



Weeks 2-3 Global Tropics Hazards Outlook

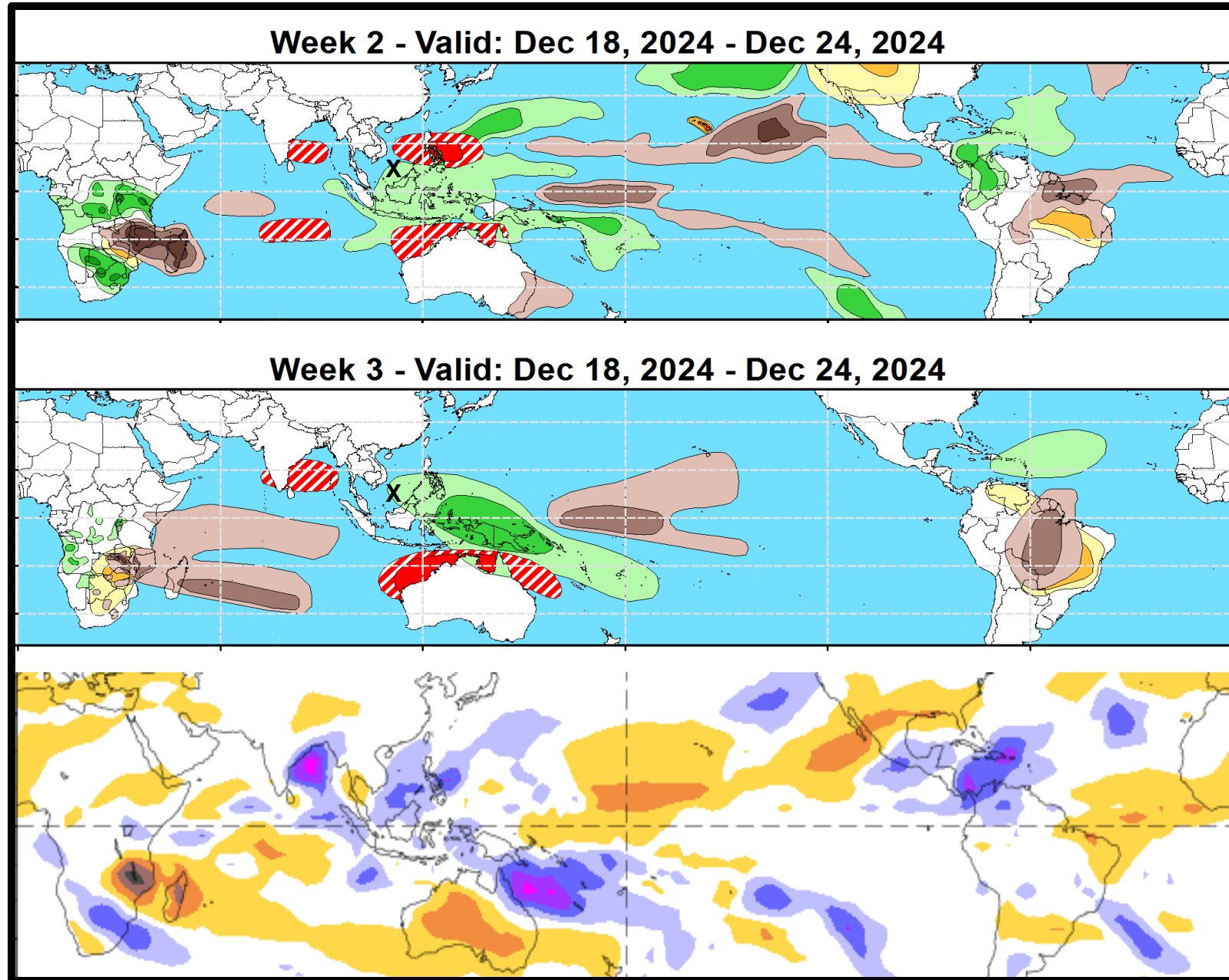
12/24/2024

Adam Allgood

NWS / NCEP / Climate Prediction Center

Outlook Review: TC development & anomalous precipitation during the past week

- TS Pabuk formed on 23 December over the South China Sea.
- Hawaii dryness was well captured in the outlooks, as was wet conditions across the Maritime Continent
- The MJO contributed to enhanced wetness over the Coral Sea



Synopsis of Climate Modes:

ENSO: (Dec 12, 2024Update) *next update on Thursday, Jan 9th*

- ENSO Alert System Status: [La Niña Watch](#)
- La Niña conditions are most likely to emerge in November 2024 - January 2025 (59% chance), with a transition to ENSO-neutral most likely by March-May 2025 (61% chance).

MJO and other subseasonal tropical variability:

- The MJO remains active, with the enhanced convective phase now crossing the Pacific.
- Interference from ENSO, an unusually late peaking –IOD (possibly helped driven by the slowing MJO), and pronounced Rossby wave activity over the Maritime Continent have contributed to slowing the eastward propagation of the MJO considerably over the last few weeks.
- Dynamical model RMM index forecasts show a quick transition across the Pacific, partly in response to Rossby wave activity over the East Pacific constructively interfering with the MJO. During Weeks 2-3, the signal is favored to cross the eastern Pacific and Western Hemisphere, with some ensemble members showing a return to the Indian Ocean.
- Ensemble spread is quite high, and the low frequency state will continue to play a large role in the tropical convective pattern.
- Extratropical teleconnections to MJO favor a pattern change with a –NAO developing and troughing over the eastern US. This pattern change is featured in dynamical model forecasts.

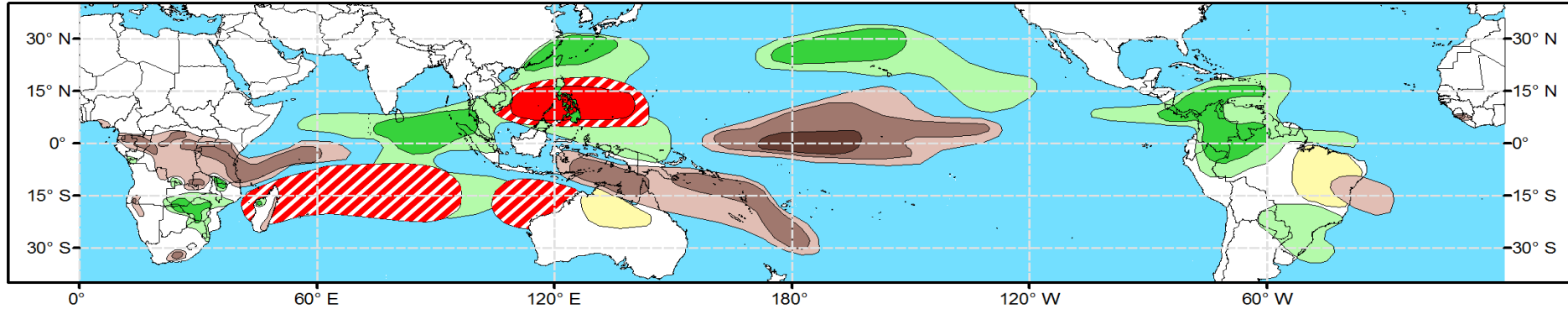
GTH Outlook:



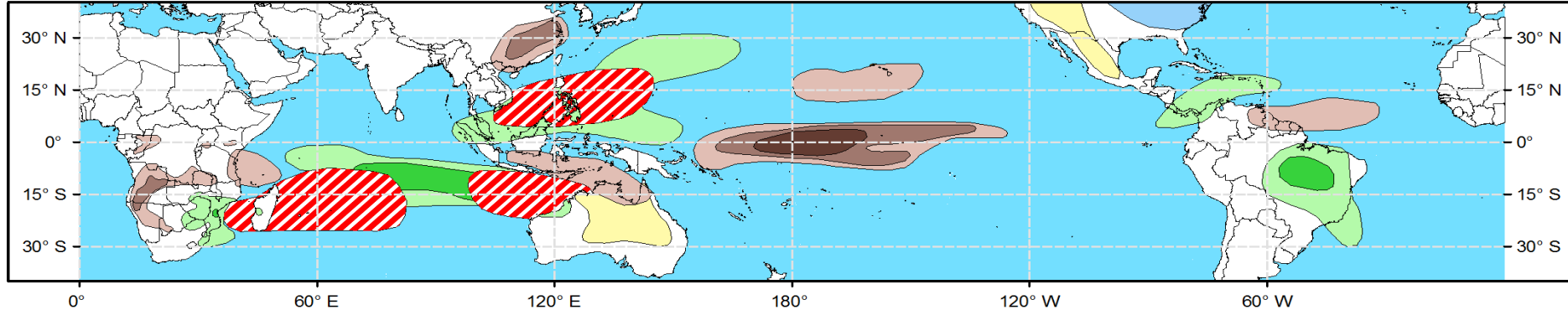
Global Tropics Hazards Outlook Climate Prediction Center



Week 2 - Valid: Jan 01, 2025 - Jan 07, 2025



Week 3 - Valid: Jan 08, 2025 - Jan 14, 2025



**Tropical Cyclone (TC)
Formation Probability**



>20% >40% >60%

*Tropical Depression (TD)
or greater strength*

**Above-Average
Rainfall Probability**



>50% >65% >80%

*Weekly total rainfall in the
Upper third of the historical range*

**Below-Average
Rainfall Probability**



>50% >65% >80%

*Weekly total rainfall in the
Lower third of the historical range*

**Above-Average
Temperatures Probability**



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*7-day max temperatures in the
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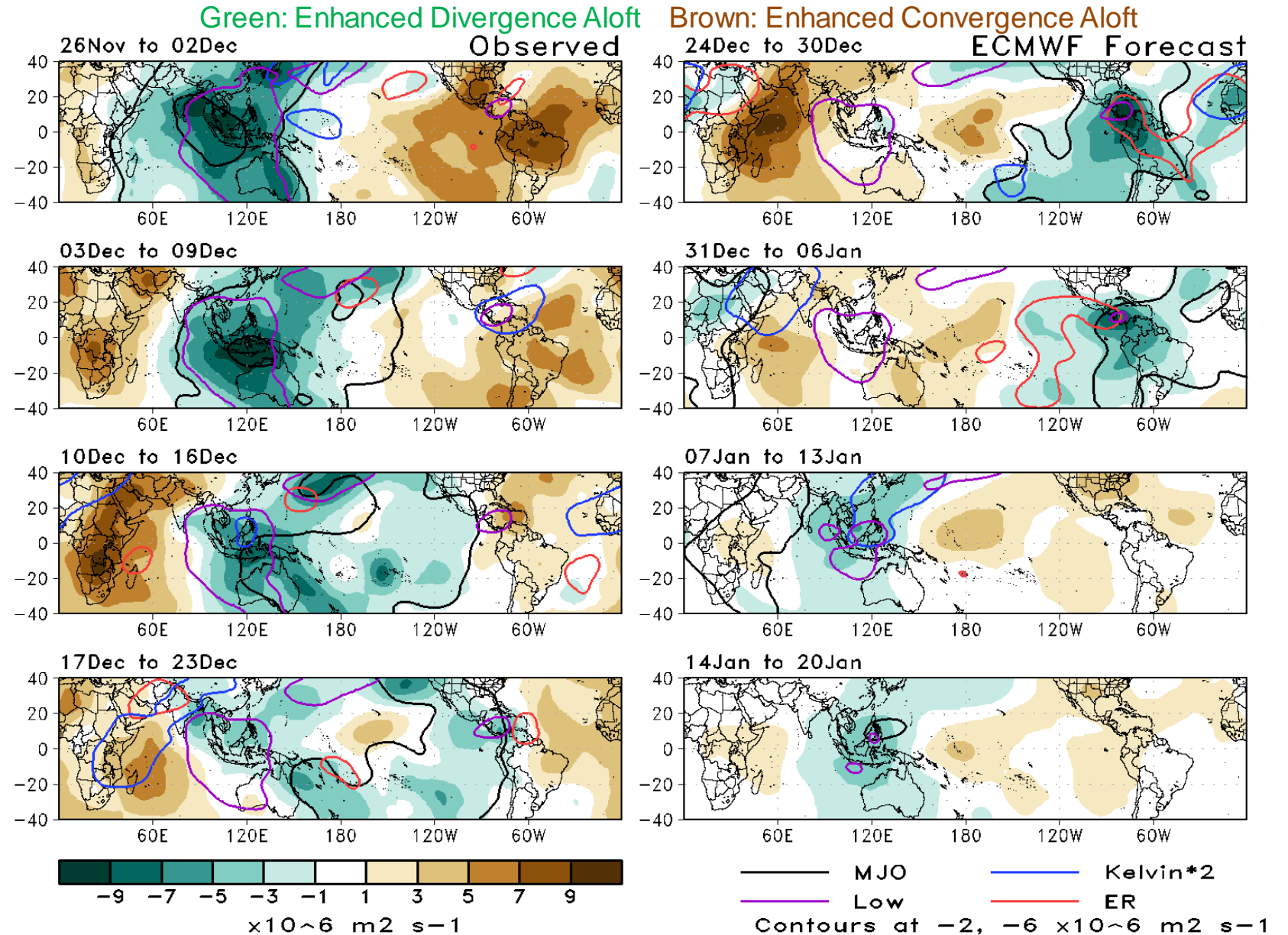
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**Issued: 12/24/2024
Forecaster: Allgood**

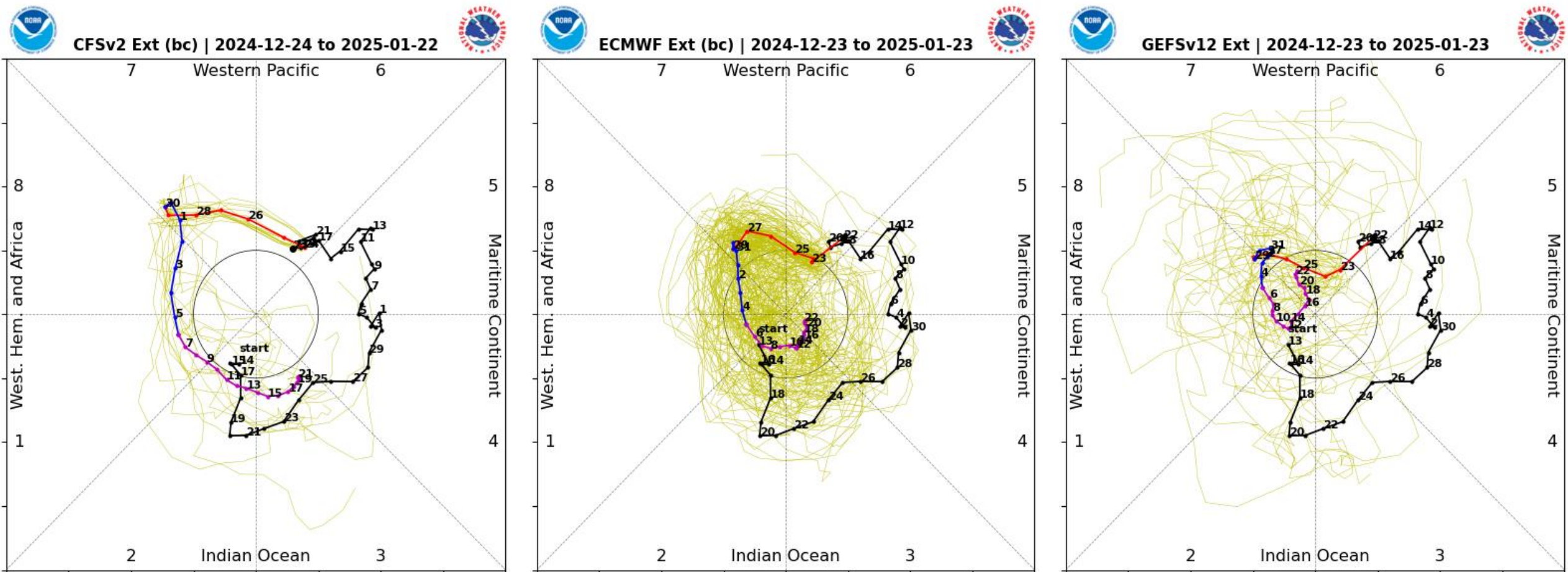
This product is updated once per week and targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

200-hPa Velocity Potential Anomaly Maps:

- During December, the MJO Wave-1 structure persisted, but with a much slower eastward propagation.
- Propagation across the Pacific was observed during mid- to late-December, with an enhanced signal persisting over the MT.
- ECMWF forecasts show a rapid shift to the Western Hemisphere, followed by a weaker signal more reflective of the base state.

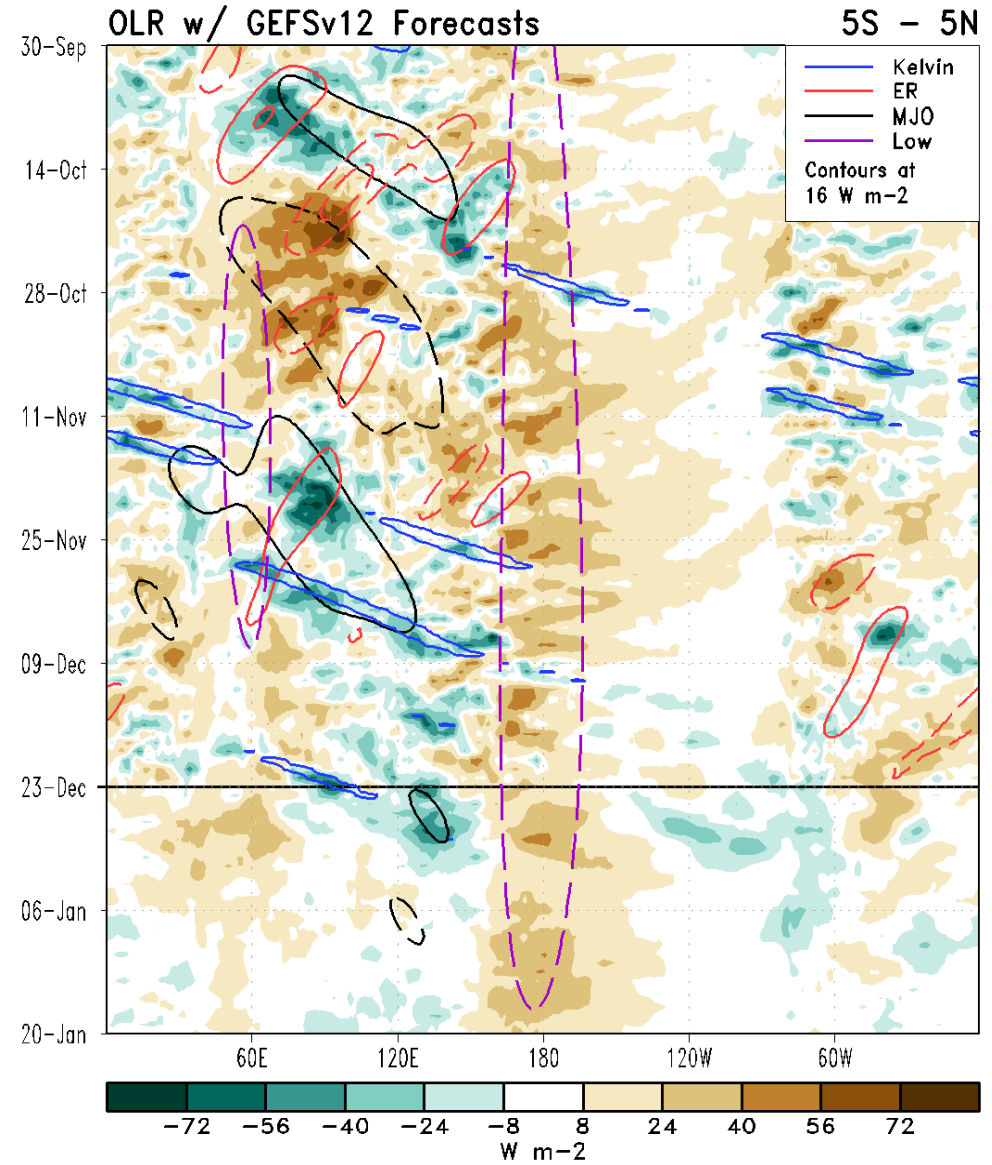
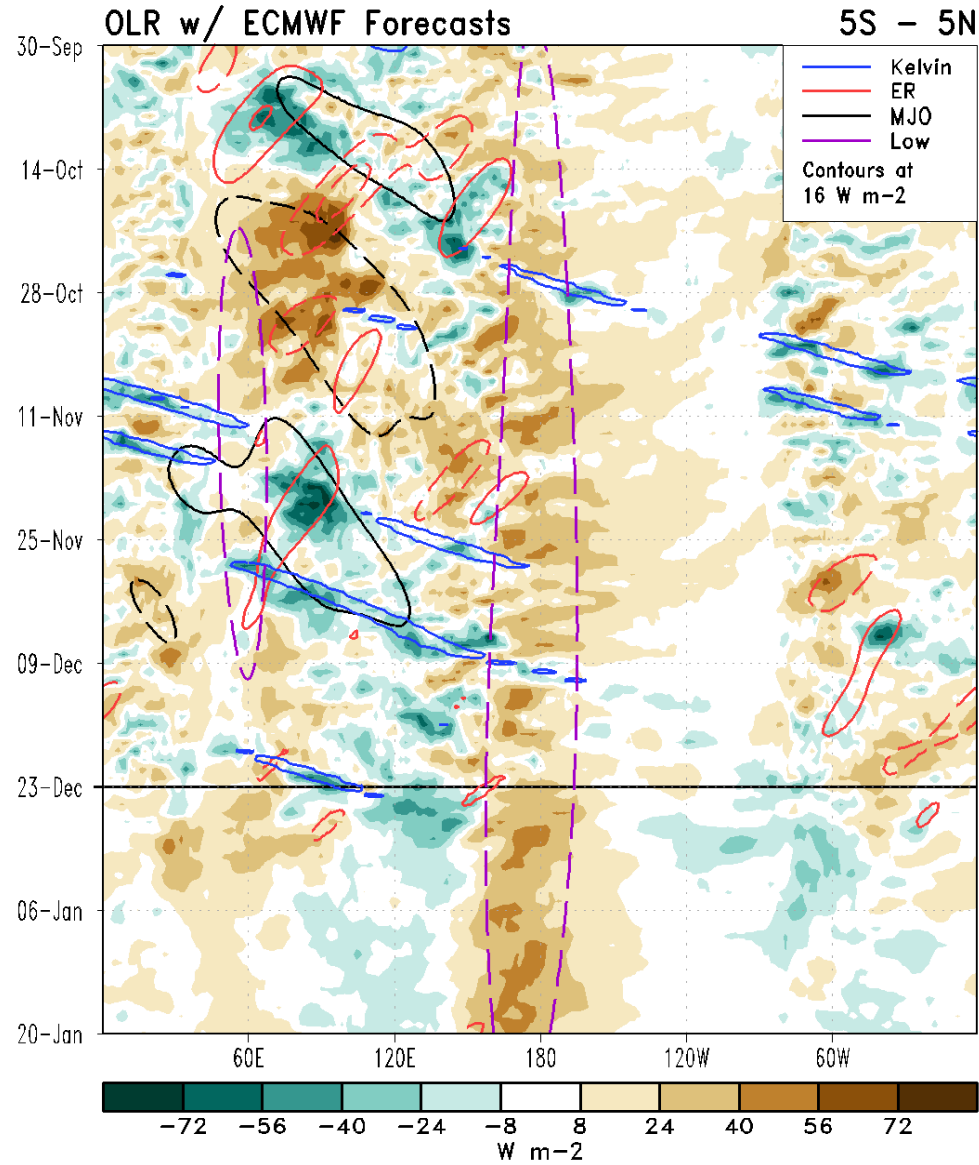


RMM Index Observations & Forecasts:



- CFS – strongest MJO, ECMWF – in the middle, GEFs – weakest signal.
- Many ECMWF ensemble members depict robust MJO activity over the next few weeks, though the majority depict a weakening signal
- GEFs ensemble members are all over the place, with some depicting a return of strong Pacific activity

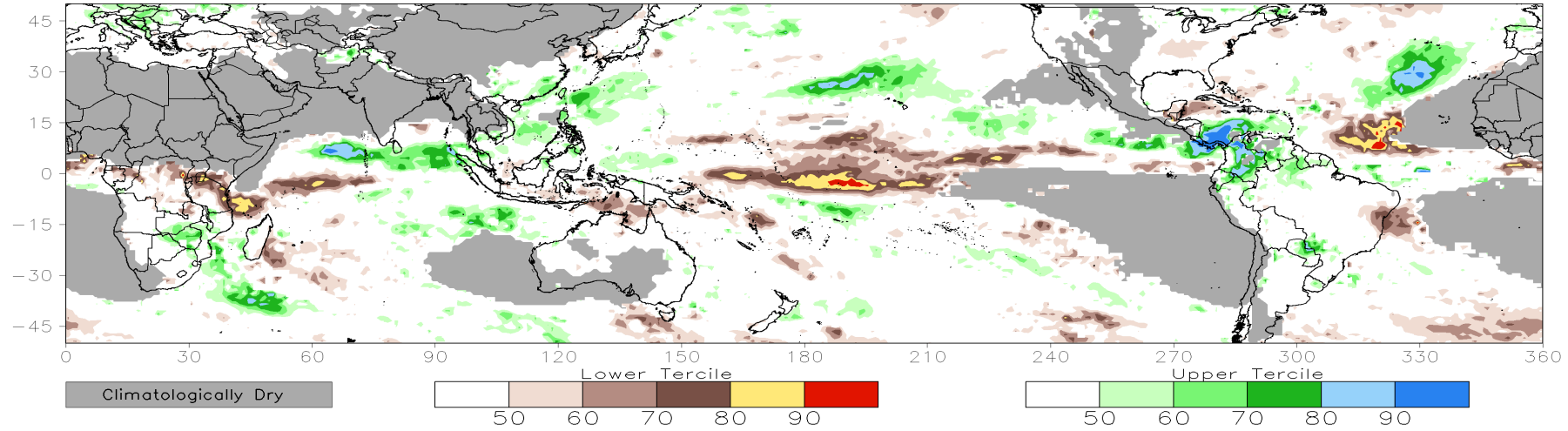
Outgoing Longwave Radiation (OLR) Anomaly Time/Lon Plots:



Consolidated Probabilistic Precipitation: Weeks 2 & 3

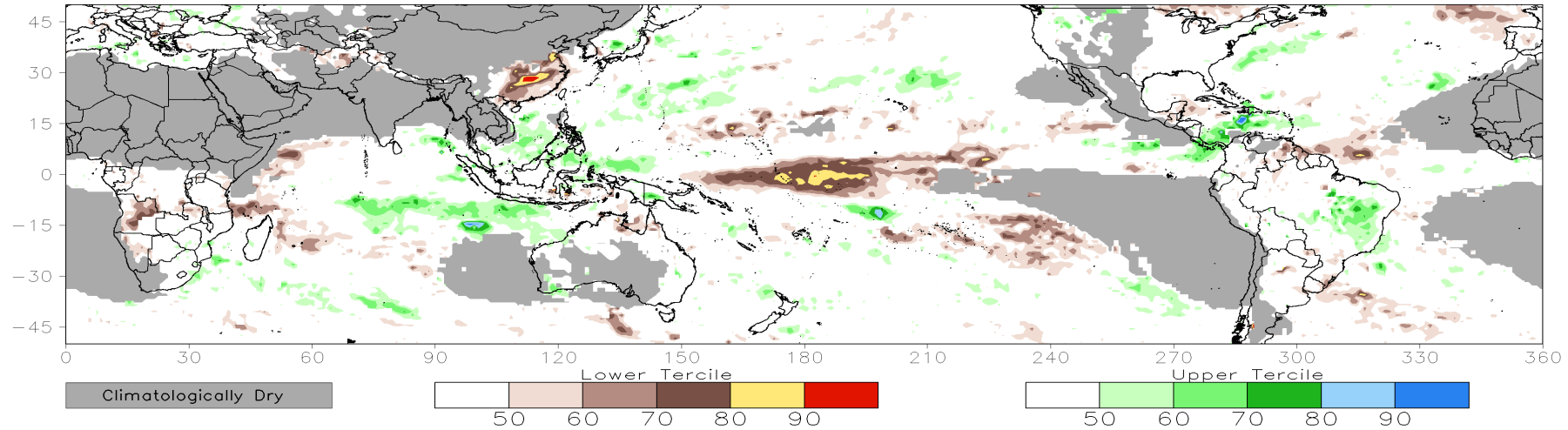
CONS 00z: Week2 Probability for Total Rainfall Below(Above) Lower(Upper) Tercile (%)

Valid: 01Jan2025–07Jan2025



CONS 00z: Week3 Probability for Total Rainfall Below(Above) Lower(Upper) Tercile (%)

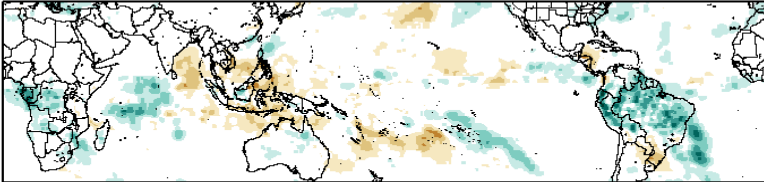
Valid: 08Jan2025–14Jan2025



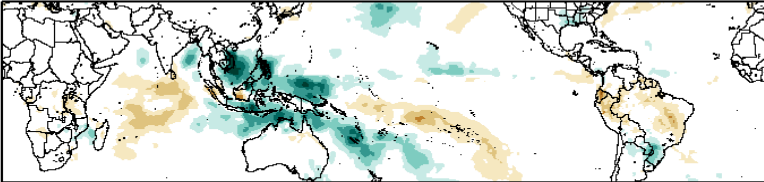
Historical Precipitation Anomalies By MJO Phase:

NDJ MJO Composite: GPCP1DD (mm/day)

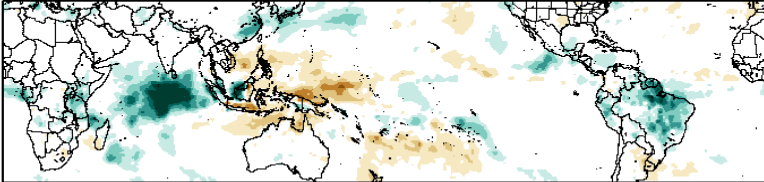
Phase 1



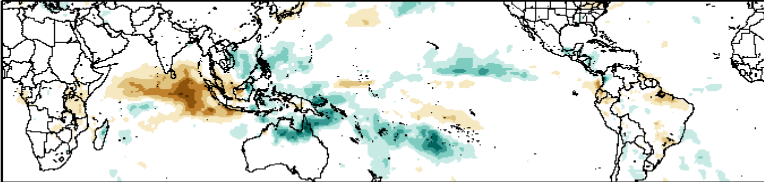
Phase 5



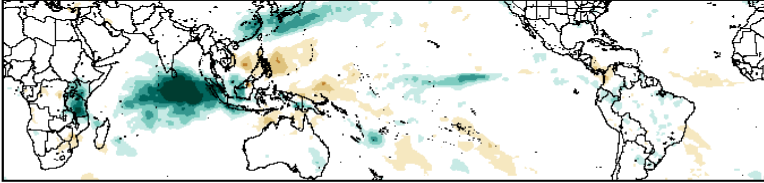
Phase 2



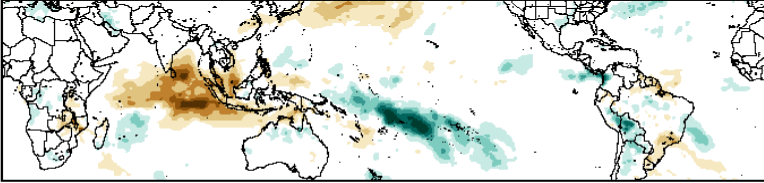
Phase 6



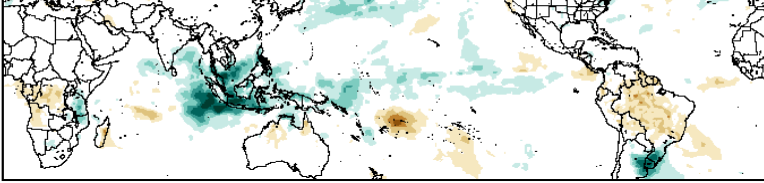
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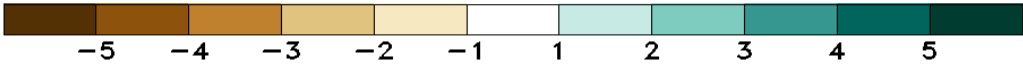
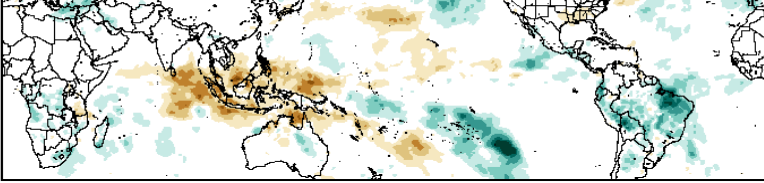
Phase 7



Phase 4

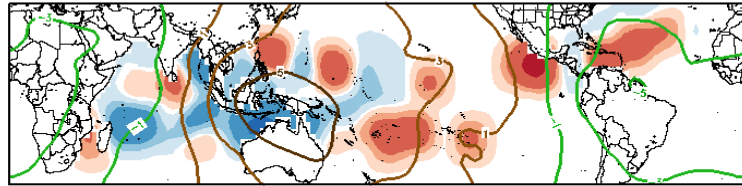


Phase 8

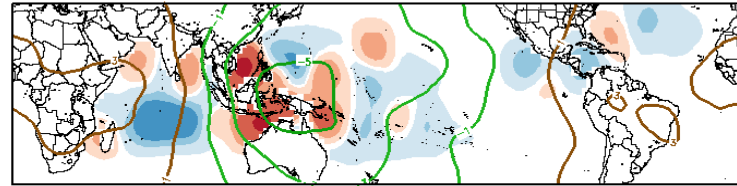


Historical TC Origin Anomalies By MJO Phase & Weeks 2+3 Genesis Climo:

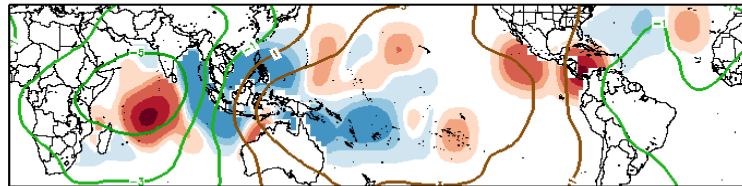
NDJ MJO Composite: Mean TC Origin Density Anomaly ($\#TCs/277km^2*100$)
w/ NDJ CHI200 ($\times 10^6 m^2 s^{-1}$) / Contours every $2 \times 10^6 m^2 s^{-1}$



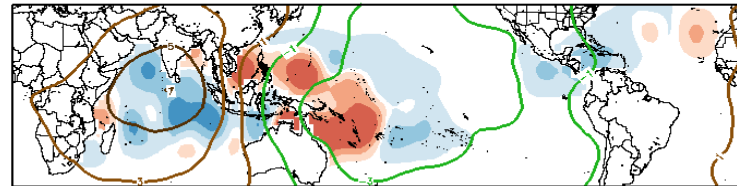
Phase 1



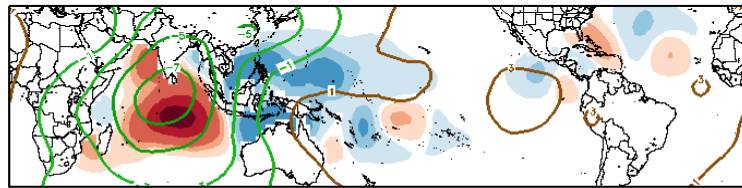
Phase 5



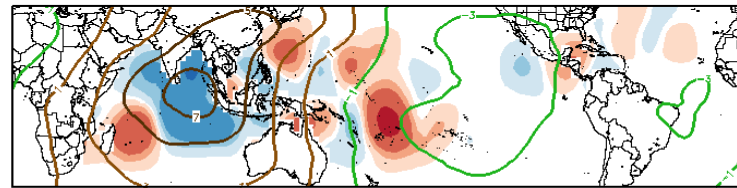
Phase 2



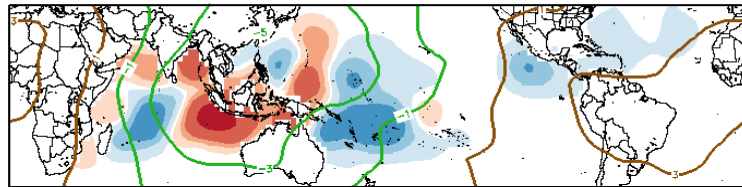
Phase 6



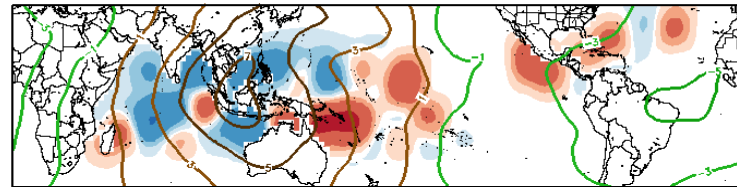
Phase 3



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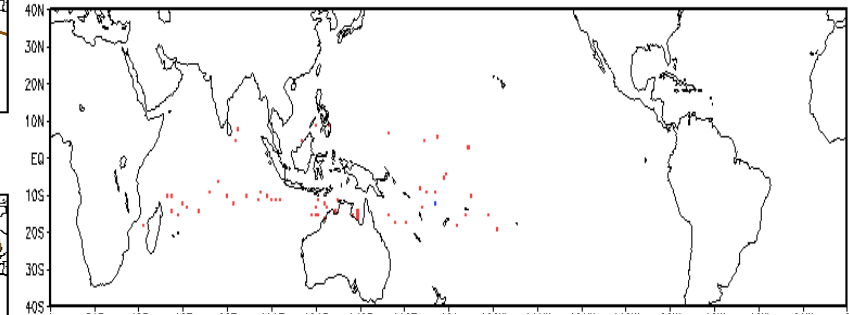


Phase 4

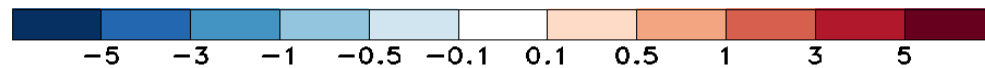
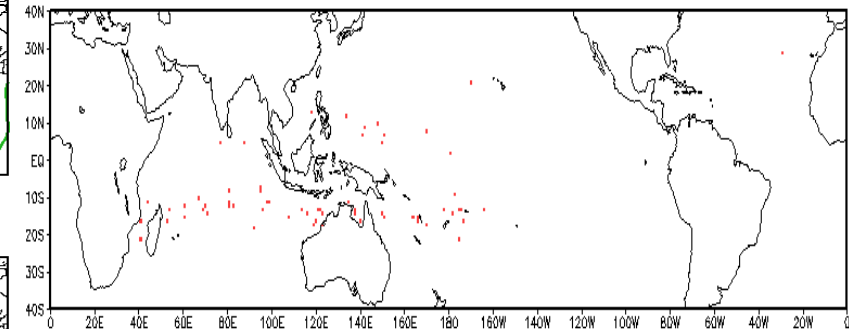


Phase 8

Observed TC Genesis, 1979-2021
7-day Period 0101 to 0107



Observed TC Genesis, 1979-2021
7-day Period 0108 to 0114

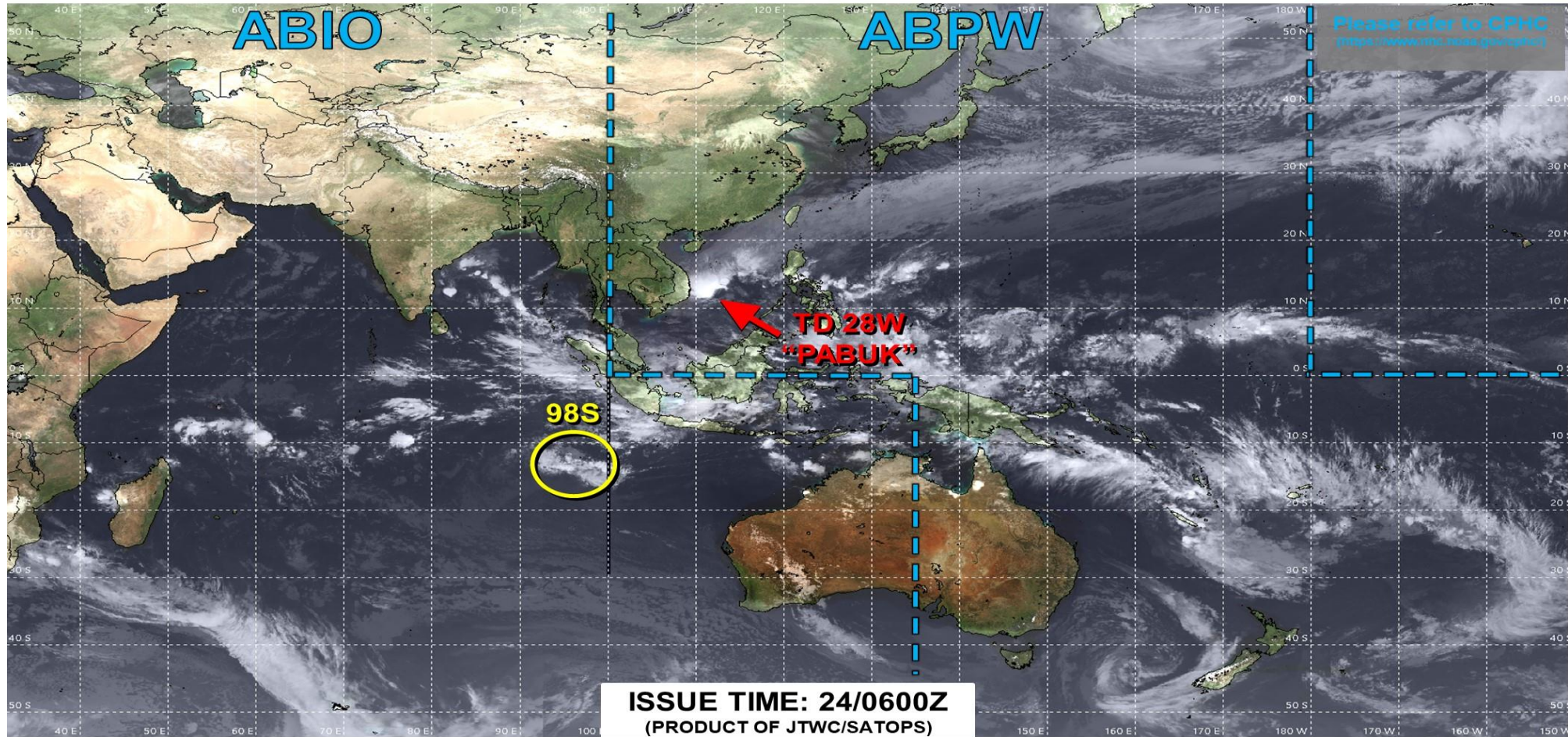


Experimental

Tropical Cyclone Monitoring/Forecast: JTWC



JOINT TYPHOON WARNING CENTER



TC development unlikely within 24 hours



TC development likely, but expected to occur beyond 24 hours



TC development likely within 24 hours (Reference TCFA)



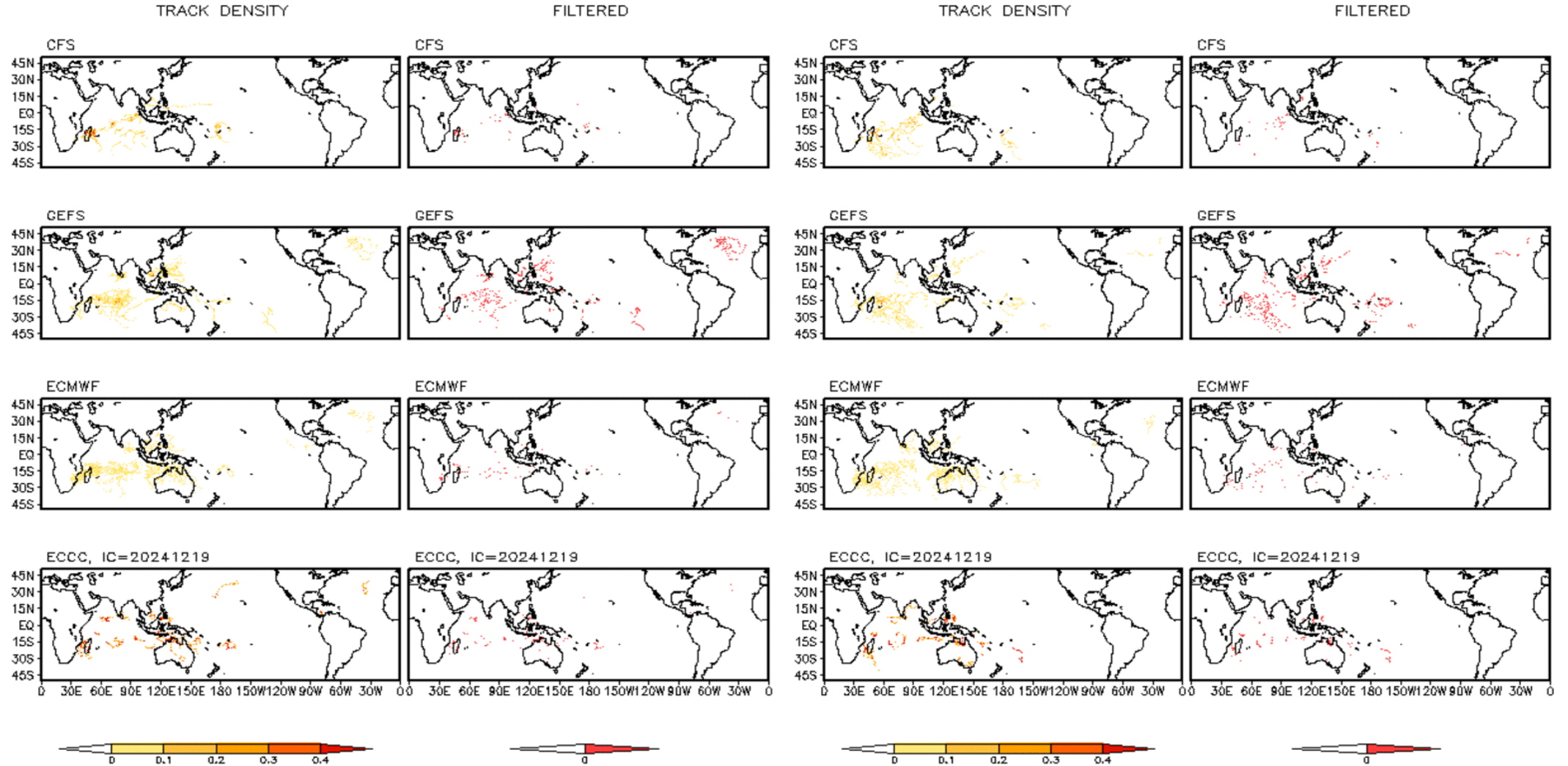
Monitoring for potential transition to TC. Invest label color denotes tropical transition probability

 Tropical Cyclone (Reference Warning)

Multi-Model TC Track Densities: Weeks 2+3

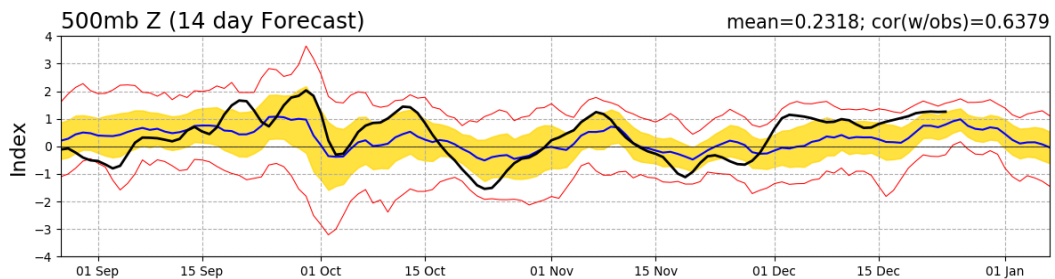
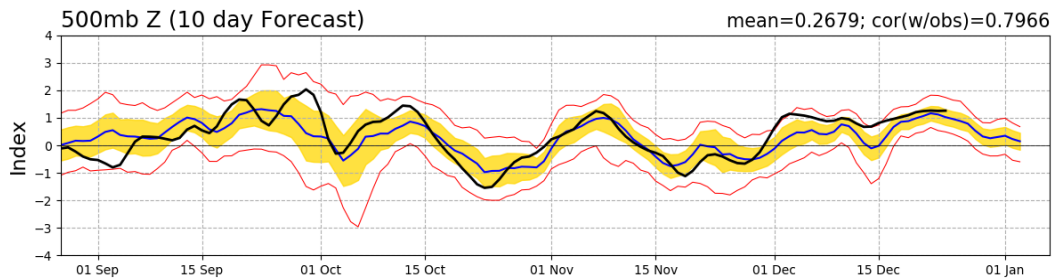
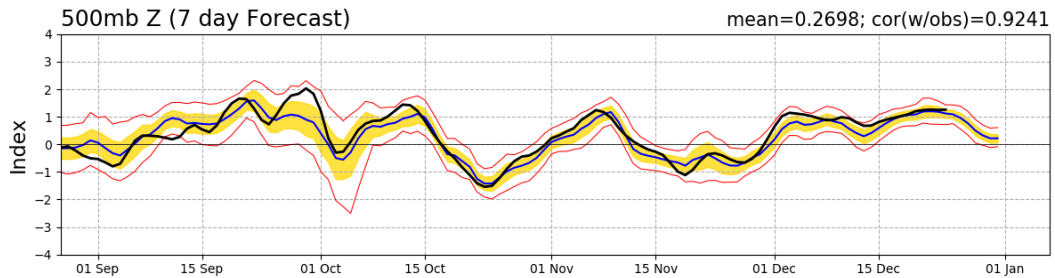
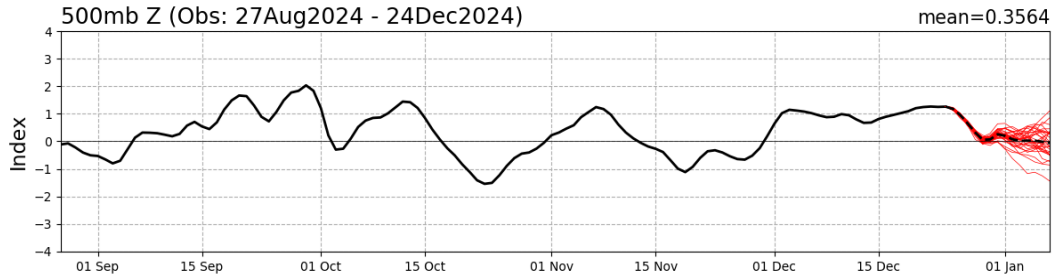
Storm Track Density Distribution, IC=20241223
Week 2 Forecast: 0101-0107

Storm Track Density Distribution, IC=20241223
Week 3 Forecast: 0108-0114

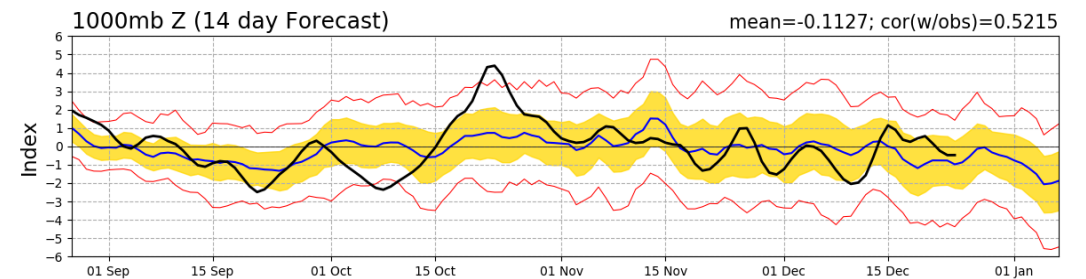
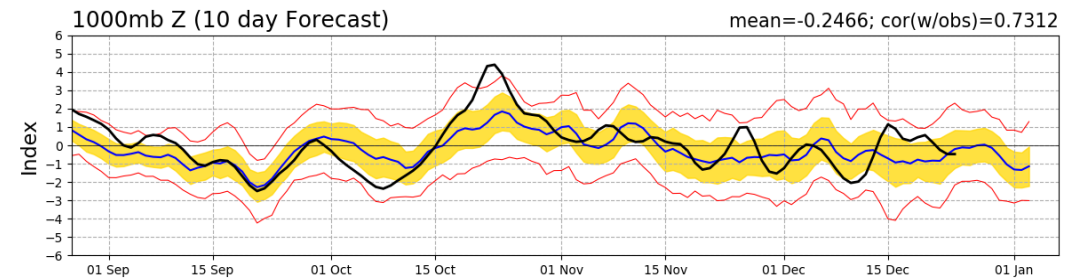
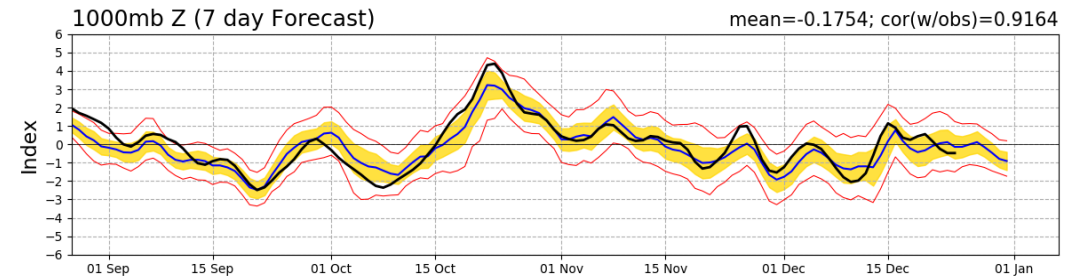
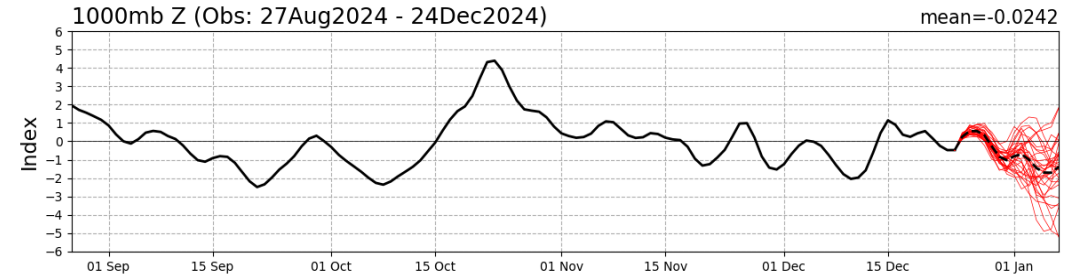


Teleconnection Indices: PNA / AO:

PNA Index: Observed & GEFS Forecasts

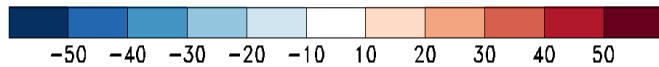
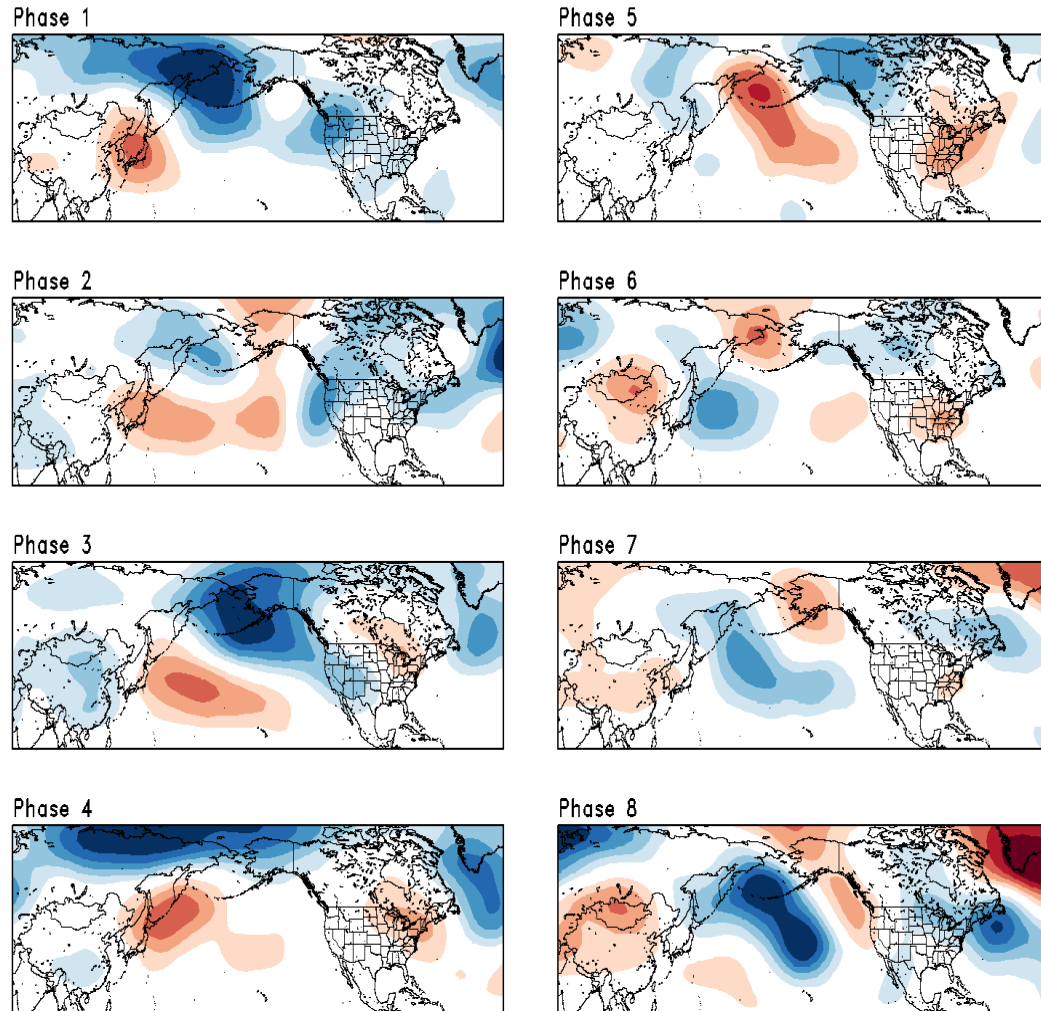


AO Index: Observed & GEFS Forecasts

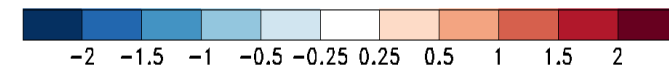
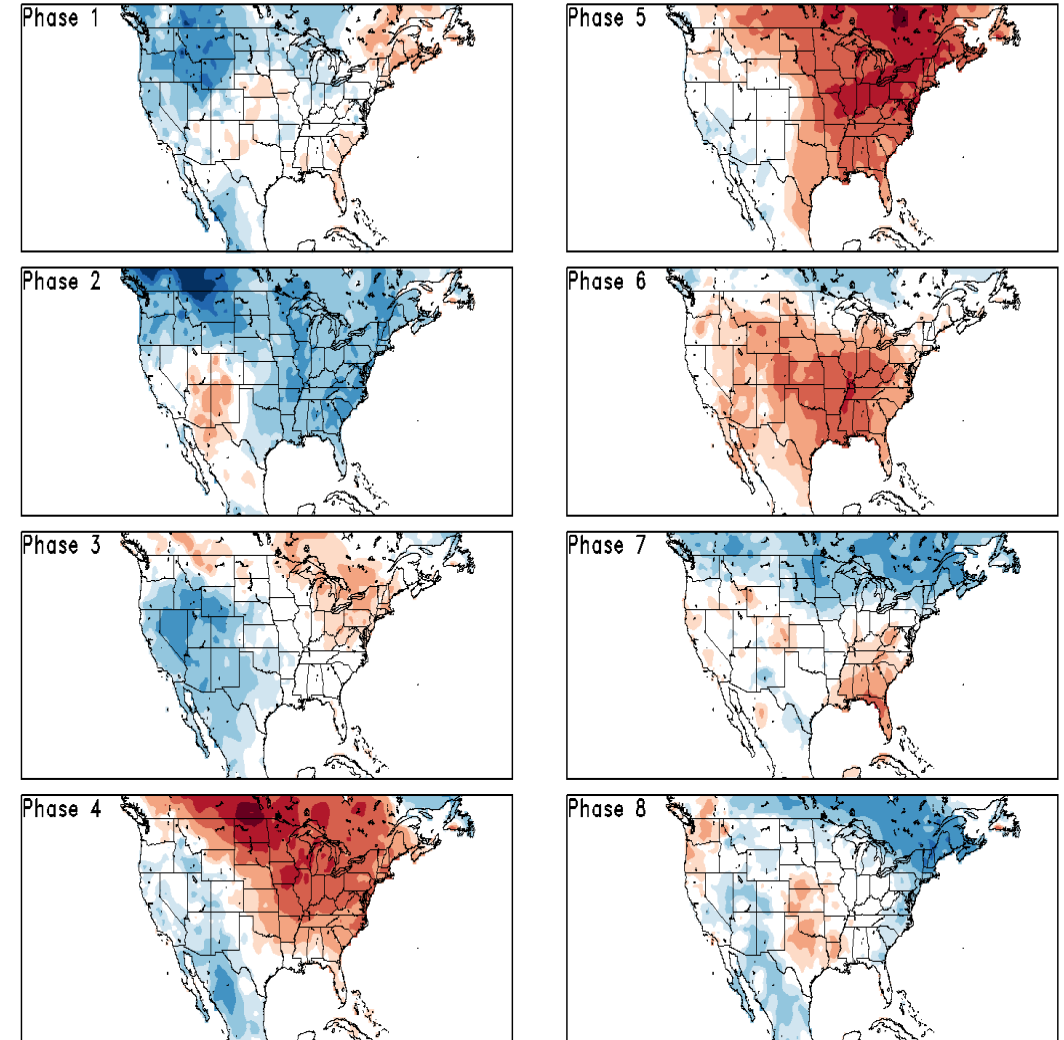


Historical 500-hPa Height & U.S. Temperatures By MJO Phase:

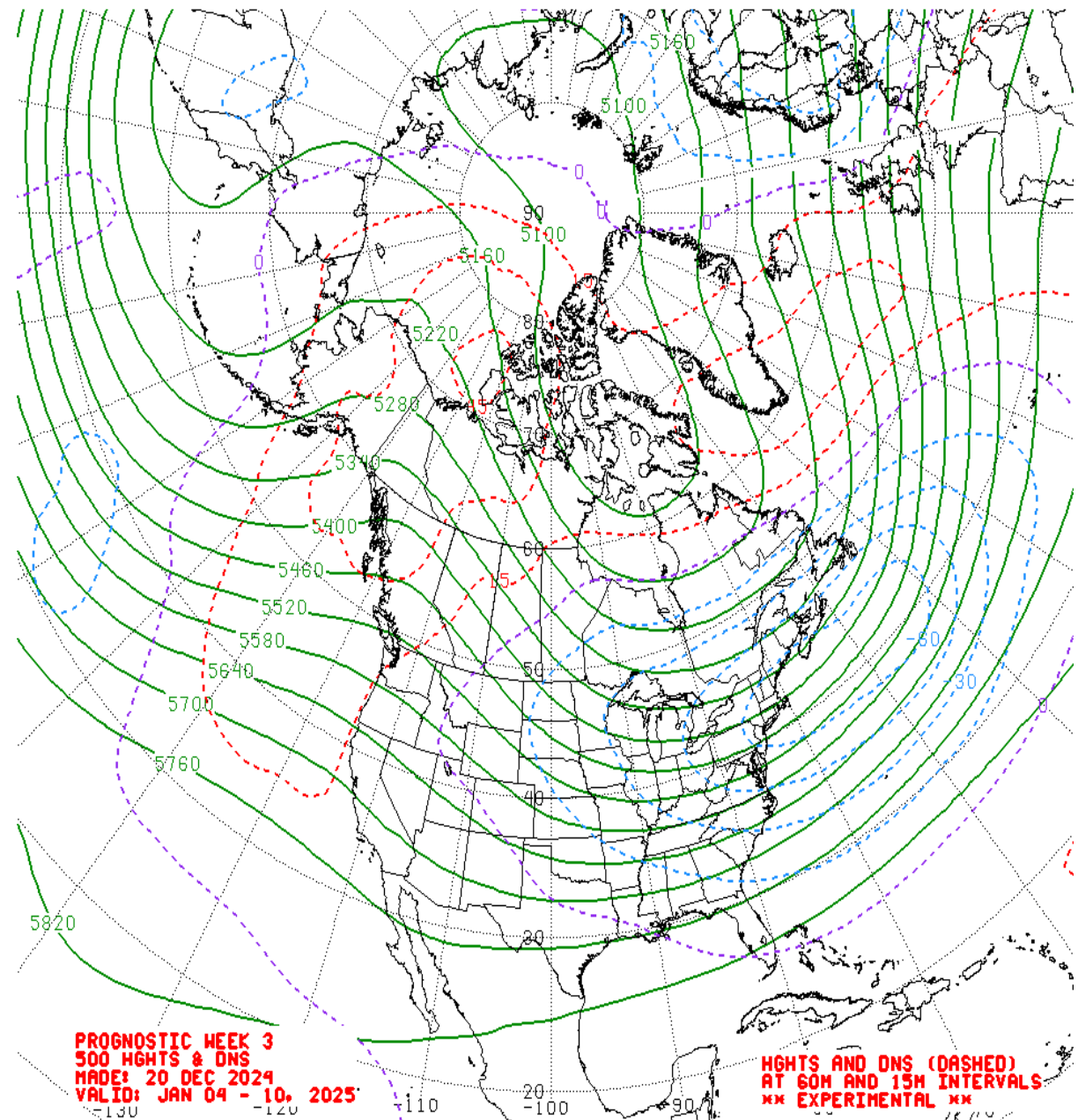
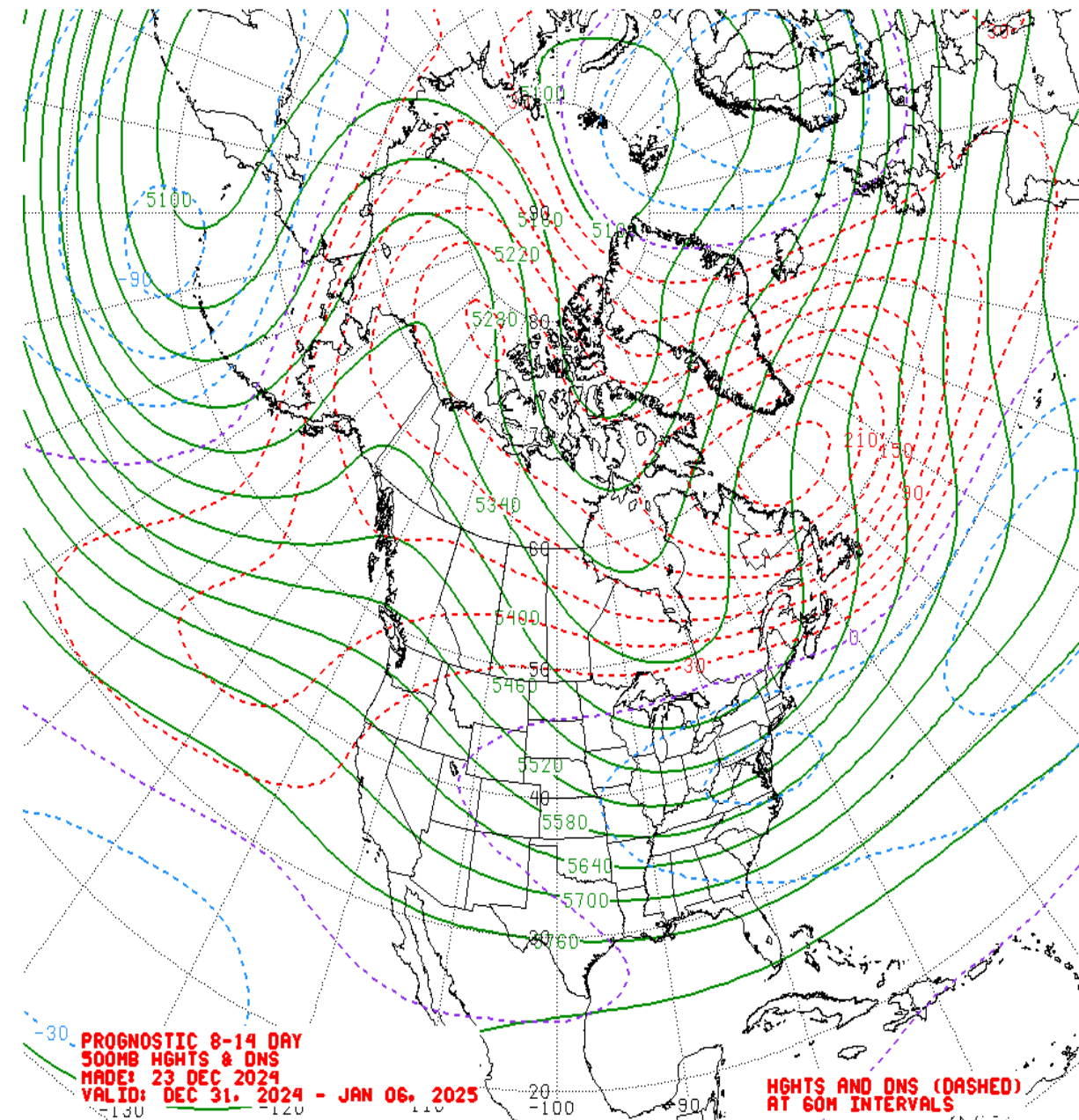
NDJ MJO Composite: CDAS 500-hPa Height (m)



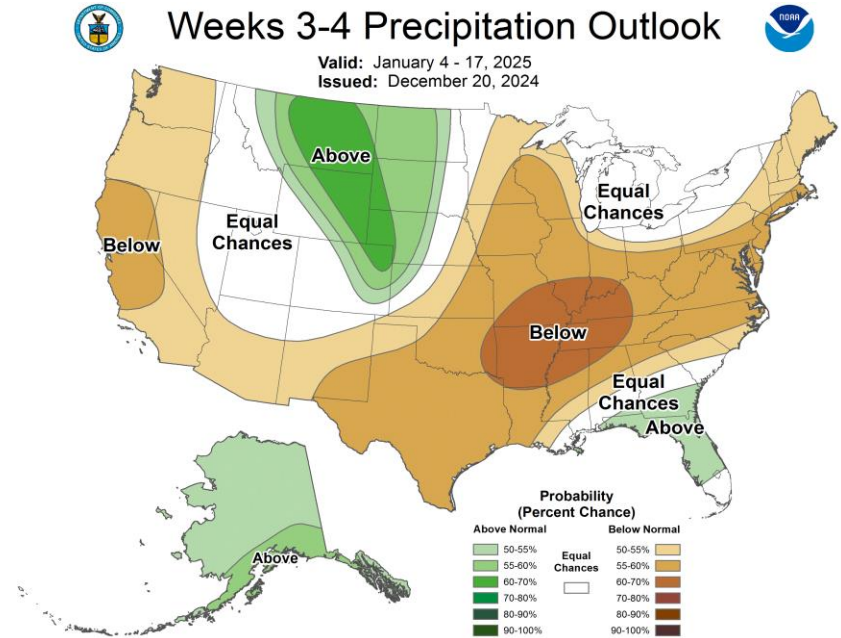
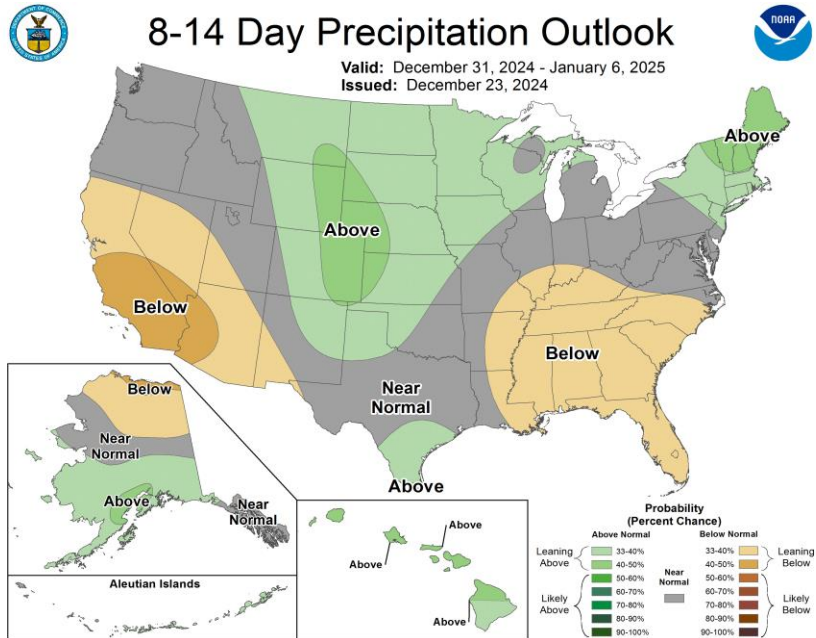
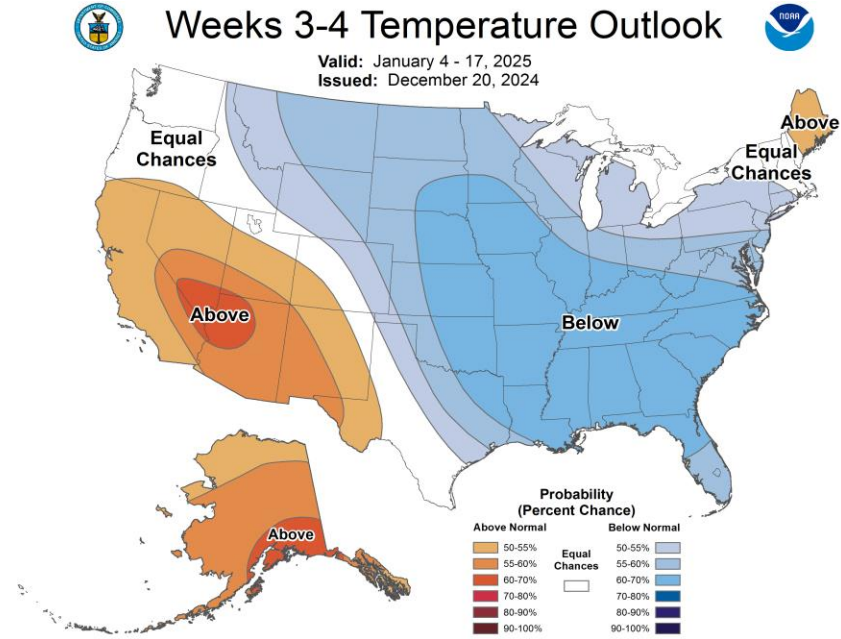
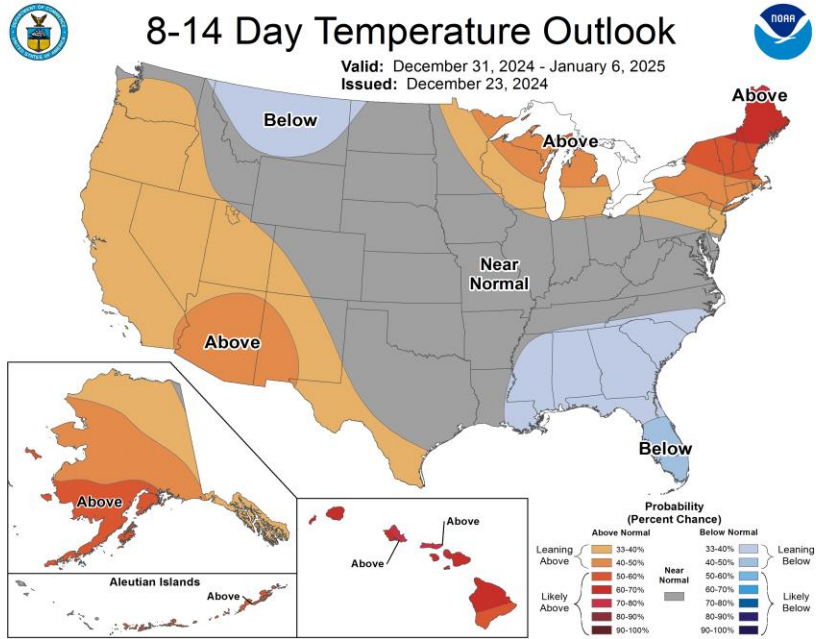
NDJ MJO Composite: GLBT (degC)



Mean 500-hPa Height Anomaly Forecasts: Weeks 2+3



Official Temperature & Precipitation Forecasts:



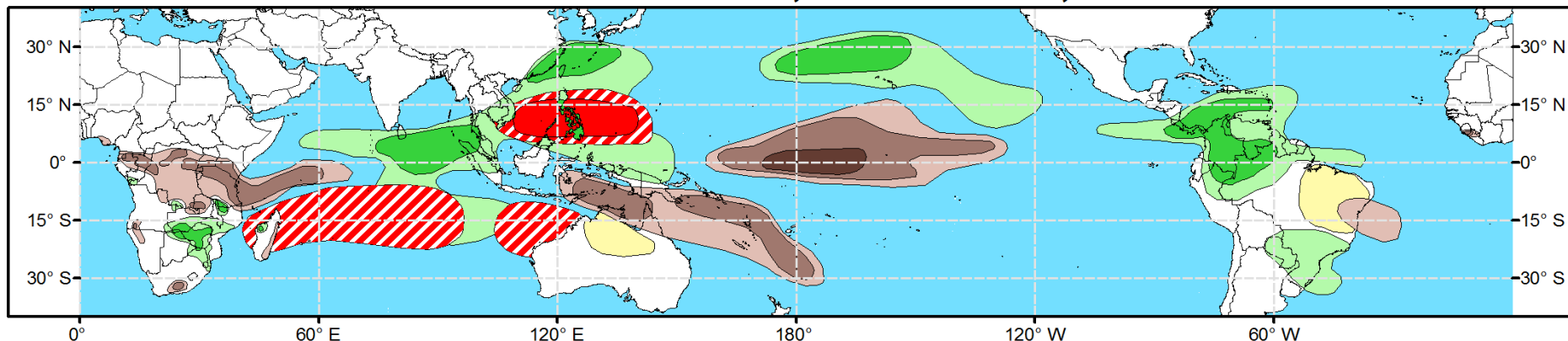


Global Tropics Hazards Outlook

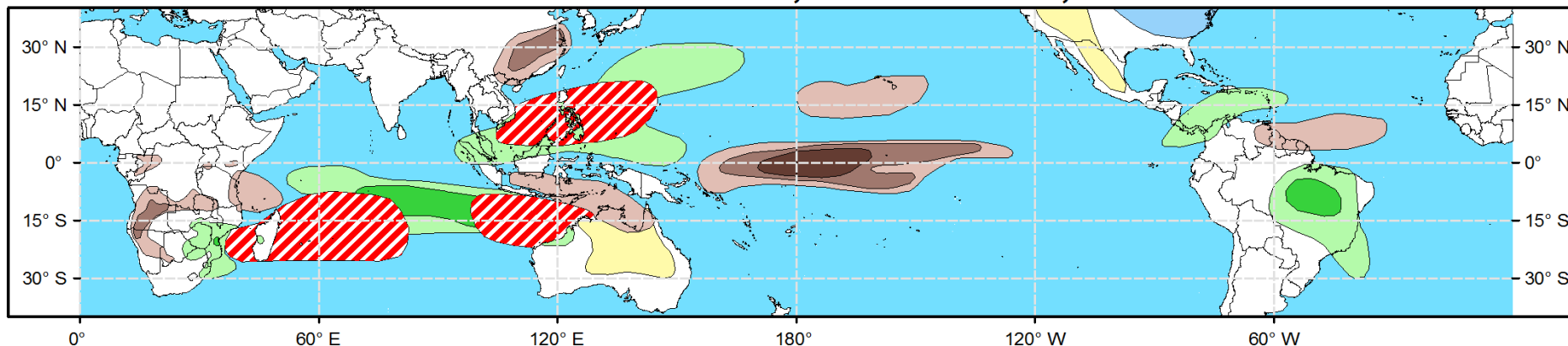
Climate Prediction Center



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