18th SESSION OF THE PACIFIC ISLANDS CLIMATE OUTLOOK FORUM PICOF - 18

23 - 24 April, 2026 | Nadi, Fiji

WMO | PACIFIC REGIONAL CLIMATE CENTRE NETWORK | ClimSA | SPREP | COSPPac Climate and Oceans Support Program in the Pacific | Pacific Community Communauté du Pacifique | Australian Government Bureau of Meteorology | CSIRO | Earth Sciences New Zealand | APCC APEC CLIMATE CENTER | METEO FRANCE

Session 4i: Oceans
Long Term Looking Back

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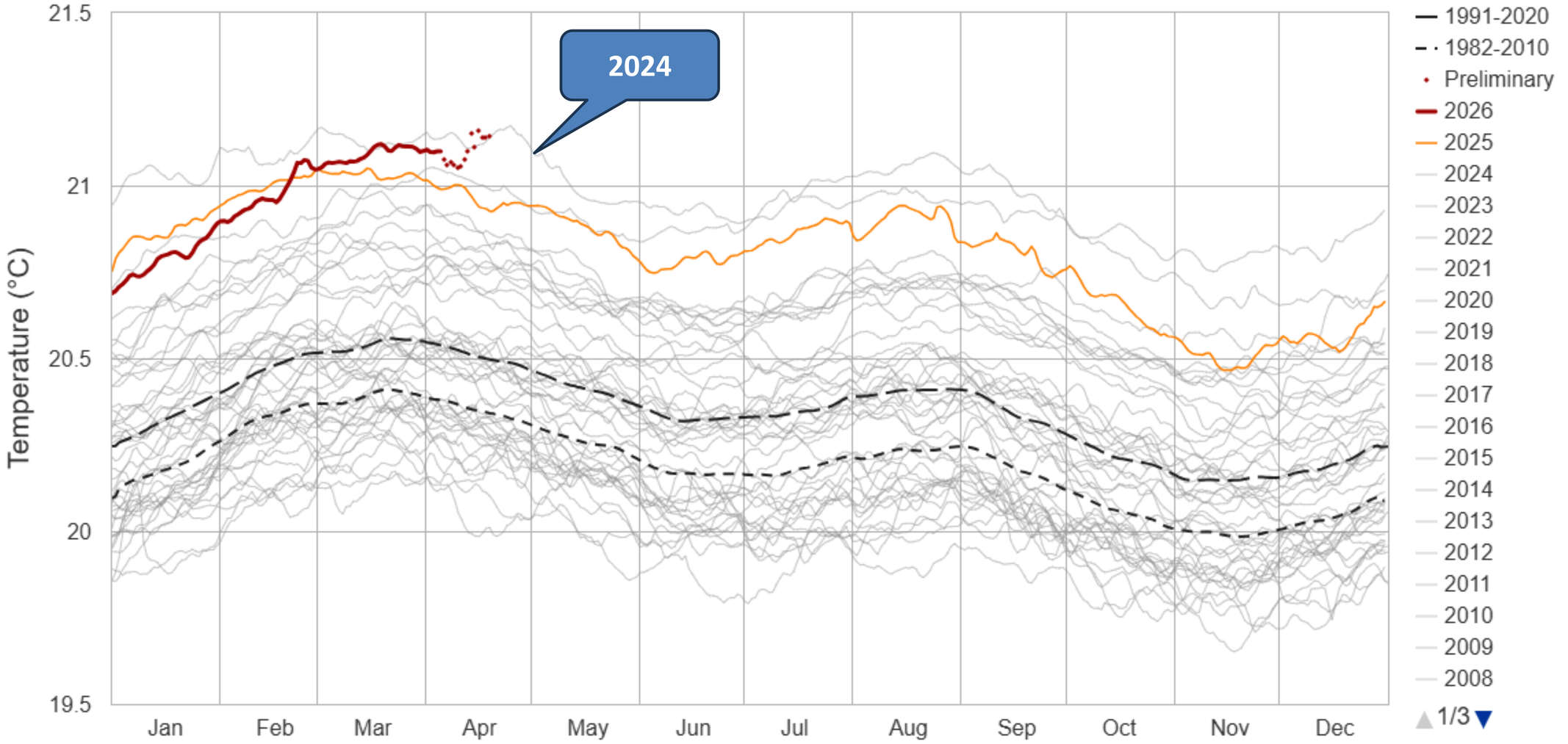
Daily Sea Surface Temperature, World (60°S–60°N, 0–360°E)

Dataset: NOAA OISST V2.1 | Image Credit: ClimateReanalyzer.org, Climate Change Institute, University of Maine



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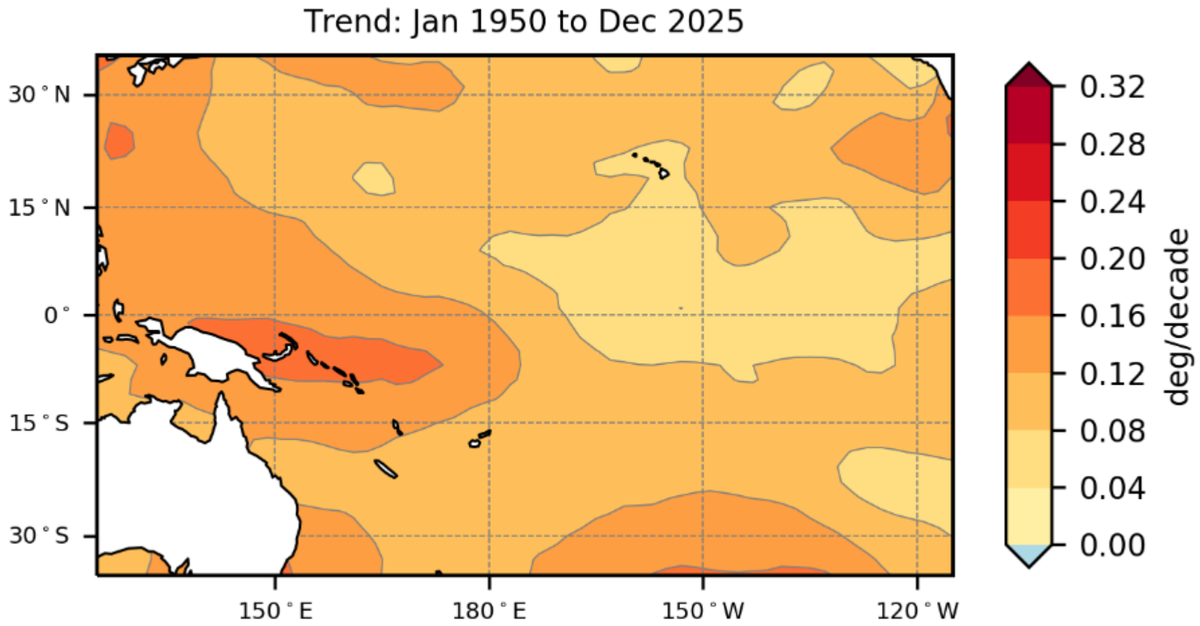
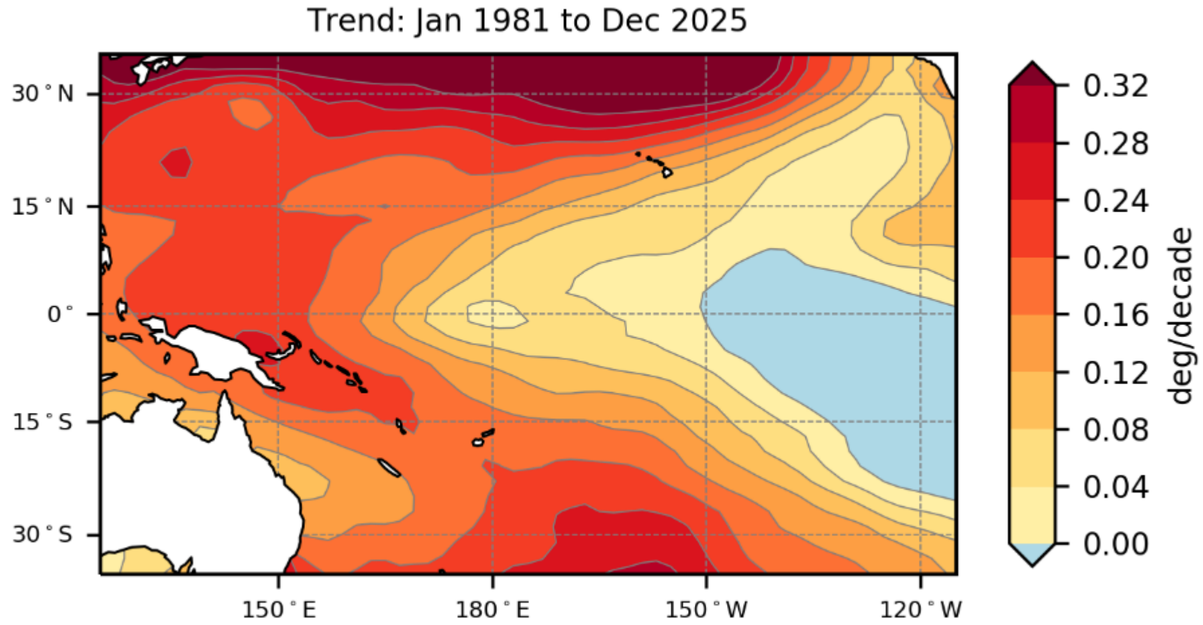
SST Trend: ….. to 2025

- From 1950 to present, sustained warming trends persist across the Pacific
- Highest trends are in the western and southern Pacific
- Much of this warming has occurred since 1980 onwards
- Rising SSTs have driven:
  - More frequent and intense marine heatwaves,
  - Coral bleaching and ecosystem stress,
  - Enhanced tropical cyclone intensity potential, and
  - Thermal expansion contributing to sea-level rise.

Source: ERSST5





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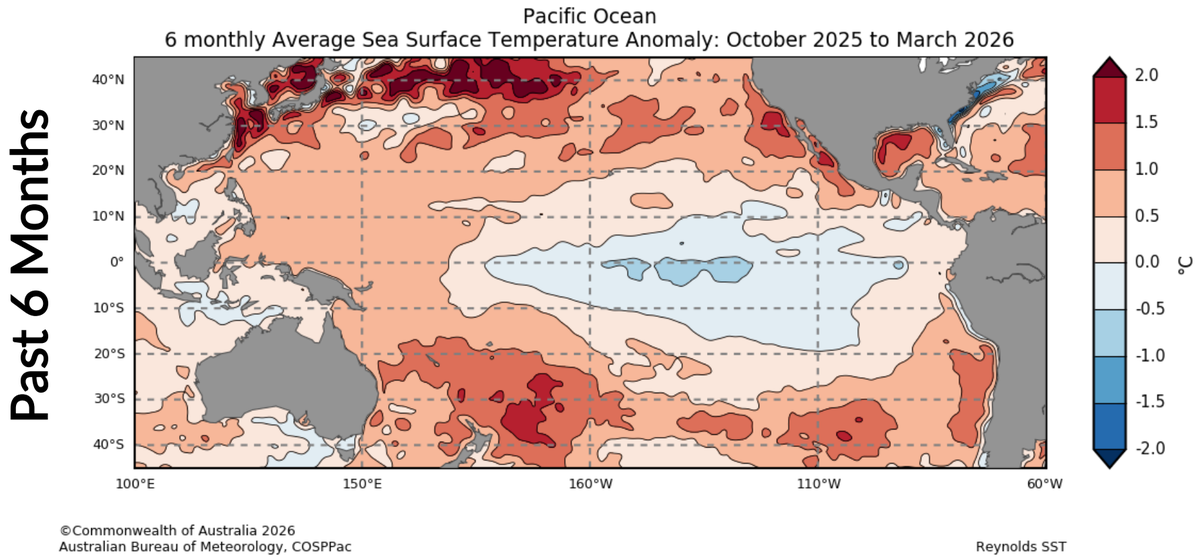
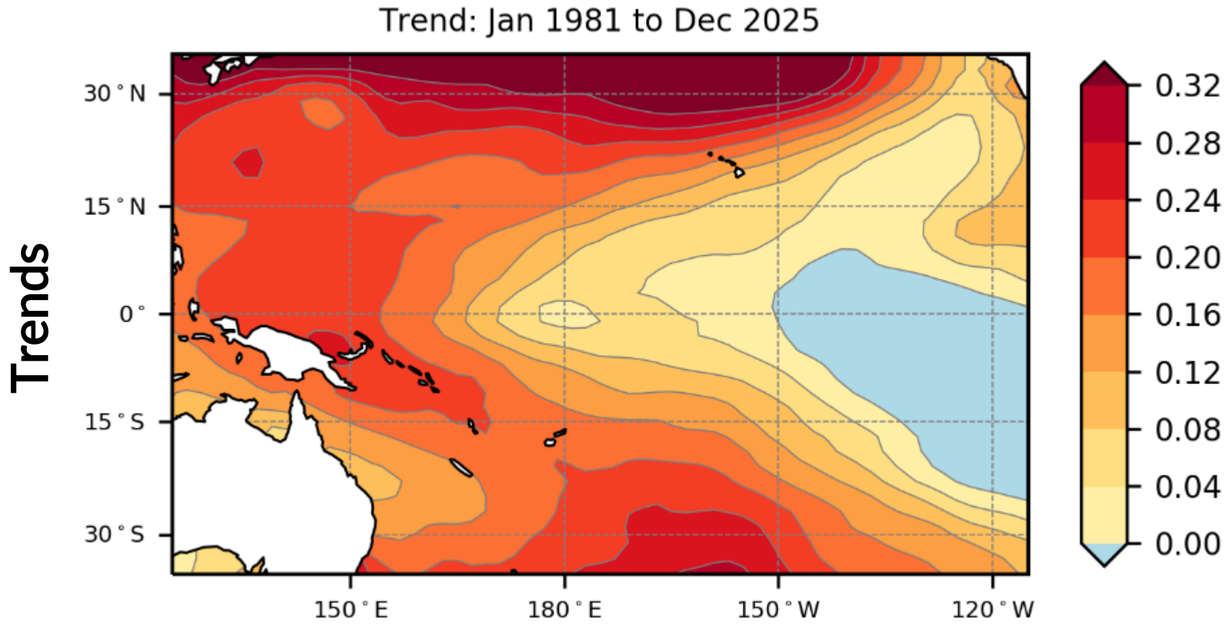
SST Trend: ….. to 2025 Source: ERSST5 & Reynolds

- Past six month show similar patterns of positive anomalies to the trend since 1981
- Increase in likelihood of consecutive year La Niña (Geng et al. 2023)





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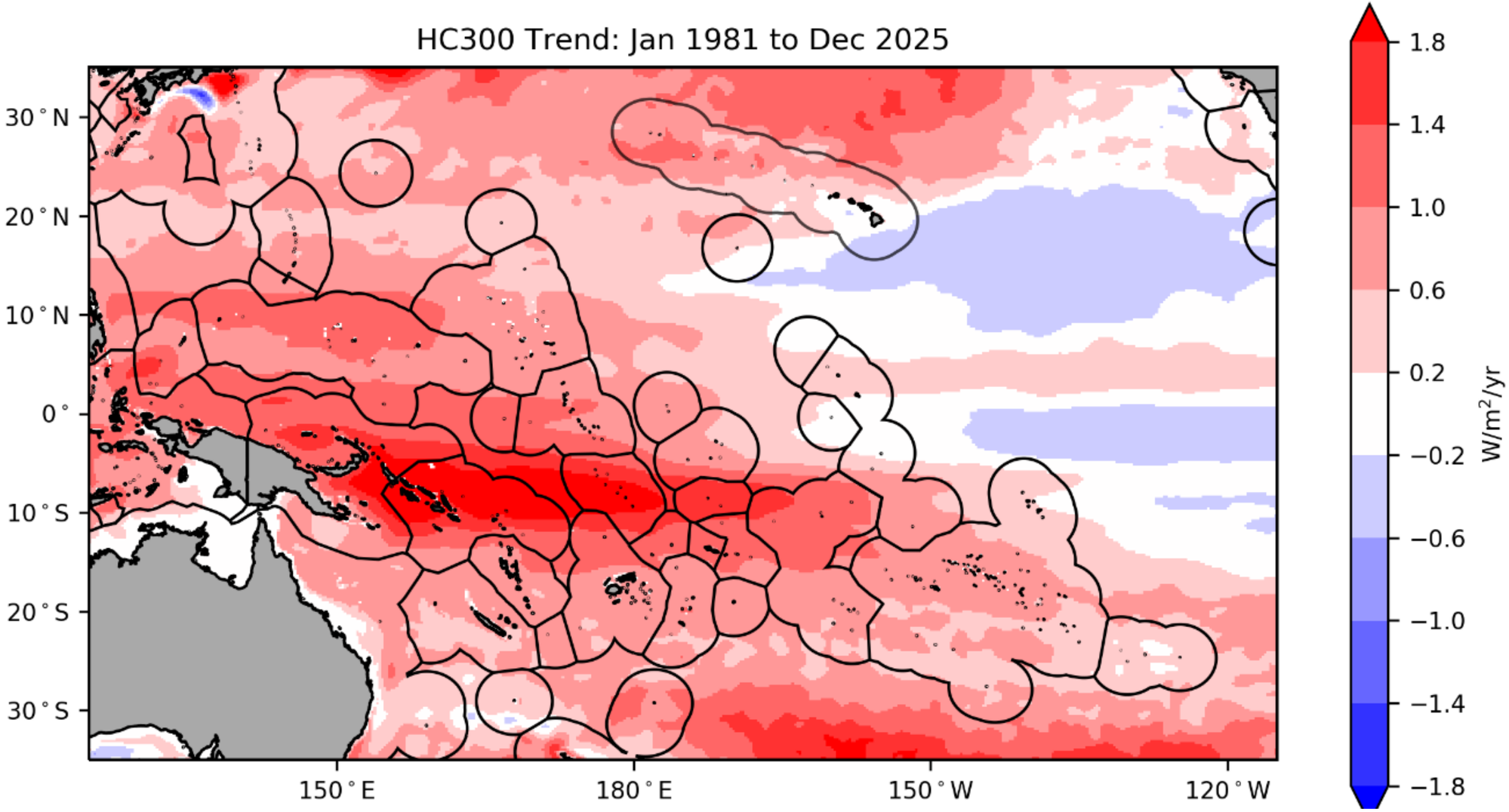
Heat Content Down to 300 Metres Trend: 1981 to 2025

Source: ACCESS-S2 Reanalysis

- Ocean is absorbing 90% of the excess heat from global warming.
- Highest trends span from PNG across Solomon Is. To Tuvalu
- Negative trends in parts of eastern Pacific



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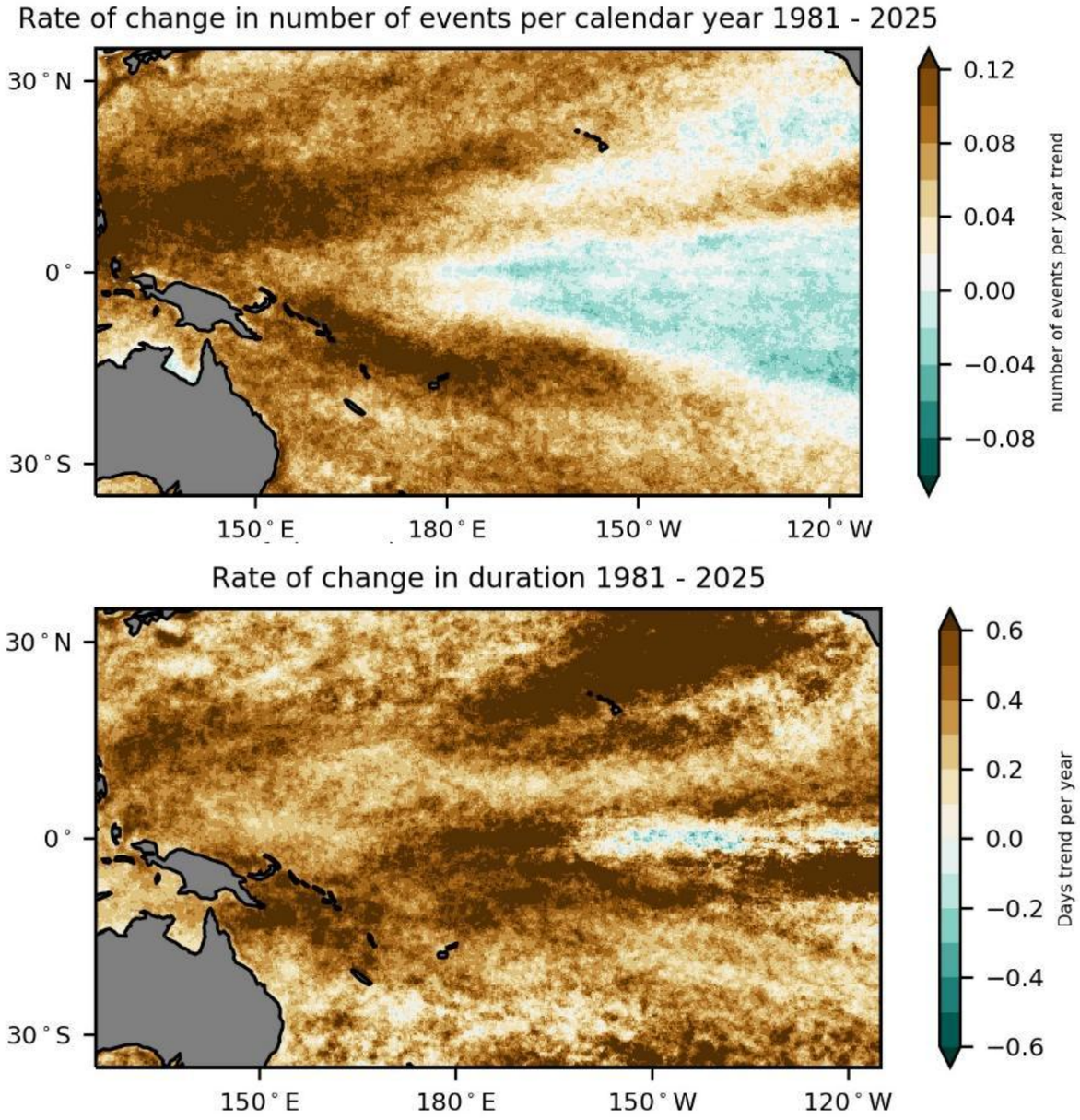
Marine Heatwave Trends: 1981 - 2025

Source: OISSTv2.1

- Marine Heatwaves events defined when SST exceeds 90th percentile for 5-days or more
- The number of Marine Heatwave events is increasing in western, northern, and southern Pacific
- Number of events decreasing in central and eastern Pacific
- Event durations are increasing almost everywhere in the Pacific, except a small equatorial band



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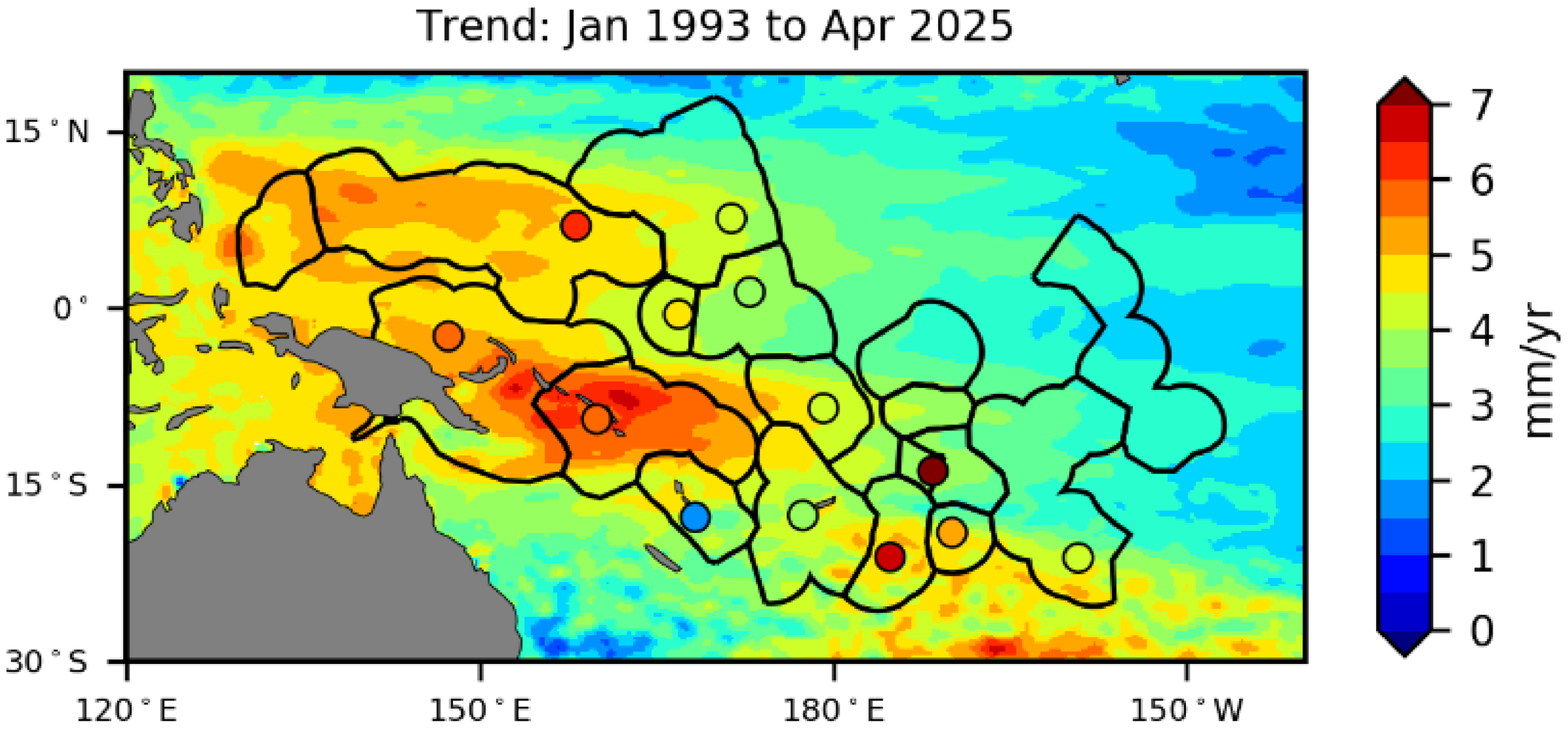
Sea Level Trends: Altimetry and Tide Gauge

Source: Copernicus two satellite DUACS & COSPPac Tide Gauge Network

- Sea Level trends are positive , highest in western warm pool regions
- Strong relationship with heat content



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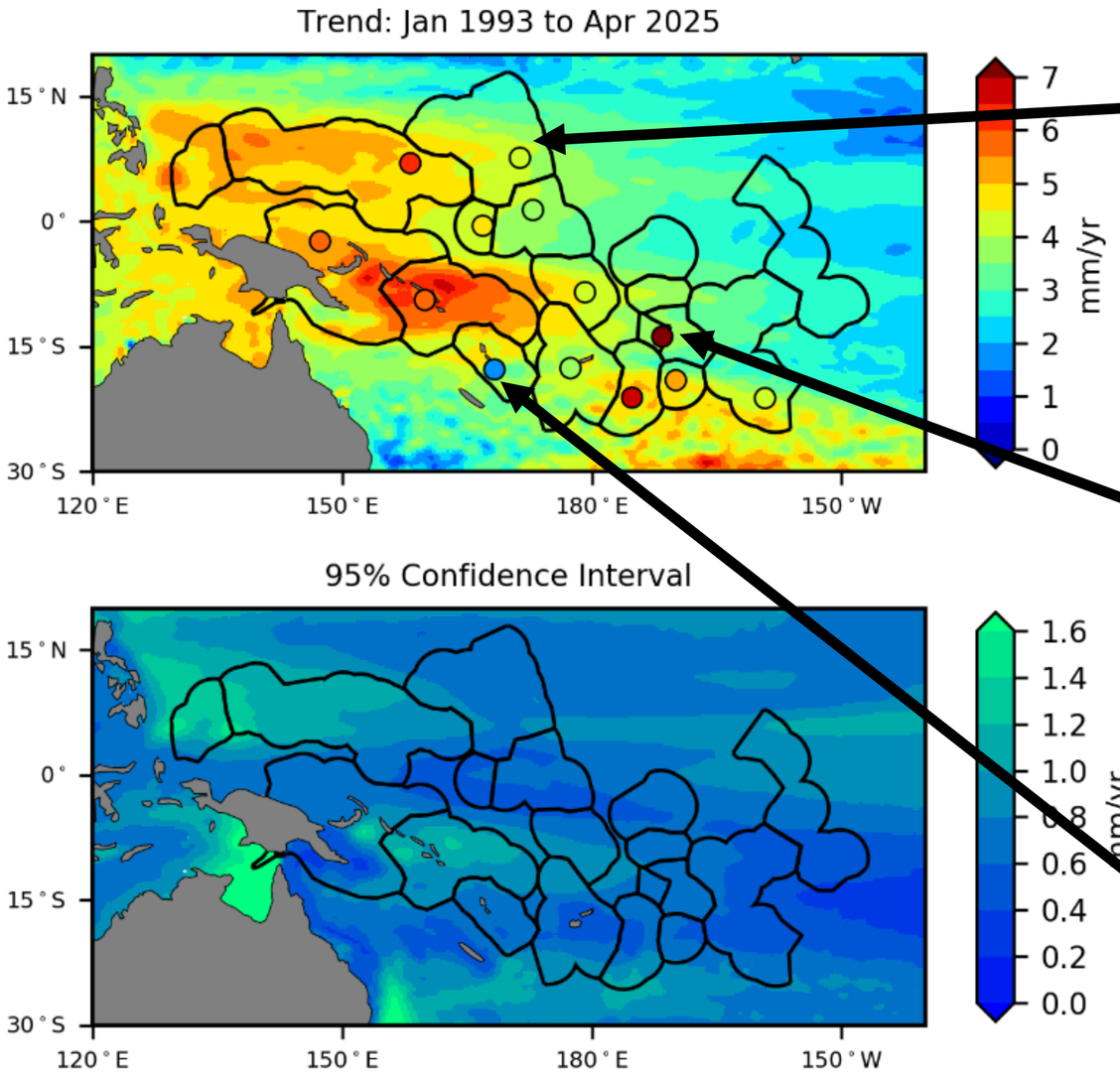
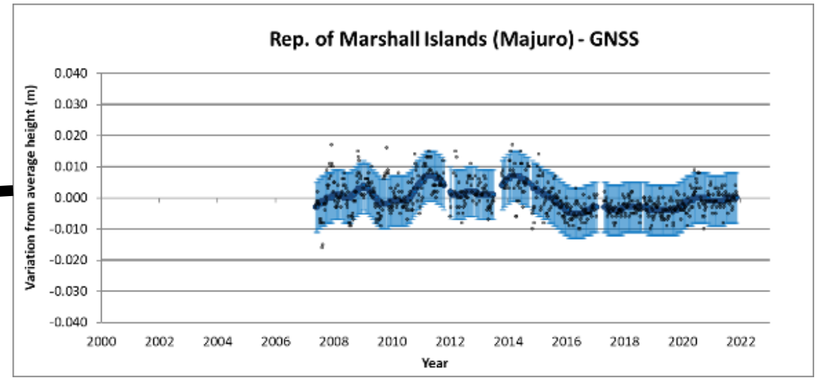
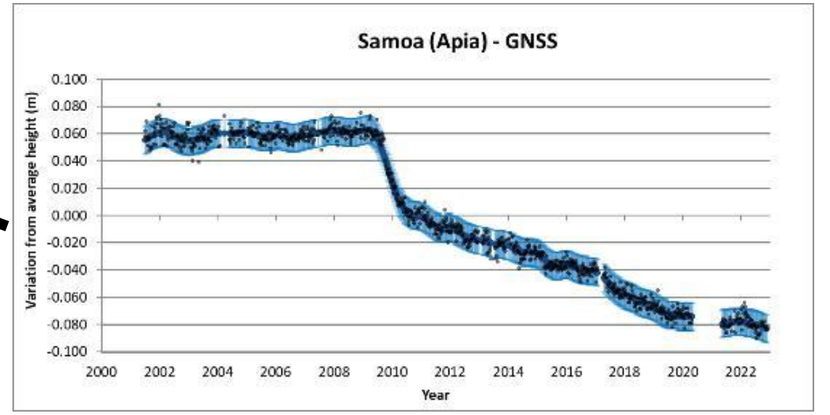
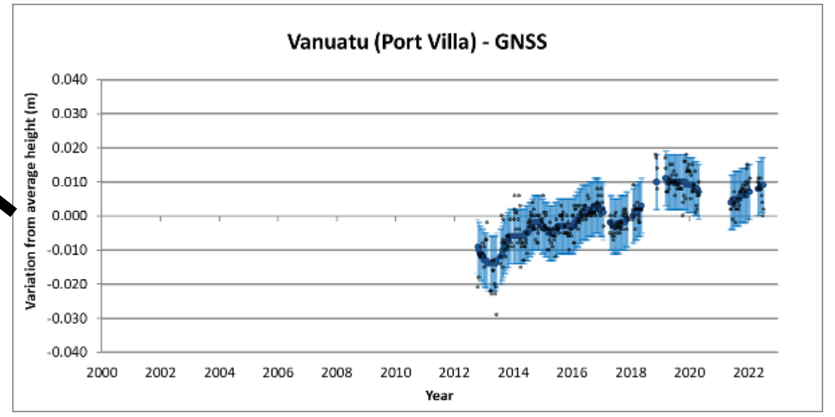
Sea Level Trends: Altimetry and Tide Gauge

Source: Geoscience Australia









- 95% Confidence interval 0.5 and 1.2 mm/year across the SW Pacific Countries
- Tide gauge differences largely related to land movement

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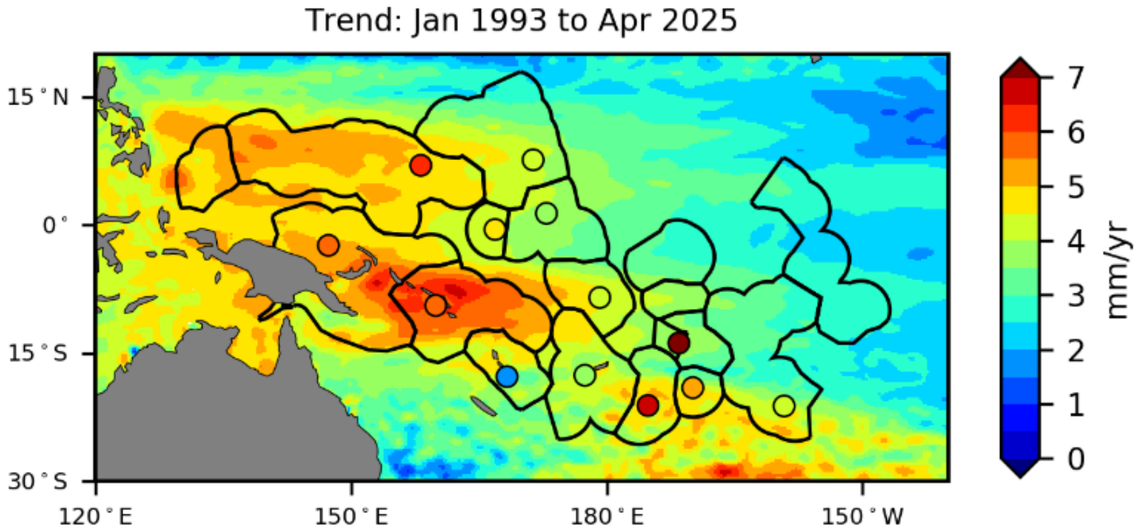
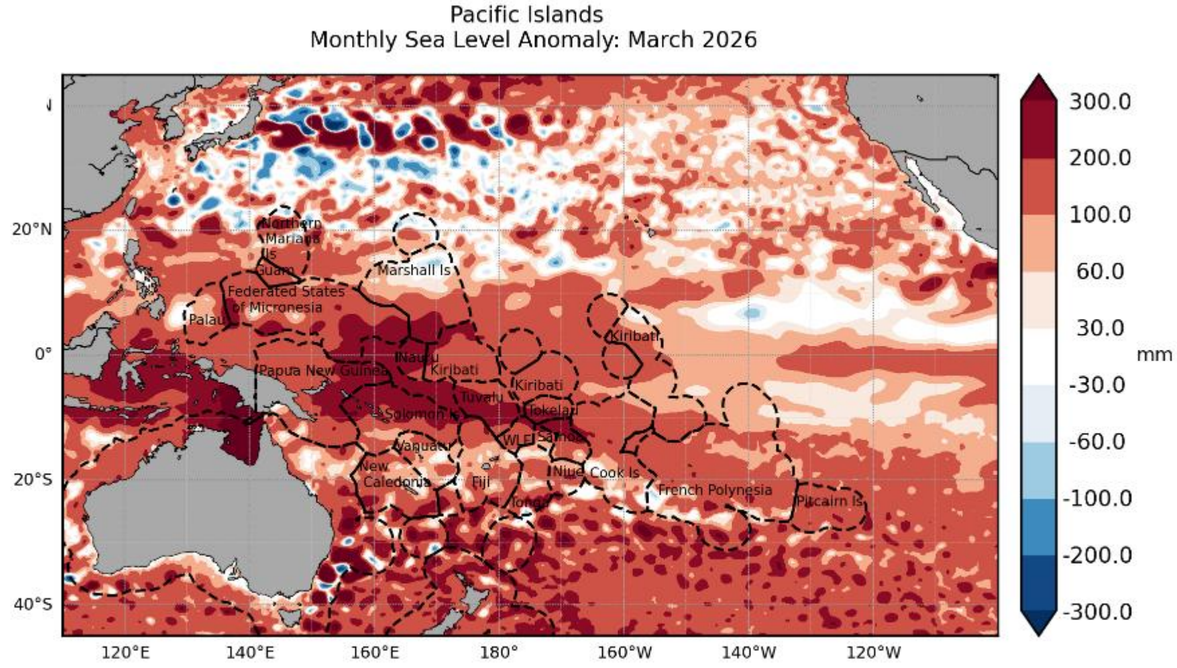
Sea Level Trends: Altimetry and Tide Gauge

Source: Copernicus two satellite DUACS, COSPPac Tide Gauge Network, ACCESS-S2 Reanalysis



- Sea level anomaly product from Ocean Portal includes long term trends
- Similar patterns in recent observations to the long term trends.



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THANK YOU

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