

# Global Tropics Hazards And Benefits Outlook

3/9/2021

Adam Allgood

## Outline

1. Review of Recent Conditions
2. Synopsis of Climate Modes
3. GTH Outlook and Forecast Discussion
4. Connections to U.S. Impacts

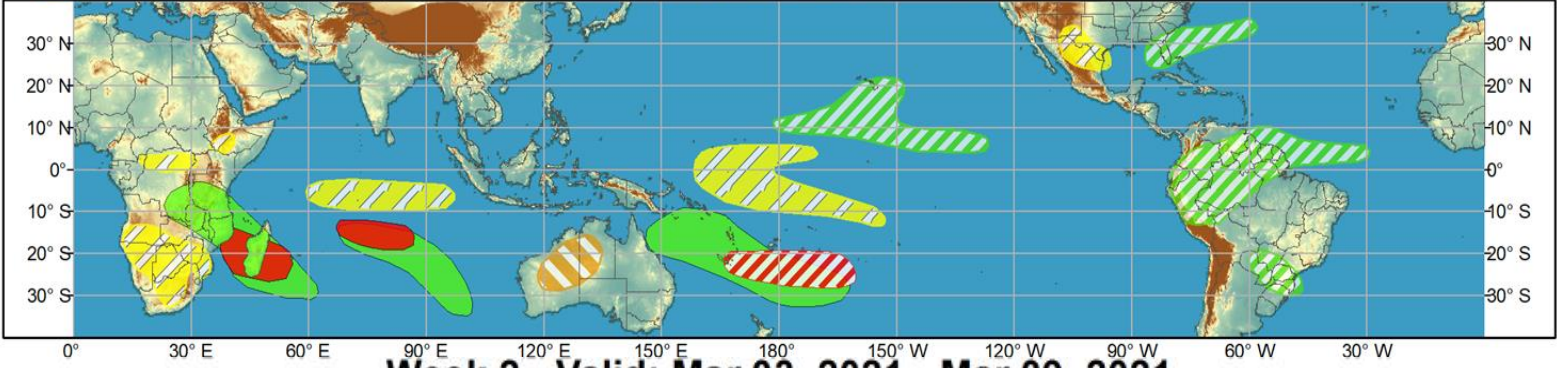
# Outlook Review



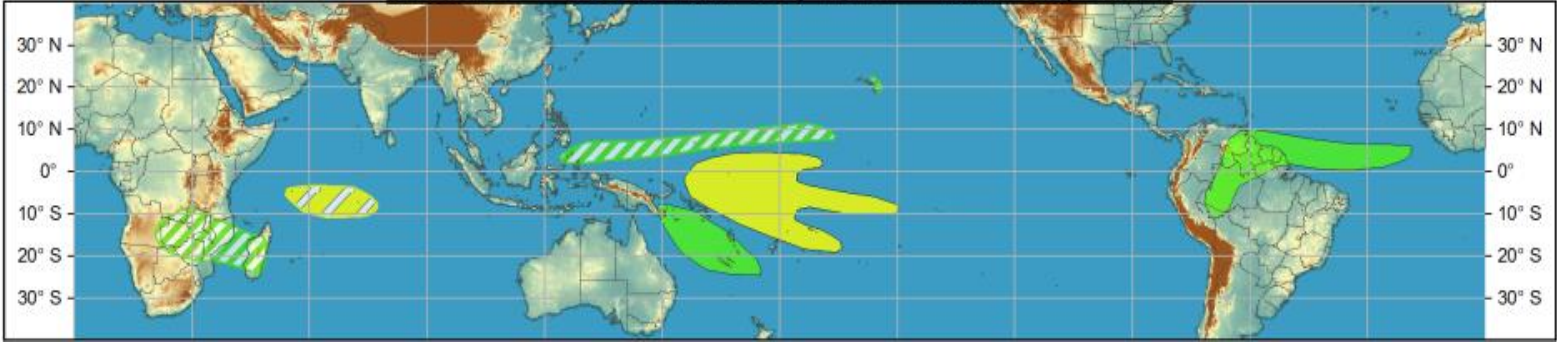
## Global Tropics Hazards and Benefits Outlook - Climate Prediction Center



**Week 1 - Valid: Mar 03, 2021 - Mar 09, 2021**



**Week 2 - Valid: Mar 03, 2021 - Mar 09, 2021**

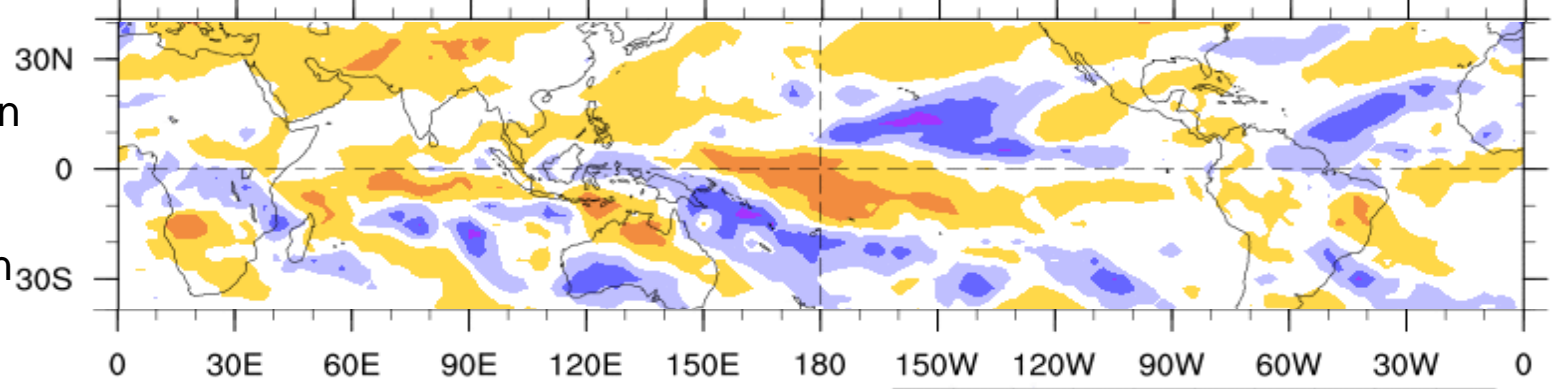


7-Day Average OLR Anomaly

2021/03/01 - 2021/03/07

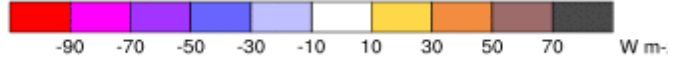
Cool shading  
More clouds/rain

Warm shading  
Less clouds/rain



NOAA/PSL

Base Period: 1981-2010



# Synopsis of Climate Modes

## **ENSO: (February 11, 2021 Update)**

*next update on 11<sup>th</sup> of March!*

- ENSO Alert System Status: [La Niña Advisory](#)
- There is a ~60% chance of a transition from La Niña to ENSO-Neutral during the Northern Hemisphere spring 2021 (April-June).

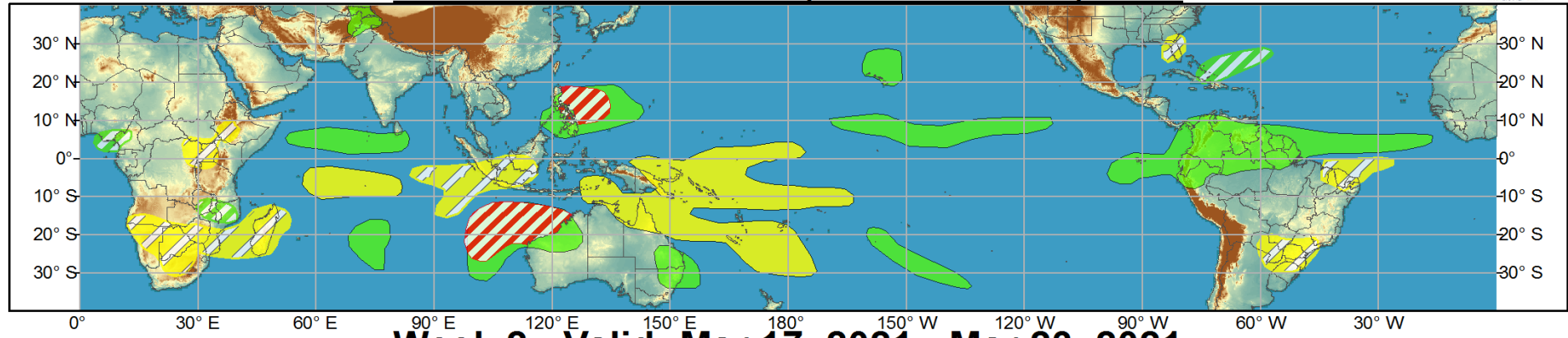
## **MJO and other subseasonal tropical variability:**

- An MJO signal remains apparent in the upper-level velocity potential field, though La Niña and Rossby wave activity are weakening the signal in other fields.
- Dynamical models favor a strengthening MJO signal as it reaches the East Pacific and Western Hemisphere. What happens after that is highly uncertain.
- A downwelling oceanic Kelvin wave is beginning to erode the western extent of the cold equatorial Pacific. The current MJO has not contributed much to this signal.
- The MJO favors heavy precipitation across northern South America, with a potential for flooding impacts. Additional heavy rainfall is also favored for Hawaii.

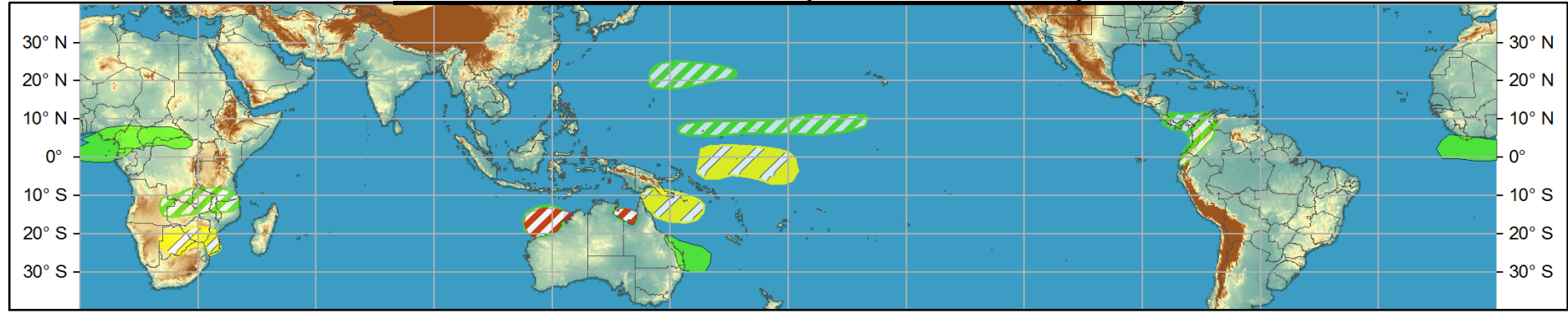


# Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

## Week 1 - Valid: Mar 10, 2021 - Mar 16, 2021



## Week 2 - Valid: Mar 17, 2021 - Mar 23, 2021



Produced: 03/09/2021  
Forecaster: Allgood

Confidence		
High	Moderate	
		<b>Tropical Cyclone Formation</b> Development of a tropical cyclone (tropical depression - TD, or greater strength).
		<b>Above-average rainfall</b> Weekly total rainfall in the upper third of the historical range.
		<b>Below-average rainfall</b> Weekly total rainfall in the lower third of the historical range.
		<b>Above-normal temperatures</b> 7-day mean temperatures in the upper third of the historical range.
		<b>Below-normal temperatures</b> 7-day mean temperatures in the lower third of the historical range.

**Product is updated once per week, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.**



# IR Satellite & 200-hpa Velocity Potential Anomalies

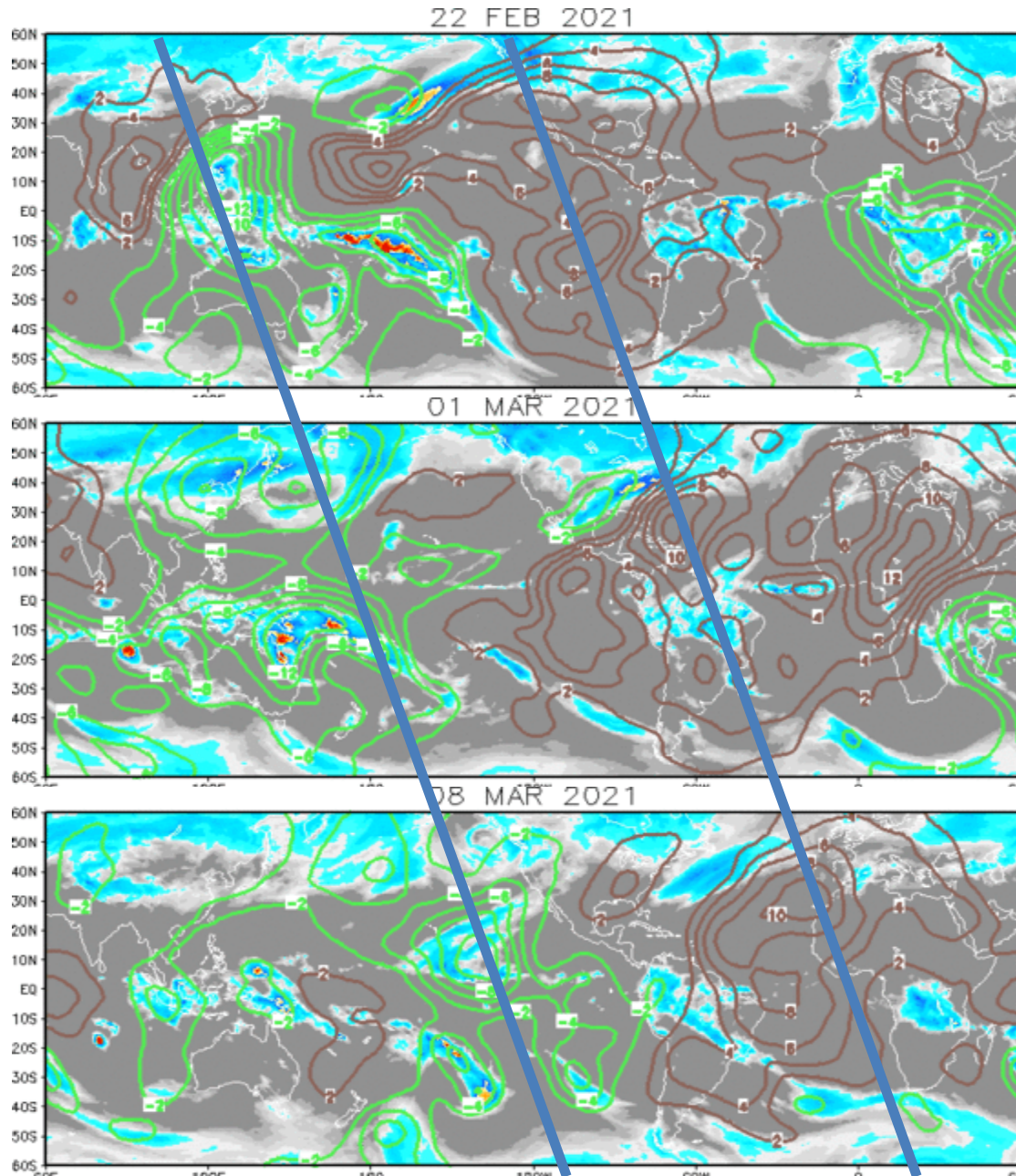
Green: Enhanced Divergence

Brown: Enhanced Convergence

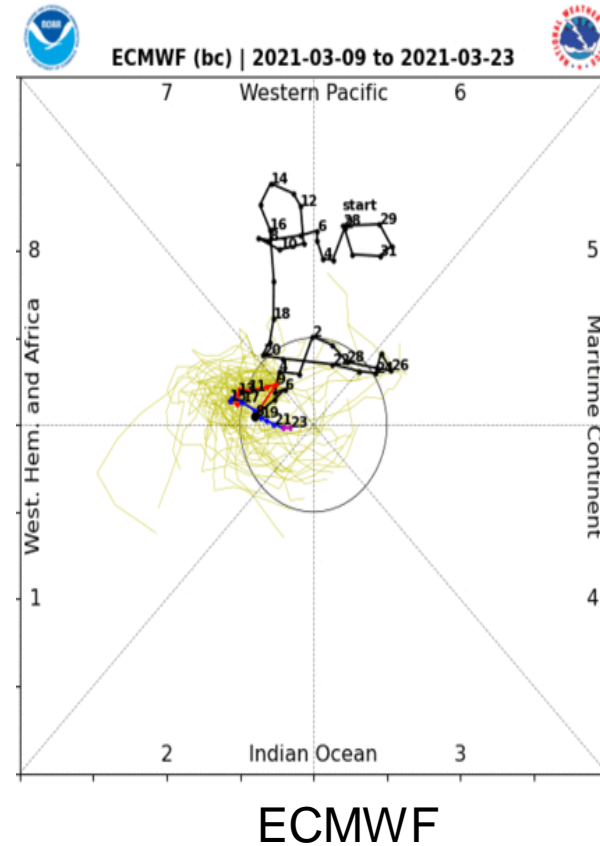
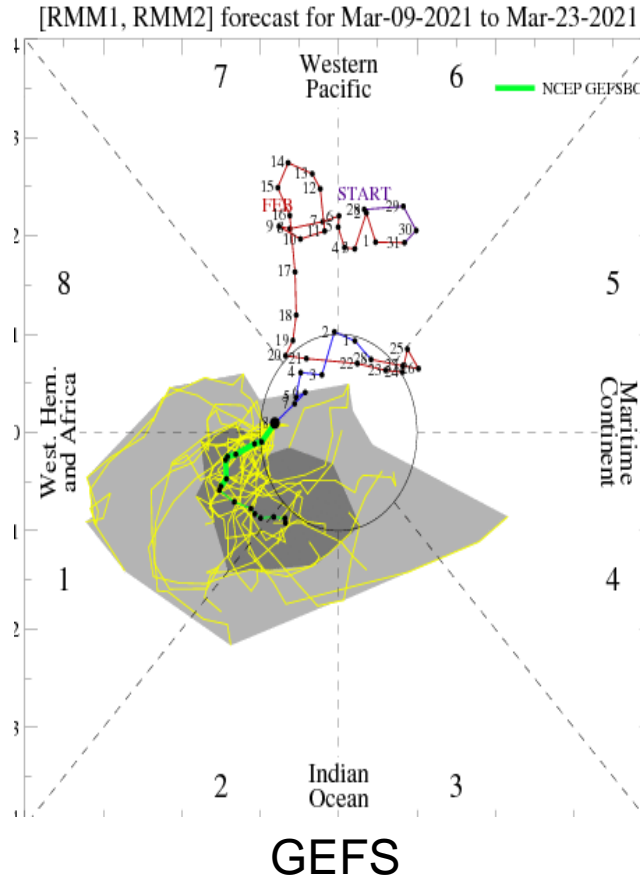
Enhanced Maritime Continent/SPCZ related to very strong Rossby wave (that also helped generate the oceanic Kelvin wave). CCKW over Africa.

Rossby/Kelvin wave interference helped generate a broader convective envelope over the Indian Ocean/Maritime Continent.

The enhanced envelope has propagated eastward across the Pacific, though most of the signal is off-Equator due to La Niña interference.



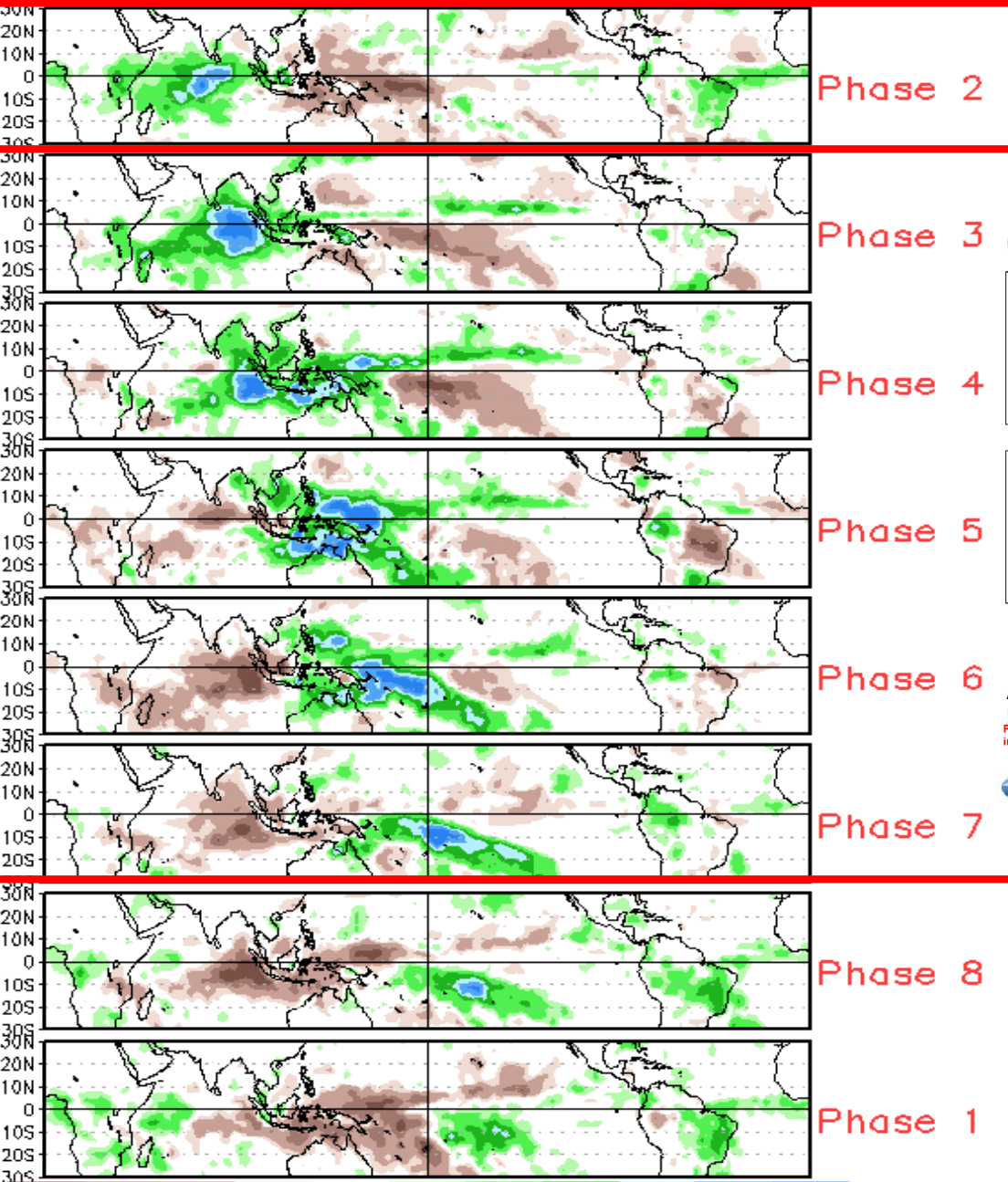
# MJO Observation/Forecast



GEFS and ECWFM both show some amplification over the East Pacific or Western Hemisphere in Week-1.

High uncertainty in Week-2, with some ensemble members depicting a strong event while others crash into the unit circle. GEFS also shows considerable variability in eastward progression of the signal.

# Average Conditions when the MJO is present



Phase 2

Phase 3

Phase 4

Phase 5

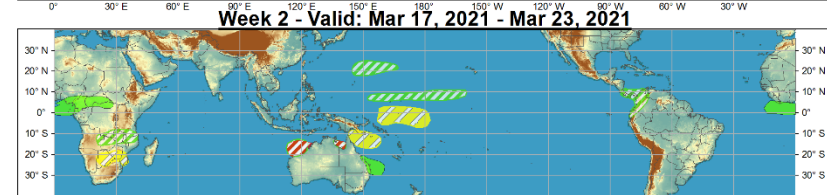
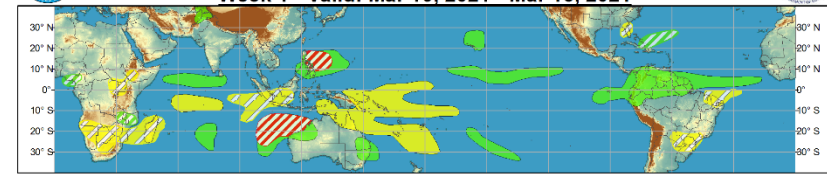
Phase 6

Phase 7

Phase 8

Phase 1

Global Tropics Hazards and Benefits Outlook - Climate Prediction Center  
 Week 1 - Valid: Mar 10, 2021 - Mar 16, 2021



Produced: 03/09/2021  
 Forecaster: Allgood

- Confidence**  
 High: Red box, Moderate: Blue box
  - Tropical Cyclone Formation**  
 High: Red box with diagonal lines, Moderate: Blue box with diagonal lines
  - Above-average rainfall**  
 High: Green box, Moderate: Yellow box
  - Below-average rainfall**  
 High: Yellow box, Moderate: Green box
  - Above-normal temperatures**  
 High: Orange box, Moderate: Brown box
  - Below-normal temperatures**  
 High: Blue box, Moderate: Light blue box
- Development of a tropical cyclone (tropical depression - TD, or greater strength).  
 Weekly total rainfall in the upper third of the historical range.  
 Weekly total rainfall in the lower third of the historical range.  
 7-day mean temperatures in the upper third of the historical range.  
 7-day mean temperatures in the lower third of the historical range.

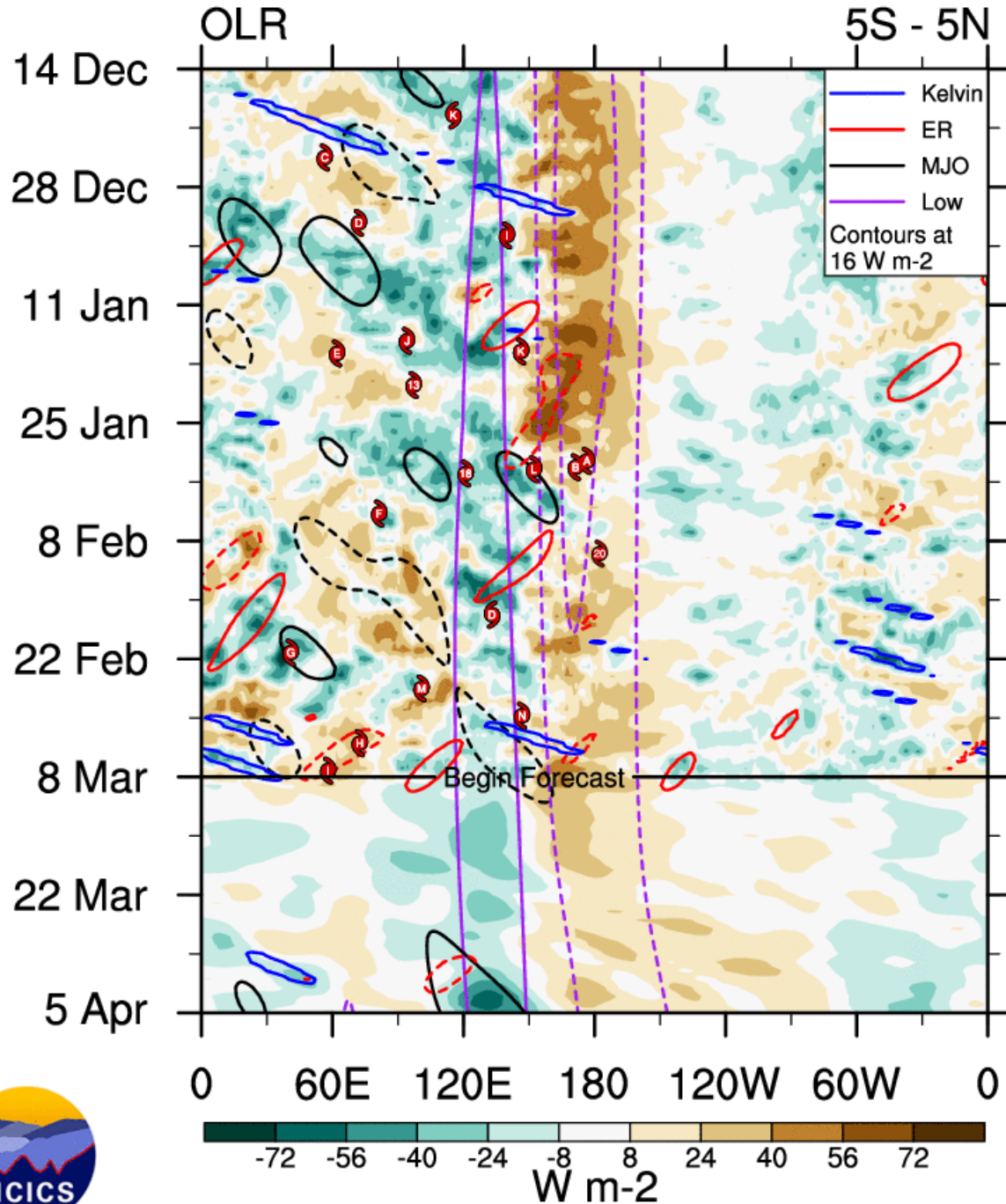
Product is updated once per week, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.



CAVEAT: These panels are representative of robust MJO events.

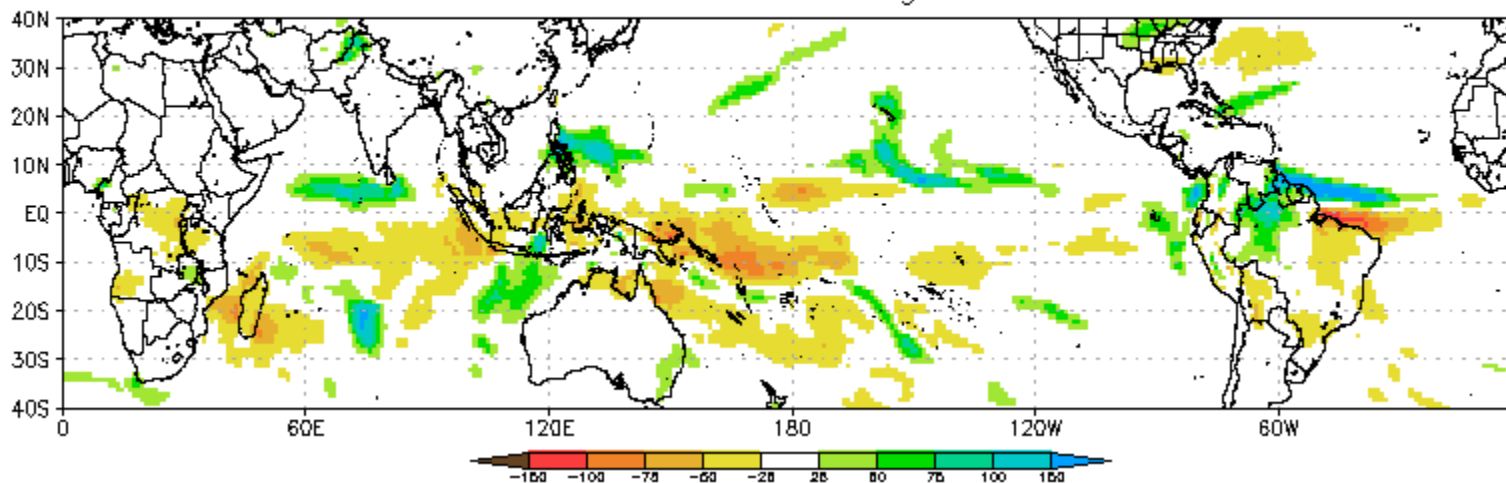
**MJO** activity is less apparent in the OLR field, though there are hints of eastward propagation.

**Low frequency** contours depict ENSO cold conditions, which continue to dominate the pattern close to the Equator.

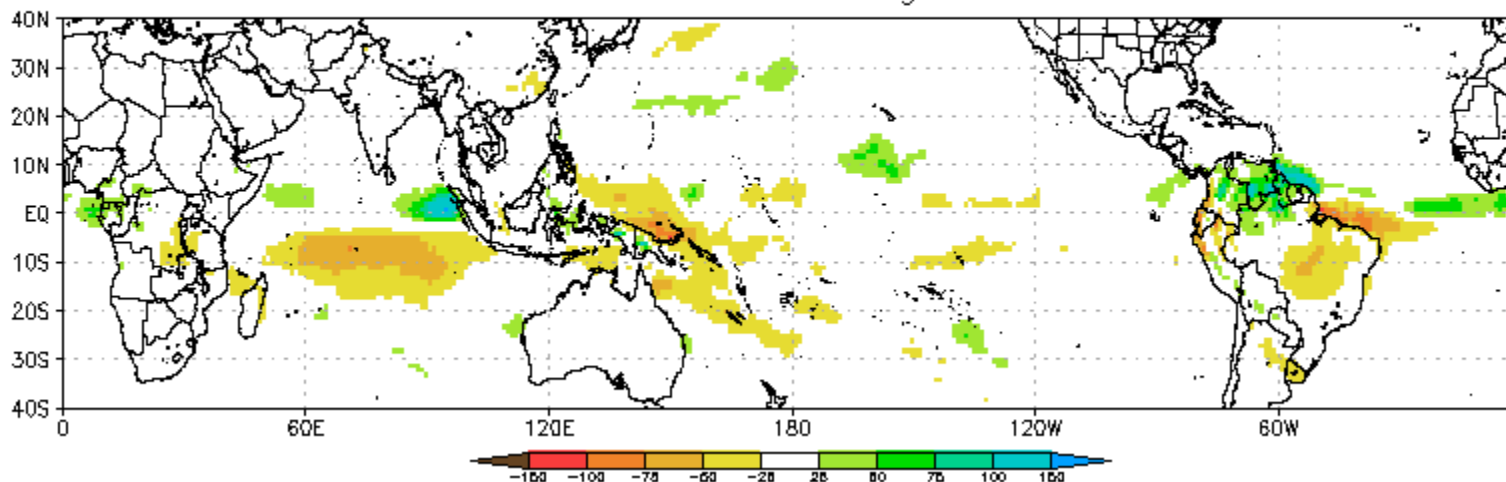




CFS Precipitation Anomalies (mm) Issued 08Mar2021  
Week-1 Forecast Ending 16Mar2021

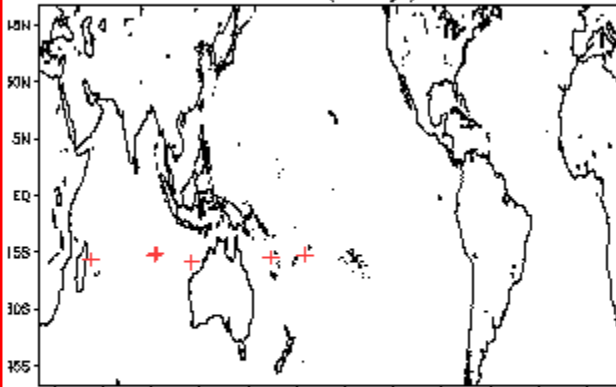


CFS Precipitation Anomalies (mm) Issued 08Mar2021  
Week-2 Forecast Ending 23Mar2021

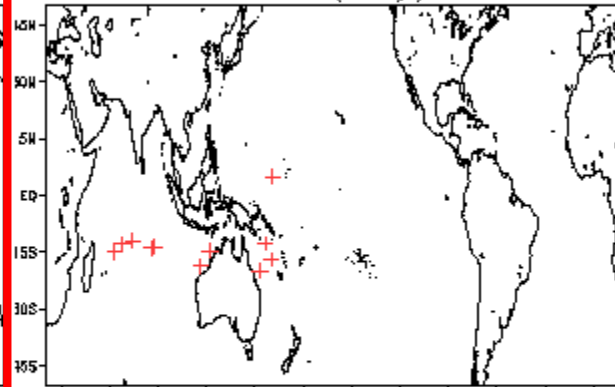


# March Tropical Storm Formation by MJO phase

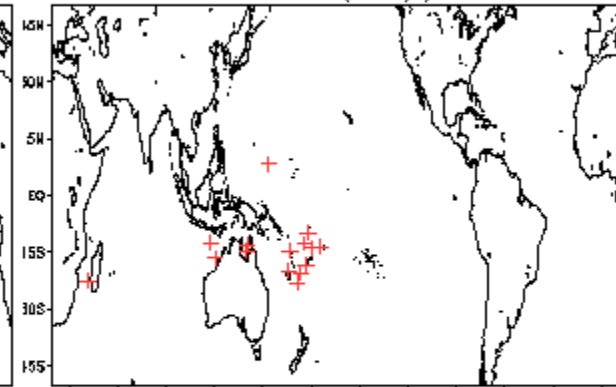
Phase 1 (98 days) 7 storms



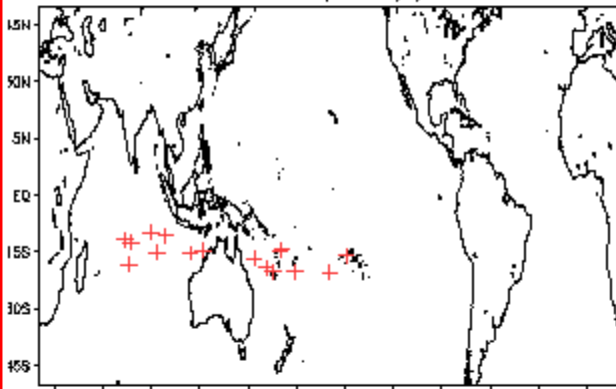
Phase 4 (72 days) 12 storms



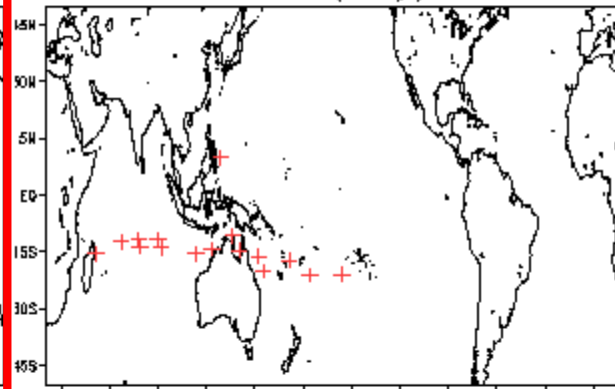
Phase 7 (81 days) 16 storms



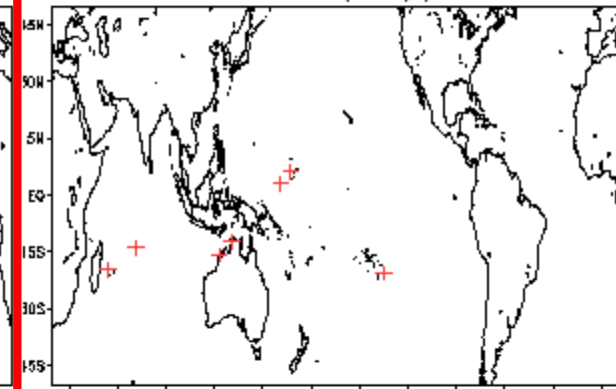
Phase 2 (111 days) 17 storms



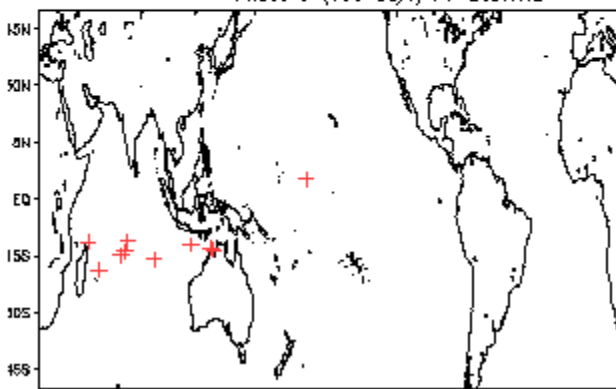
Phase 5 (77 days) 17 storms



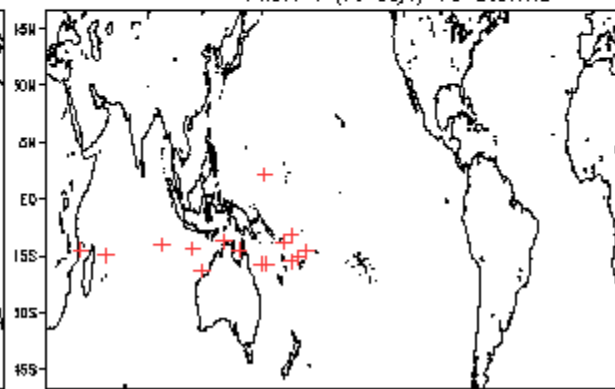
Phase 8 (92 days) 8 storms



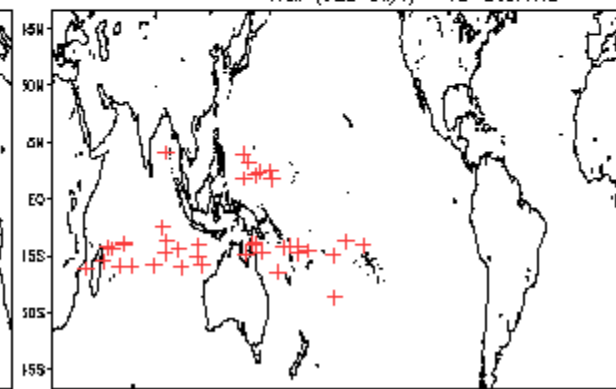
Phase 3 (108 days) 11 storms



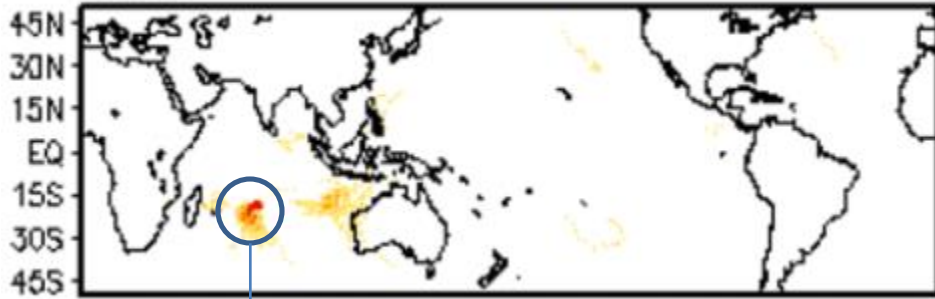
Phase 6 (78 days) 16 storms



Null (322 days) 40 storms

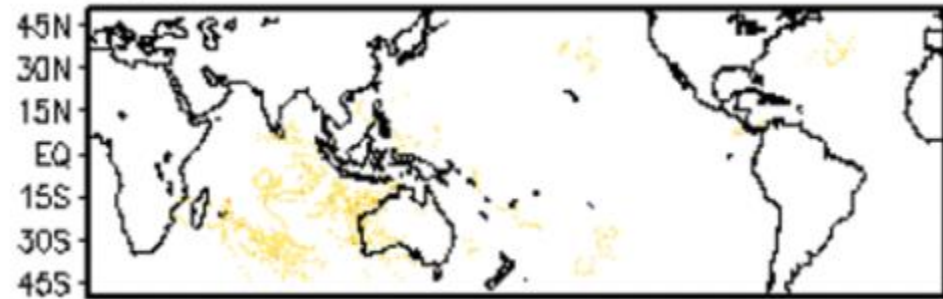


GEFS



Week-1

GEFS



Week-2

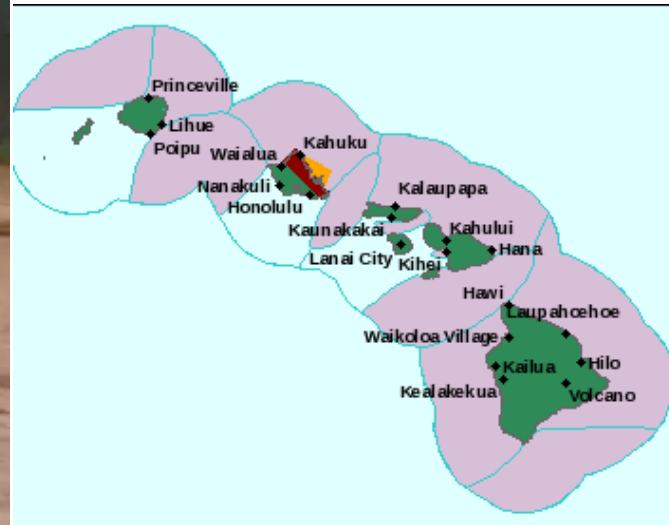
Cyclone  
Habana

# Connections to U.S. Impacts

# Hawaii Flooding

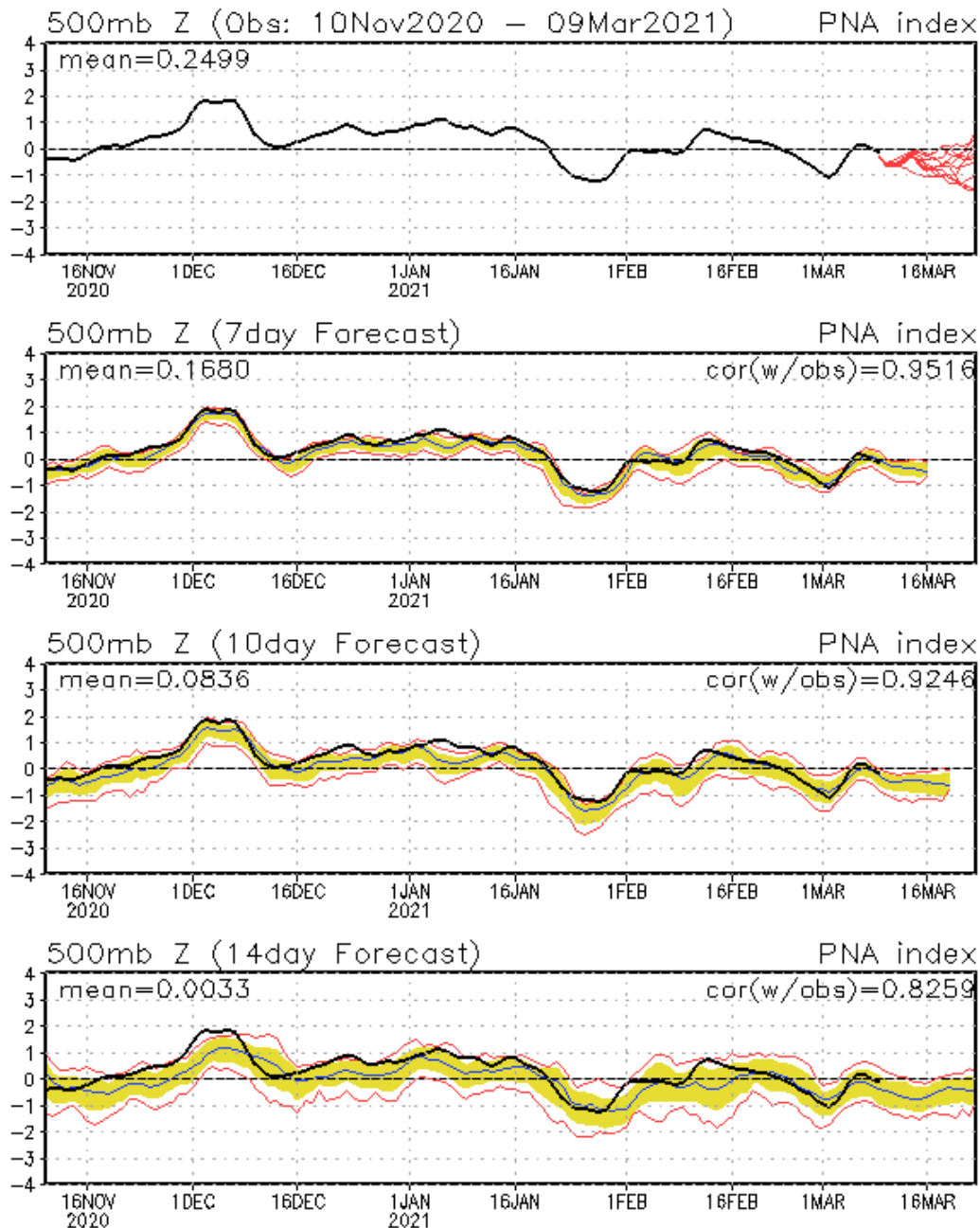


Hana Highway  
(Maui)

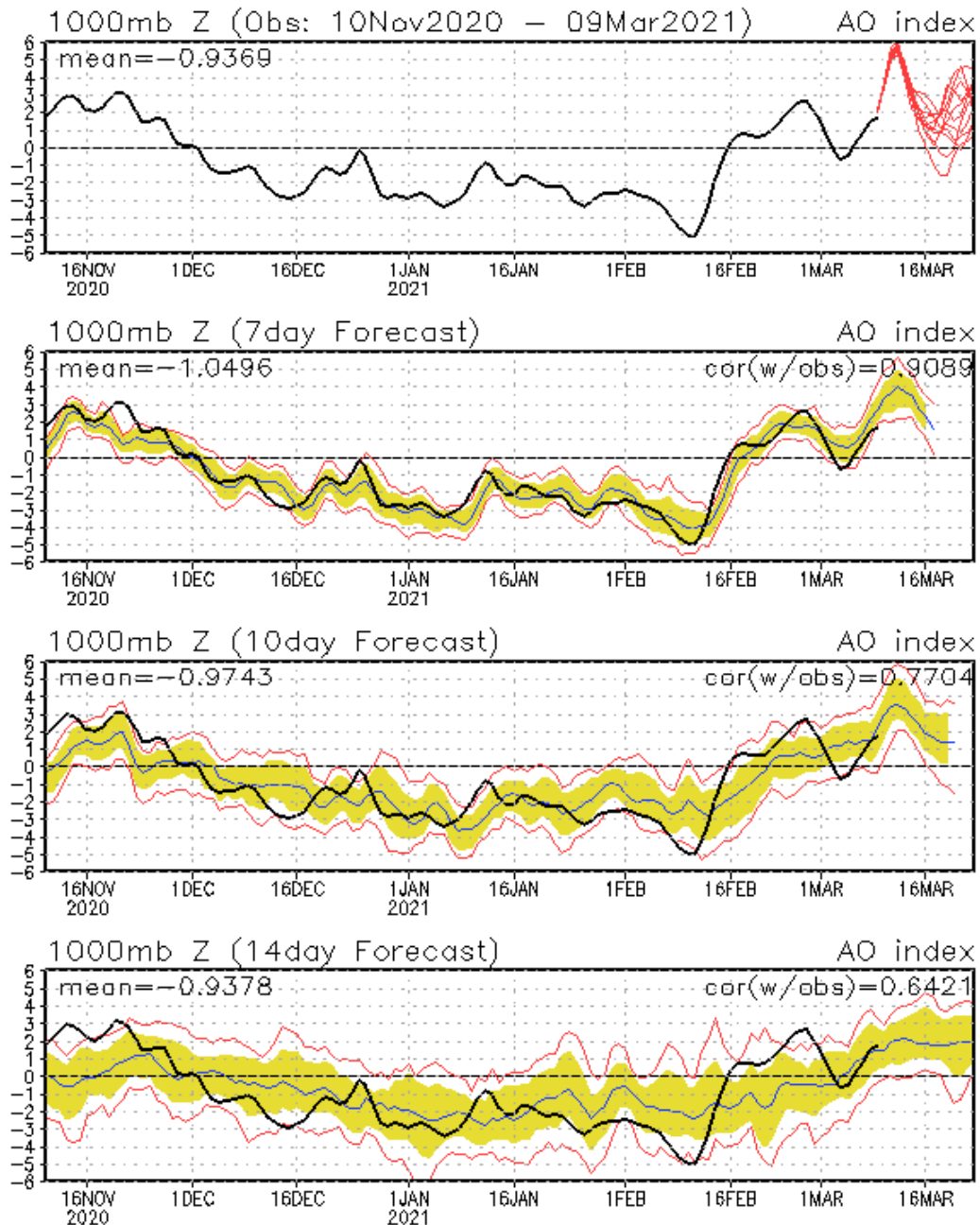


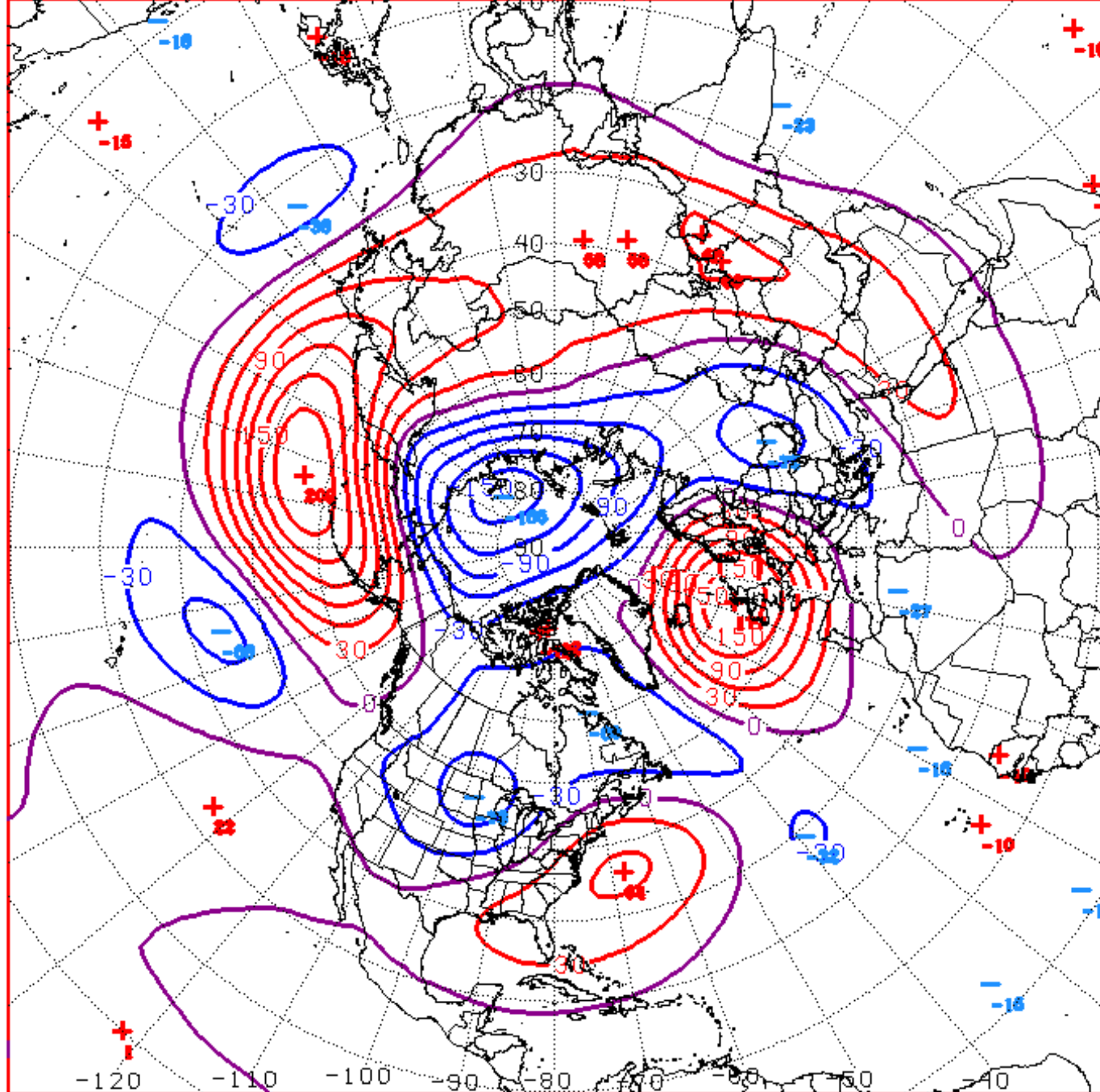
Evacuations ordered due to failure of Kaupakalua Dam

## PNA: Observed & ENSM forecasts



## AO: Observed & ENSM forecasts

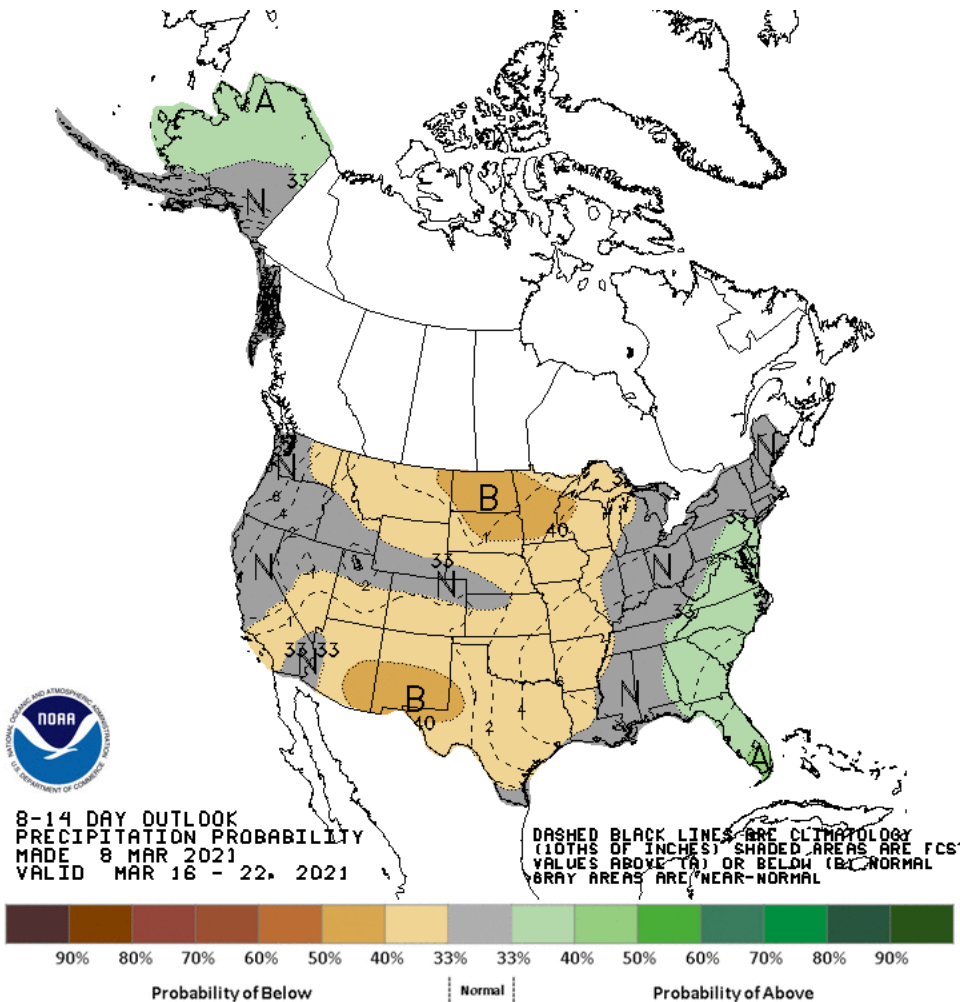
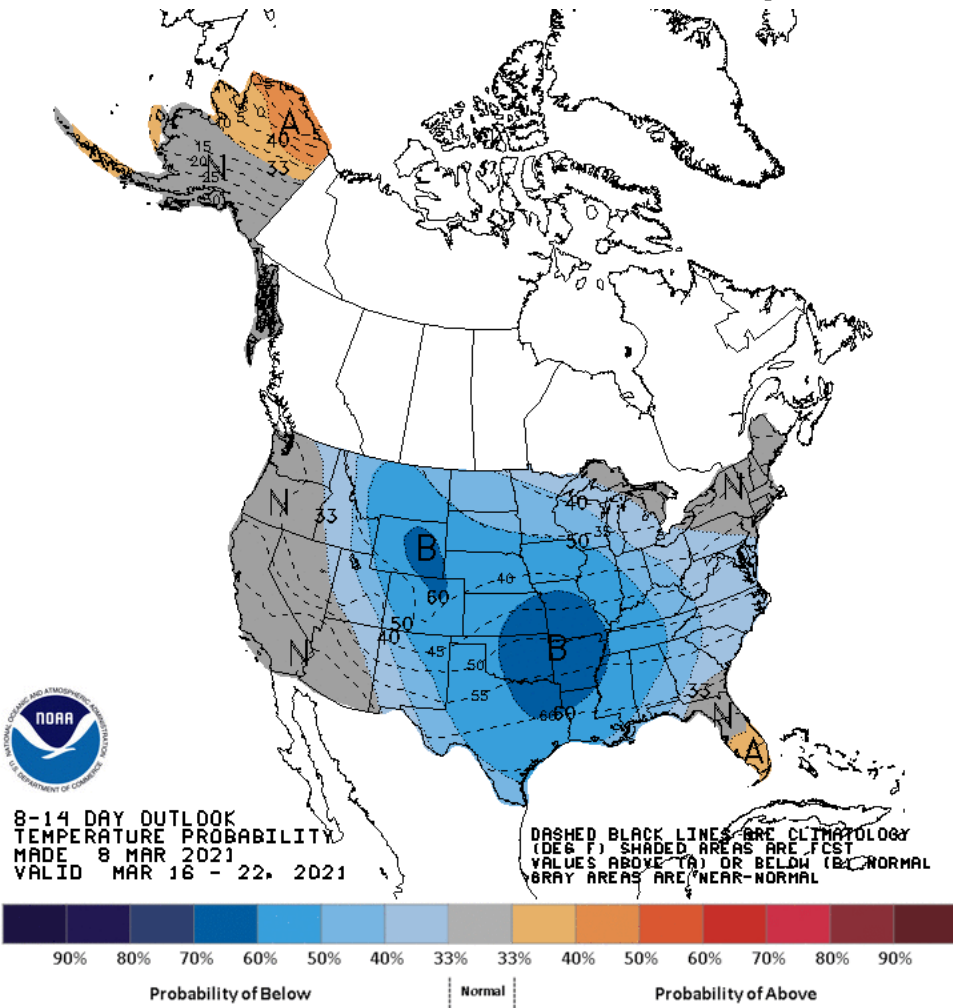




D+11 500 MB ANOMALIES FROM ALZ ENSM  
 CPC MAP MADE MAR 09 2021 1421 UTC CNTD MAR 20 2021



# Week 2 – Temperature and Precipitation

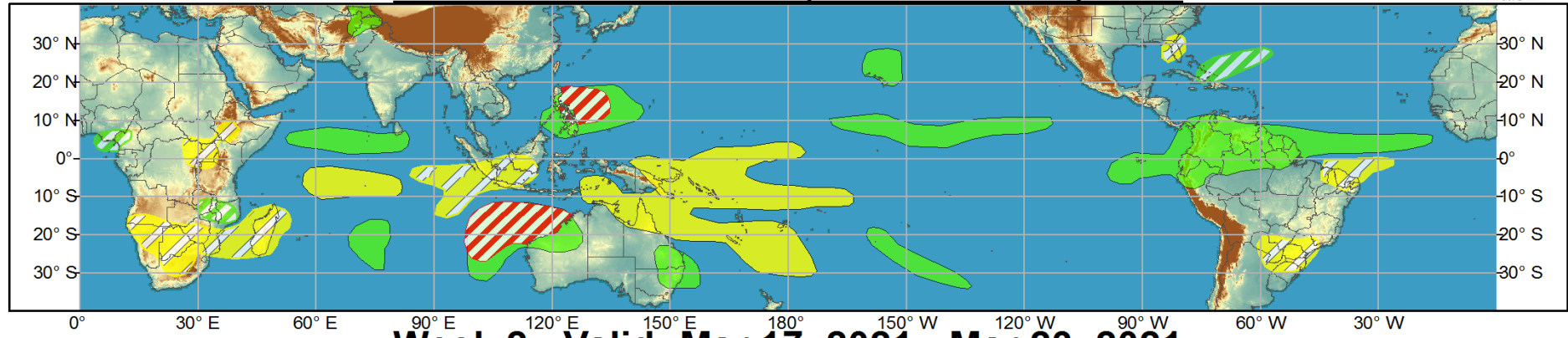


Since we are in an amplified, stable pattern today's outlooks are likely to be similar.

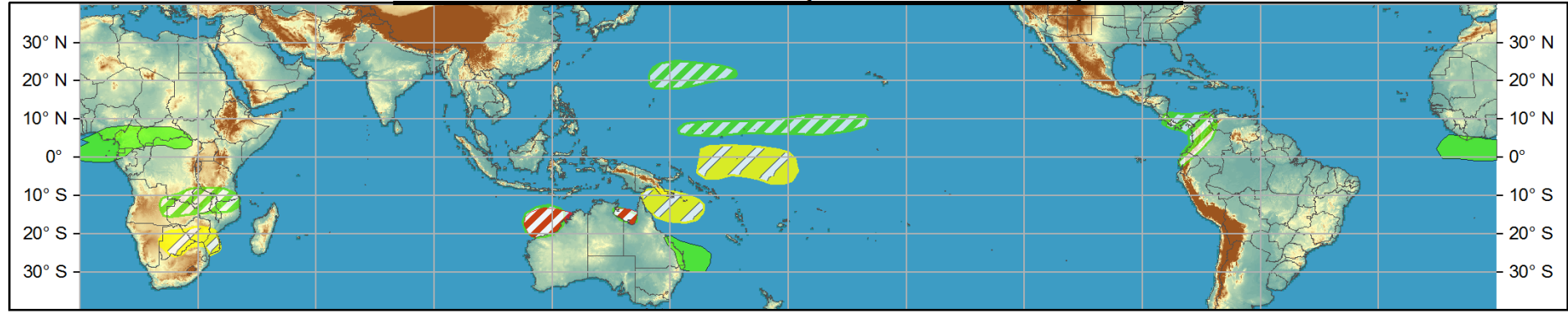


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