

# Global Tropics Hazards And Benefits Outlook

1/7/2020

Dan Harnos

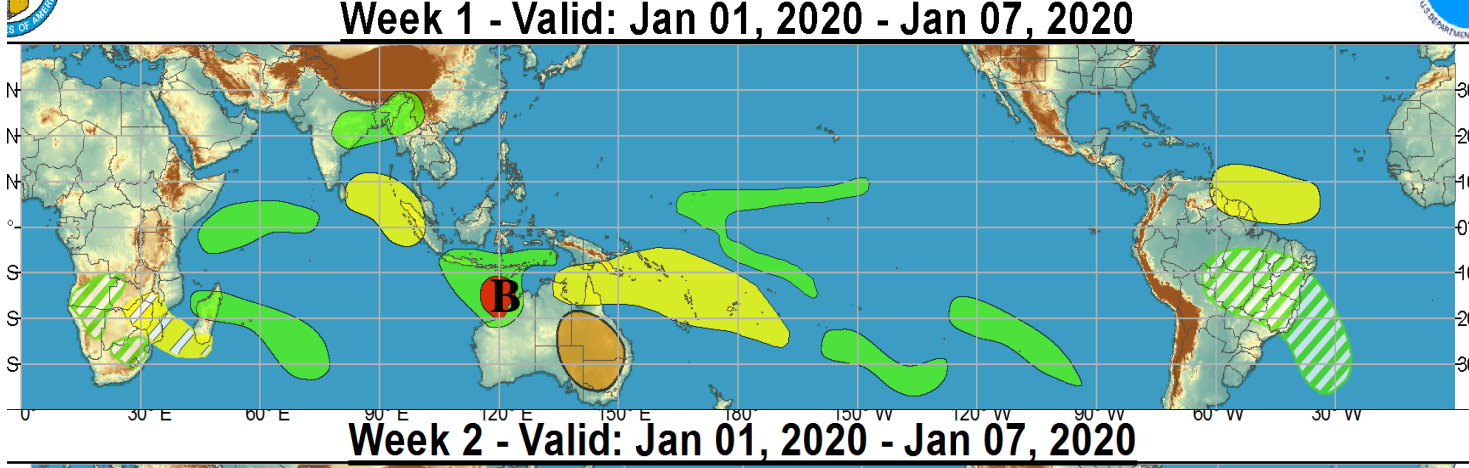
## Outline

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

# Outlook Review

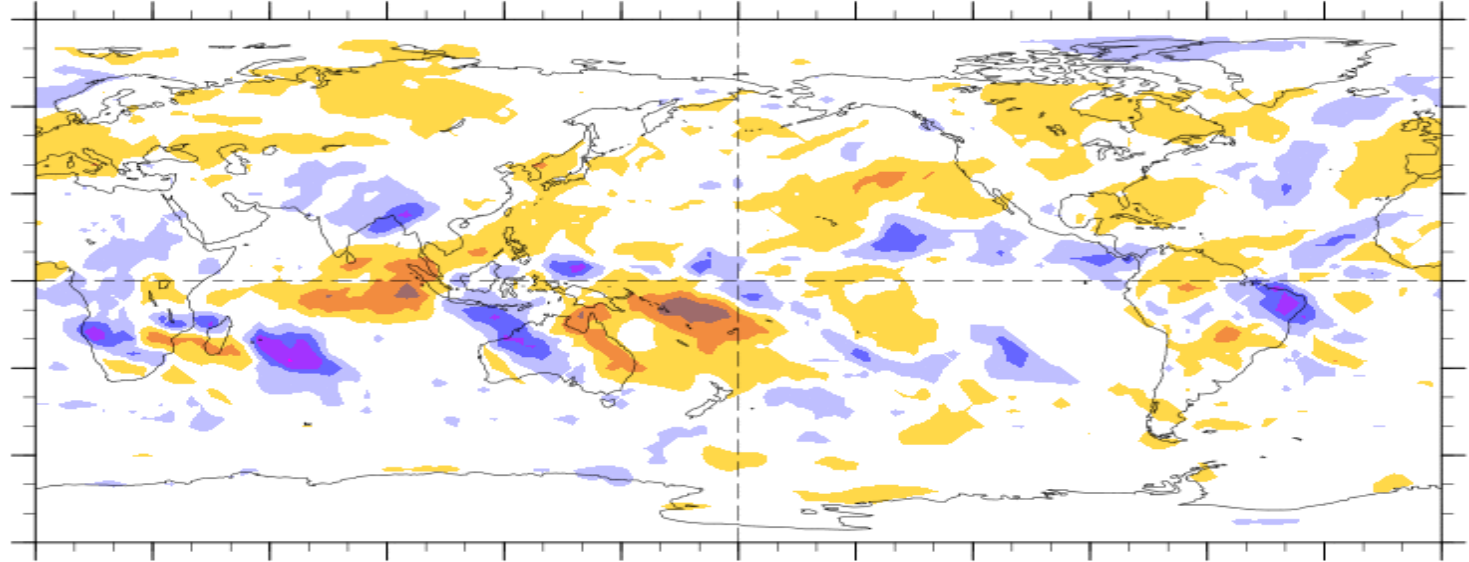
## TC Blake:

- 5<sup>th</sup> – present
- Peak: 50 knots



7-Day Average OLR Anomaly

2019/12/30 - 2020/01/05



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 winter 2019-20 (70% chance), continuing through spring 2020 (~65% chance).

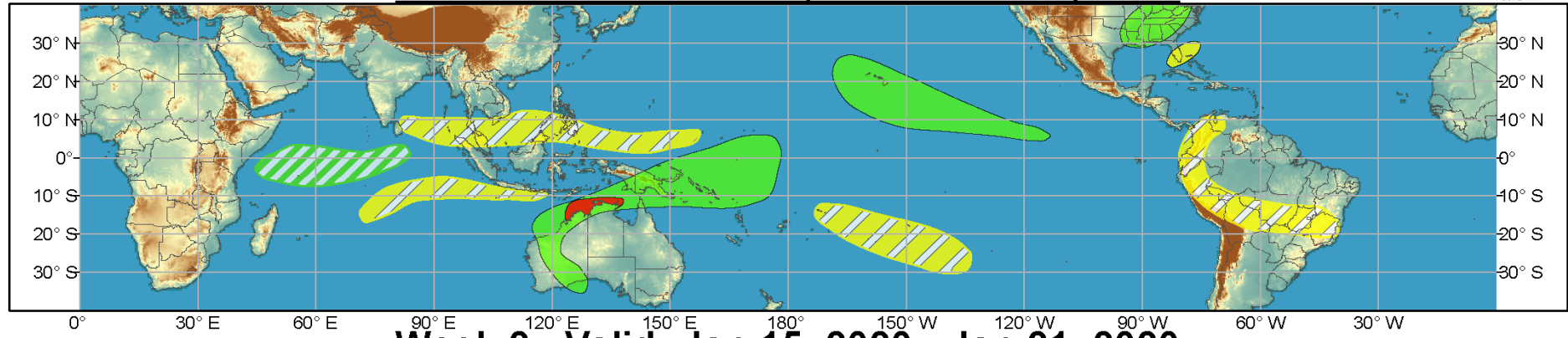
## **MJO and other subseasonal tropical variability:**

- The Indian Ocean Dipole has become neutral.
- The Madden-Julian Oscillation recently emerged over the Western Maritime Continent and is forecast to reach the West Pacific by Week-2.
- Typically the MJO crossing the Maritime Continent to the West Pacific results in below-normal (above-normal) temperatures across western (eastern) North America, as have been observed recently. By February the tropics would support below-normal temperatures emerging across the Northeast, as above-normal temperatures shift westward.

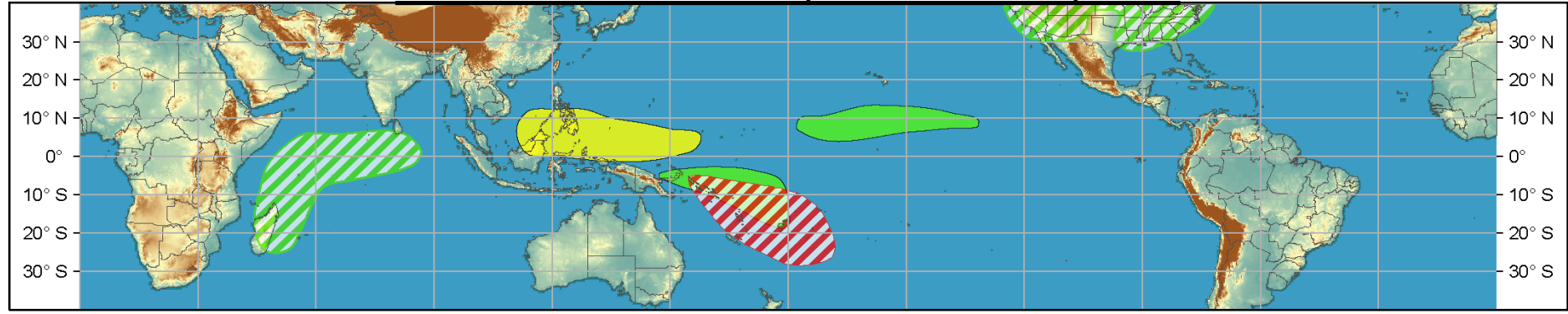


# Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

## Week 1 - Valid: Jan 08, 2020 - Jan 14, 2020



## Week 2 - Valid: Jan 15, 2020 - Jan 21, 2020



Produced: 01/07/2020  
Forecaster: Harnos

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.
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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

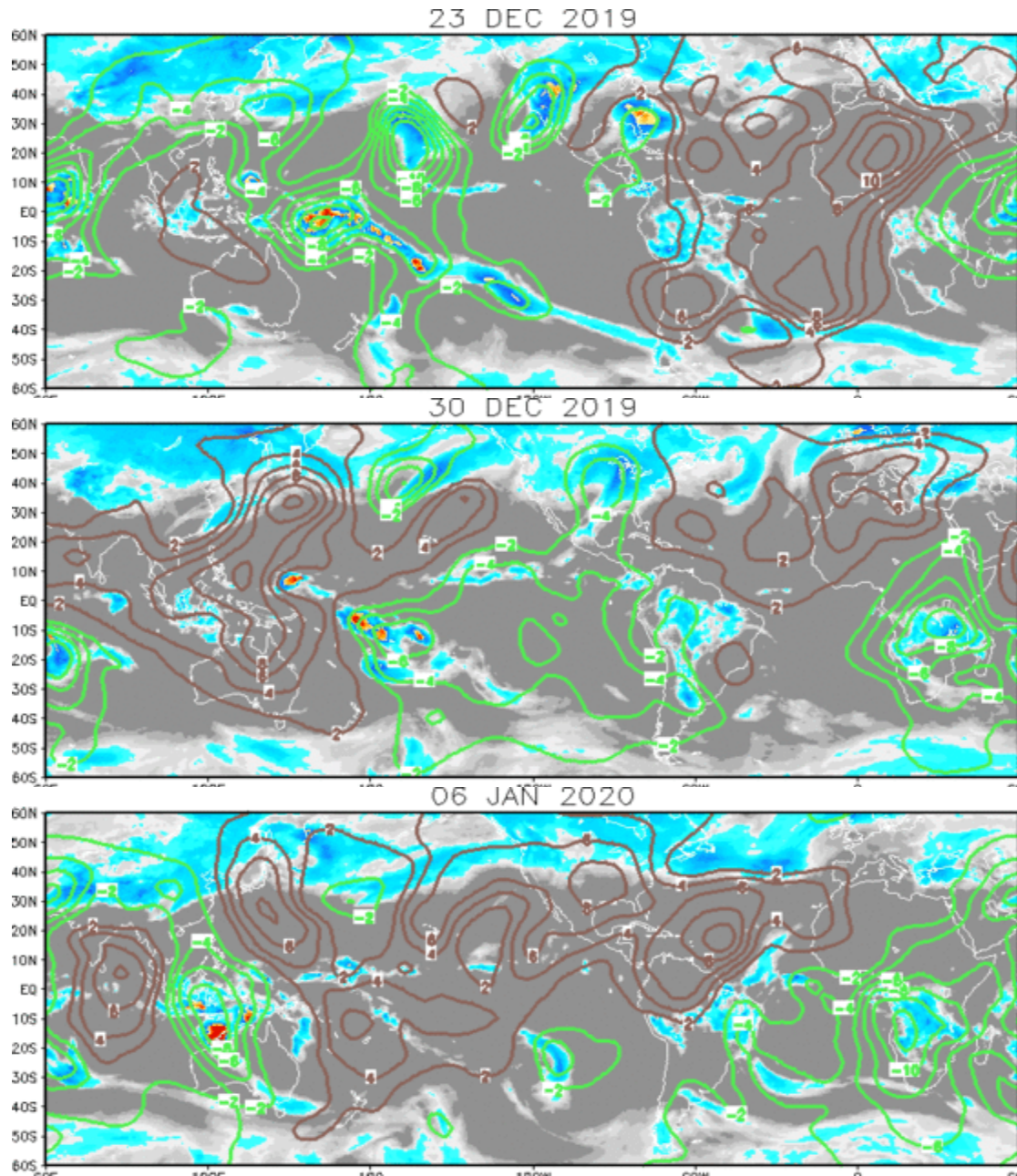
Green: Enhanced Divergence

Brown: Enhanced Convergence

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

Some eastward propagation of enhanced convective anomalies over the Pacific. Substantial drying over the Arabian Sea.

Convection explodes over the Maritime Continent, supporting the full demise of the +IOD.

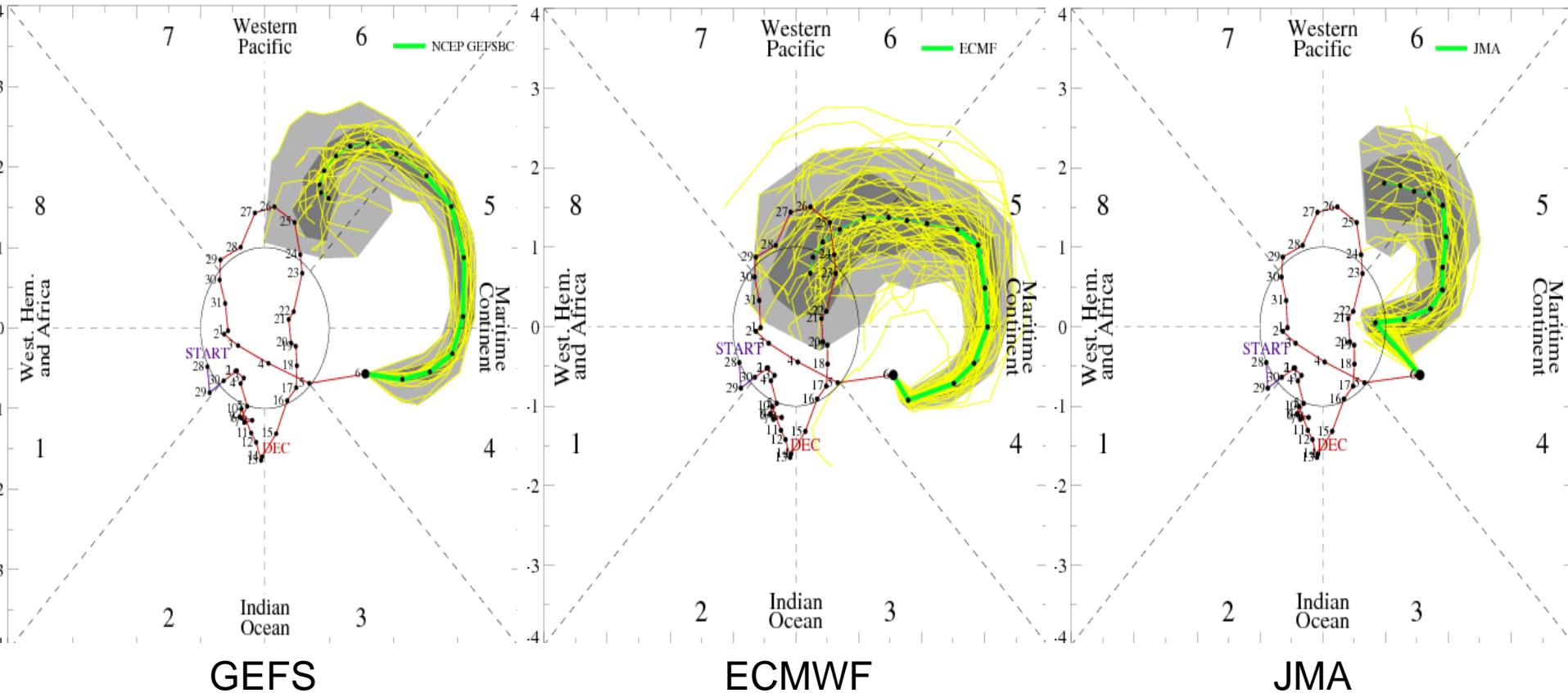


# MJO Observation/Forecast

[RMM1, RMM2] forecast for Jan-07-2020 to Jan-21-2020

MJO Index Forecast for 07Jan2020-21Jan2020

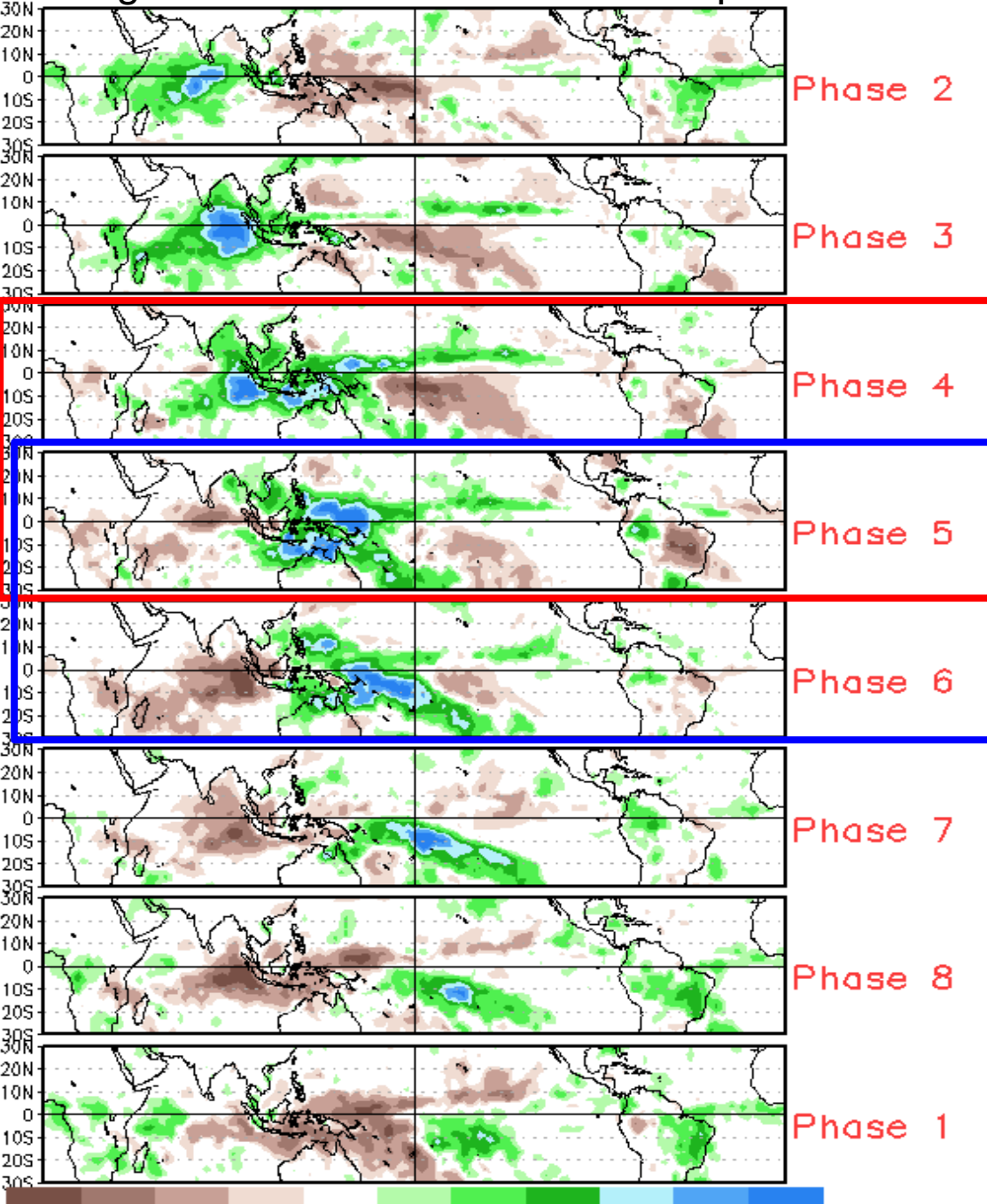
MJO Index Forecast for 07Jan2020-15Jan2020



Models unanimously forecast a strengthening MJO that crosses the Maritime Continent by the second half of January.

While a robust MJO is anticipated, it may be overdone, as the downfall of the +IOD is likely causing the RMM to be biased toward Phases 4/5.

# Average Conditions when the MJO is present

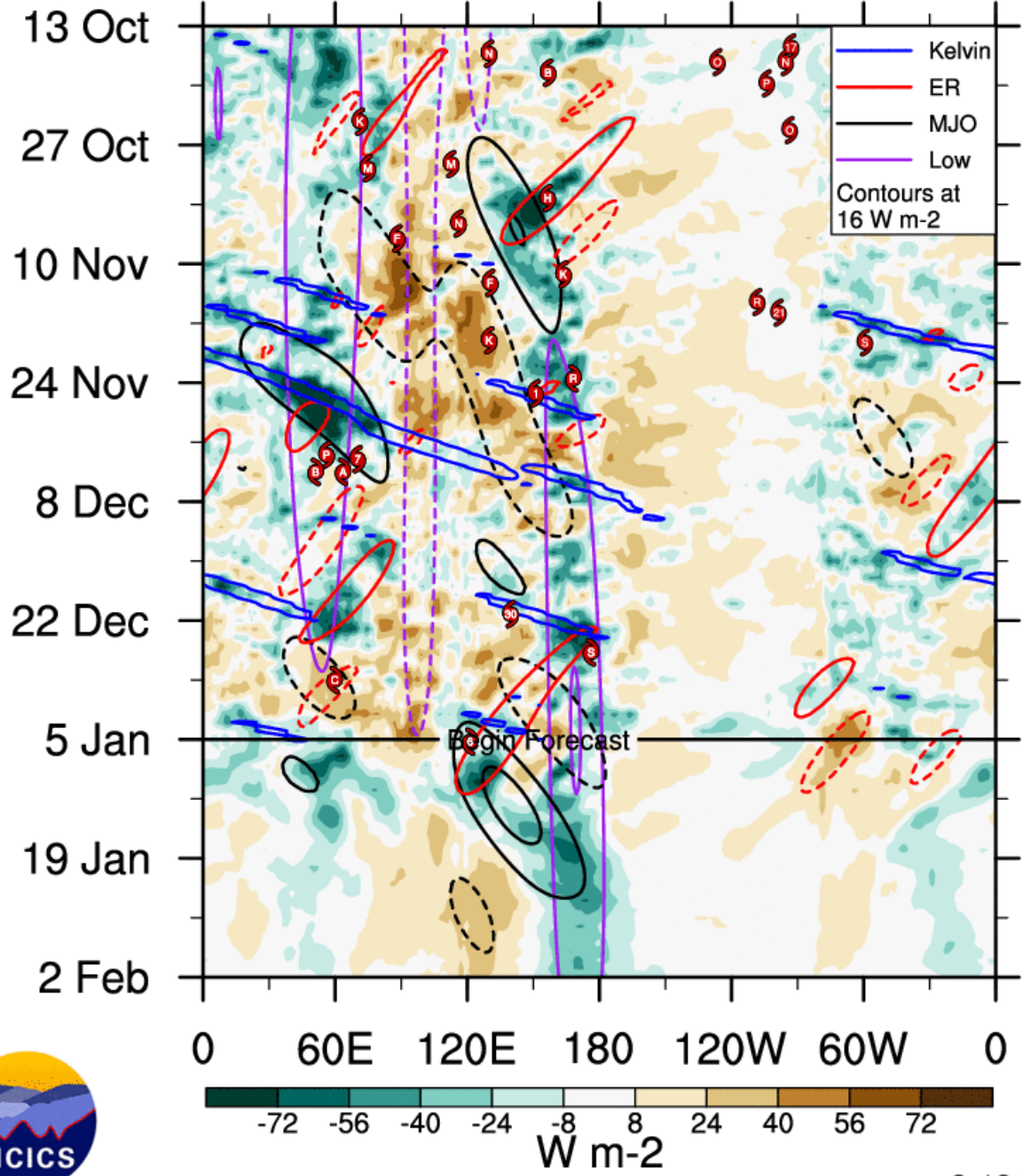


Week-1: Phases 4/5  
Week-2: Phases 5/6

CAVEAT: These panels are representative of robust MJO events.

OLR with CFS forecasts

5S - 5N



**MJO** and **Rossby wave** presence near 120E.

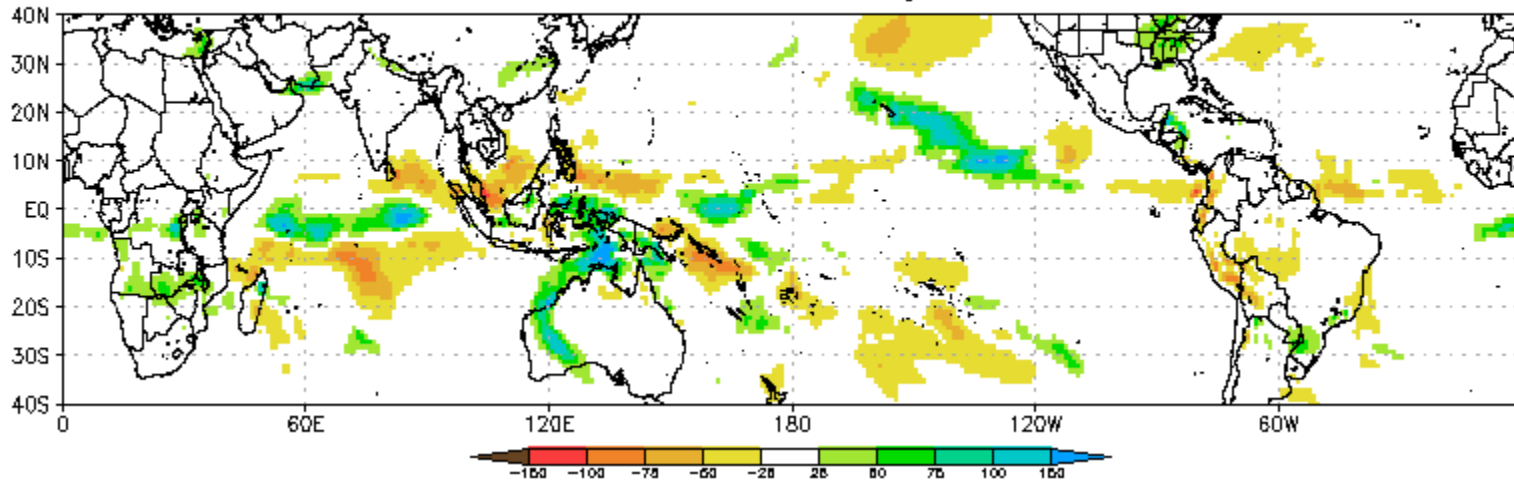
**Kelvin wave** over the Indian Ocean.

**Low frequency** contours from +IOD have timed out, but something west of the Date Line (weak El Niño?)

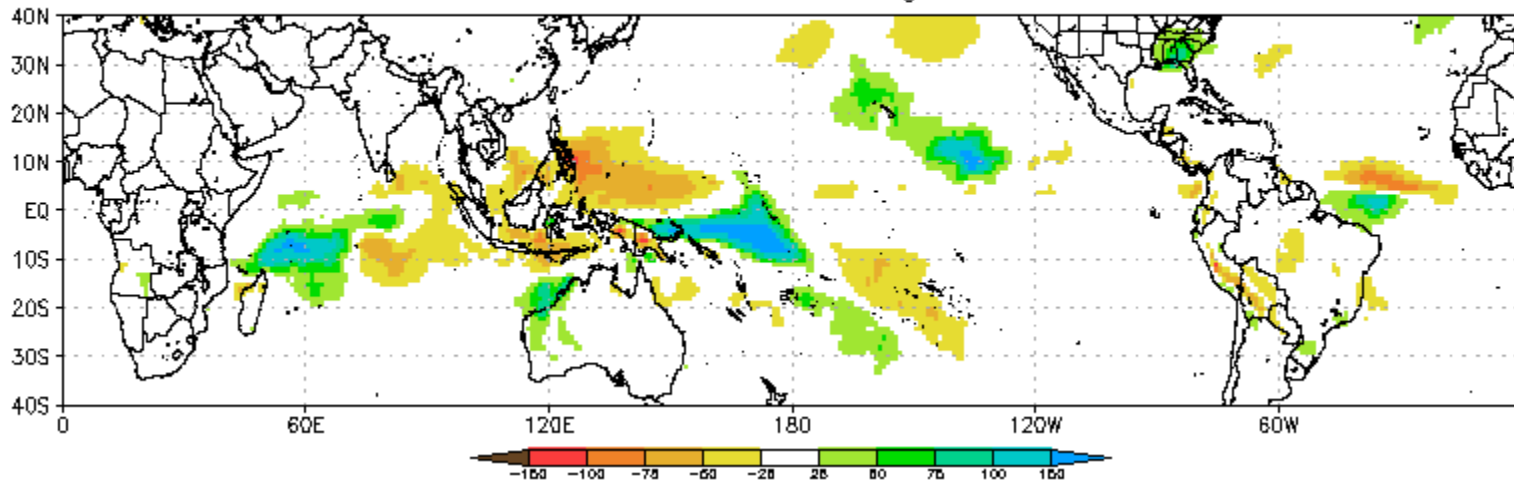




CFS Precipitation Anomalies (mm) Issued 06Jan2020  
Week-1 Forecast Ending 14Jan2020

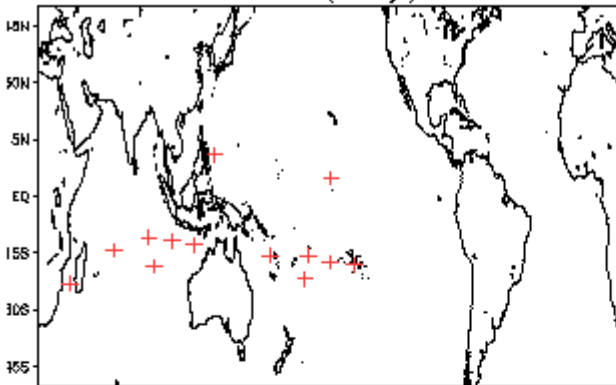


CFS Precipitation Anomalies (mm) Issued 06Jan2020  
Week-2 Forecast Ending 21Jan2020

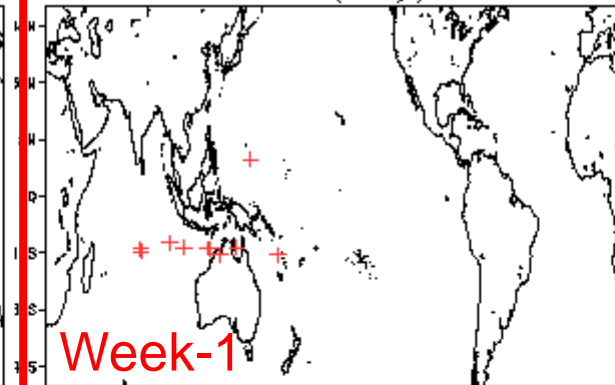


# January Tropical Storm Formation by MJO phase

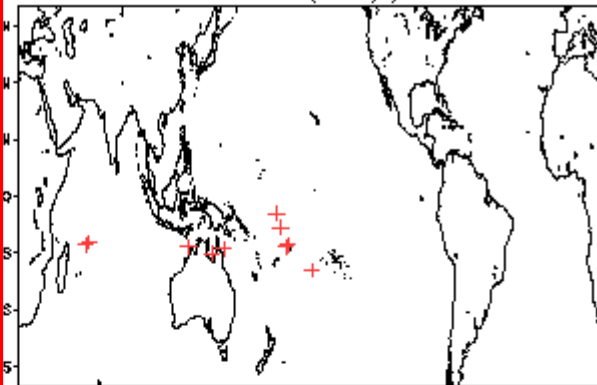
Phase 1 (67 days) 14 storms



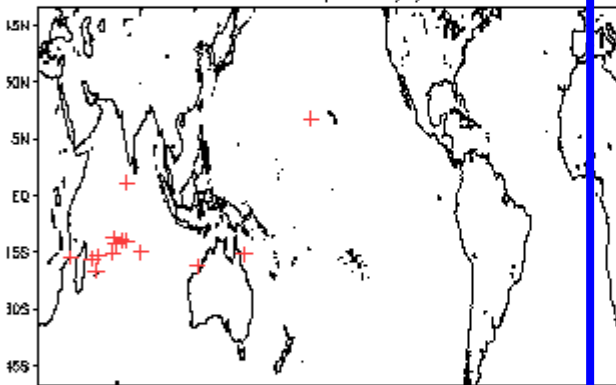
Phase 4 (69 days) 11 storms



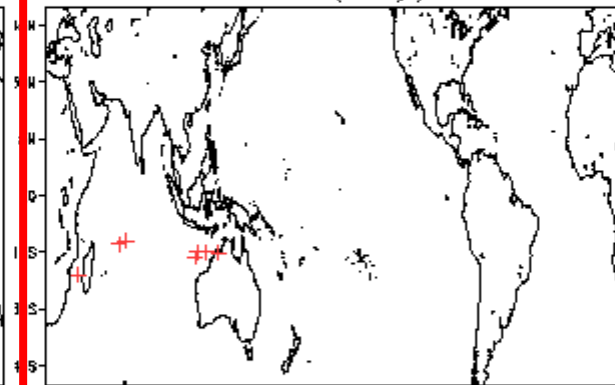
Phase 7 (81 days) 11 storms



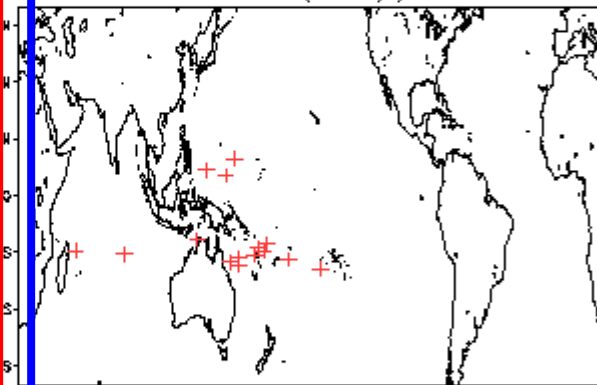
Phase 2 (101 days) 15 storms



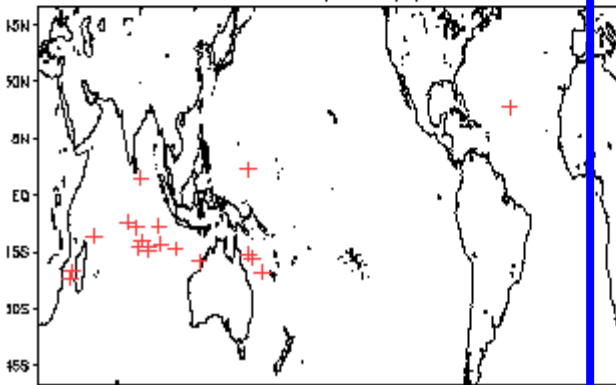
Phase 5 (67 days) 8 storms



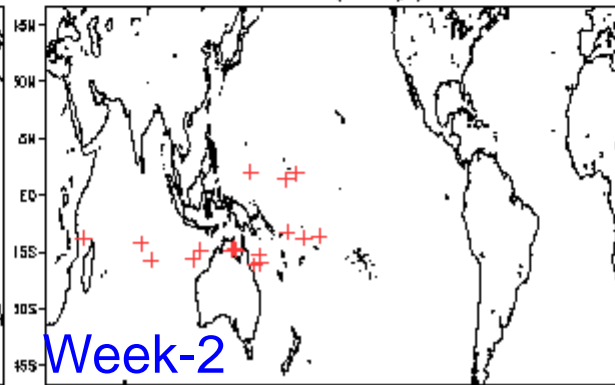
Phase 8 (105 days) 16 storms



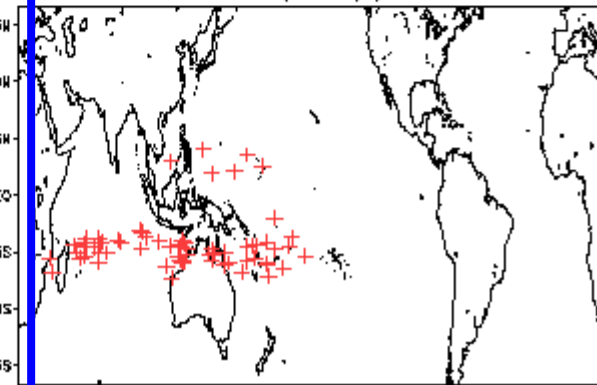
Phase 3 (112 days) 20 storms



Phase 6 (88 days) 18 storms



Null (364 days) 67 storms

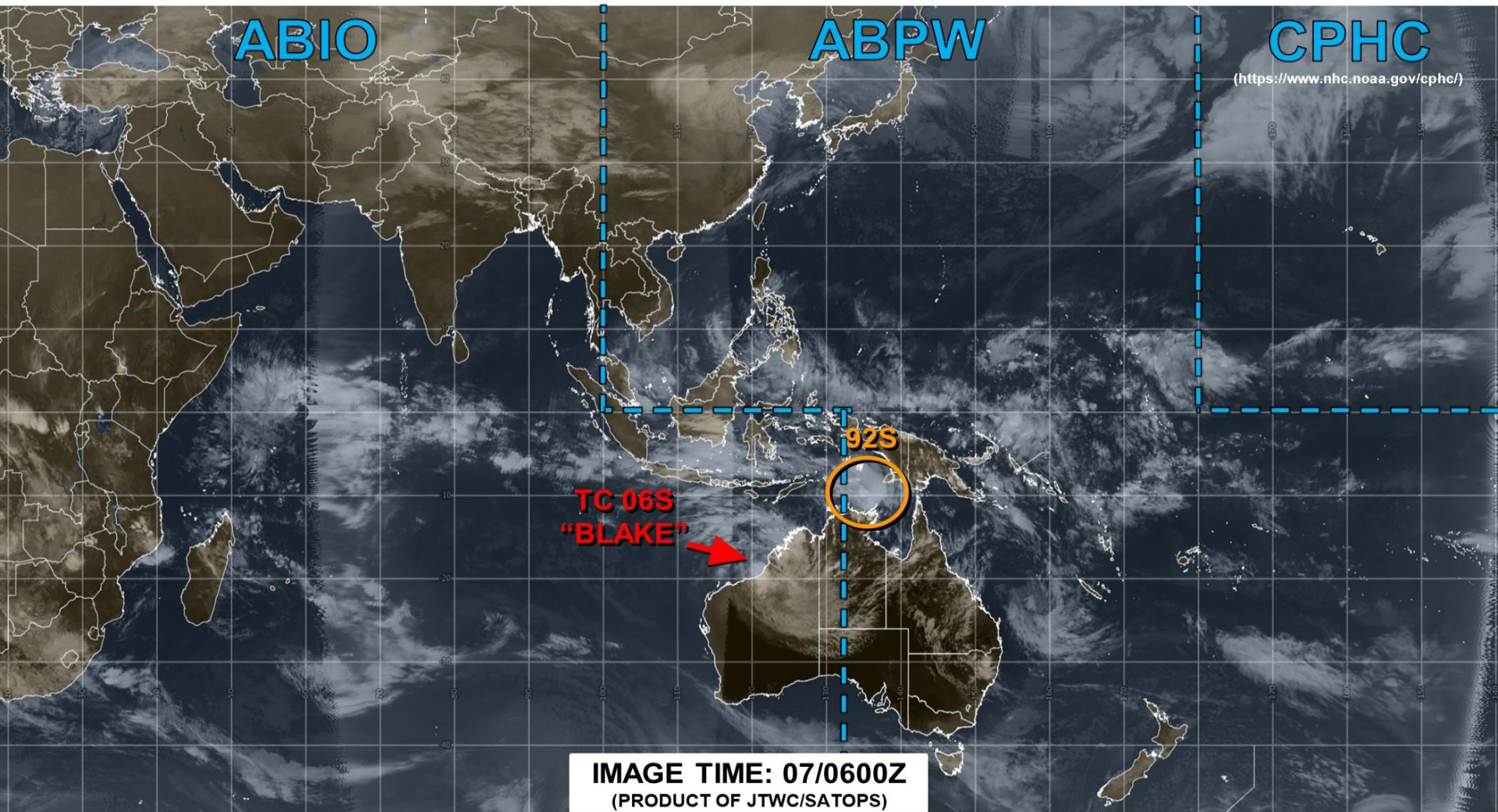


Week-1

Week-2



# JOINT TYPHOON WARNING CENTER



**IMAGE TIME: 07/0600Z**  
(PRODUCT OF JTWC/SATOPS)

**LOW** TC development unlikely within 24 hours

**MEDIUM** TC development likely, but expected to occur beyond 24 hours

**HIGH** TC development likely within 24 hours (Reference TCFA)

**SUB TROPICAL** Monitoring for potential transition to TC. Invest color denotes tropical transition probability

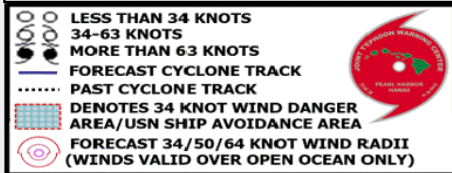
 Tropical Cyclone (Reference Warning)

JTWC

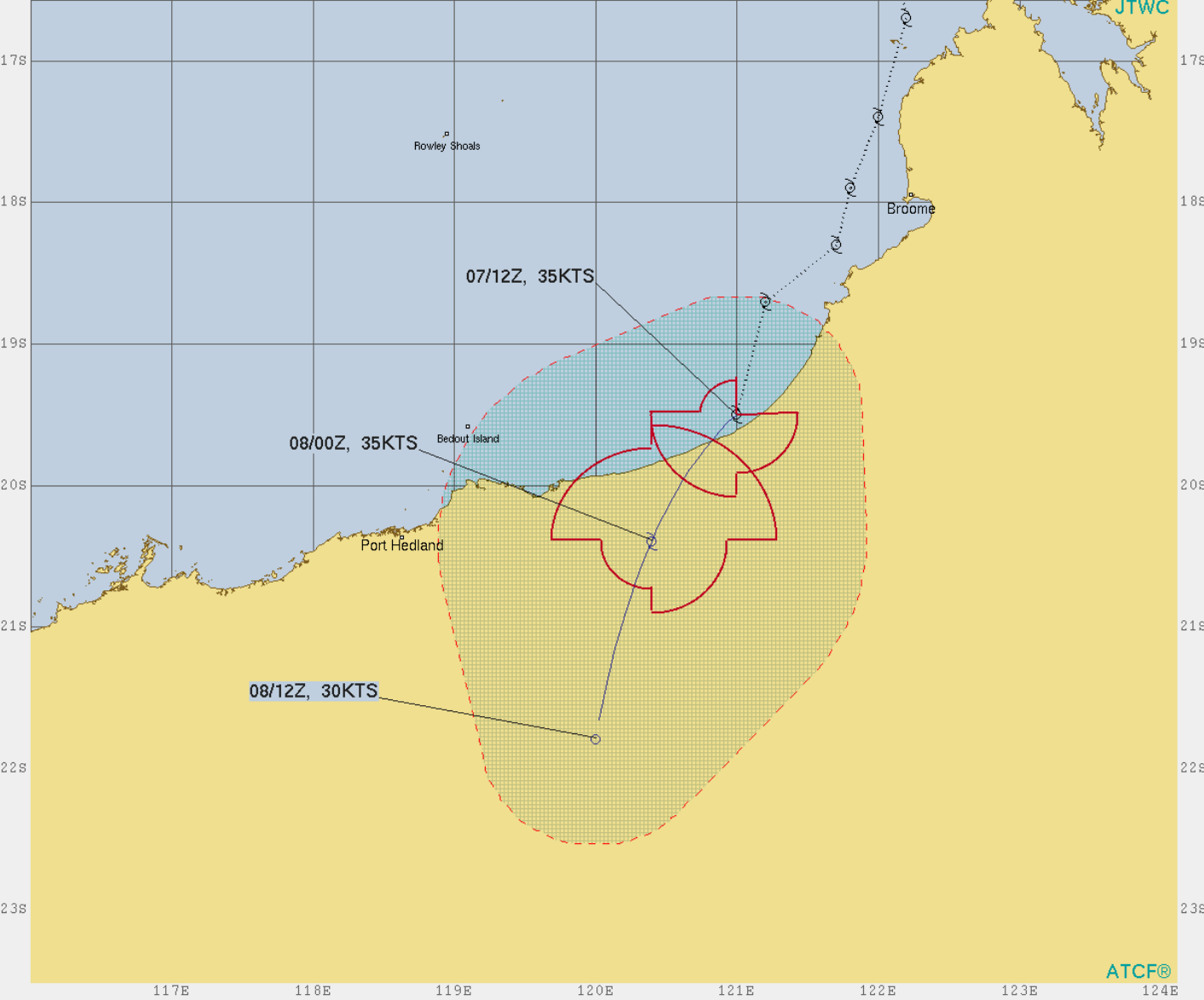
TROPICAL CYCLONE 06S (BLAKE) WARNING #8  
 WTKS31 PGTW 071500  
 071200Z POSIT: NEAR 19.5S 121.0E  
 MOVING 195 DEGREES TRUE AT 08 KNOTS  
 MAXIMUM SIGNIFICANT WAVE HEIGHT: 11 FEET  
 07/12Z, WINDS 035 KTS, GUSTS TO 045 KTS  
 08/00Z, WINDS 035 KTS, GUSTS TO 045 KTS  
 08/12Z, WINDS 030 KTS, GUSTS TO 040 KTS

CPA TO:	NM	DTG
PORT_HEDLAND	97	08/04Z
LEARMONTH	329	08/12Z

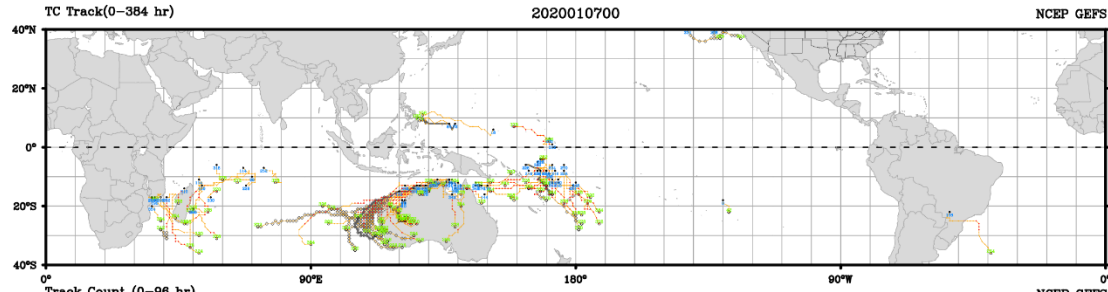
BEARING AND DISTANCE	DIR	DIST (NM)	TAU (HRS)
BROOME	215	118	0
PORT_HEDLAND	071	144	0



○ ○ LESS THAN 34 KNOTS  
 ○ ○ 34-63 KNOTS  
 ● ● MORE THAN 63 KNOTS  
 — FORECAST CYCLONE TRACK  
 - - - - PAST CYCLONE TRACK  
 [Red dashed area] DENOTES 34 KNOT WIND DANGER AREA/USN SHIP AVOIDANCE AREA  
 [Red concentric circles] FORECAST 34/50/64 KNOT WIND RADII (WINDS VALID OVER OPEN OCEAN ONLY)



ATCF®

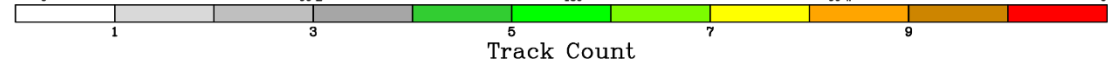


Days 1-4

Day 5-8

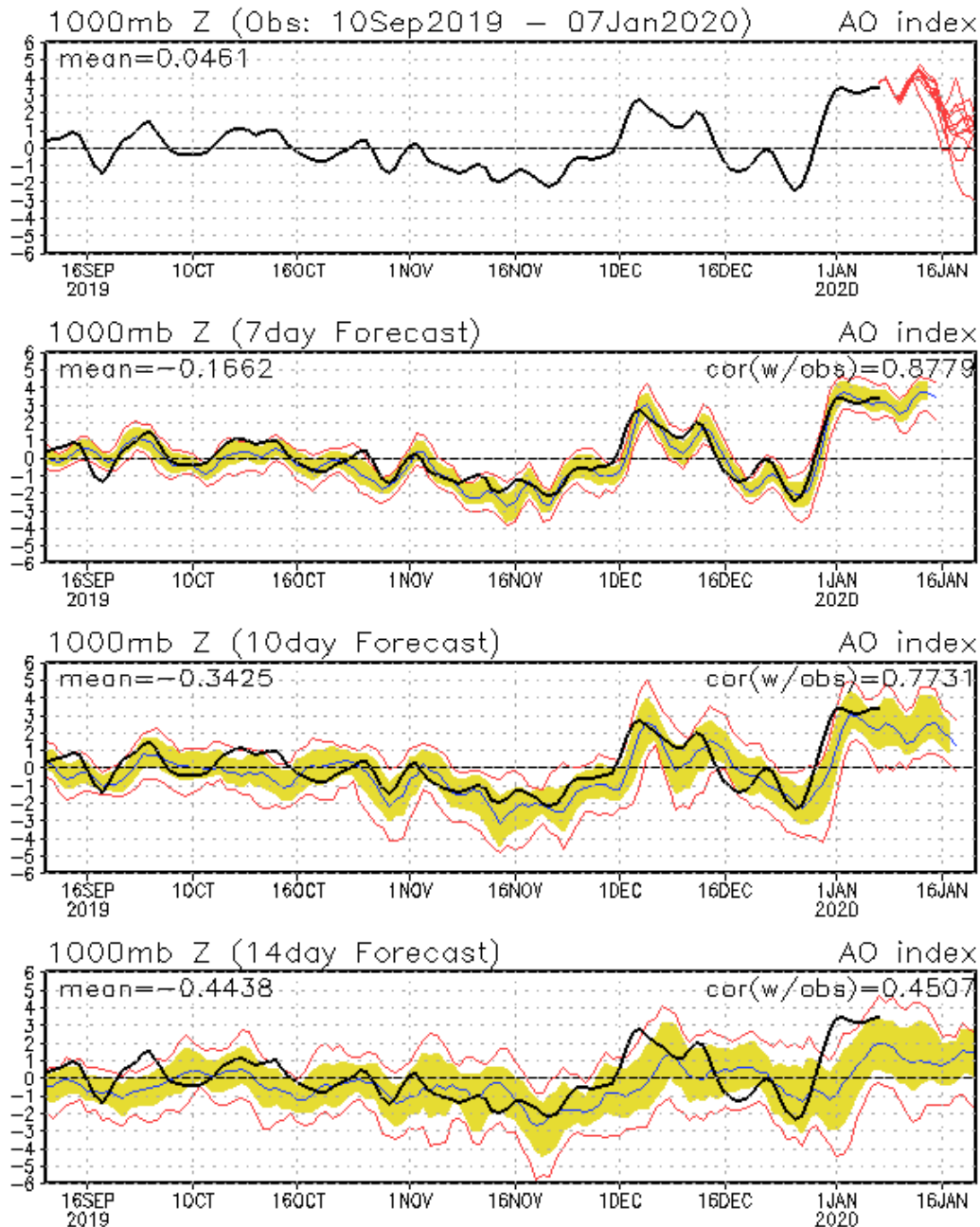
Day 9-12

Day 13-15

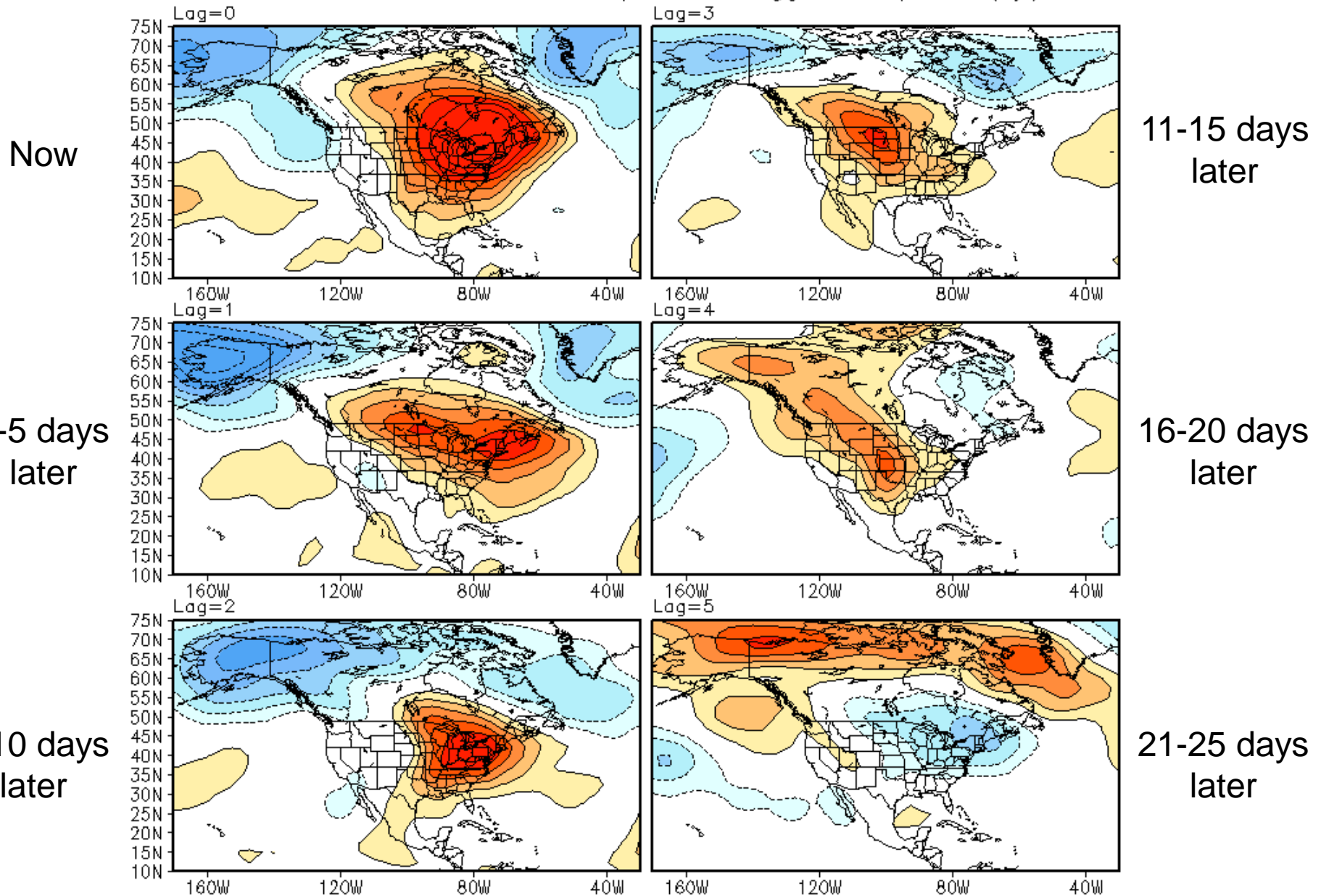


# Connections to U.S. Impacts

## AO: Observed & ENSM forecasts

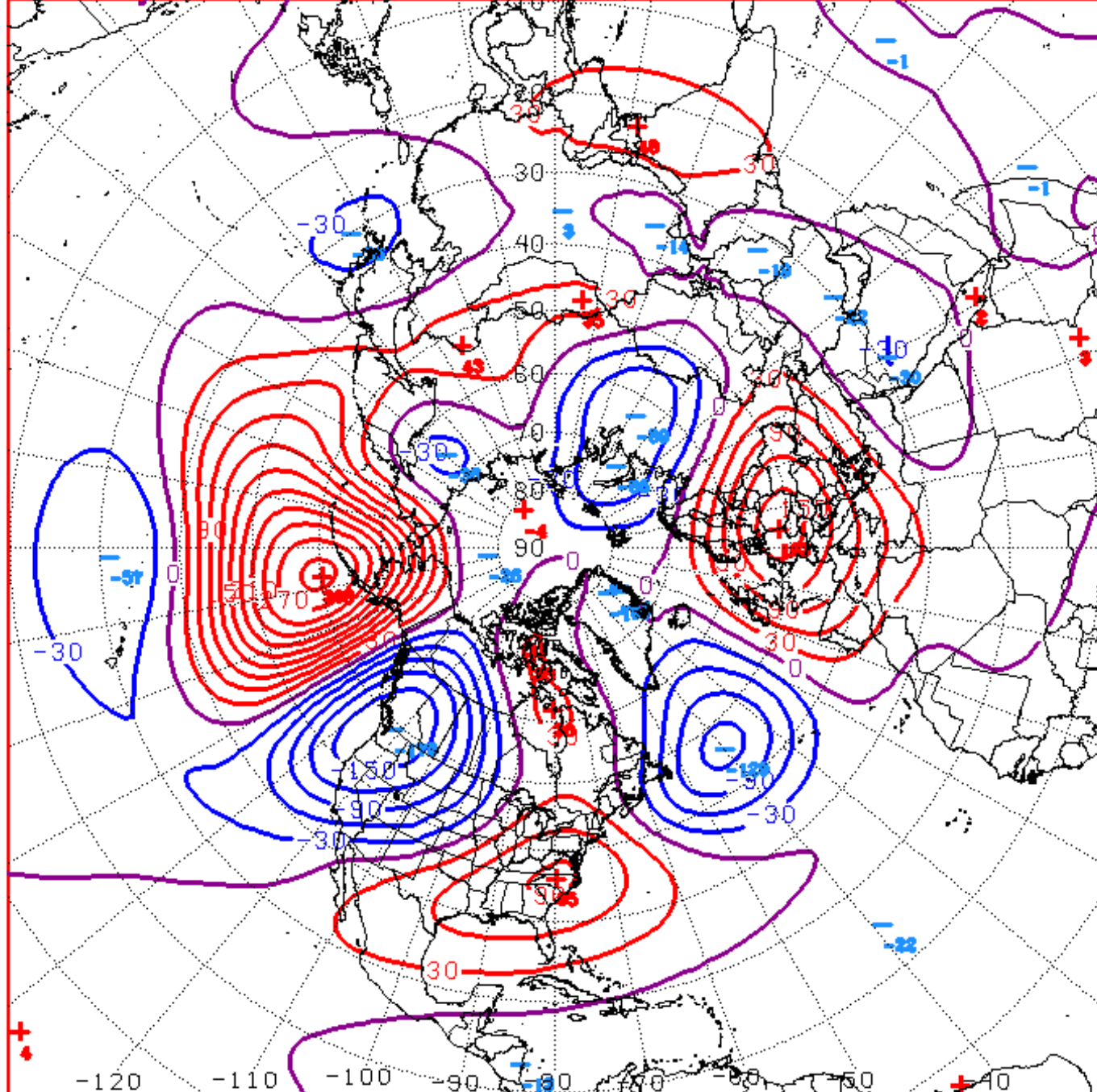


RMM Phase 4 850-hPa Temperature Lagged Composite (djf)



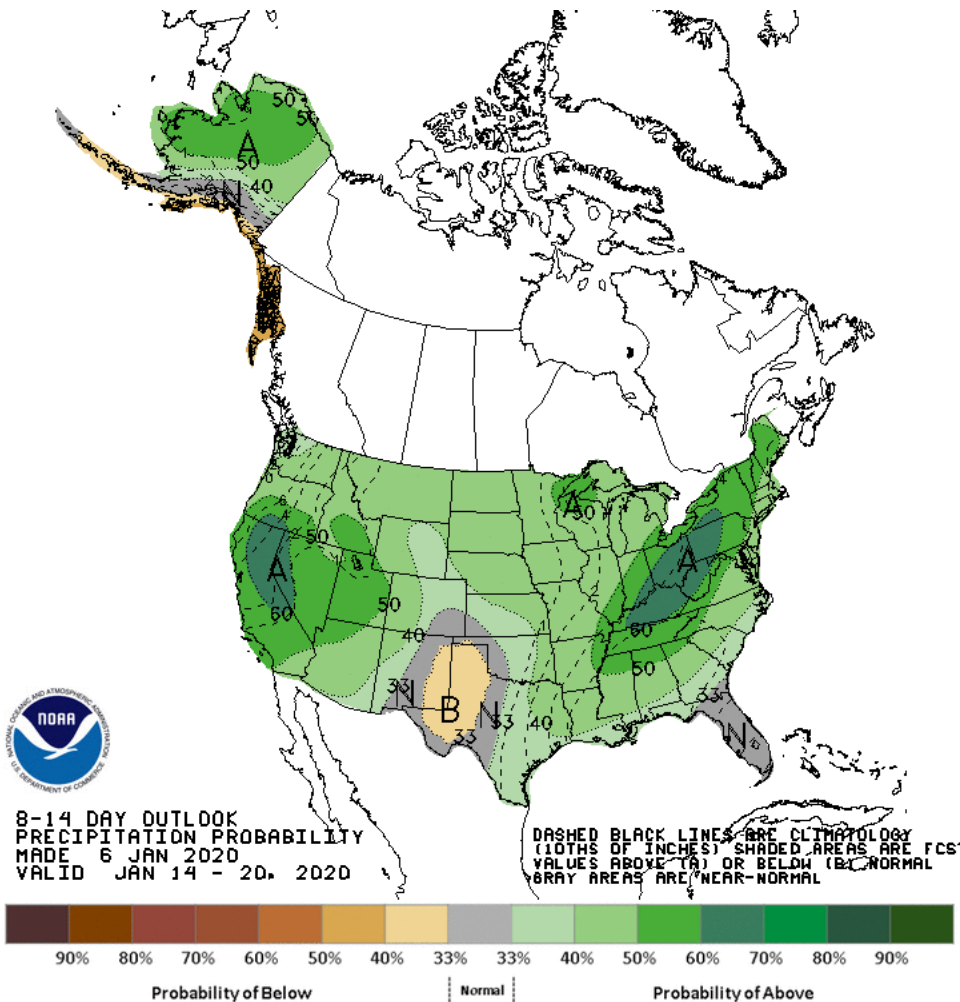
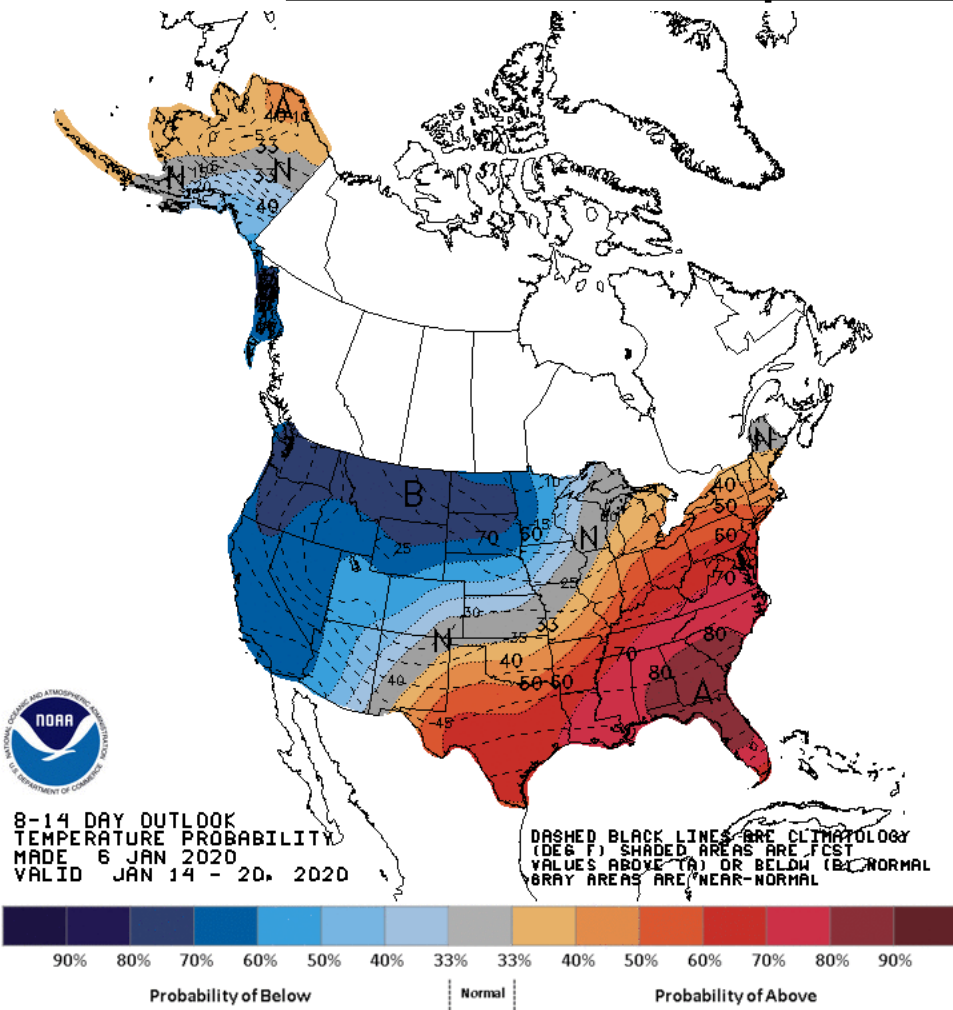
*CAVEAT: Other mechanisms will always be at play, aside from the MJO!*





D+11 500 MB ANOMALIES FROM ALZ ENSM  
 CPC MAP MADE JAN 07 2020 1324 UTC CNTD JAN 18 2020

# Week 2 – Temperature and Precipitation

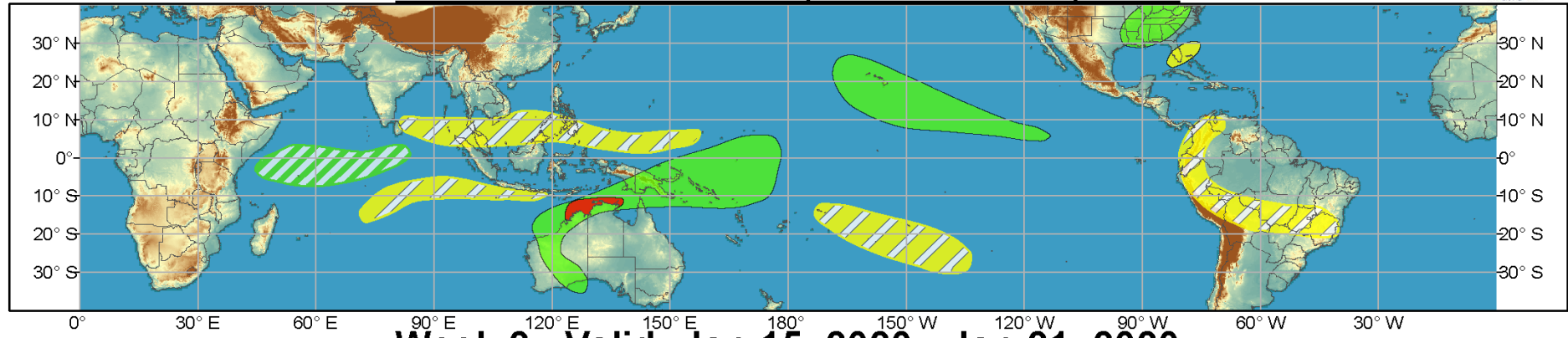


Since we are in an amplified, stable pattern today's outlooks are likely to be similar.

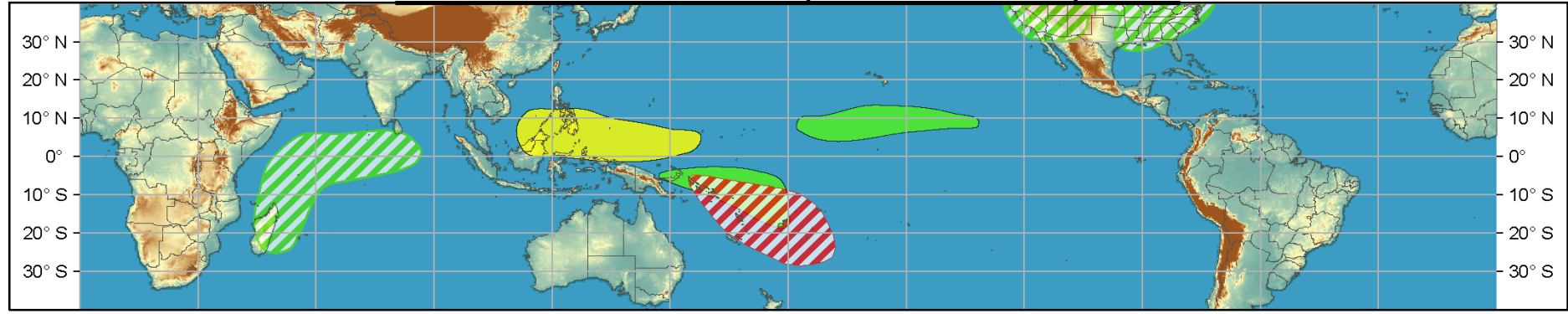


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