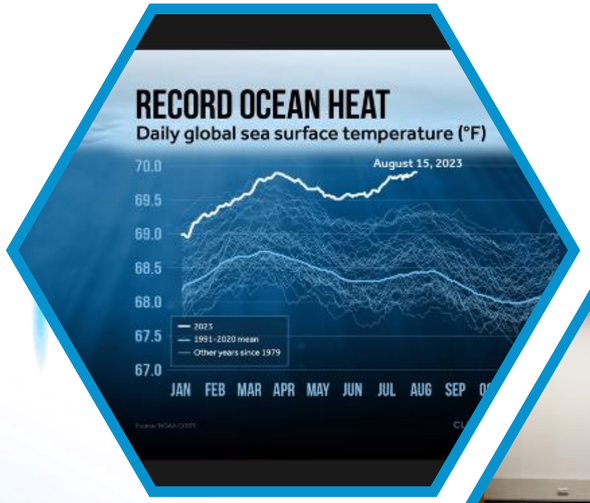
15TH SESSION OF THE PACIFIC ISLANDS CLIMATE OUTLOOK & STAKEHOLDER FORUM



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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

Session 4: Looking Forward – Monthly and Seasonal Outlooks for November 2024 to April 2025

iii. Tropical cyclones

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(Australian) Bureau of Meteorology

The Bureau – South Pacific TC outlook November 2024 to April 2025

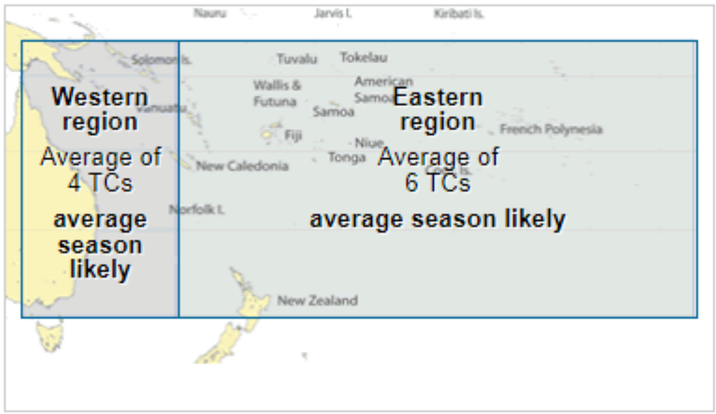
Average number of tropical cyclones likely in the South Pacific in 2024–25

- The number of tropical cyclones expected during the 2024–25 South Pacific tropical cyclone season (November to April), 6 in the Eastern region and 4 in the Western region, is expected to be close to average.
- The likelihood of severe (strong) tropical cyclones is higher than average, because of the warmer than average ocean temperatures forecast for the South Pacific region in the coming months.
- Due to rising sea levels, the risk of storm surge from tropical cyclones is likely to continue to increase.
- Tropical cyclones can affect Pacific Islands and coastal regions even when they remain well offshore.
- Tropical lows that do not intensify into tropical cyclones, or lows that are the remnants of older tropical cyclones, can still produce damaging winds, widespread rainfall, and dangerous flooding.

The South Pacific tropical cyclone season typically runs from 1 November to 30 April, although tropical cyclones can, and do, form outside of these dates. All tropical cyclones that are active between 1 July and 30 June count toward the season's total. The average number of tropical cyclones during the season is 4 in the Western region and 6 in the Eastern region.

This forecast is based on the analysis of ENSO oceanic and atmospheric indicators over July to September 2024. The skill of this forecast is limited and the long-term trend towards fewer tropical cyclones can provide better guidance on the expected number of tropical cyclones.

Region tropical cyclone forecast



Region	Long-term average (median) number of tropical cyclones	Chance more than average number of tropical cyclones
Western	4	average season likely
Eastern	6	average season likely

The long-term average number of tropical cyclones is calculated using data from the 1969–70 season up to the most recent season.

Ocean temperatures are currently cooler that average in parts of the eastern and central equatorial Pacific, close to average in the vicinity of the Date Line, and warmer than average in the South Pacific, south of 20° S.

The Bureau – South Pacific TC outlook November 2024 to April 2025

About the long-range forecasts

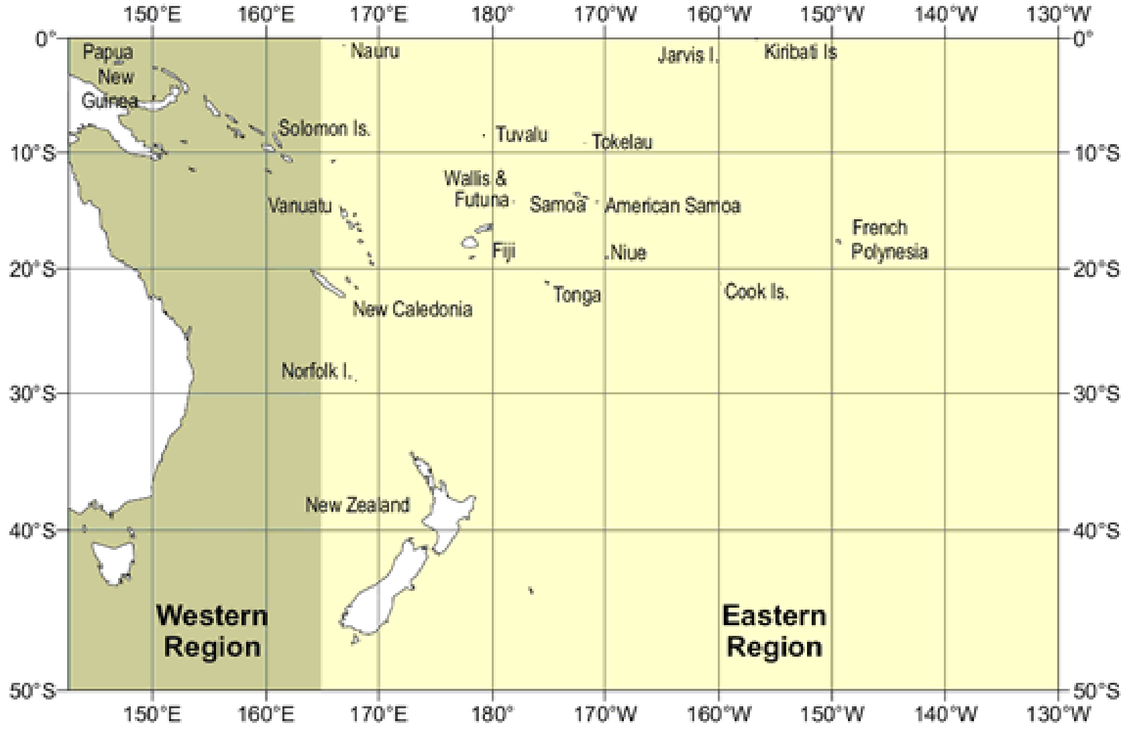
The tropical cyclone season long-range forecast uses the statistical relationships between historical tropical cyclone numbers and two indicators: the Southern Oscillation Index (SOI) and the Niño3.4 sea surface temperature (SST) anomaly (relative to the 1991–2020 average). These two indicators provide a measure of the atmospheric and oceanic state, respectively, of El Niño-Southern Oscillation (ENSO).

The July, August and September SOI and NINO3.4 anomaly values are used in making the Australian Tropical Cyclone Outlook.

2024	July	August	September
SOI	-6.9	7.8	-1.0
NINO3.4 SST	0.05 °C	-0.07 °C	-0.45 °C

Interpreting the outlook

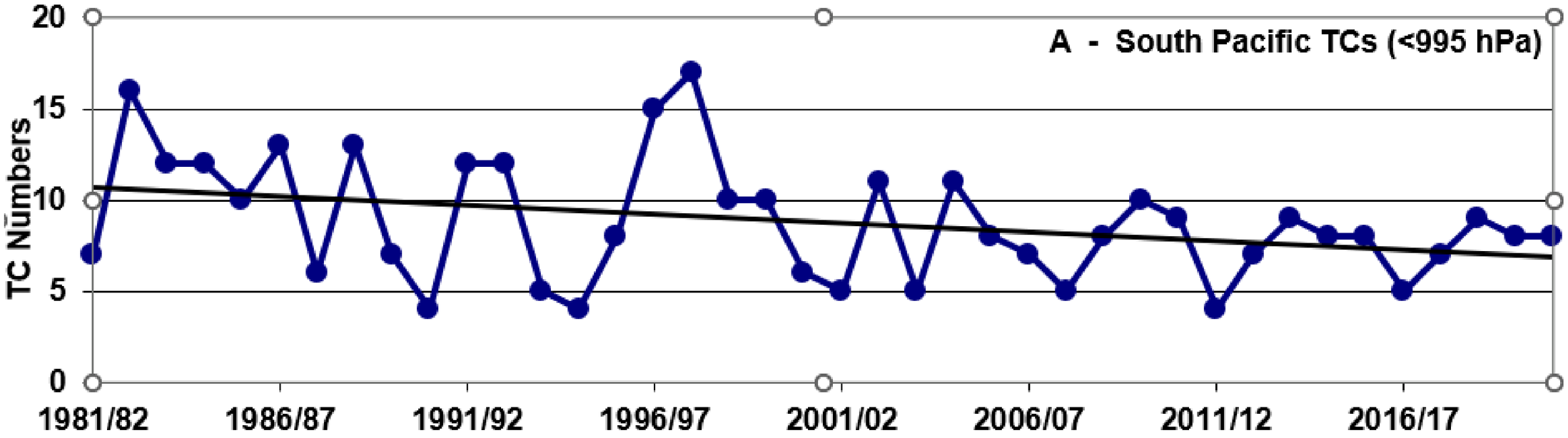
Percentages such as a 60% chance of having more tropical cyclones than average (or a 40% chance of having fewer) mean that for every ten years with similar climate patterns to those currently observed, six years would be expected to have an above-average number of tropical cyclones and four years would be expected to have a below-average number.



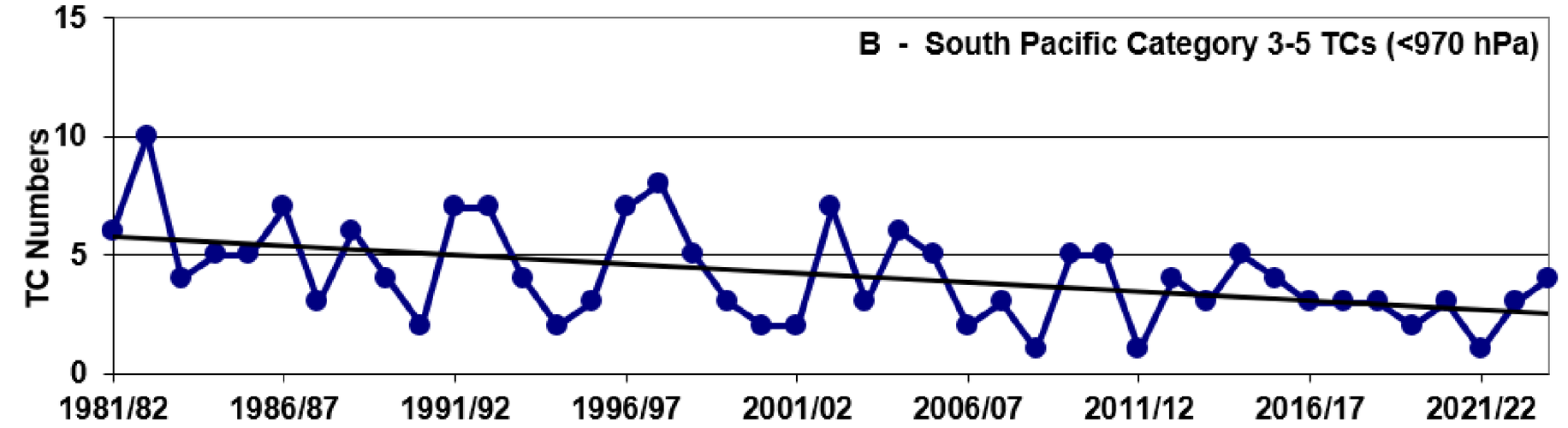
South Pacific region long-range forecast accuracy

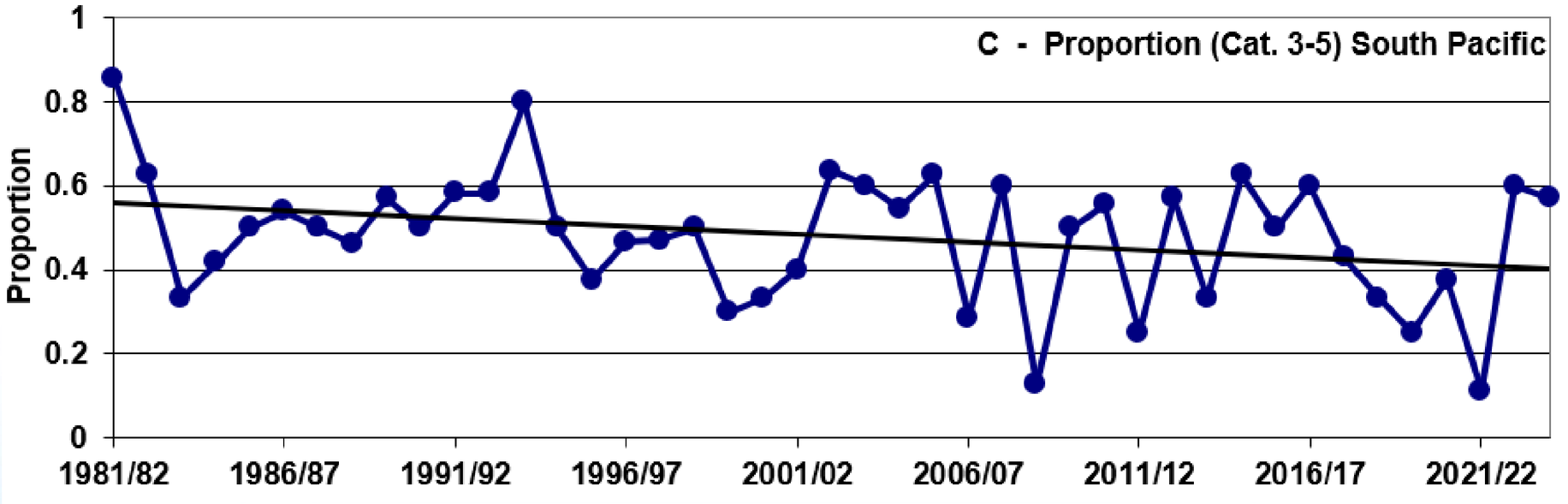
The statistical model used for this long-range forecast has a **high** level of accuracy predicting cyclone numbers in the **western region**, but a **very low** level of accuracy for the **eastern region**.

The Bureau – South Pacific TC outlook November 2024 to April 2025



The Bureau – South Pacific TC outlook November 2024 to April 2025





NIWA – TC outlook Nov-Apr 2024-25

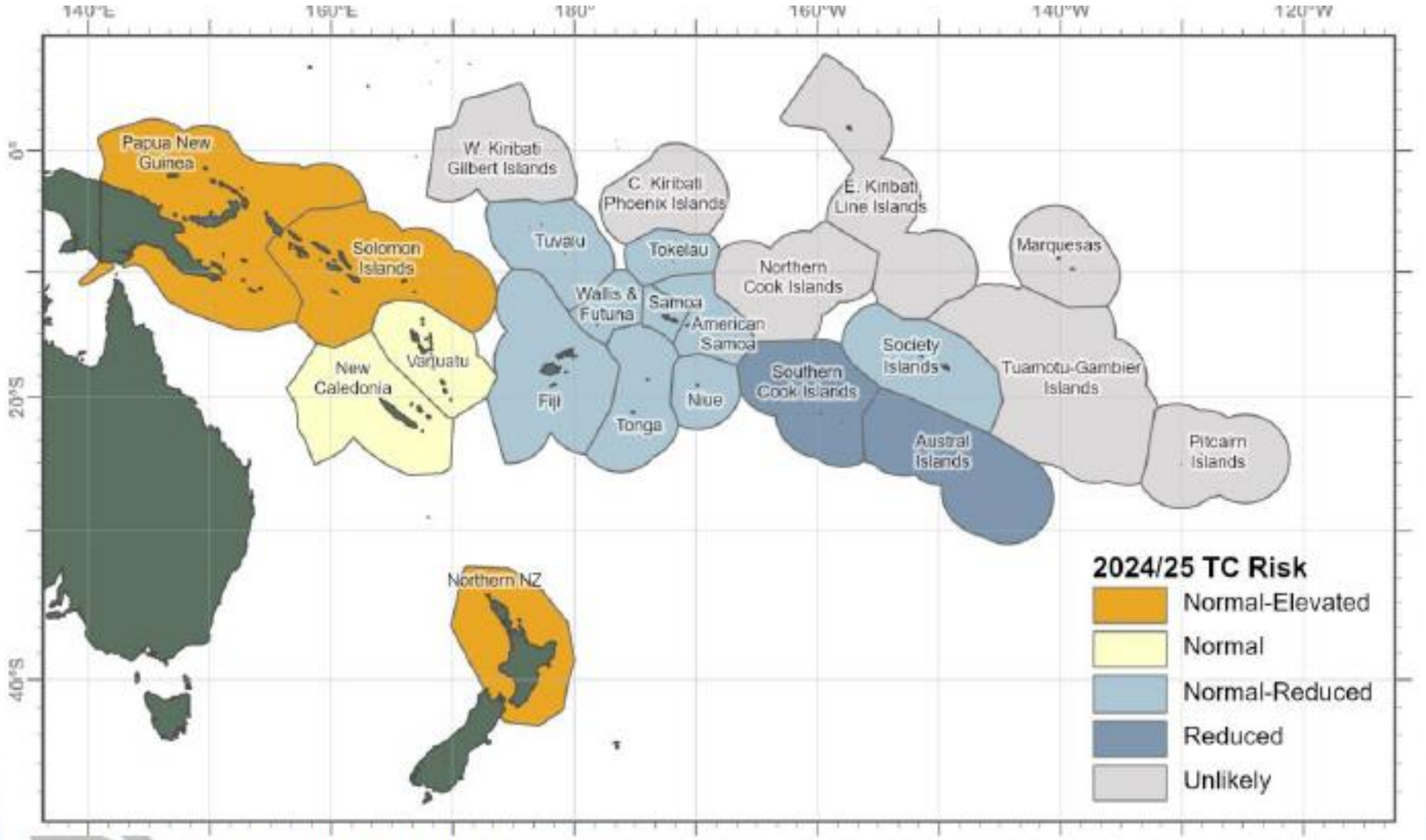


Figure 1: Tropical cyclone risk for the 2024-25 season

NIWA – TC outlook Nov-Apr 2024-25

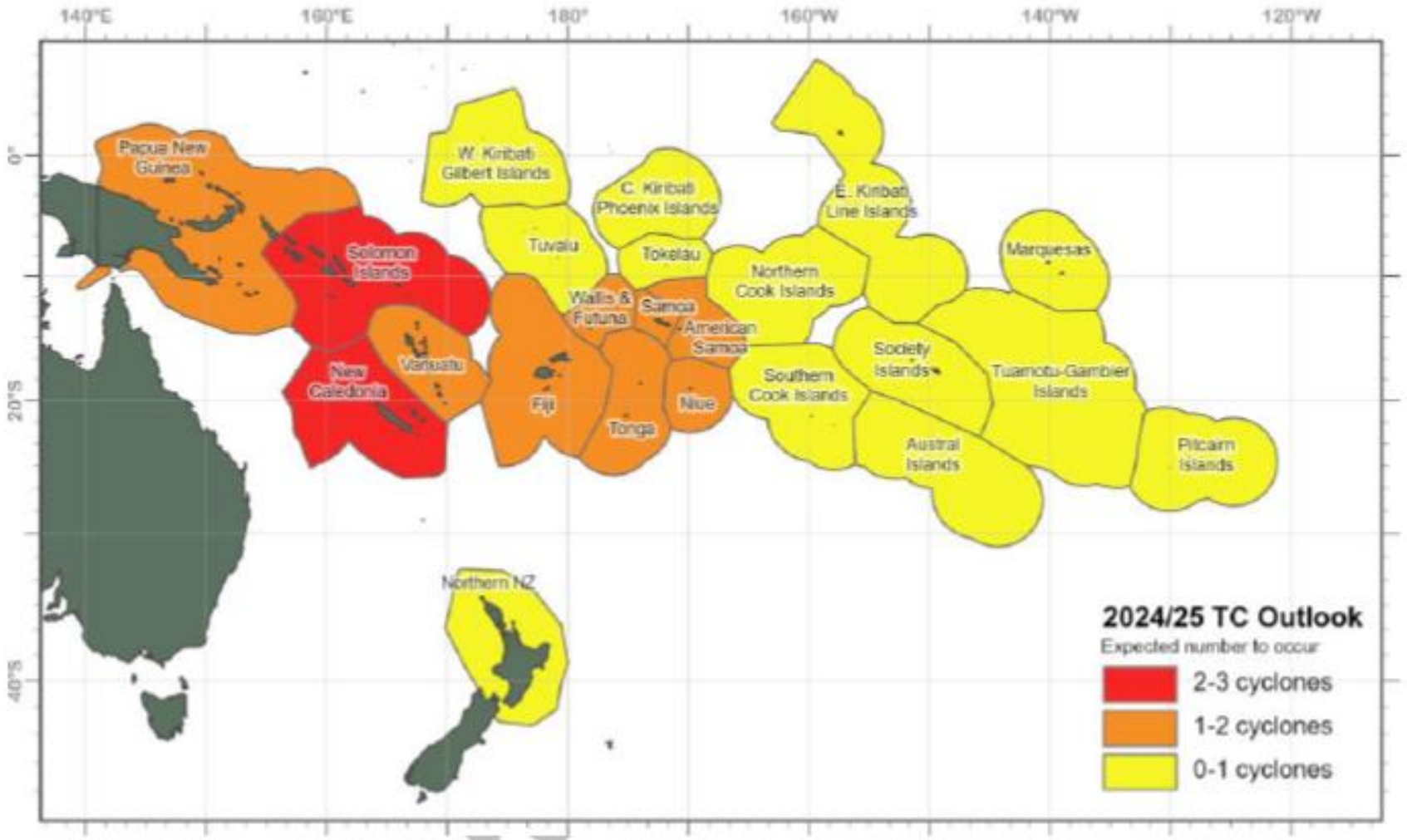
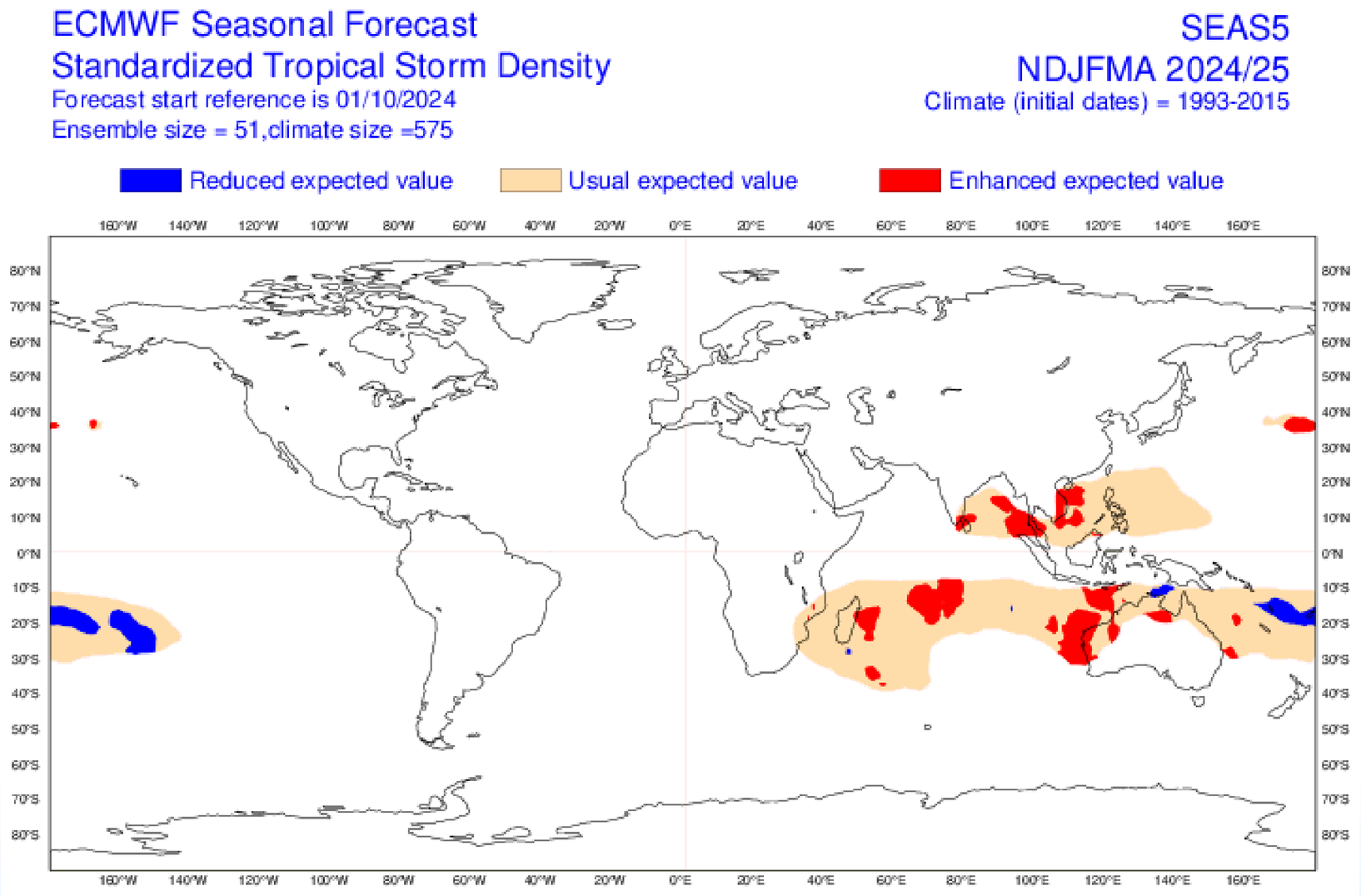
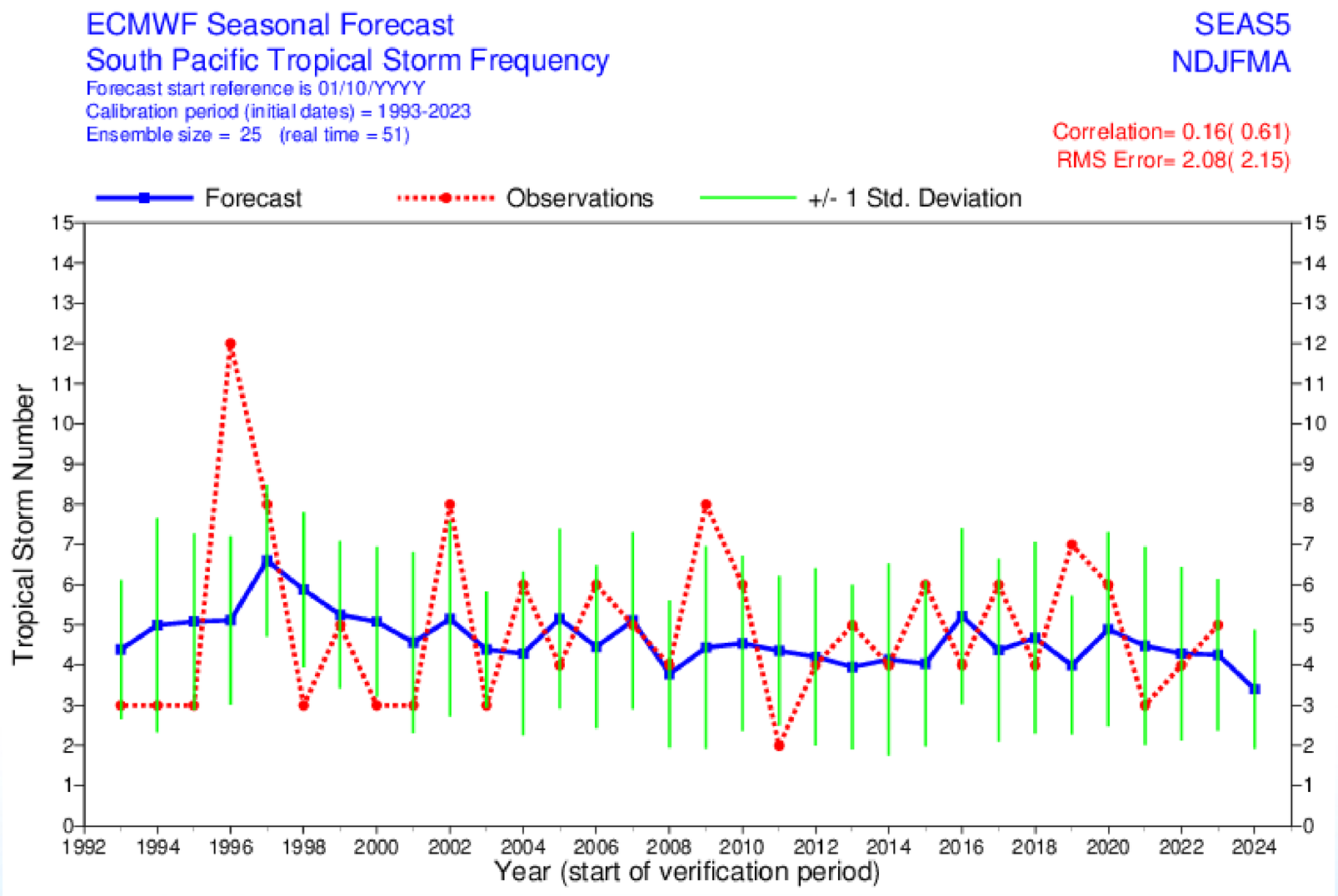


Figure 2: Number of predicted named tropical cyclones interacting with an island group for the 2024-25 season

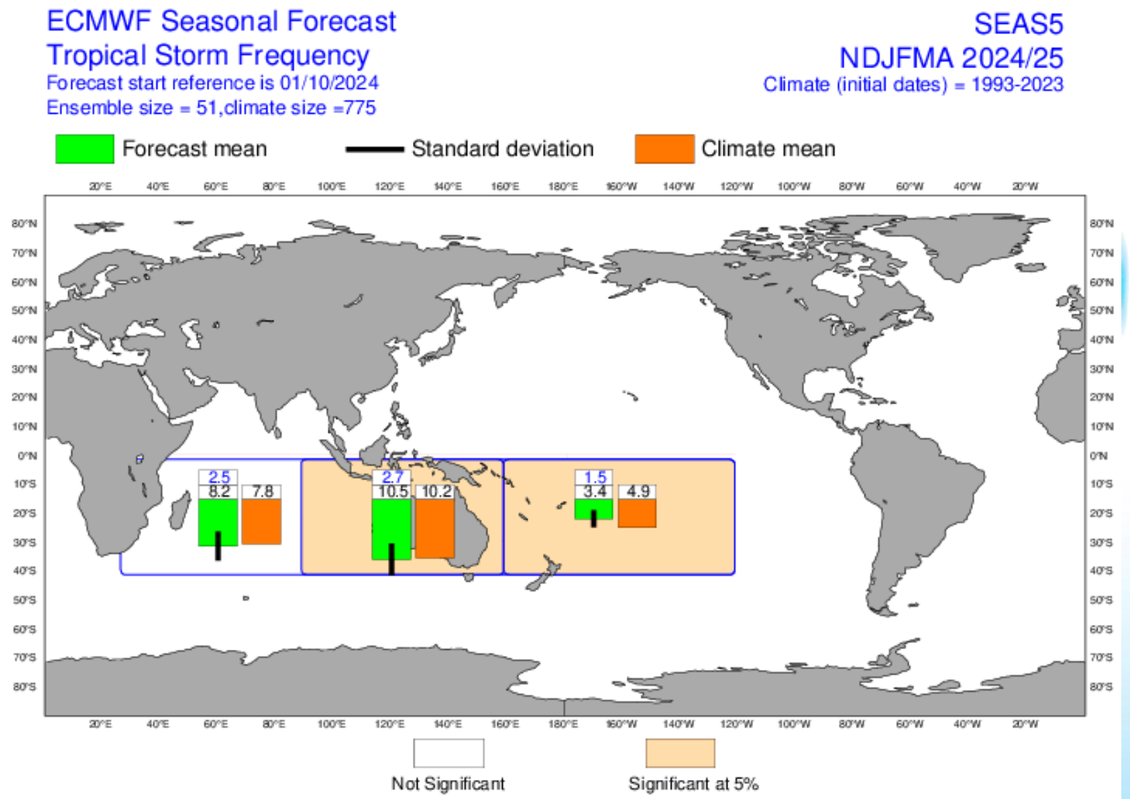
ECMWF – TC outlook Nov-Apr 2024-25

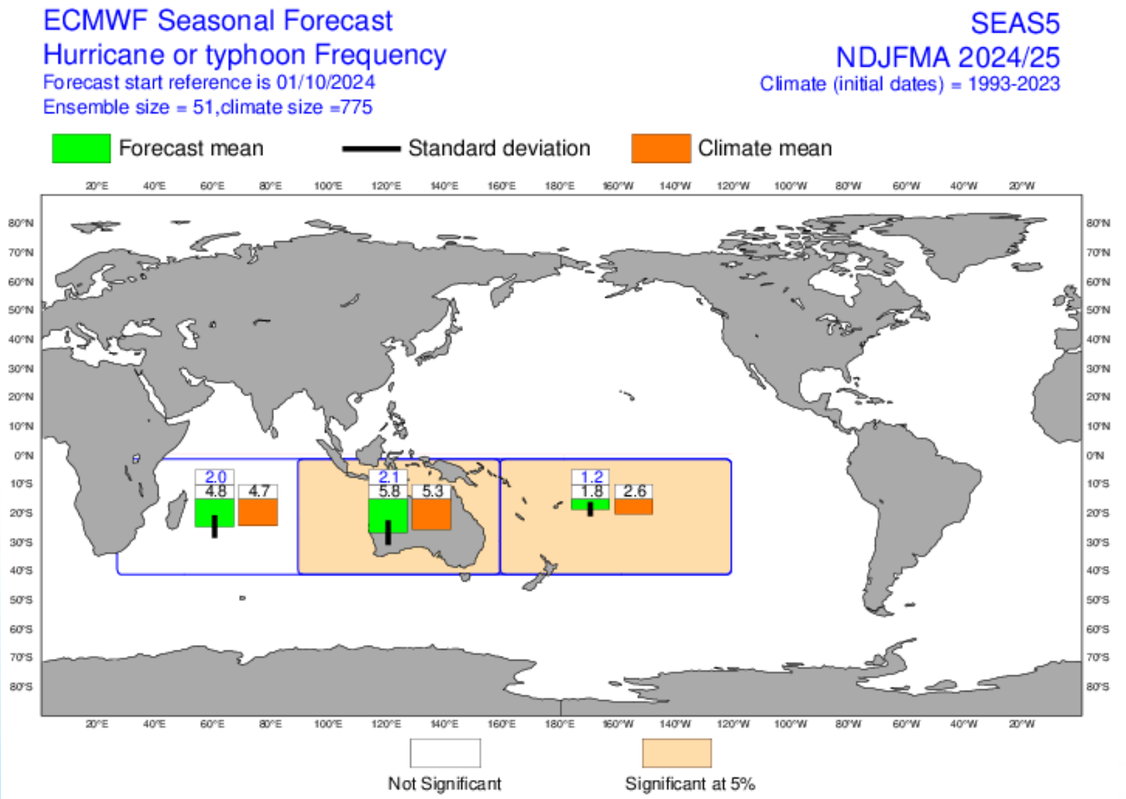


ECMWF – TC outlook Nov-Apr 2024-25

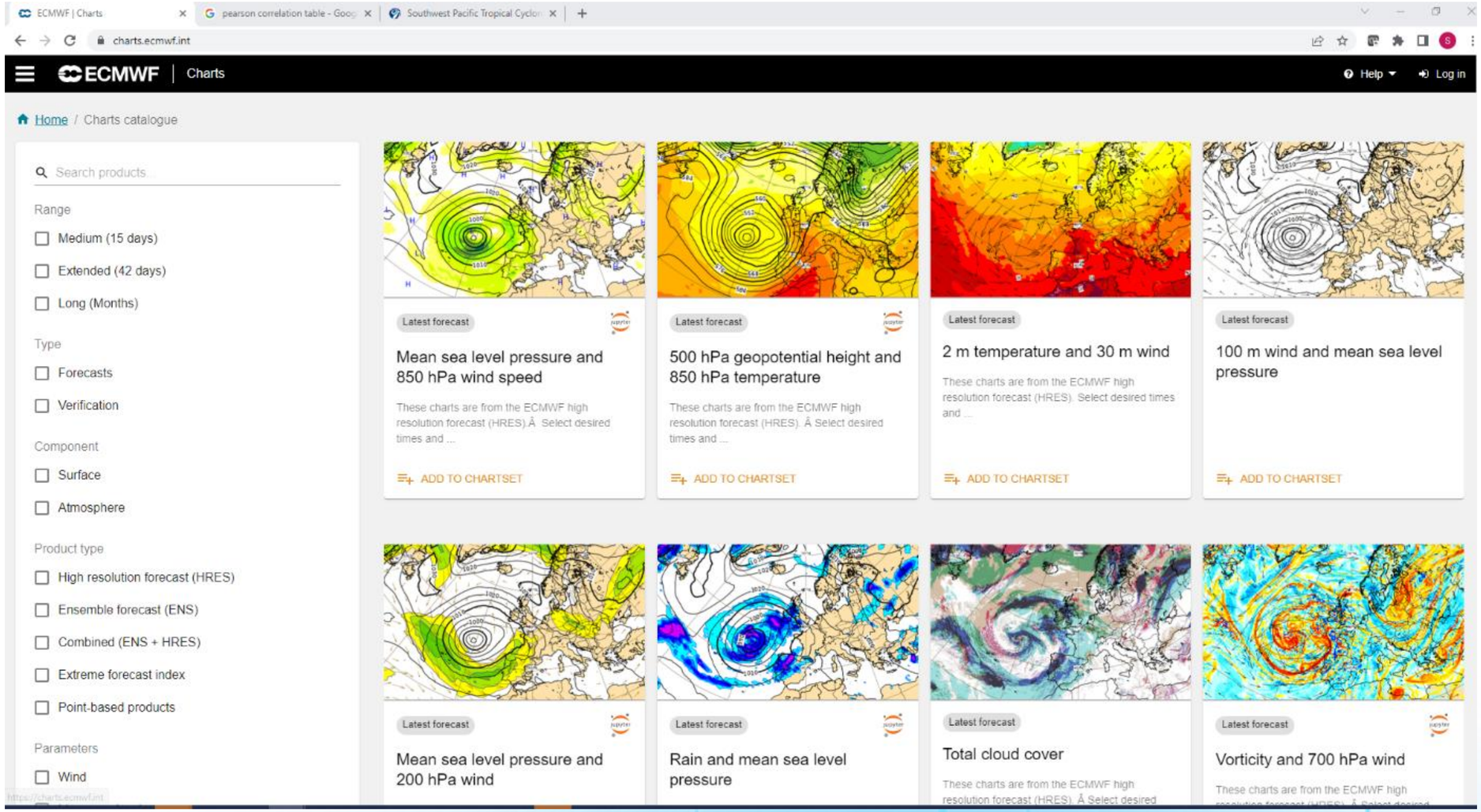


ECMWF – TC outlook Nov-Apr 2024-25



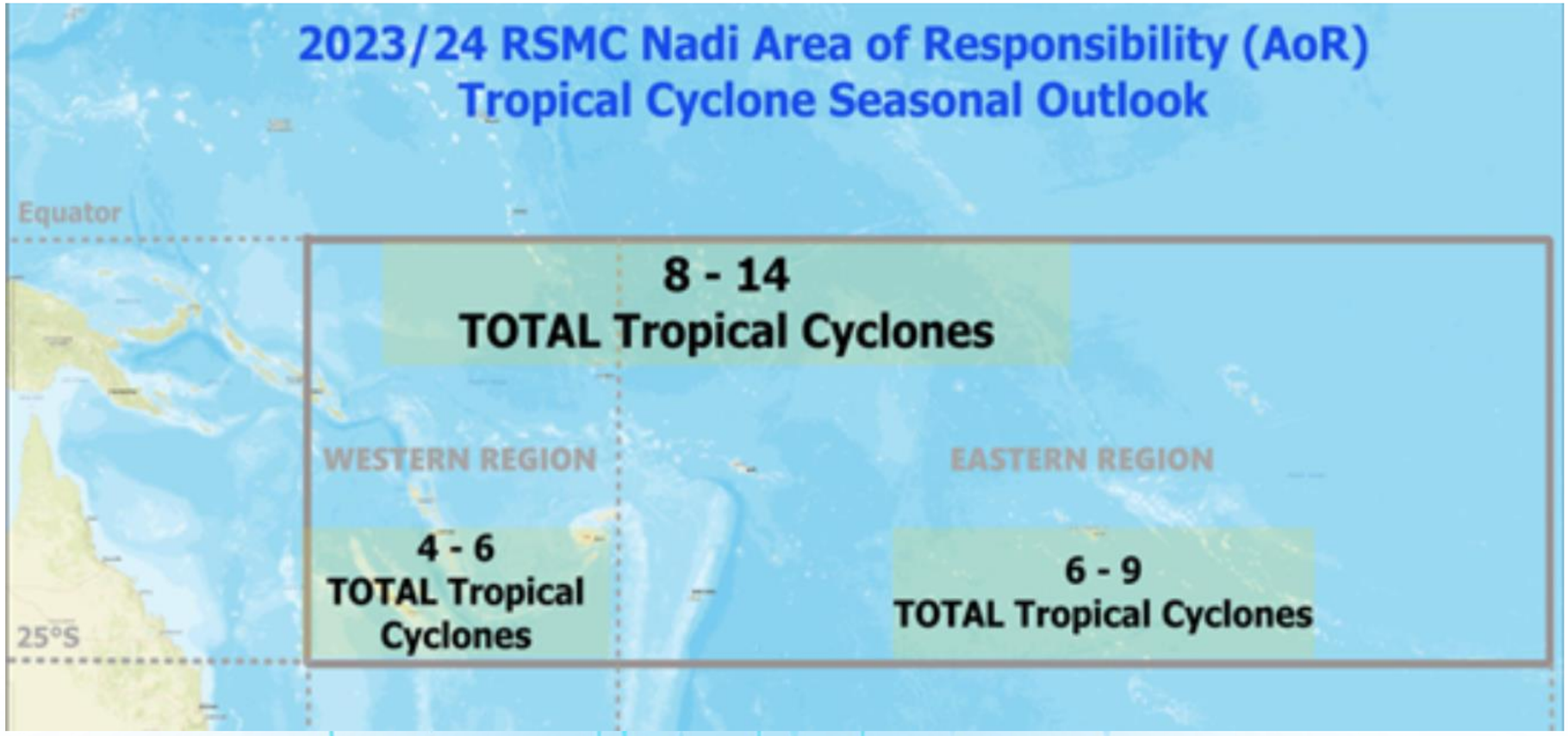


ECMWF – TC outlook Nov-Apr 2024-25

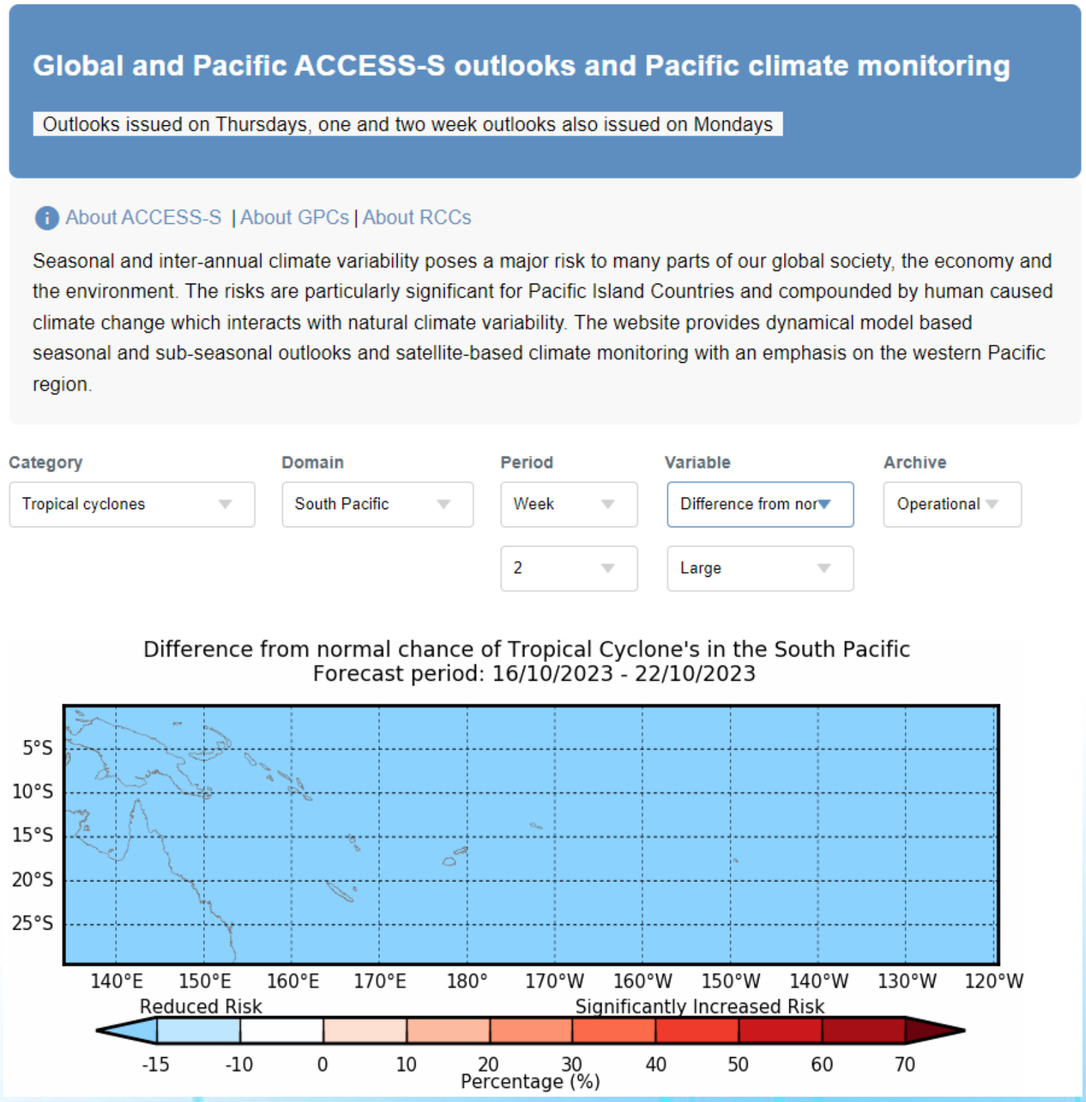


https://charts.ecmwf.int/ - Select Range = Long, Type = Forecasts Parameters = Tropical cyclones

RSMC Nadi TC outlook Nov-Apr 2023-24

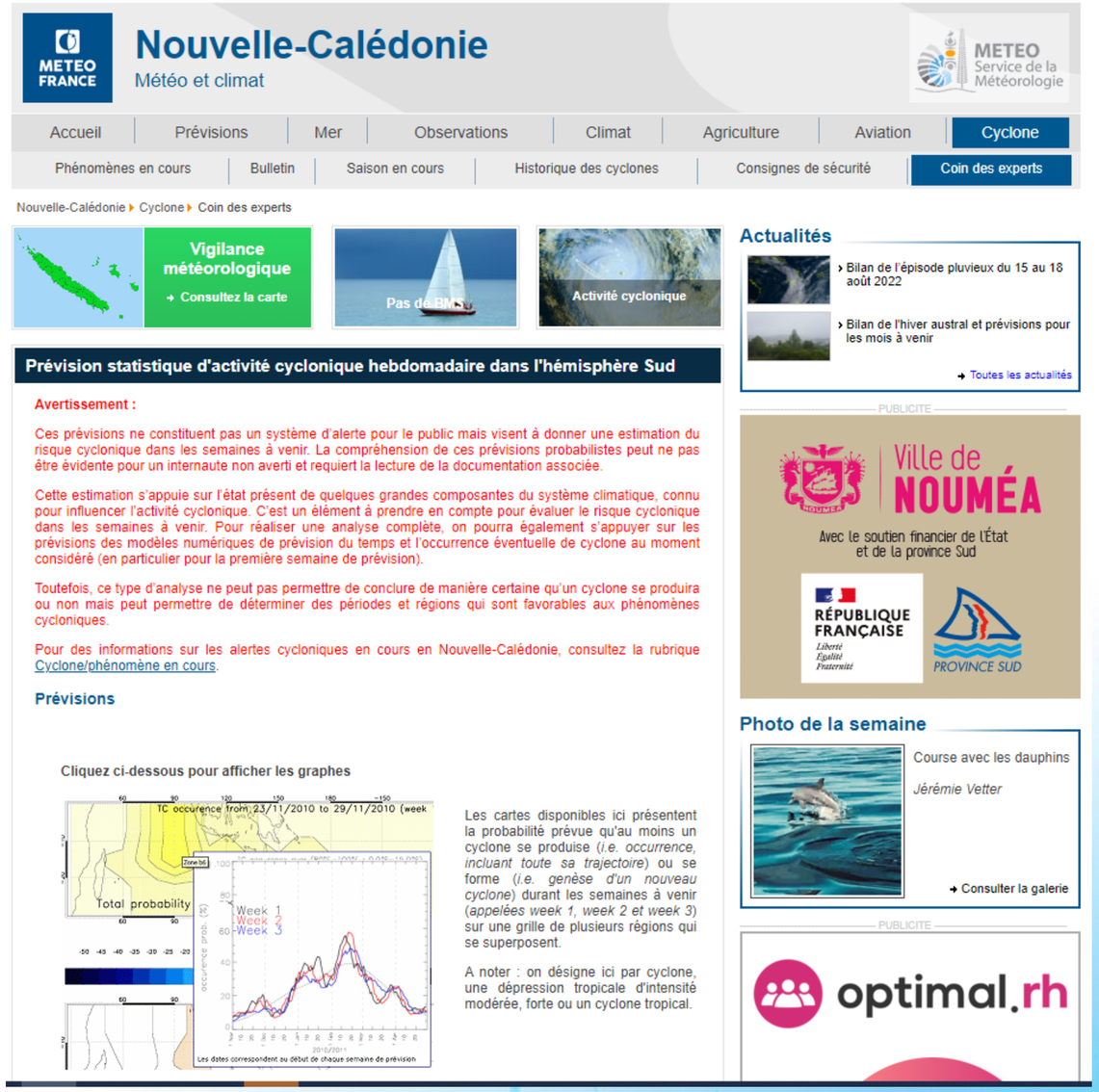


Multi-week TC outlooks – from the Bureau

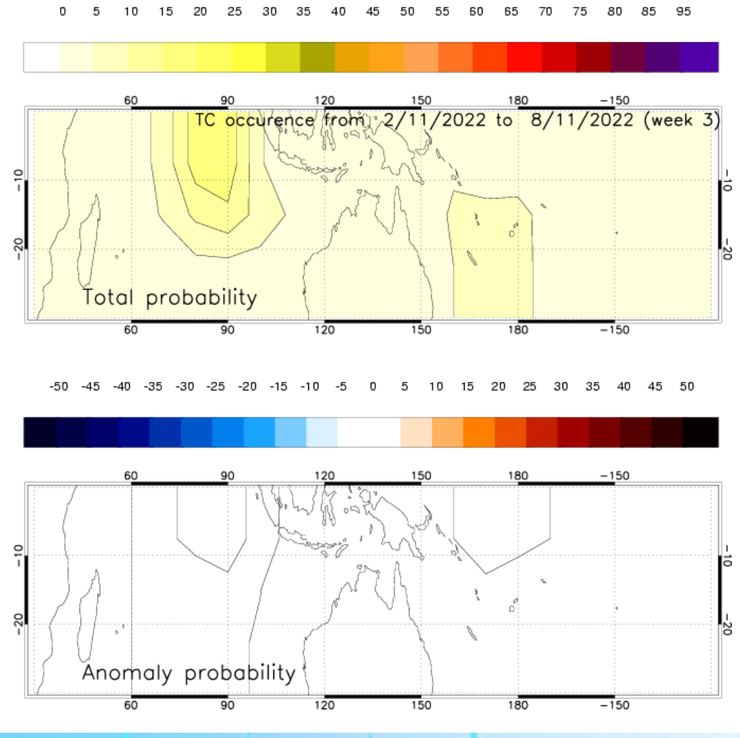


- Source = http://www.bom.gov.au/climate/pacific/outlooks/
- Multi-week TC outlooks out to week 3 (South Pacific), 4 (Northwest Pacific)
- Use 'difference from normal chance of TC formation' option
- The Bureau only has one category = tropical cyclone (27.2 knot at 850 hPa threshold)

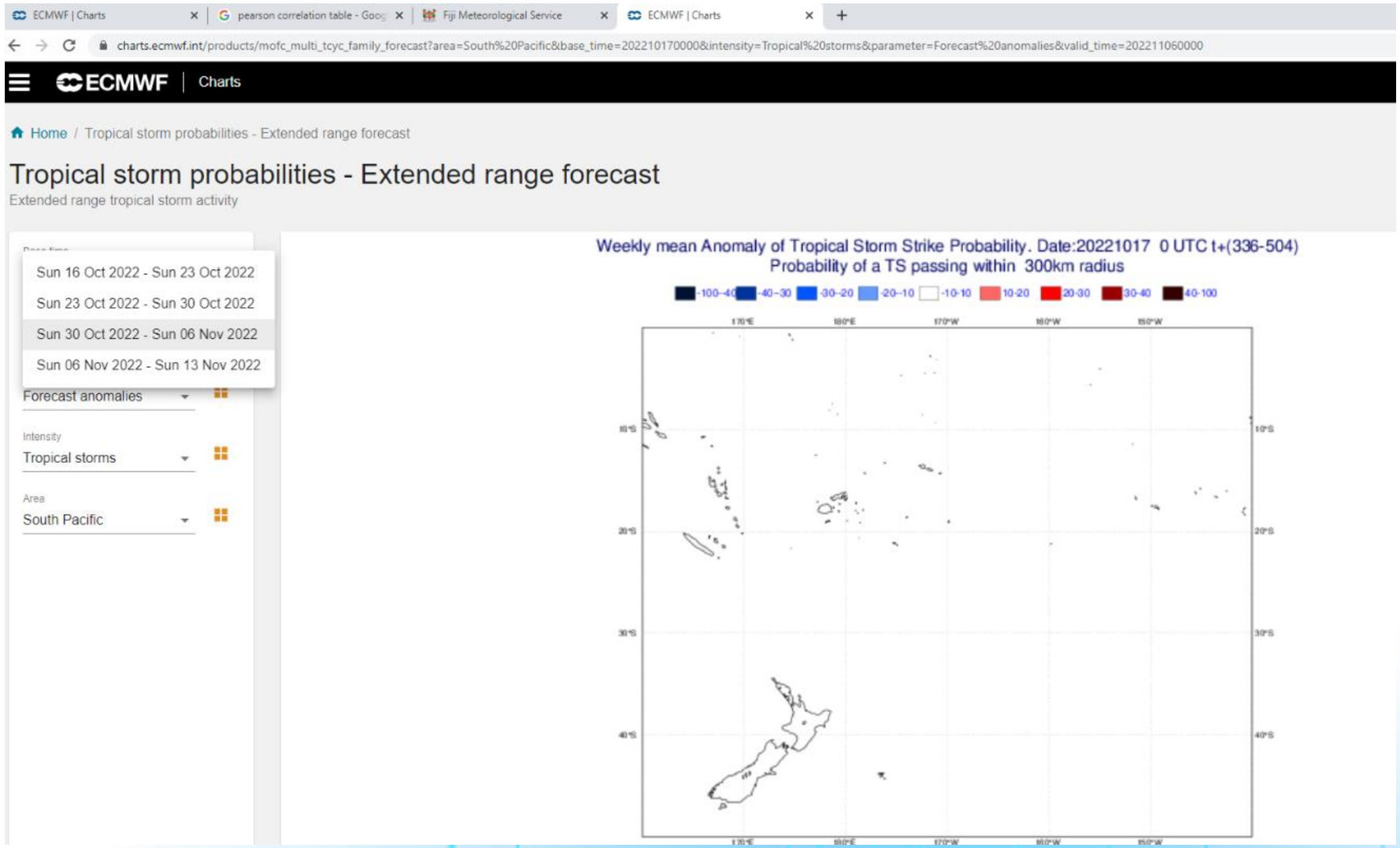
Multi-week TC outlooks – from MeteoFrance New Caledonia



- Source = https://www.meteo.nc/nouvelle-caledonie/cyclone/coin-des-experts
- Southern hemisphere only
- Weeks 1-3
- Focus on Anomaly probability map



Multi-week TC outlooks – from ECMWF



- Source = https://charts.ecmwf.int/
- Multi-week TC outlooks out to week 4
- Both Northwest and South Pacific
- Use forecast anomalies option! These are probabilities of a TS, Depression or Hurricane passing within 300 km radius

Summary

- The official 2024/25 Southwest Pacific tropical cyclone (TC) season begins on 1 November 2024 and will continue until 30 April 2025. TCs have occurred out-of-season in the months of May, June and October;
- TCs are categorised in strength from 1 to 5, with 5 being most intense. TCs that reach category 3 or higher are classified as severe;
- For the coming season normal or above normal TC activity is likely west of and including Vanuatu. East of Vanuatu, normal to below normal TC activity is likely.
- Since the 1981/82 TC season there has been a significant decline in the total numbers of TCs east of Cape York, northern Australia. In the early 1980s the average number of TCs per season was 11. In recent years this has declined to about 7 per season. The average number of severe TCs has declined as well from about 6 per season in the early 1980s to about 3 per season in recent years. These trends are likely to be the better predictor of TC occurrence in the coming season;
- Monitoring multi-week weekly TC outlooks through the season is highly recommended as well as monitoring daily weather forecasts when the chance of TC occurrence is higher than normal;
- It does not take a direct hit or severe TC to cause considerable damage or life-threatening weather. When dangerous weather is forecast, please heed the advice of your local meteorological service, civil deference, or disaster management office.

THANK YOU!

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