WMO VLab Regional Focus Group
of the Americas and Caribbean

Since 2004

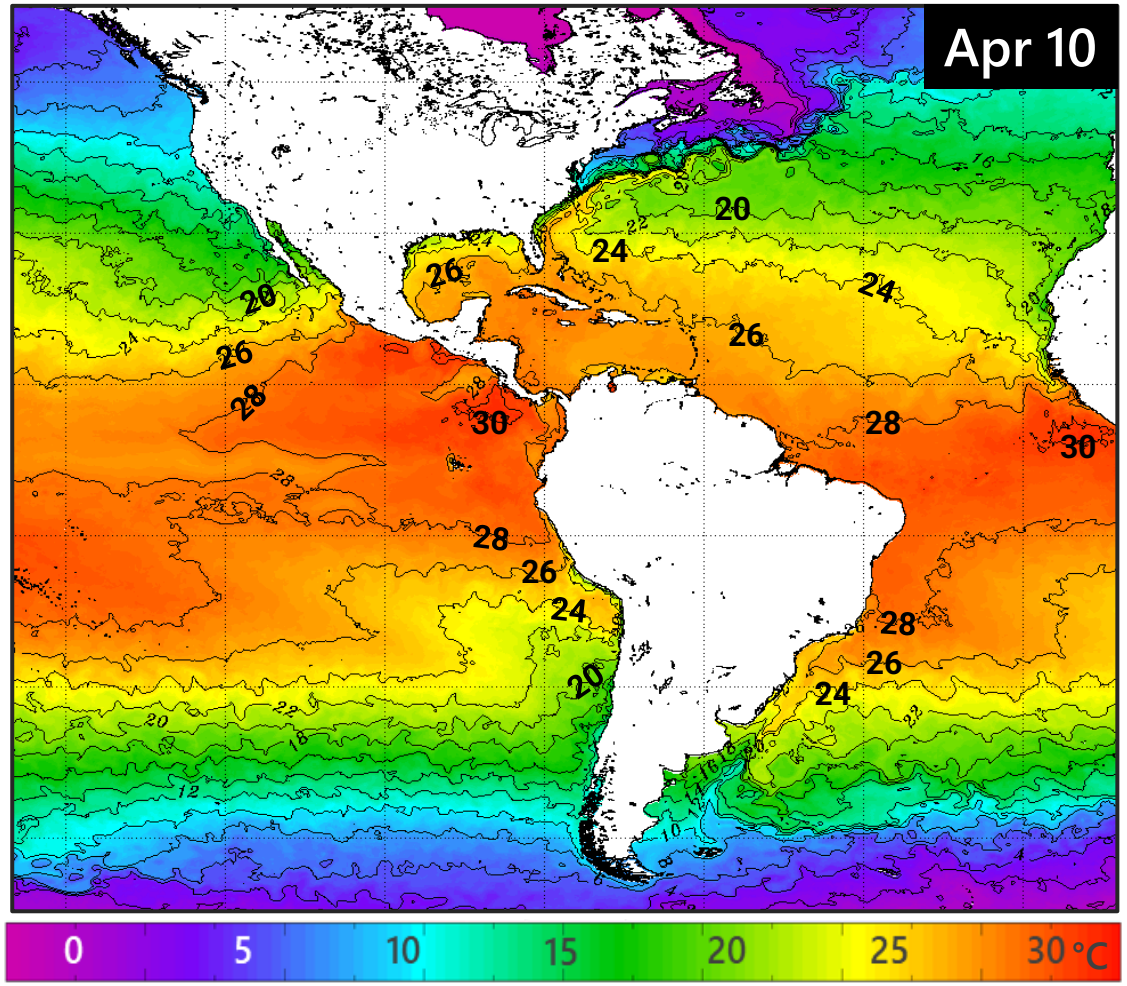
Climate Indices

Current Status and Projections

Wednesday 12 April 2023 at 15 UTC

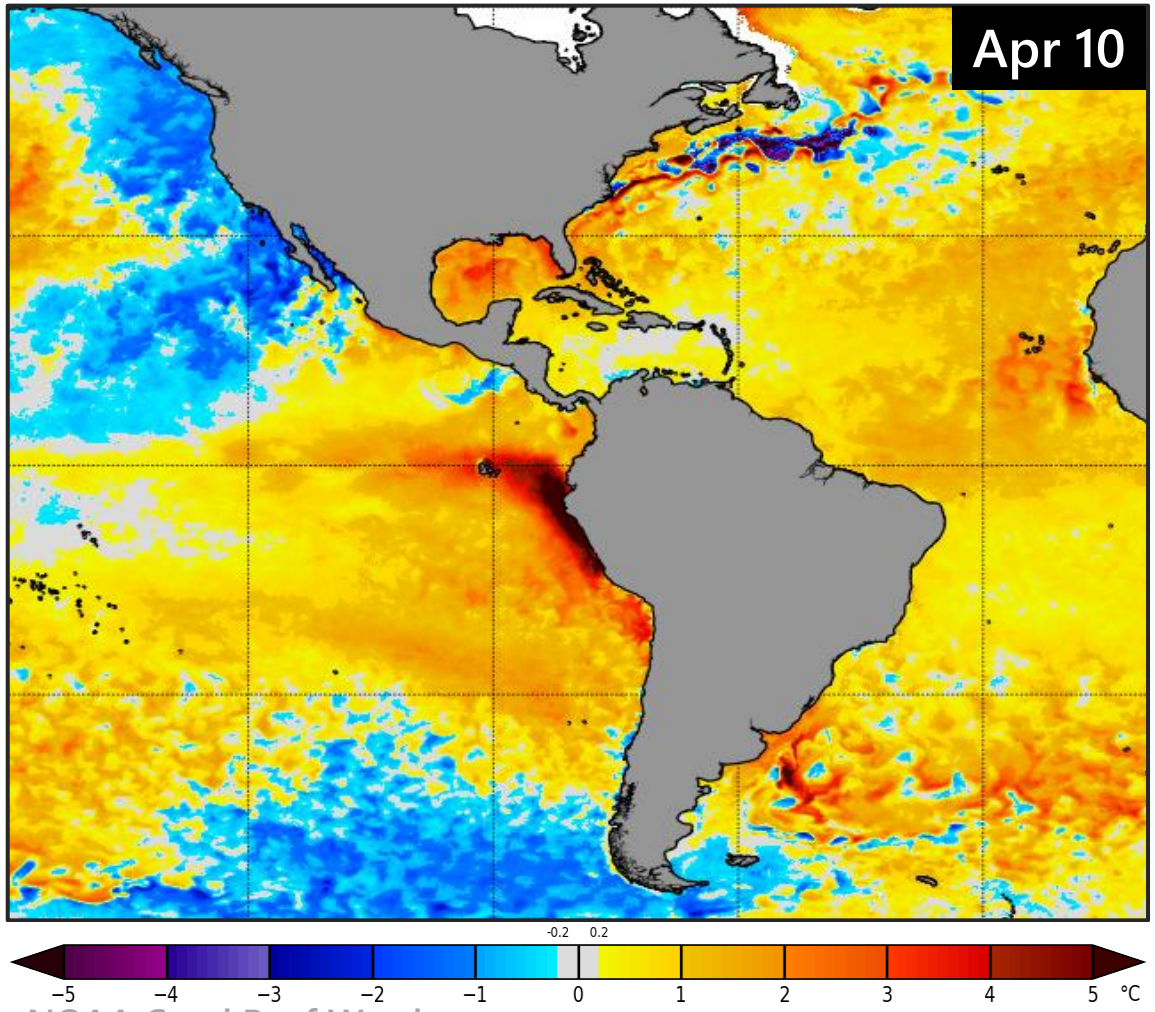
Sea Surface Temperature (SST)

SST



NOAA OSPO
https://www.ospo.noaa.gov/data/sst/contour/global_small.c.gif

SST Anomaly

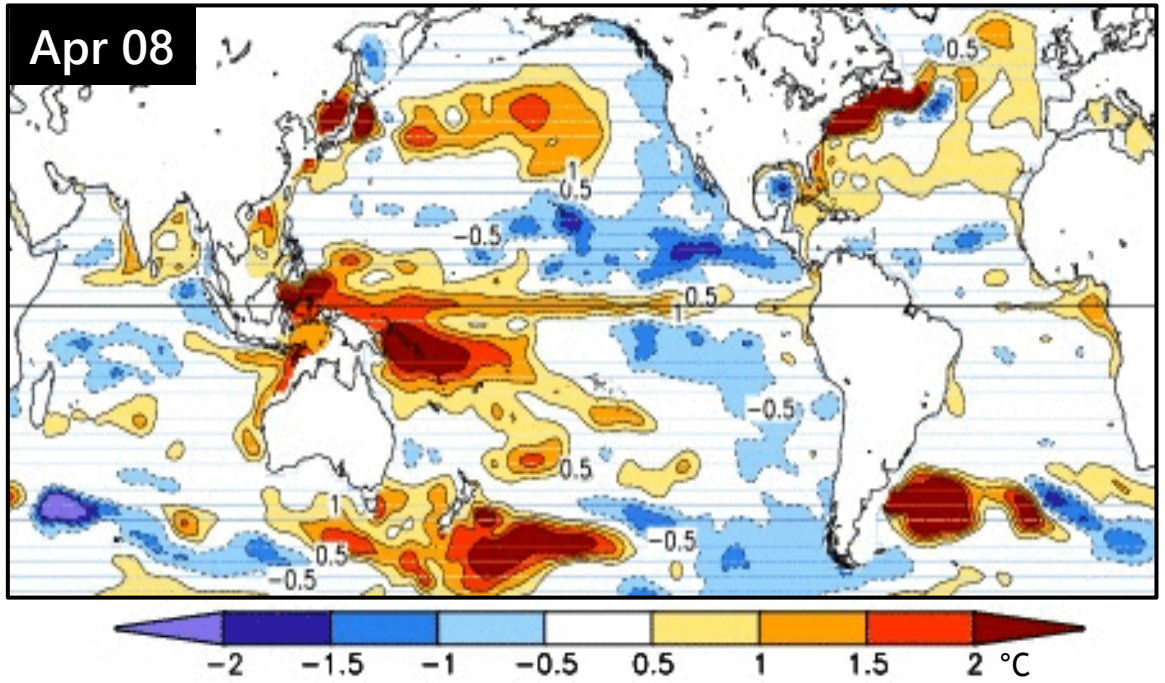


NOAA Coral Reef Watch
https://coralreefwatch.noaa.gov/product/5km/index_5km_ssta.php

Sea Temperature Anomaly in Top Layer

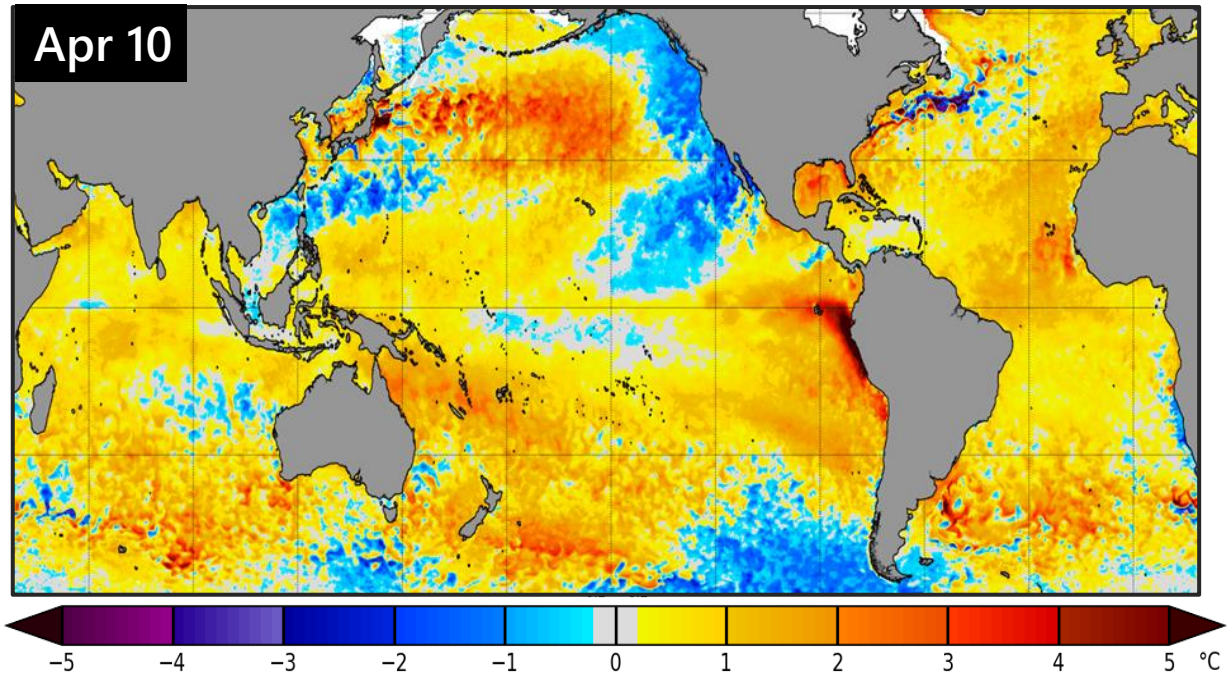
Anomalies in a layer take longer to dissipate than superficial ones,
and can last for weeks.

Top 300m-Layer Anomaly



NOAA CPC
Source: CPC GODAS, https://www.cpc.ncep.noaa.gov/products/GODAS/

Surface Anomaly



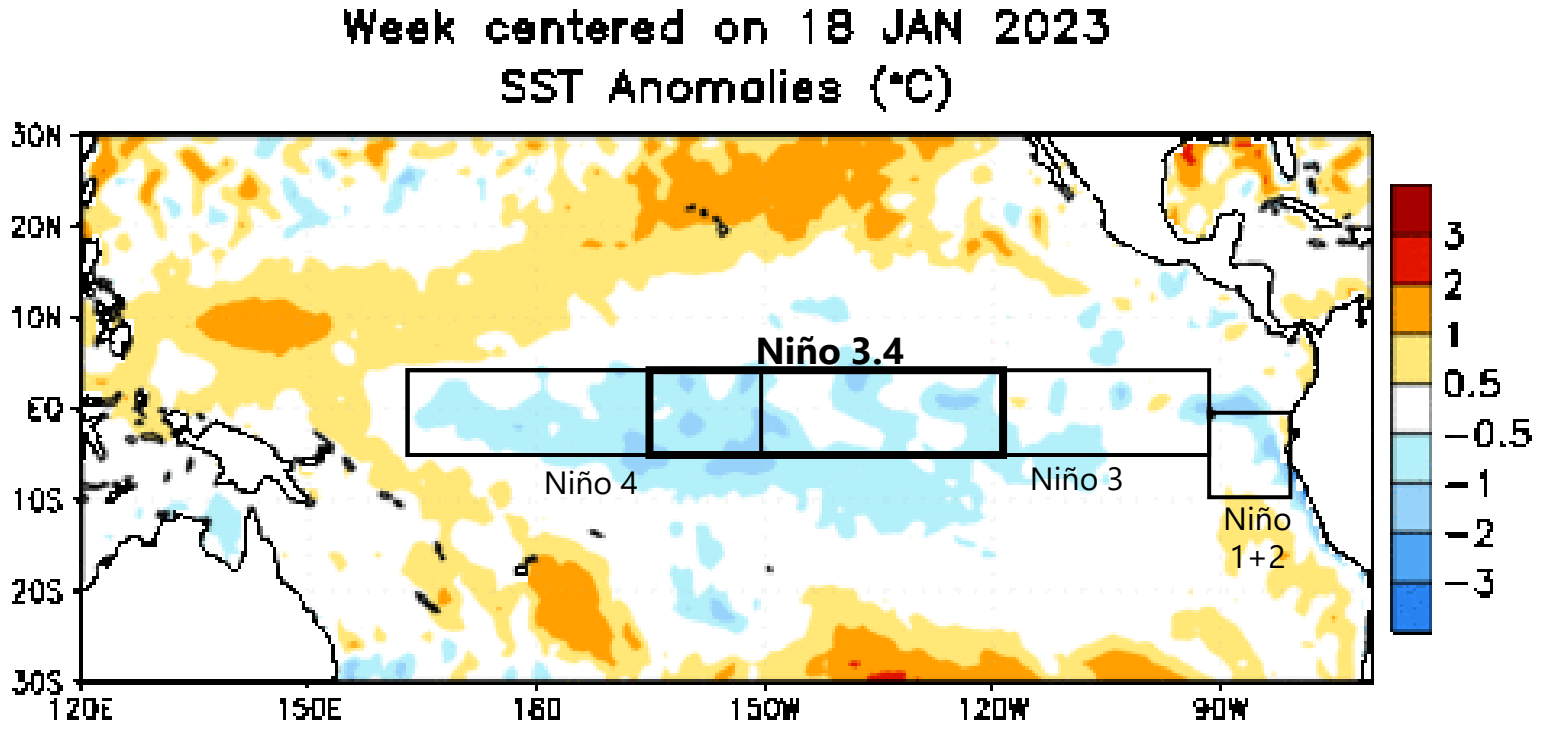
NOAA Coral Reef Watch
https://coralreefwatch.noaa.gov/product/5km/index_5km_ssta.php

El Niño-Southern Oscillation (ENSO)

CPC Official Statement

Status: Neutral

- ENSO-neutral conditions are observed.*
- Equatorial sea surface temperatures (SSTs) are near average across most of the Pacific Ocean.

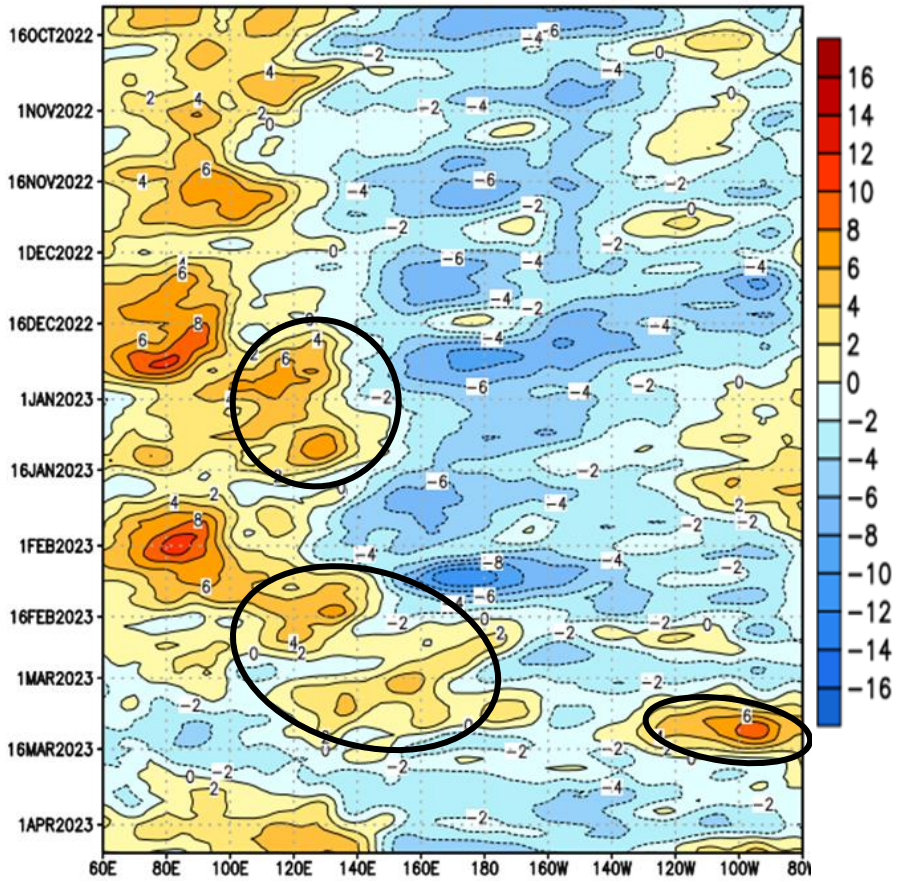


TAKEAWAYS

- The EPAC has warmed very rapidly near South America, but mostly superficially.
- The warming has been producing severe impacts in South America since February.
- Niño 3.4 is near average at this time.

Kelvin Waves: Hovmöller of Winds and Heat Content

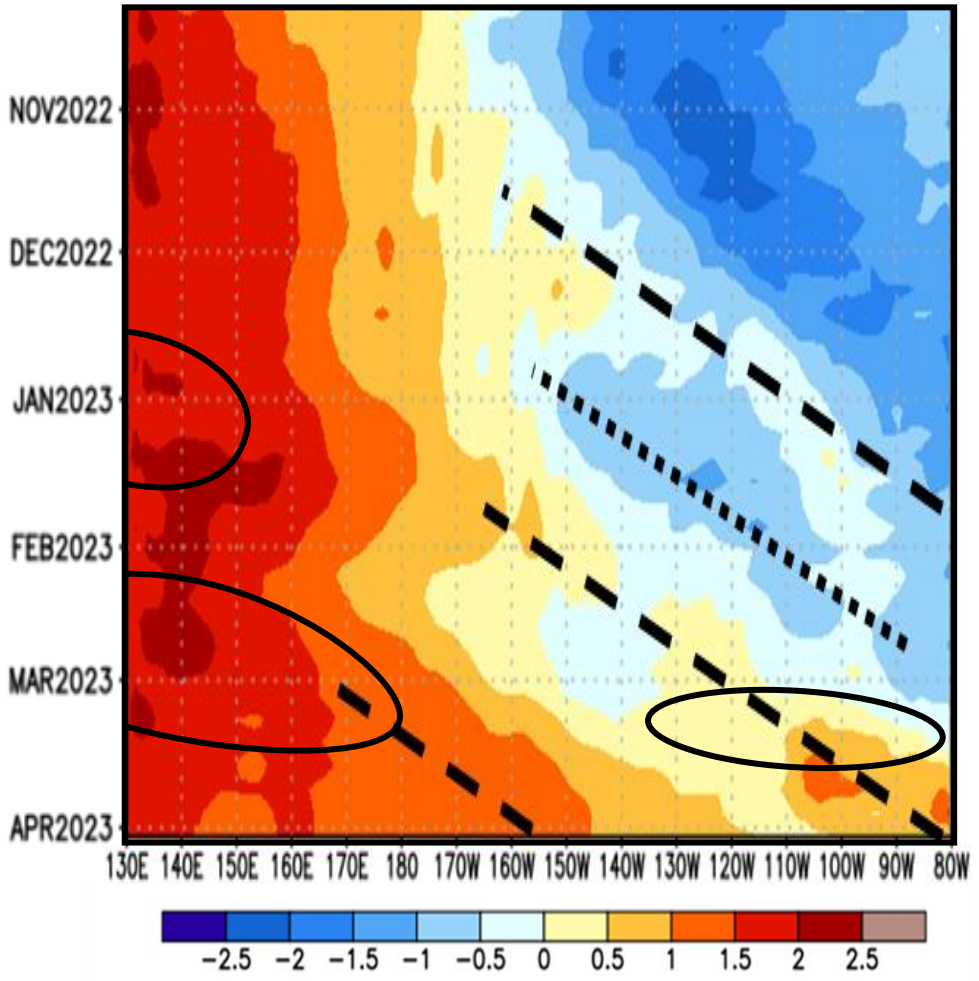
850 hPa Zonal Wind Anomaly



Source: CDAS, CPC

(5N-5S) in m/s

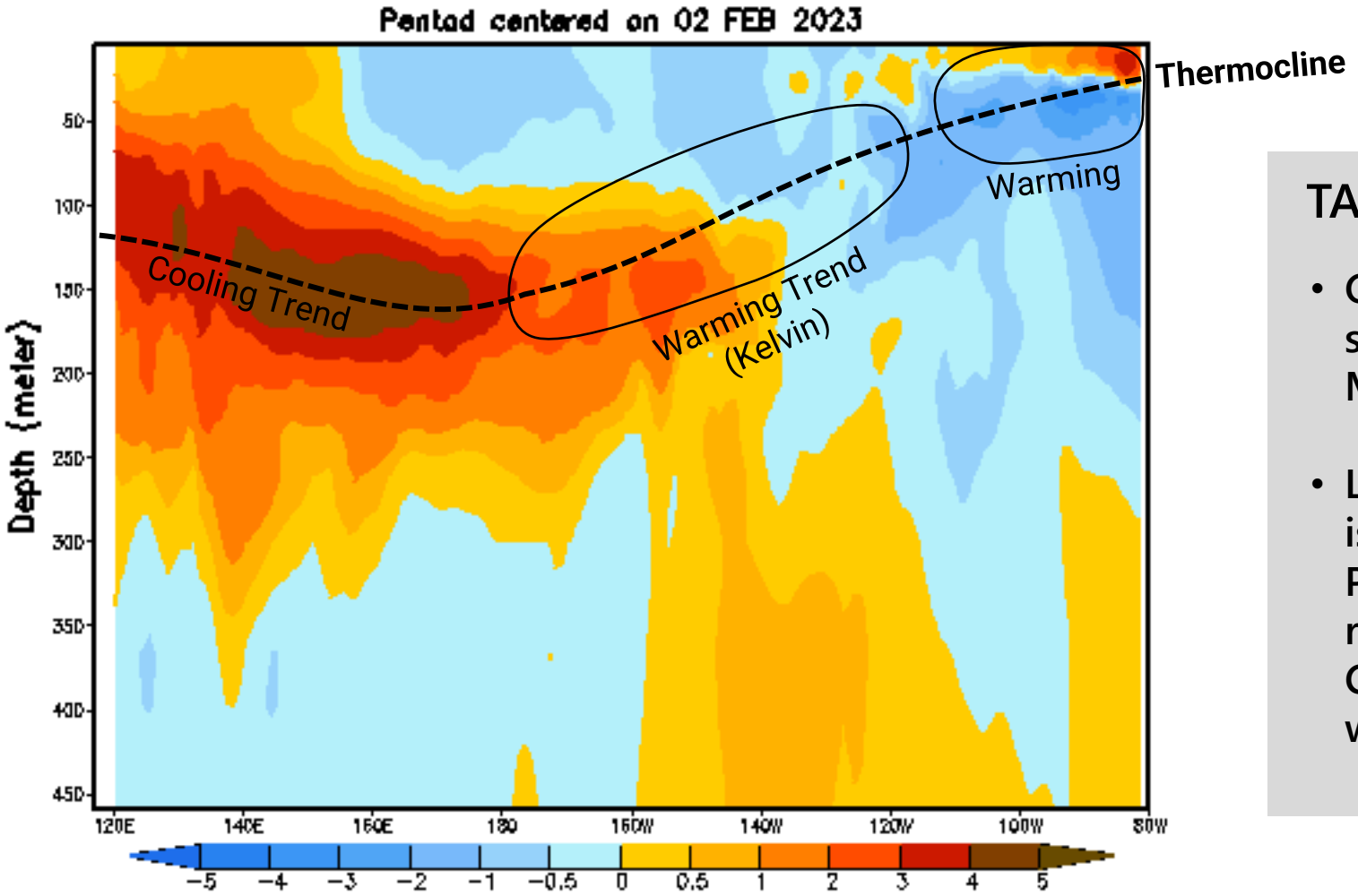
Heat Content Anomaly Hovmöller



- Westerly wind bursts (oranges) can trigger downwelling (warm) Kelvin Waves that propagate towards South America.
- Heat Content Anomalies suggest potentially 3 of these processes since January: The latest warm Kelvin is propagating already into 120°W.

ENSO: Oceanic Kelvin Waves

Equatorial Pacific Temperature Anomaly Section



TAKEAWAYS

- Generalized sub-superficial and superficial warming in the EPAC from March MJO's low-level westerlies.
- Long-fetch downwelling Kelvin wave is propagating across the Central Pacific, approaching 120W, likely to reach the coast by the end of April. Could support current Niño 1+2 warming through the end of May.

Oceanic Niño Index (ONI)

Calculated averaging SST anomalies in region 3.4.

Warm ENSO “El Niño” is classified when ONI exceeds +0.5°C for 3 consecutive trimesters.

The earliest this could happen in 2023 is early July, but we do not know at this time. This does not mean that ongoing warmings will not generate severe impacts. The atmosphere reads what the ocean surface is doing now.

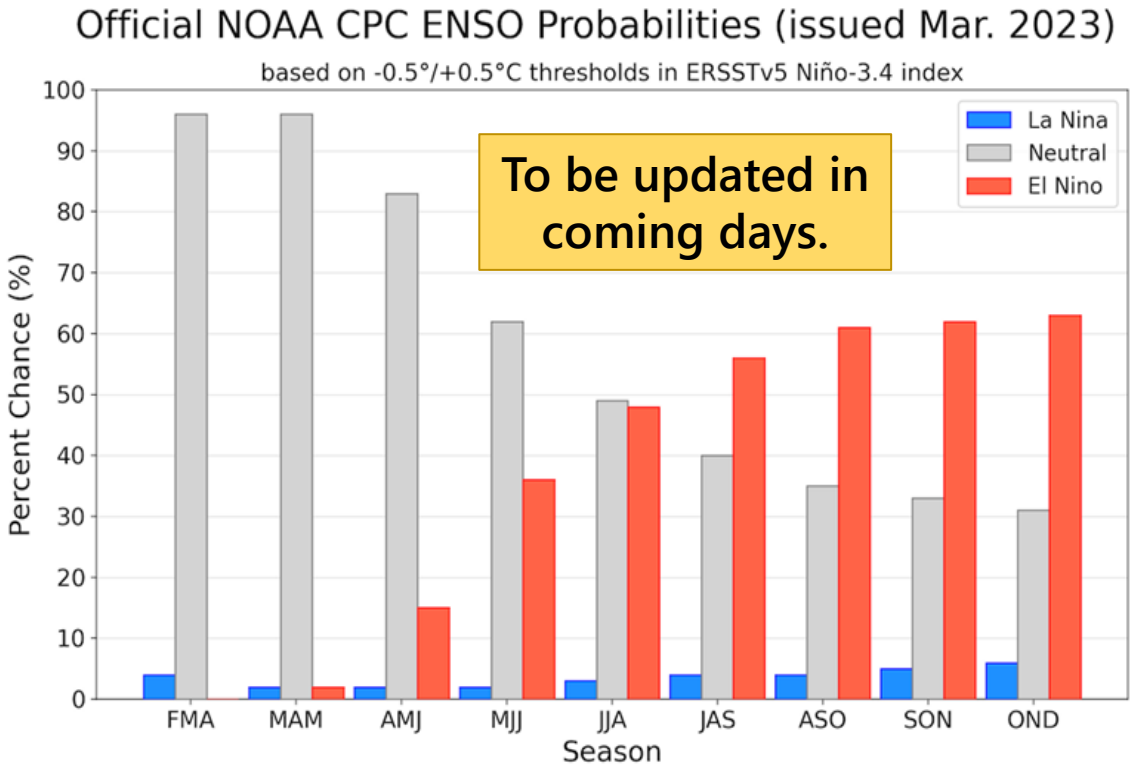
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2011	-1.4	-1.2	-0.9	-0.7	-0.6	-0.4	-0.5	-0.6	-0.8	-1.0	-1.1	-1.0
2012	-0.9	-0.7	-0.6	-0.5	-0.3	0.0	0.2	0.4	0.4	0.3	0.1	-0.2
2013	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.5	-0.3	0.0	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.7
2015	0.5	0.5	0.5	0.7	0.9	1.2	1.5	1.9	2.2	2.4	2.6	2.6
2016	2.5	2.1	1.6	0.9	0.4	-0.1	-0.4	-0.5	-0.6	-0.7	-0.7	-0.6
2017	-0.3	-0.2	0.1	0.2	0.3	0.3	0.1	-0.1	-0.4	-0.7	-0.8	-1.0
2018	-0.9	-0.9	-0.7	-0.5	-0.2	0.0	0.1	0.2	0.5	0.8	0.9	0.8
2019	0.7	0.7	0.7	0.7	0.5	0.5	0.3	0.1	0.2	0.3	0.5	0.5
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4										

Takeaway: Regardless of neutral ENSO, regions prone to impacts from warmings in Niño 1+2 (and potentially Niño 3) should monitor this risk through the end of May.

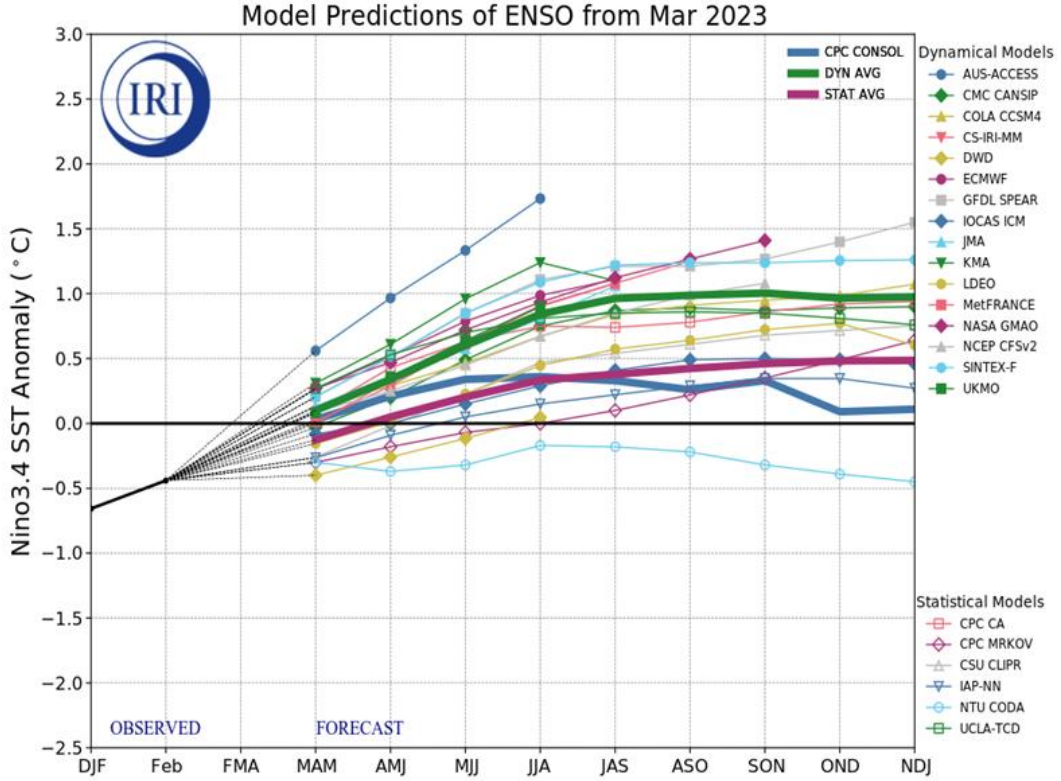
ENSO Outlook

ENSO-neutral conditions are expected to continue through the Northern Hemisphere spring and early summer 2023.*

CPC Probabilistic Forecast



IRI/CPC Dynamic Models

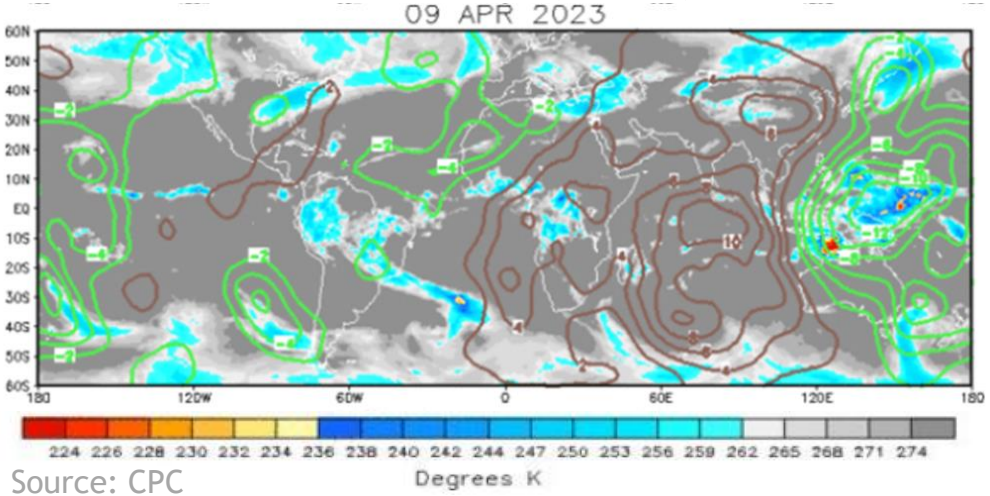


Madden-Julian Oscillation (MJO)

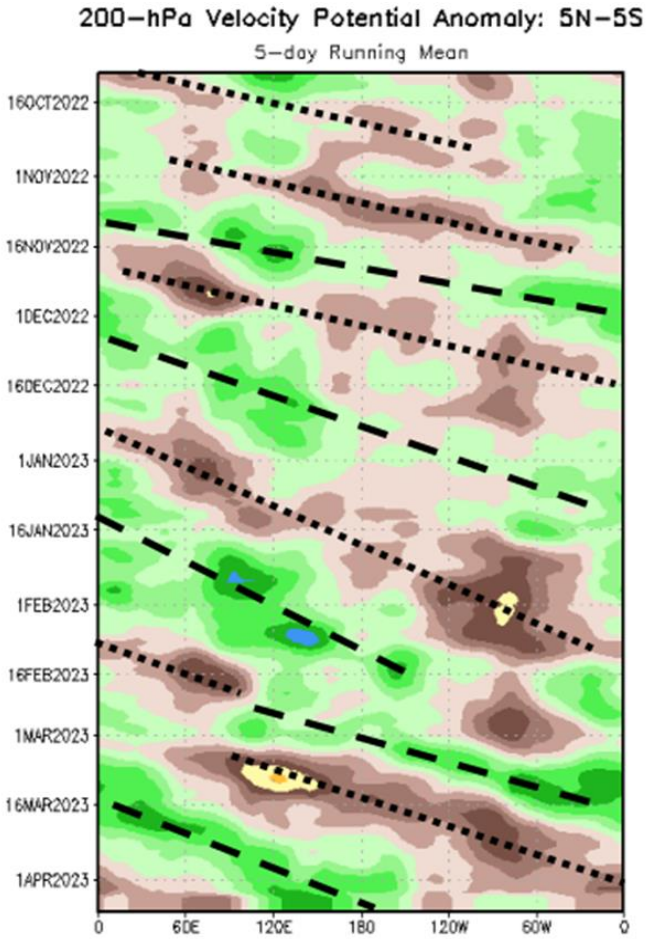
Current Observations:

- Wave-1 Pattern continues, propagation is well defined.
- Speed: Below average, about 1.5 months to circle the globe.
- Wet phase in the Western Pac. arriving in the Americas ~ April 20.

Velocity Potential (contours) and
Brightness Temperature (shaded) – April 09

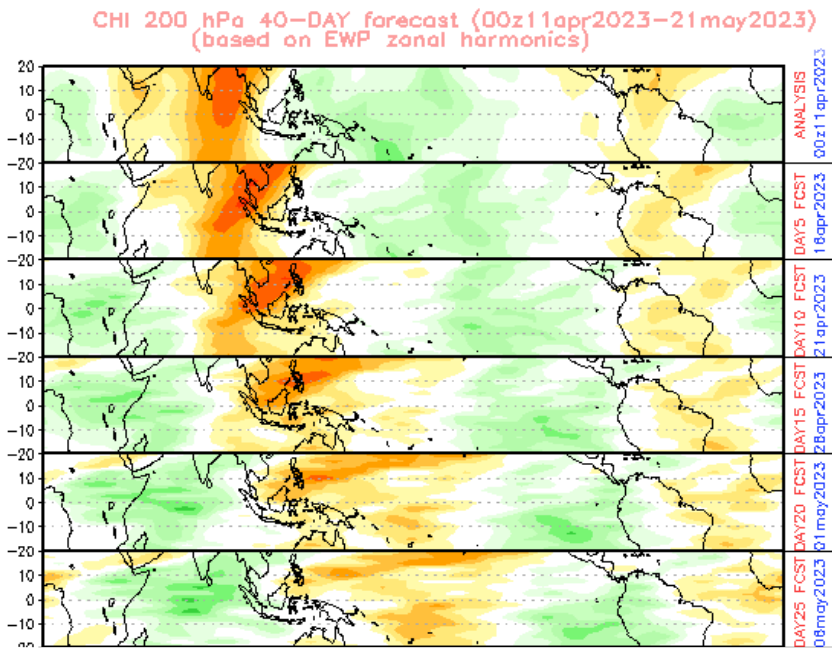


Source: CPC

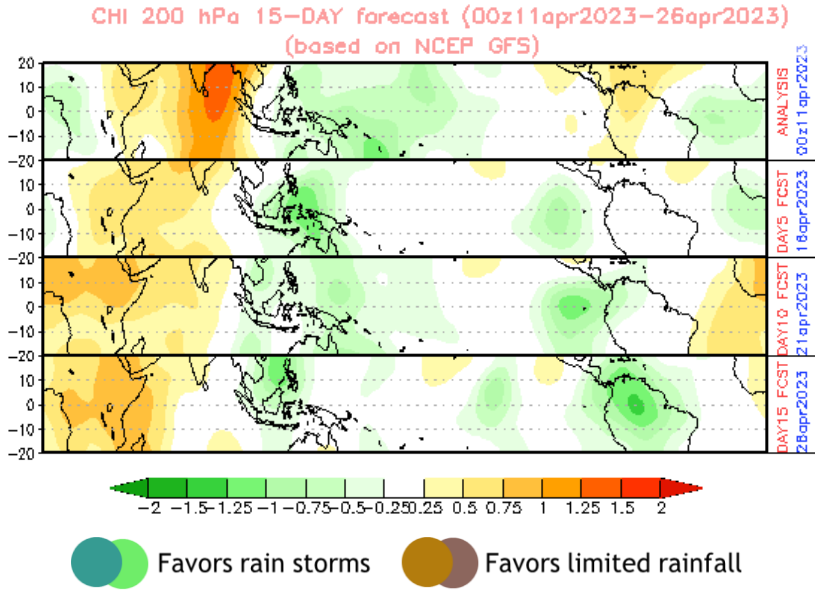


MJO Forecasts

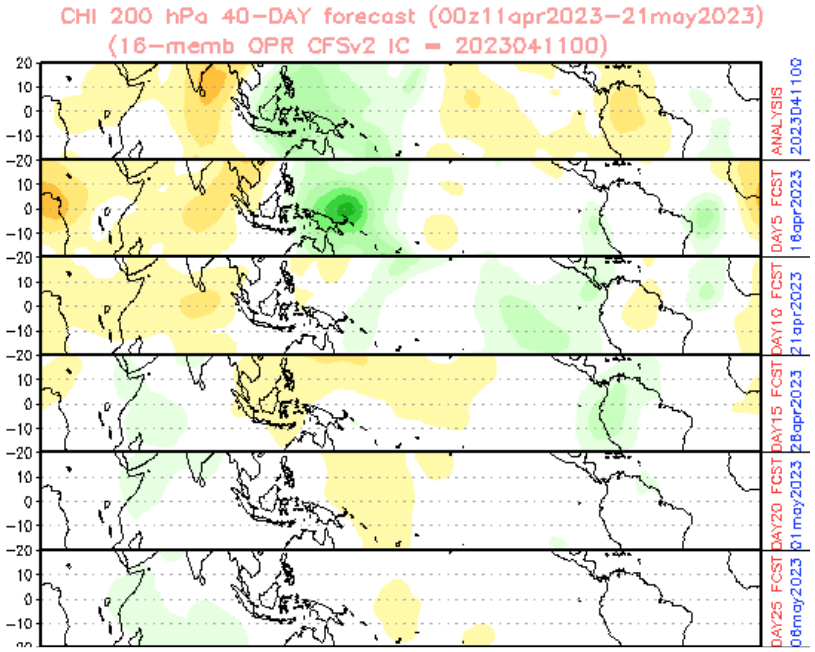
Empirical Wave Propagation (EWP)



Global Forecast System (GFS)



Climate forecast System (CFS)



Source: CPC

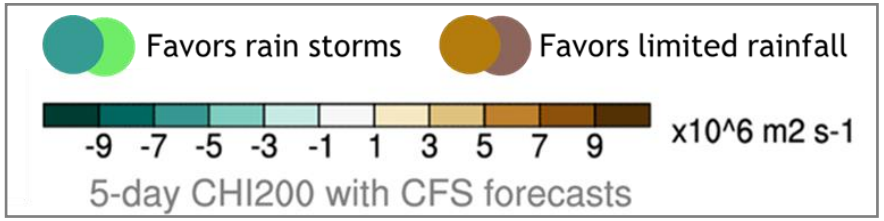
TAKEAWAYS

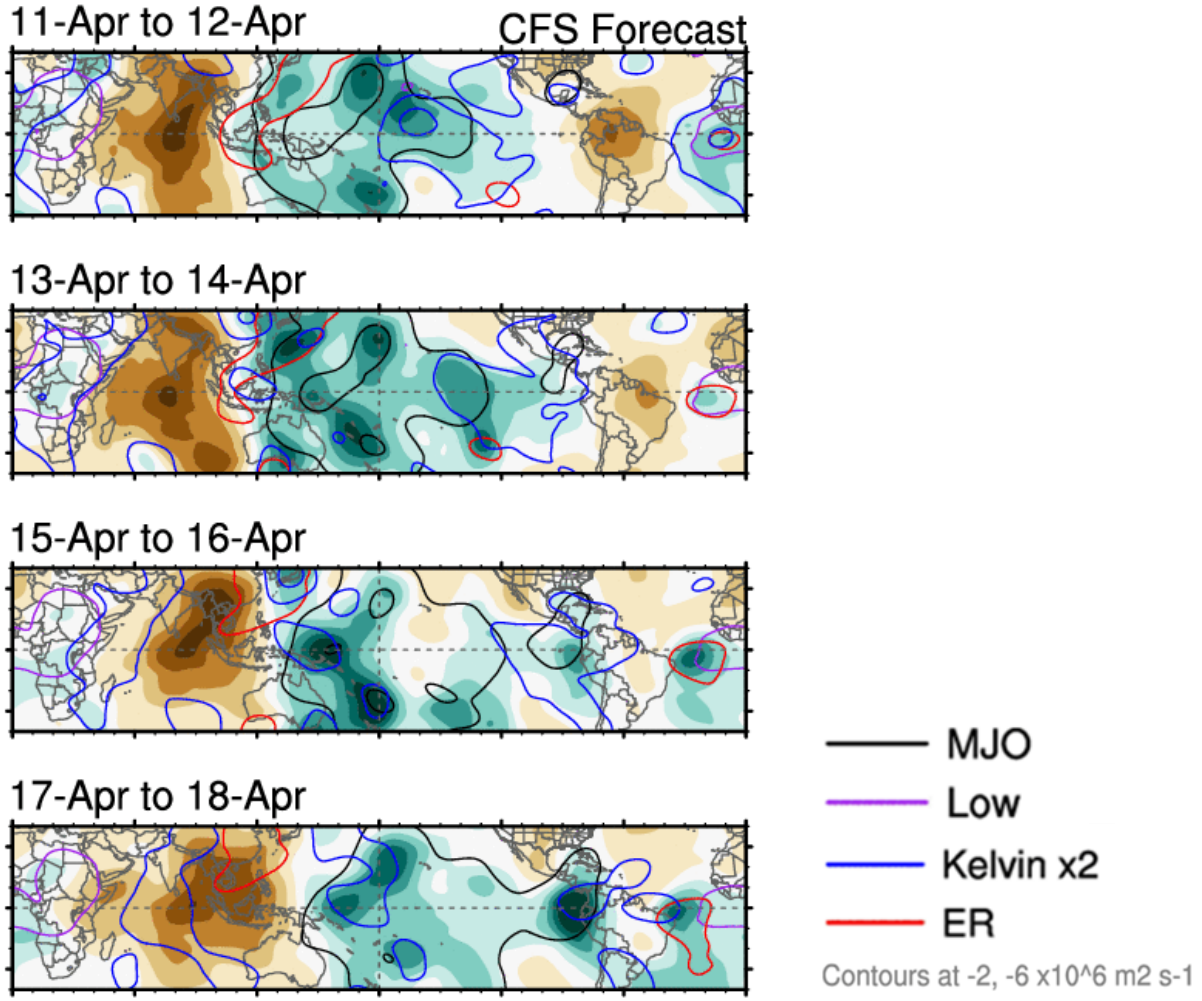
- **Dry MJO crossing the region through April 14.**
- **Wet the second half of April.**
- **Watch out for wet Kelvin activity starting April 15.**

MJO and Upper Tropospheric Waves

Outlook for the next few days:

- Wet Kelvin April 15-18. Impacts in northwest South America mostly. Milder enhancement in Central America.

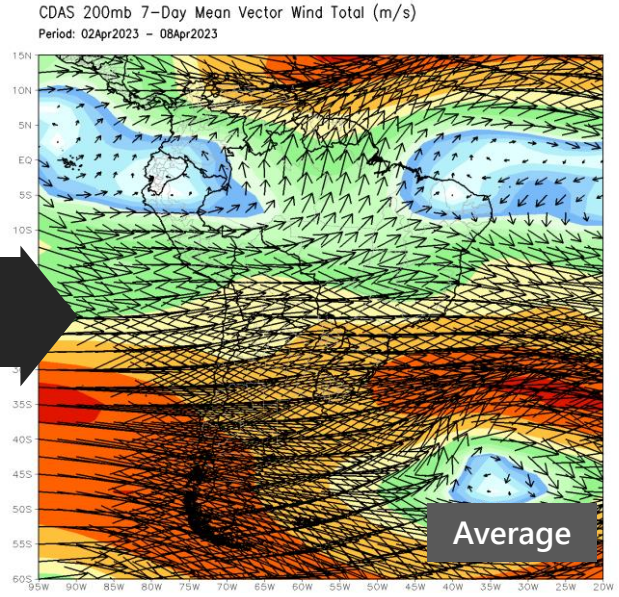


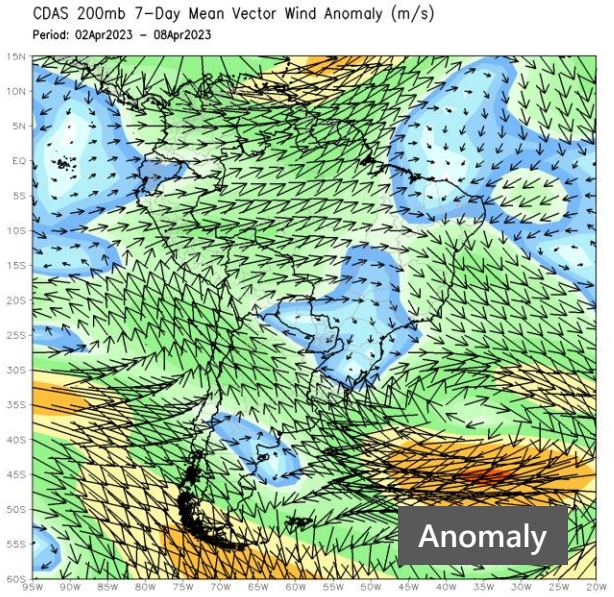


Source: NCICS

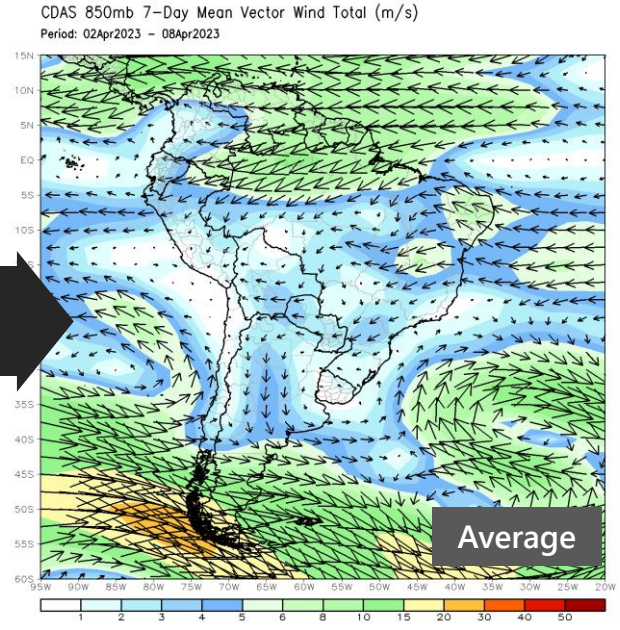
South America, Last 7 Days

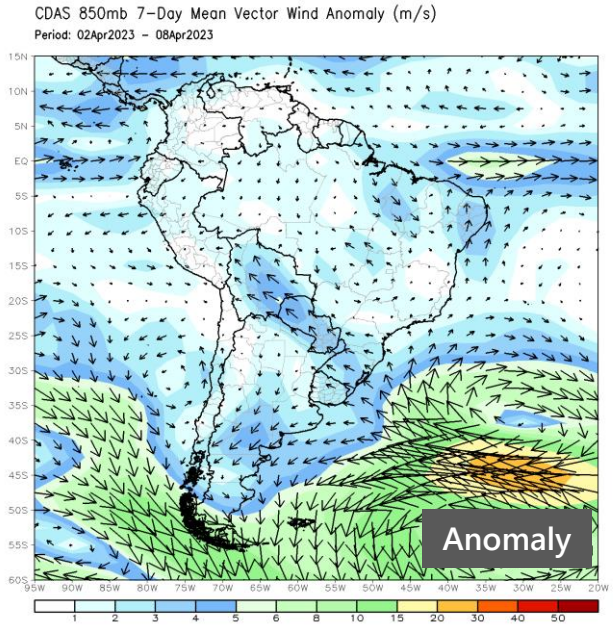
200 hPa Flow



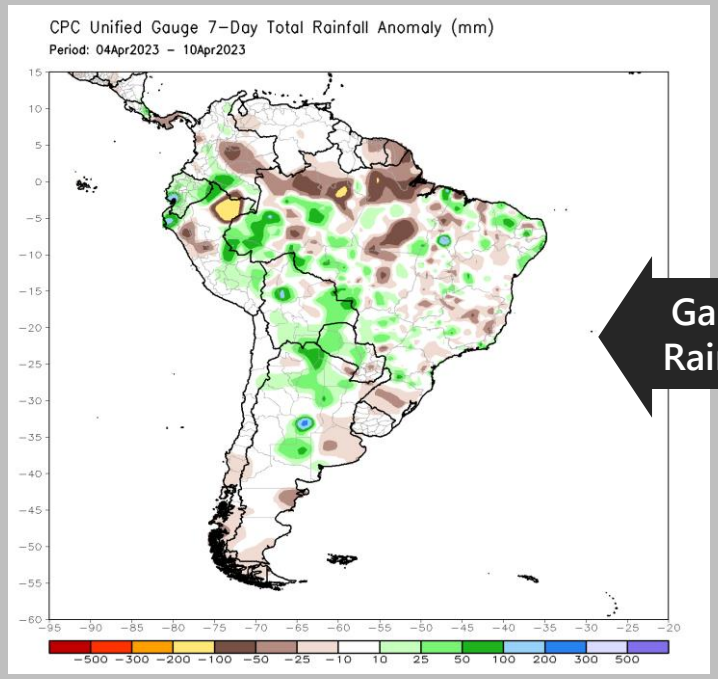


850 hPa Flow

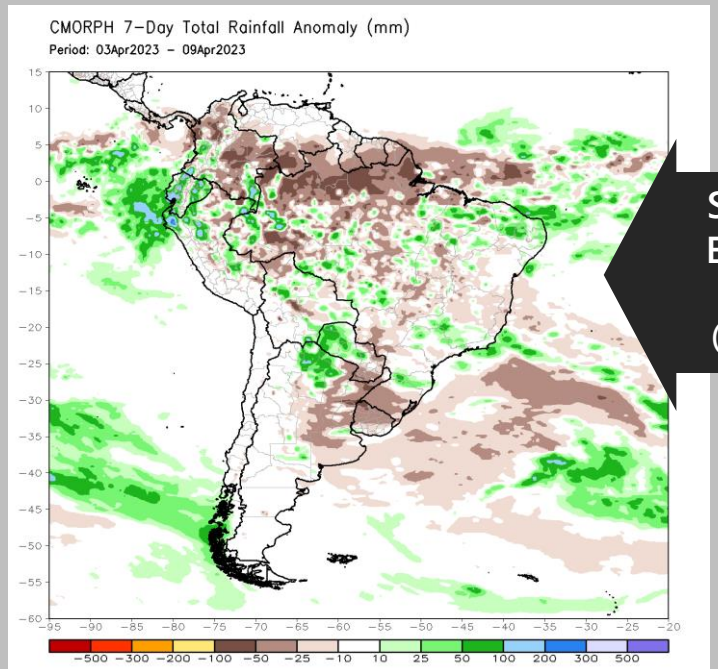




Gauge Rainfall

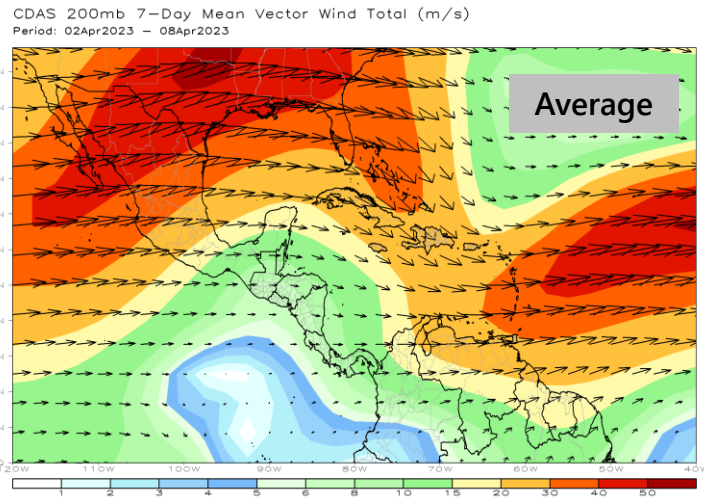


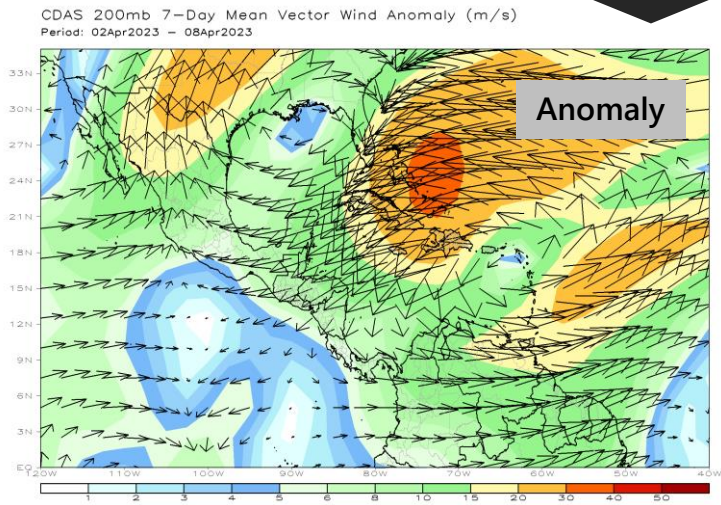
Satellite – Estimated Rainfall (CMORPH)



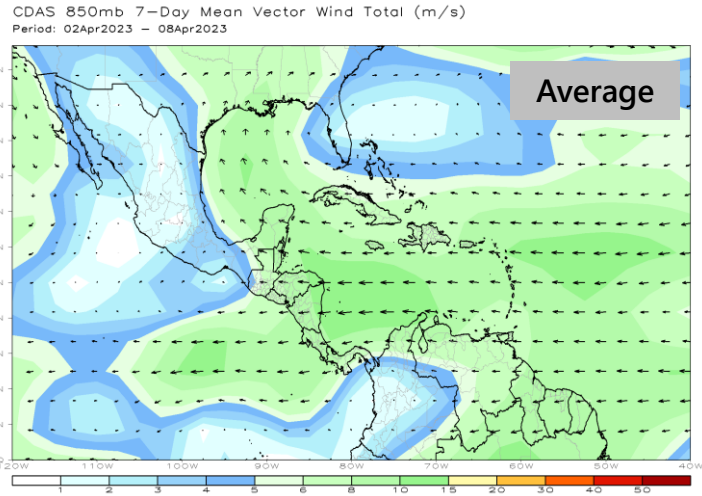
Caribbean/Central America, Last 7 Days

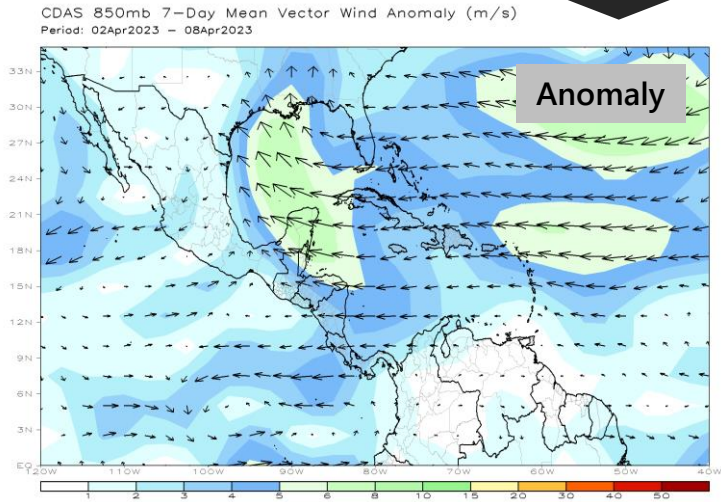
200 hPa Flow



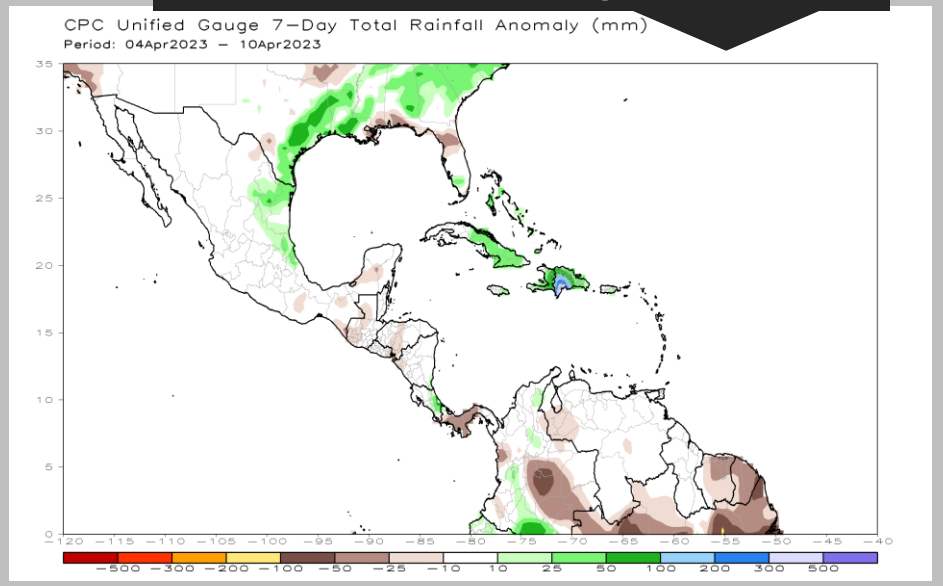


850 hPa Flow

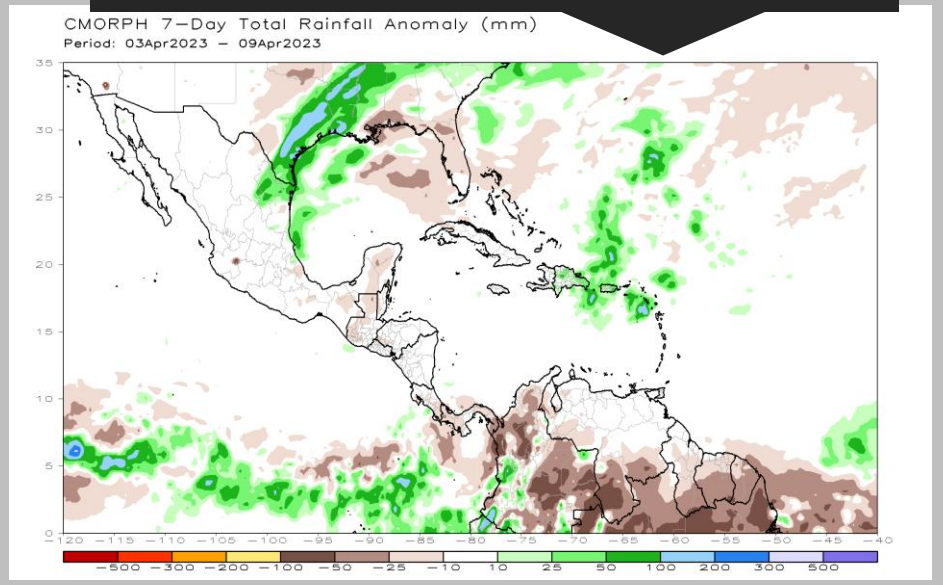




Rainfall from Gauges (CPC)



Satellite – Estimated Rainfall (CMORPH)



¡Gracias! Thank you! ¡Obrigado!

Next Session: May 10, 2023, 15UTC

Recorded sessions and more information available at:
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