

WMO VLab Regional Focus Group  
of the Americas and Caribbean



Since 2004

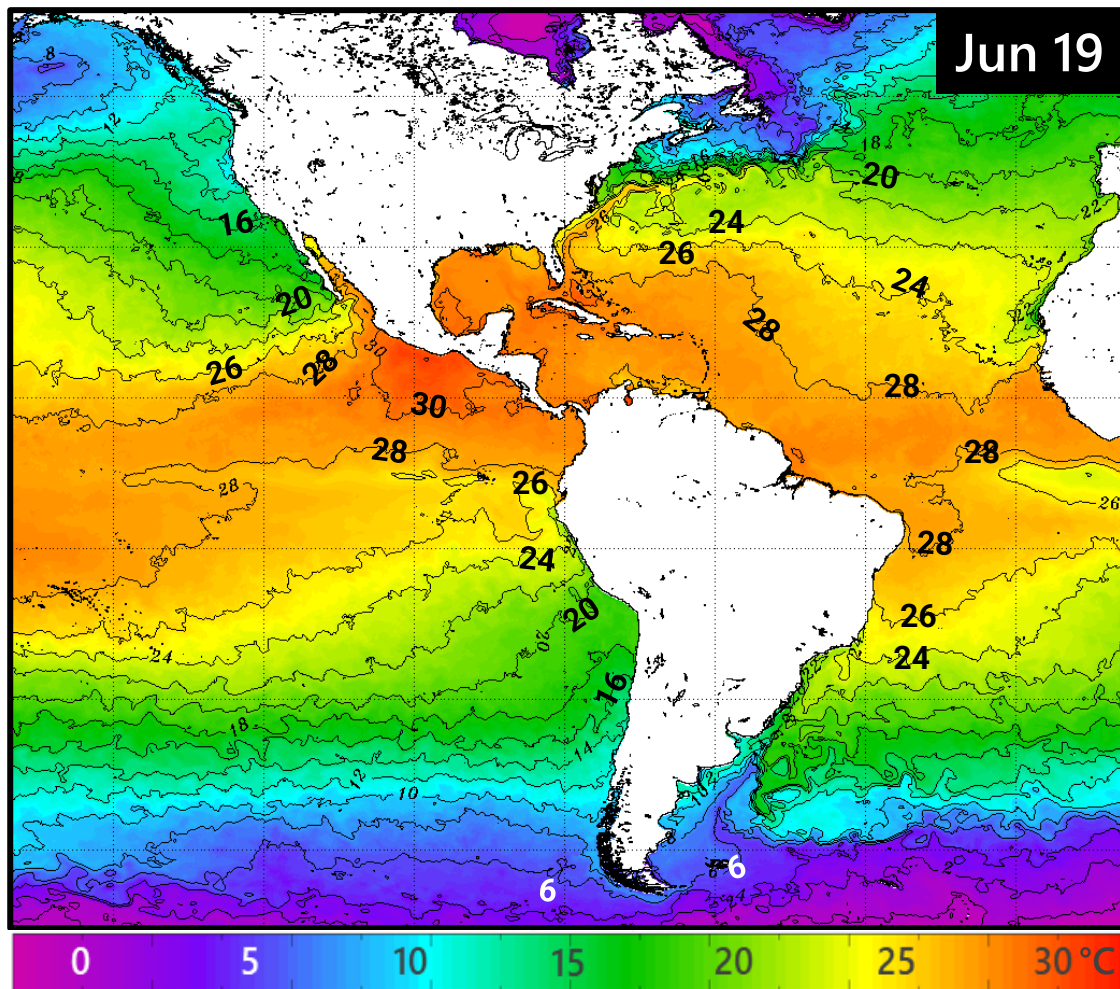
# Climate Indices

## Current Status and Projections

Wednesday 21 June 2023

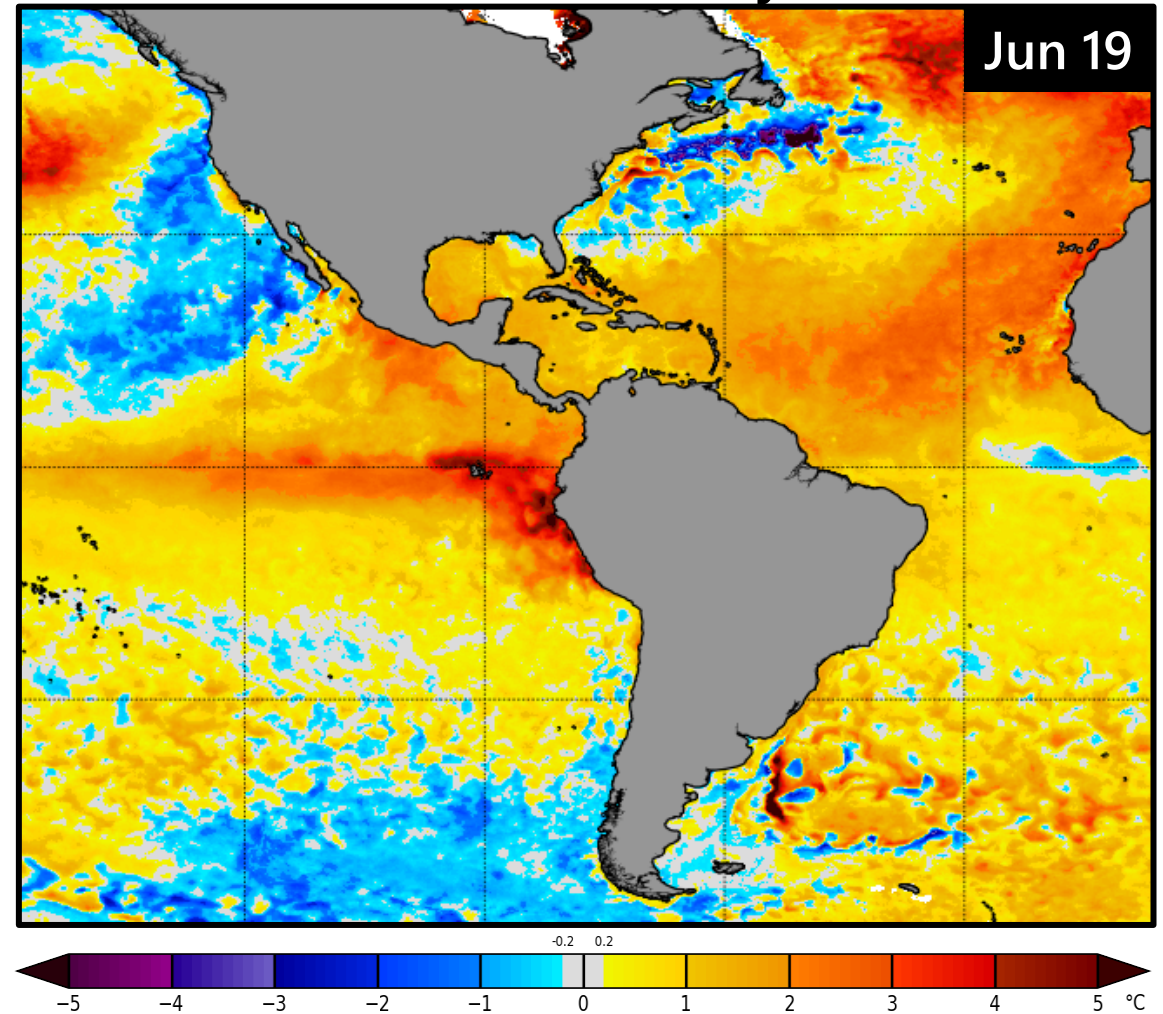
# Sea Surface Temperature (SST)

## SST



NOAA OSPO  
[https://www.ospo.noaa.gov/data/sst/contour/global\\_small.c.gif](https://www.ospo.noaa.gov/data/sst/contour/global_small.c.gif)

## SST Anomaly



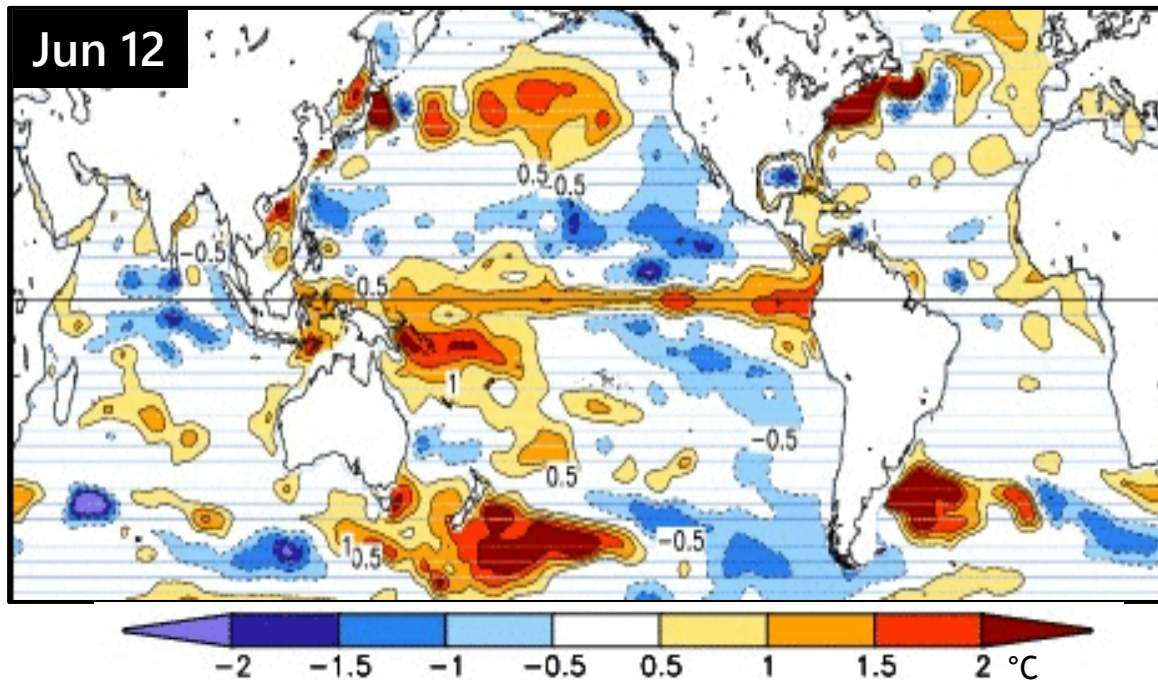
NOAA Coral Reef Watch  
[https://coralreefwatch.noaa.gov/product/5km/index\\_5km\\_ssta.php](https://coralreefwatch.noaa.gov/product/5km/index_5km_ssta.php)



# Top Layer Temperature Anomaly

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

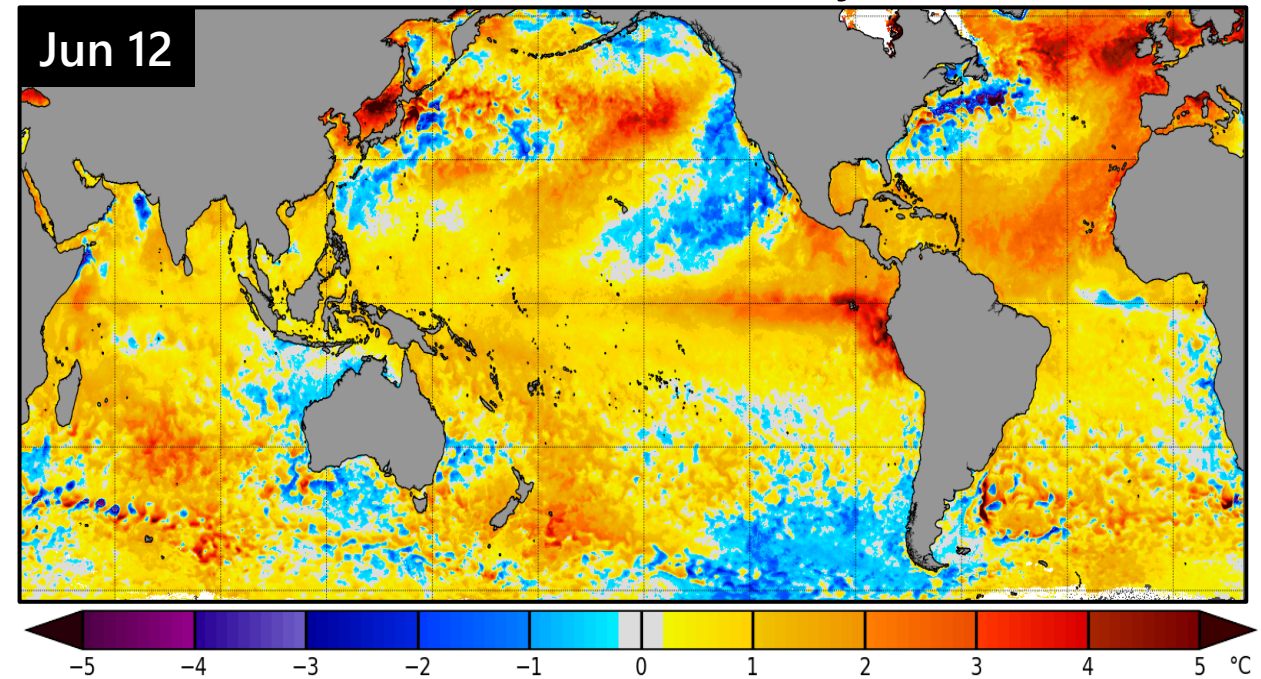
## Top 300m-Layer Anomaly



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](https://coralreefwatch.noaa.gov/product/5km/index_5km_ssta.php)

# El Niño-Southern Oscillation (ENSO)

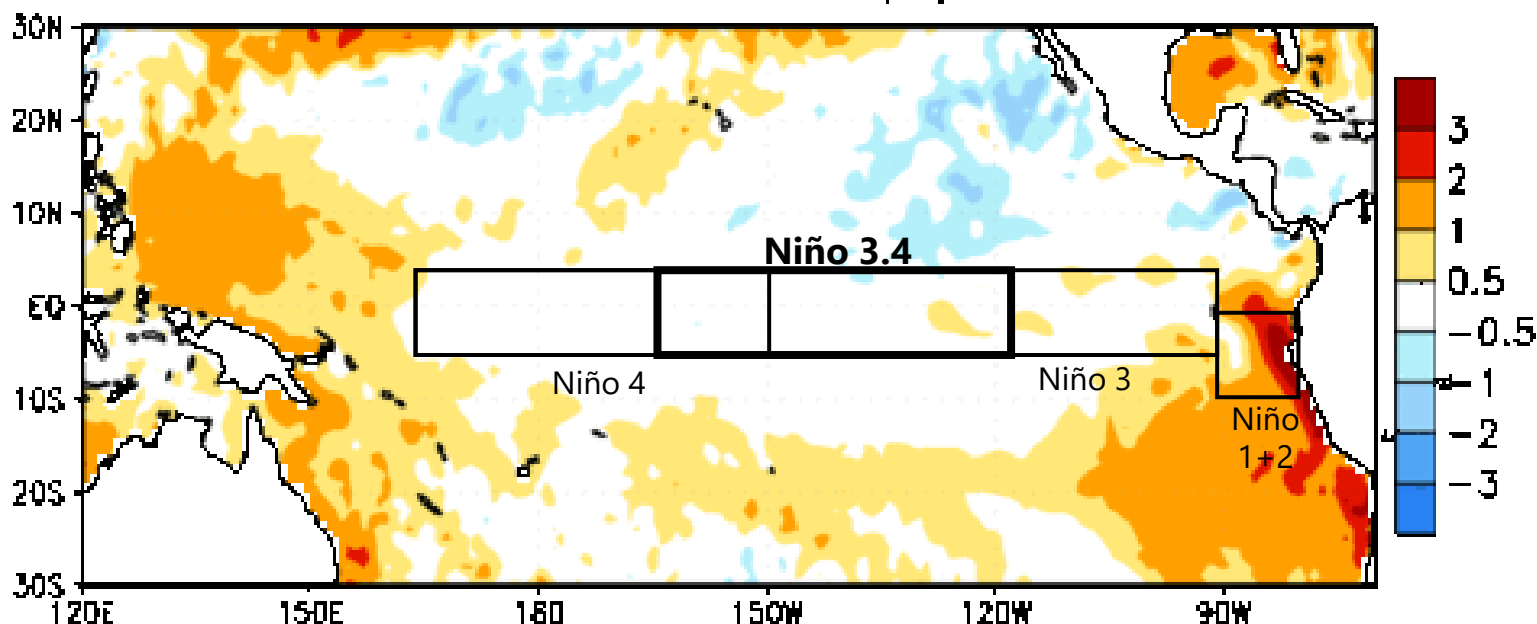
## CPC Official Statement

### Status: El Niño Advisory

- ☉ El Niño conditions are observed.\*
- ☉ Equatorial sea surface temperatures (SSTs) are above average across the east-central and eastern Pacific Ocean.
- ☉ The tropical Pacific atmospheric anomalies are consistent with weak El Niño conditions.

Week centered on 29 MAR 2023

SST Anomalies (°C)



## TAKEAWAYS

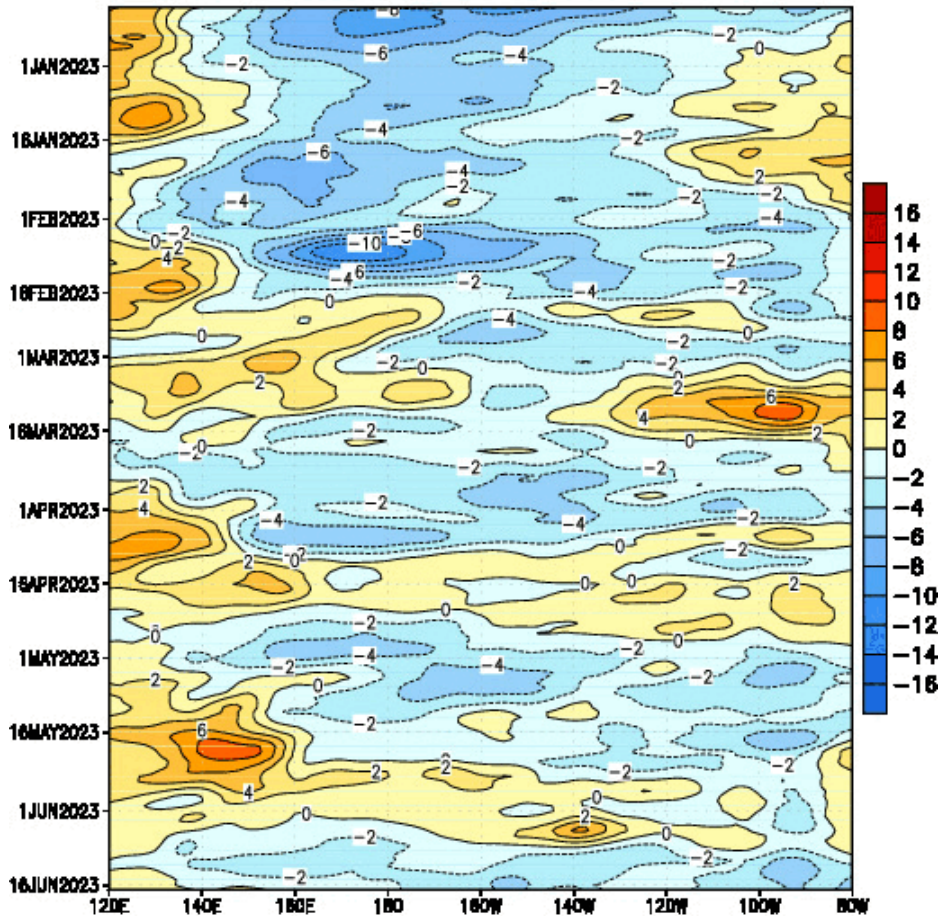
- EPAC warming is spreading west.
- Niño 3.4 has now T anomalies between +0.5 and +1.5°C.
- The warming in the SAM coast is neither increasing nor decreasing in strength.



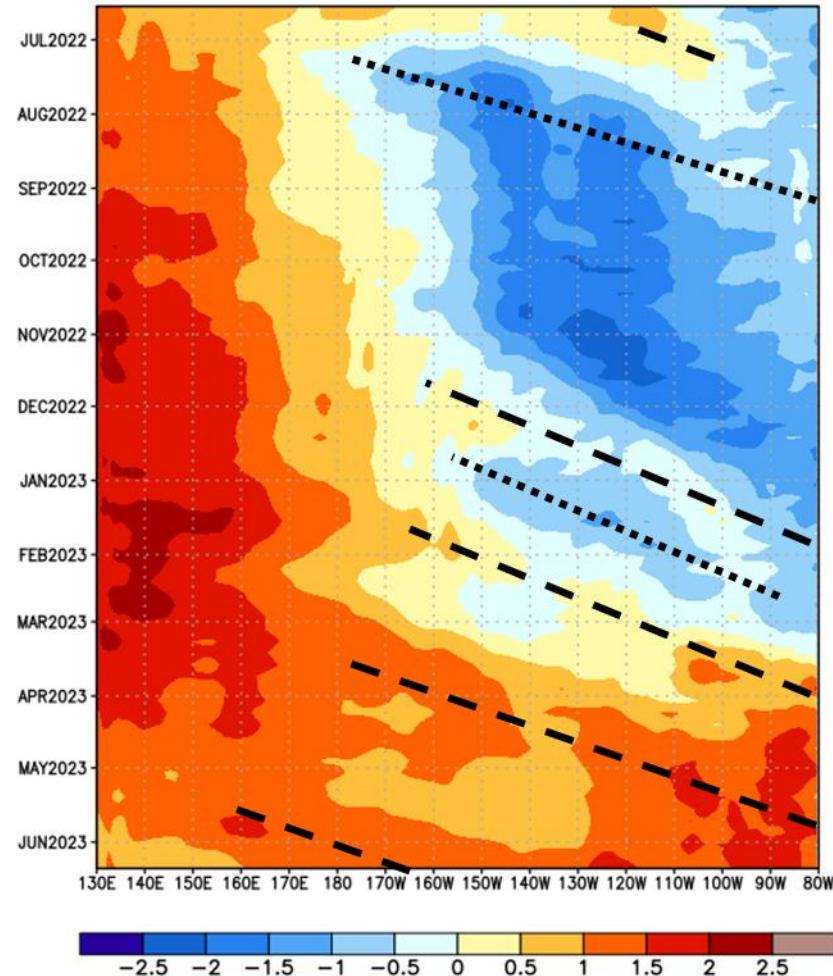
# Hovmöller of Zonal Wind & Heat Content Anomalies

Westerly wind bursts can trigger warm Kelvin Waves that propagate towards South America.

CDAS 850-hPa U Anoms. (5N–5S)



EQ. Upper-Ocean Heat Anoms. (deg C)



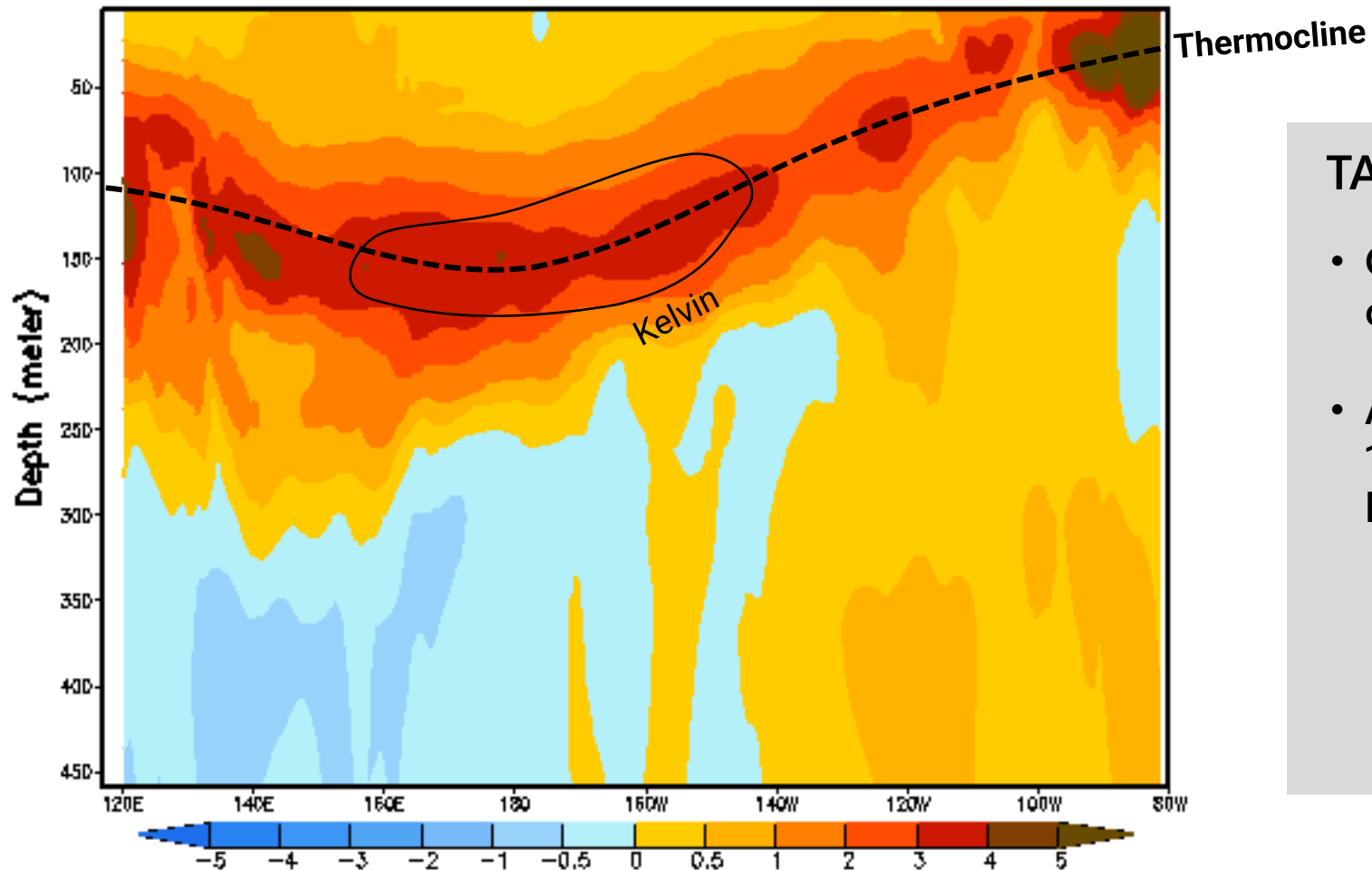
## TAKEAWAYS

- Downwelling (warm) Kelvin propagating near 165W.
- To arrive in South America in 1.5 months or near early August, reinforcing surface warming.

# ENSO: Oceanic Kelvin Waves

## Equatorial Pacific Temperature Anomaly Section

Pentad centered on 13 APR 2023



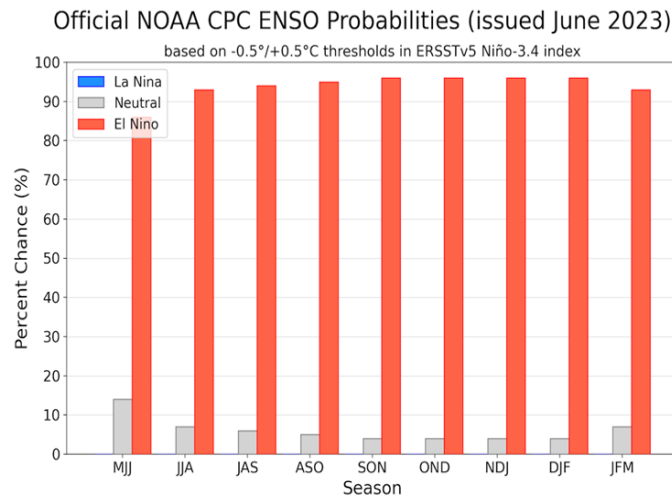
### TAKEAWAYS

- Generalized sub-superficial warming of the equatorial Pacific.
- A warm Kelvin is propagating near 165W. No warm Kelvins are trailing behind at the moment.

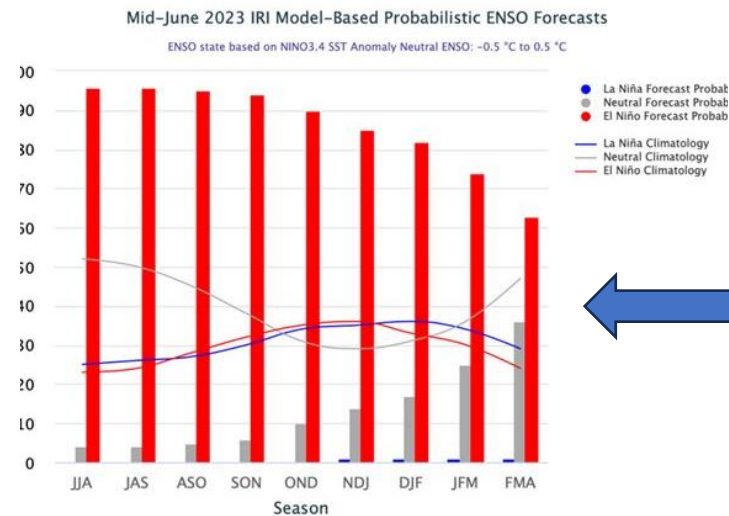
# ENSO Outlook

El Niño conditions are expected to gradually strengthen into the Northern Hemisphere winter 2023-24.\*

## Probabilistic Forecast

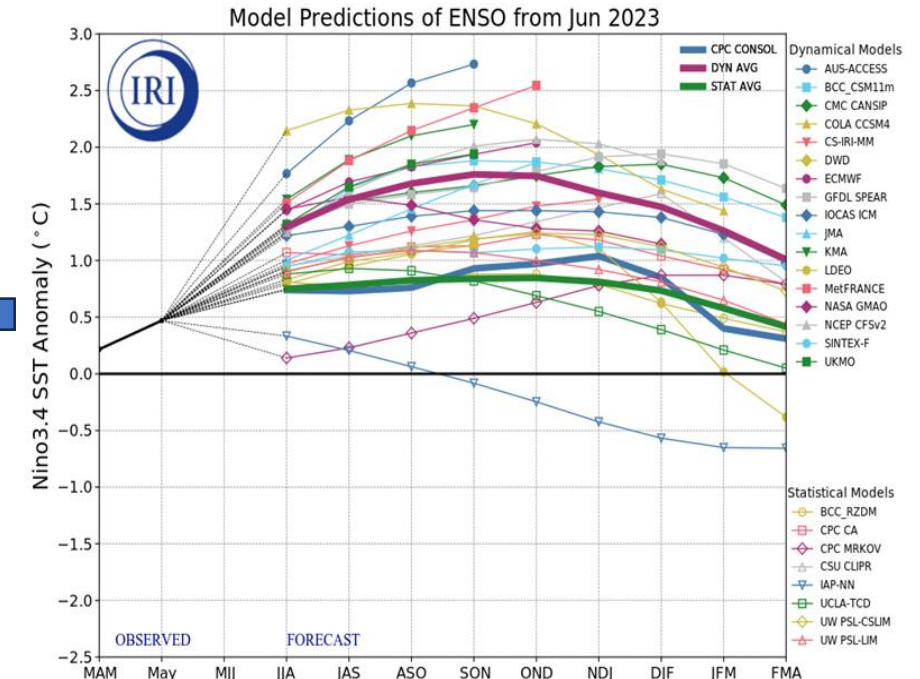


Source: CPC



Source: IRI

## IRI/CPC Dynamic Models





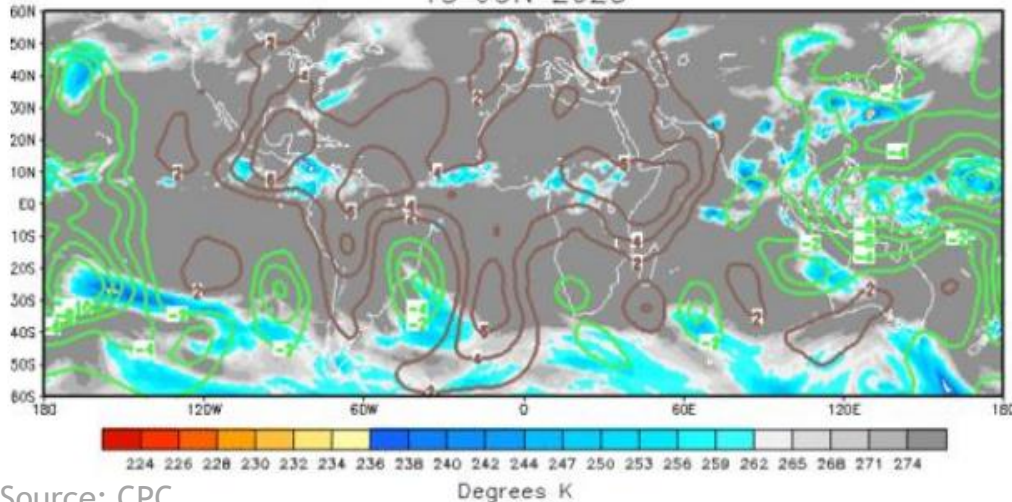
# Madden-Julian Oscillation (MJO)

## Current Observations:

- Propagation slower and not as well defined as in previous months.
- Positive interference with ENSO, enhancing convection west of the dateline.
- Extrapolating propagation, next wet MJO in early to mid July.

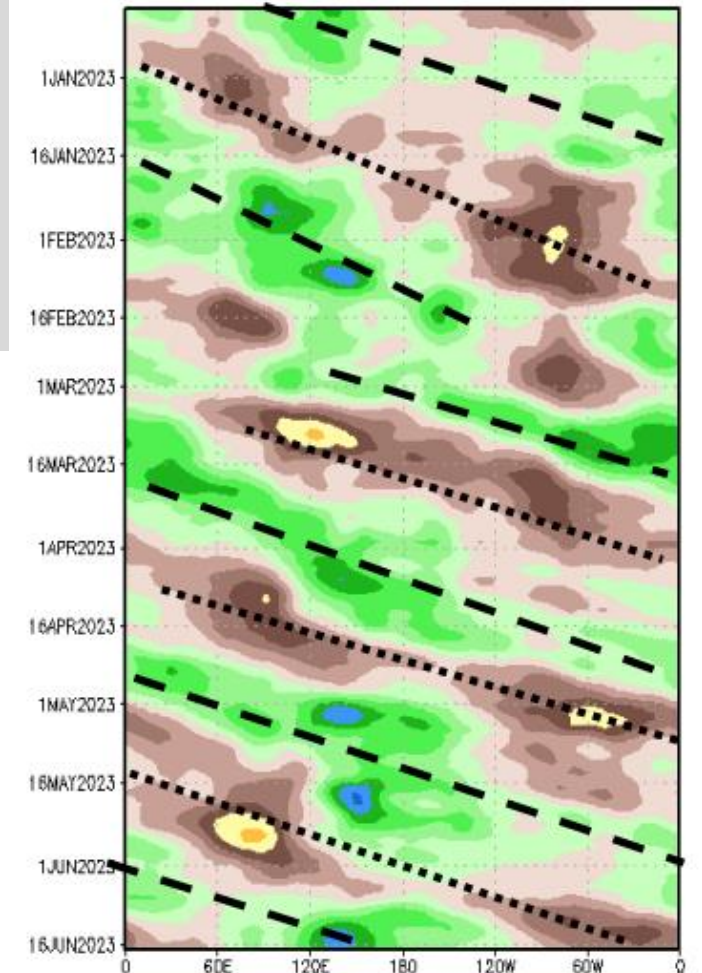
Velocity Potential and Brightness Temperature (shaded)



18 JUN 2023



Source: CPC

200-hPa Velocity Potential Anomaly: 5N-5S  
5-day Running Mean



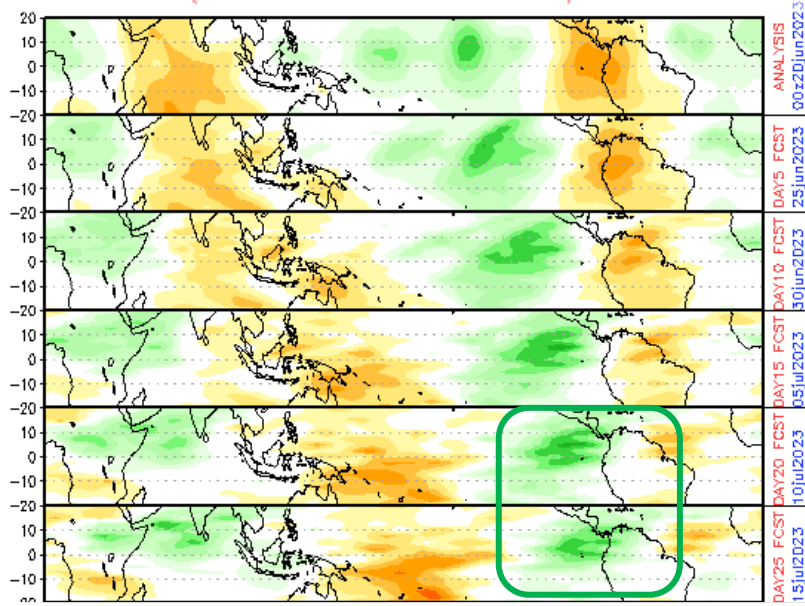
-  Favors rain storms
-  Favors limited rainfall



# MJO Forecasts

## Empirical Wave Propagation (EWP)

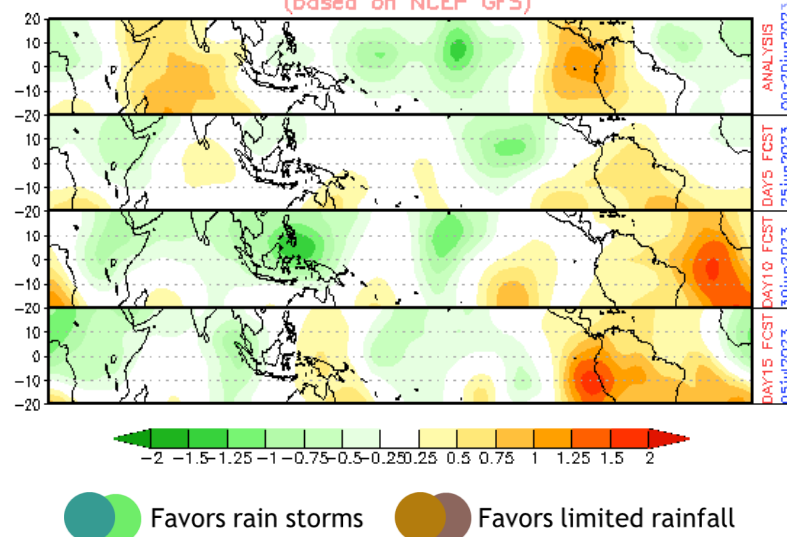
CHI 200 hPa 40-DAY forecast (00z20jun2023–30jul2023)  
(based on EWP zonal harmonics)



Source: CPC

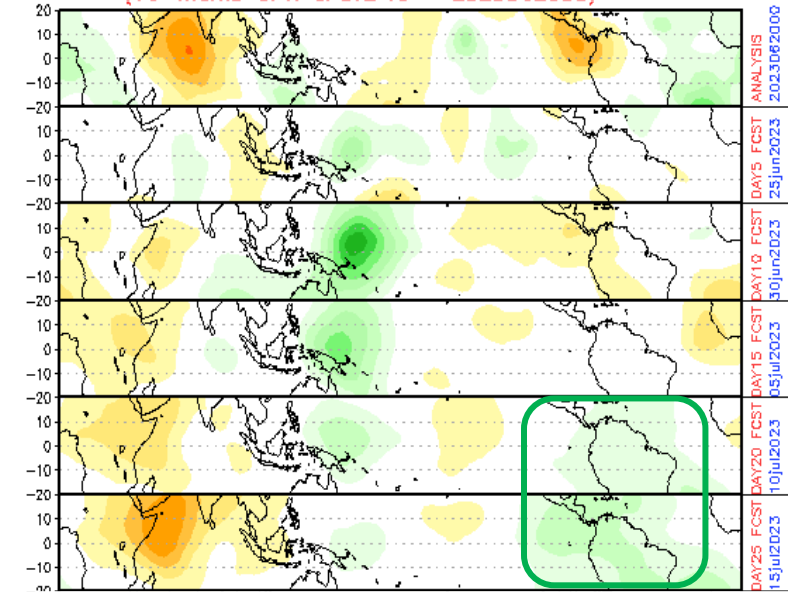
## Global Forecast System (GFS)

CHI 200 hPa 15-DAY forecast (00z20jun2023–05jul2023)  
(based on NCEP GFS)



## Climate forecast System (CFS)

CHI 200 hPa 40-DAY forecast (00z20jun2023–30jul2023)  
(16-memb OPR CFSv2 IC = 2023062000)



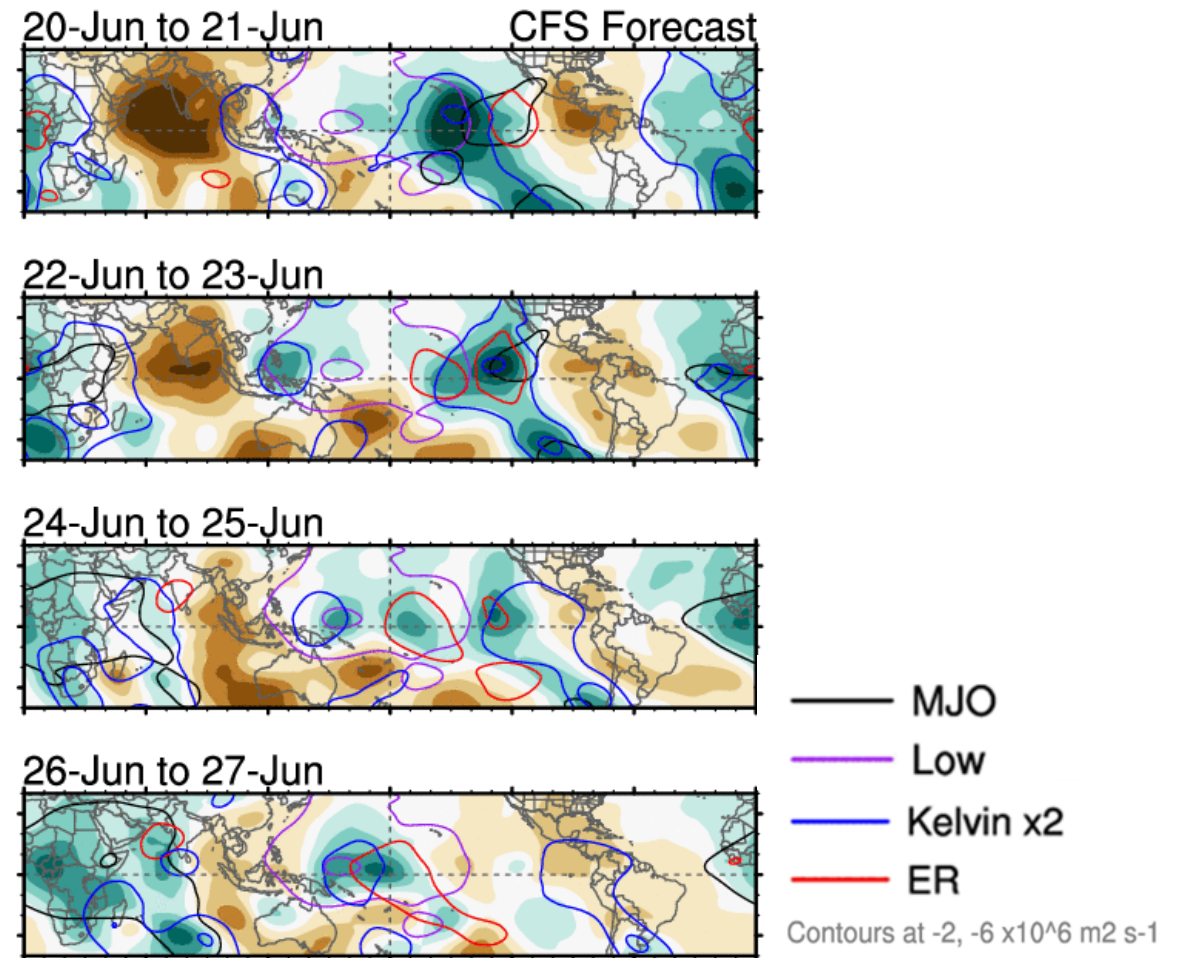
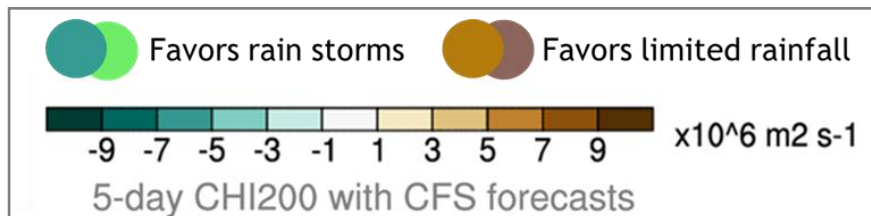
## TAKEAWAYS

- MJO slower and discrepancies in models.
- Wet likely during the first half of July.

# MJO and Upper Tropospheric Waves

## Outlook for the next few days:

- Wet Kelvin arriving in Central America, but coinciding with large scale upper convergent pattern = limited impacts.
- Eastward propagating upper divergence anomalies might help with convection in Argentina/Uruguay on June 26-28.



Source: NCICS

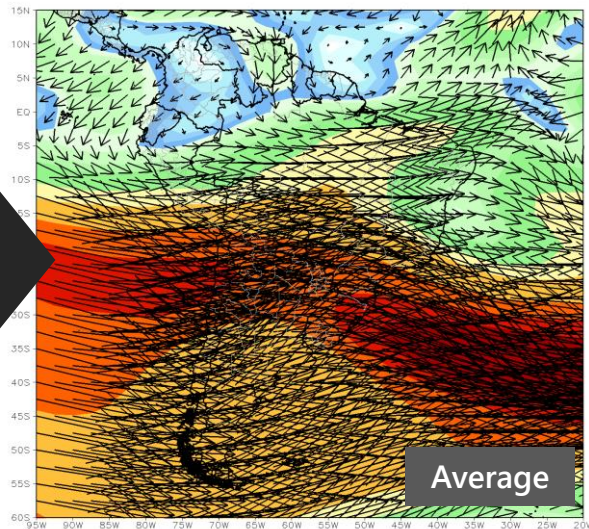


# South America, Last 7 Days

## Rainfall Anomalies

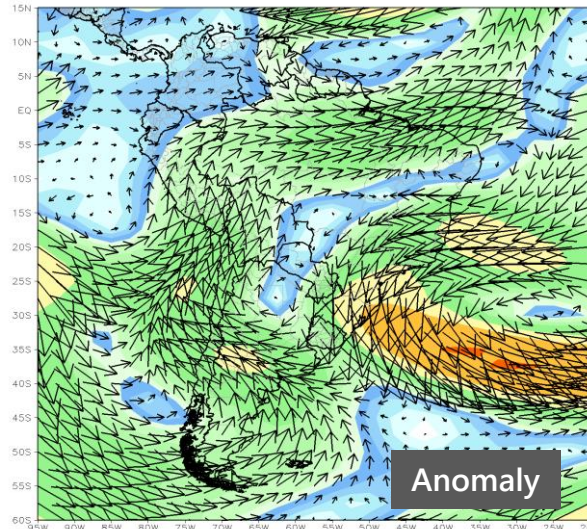
200 hPa  
Flow

CDAS 200mb 7-Day Mean Vector Wind Total (m/s)  
Period: 11Jun2023 - 17Jun2023



Average

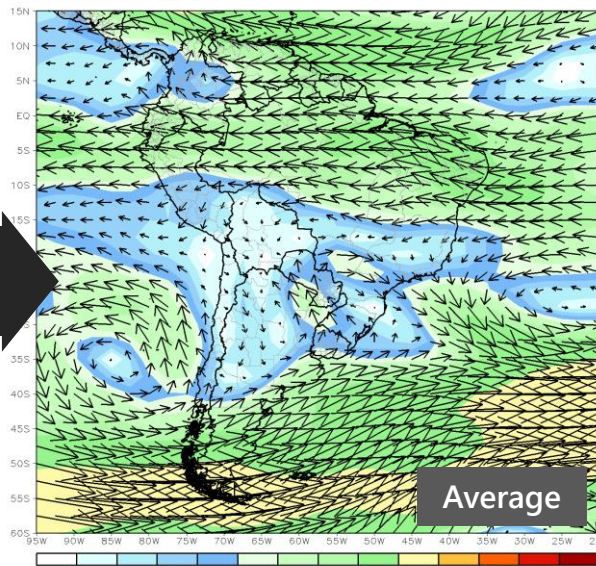
CDAS 200mb 7-Day Mean Vector Wind Anomaly (m/s)  
Period: 11Jun2023 - 17Jun2023



Anomaly

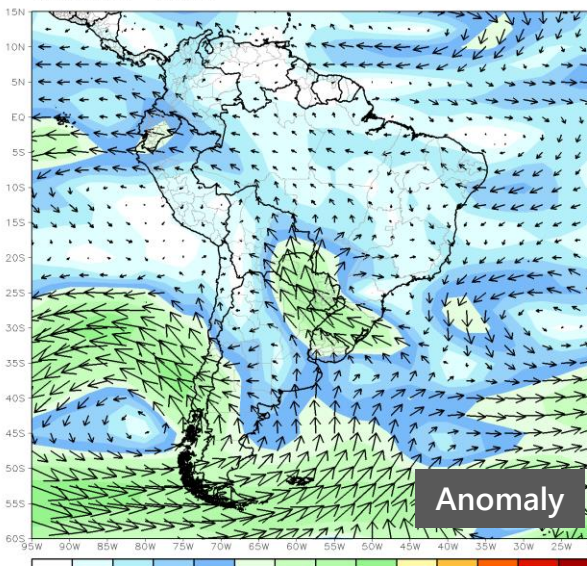
850 hPa  
Flow

CDAS 850mb 7-Day Mean Vector Wind Total (m/s)  
Period: 11Jun2023 - 17Jun2023



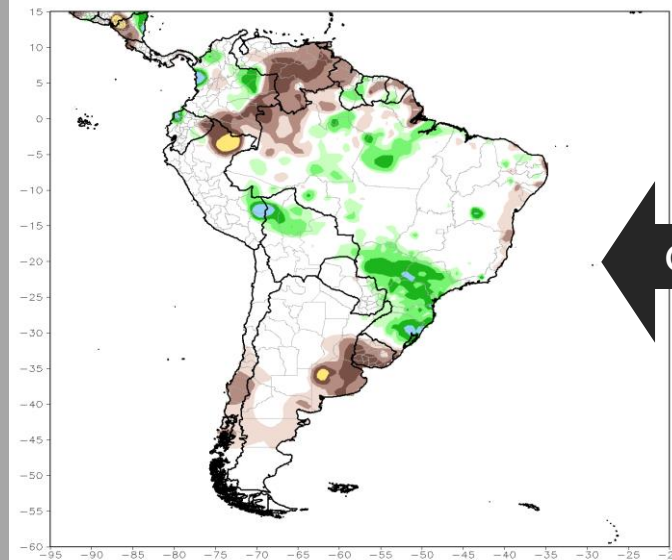
Average

CDAS 850mb 7-Day Mean Vector Wind Anomaly (m/s)  
Period: 11Jun2023 - 17Jun2023



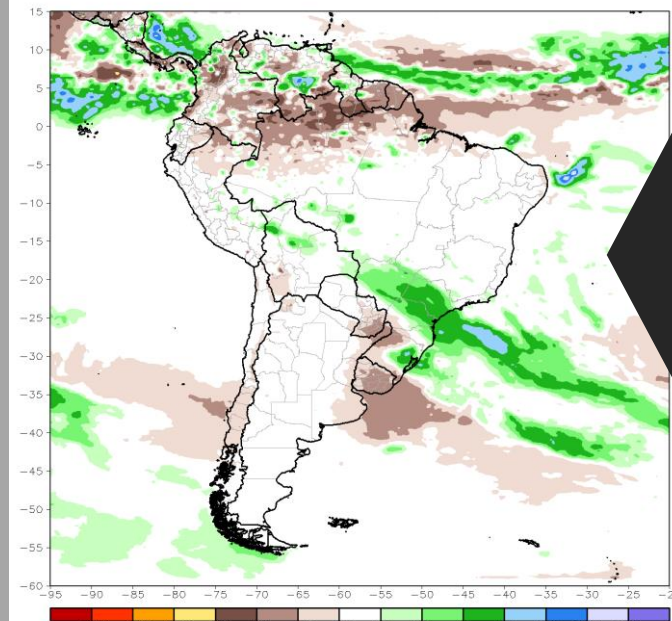
Anomaly

CPC Unified Gauge 7-Day Total Rainfall Anomaly (mm)  
Period: 13Jun2023 - 19Jun2023



Gauges

CMORPH 7-Day Total Rainfall Anomaly (mm)  
Period: 12Jun2023 - 18Jun2023



Satellite –  
Estimated  
(CMORPH)

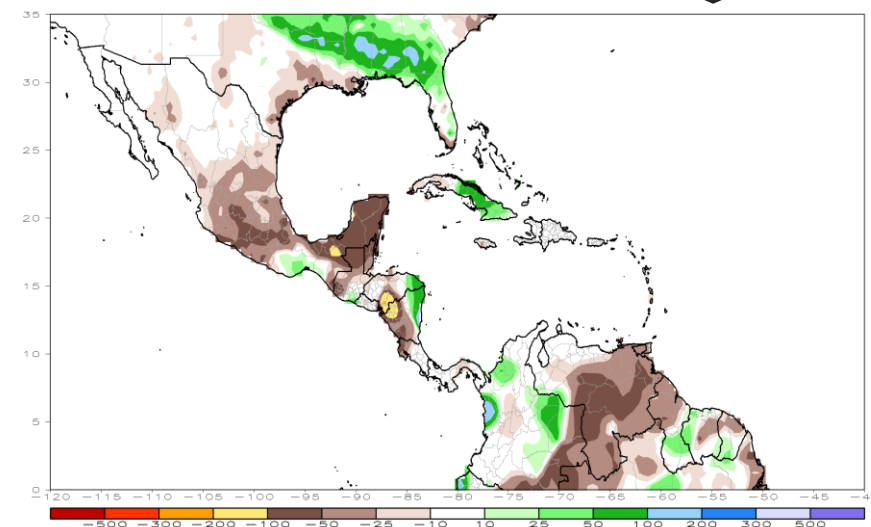


# Caribbean and Central America, Last 7 Days

## Rainfall Anomalies

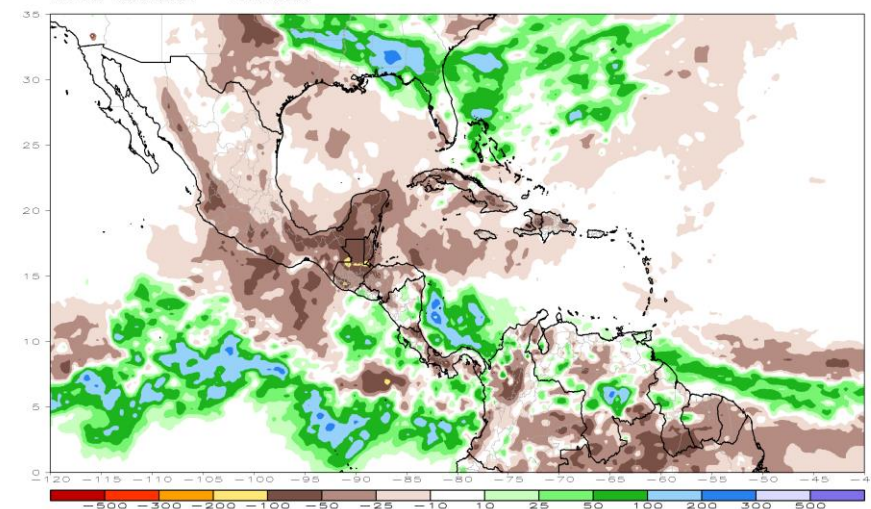
### Gauges (CPC)

CPC Unified Gauge 7-Day Total Rainfall Anomaly (mm)  
Period: 13Jun2023 - 19Jun2023



### Satellite – Estimated (CMORPH)

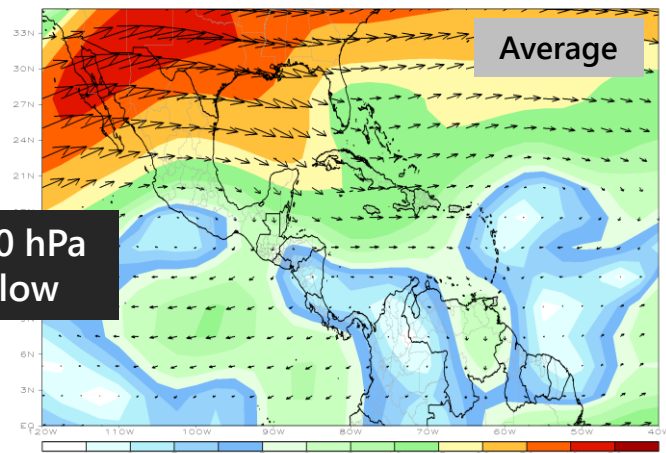
CMORPH 7-Day Total Rainfall Anomaly (mm)  
Period: 12Jun2023 - 18Jun2023



CDAS 200mb 7-Day Mean Vector Wind Total (m/s)  
Period: 11Jun2023 - 17Jun2023

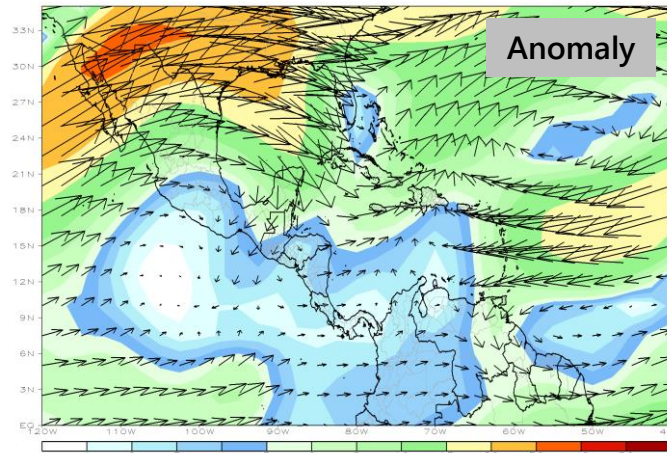
Average

200 hPa  
Flow



CDAS 200mb 7-Day Mean Vector Wind Anomaly (m/s)  
Period: 11Jun2023 - 17Jun2023

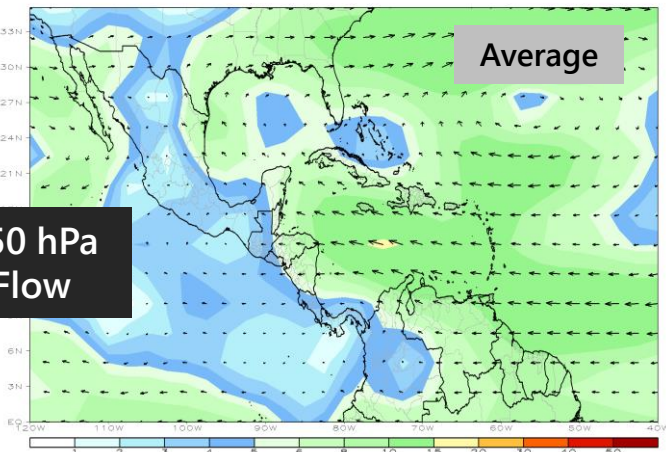
Anomaly



CDAS 850mb 7-Day Mean Vector Wind Total (m/s)  
Period: 11Jun2023 - 17Jun2023

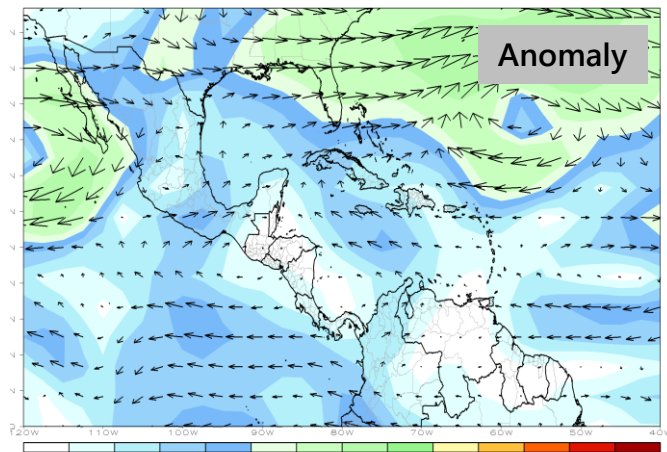
Average

850 hPa  
Flow



CDAS 850mb 7-Day Mean Vector Wind Anomaly (m/s)  
Period: 11Jun2023 - 17Jun2023

Anomaly



**¡Gracias! Thank you! ¡Obrigado!**

**Next Session: To be discussed**

Recorded sessions and more information available at:  
<https://rammb2.cira.colostate.edu/training/rmtc/focusgroup/>

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