Global Tropics Hazards And Benefits Outlook

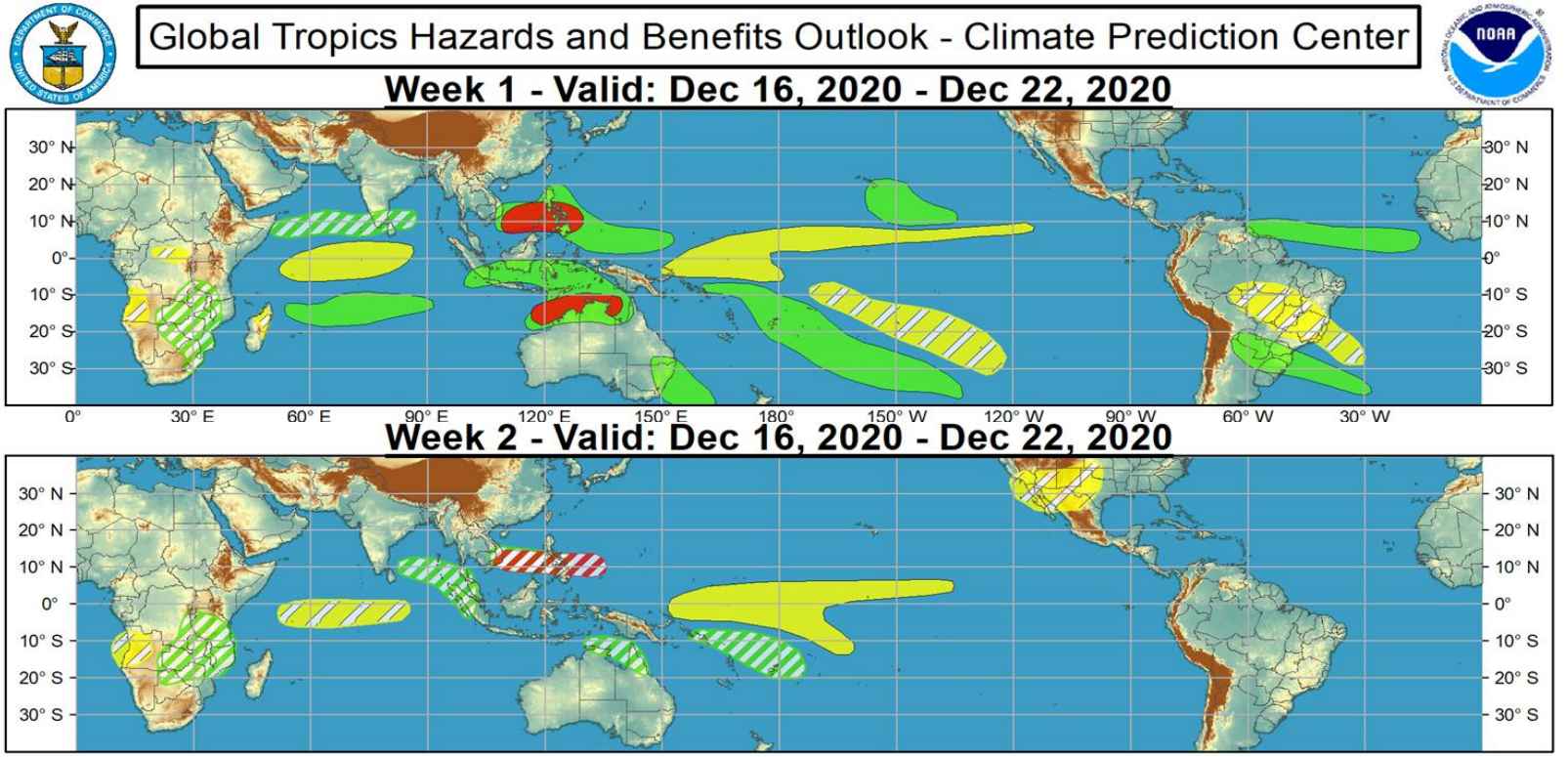
12/22/2020

Adam Allgood

Outline

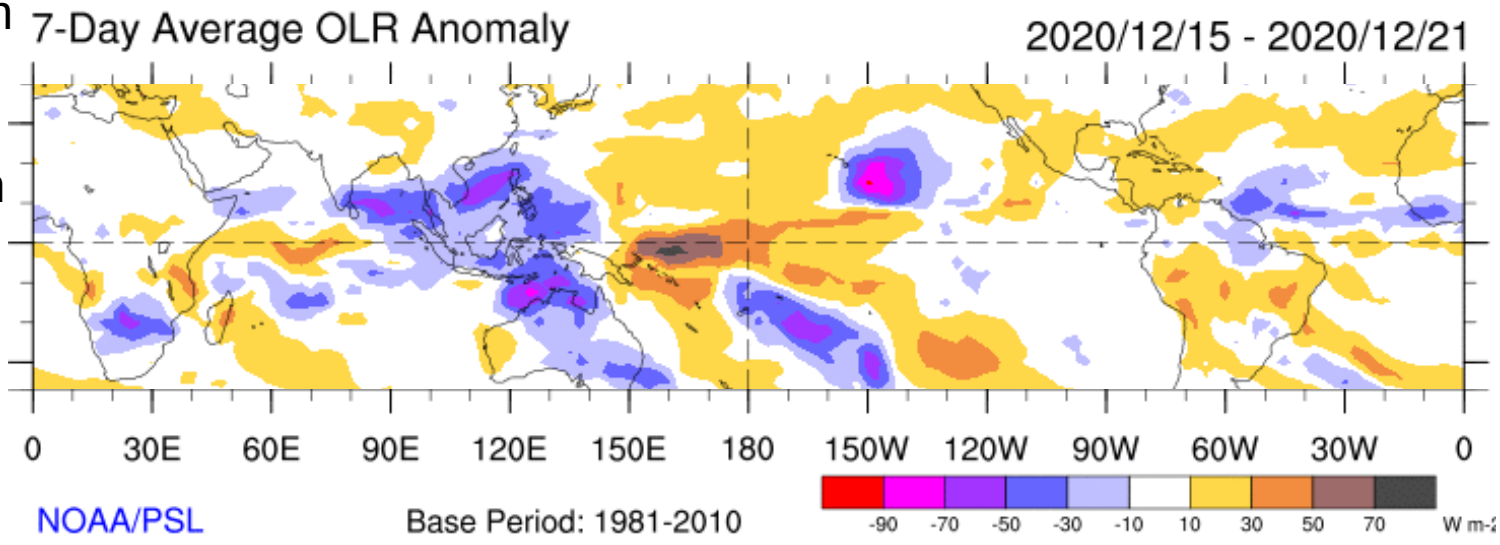
1. Review of Recent Conditions
2. Synopsis of Climate Modes
3. GTH Outlook and Forecast Discussion
4. Connections to U.S. Impacts

Outlook Review



Cool shading
More clouds/rain

Warm shading
Less clouds/rain



Synopsis of Climate Modes

ENSO: (December 10, 2020 Update) ***next update on 14th of Jan.!***

- ENSO Alert System Status: La Niña Advisory

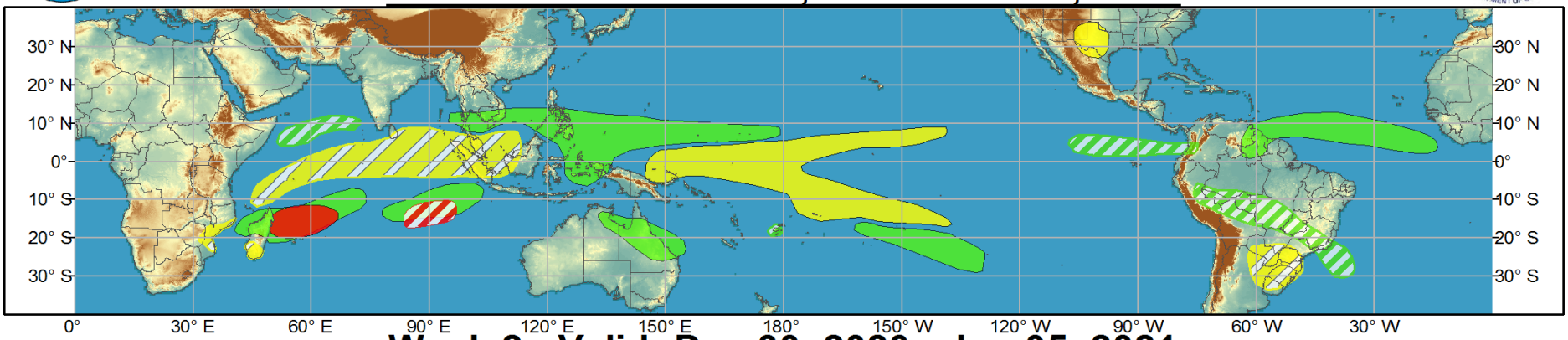
- La Niña is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March), with a potential transition during the spring 2021 (~50% chance of Neutral during April-June).

MJO and other subseasonal tropical variability:

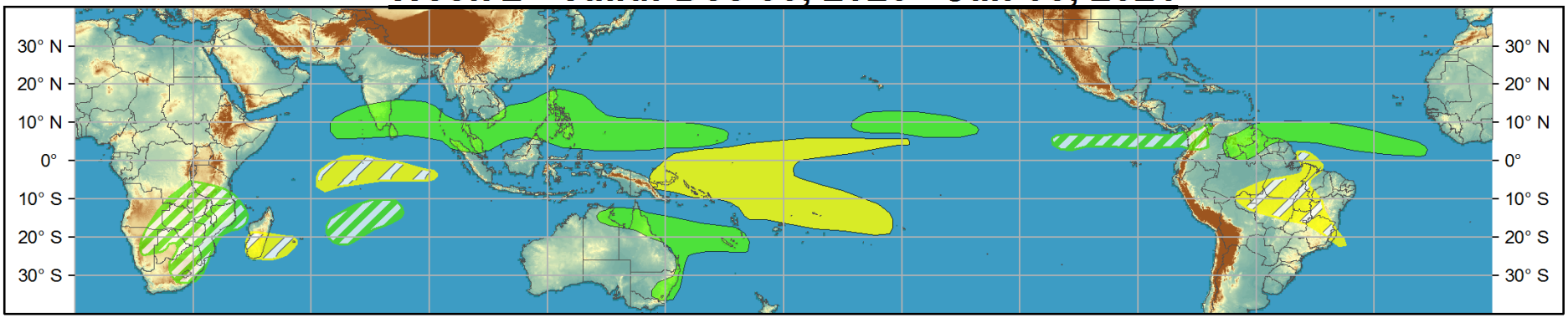
- MJO indices show a very slow evolution from the Indian Ocean across the Maritime Continent over the past month.
- Analyses of OLR anomalies reveal several discrete eastward propagating events initiating over the Indian Ocean and crossing the Maritime Continent before getting destroyed by the La Niña signal over the Pacific.
- Rather than canonical MJO evolution with an upper-level signal circumnavigating the globe, these events appear to be generated by extratropical forcing.
- Dynamical models favor a repetition of this pattern, with the current signal fading over the Pacific while a new wavebreaking event generates renewed convection over the northern Indian Ocean by Week-2.
- Tropical cyclone activity over the southern IO may also play a role in the pattern evolution.

Global Tropics Hazards and Benefits Outlook - Climate Prediction Center

Week 1 - Valid: Dec 23, 2020 - Dec 29, 2020



Week 2 - Valid: Dec 30, 2020 - Jan 05, 2021



Produced: 12/22/2020

Forecaster: Allgood

	Confidence: High	Confidence: 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.
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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.

中央氣象局 Central Weather Bureau

UNIVERSITY AT ALBANY State University of New York

EARTH SYSTEM SCIENCE INTERDISCIPLINARY CENTER ESSIC UNIVERSITY OF MARYLAND

Australian Government Bureau of Meteorology

cics.nc

NPS PRAESTANTIA PER SCIENTIAM

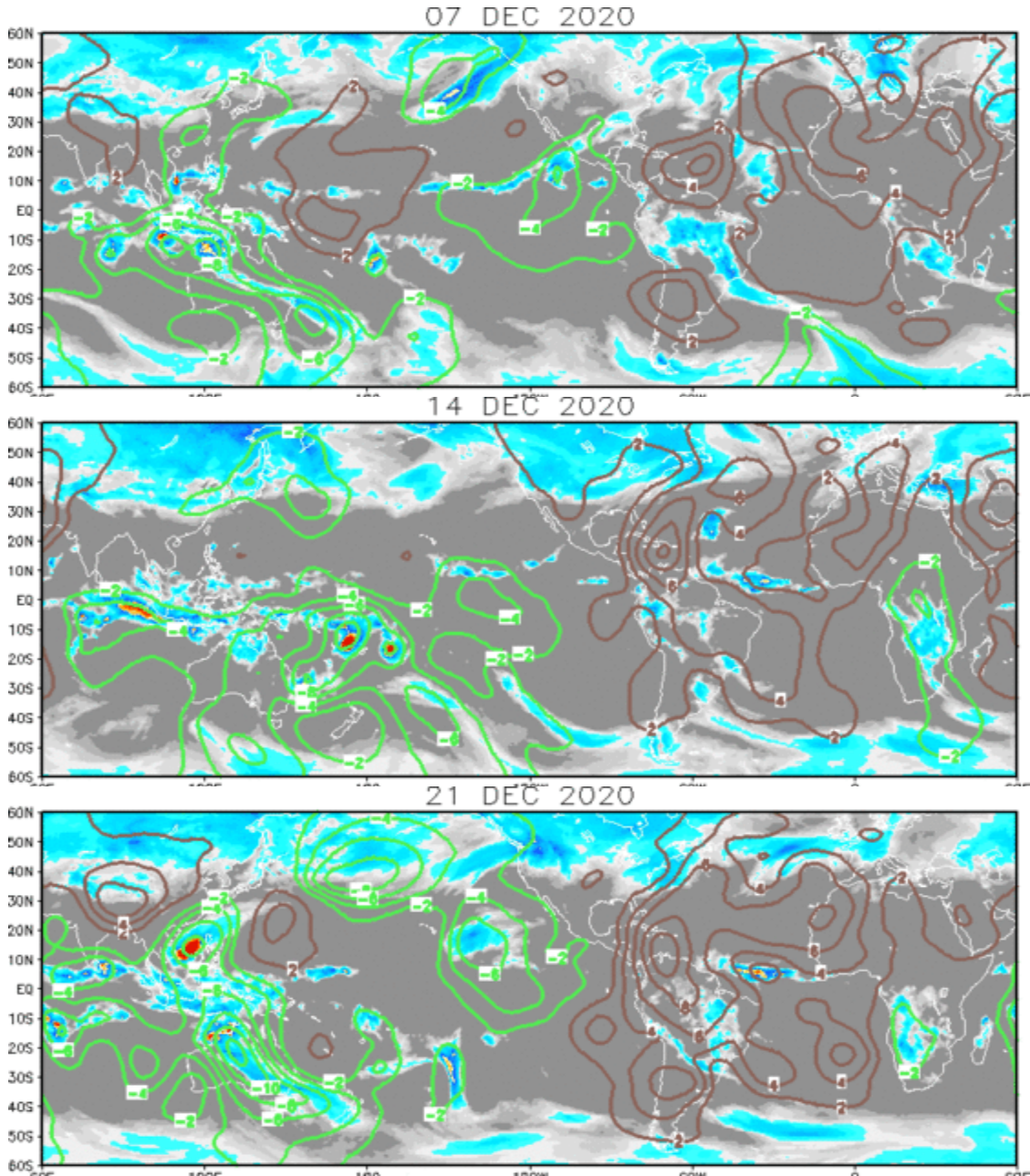
IR Satellite & 200-hpa Velocity Potential Anomalies

Green: Enhanced Divergence Brown: Enhanced Convergence

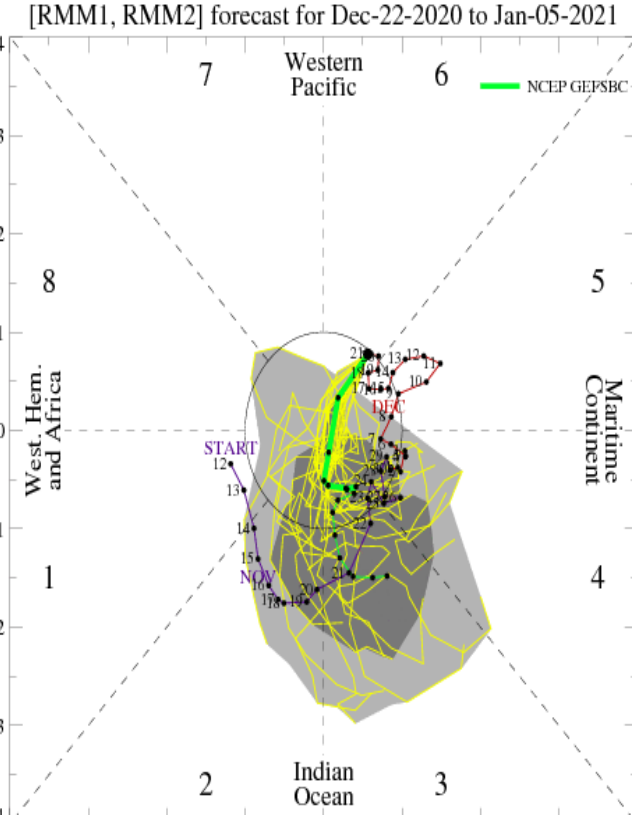
As November MJO activity weakened after crossing the Pacific, renewed activity fired over the Maritime Continent

Wave-1 pattern became more evident, with destructive interference beginning over the Pacific as the new signal moved east.

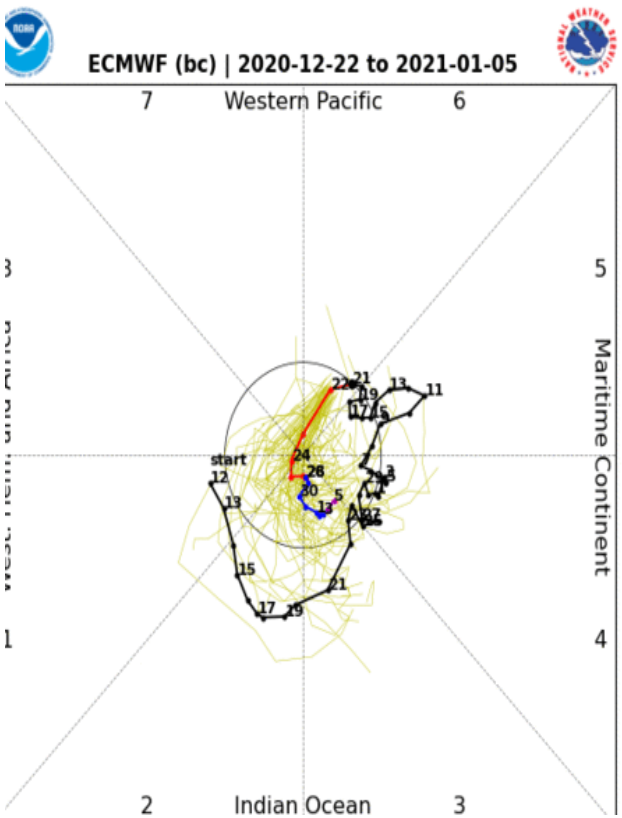
Destructive interference over the Pacific is ongoing, with activity beginning to renew again over the Indian Ocean.



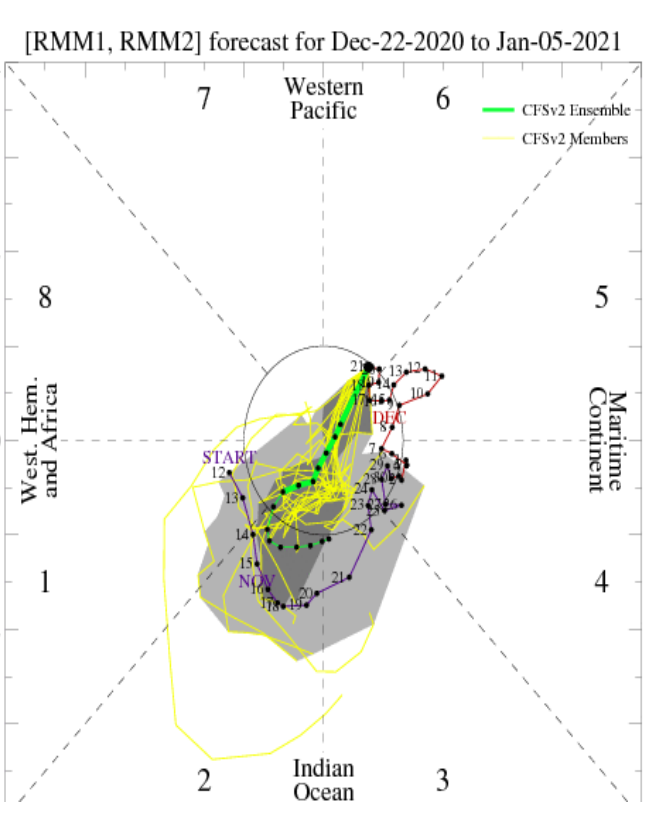
MJO Observation/Forecast



GEFS



ECMWF



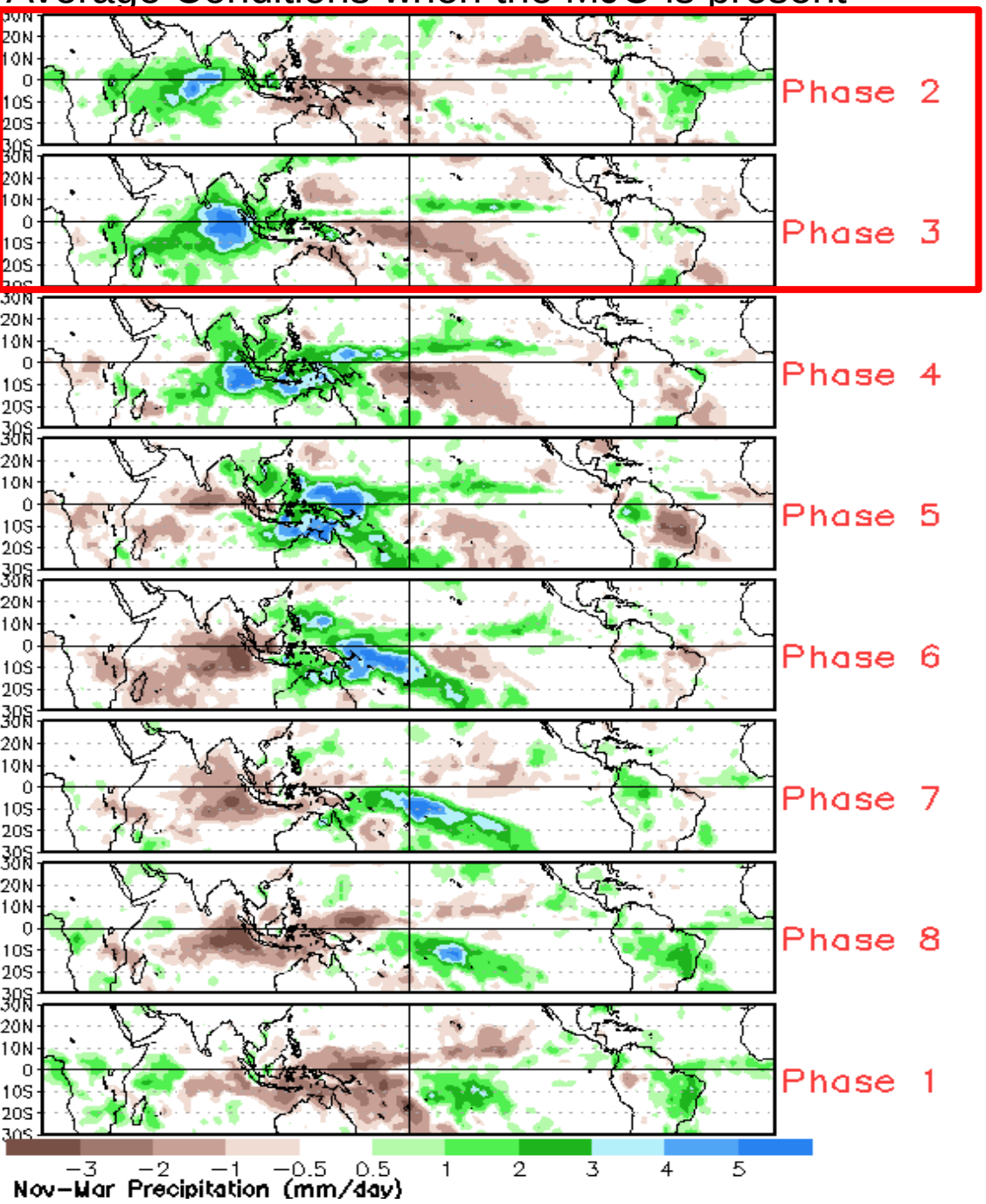
CFS

All three models show rapid weakening during Week-1, with Rossby wave activity likely contributing to the abrupt “left turn”.

The CFS and GEFS both show renewed Indian Ocean activity during Week-2.

The ECMWF maintains a weak signal, but also shifts the activity back towards the Indian Ocean.

Average Conditions when the MJO is present

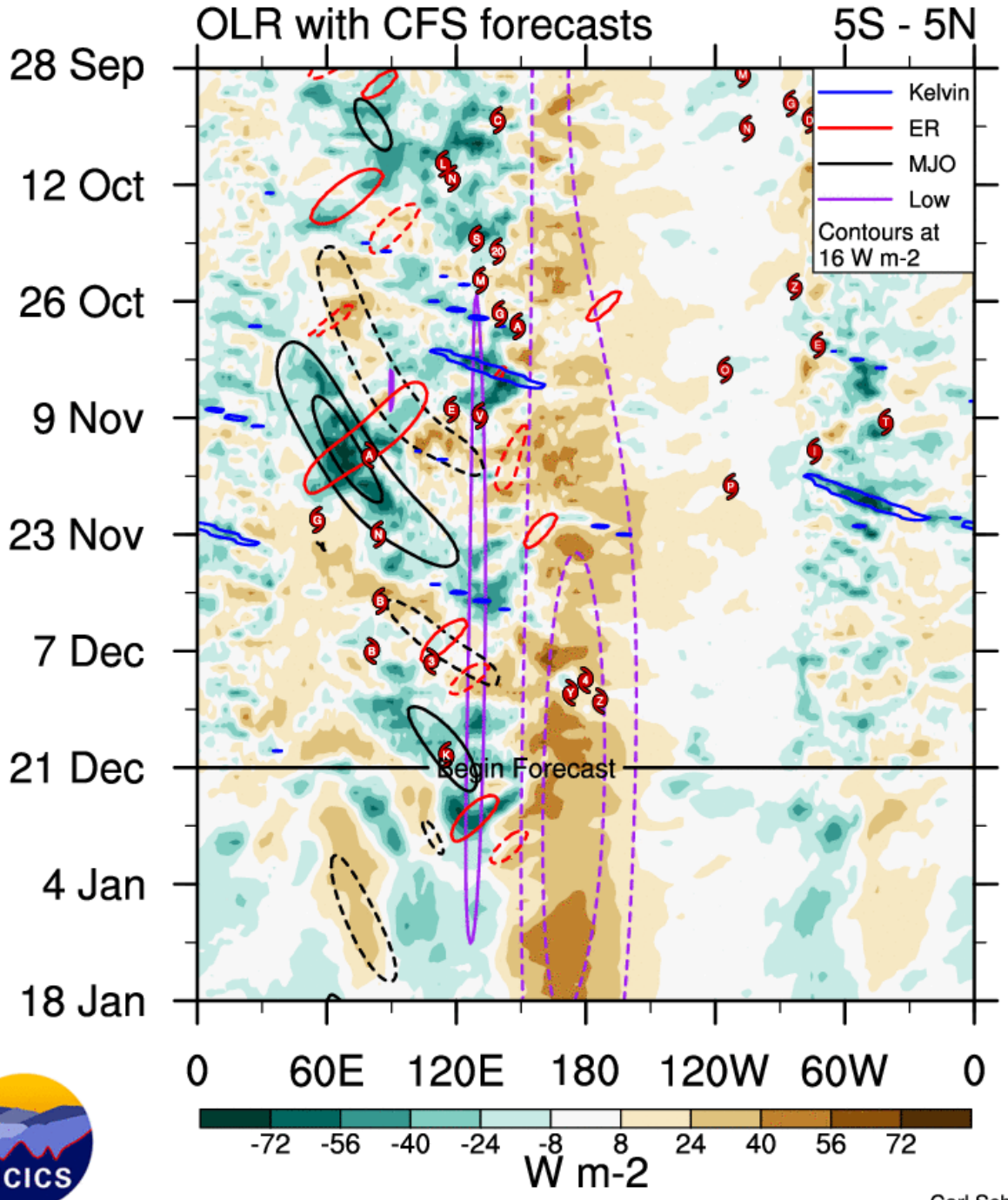


Note convection centered near the Equator. Dynamical model forecasts show the renewed convection centered closer to 10N.

CAVEAT: These panels are representative of robust MJO events.

Discrete **MJO** activity shows up in the filtering during November and again in mid/late December.

Low frequency remains the strongest driver of the pattern.

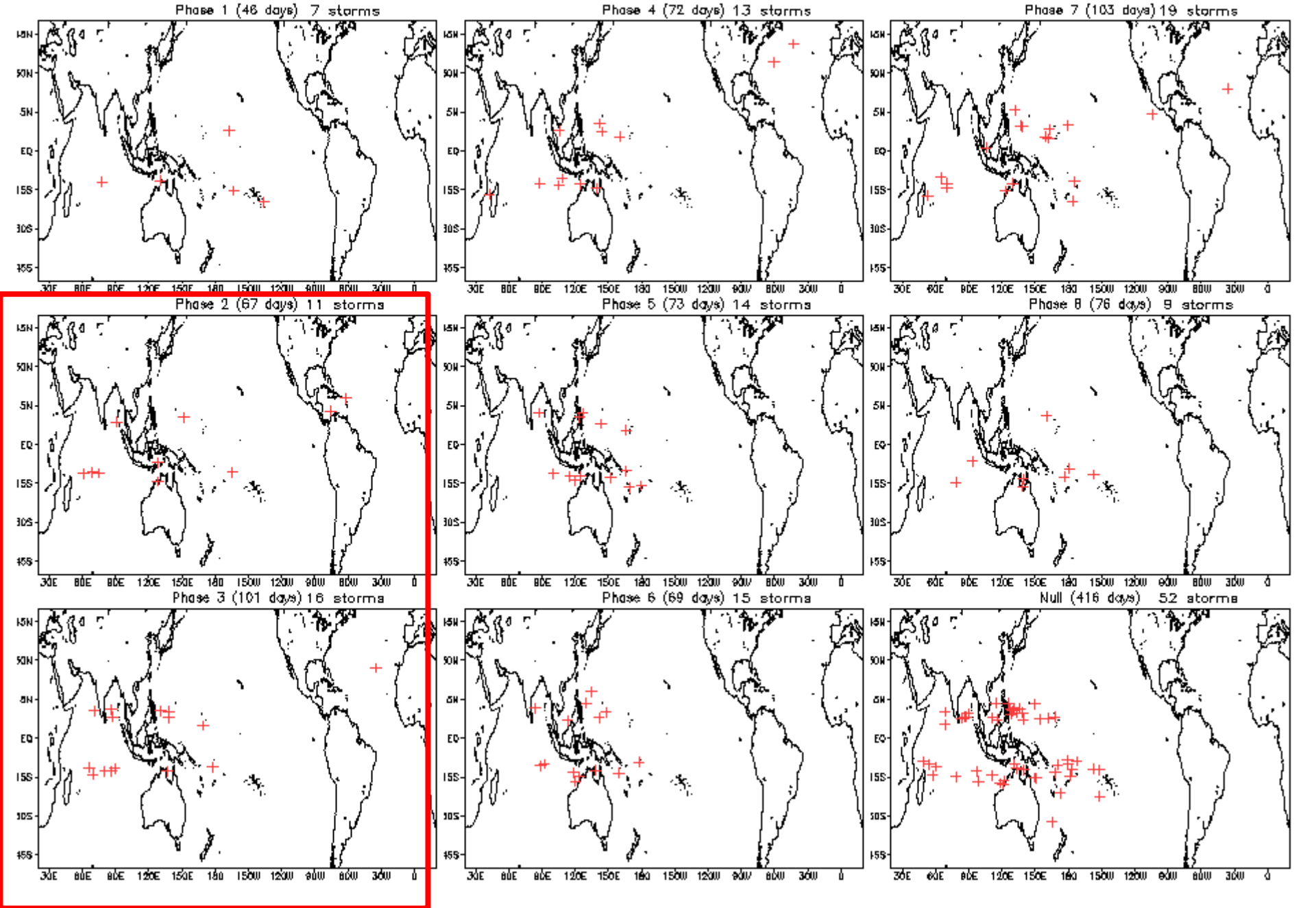


ncics.org/mjo

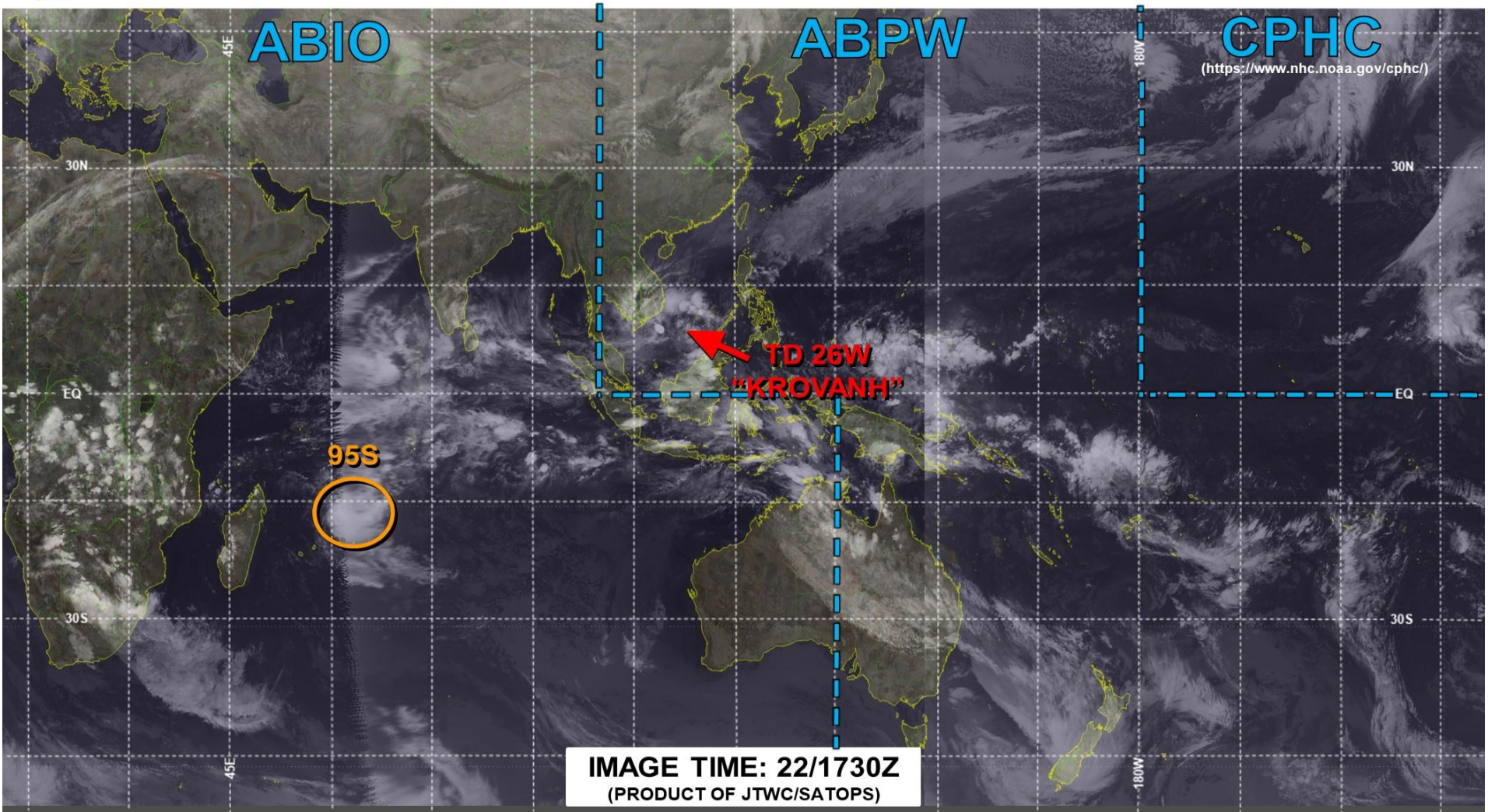
Tue 2020-12-22 1639 UTC

Carl Schreck
carl_schreck@ncsu.edu

December Tropical Storm Formation by MJO phase



JOINT TYPHOON WARNING CENTER



LOW — TC development unlikely within 24 hours

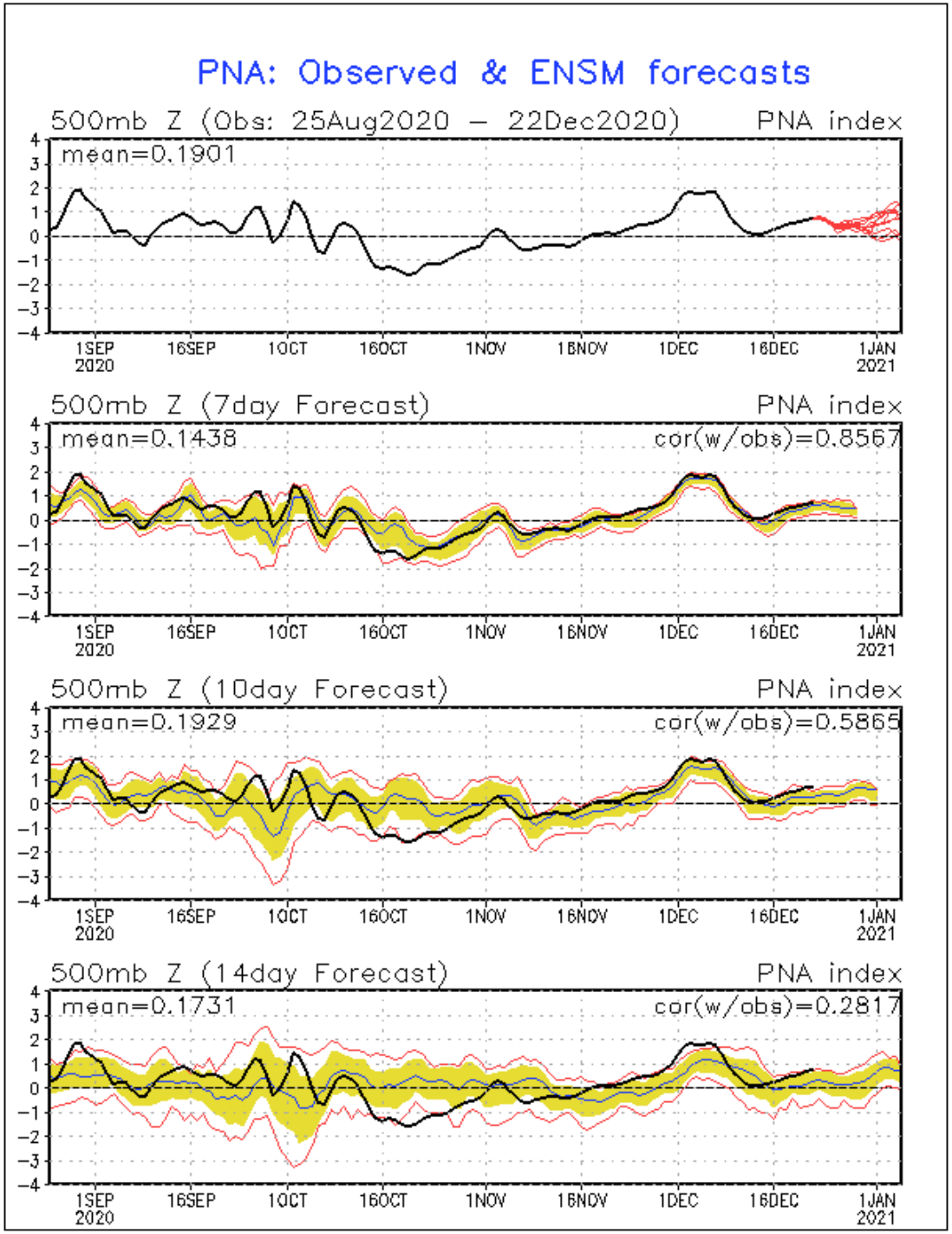
MEDIUM — TC development likely, but expected to occur beyond 24 hours

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

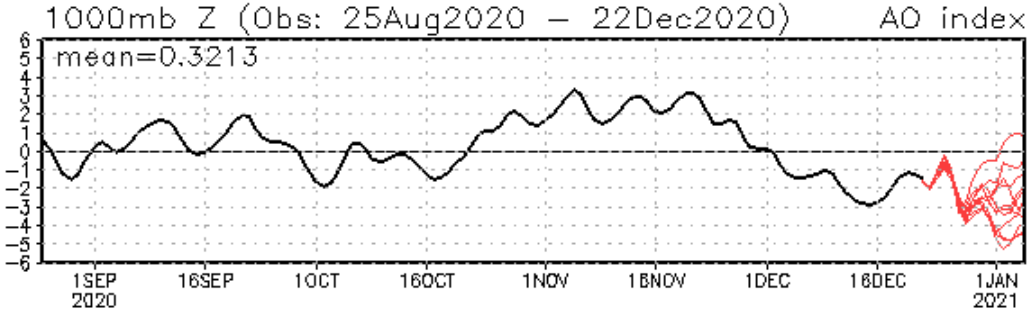
SUB TROPICAL — Monitoring for potential transition to TC. Invest label color denotes tropical transition probability

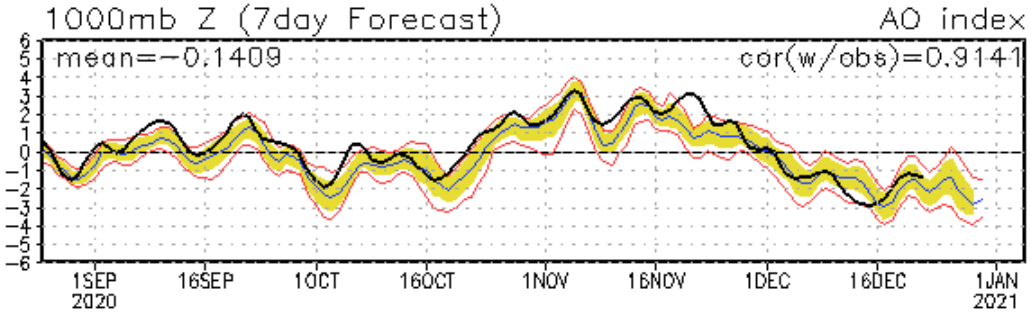
Tropical Cyclone (Reference Warning)

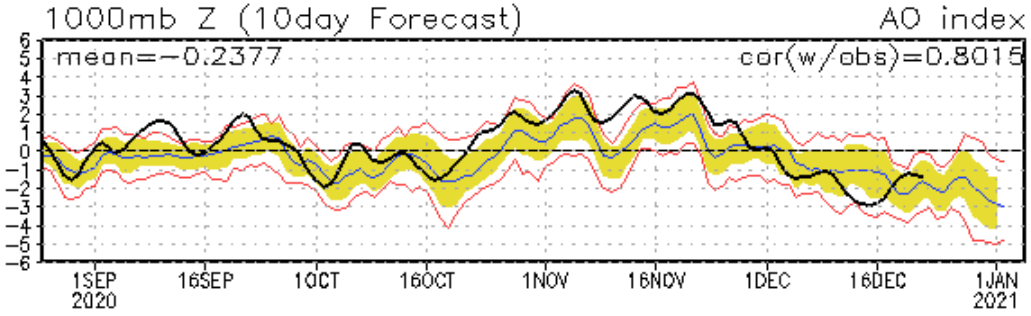
Connections to U.S. Impacts

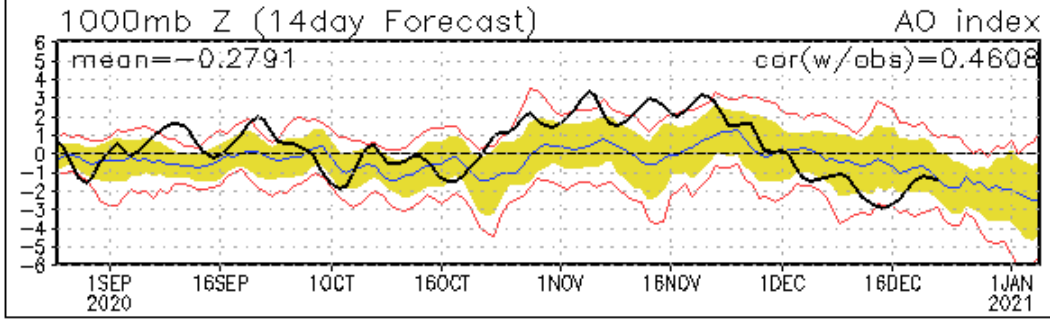

PNA: Observed & ENSM forecasts
500mb Z (Obs: 25Aug2020 – 22Dec2020)
PNA index
mean=0.1901
500mb Z (7day Forecast)
PNA index
mean=0.1438
cor(w/obs)=0.8567
500mb Z (10day Forecast)
PNA index
mean=0.1929
cor(w/obs)=0.5865
500mb Z (14day Forecast)
PNA index
mean=0.1731
cor(w/obs)=0.2817
4
3
2
1
0
−1
−2
−3
−4
1SEP 2020
16SEP
1OCT
16OCT
1NOV
16NOV
1DEC
16DEC
1JAN 2021

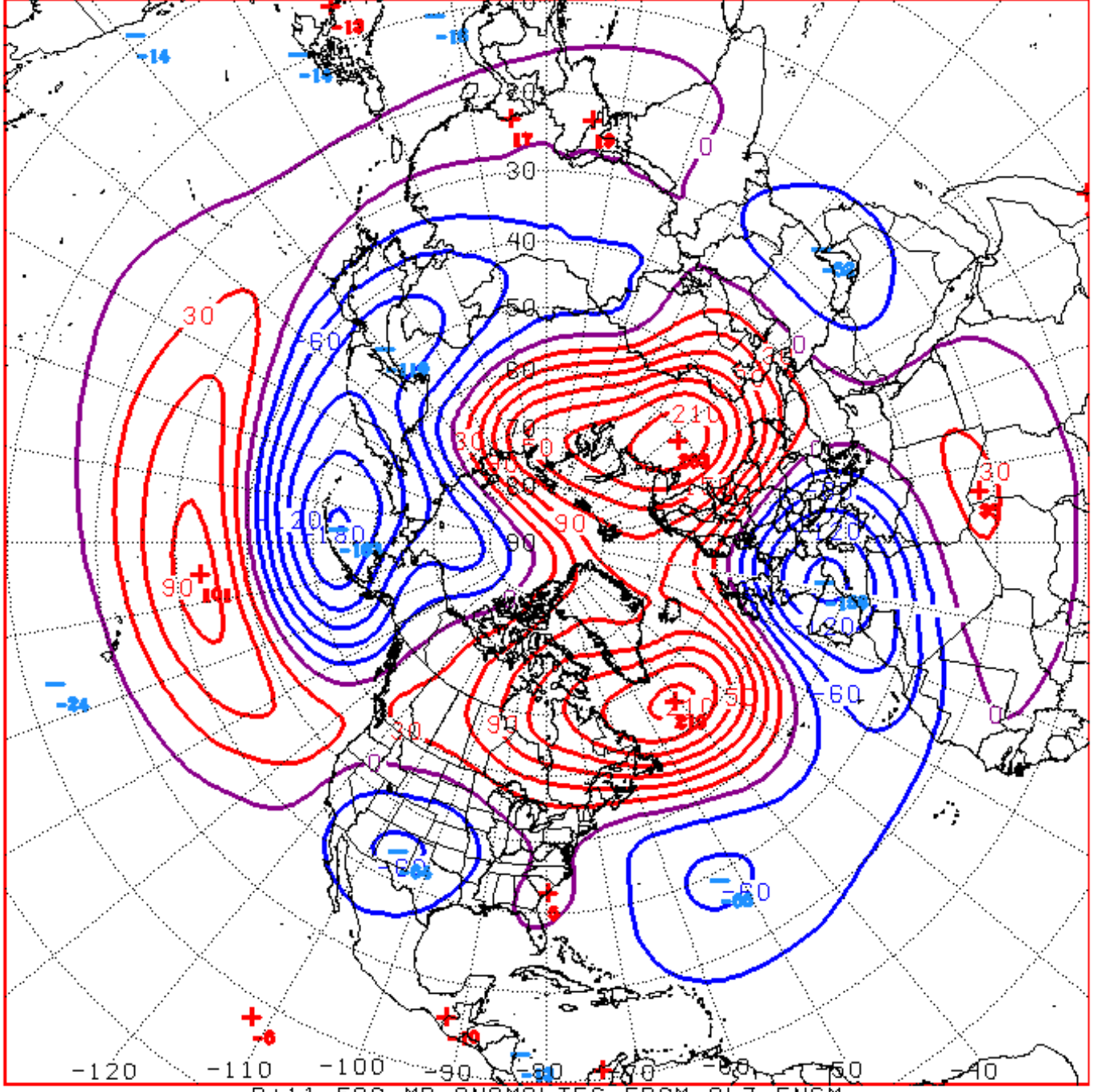
AO: Observed & ENSM forecasts





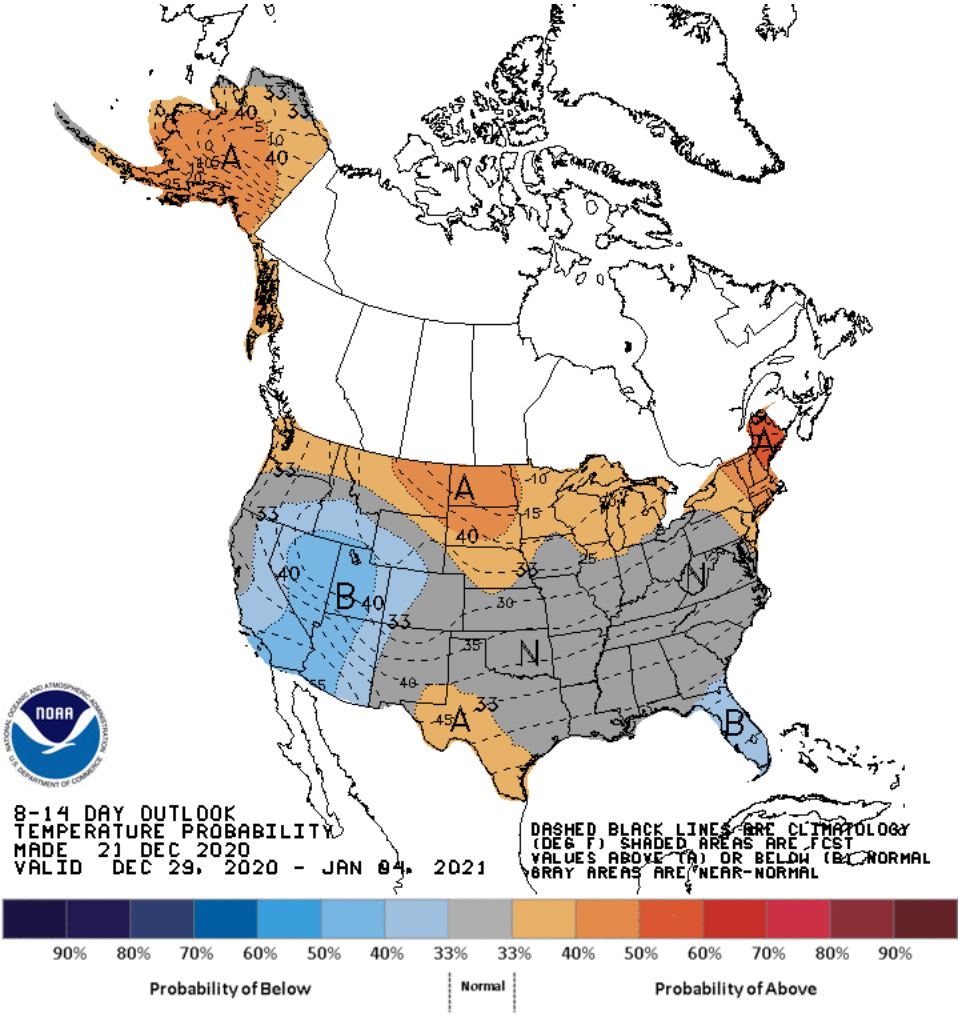


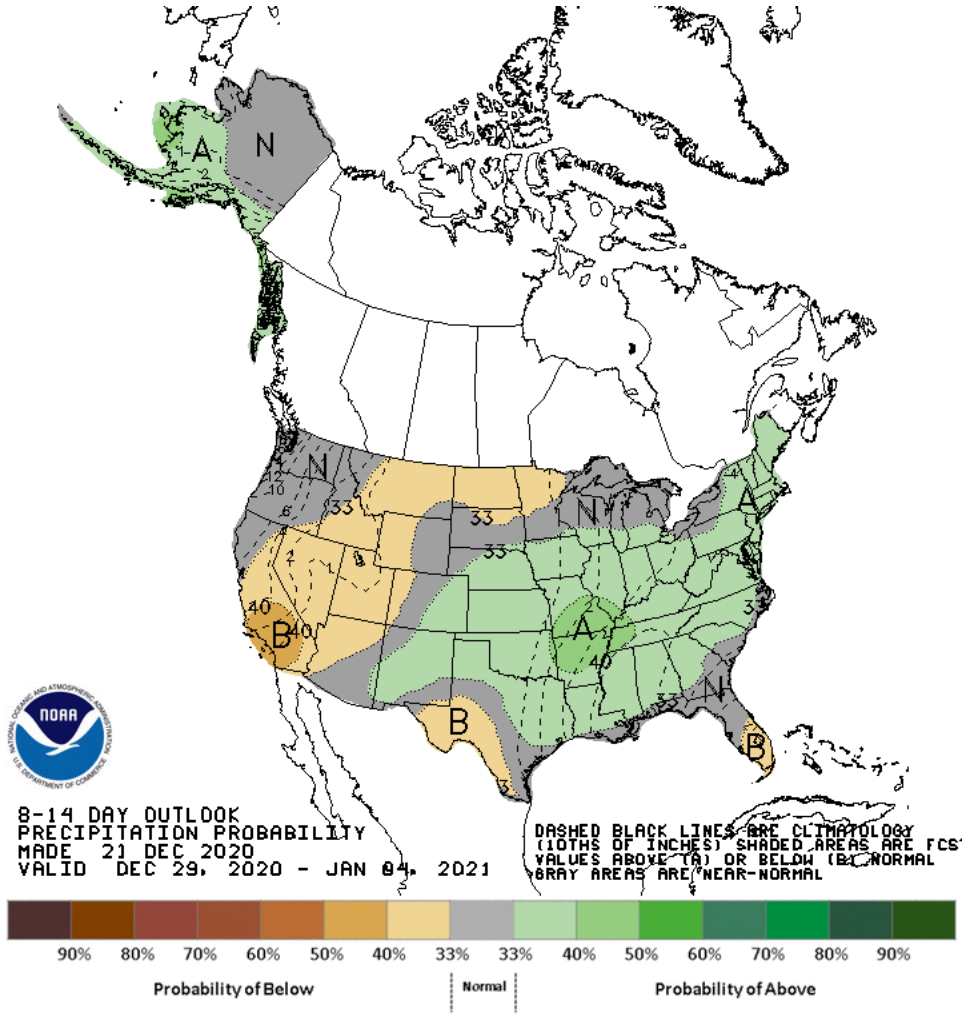




D+11 500 MB ANOMALIES FROM ALZ ENSM
CPC MAP MADE DEC 22 2020 1404 UTC CNTD JAN 02 2021

Week 2 – Temperature and Precipitation





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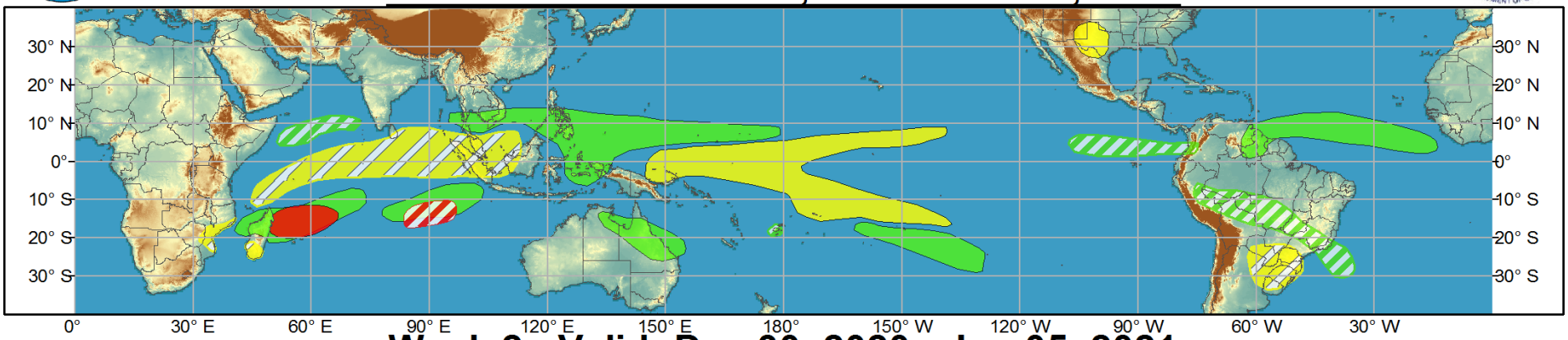

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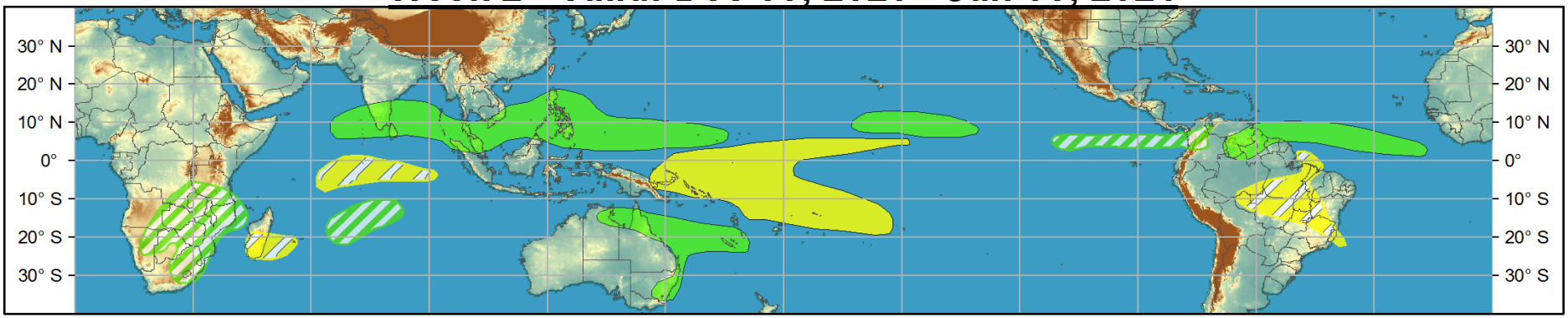

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