



Weeks 2-3 Global Tropics Hazards Outlook

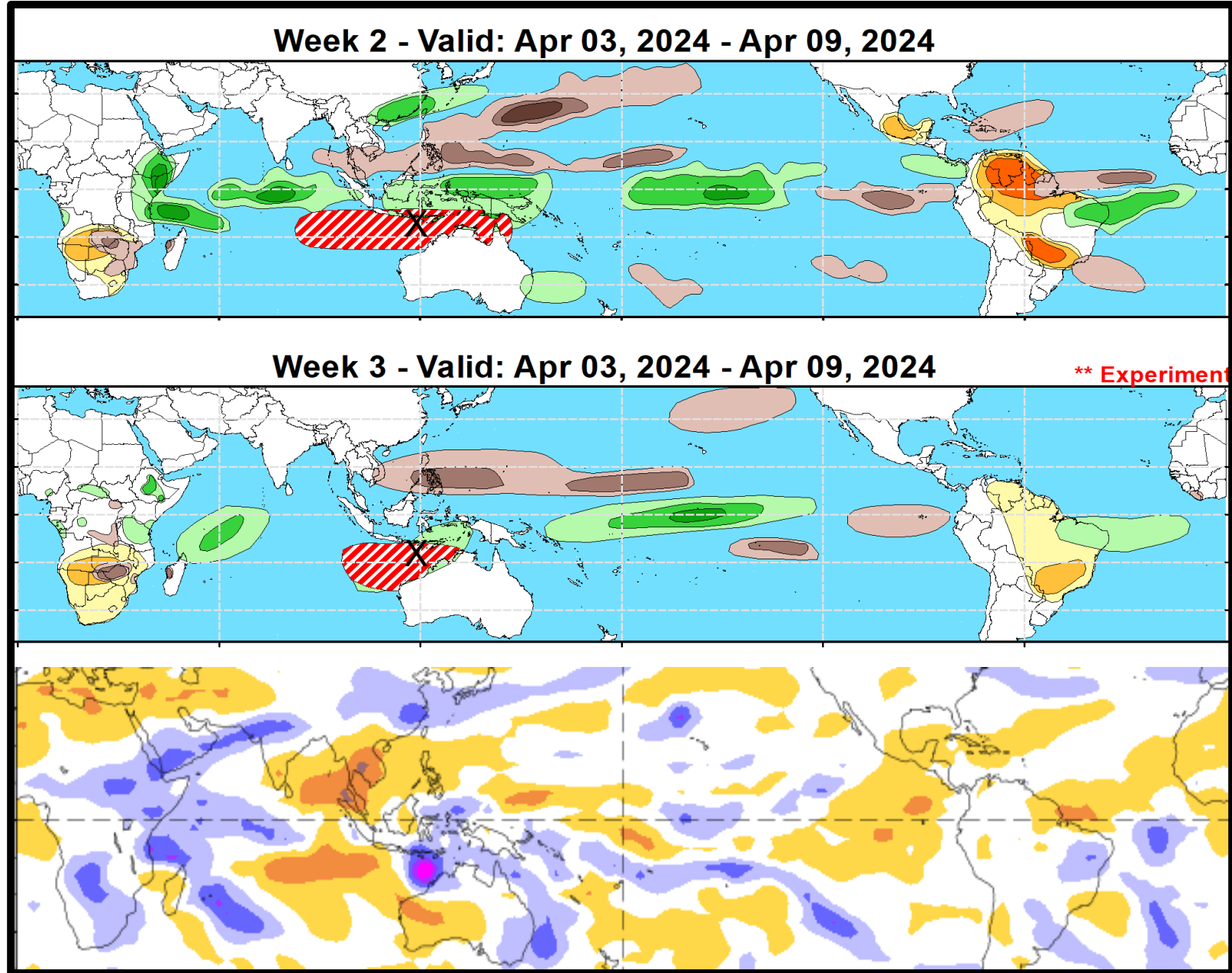
4/9/2023

Nick Novella

NWS / NCEP / Climate Prediction Center

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

- SE IO: Olga (4/5)



Synopsis of Climate Modes:

ENSO: (Mar 14, 2024 Update) *next update on Thursday, Apr 11th*

- ENSO Alert System Status: [El Niño Advisory](#) / [La Niña Watch](#)
- A transition from El Niño to ENSO-neutral is likely by April-June 2024 (83% chance), with odds of La Niña developing by June-August (62% chance).

MJO and other subseasonal tropical variability:

- RMM observations depict a much weaker and slowed MJO signal since late March, but has continued to propagate eastward across the Indian Ocean and into the Maritime Continent during the past week.
- RMM forecasts generally favor much less organized MJO activity through the end of April. This weakening appears tied to destructive interference with a developing low frequency response in the eastern Hemisphere that resembles a positive Indian Ocean Dipole reemerging. While there is some support for the MJO maintaining some coherence as reaches the western Pacific, there is overall more uncertainty in the outlook.
- Constructive interference between an equatorial Rossby wave and the MJO over the Maritime Continent increases chances for tropical cyclogenesis north of Australia during week-2. Beyond this time, there is reduced outlook confidence for tropical cyclone development given climatology and uncertainty with MJO.

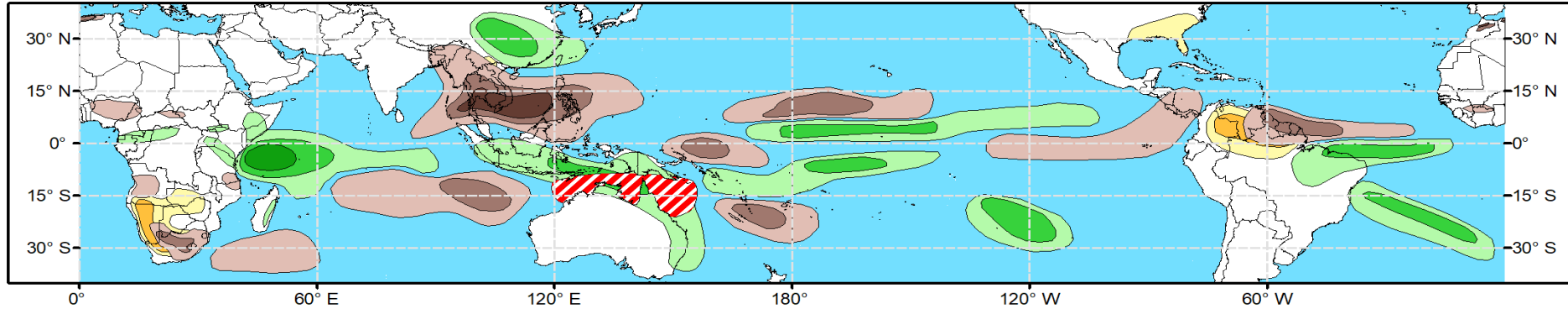
GTH Outlook:



Global Tropics Hazards Outlook Climate Prediction Center

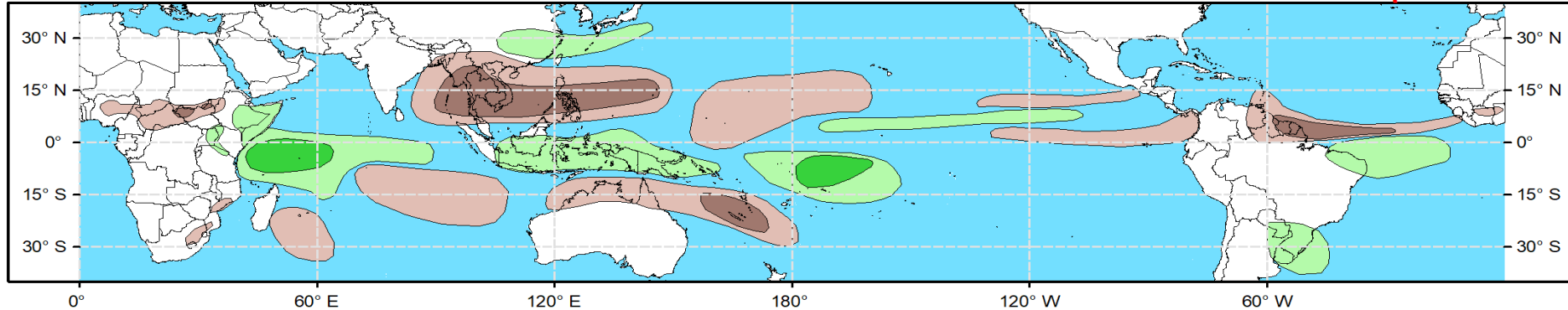


Week 2 - Valid: Apr 17, 2024 - Apr 23, 2024



Week 3 - Valid: Apr 24, 2024 - Apr 30, 2024

**** Experimental ****



**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**



>50% >65% >80%

7-day max temperatures in the
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**Below-Average
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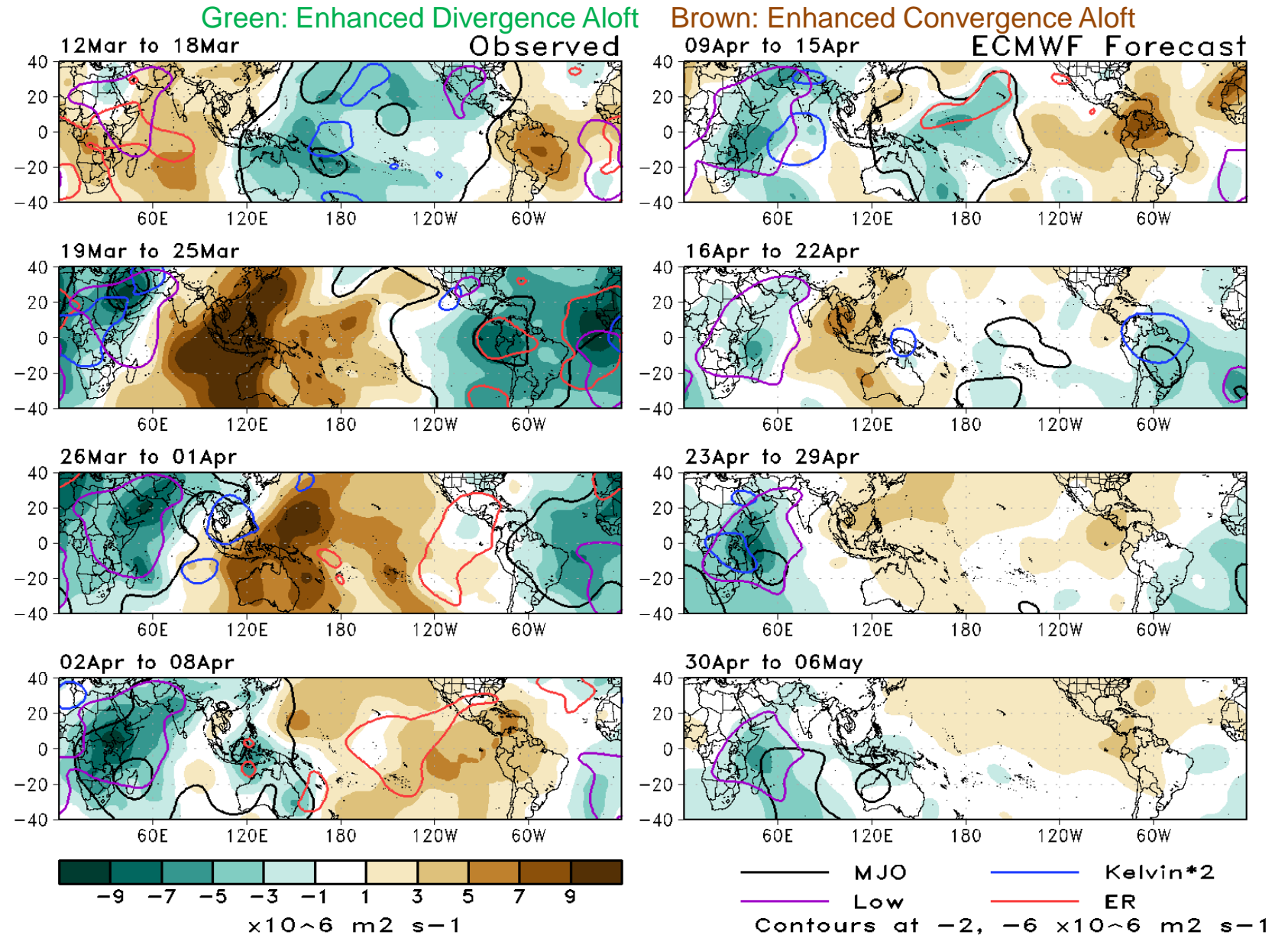
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**Issued: 04/09/2024
Forecaster: Novella**

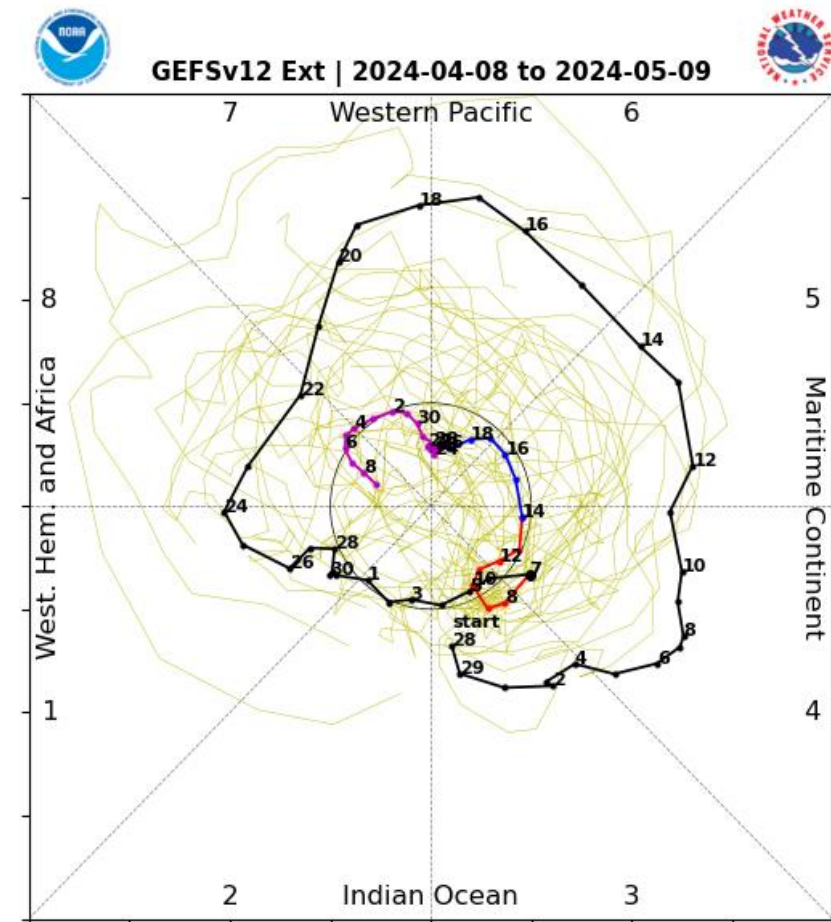
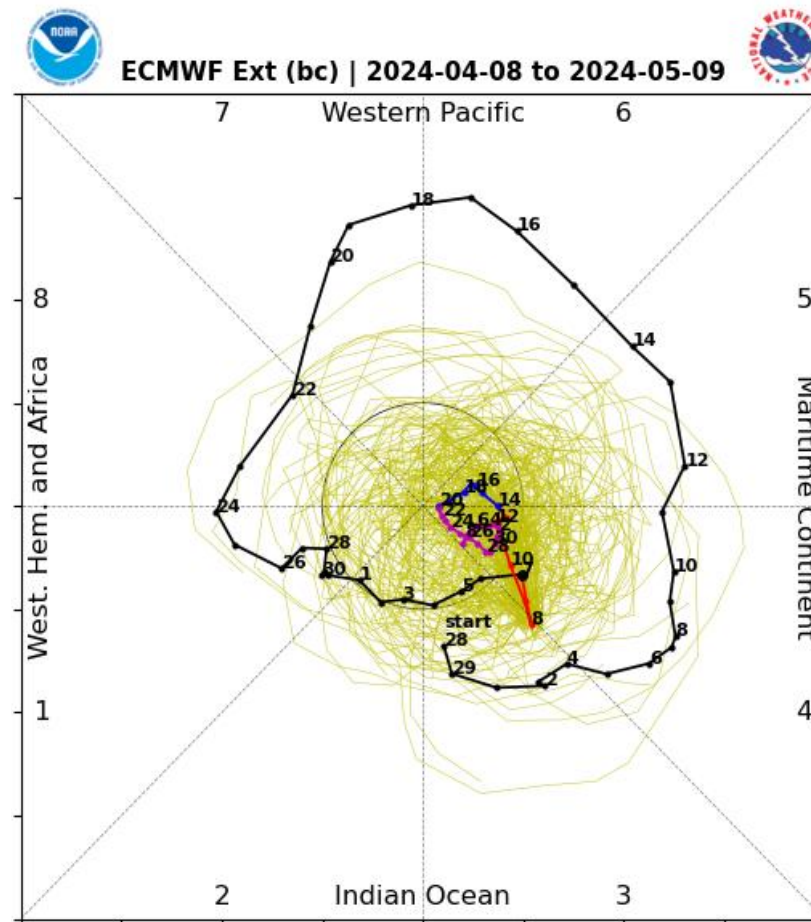
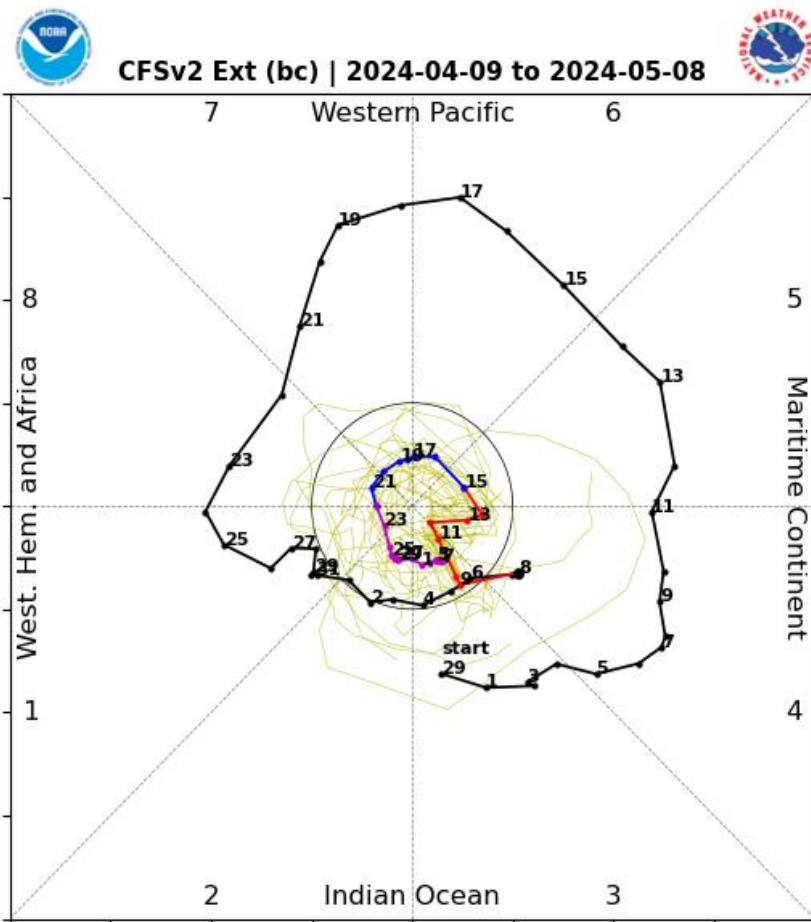
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200-hPa Velocity Potential Anomaly Maps:

- A wave-1 pattern is evident in the latest observations with **Rossby** wave activity likely playing a role in the weakening RMM obs.
- During week-1, the same **Rossby** wave is favored to shift westward and constructively interfere with the **MJO** over the Maritime Continent.
- There is a separation of the main enhanced divergence envelope, with one shifting across the Maritime Continent and the western Pacific (**MJO**), and the another remaining fixed over Africa and the western Indian Ocean associated with **Low Frequency** variability that persists through the filtering into early May.

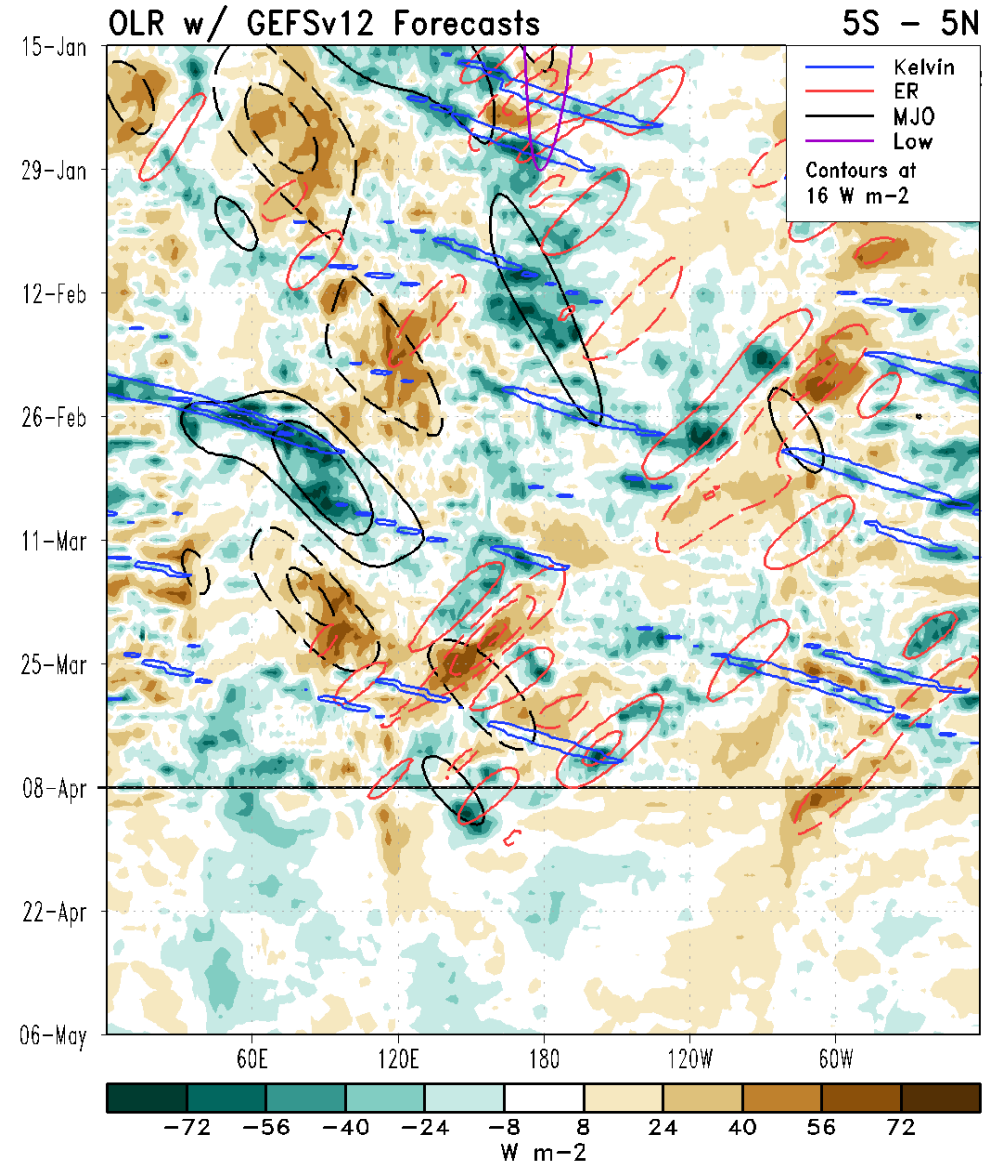
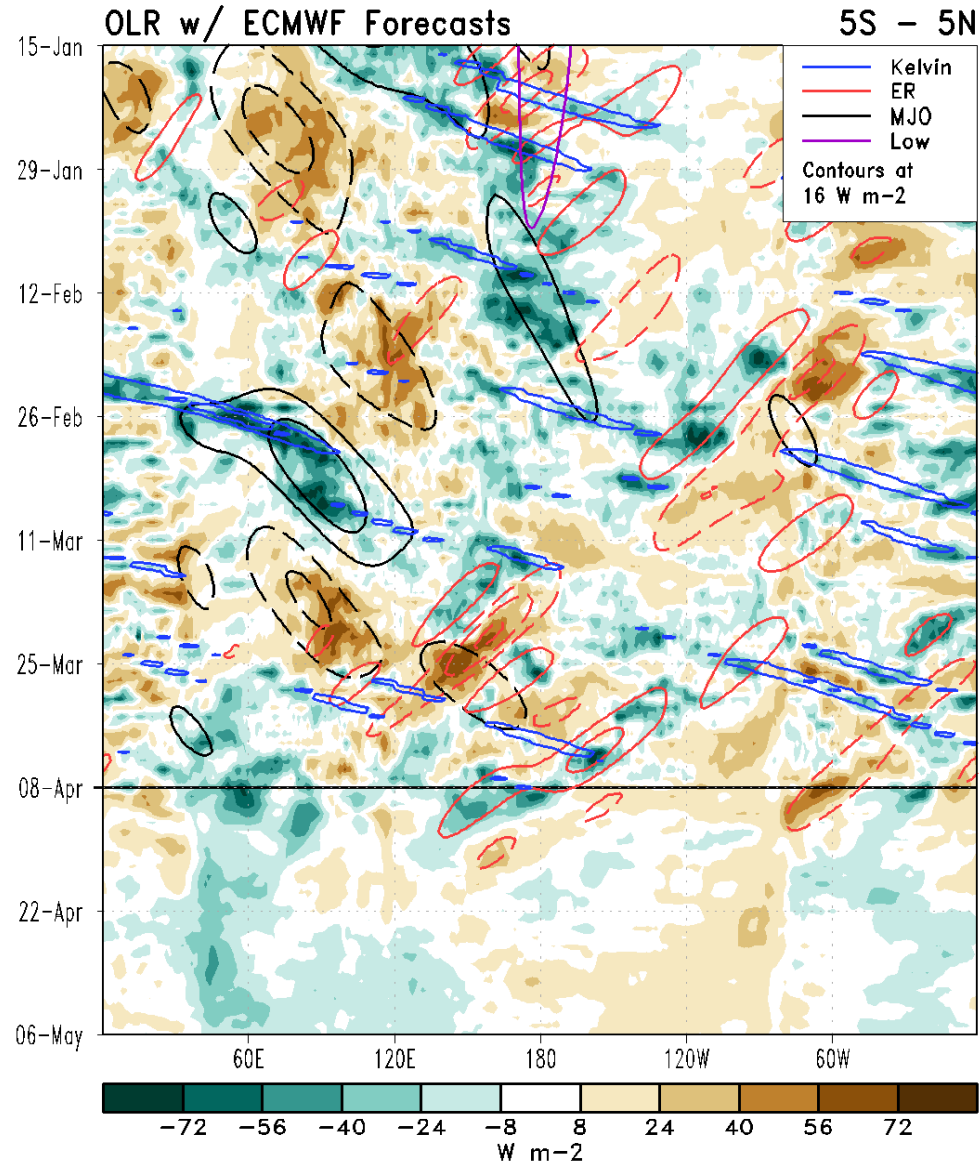


RMM Index Observations & Forecasts:



- A weakened MJO is generally favored in the RMM forecasts, though some ensemble members favor continued eastward propagation at a higher amplitude into the western Pacific
- With the MJO propagating into the western Pacific, its suppressed phase overspreading the Indian Ocean is likely to destructively interfere with the low frequency convective footprint that has emerged in the basin, which may help explain the low amplitude, weakened forecasts.

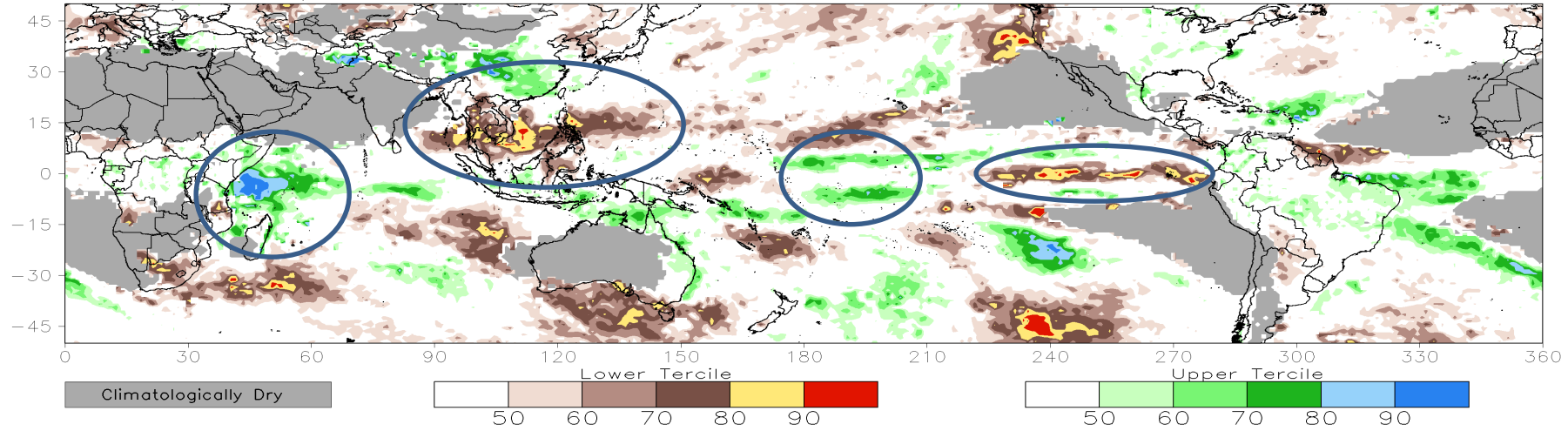
Outgoing Longwave Radiation (OLR) Anomaly Time/Lon Plots:



Consolidated Probabilistic Precipitation: Weeks 2 & 3

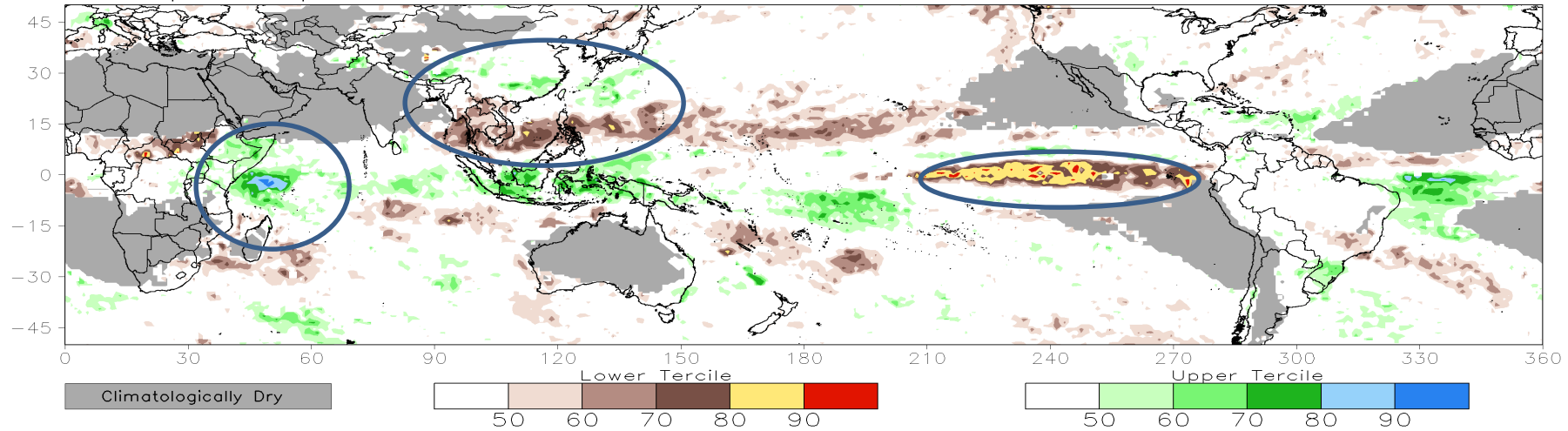
CONS 00z: Week2 Probability for Total Rainfall Below(Above) Lower(Upper) Tercile (%)

Valid: 17Apr2024–23Apr2024



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

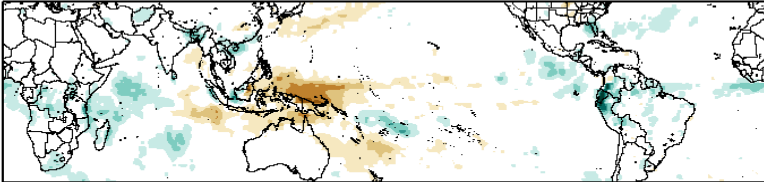
Valid: 24Apr2024–30Apr2024



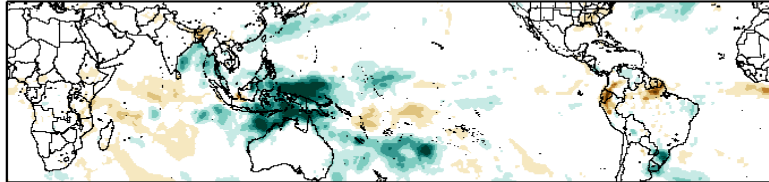
Historical Precipitation Anomalies By MJO Phase:

MAM MJO Composite: GPCP1DD (mm/day)

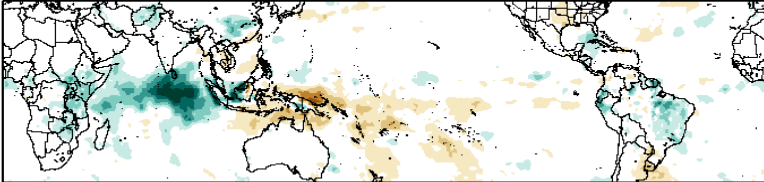
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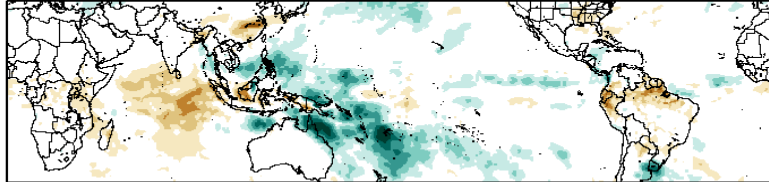
Phase 5



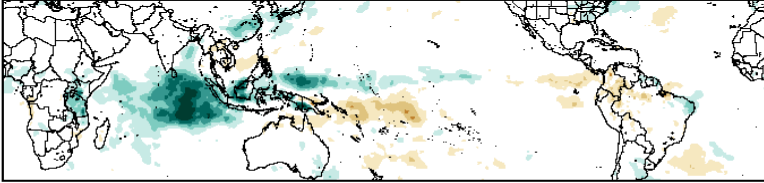
Phase 2



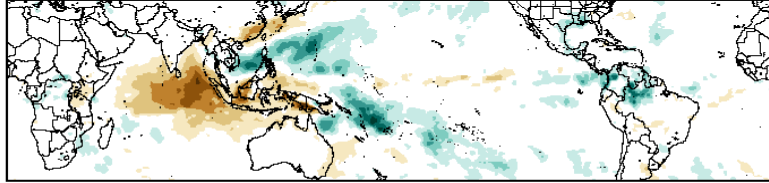
Phase 6



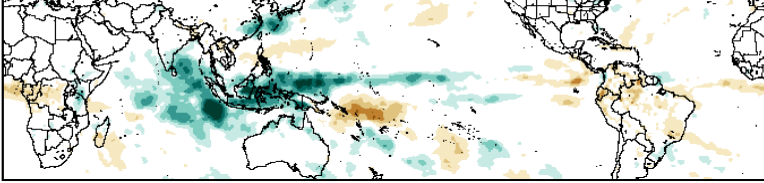
Phase 3



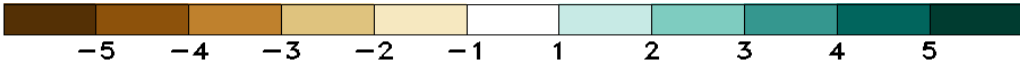
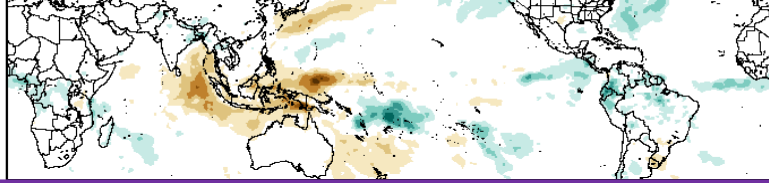
Phase 7



Phase 4

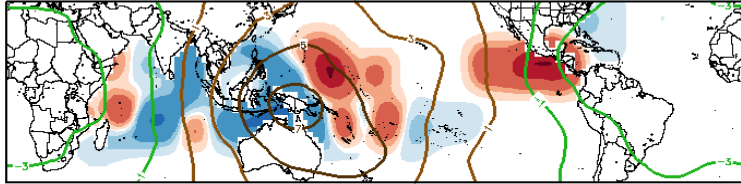


Phase 8

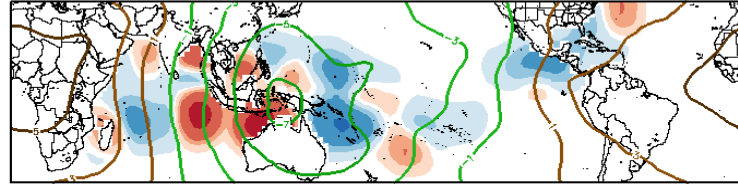


Historical TC Origin Anomalies By MJO Phase & Weeks 2+3 Genesis Climo:

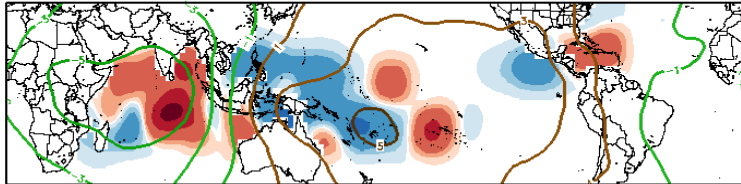
MAM MJO Composite: Mean TC Origin Density Anomaly ($\#TCs/277km^2*100$)
w/ MAM CHI200 ($\times 10^{-6} m^{-2} s^{-1}$) / Contours every $2 \times 10^{-6} m^{-2} s^{-1}$



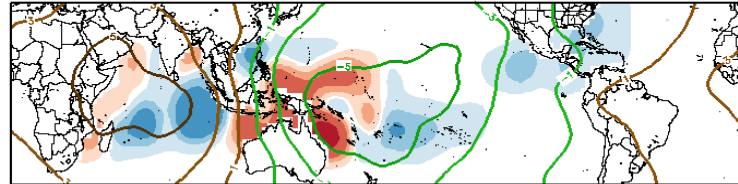
Phase 1



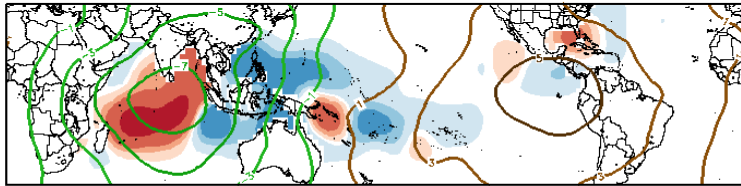
Phase 5



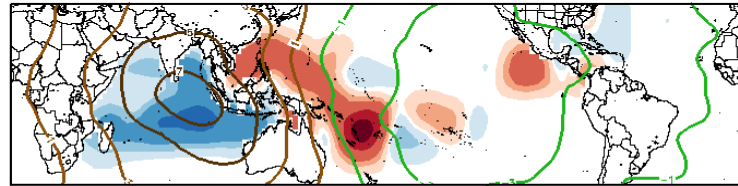
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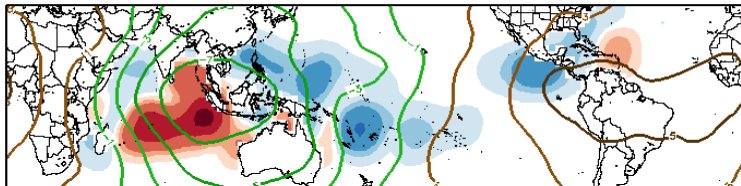
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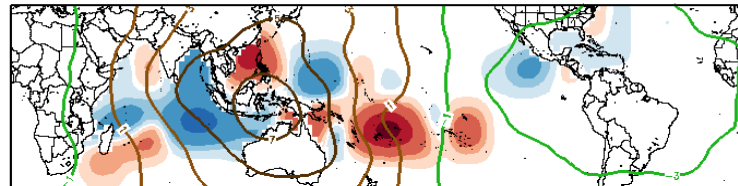
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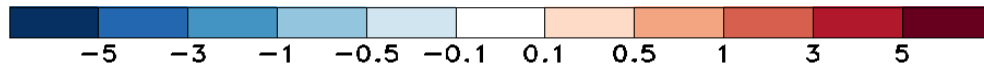
Phase 7



Phase 4



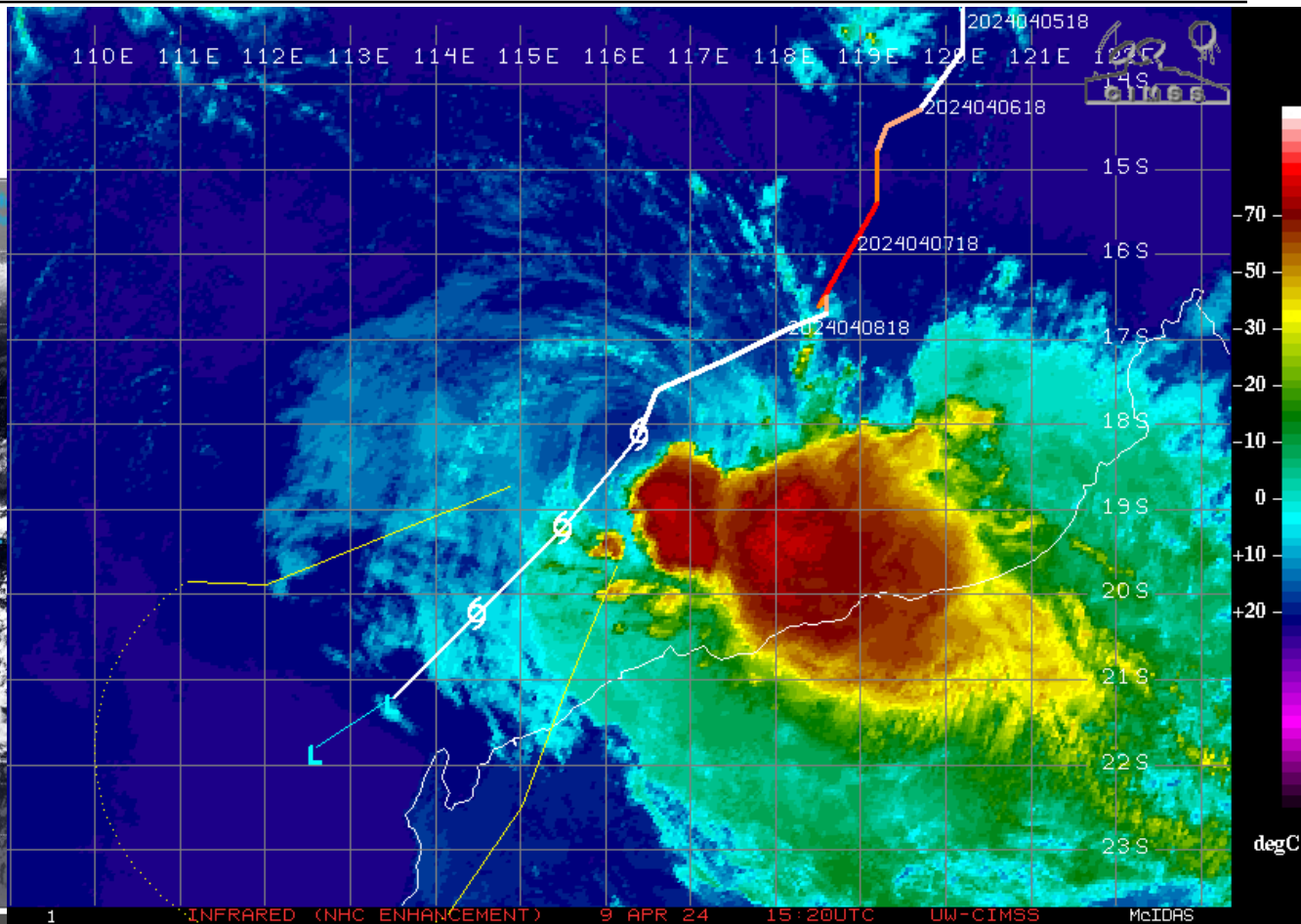
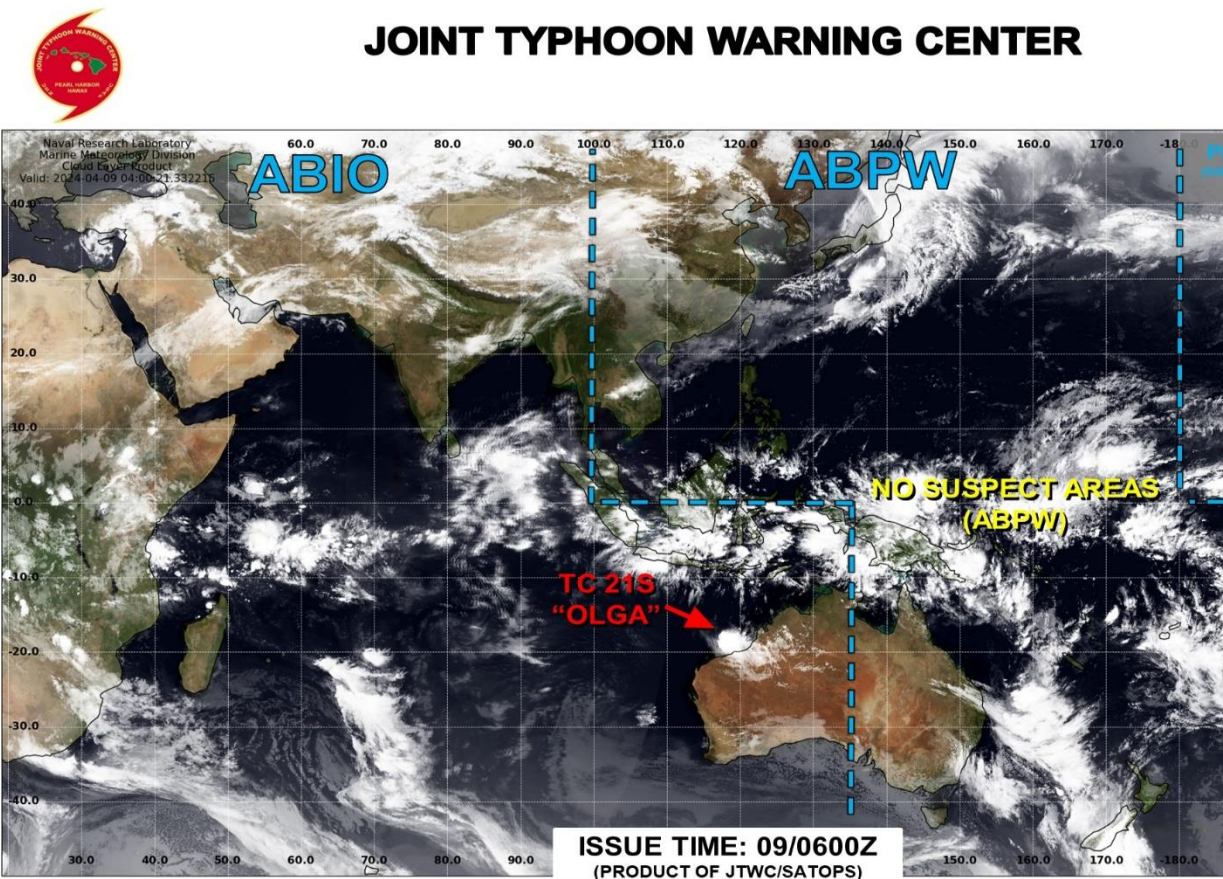
Phase 8



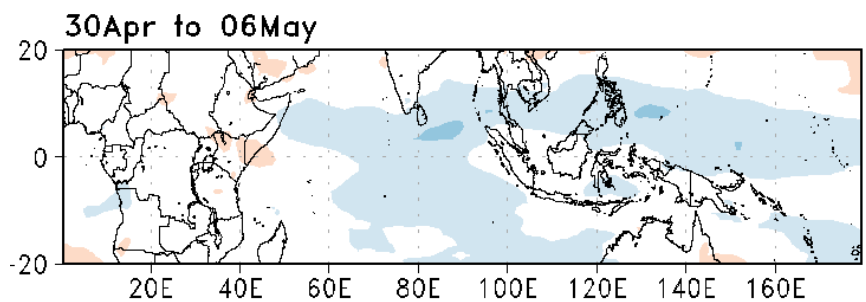
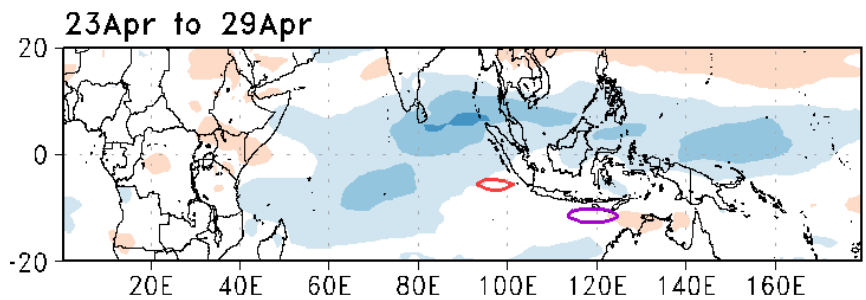
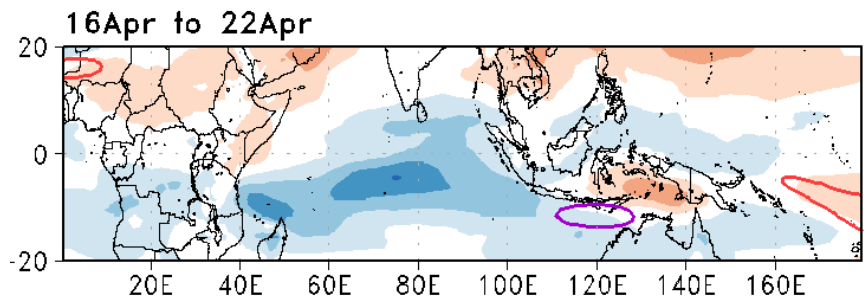
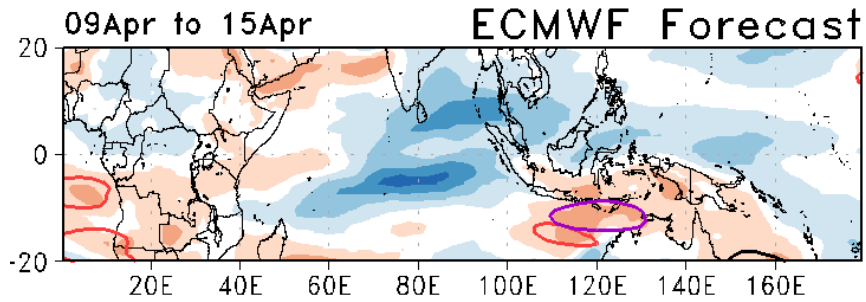
Experimental

Tropical Cyclone Monitoring/Forecast: JTWC

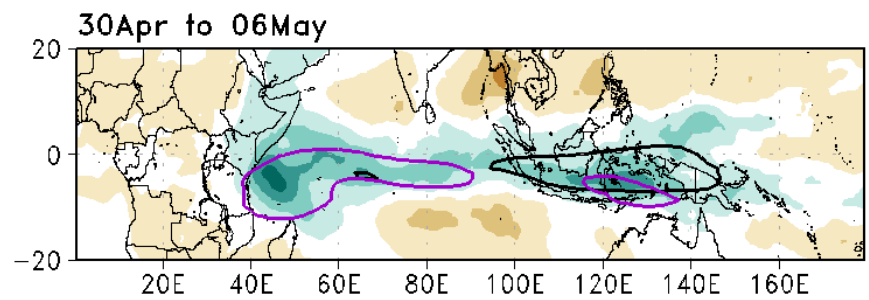
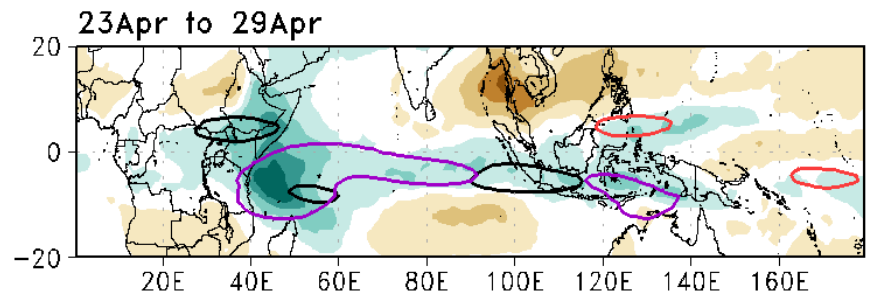
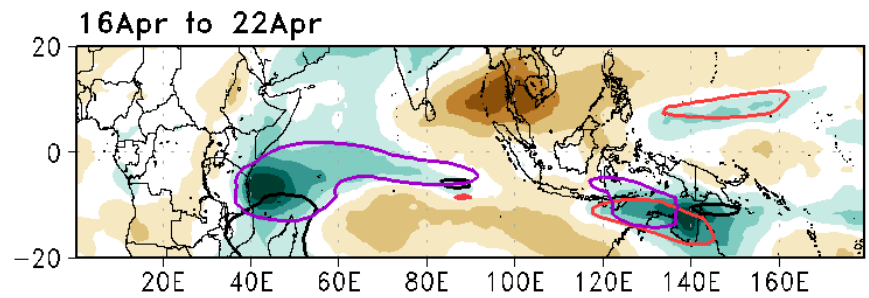
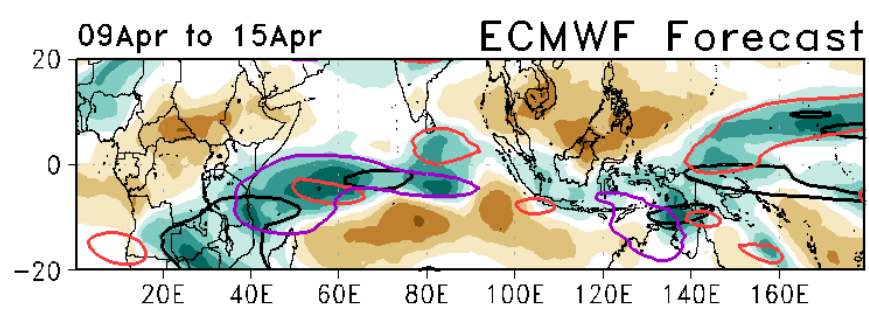
JOINT TYPHOON WARNING CENTER



<div style="border: 2px solid yellow; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">LOW</div> <p>TC development unlikely within 24 hours</p>	<div style="border: 2px solid orange; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">MEDIUM</div> <p>TC development likely, but expected to occur beyond 24 hours</p>	<div style="border: 2px solid red; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">HIGH</div> <p>TC development likely within 24 hours (Reference TCFA)</p>	<div style="border: 2px solid cyan; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">SUB TROPICAL</div> <p>Monitoring for potential transition to TC. Invest label color denotes tropical transition probability</p>	<div style="color: red; font-size: 2em;">➔</div> <p>Tropical Cyclone (Reference Warning)</p>
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— MJO — Kelvin*2
 — Low — ER
 Contours at 2, 6 m s⁻¹

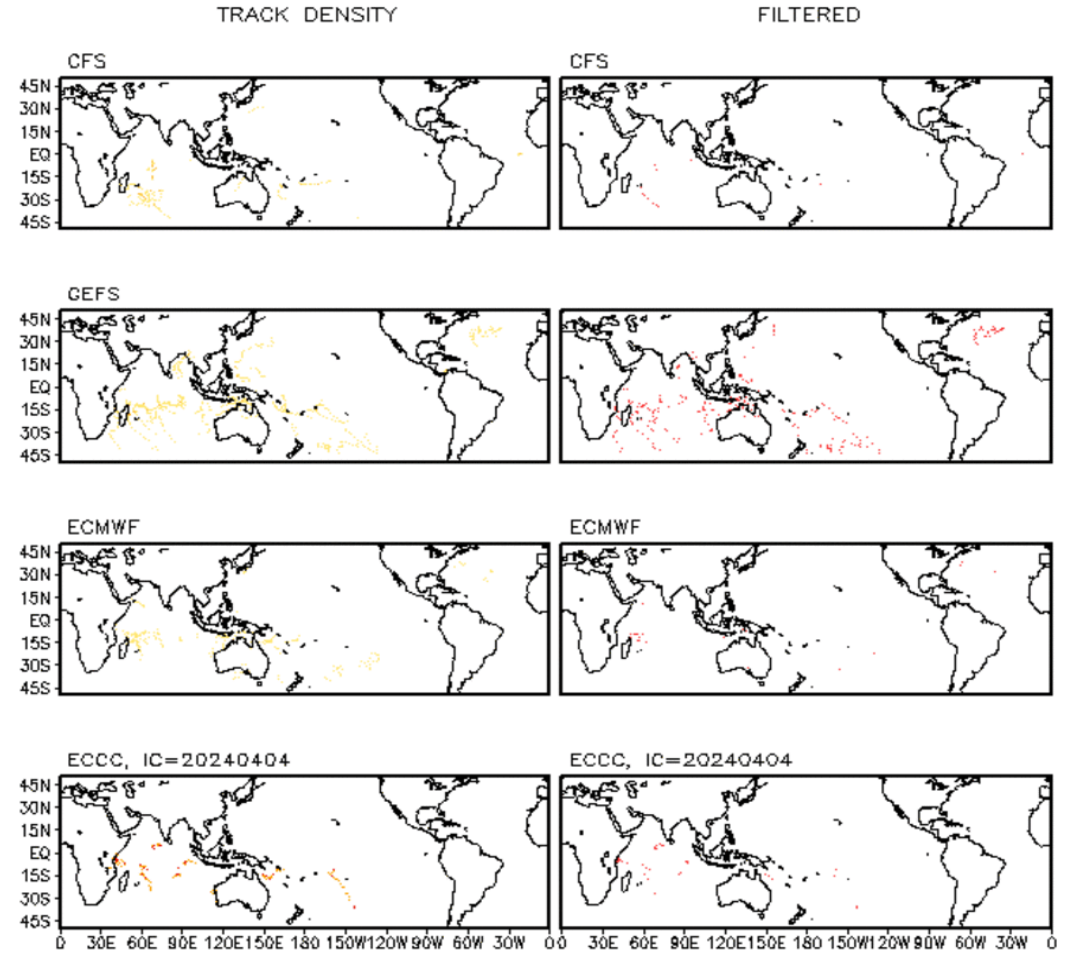
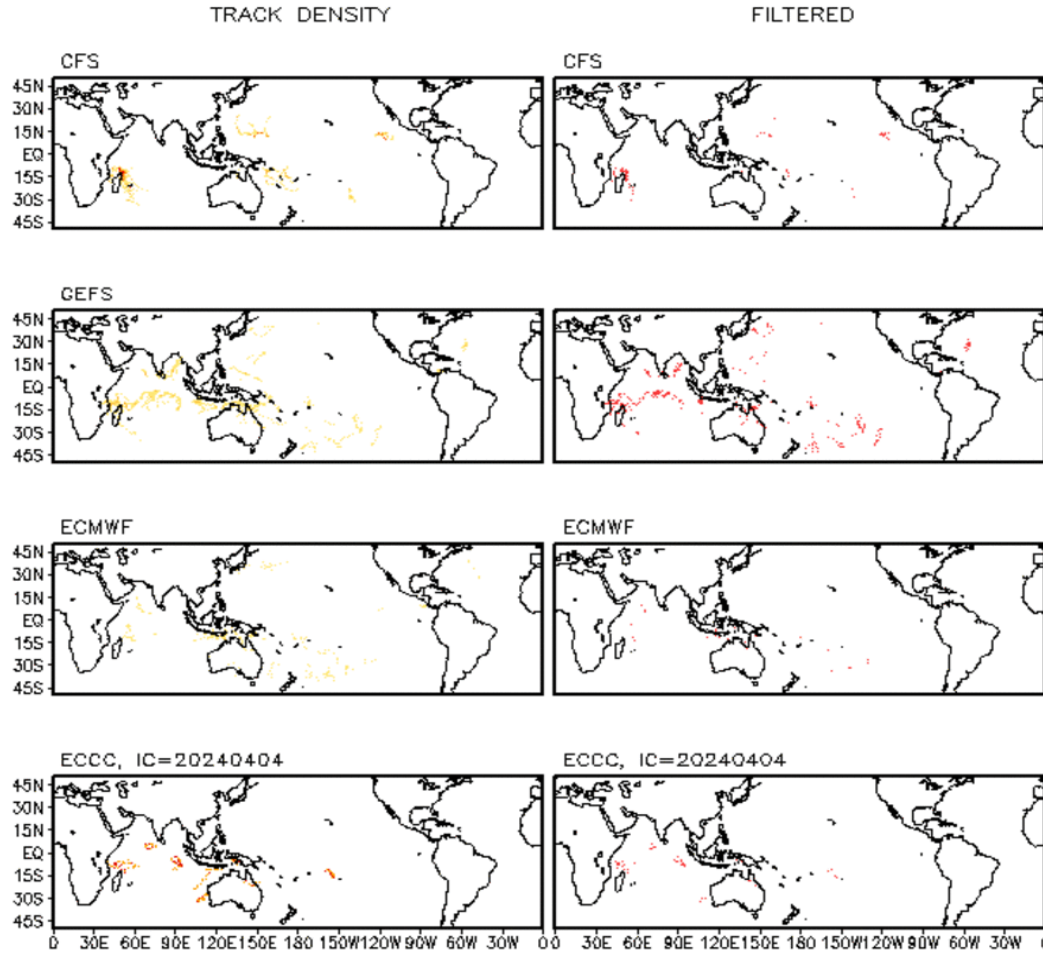


— MJO — Kelvin*2
 — Low — ER
 Contours at -12, -36 W m⁻²

Multi-Model TC Track Densities: Weeks 2+3

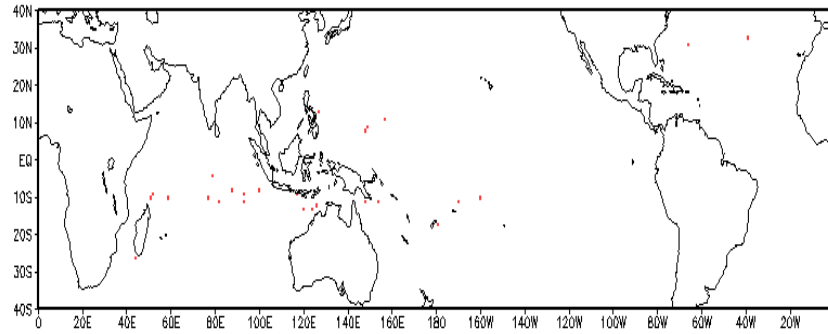
Storm Track Density Distribution, IC=20240408
Week 2 Forecast: 0417-0423

Storm Track Density Distribution, IC=20240408
Week 3 Forecast: 0424-0430



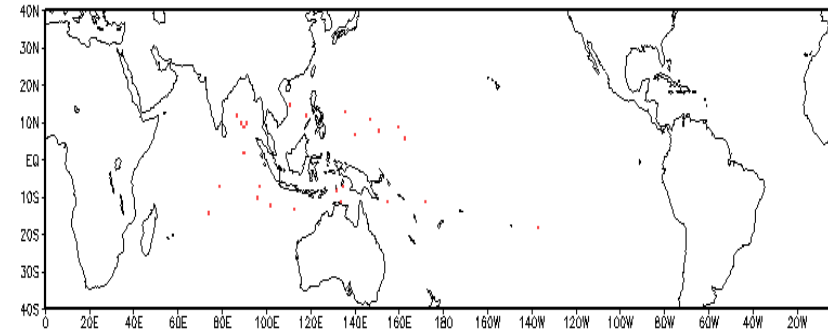
Observed TC Genesis, 1979-2021

7-day Period 0417 to 0423



Observed TC Genesis, 1979-2021

7-day Period 0424 to 0430

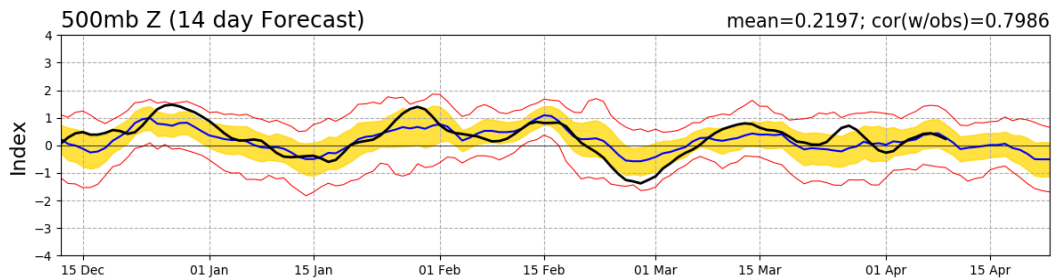
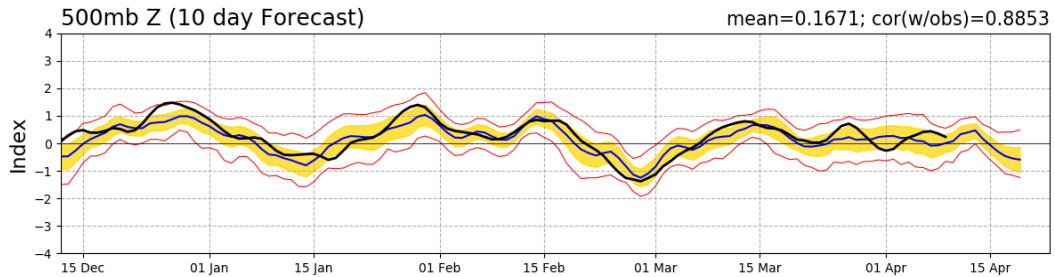
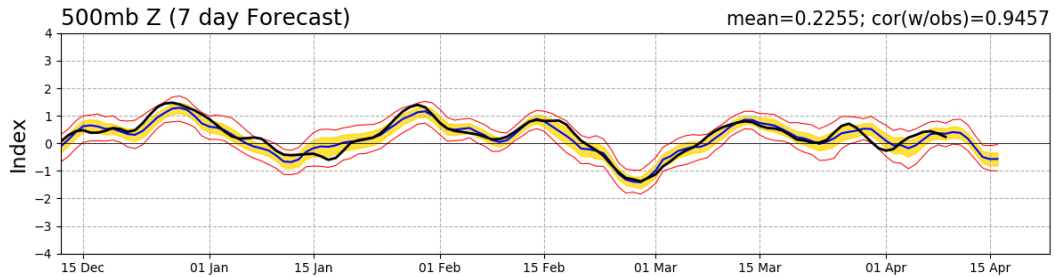
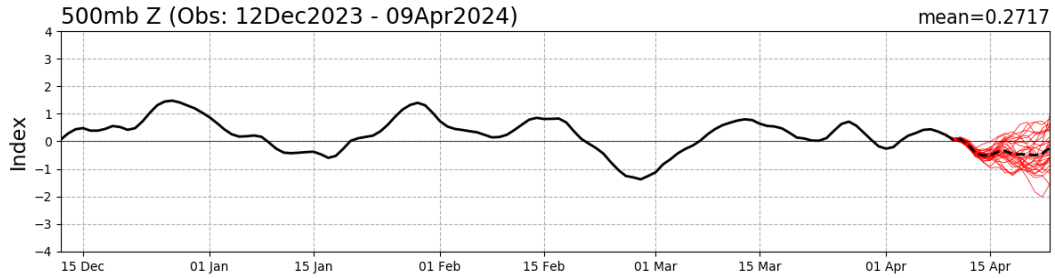


Global Climatological Total # of TC formations for a 7-day period (1979-2022)

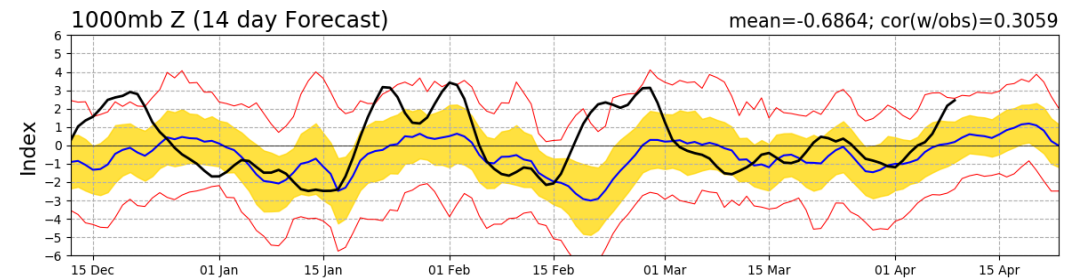
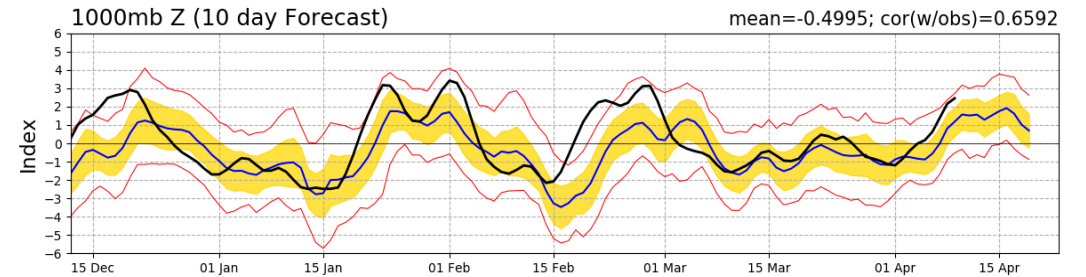
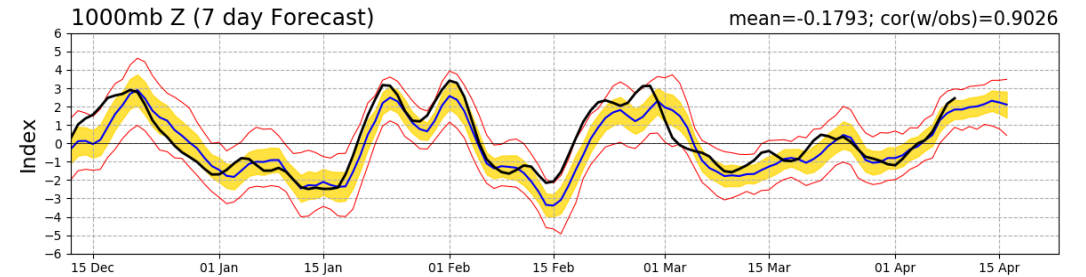
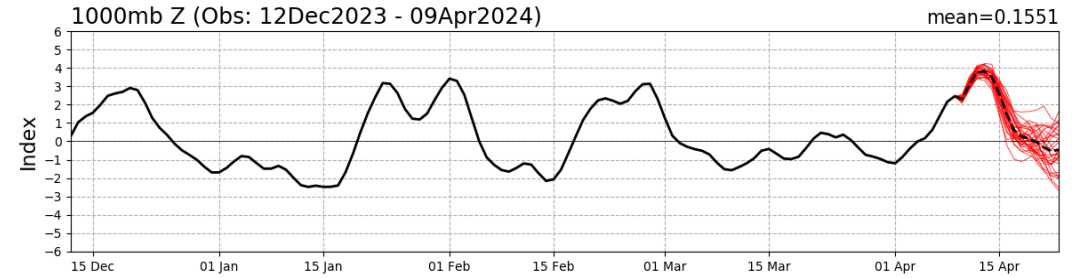


Teleconnection Indices: PNA / AO:

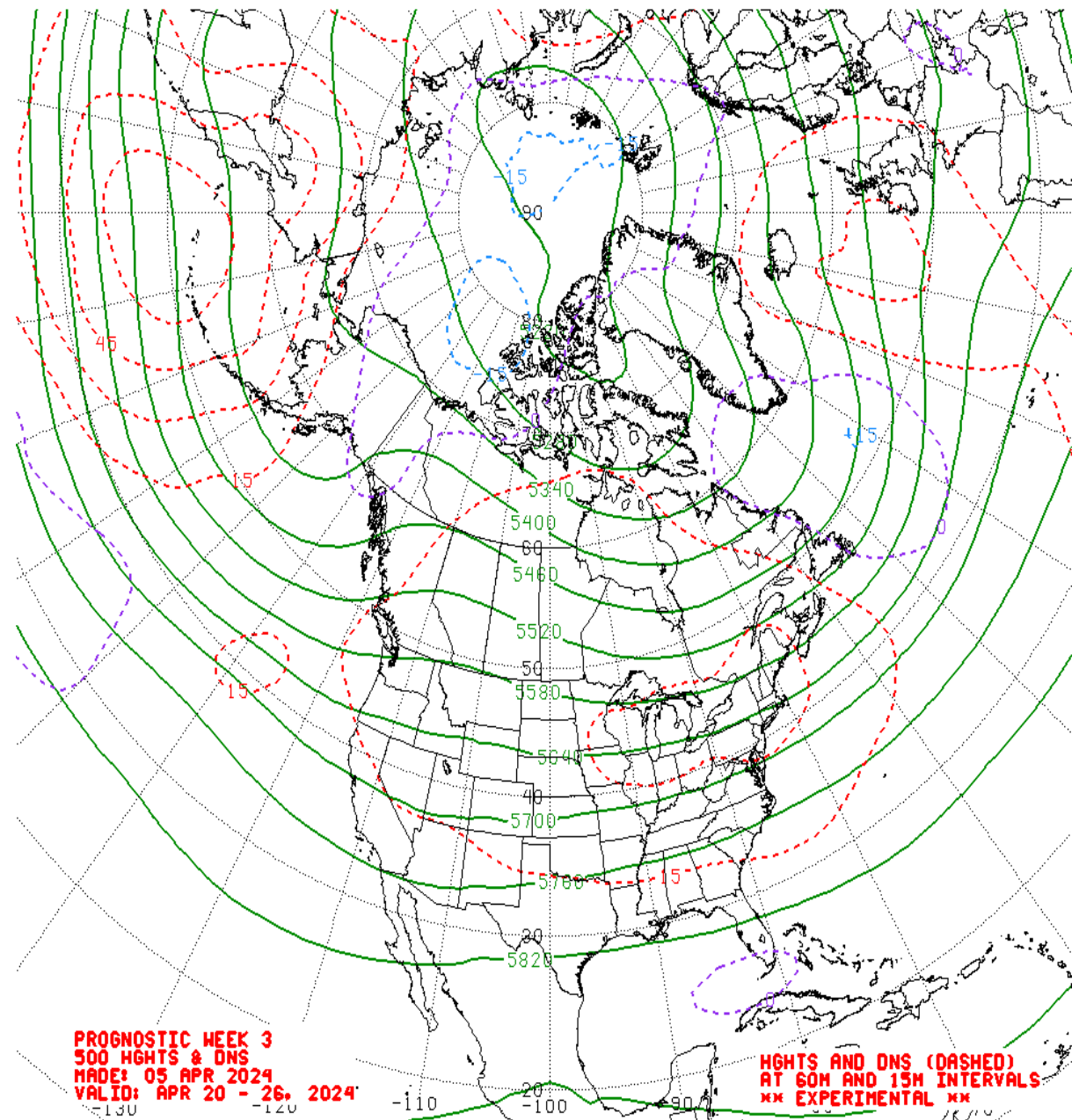
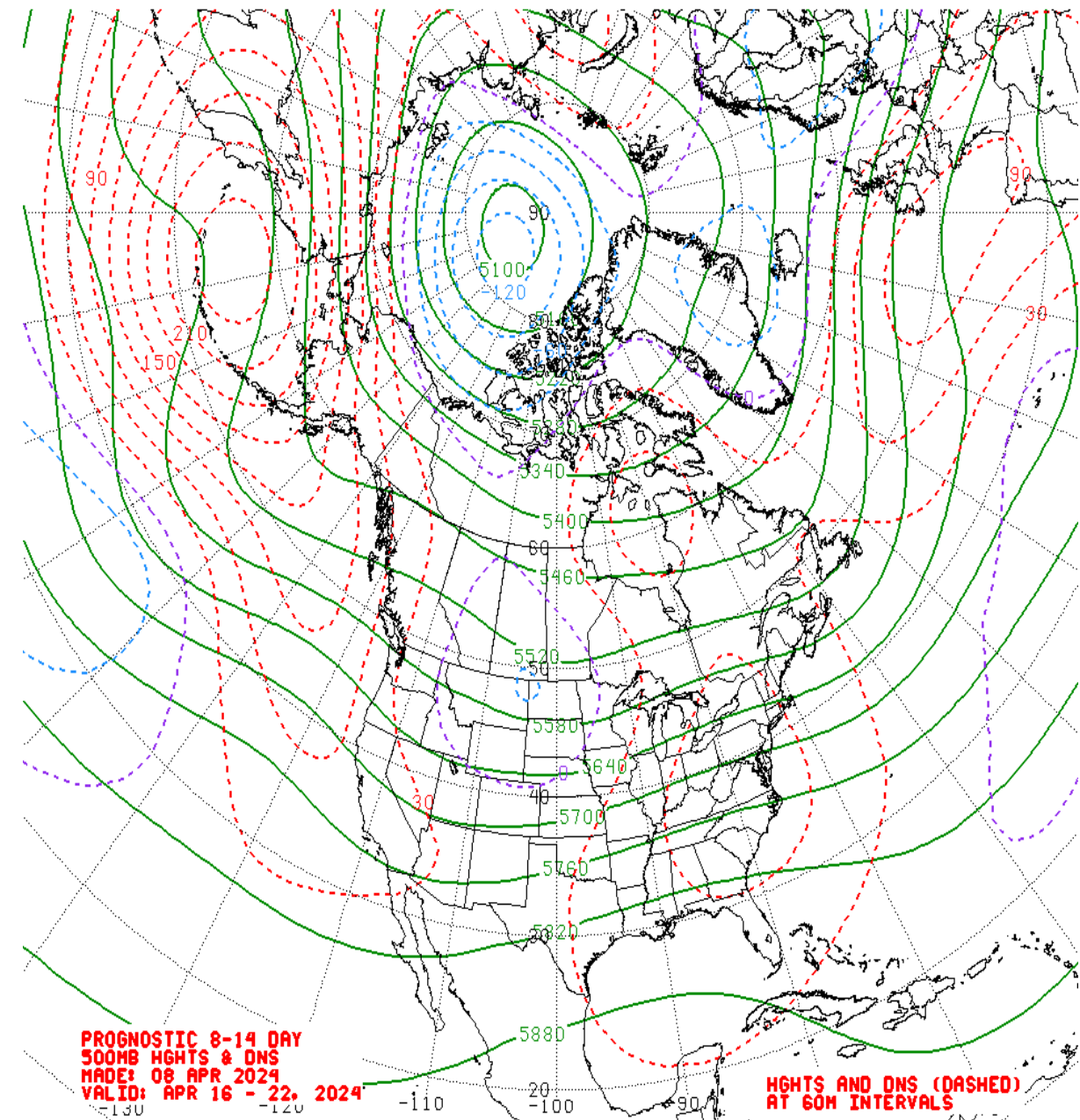
PNA Index: Observed & GEFS Forecasts



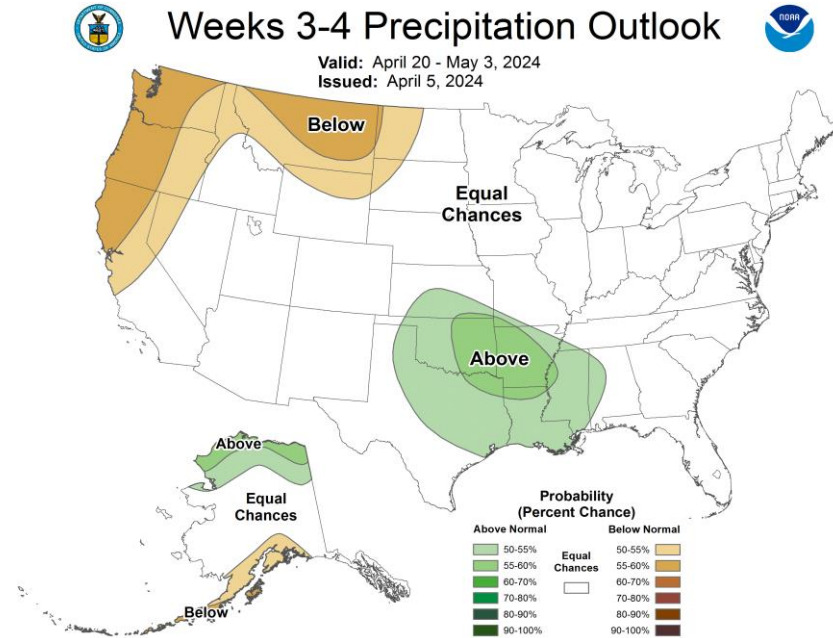
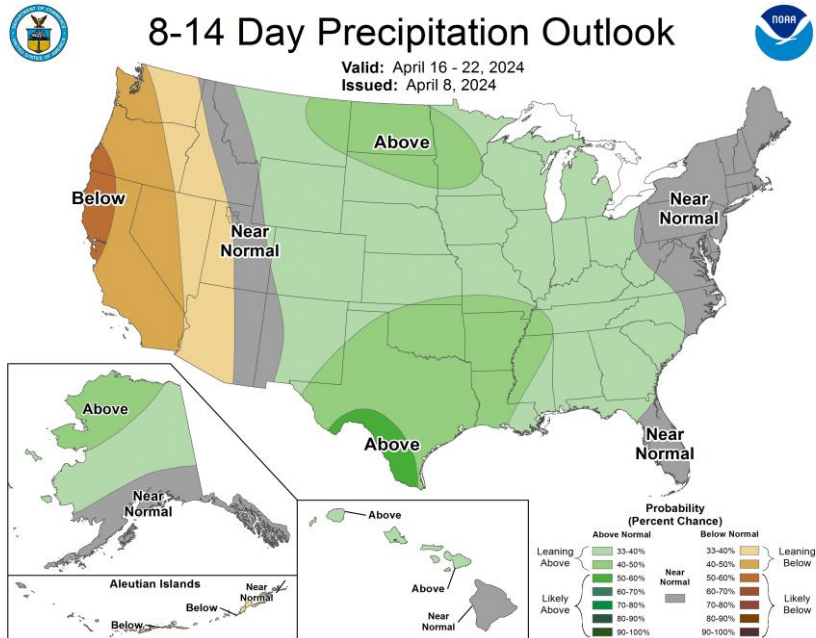
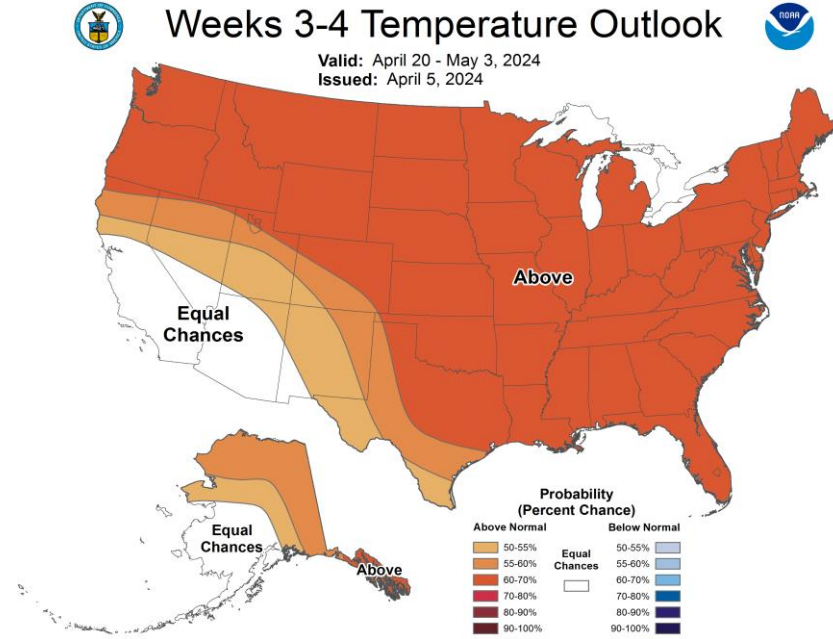
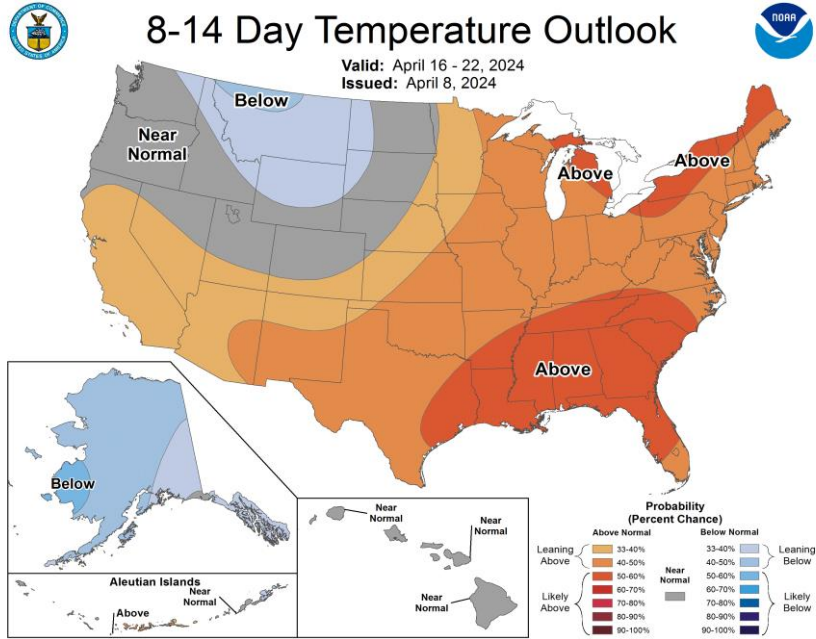
AO Index: Observed & GEFS Forecasts



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



Official Temperature & Precipitation Forecasts:



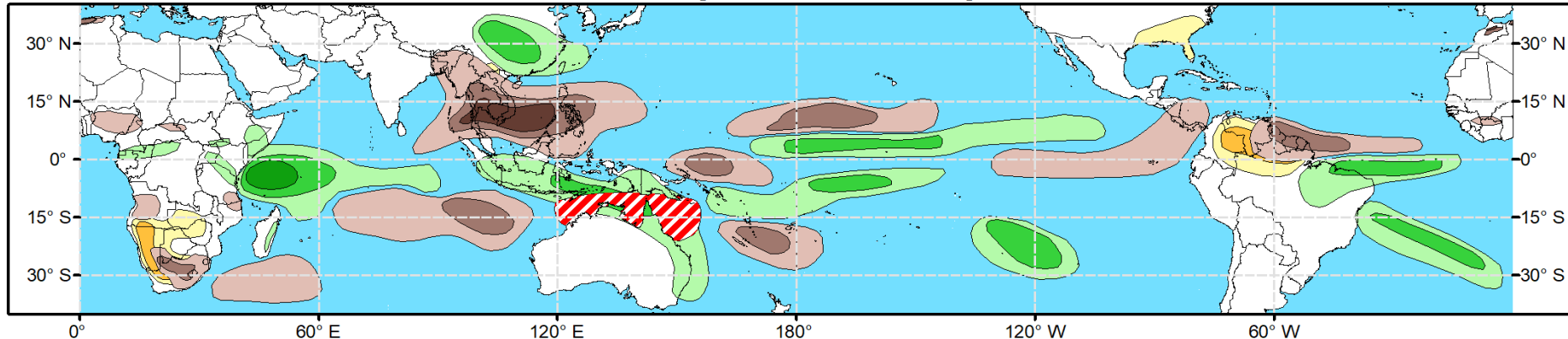


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Climate Prediction Center

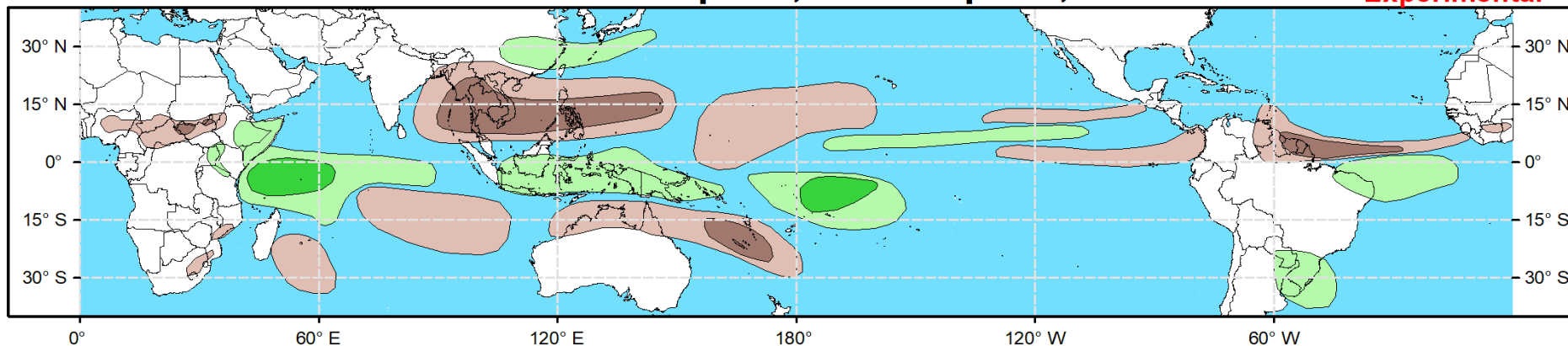


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