

# Global Tropics Hazards And Benefits Outlook

1/14/2020

Chrissy Maurin

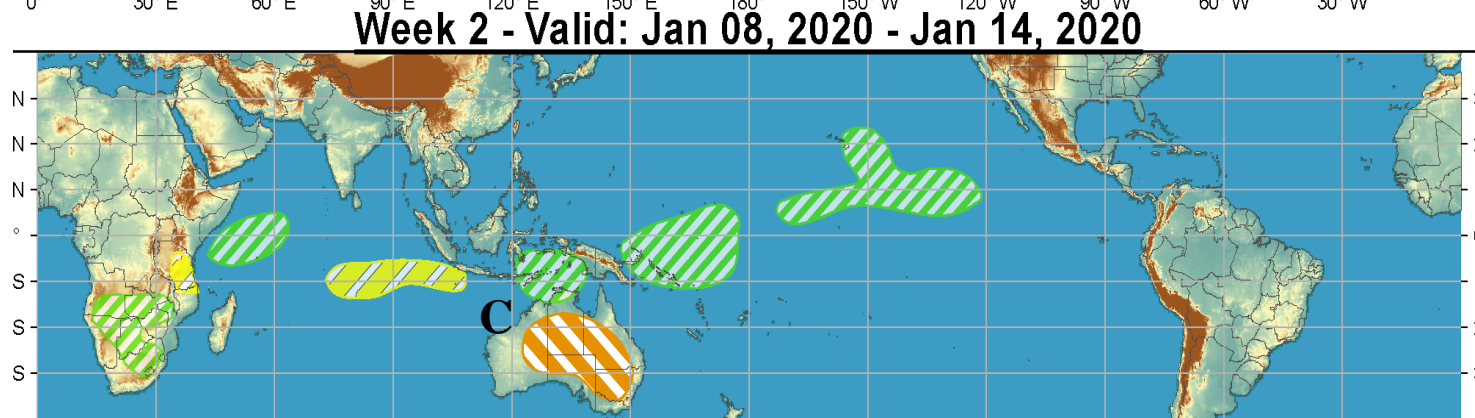
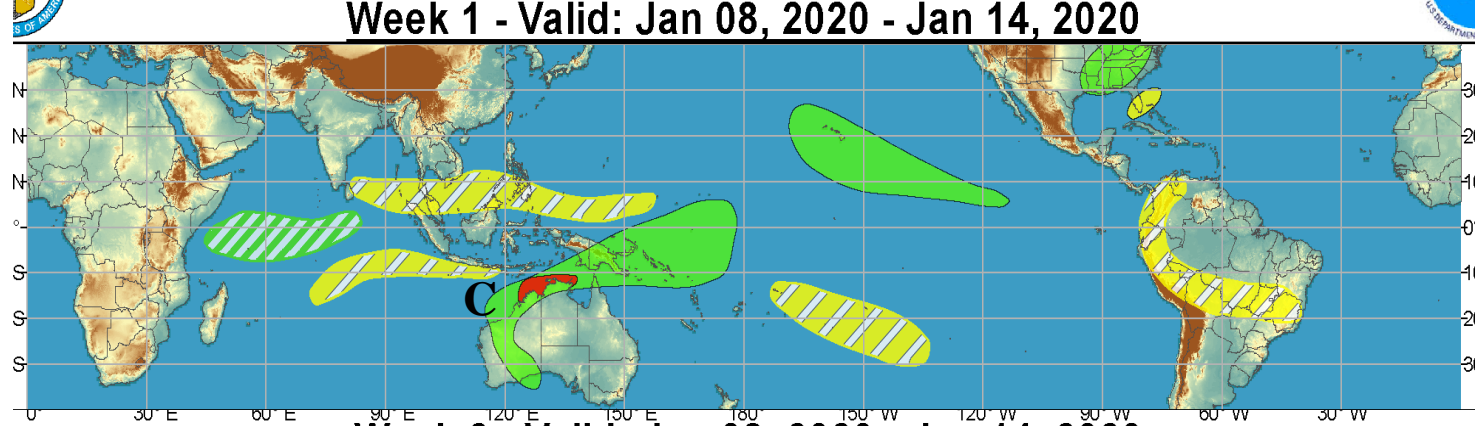
## Outline

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

# Outlook Review

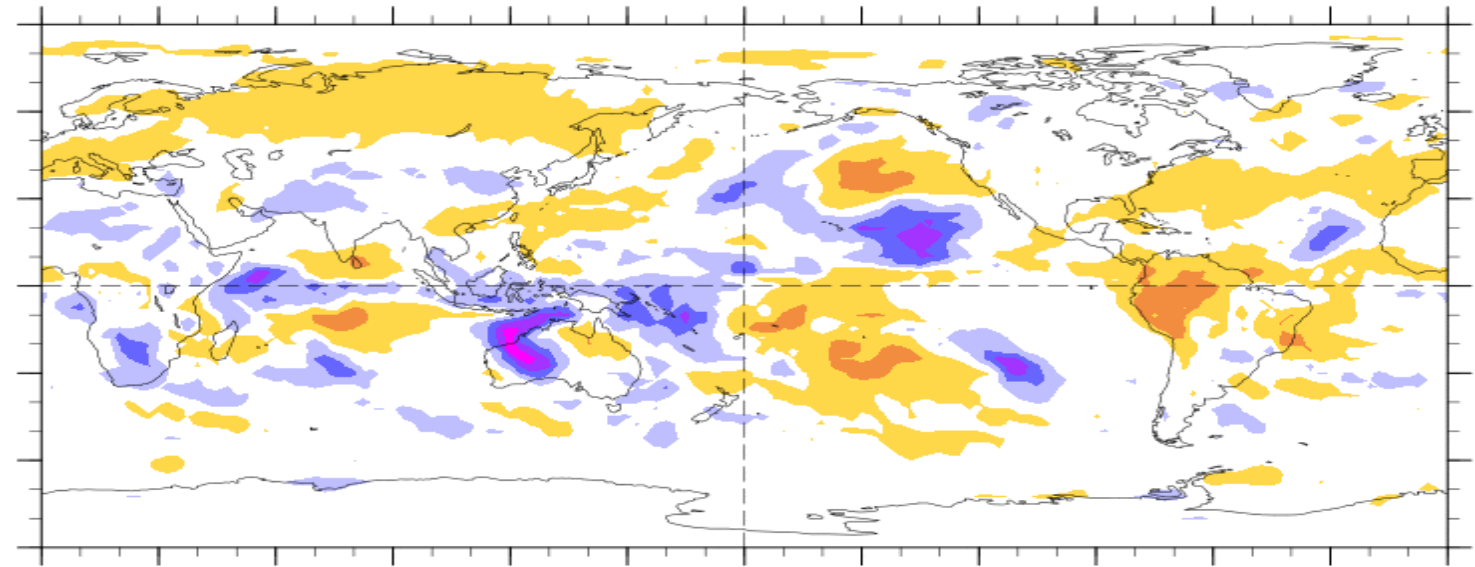
## TC Claudia:

- 1/11 – present
- Peak: 85 knots



7-Day Average OLR Anomaly

2020/01/06 - 2020/01/12



Cool shading  
More clouds/rain

Warm shading  
Less clouds/rain

# Synopsis of Climate Modes

## **ENSO: (December 12, 2019 Update)**

*next update on 9<sup>th</sup> of Jan.!*

- ENSO Alert System Status: Not Active
- ENSO-neutral is favored during the Northern Hemisphere spring (~60% chance), continuing through summer 2020 (~50% chance).

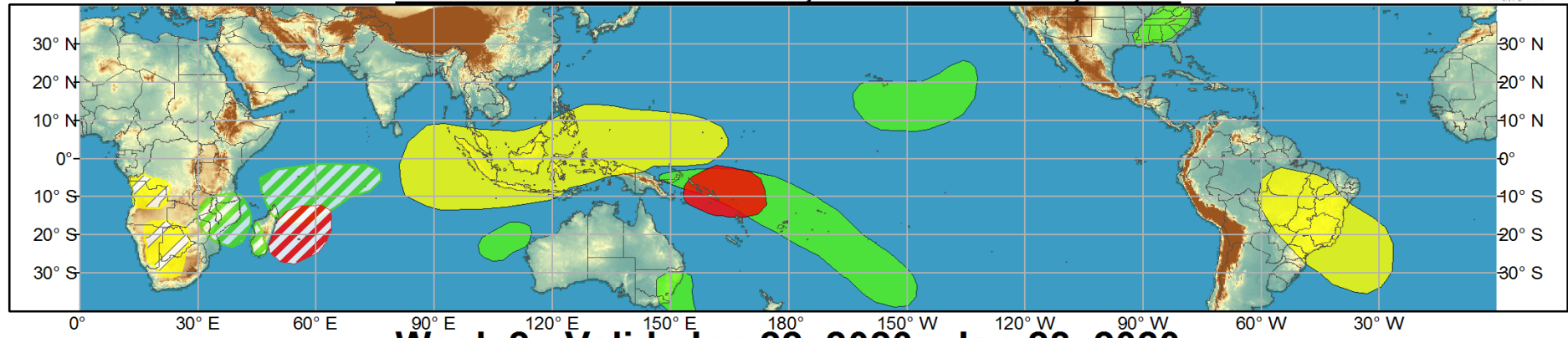
## **MJO and other subseasonal tropical variability:**

- The Indian Ocean Dipole remains near neutral, slightly positive. Footprint of its impacts has mostly decayed.
- The Madden-Julian Oscillation emerged over the past week, with a strong signal over the Maritime Continent. The MJO is forecast to remain strong through week-1 and most of week-2, reaching the western hemisphere toward the end of week-2.
- If the MJO remains strong and continues at this phase speed, there is likely to be a regime change for the North America. The MJO composites indicate that a Phase 8 MJO supports below-normal temperatures for the eastern U.S. and more moderate temperatures in the west. Currently, week-2 and week 3/4 forecasts support this scenario.

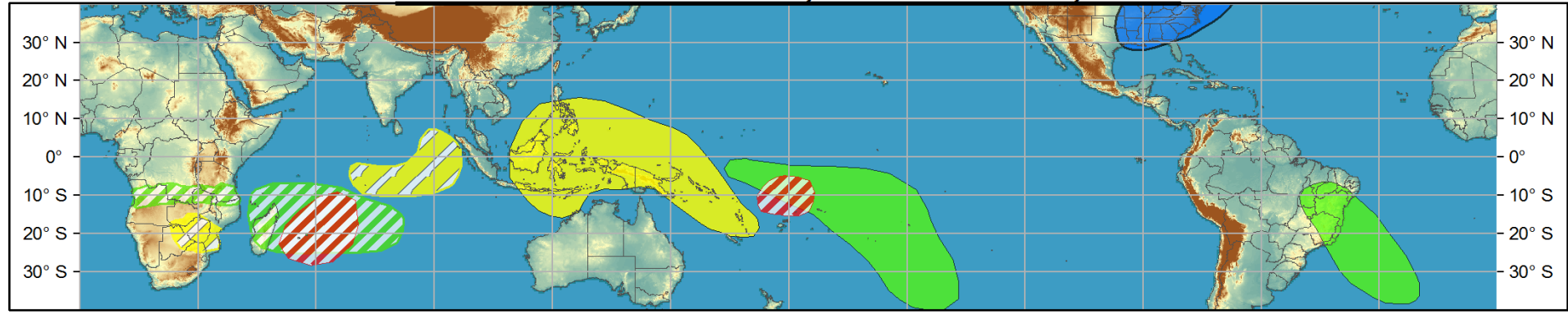


# Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

## Week 1 - Valid: Jan 15, 2020 - Jan 21, 2020



## Week 2 - Valid: Jan 22, 2020 - Jan 28, 2020



Produced: 01/14/2020  
Forecaster: Maurin

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

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# IR Satellite & 200-hpa Velocity Potential Anomalies

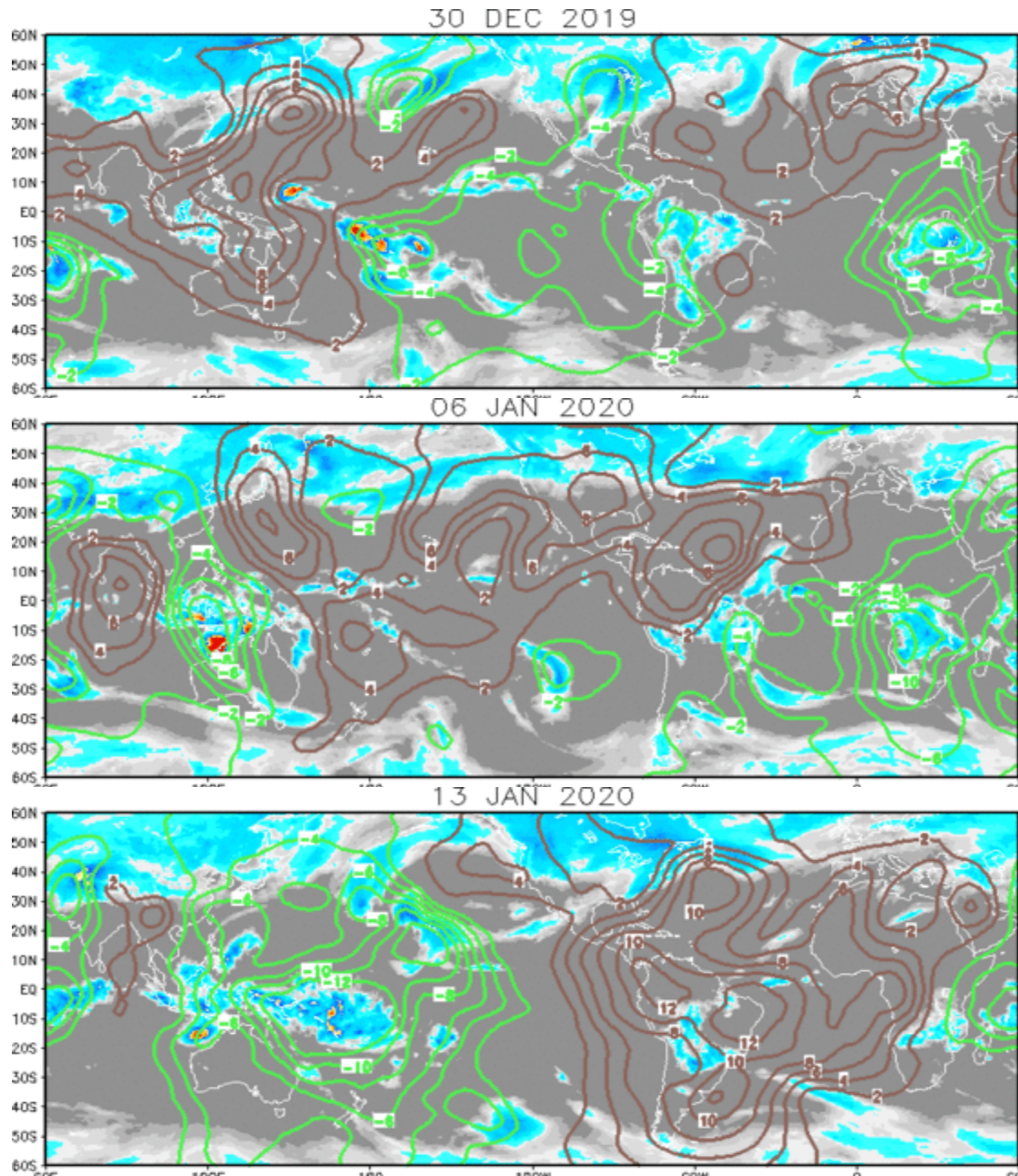
Green: Enhanced Divergence

Brown: Enhanced Convergence

+IOD signature (wet Arabian Sea and western Indian Ocean, dry Maritime Continent and Australia).

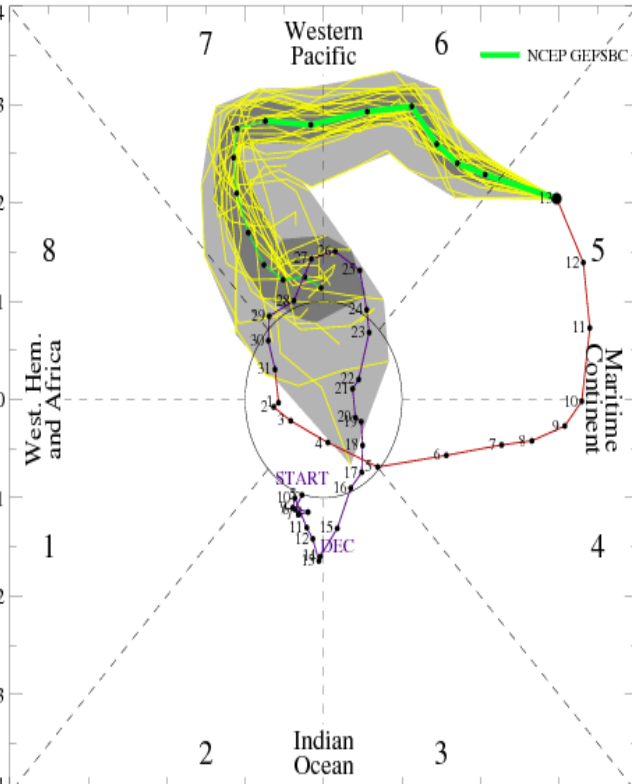
+IOD influence breaking down, convection breaking through over the Maritime Continent

Convection is now widespread over the Maritime Continent and eastward. Clear Wave-1 pattern, supporting the strong MJO.



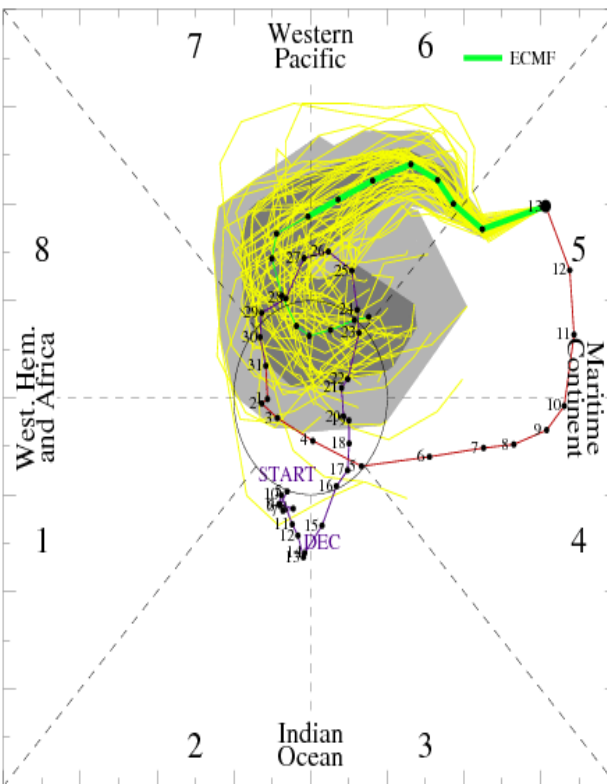
# MJO Observation/Forecast

[RMM1, RMM2] forecast for Jan-14-2020 to Jan-28-2020



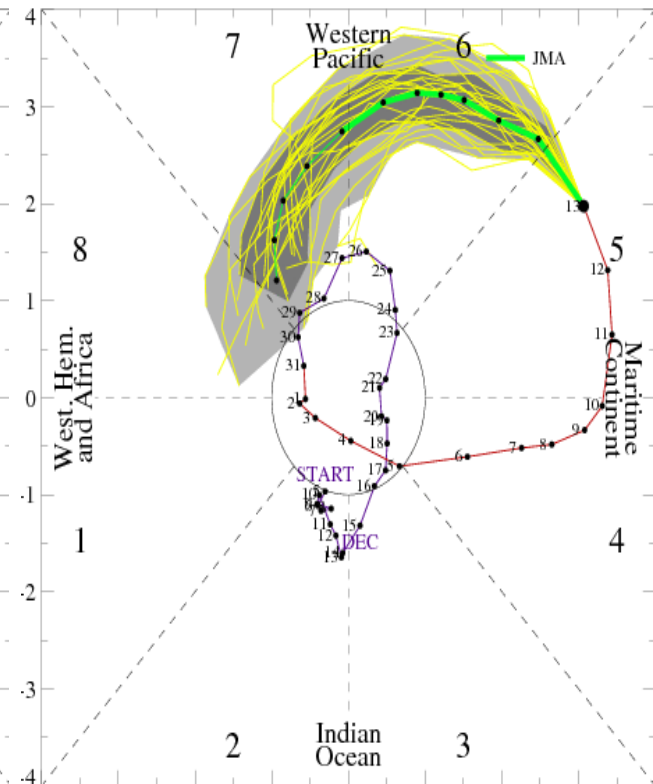
GEFS

MJO Index Forecast for 14Jan2020-28Jan2020



ECMWF

MJO Index Forecast for 14Jan2020-22Jan2020

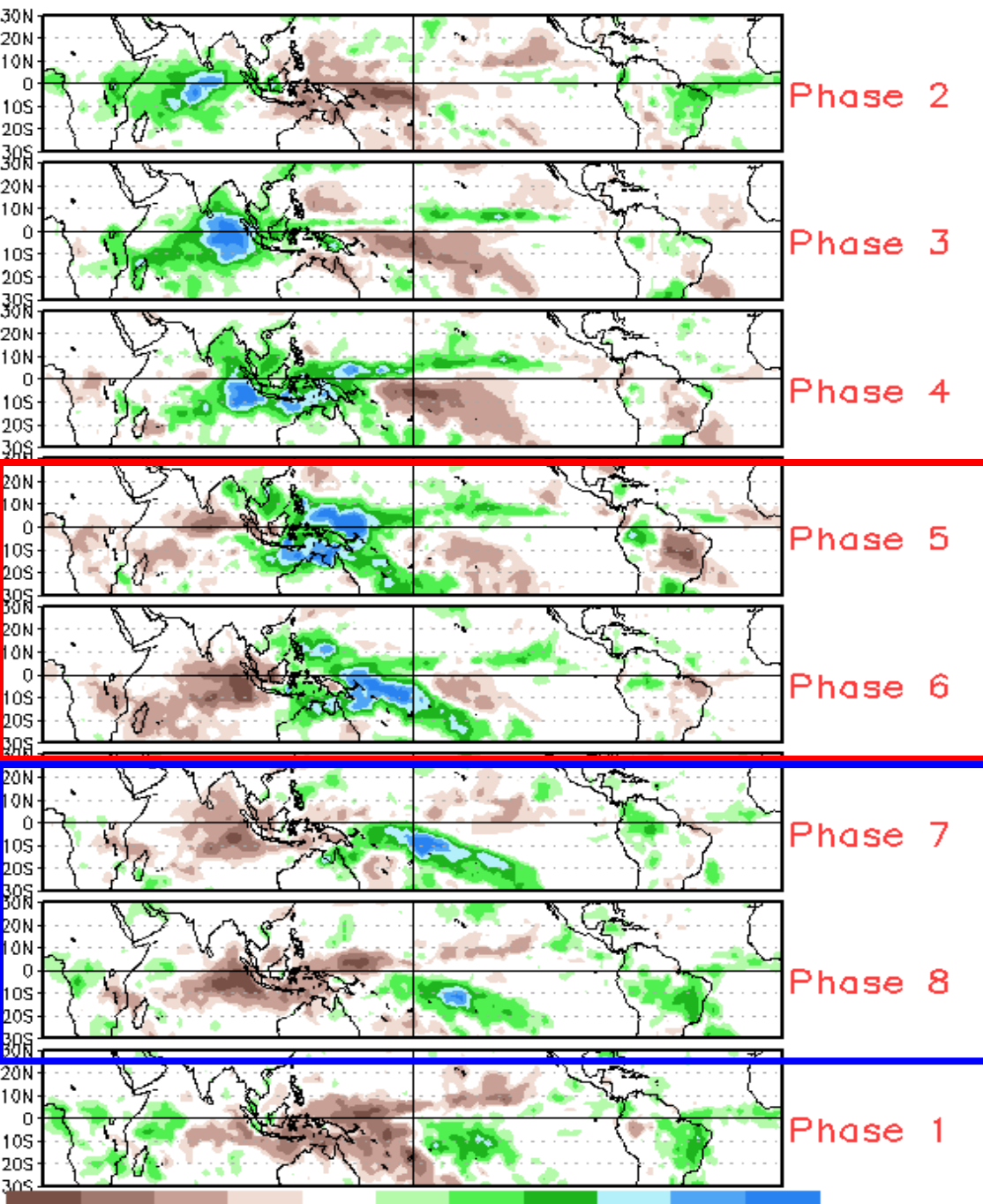


JMA

Models all indicate that this anomalous strong MJO will continue through week-1 and part of week-2, with propagation toward the western hemisphere in week-2.

The weakening of the MJO signal on the RMM index could be resultant from the breakdown of the +IOD event (biasing toward Phase 3/4), good chance for this signal to continue through week-2.

# Average Conditions when the MJO is present



Week-1: Phases 5/6  
Week-2: Phases 7  
(maybe 8)

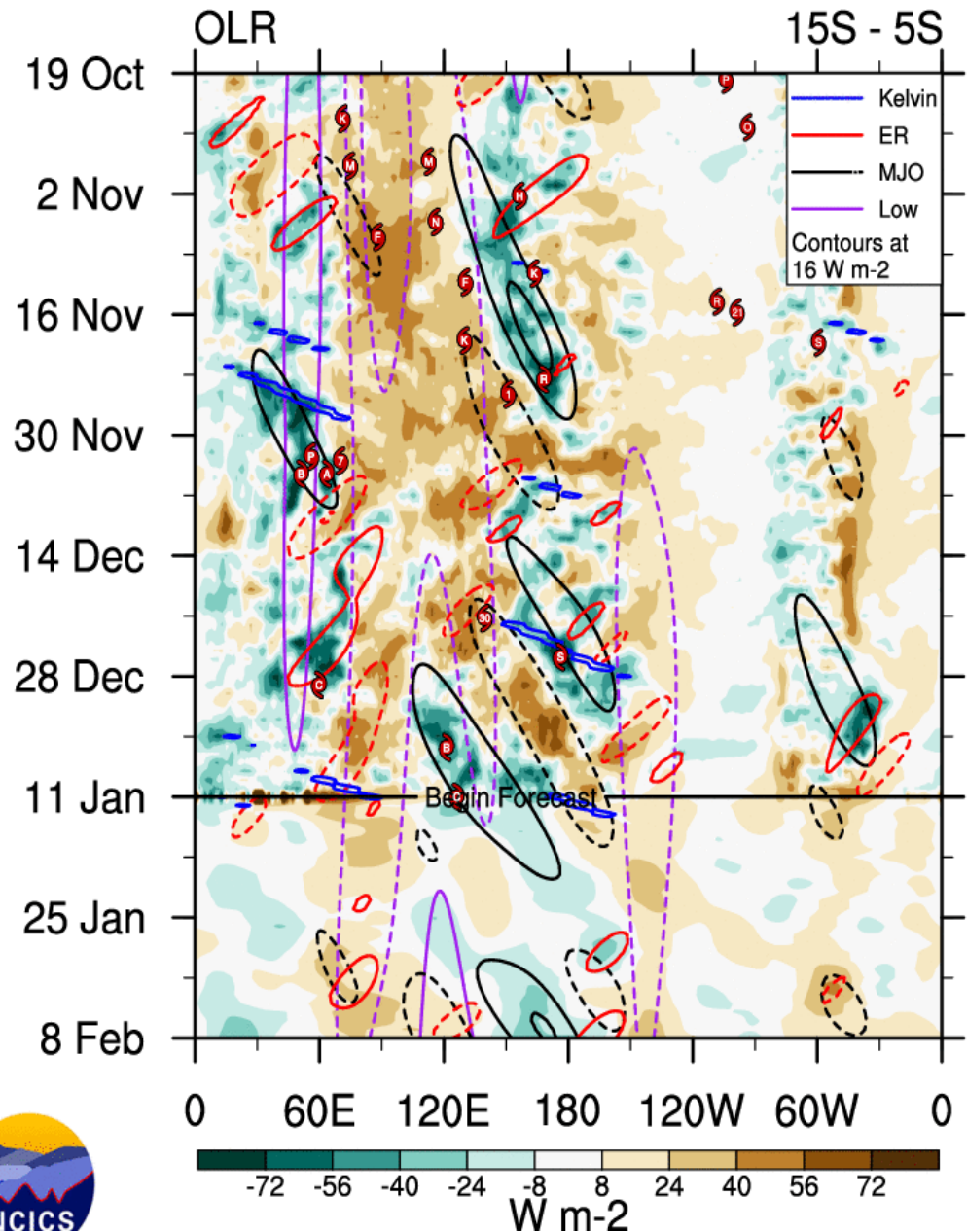
CAVEAT: These panels are representative of robust MJO events.



**MJO** becomes dominant over the Maritime Continent. Tripole set up, surrounded by suppressed convection.

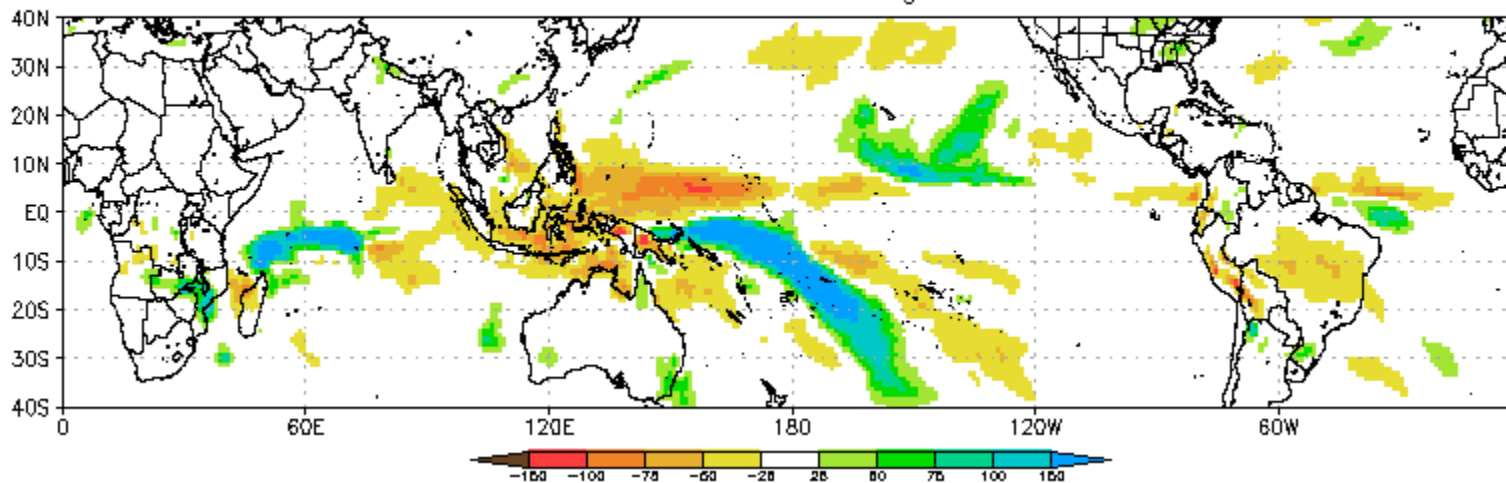
**Rossby wave** presence over the Indian Ocean and a **Kelvin wave** over the Western Pacific.

**Low frequency** contours from +IOD have timed out, but something west of the Date Line.

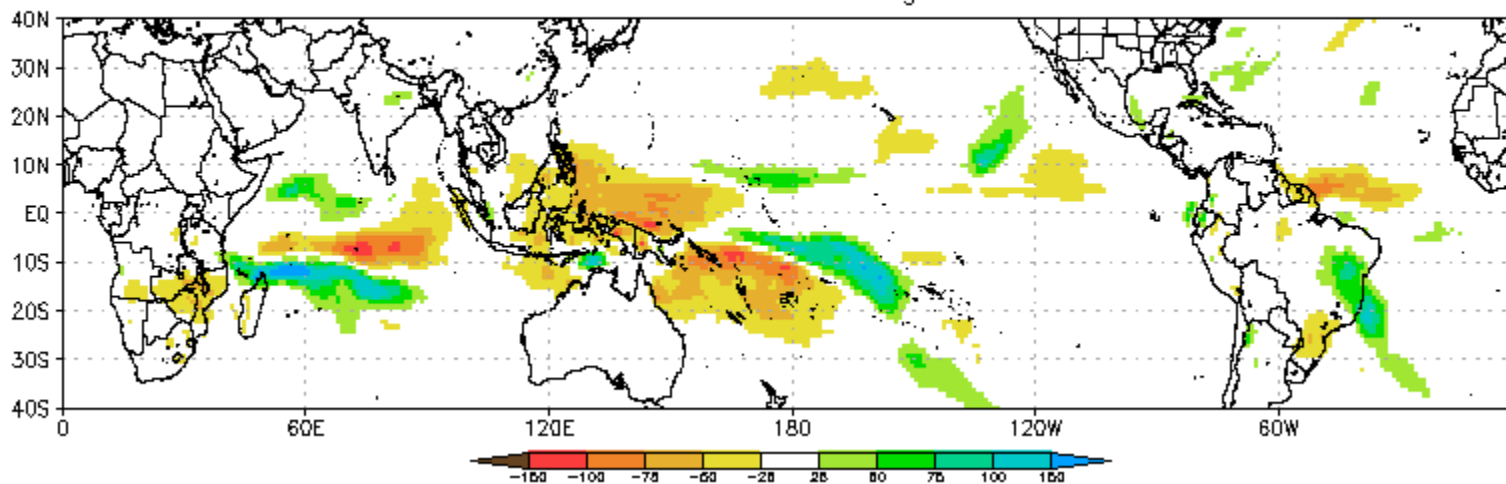




CFS Precipitation Anomalies (mm) Issued 13Jan2020  
Week-1 Forecast Ending 21Jan2020

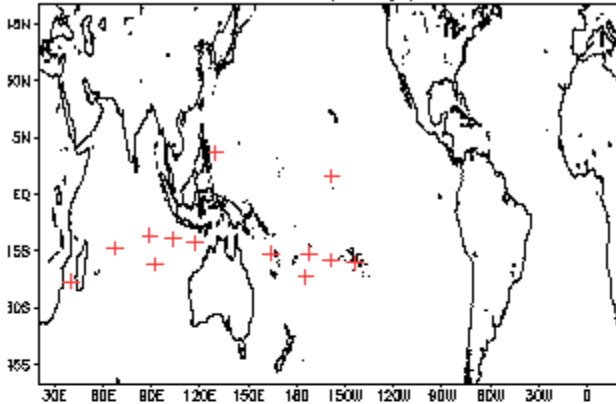


CFS Precipitation Anomalies (mm) Issued 13Jan2020  
Week-2 Forecast Ending 28Jan2020

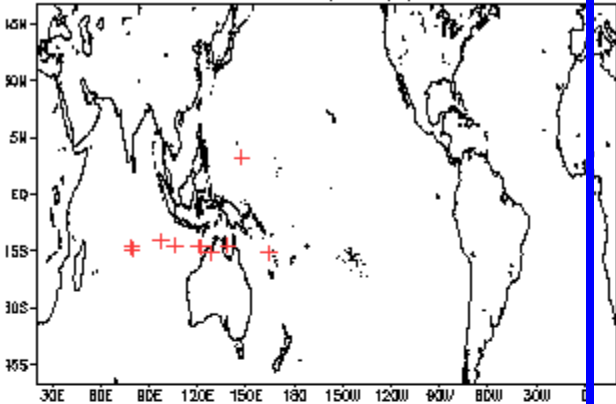


# January Tropical Storm Formation by MJO phase

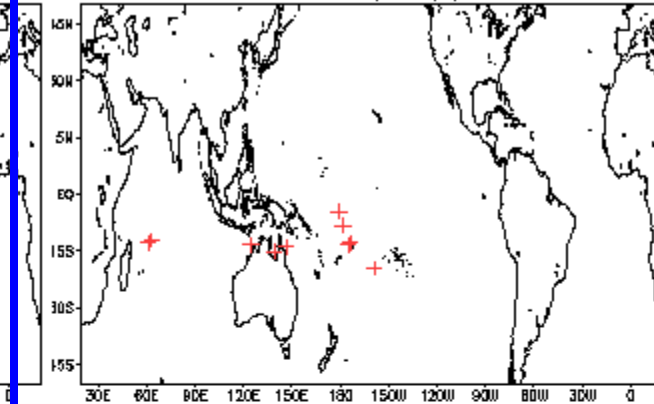
Phase 1 (67 days) 14 storms



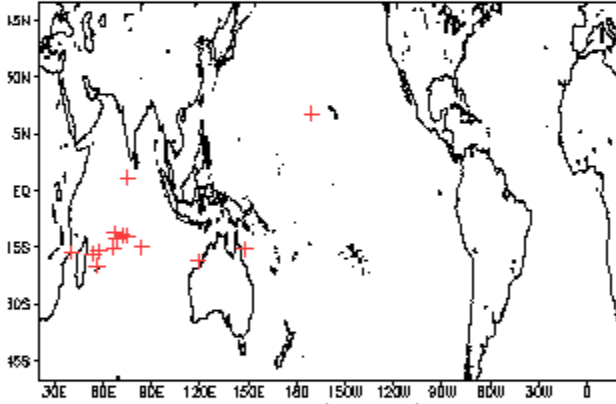
Phase 4 (69 days) 11 storms



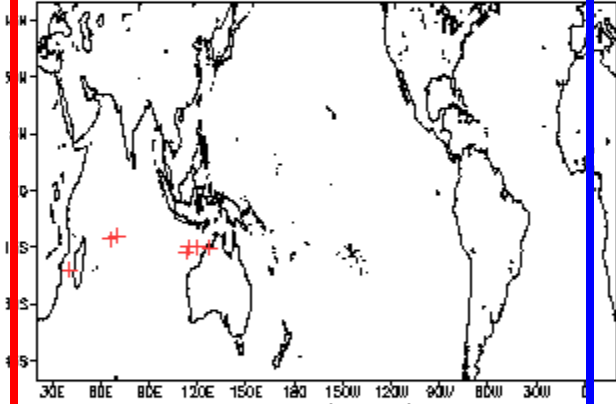
Phase 7 (81 days) 11 storms



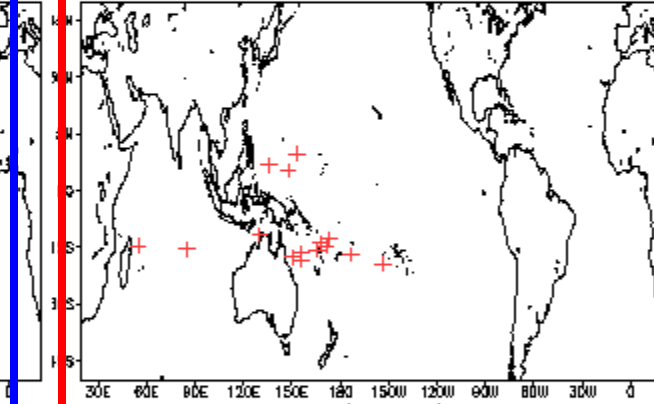
Phase 2 (101 days) 15 storms



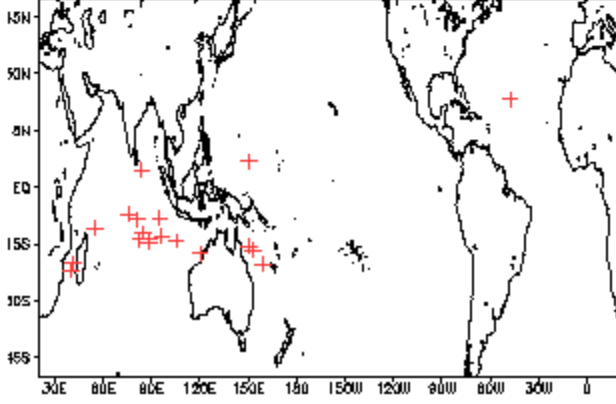
Phase 5 (67 days) 8 storms



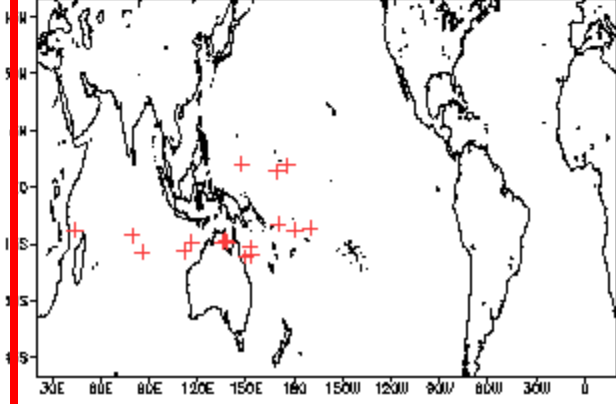
Phase 8 (105 days) 16 storms



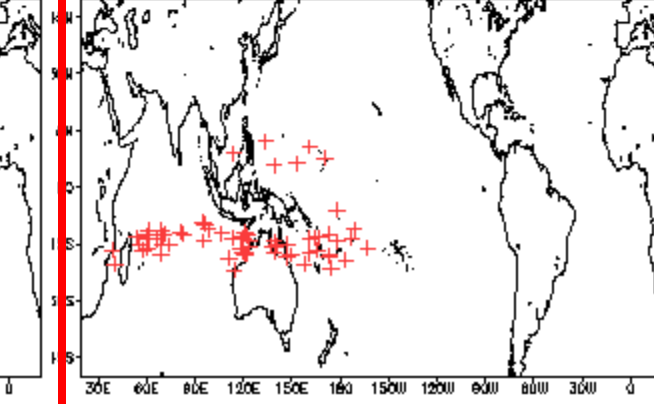
Phase 3 (112 days) 20 storms



Phase 6 (88 days) 18 storms



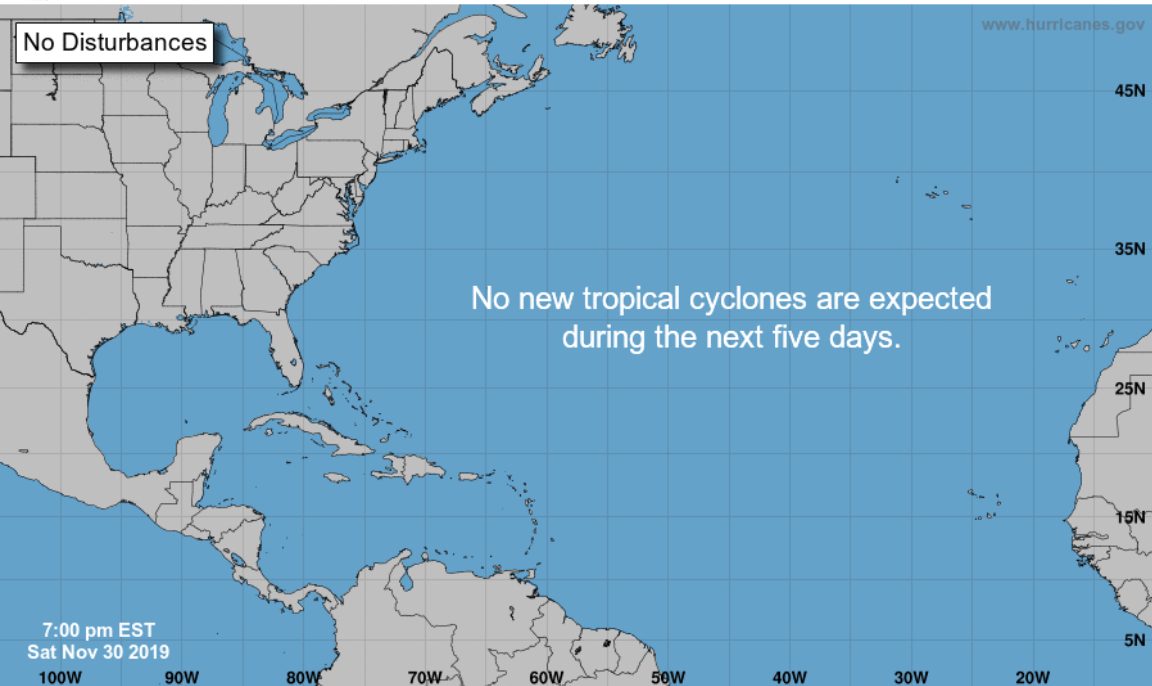
Null (364 days) 67 storms





# Five-Day Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida



7:00 pm EST  
Sat Nov 30 2019

Current Disturbances and Five-Day Cyclone Formation Chance: < 40% 40-60% > 60%

Tropical or Sub-Tropical Cyclone: Depression Storm Hurricane

Post-Tropical Cyclone or Remnants

# Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida

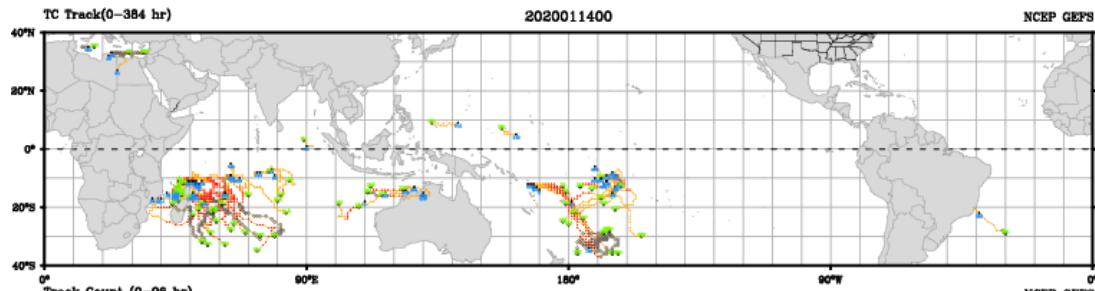


4:00 pm PST  
Sat Nov 30 2019

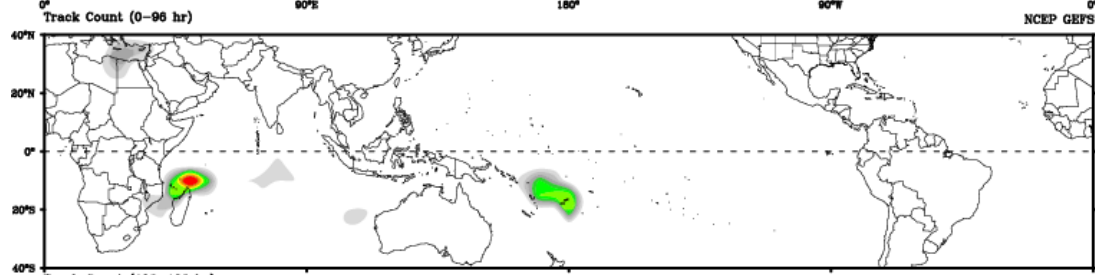
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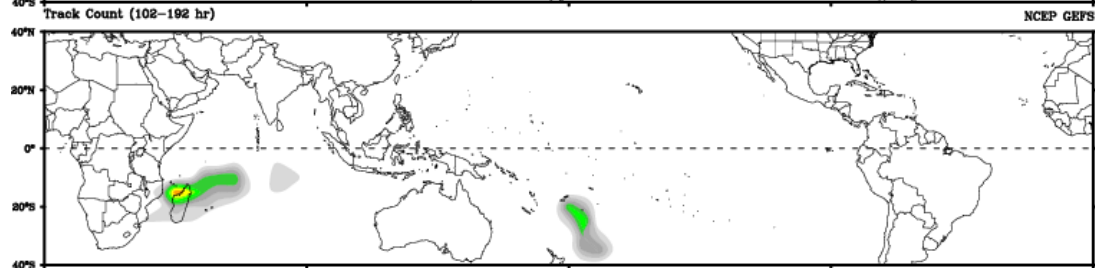
Post-Tropical Cyclone or Remnants



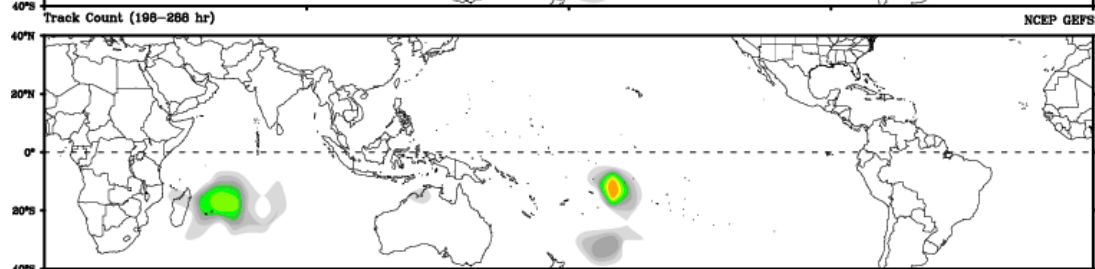
Days 1-4



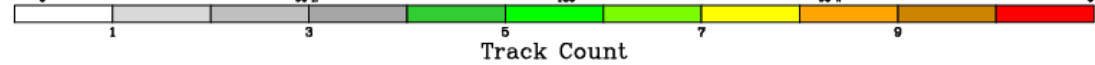
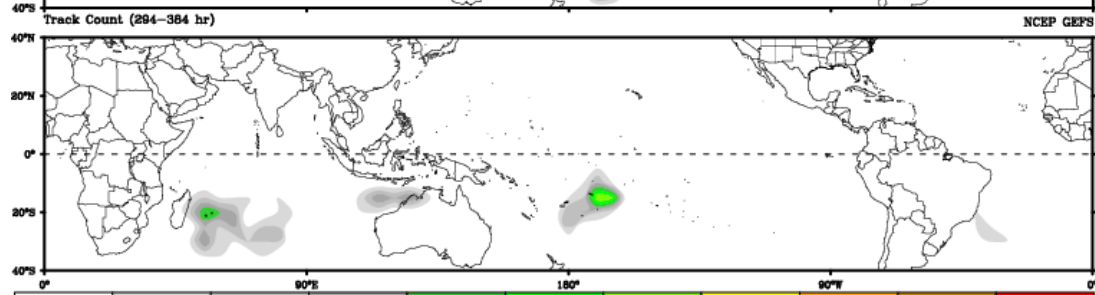
Day 5-8



Day 9-12



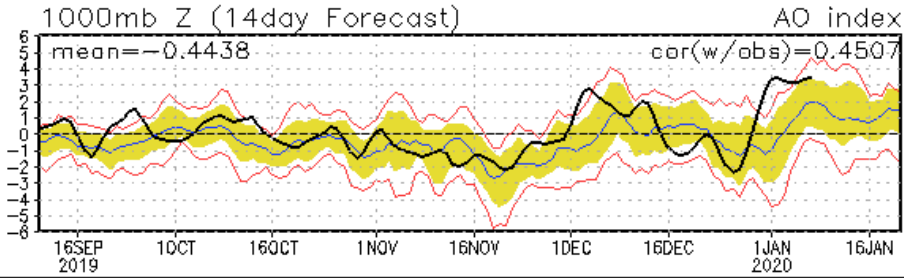
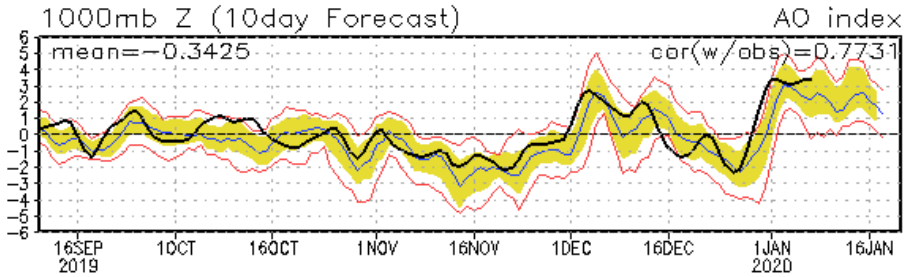
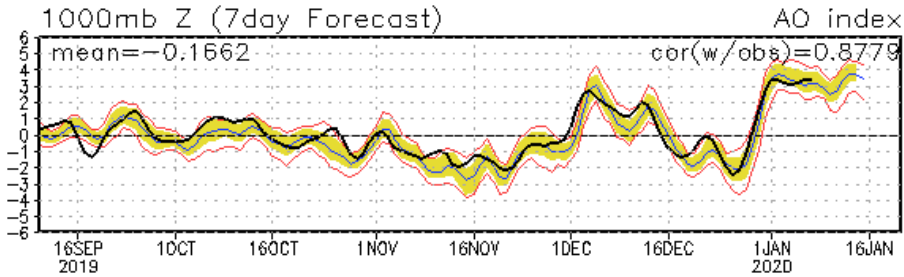
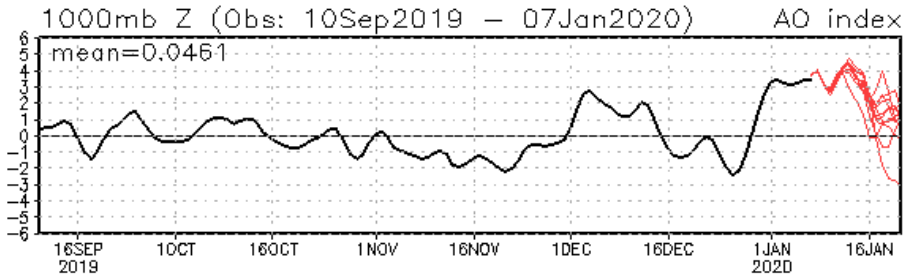
Day 13-15



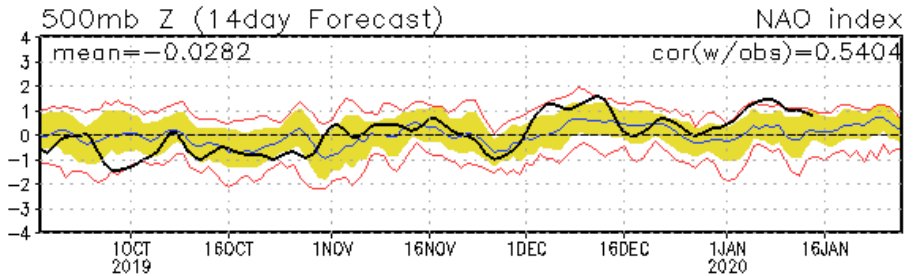
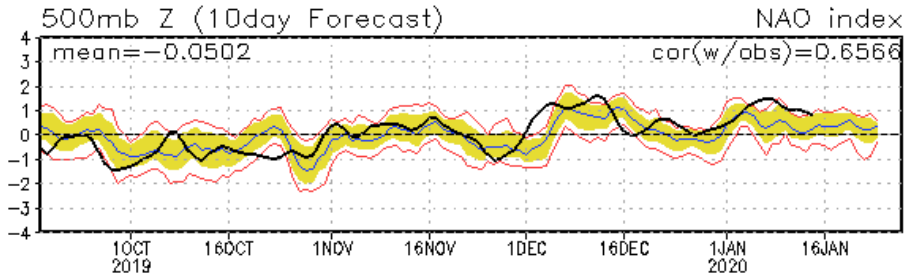
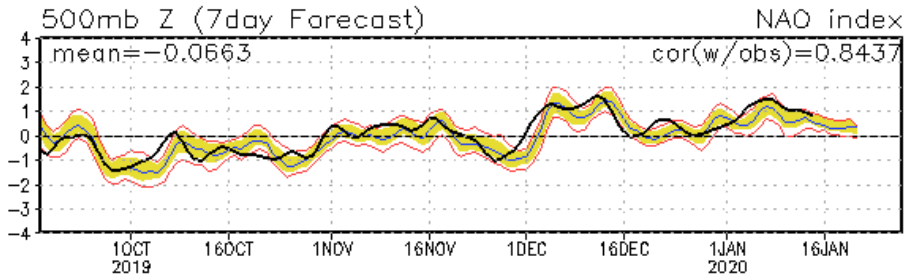
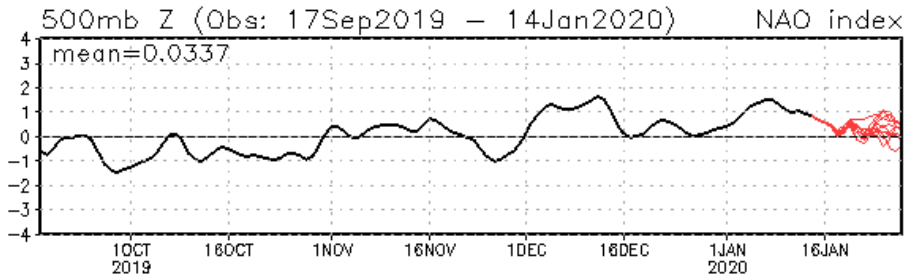


# Connections to U.S. Impacts

### AO: Observed & ENSM forecasts

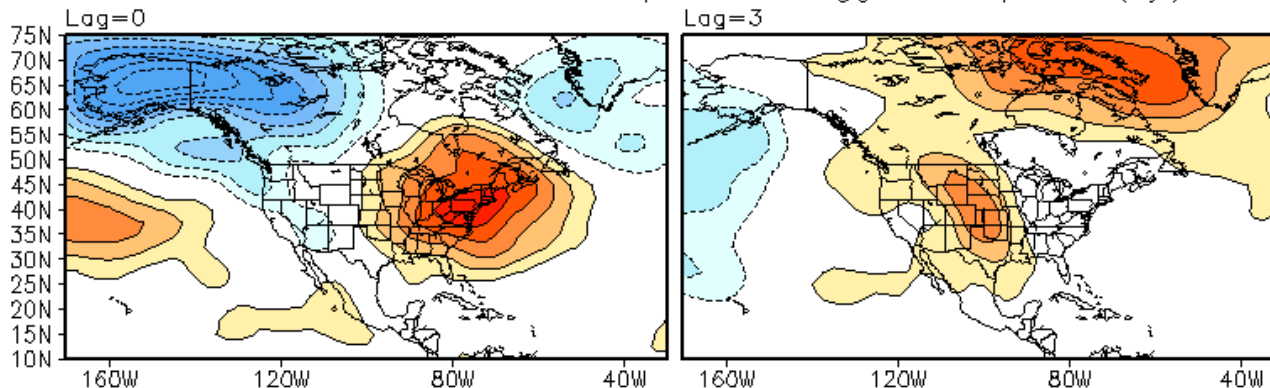


### NAO: Observed & ENSM forecasts



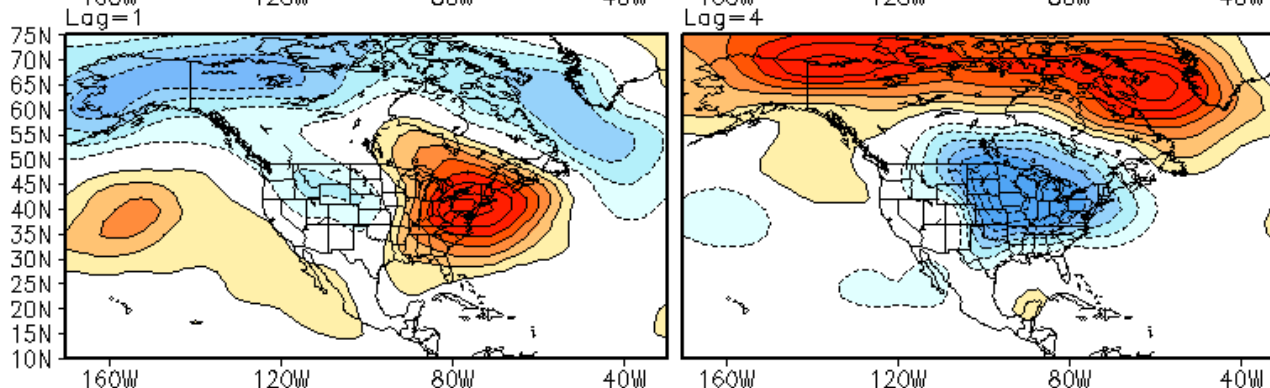
RMM Phase 5 850-hPa Temperature Lagged Composite (djf)

Now



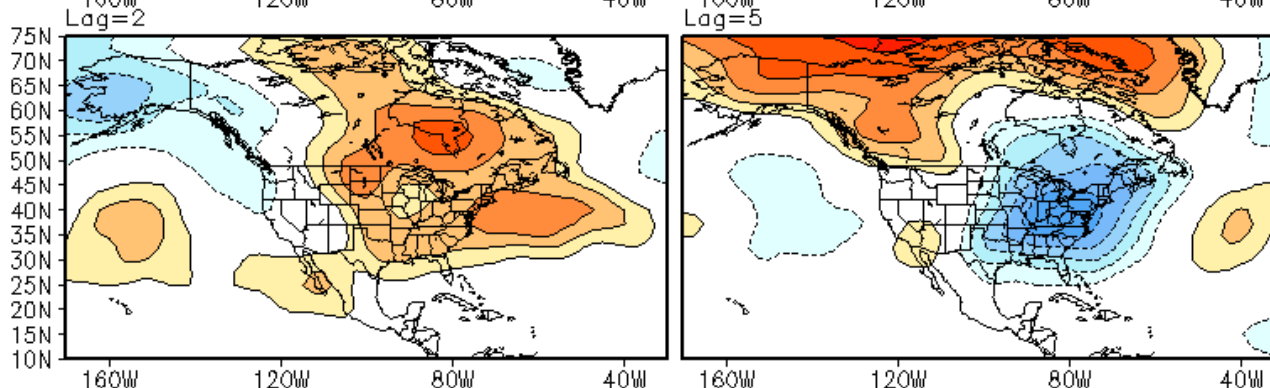
11-15 days later

1-5 days later



16-20 days later

6-10 days later

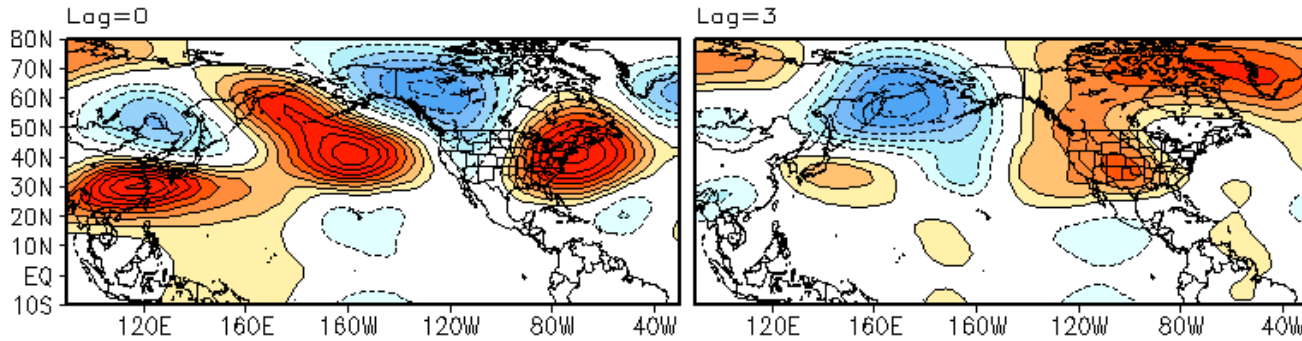


21-25 days later

*CAVEAT: Other mechanisms will always be at play, aside from the MJO!*

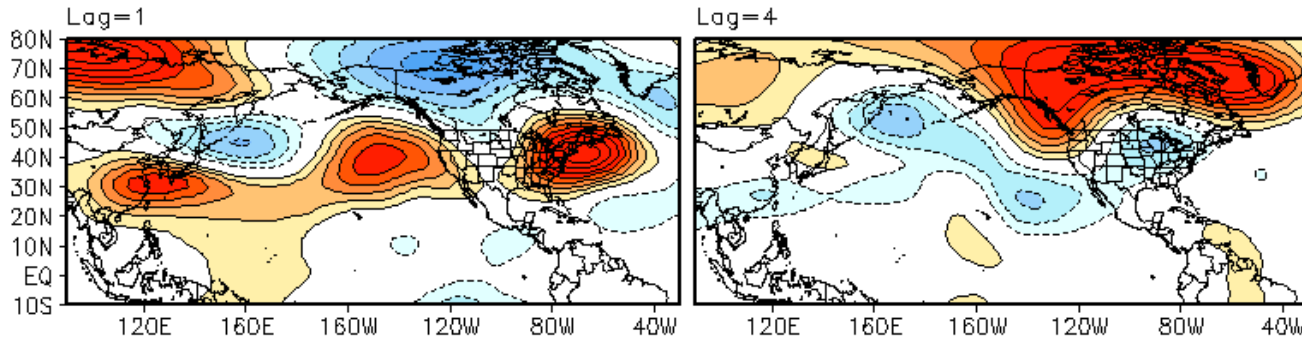
RMM Phase 5 200-hPa Height Lagged Composite (djf)

Now



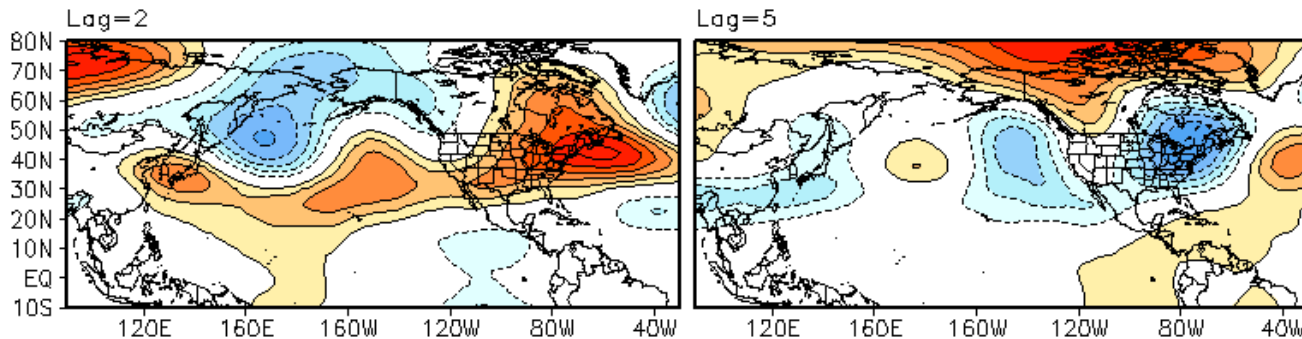
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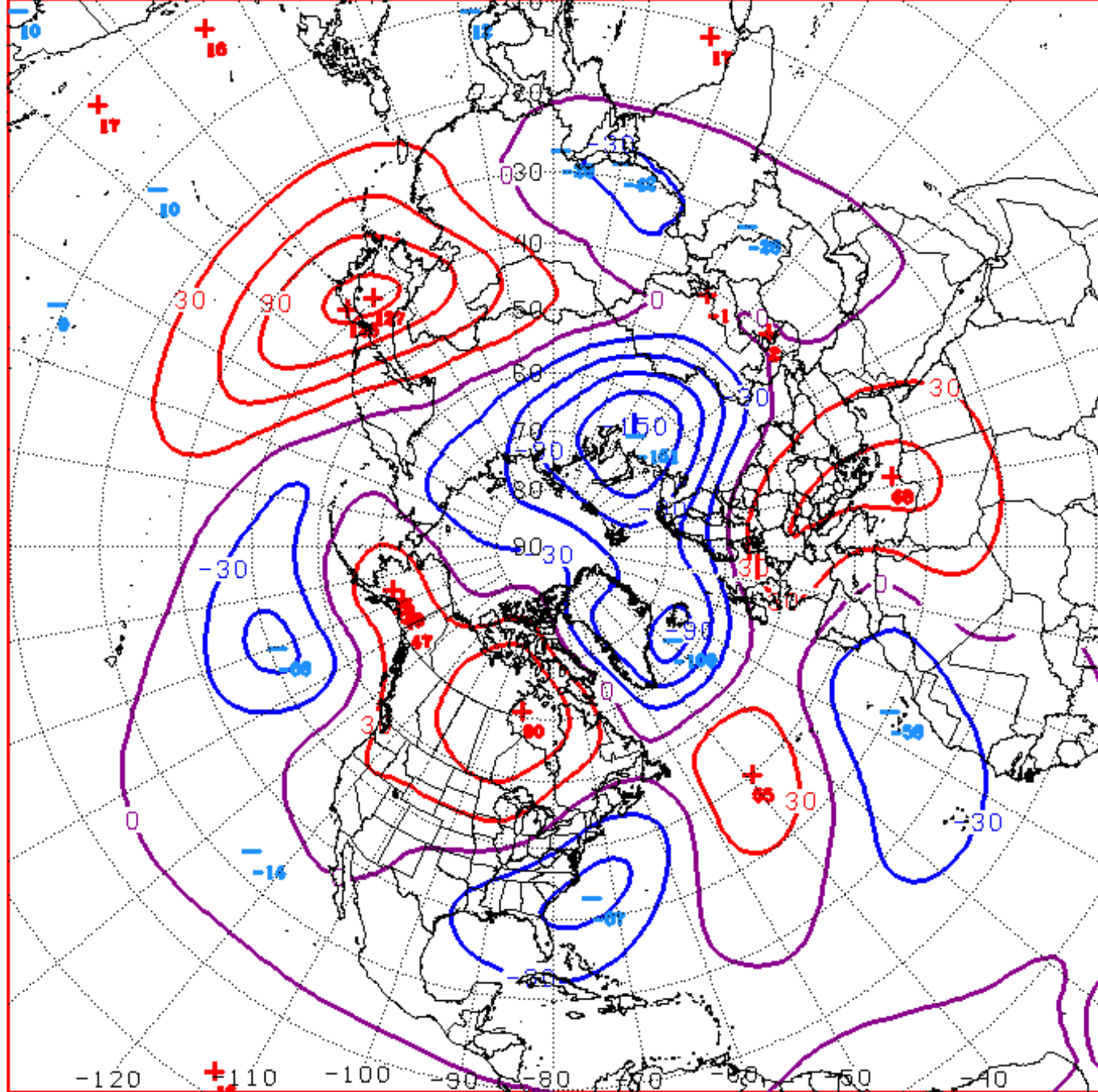
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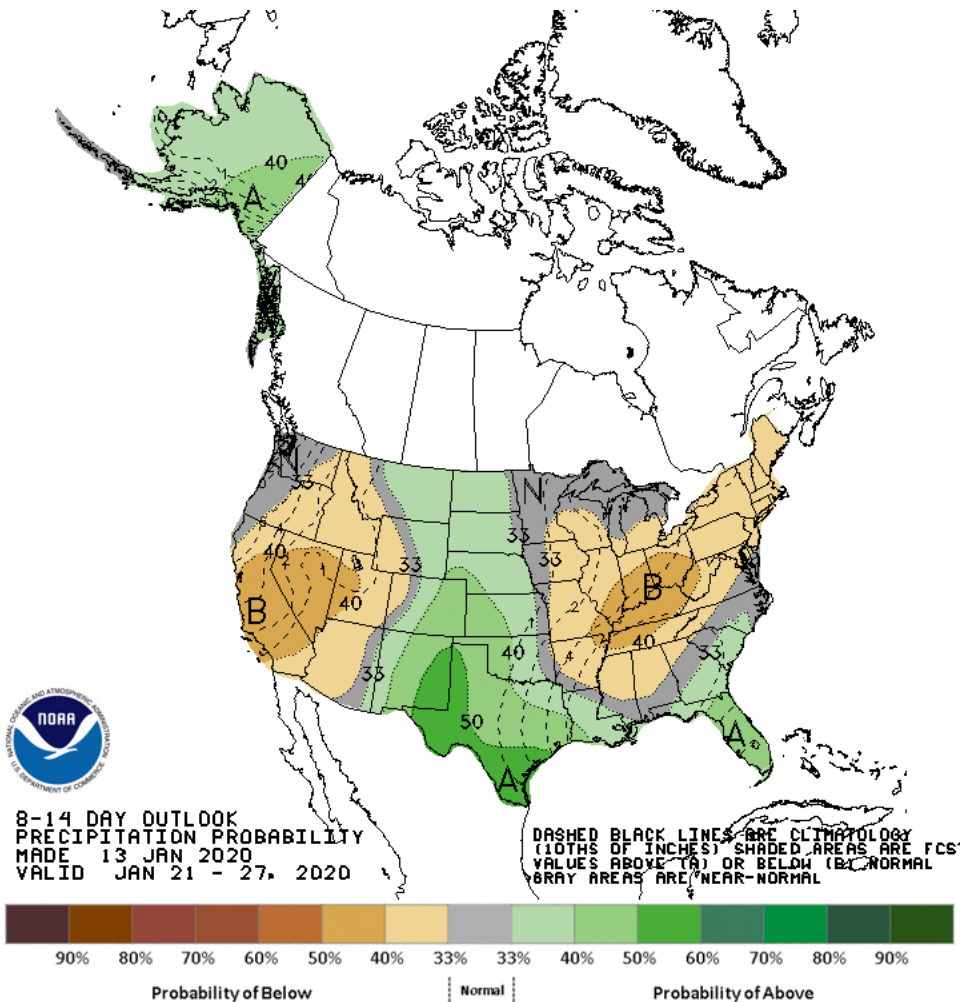
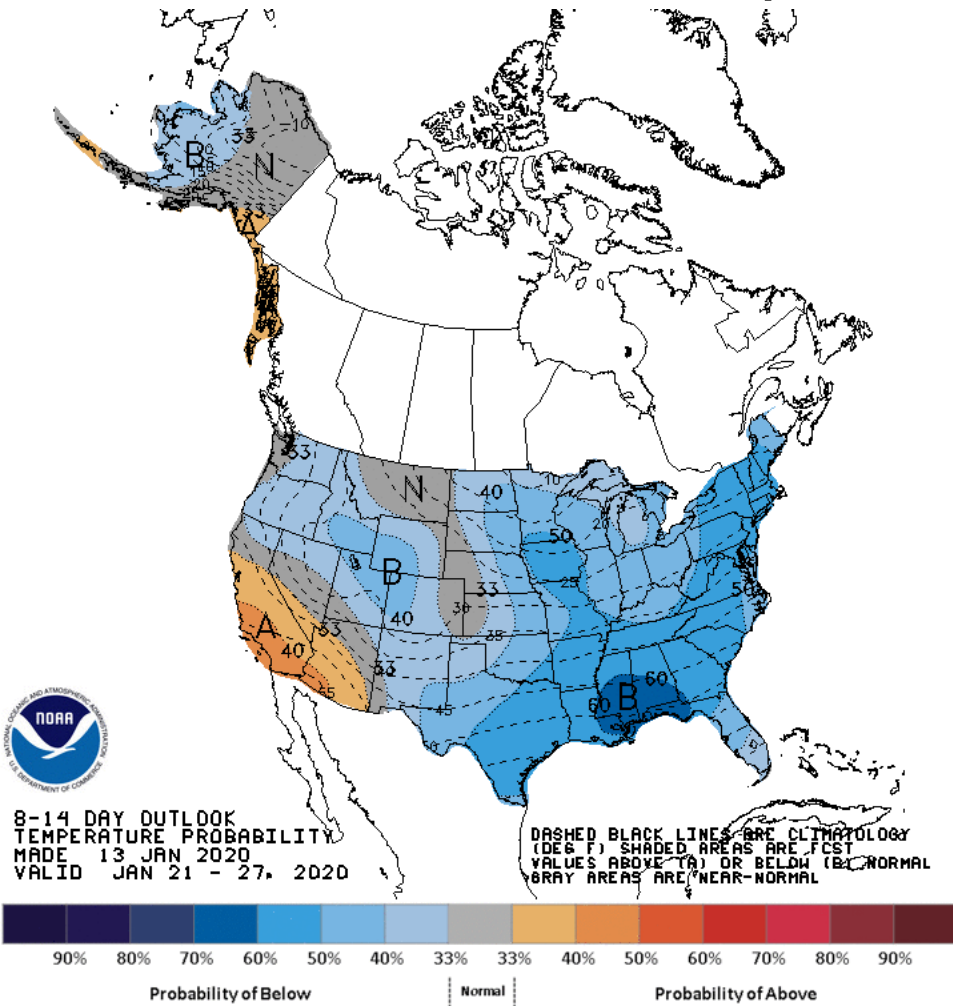




-120 +110 -100 -90 -80 -70 -60 -50

D+11 500 MB ANOMALIES FROM ALZ ENSM  
 CPC MAP MADE JAN 14 2020 1334 UTC CNTD JAN 25 2020

# Week 2 – Temperature and Precipitation

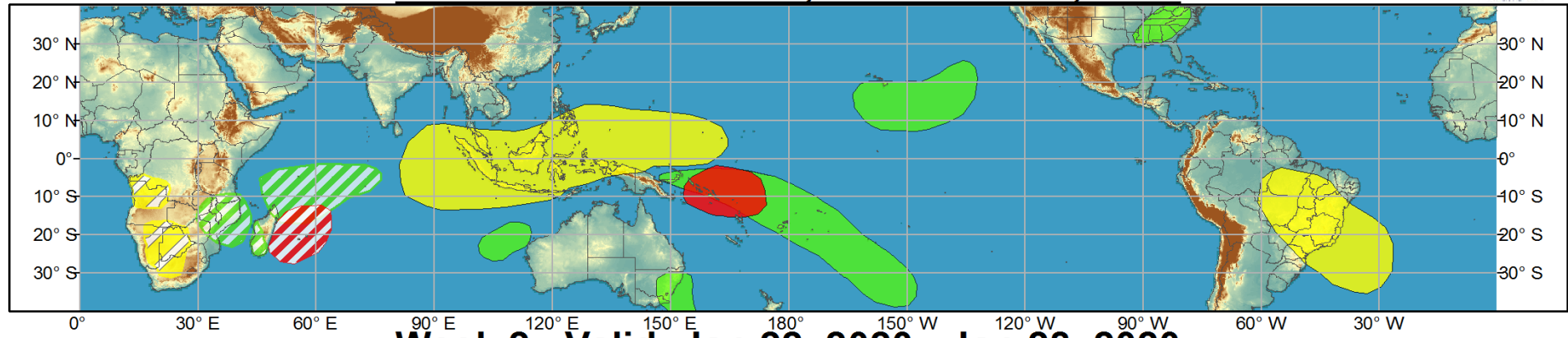


Since we are in an amplified, stable pattern today's outlooks are likely to be similar.

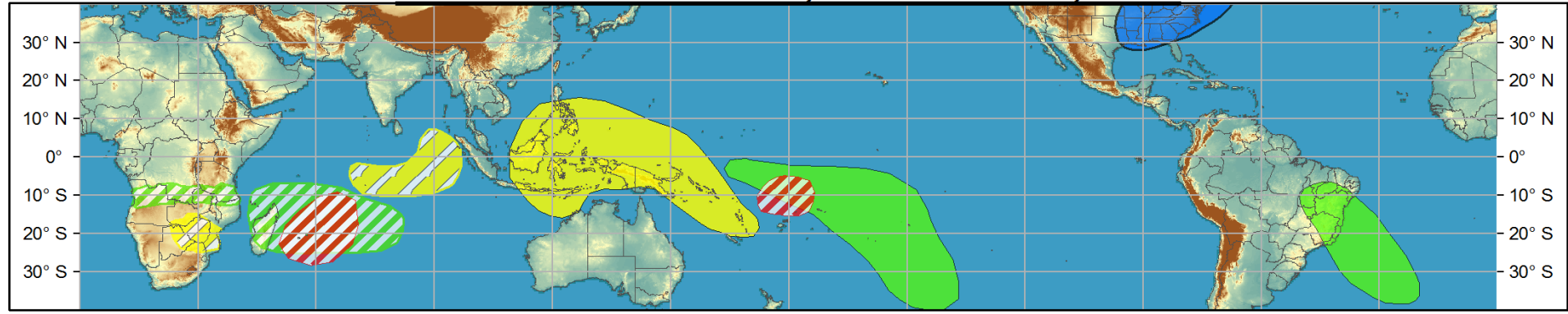


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