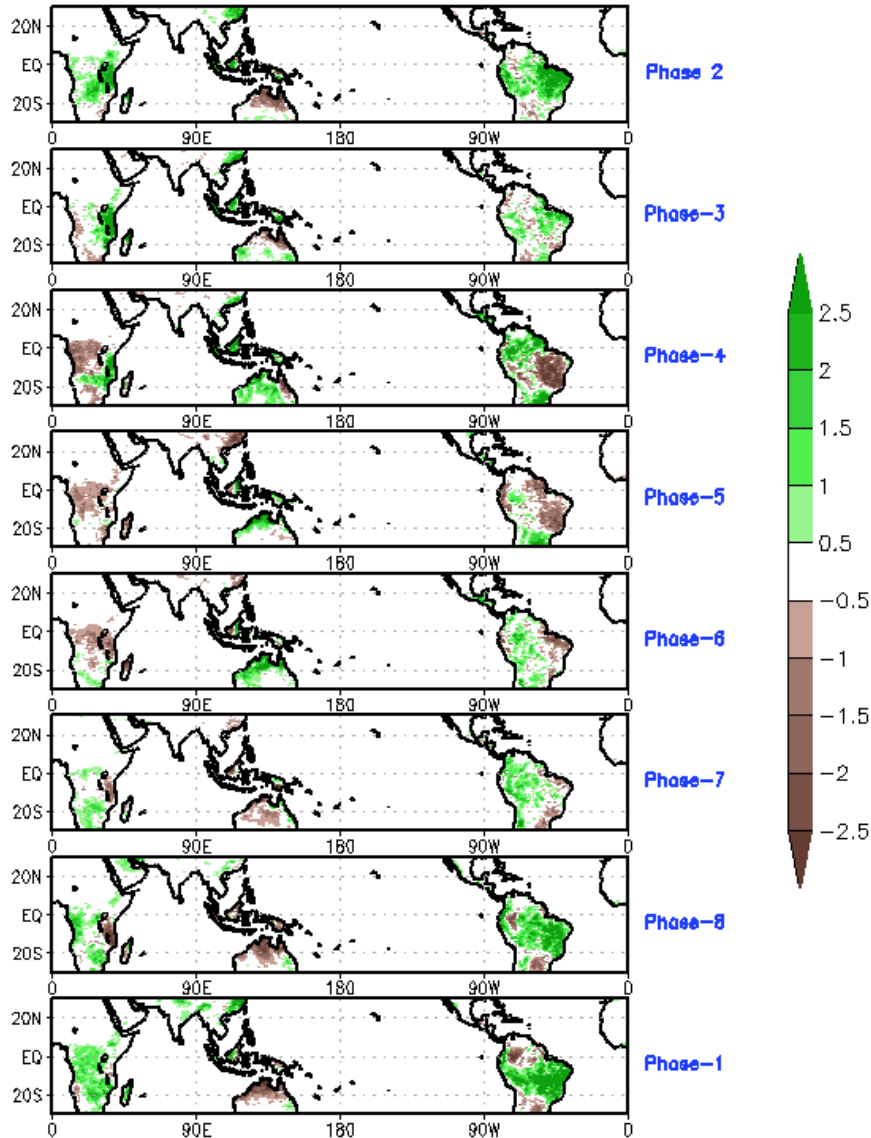
Wheeler-Hendon Index – Forecasts



Most models forecasts suggest eastward propagation, but lower amplitude => Weak MJO.

Evolution of MJO-related Anomalies

MJO Related Composites of Daily Precip Anomalies, October – December



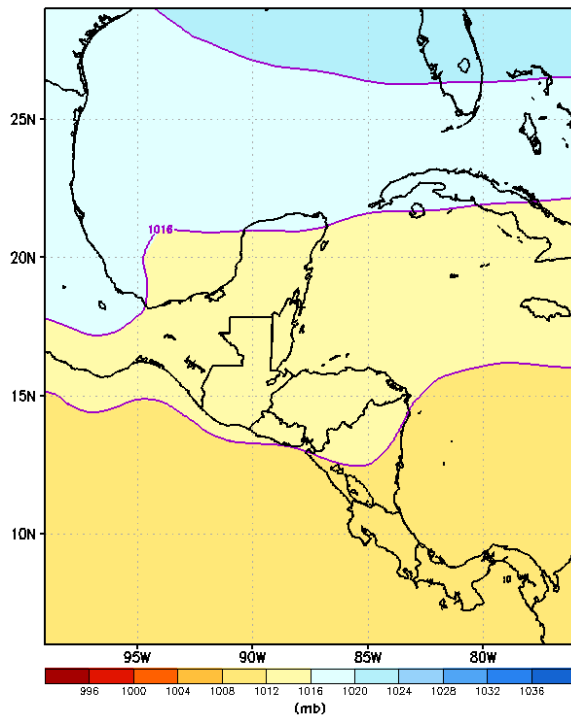
Active MJO in Phases 4 to 6 over Belize.

Mean Sea Level Pressure

Neutral msl pressure conditions

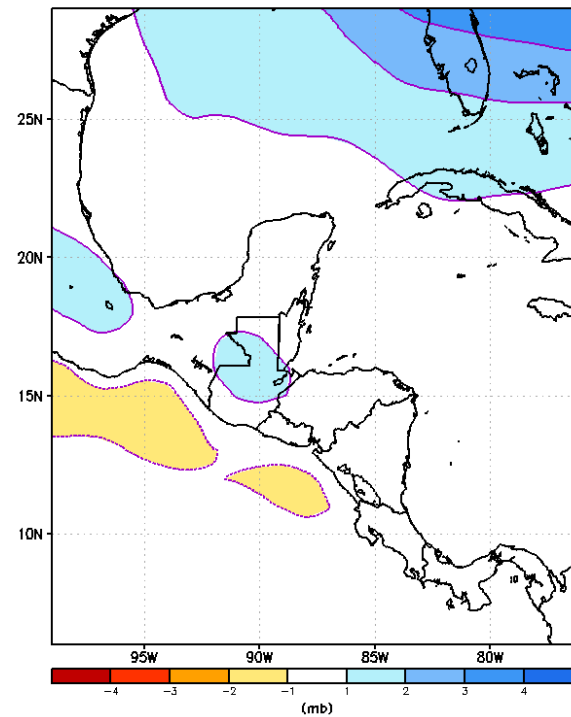
Total

GEFS Week-2 Mean Sea Level Pressure Total
Valid: 20211117 - 20211123



Anomaly

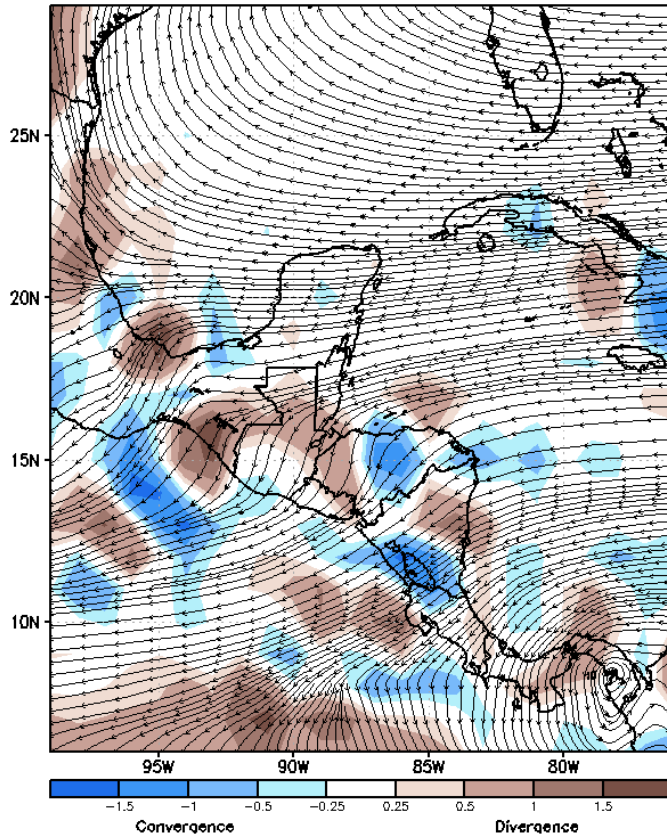
GEFS Week-2 Mean Sea Level Pressure Anomaly
Valid: 20211117 - 20211123



850-hPa Wind

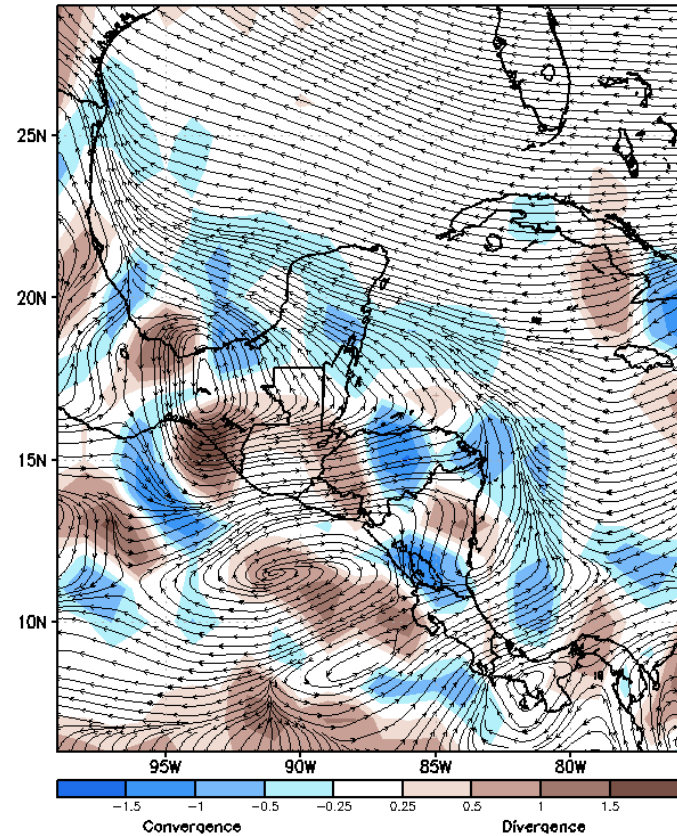
Total

GEFS Week-2 850-hPa Divergence and Wind Total
Valid: 20211117 - 20211123



Anomaly

GEFS Week-2 850-hPa Divergence and Wind Anomaly
Valid: 20211117 - 20211123

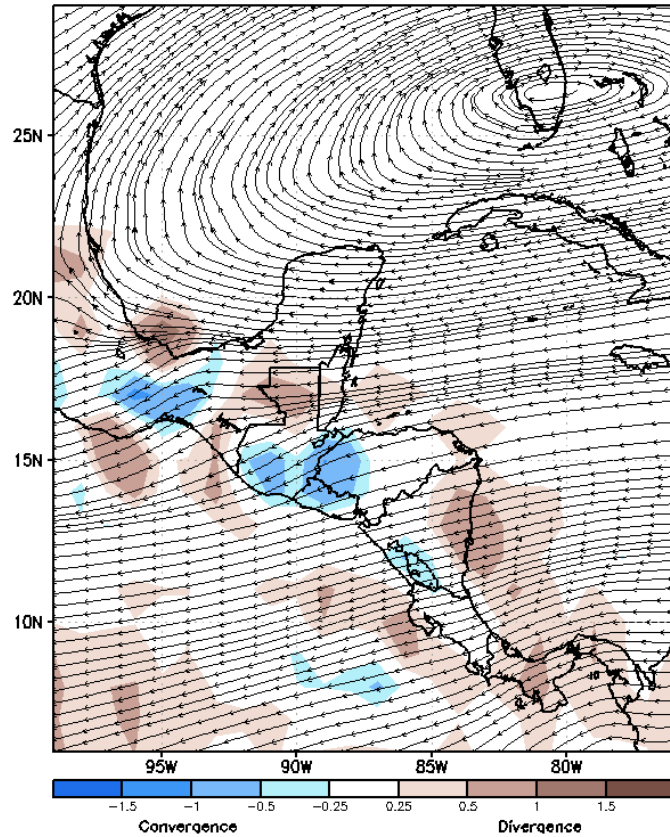


Shallow low level convergence over Northern Belize, divergence over southern areas.

700-hPa Wind

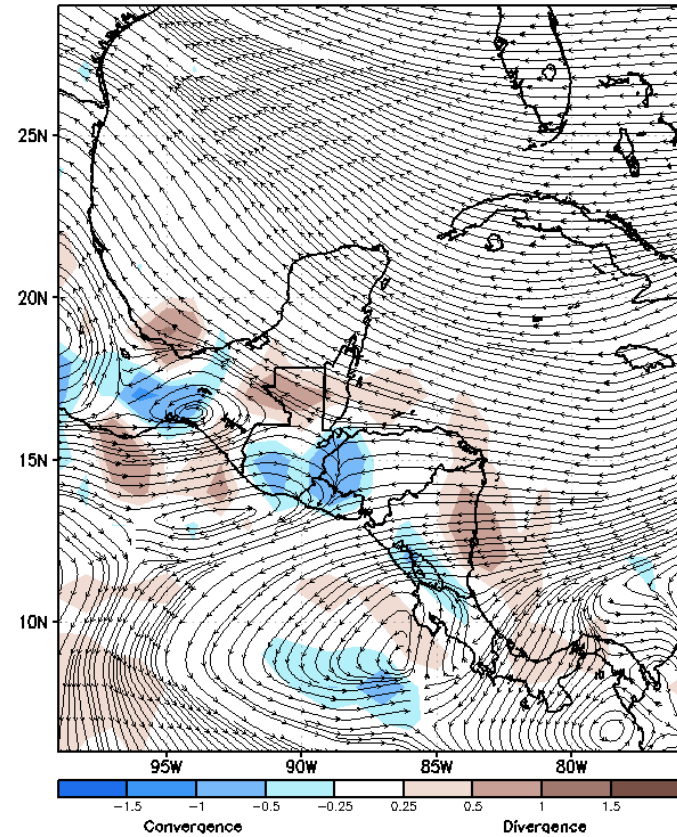
Total

GEFS Week-2 700-hPa Divergence and Wind Total
Valid: 20211117 - 20211123



Anomaly

GEFS Week-2 700-hPa Divergence and Wind Anomaly
Valid: 20211117 - 20211123

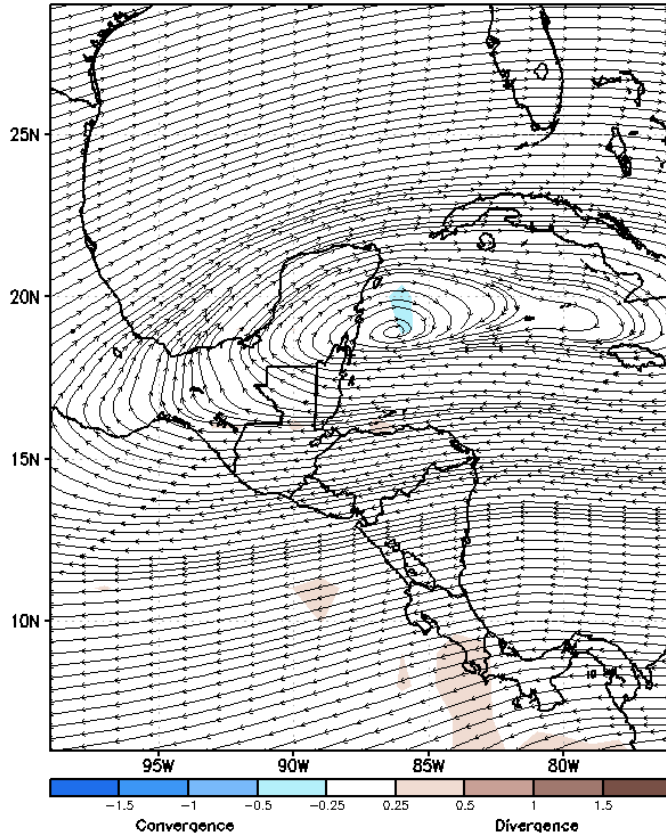


Divergent anomaly over Belize

500-hPa Wind

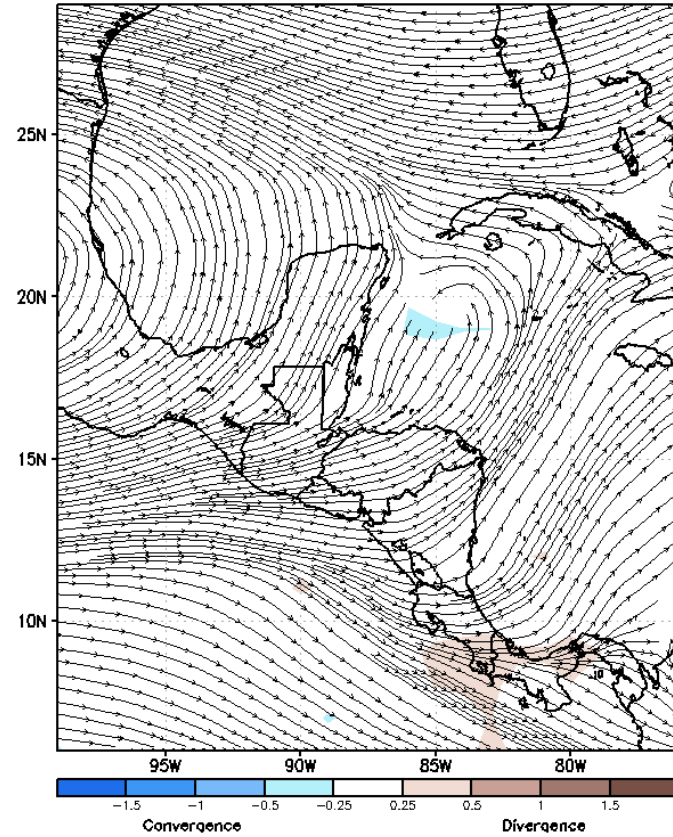
Total

GEFS Week-2 500-hPa Divergence and Wind Total
Valid: 20211117 - 20211123



Anomaly

GEFS Week-2 500-hPa Divergence and Wind Anomaly
Valid: 20211117 - 20211123

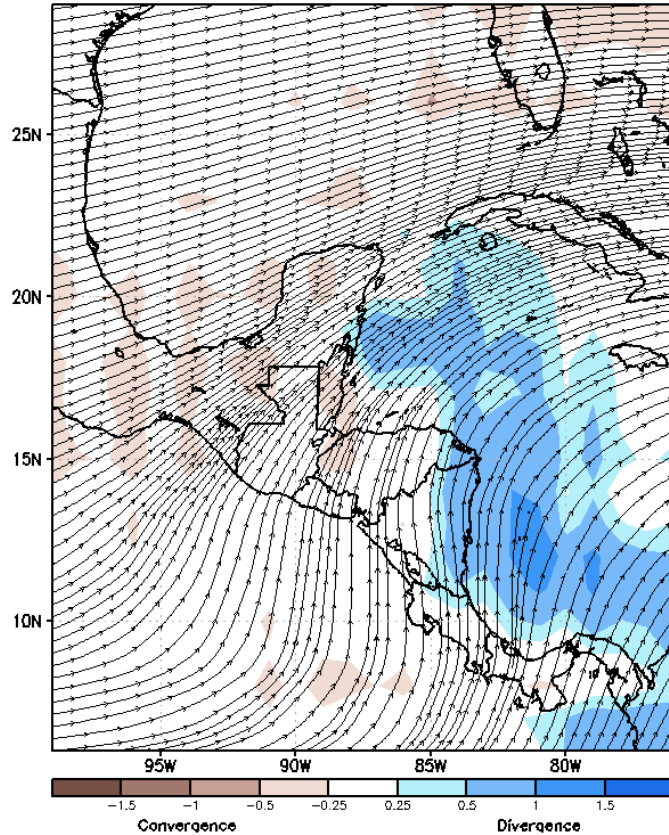


Anti-cyclonic anomaly

200-hPa Wind

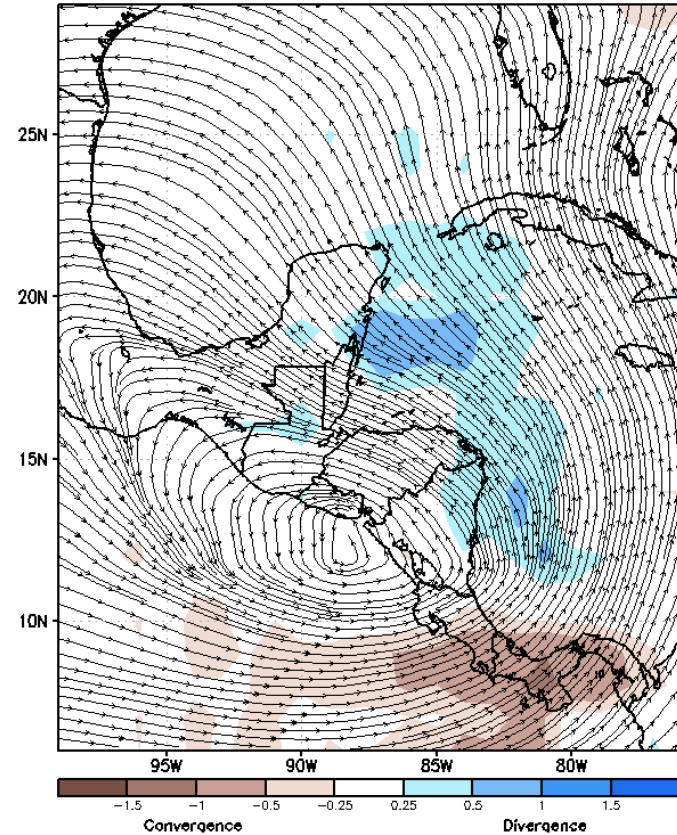
Total

GEFS Week-2 200-hPa Divergence and Wind Total
Valid: 20211117 - 20211123



Anomaly

GEFS Week-2 200-hPa Divergence and Wind Anomaly
Valid: 20211117 - 20211123

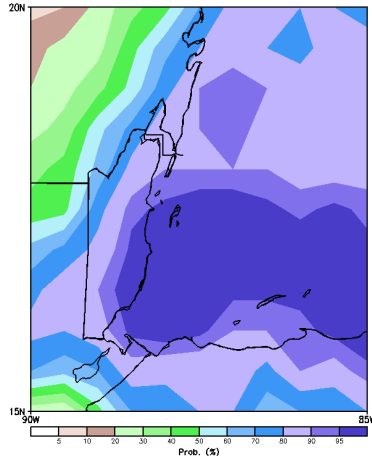


Upper Level Divergence of NW Caribbean. Weakly Convergent over Belize

Precipitation Exceedance Probability

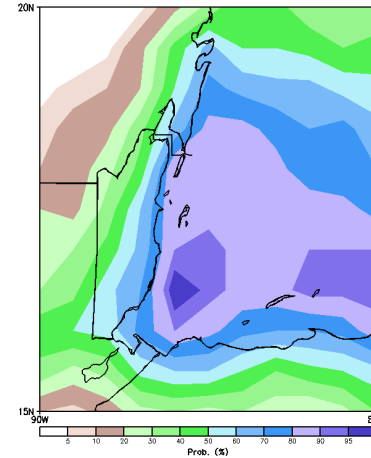
$\geq 25\text{mm}$

GEFS Week-2 Exceedance Prob. $\geq 25\text{mm}$
Valid: 20211117 - 20211123



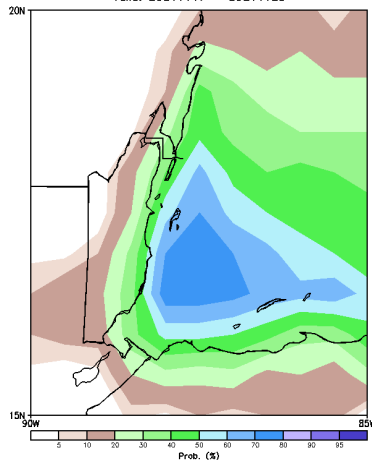
$\geq 50\text{mm}$

GEFS Week-2 Exceedance Prob. $\geq 50\text{mm}$
Valid: 20211117 - 20211123



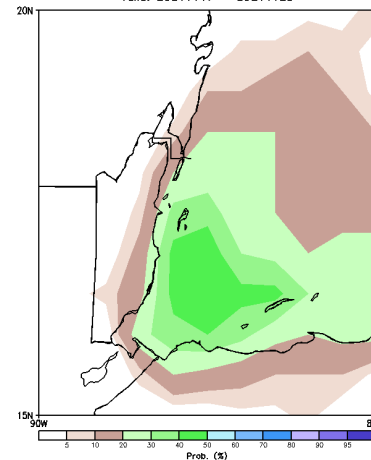
$\geq 100\text{mm}$

GEFS Week-2 Exceedance Prob. $\geq 100\text{mm}$
Valid: 20211117 - 20211123



$\geq 150\text{mm}$

GEFS Week-2 Exceedance Prob. $\geq 150\text{mm}$
Valid: 20211117 - 20211123



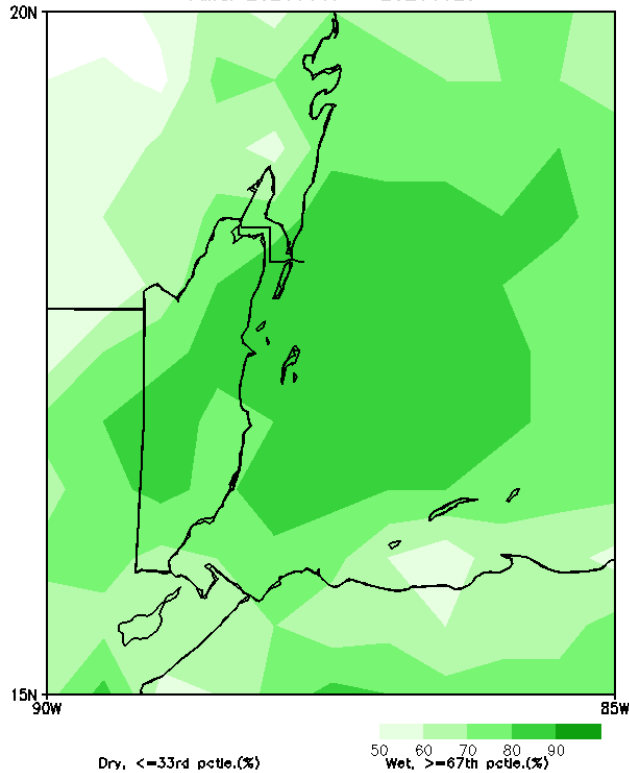
High Exceedance Probability ($\geq 25\text{mm}$) over most of the country, and $\geq 50\text{mm}$ over coastal and offshore areas.

Precipitation Exceedance Probability ($\leq 33^{\text{rd}}$ & $\geq 67^{\text{th}}$ percentiles)

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GEFS Week-2 Exceedance Probability ($\leq 33^{\text{rd}}$ / $\geq 67^{\text{th}}$ Pctl.)

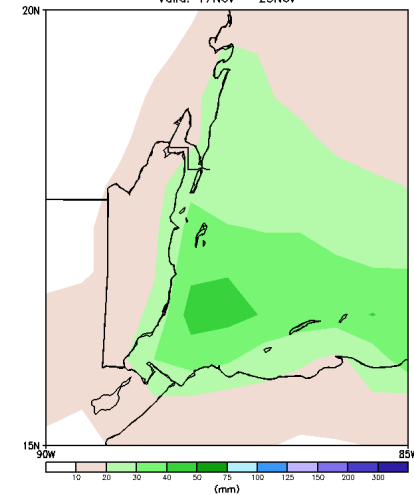
Valid: 20211117 - 20211123



High exceedance probability ($\geq 67^{\text{th}}$ percentile) over areas of the country.

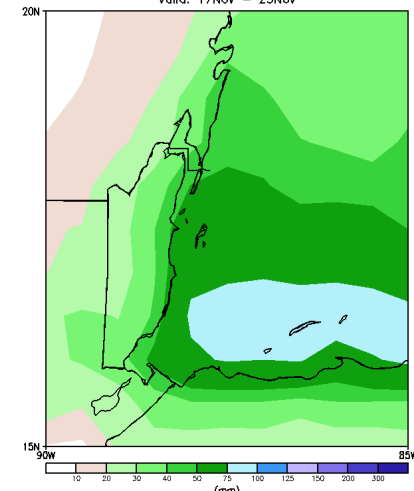
33rd percentile climo

GEFS 33rd . Model Climo.
Valid: 17Nov - 23Nov



67th percentile climo

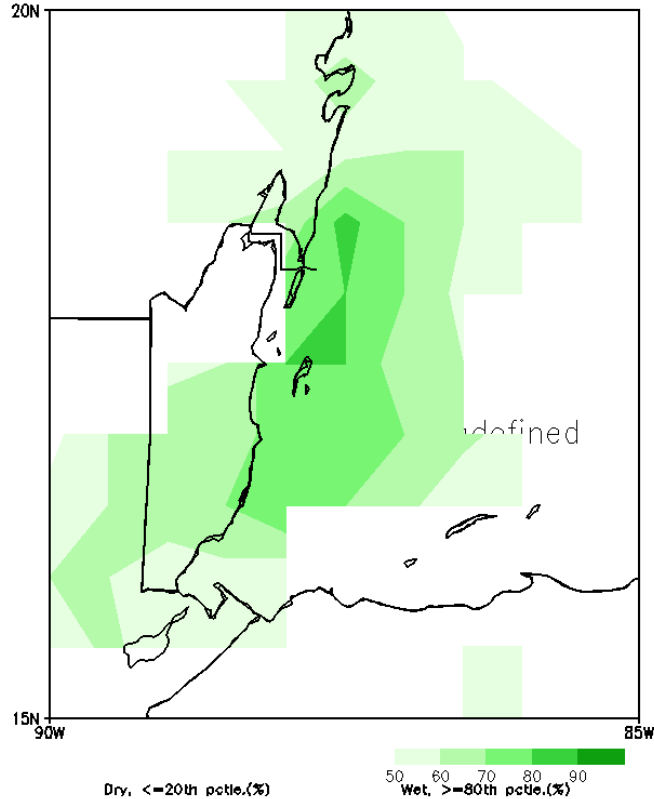
GEFS 67th . Model Climo.
Valid: 17Nov - 23Nov



Precipitation Exceedance Probability ($\leq 20^{\text{th}}$ & $\geq 80^{\text{th}}$ percentiles)

$\leq 20^{\text{th}}$ & $\geq 80^{\text{th}}$ percentiles

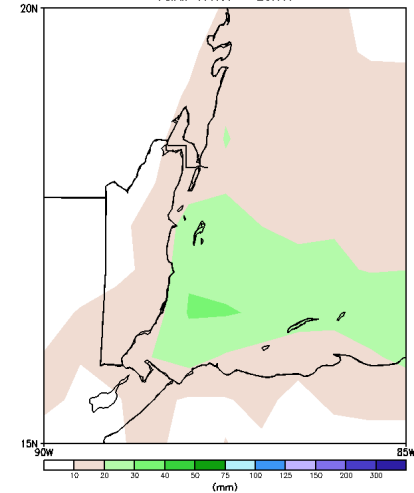
GEFS Week-2 Exceedance Probability ($\leq 20^{\text{th}}/\geq 80^{\text{th}}$ Pctl.)
Valid: 20211117 - 20211123



High exceedance probability ($\geq 80^{\text{th}}$ percentile)
over southern and offshore areas.

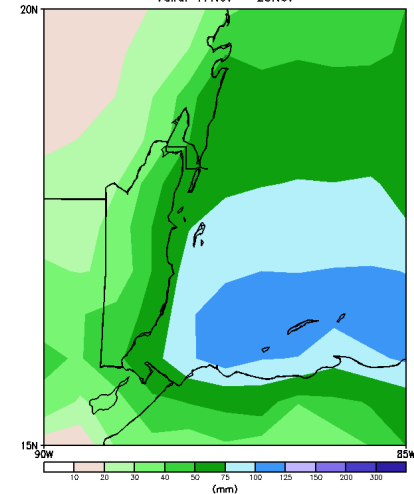
20th percentile climo

GEFS 20th . Model Climo.
Valid: 17Nov - 23Nov



80th percentile climo

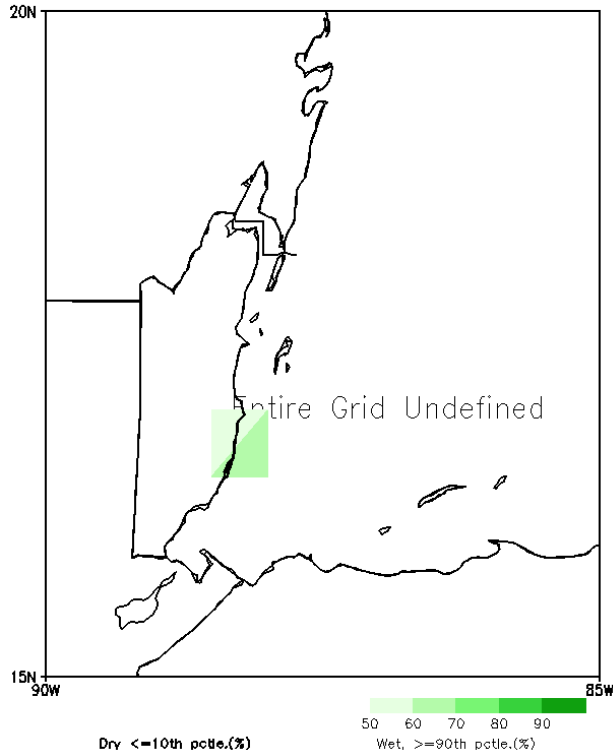
GEFS 80th . Model Climo.
Valid: 17Nov - 23Nov



Precipitation Exceedance Probability ($\leq 10^{\text{th}}$ & $\geq 90^{\text{th}}$ percentiles)

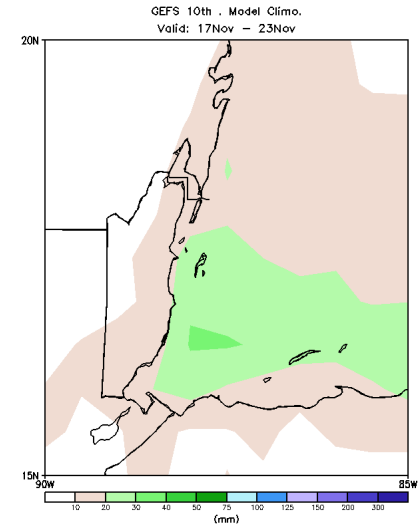
$\leq 10^{\text{th}}$ & $\geq 90^{\text{th}}$ percentiles

GEFS Week-2 Exceedance Probability ($\leq 10^{\text{th}}$ / $\geq 90^{\text{th}}$ Pctl.)
Valid: 20211117 - 20211123

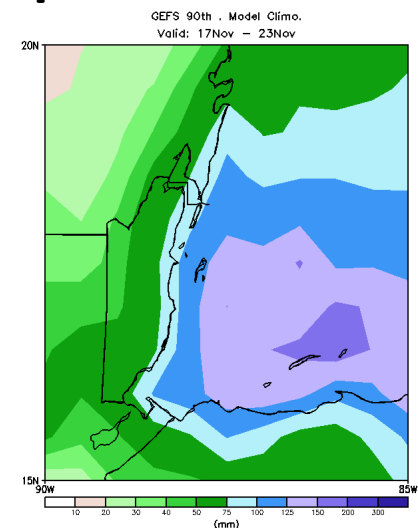


High exceedance probability ($\geq 90^{\text{th}}$ percentile) over south-eastern Belize.

10th percentile climo



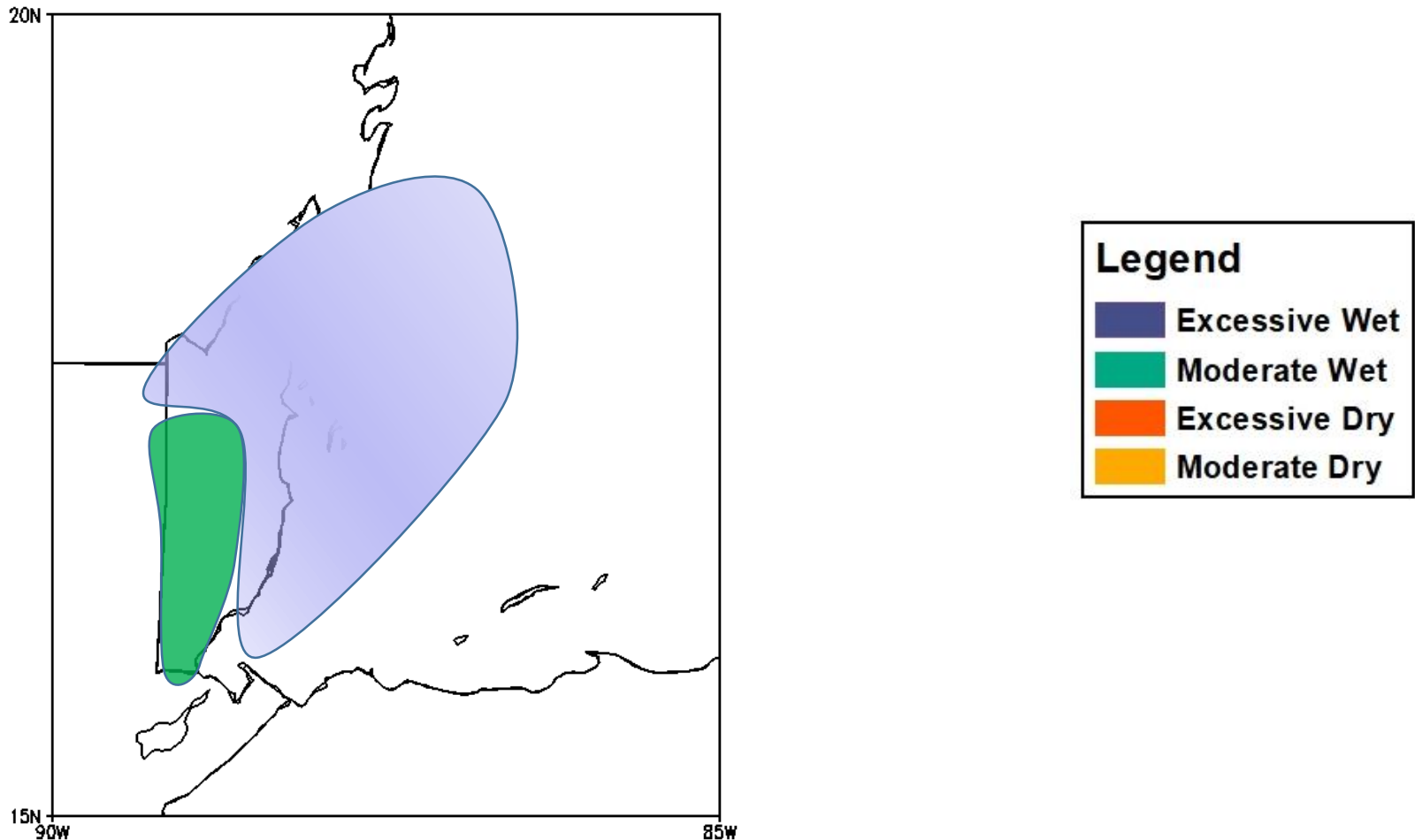
90th percentile climo



Summary

- MJO will be slightly active
- Large Scale Circulation patterns => Strong lower level convergence, combined with upper-level divergence in the NW Caribbean and Difffluence over Belize.
- Exceedance probability forecasts = > higher probability of exceedance for $\geq 67^{\text{th}}$ percentiles over most areas, 80th percentiles over southern and Offshore areas and 90th percentiles south-eastern Belize.

Extreme Precipitation Outlooks



Low level convergence, and strong upper-level divergence over northern Belize and NW Caribbean is expected to enhance rainfall over portions of northern and coastal Belize. Model precip forecasts also suggest an increased chance for the precip to exceed the 67th percentile over most areas, with pocket areas of high exceedance probabilities in excess of the 90th percentile in south-eastern Belize