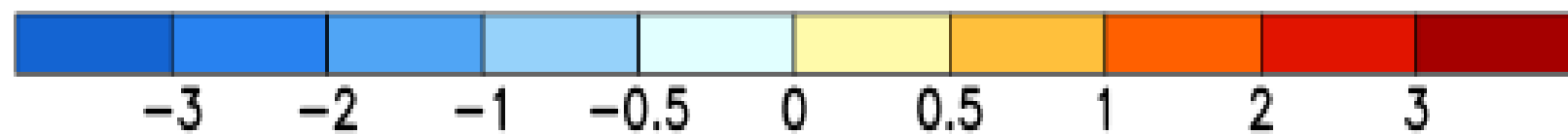
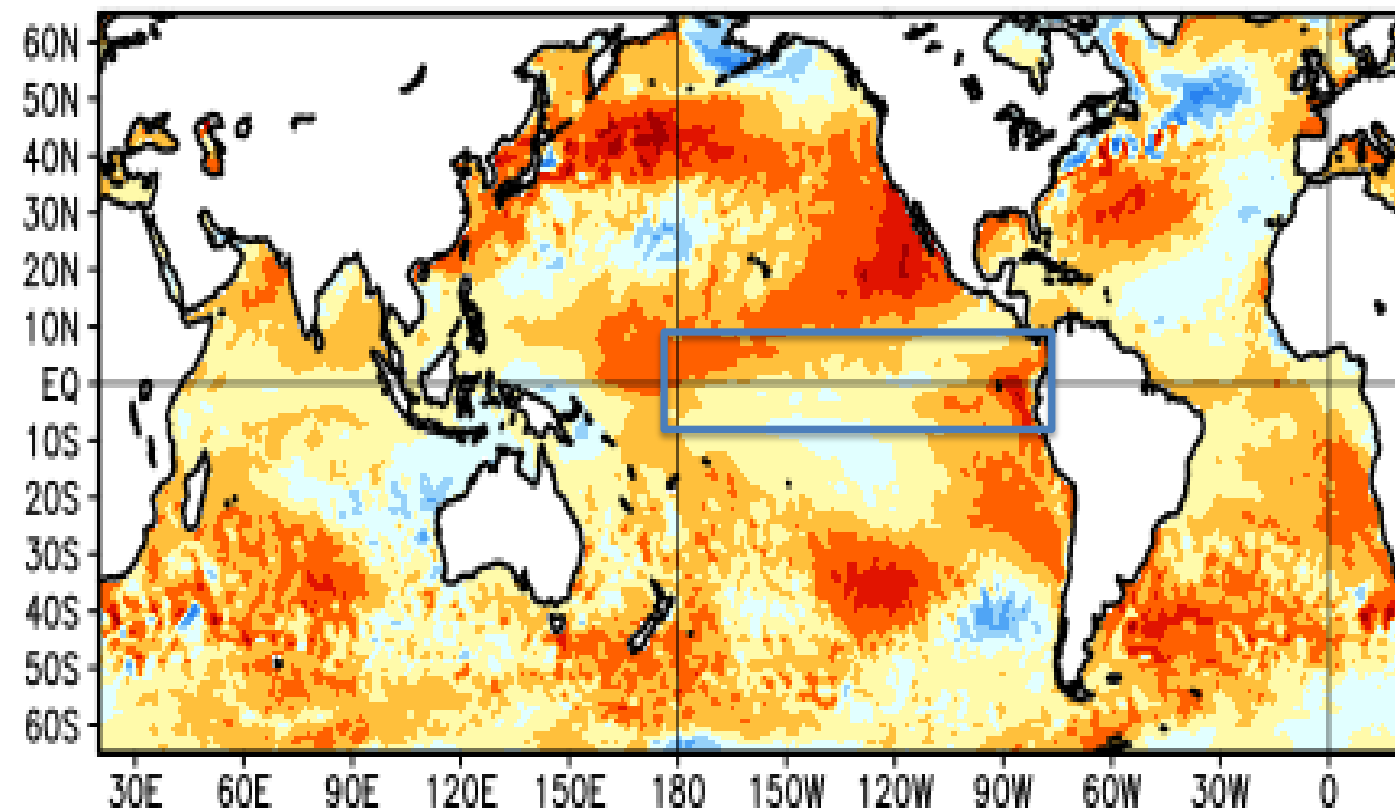
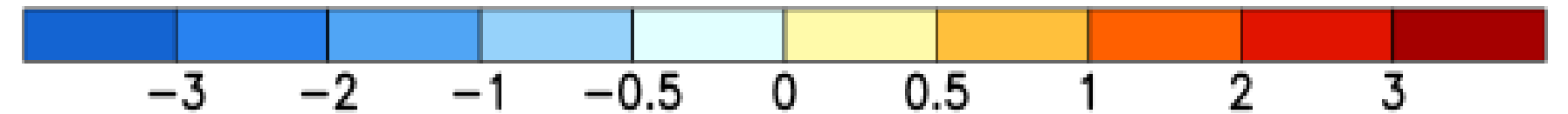
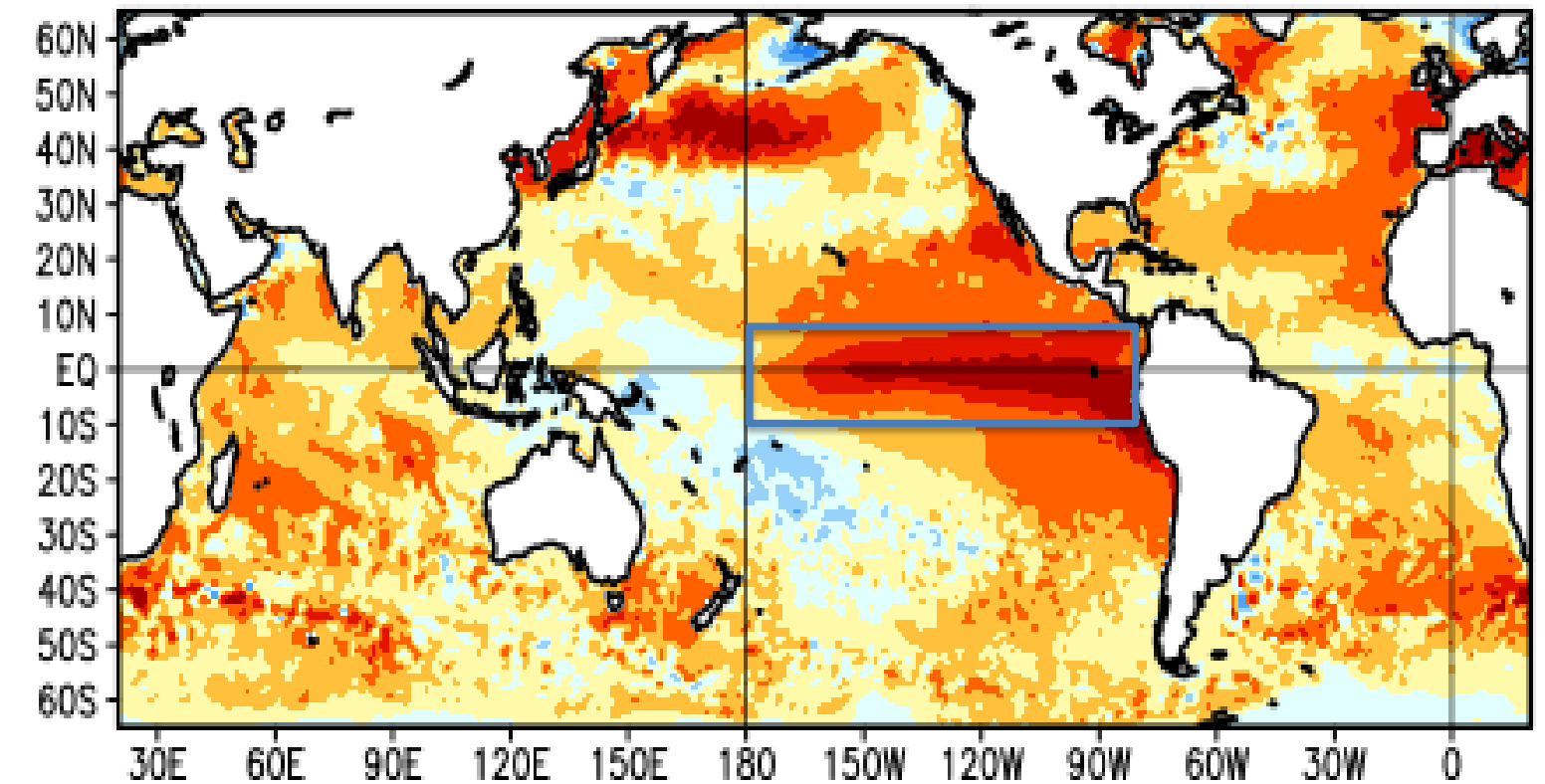


Tracking novel extremes and their impacts with earth observations

Average SST Anomalies
29 MAR 2026 – 25 APR 2026



Average SST Anomalies
26 JUL 2026 – 22 AUG 2026



Strength of El Niño

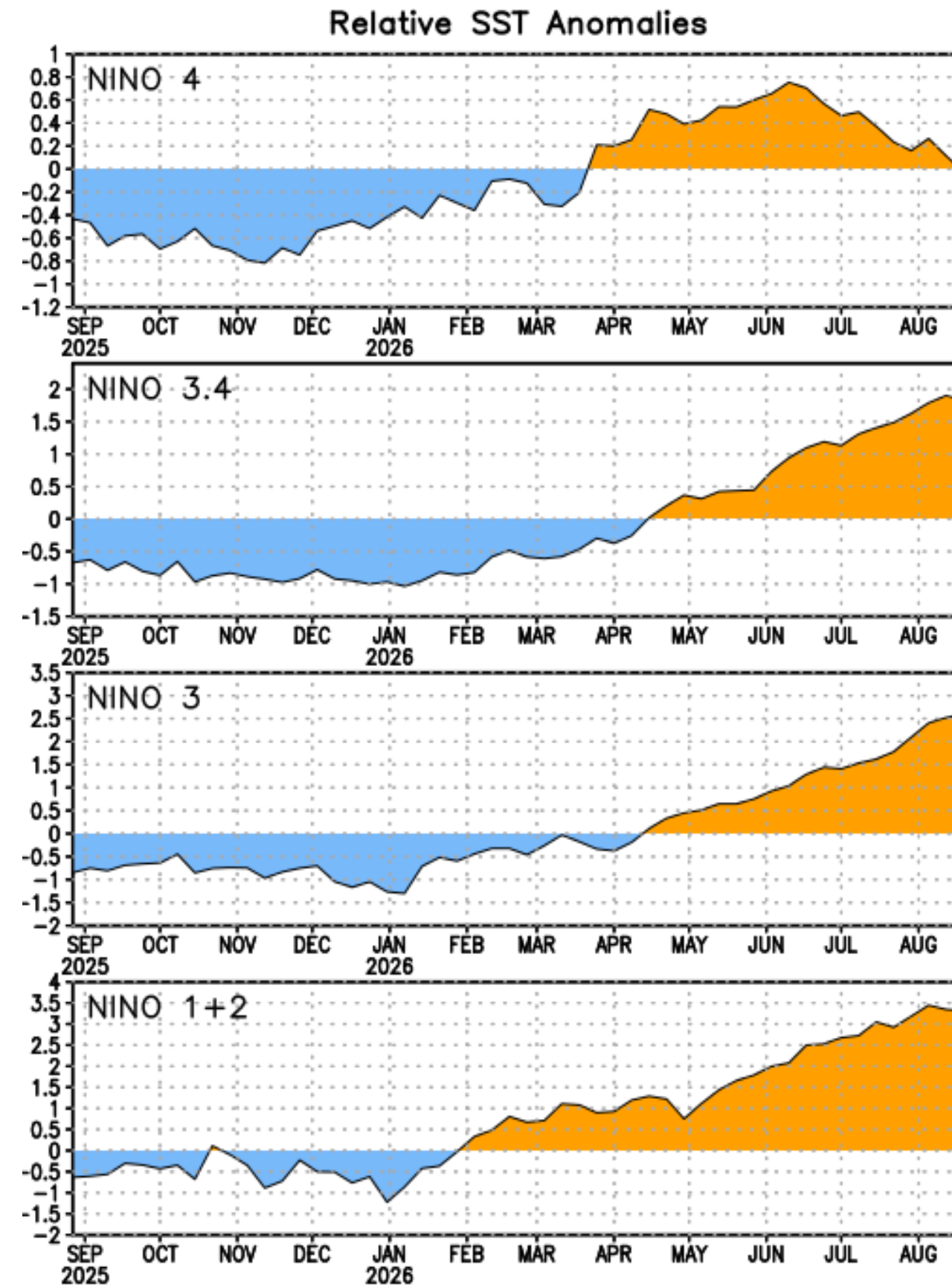
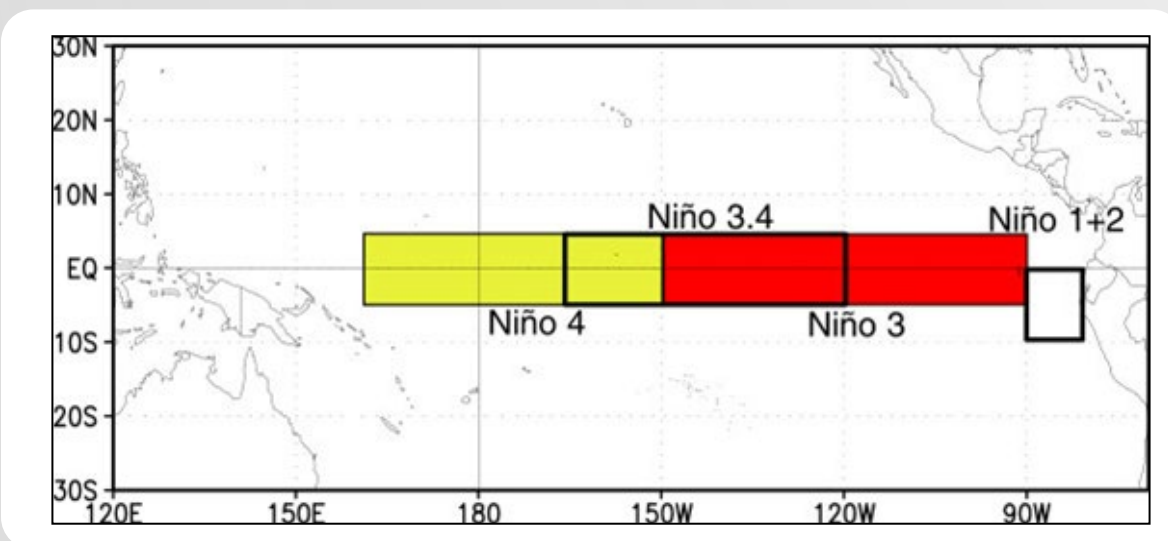
- El Niño is the warming of the eastern Pacific Ocean near the equator
- Strength is determined by size of temperature anomaly
- Relative Ocean Niño Index (RONI) tracks event
- **Weak** – 0.5 to 1.0 degrees Celsius warmer
- **Moderate**–1.0 to 1.5 degrees Celsius warmer
- **Strong** – 1.5 to 2.0 degrees Celsius warmer
- **Very Strong** – greater than 2.0 degrees Celsius warmer



Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

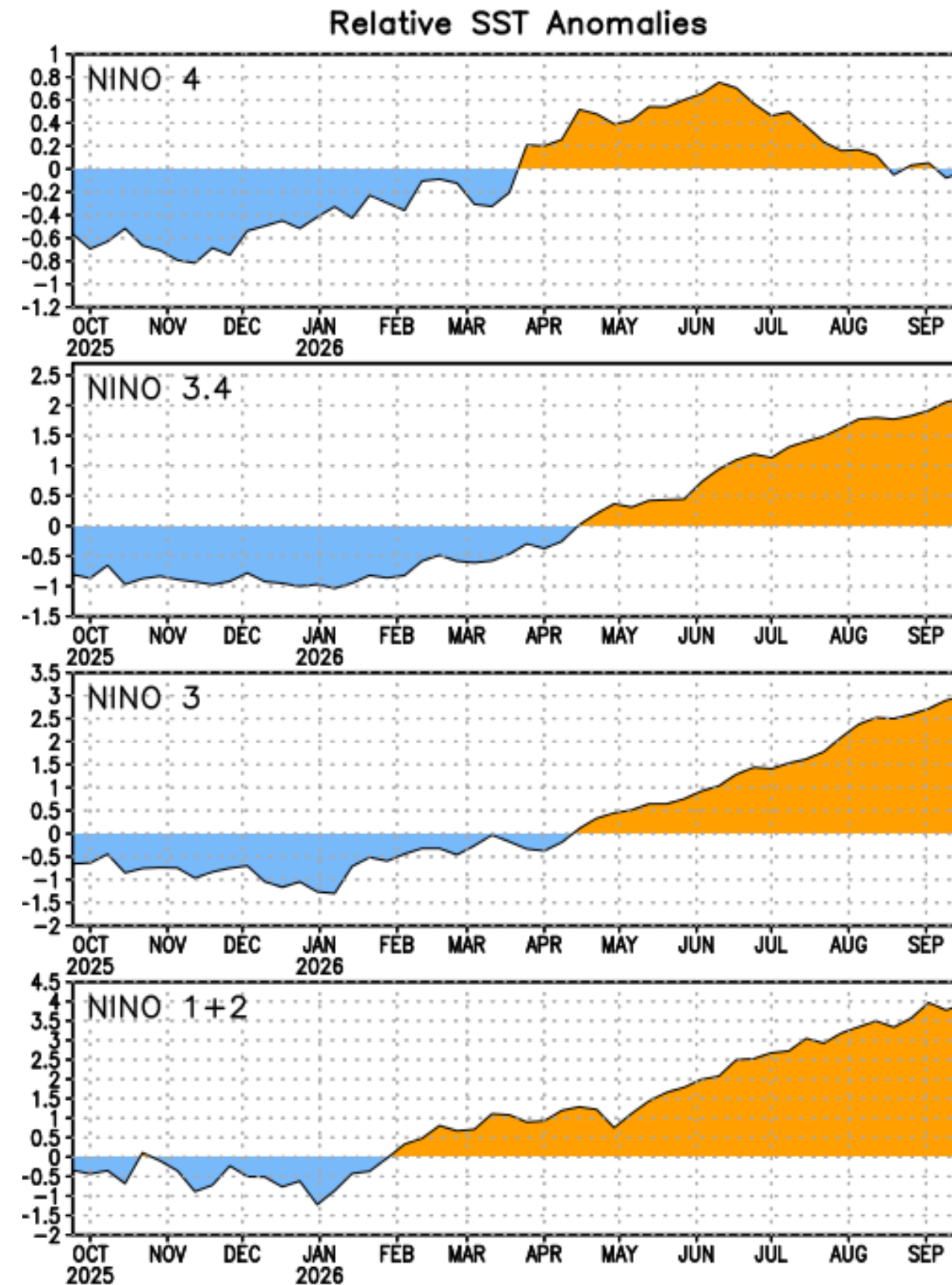
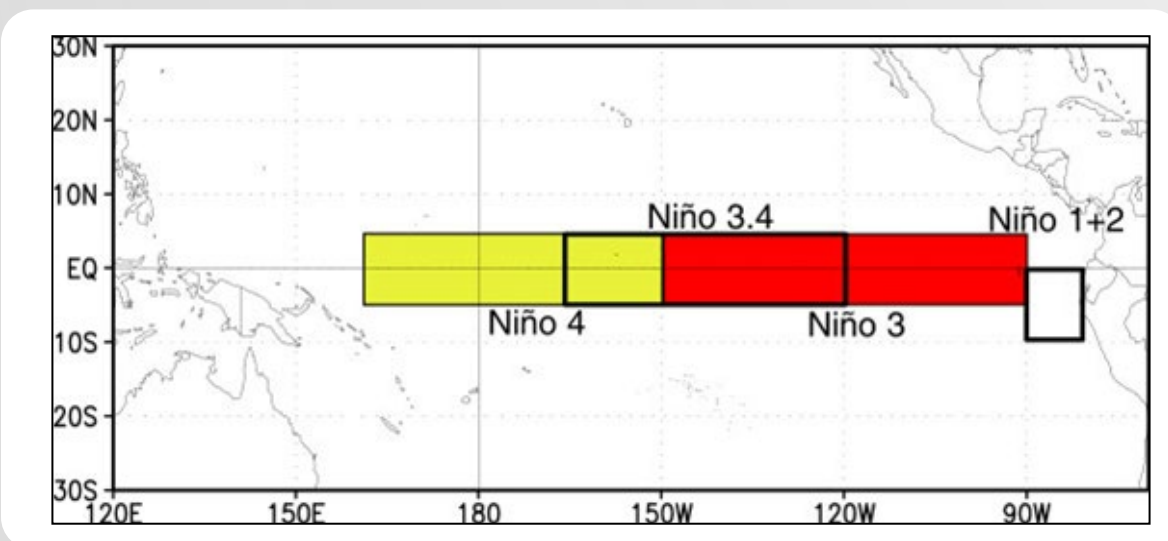
→ Niño 4	0.0°C
Niño 3.4	1.8°C
Niño 3	2.5°C
Niño 1+2	3.2°C



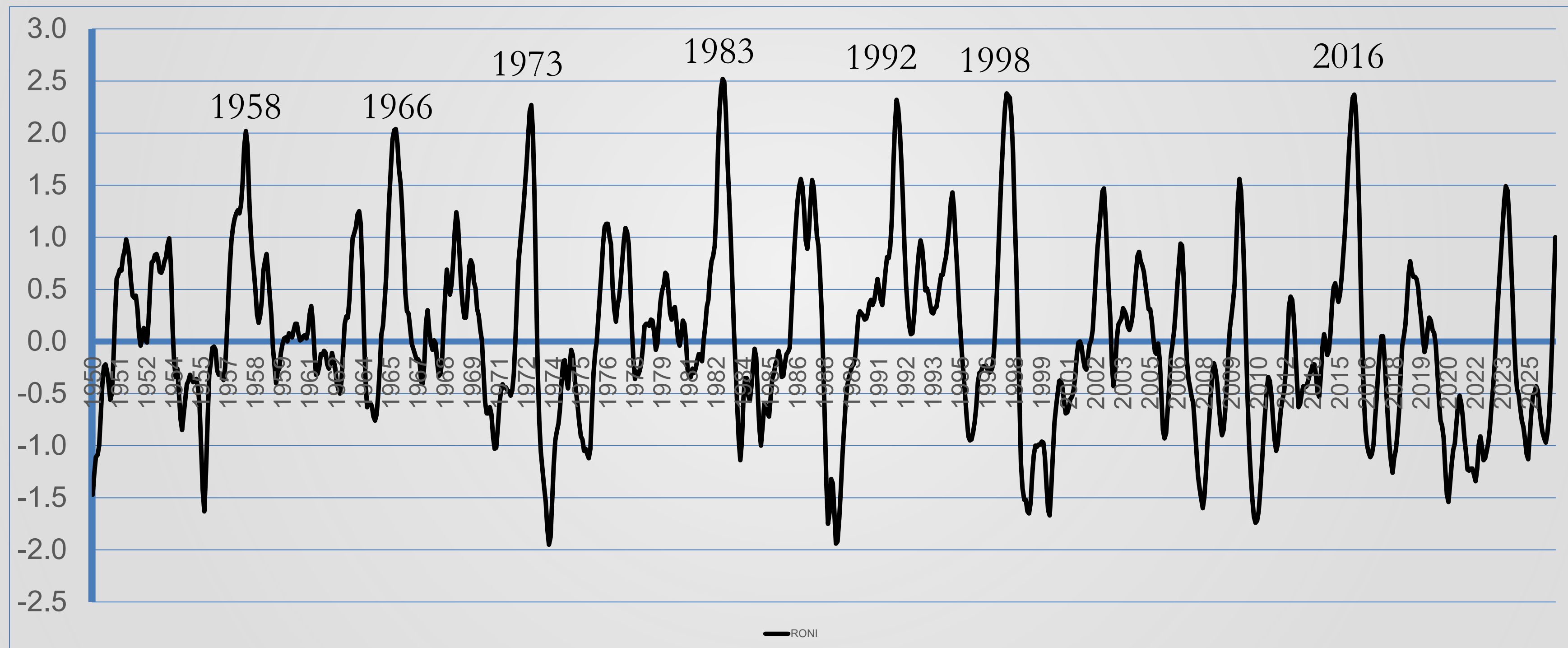
Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

→ Niño 4	0.0°C
Niño 3.4	2.1°C
Niño 3	3.0°C
Niño 1+2	3.9°C

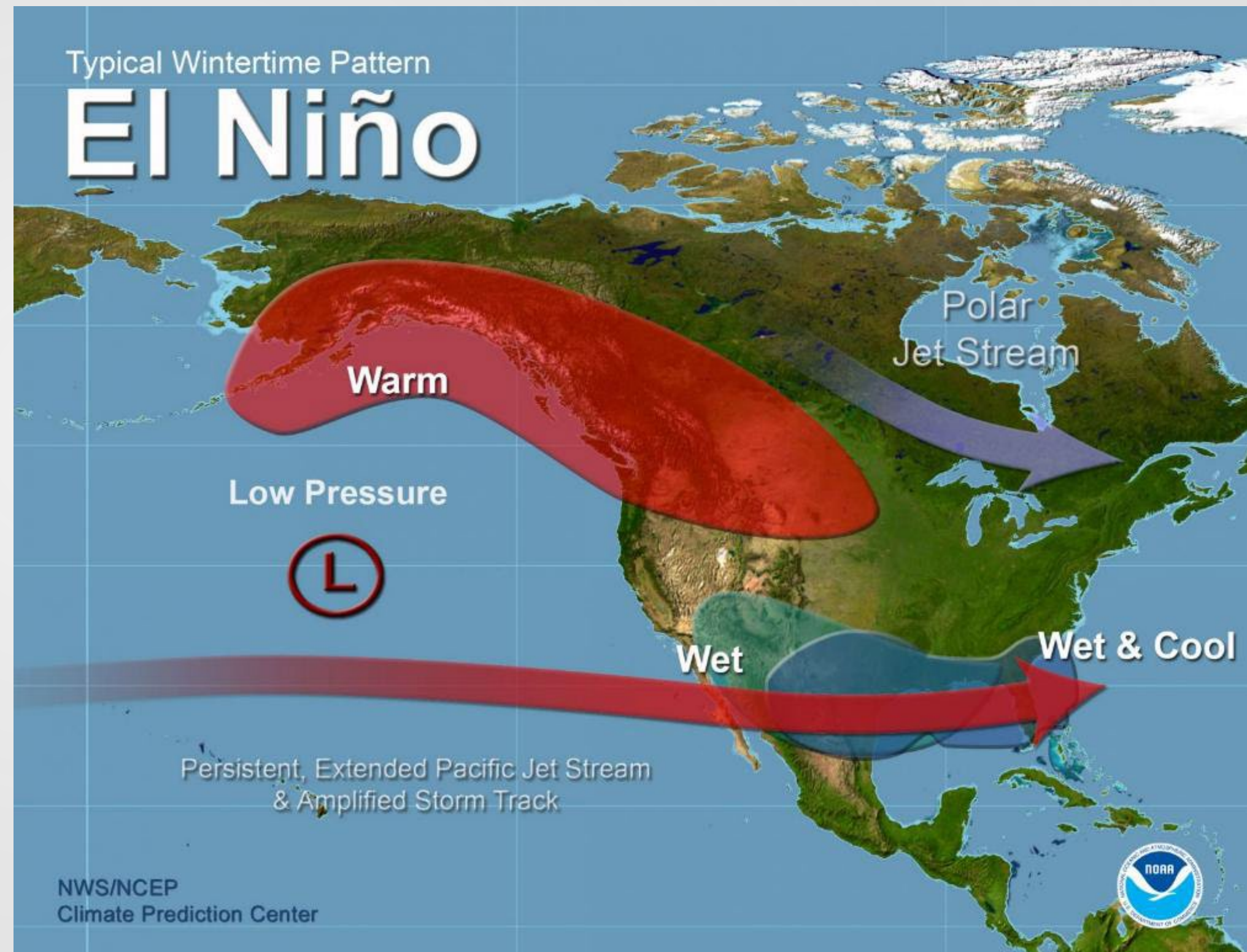


Time Series Relative Ocean Niño Index



ENSO Changes Wintertime Storm Tracks

- Jet stream flat and fast
- Displacement to the south determines CA impacts
- More coastal damage
- Higher sea levels (+1ft)



California Impacts with El Niño

- Coastal erosion from storm/wave impacts
- Coastal inundation from higher sea levels
- Elevated Sea Surface Temperatures
- Elevated Seasonal Snow Line
- Heavy precipitation event characteristics

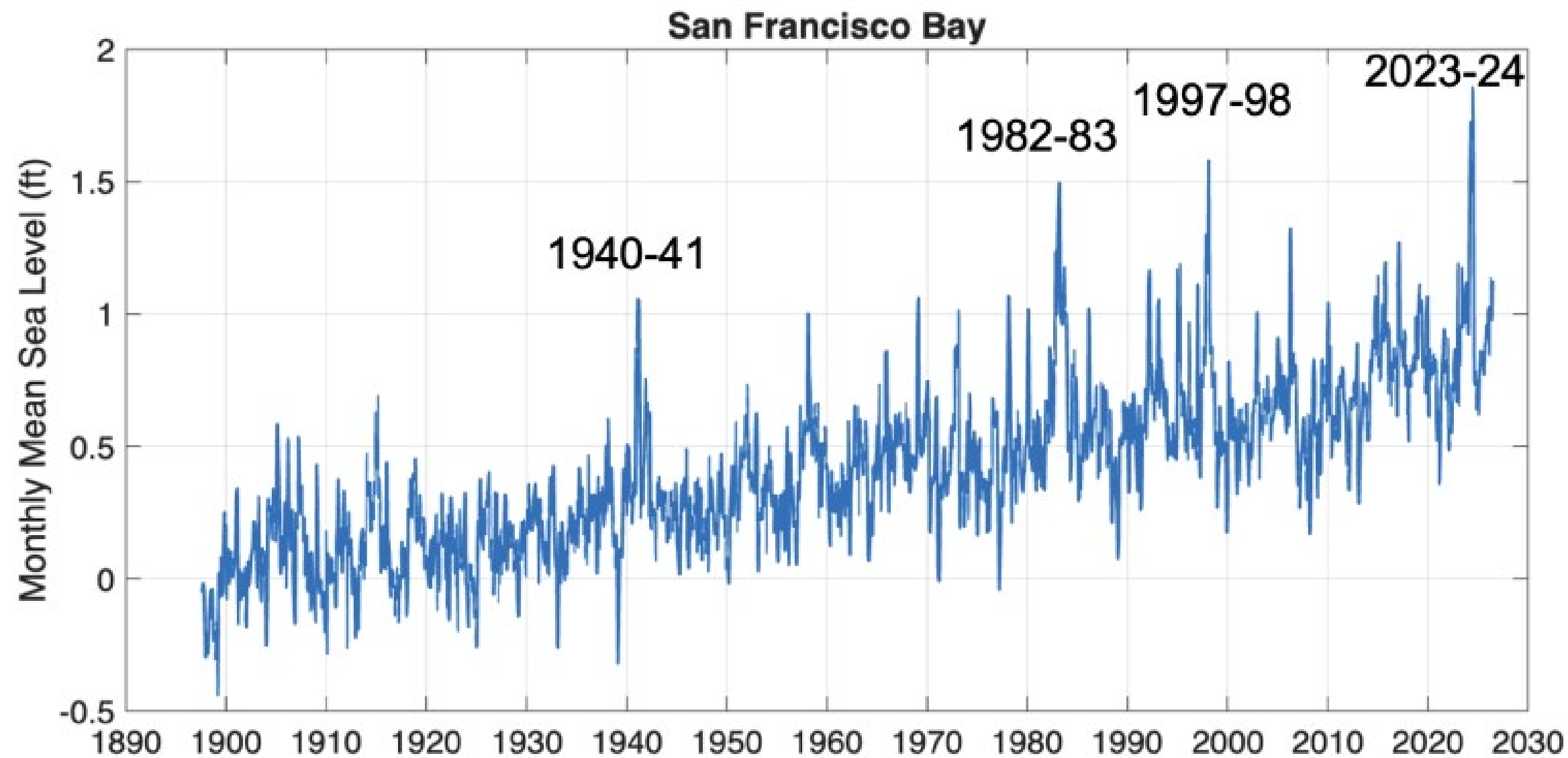


Years with Strong El Niño

Water Yr	PkRONI	Season	Statewide Precipitation	Apr 1 SWE
1958	2.02	DJF	149%	171%
1966	2.04	OND	84%	83%
1973	2.27	NDJ	113%	148%
1983	2.52	NDJ	184%	227%
1992	2.32	DJF	84%	60%
1998	2.38	SON	167%	158%
2016	2.37	NDJ	102%	85%



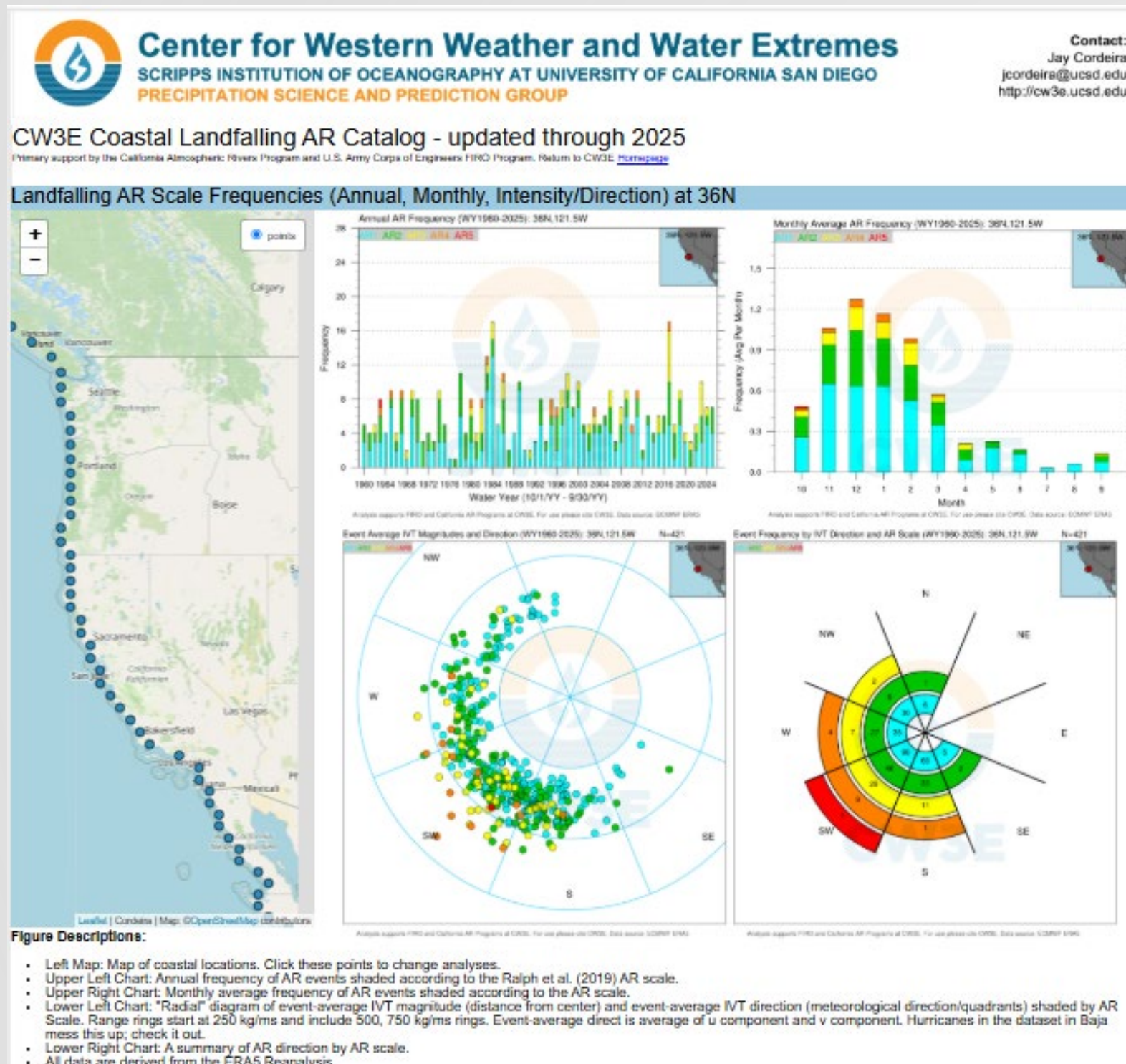
Sea Levels and El Niño



El Niño peak sea levels increase with sea-level rise. Credit: NOAA CO-OPS via the University of Hawaii Sea Level Center.



Atmospheric Rivers and El Niño



- Durations tend to be shorter for each AR
- Freezing elevation usually higher – fewer low elevation snow events
- Timing, pace, and scale of storms key to how impacts present



Earth Observing Systems and El Niño

- Sea Surface Temperature
- Sea Level
- Coastal Conditions
- Vegetation State
- Fire and Impacts
- Landslides/Debris Flows
- Inundation Extent
- Regular Observation
- Before/After Event Obs
- Threshold Crossings
- Anomalous Conditions ID



Key Takeaways

- All very strong El Nino years had at least one month of much greater than average precipitation
- Timing, pace, and scale of storms will drive impacts - storm size and time between storms key
- Coastal impacts expected from higher sea levels and wave damage from increased storminess
- Earth system observations have a role in readiness and response as well as a key role in tracking change.

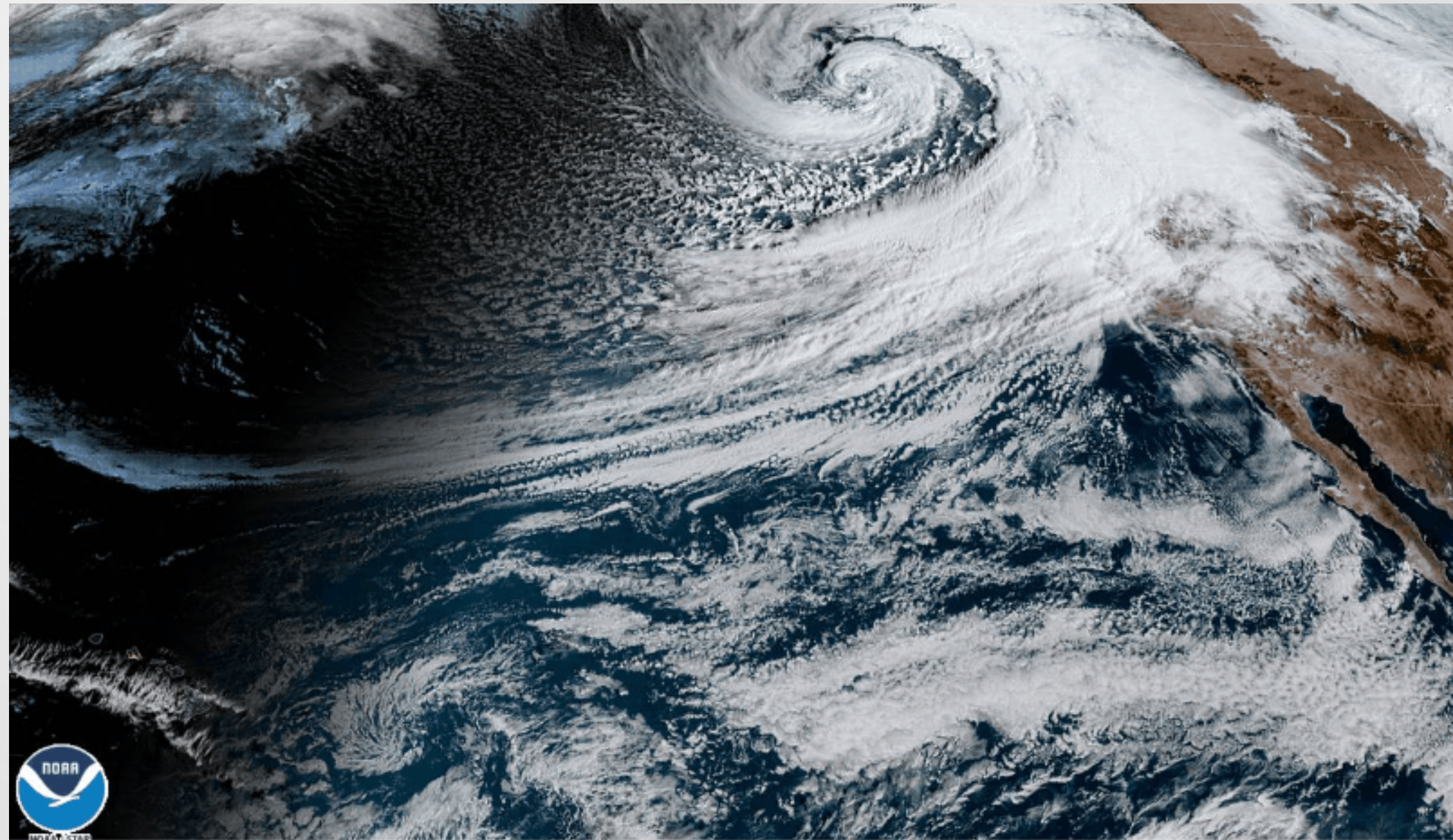


Questions?

- Email: Michael.L.Anderson@water.ca.gov



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



24 Oct 2021 16:56Z NOAA/NESDIS/STAR GOES-West GEOCOLOR