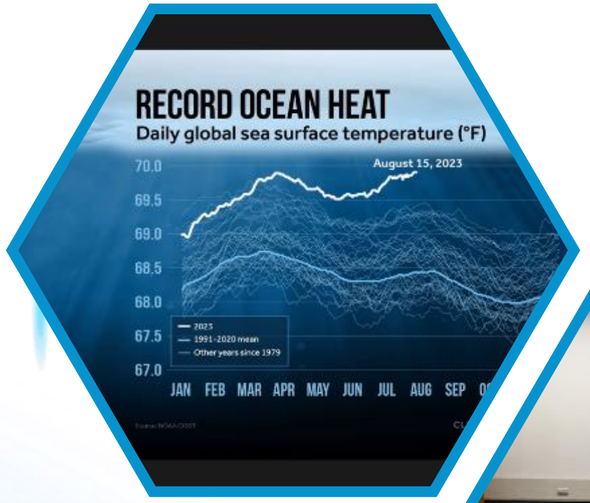
15TH SESSION OF THE PACIFIC ISLANDS CLIMATE OUTLOOK & STAKEHOLDER FORUM



PICOF-15

14 - 15 OCTOBER, 2024

HYBRID
IN-PERSON: NUKU'ALOFA, TONGA
ONLINE: ZOOM

WMO · PACIFIC REGIONAL CLIMATE CENTRE NETWORK · ClimSA · SPREP Secretariat of the Pacific Regional Environment Programme · Pacific Community Communauté du Pacifique · COSPPac · Australian Government Bureau of Meteorology · CSIRO · NIWA Taihoro Nukurangi · APCC APEC CLIMATE CENTER · NOAA · METEO FRANCE

ENSO STATUS AND OUTLOOK

Elise Chandler

Bureau of Meteorology

Global Seasonal Climate Update for October-November-December 2024

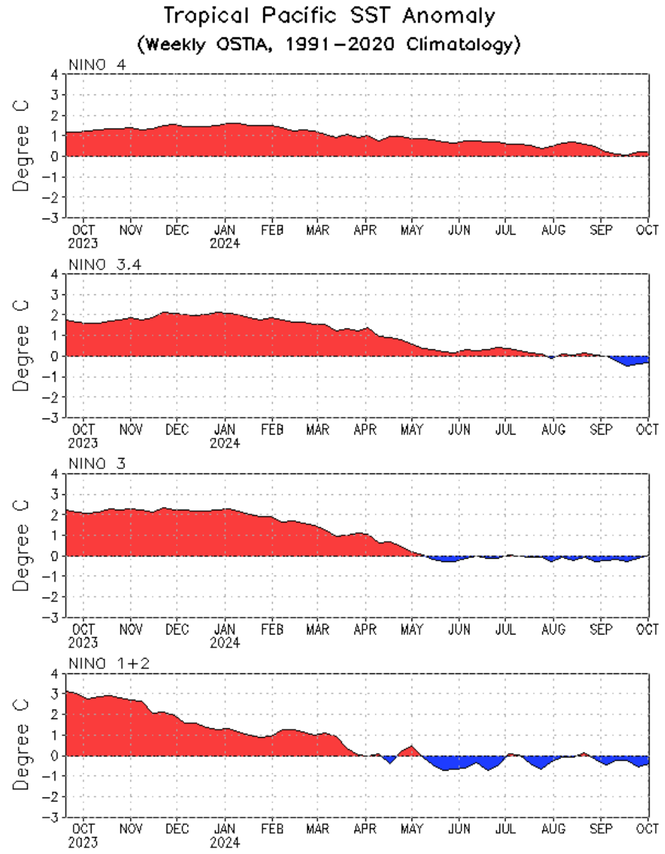
MONITORING

27 September 2024

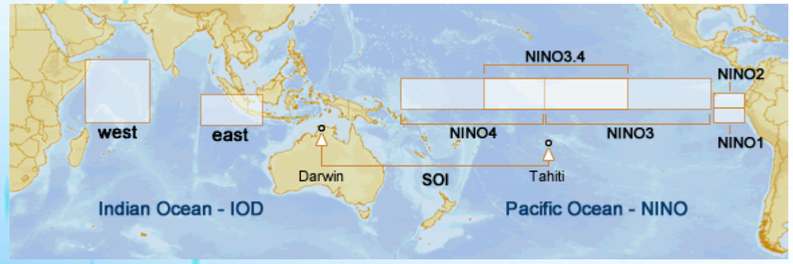
WORLD METEOROLOGICAL ORGANIZATION
Weather Climate Water

During June-August 2024, the Pacific Niño sea-surface temperature (SST) index in the eastern Pacific (Niño 1+2) was below-normal. Of the other three Niño indices only the Niño 4, the westernmost index, was above normal while SST conditions in the equatorial central and eastern Pacific were near-zero. Overall, the SST conditions in the equatorial central and eastern Pacific reflected ENSO-neutral conditions.

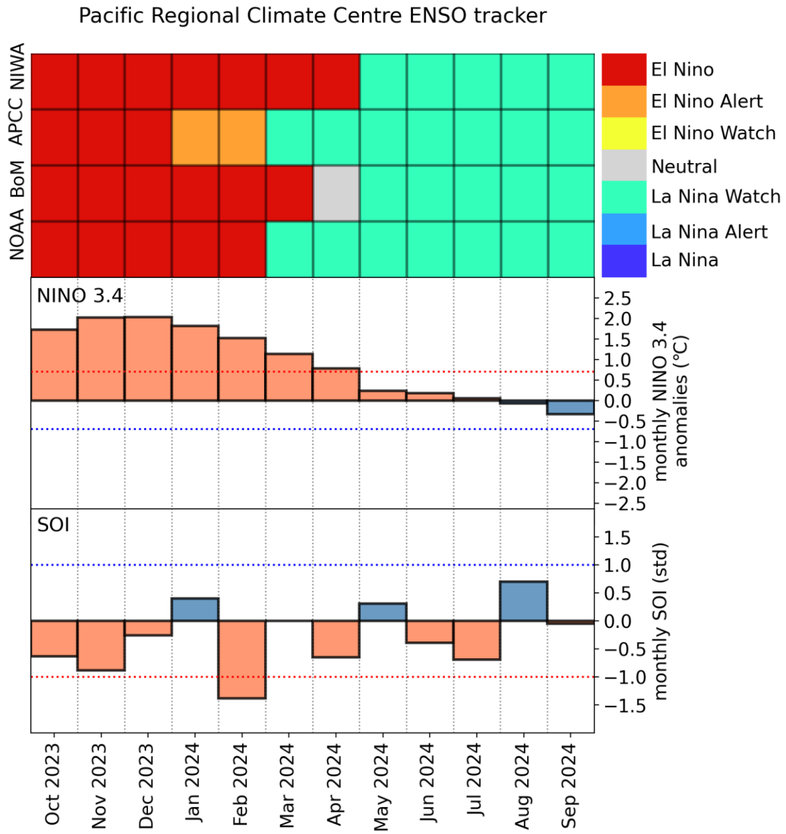
Source: https://wmo.int/media/update/global-seasonal-climate-update-october-november-december-2024



Source: CPC - Nino indices

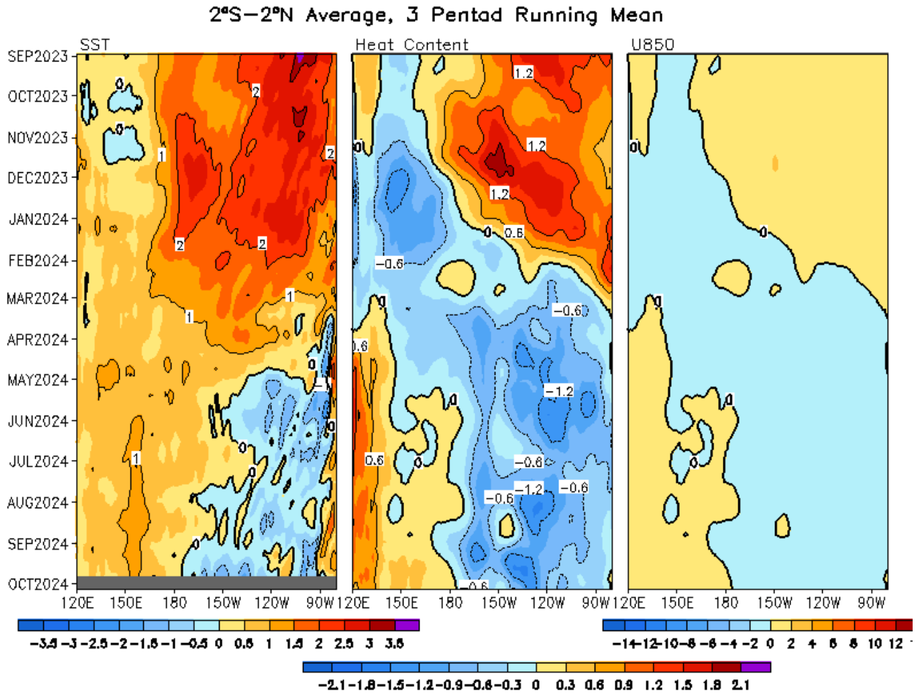


Pacific RCC ENSO Tracker and Current Status



Source: https://www.pacificmet.net/enso-tracker

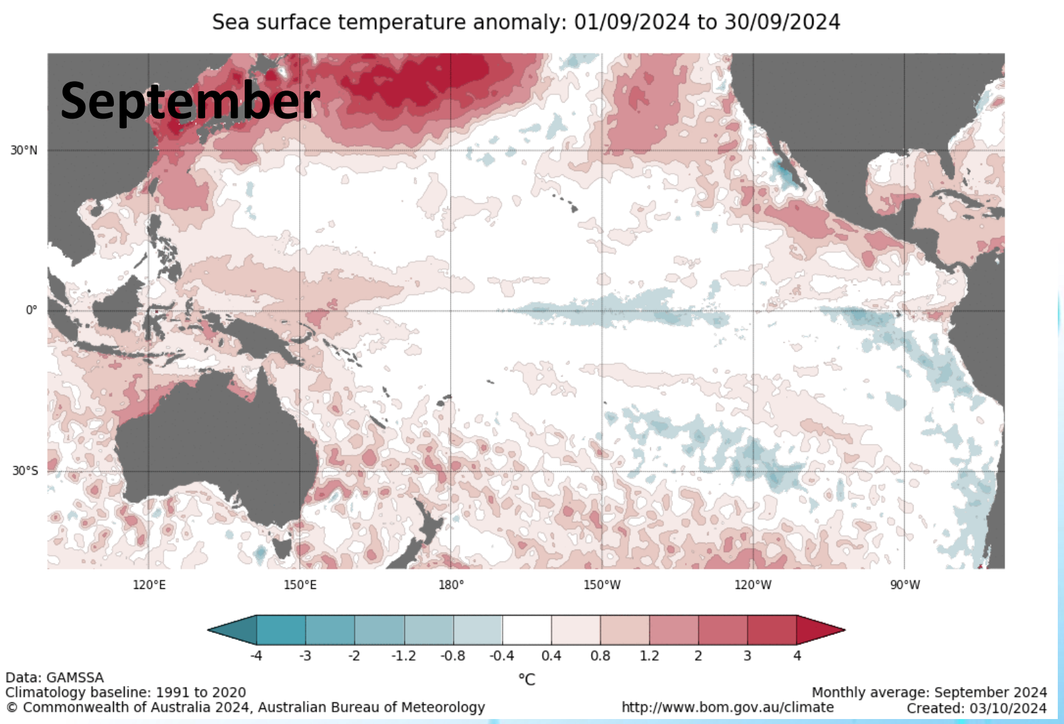
- Pacific RCC ENSO tracker is at La Niña watch.
- Rapid cooling of the central to eastern tropical Pacific sub-surface occurred in the second quarter of 2024, becoming visible in the SSTs in April.
- Easterly wind anomalies and positive SOI values were at their strongest during August and early September, with both indicators weakening in magnitude over the last month.



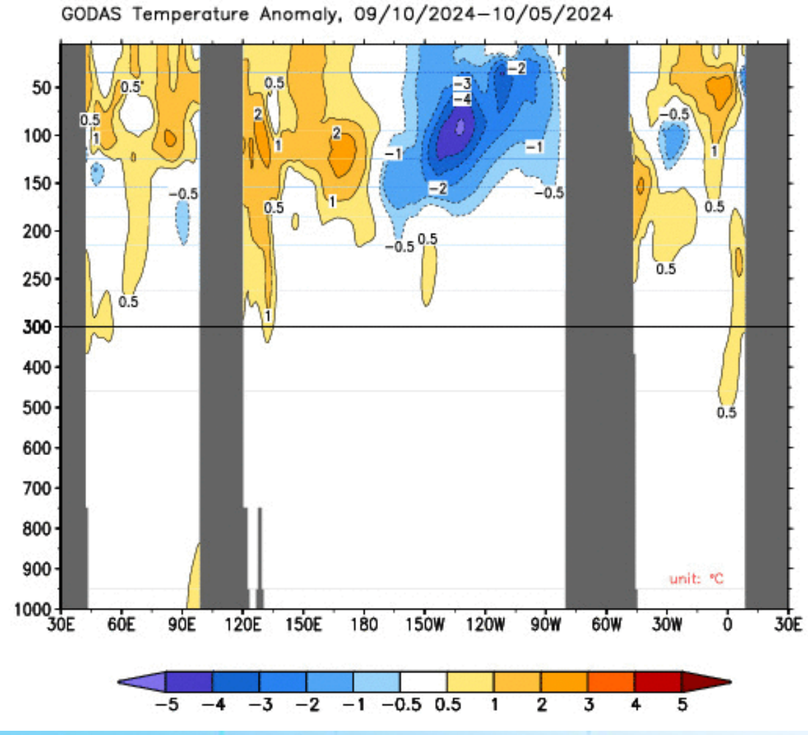
Source: CPC - OISST heat u85

Pacific RCC ENSO Tracker and Current Status

- Cool SST anomalies emerged along the equator in the eastern Pacific in April 2024, with the warm anomalies along the equator weakening in subsequent months.
- By September warm anomalies in the central and western Pacific have been eroded along with off-equatorial anomalies at around 10° N and 10 °S.
- Sub-surface cooling progression over the last few months is comparable to 2017 and 2007, both La Niña years (noting the 2017 event developed later in the year). However, the strength and size of cooler sub-surface water has not been as large as in those two years.



Source: BoM - monthly SST

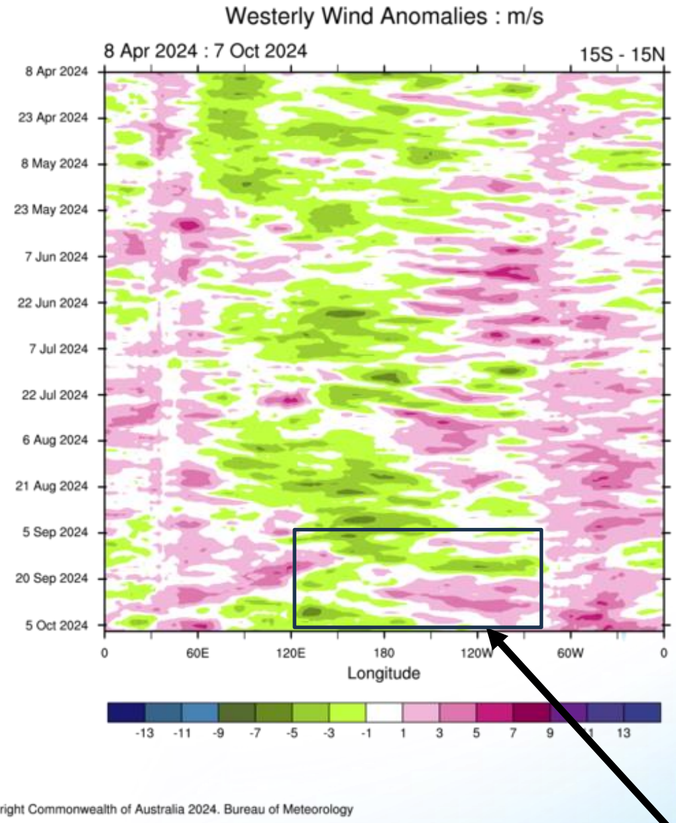


Source: GODAS sub-surface

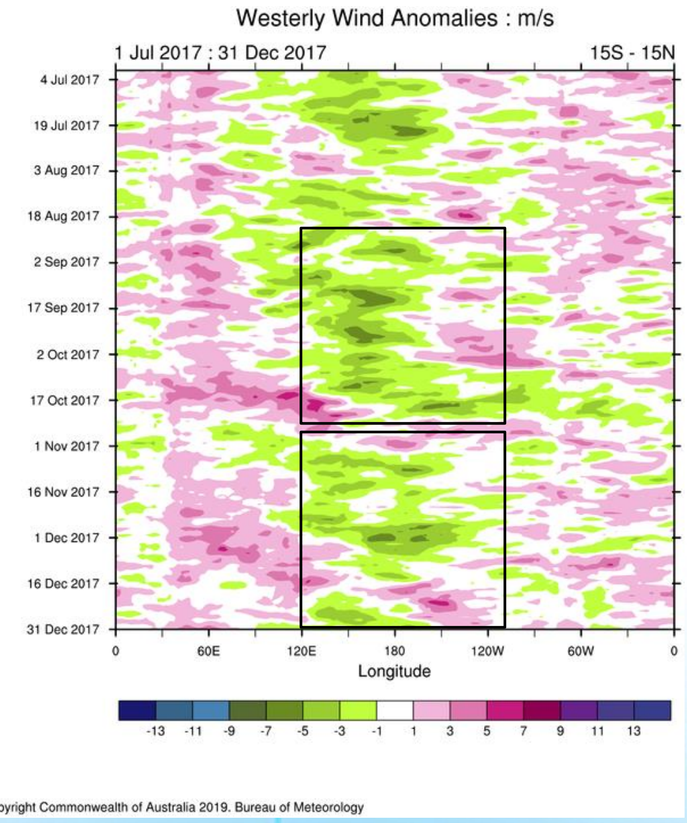
Pacific RCC ENSO Tracker and Current Status

- Stronger than usual trade winds have been present since March 2024 (green shading).
- Comparison with 2007 and 2017 indicates a similar trade wind pattern but no periods with strong and persistent central Pacific easterlies this year.

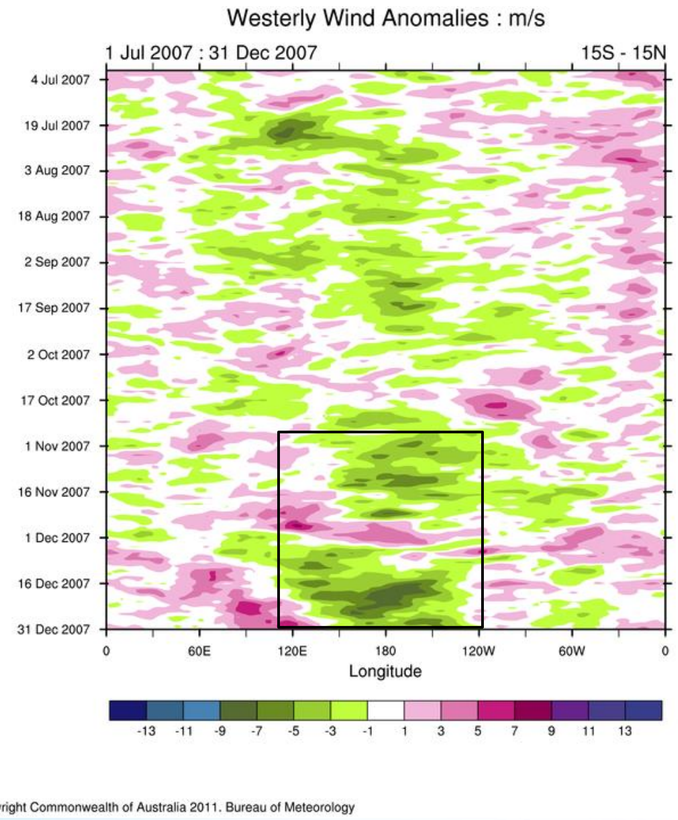
2024



2017



2007

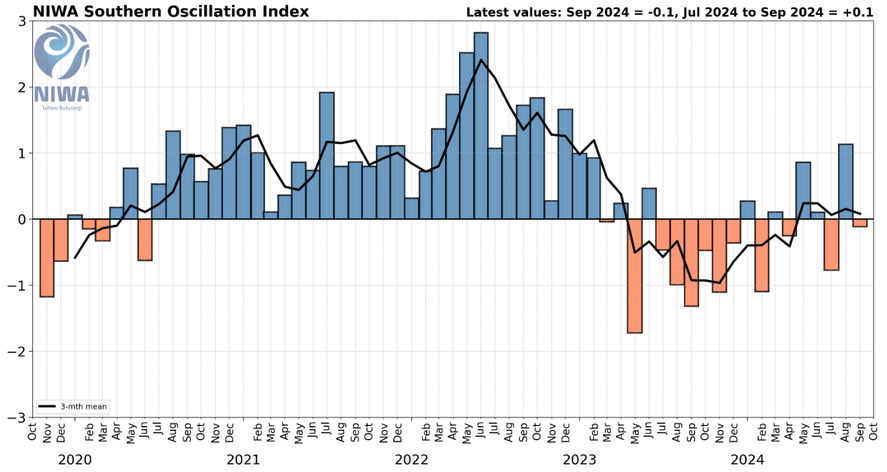


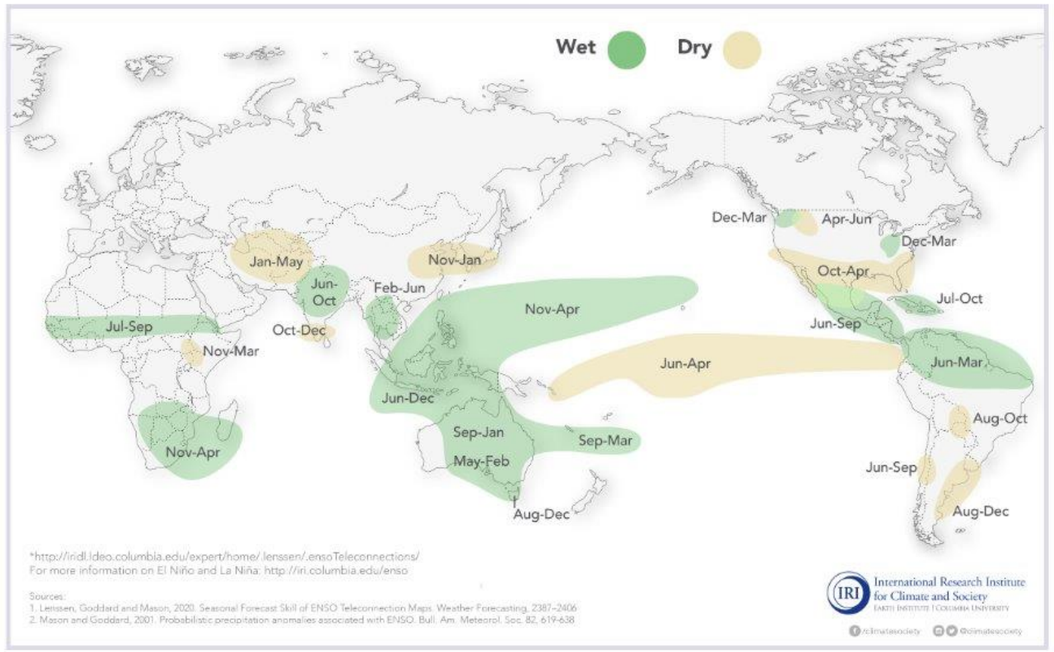
Trade winds east of the Date Line have been weaker than usual

Source: http://www.bom.gov.au/climate/mjo/#tabs=Time-longitude

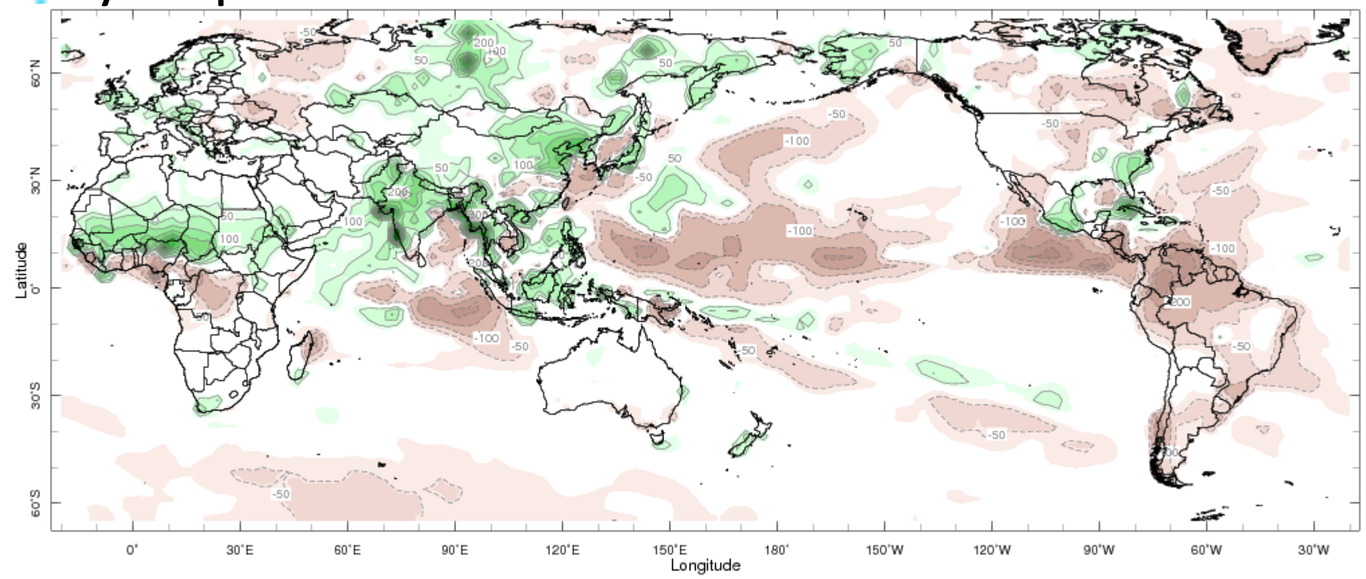
Pacific RCC ENSO Tracker and Current Status

- Southern Oscillation Index is ENSO-neutral.
- Rainfall patterns globally are moderately La Niña-like, reinforced by a neutral (but almost negative IOD).





July to September 2024



Jul-Sep 2024

Source: [IRI seasonal anomaly]

Global Seasonal Climate Update for October-November-December 2024 OUTLOOK

27 September 2024

Sea Surface Temperatures

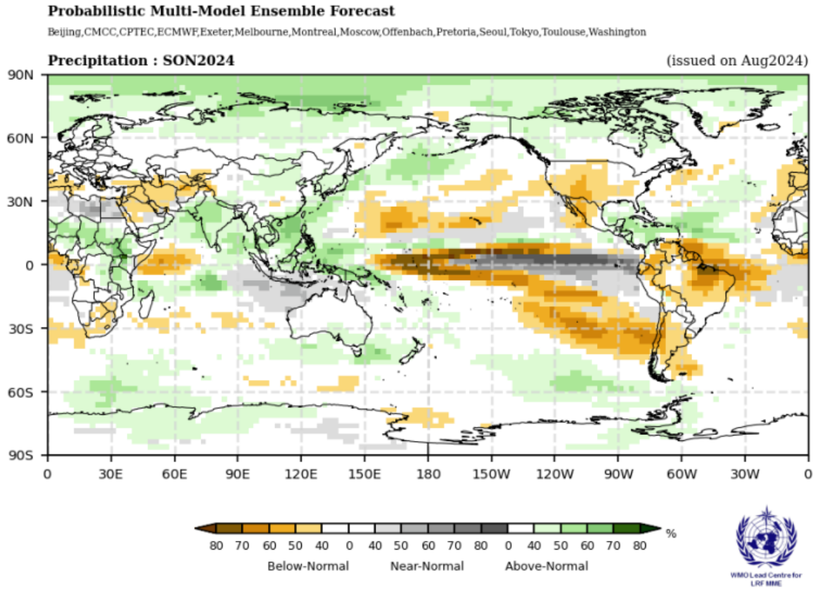
- Above-normal sea-surface temperature anomalies in the Niño 3.4 and Niño 3 regions are predicted to decline during September-November 2024 and are predicted to reach weak La Niña conditions
- Farther west in the Niño 4 region, the sea-surface temperature anomaly is predicted to be near-normal. The strength of the Indian Ocean Dipole (IOD) index is also predicted to return to near normal.

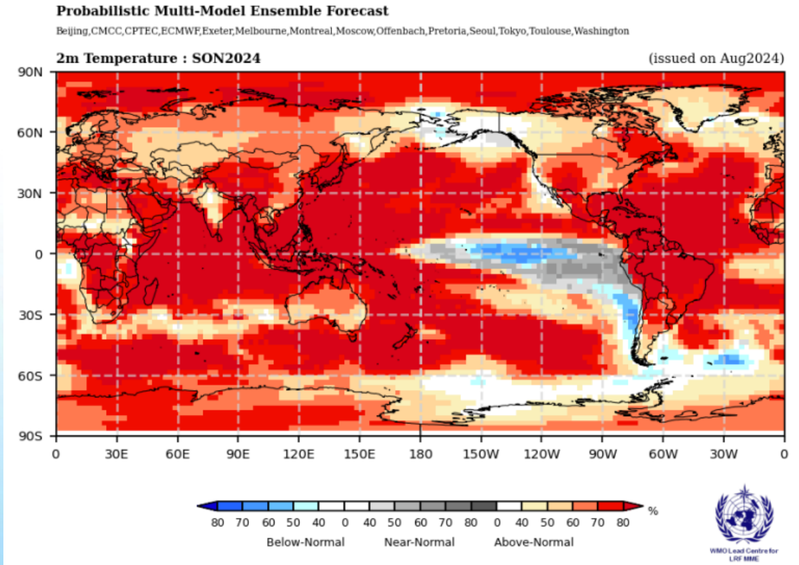
Rainfall

- Predictions for rainfall are, in part, similar to the impacts of the early stages of La Niña, which is expected to emerge during September-November 2024.

Air Temperature

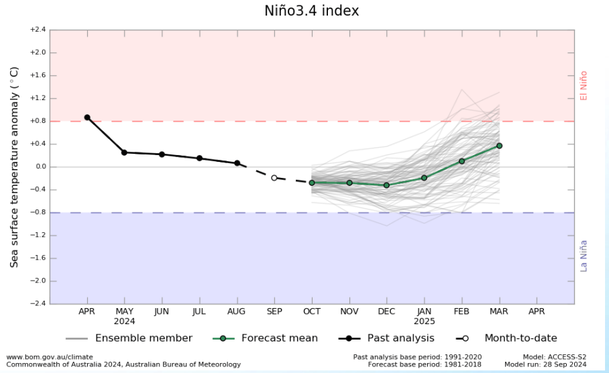
- Consistent with the anticipated persistence of widespread above-normal sea-surface temperatures in all ocean basins outside of the near-equatorial eastern Pacific Ocean, there is widespread prediction of above-normal temperatures over almost all land areas.
- (In) the eastern Pacific, below-normal temperatures are expected, consistent with the predicted emergence of weak La Niña conditions

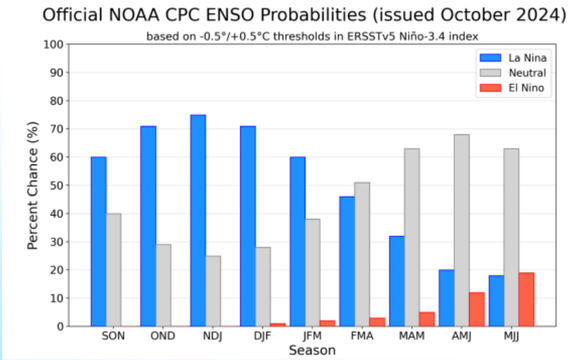




ENSO Outlook

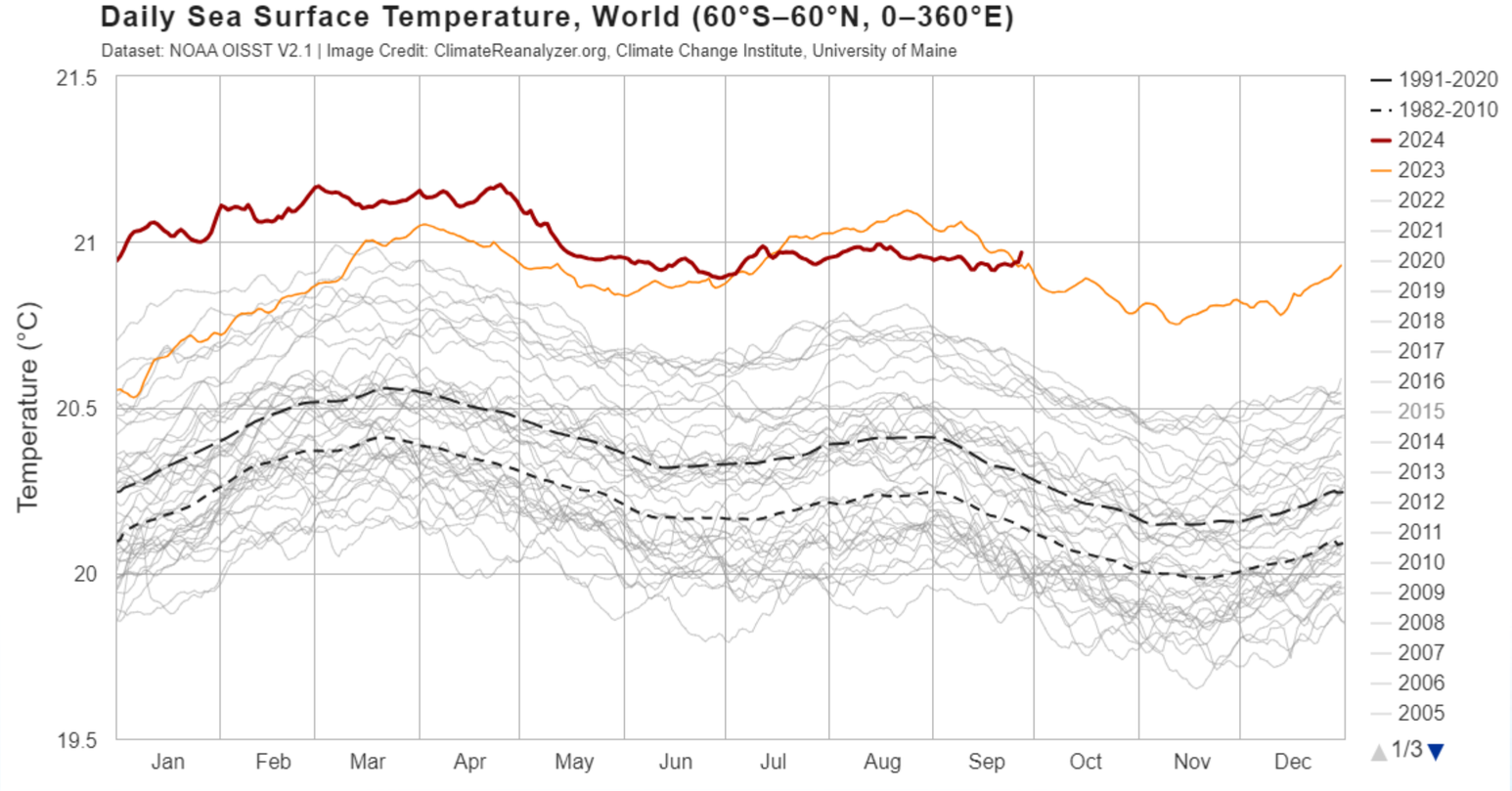
- **BoM summary** (1 October): ENSO is currently neutral. Should La Niña thresholds be met in the coming months, the event is forecast to be relatively weak (in terms of the strength of the SST anomaly) and short-lived, with most models (surveyed) indicating a return to ENSO-neutral in early 2025.
- **NIWA summary** (October): There is a 60% chance that La Niña will develop by the end of December. Tropical Pacific trade winds will continue to nudge the ocean in a La Niña-like direction.
- **NOAA summary** (10 October): La Niña is favored to emerge in September-November (60% chance) and is expected to persist through January-March 2025.





ENSO Discussion Point

- Global SSTs are at near-record levels with 2023 and 2024 temperatures well above all years since 1854.
- BoM Climate Driver Update (1 October): "The sustained nature of this significant global ocean heat suggests that climate patterns such as ENSO and IOD may not necessarily behave or evolve as they have in the past."



Summary

The El Niño-Southern Oscillation (ENSO) is currently neutral. The tropical Pacific ocean cooled throughout 2024 as it transitioned from El Niño to ENSO-neutral, with the potential for La Niña development becoming evident in the second quarter of the year.

Ocean temperatures at and below the surface in the central to eastern Pacific are currently cooler than usual but not meeting La Niña thresholds. Atmospheric indicators such as rainfall and trade wind patterns over the Pacific have been La Nina-like recently, however this pattern has yet to be sustained, and indicative of the atmosphere-ocean being coupled.

Climate model forecasts for the remainder of 2024 indicate the potential for further cooling of the tropical Pacific sea surface, with forecasts from models indicating the development of La Niña or La Niña-like conditions are the most likely outcome for remainder of 2024. Climate models indicate that should La Niña develop, it would be relatively short-lived with a return to ENSO-neutral in early 2025.

THANK YOU!

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