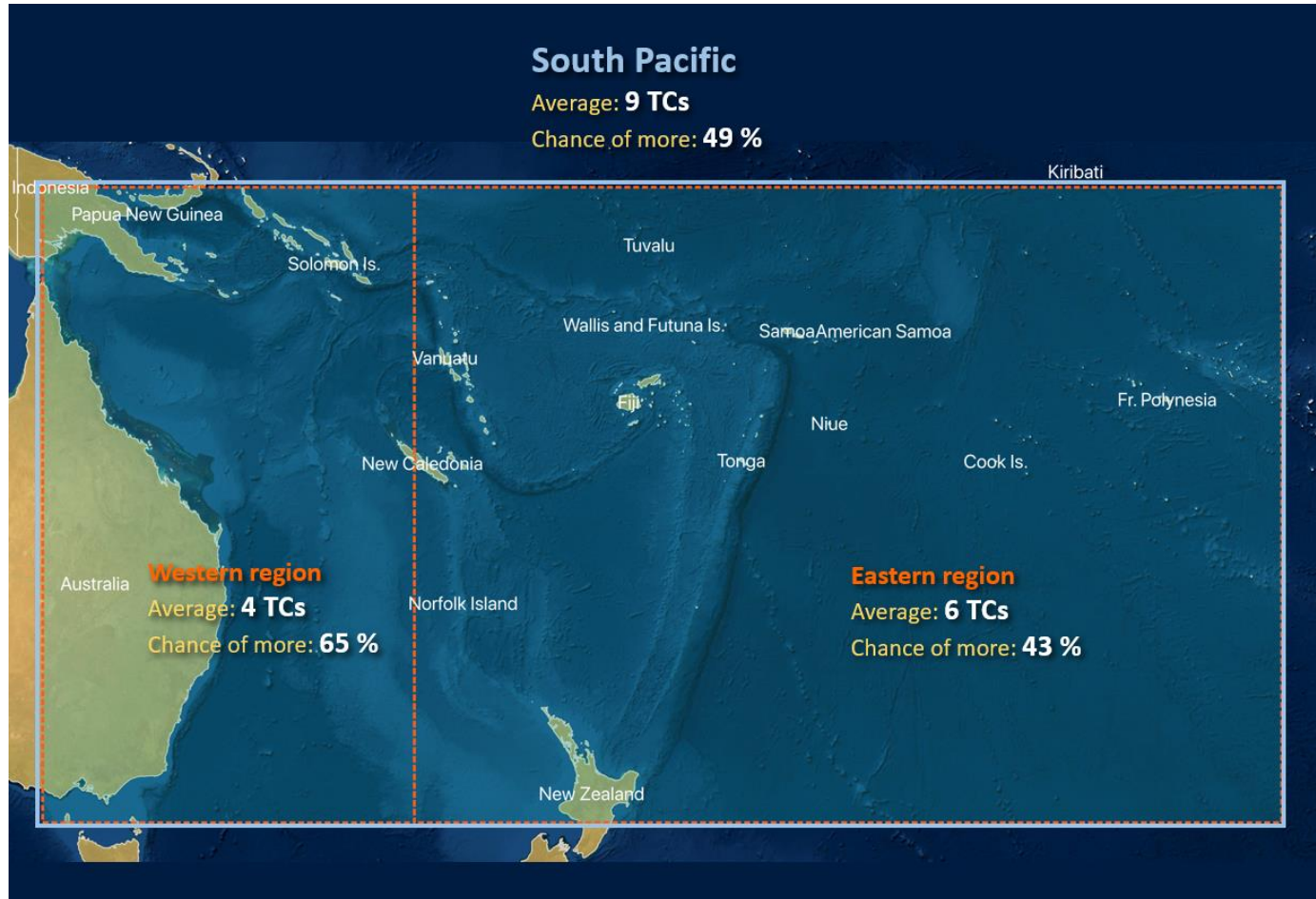




The Bureau  
of Meteorology

# Session 5: Looking Forward Session and Intra-seasonal guidance for 2022/23 Tropical Cyclones

# The Bureau – South Pacific TC outlook Nov-Apr 2022-23



- Established La Niña in the tropical Pacific Ocean influenced tropical cyclone outlook.
- An above-average number of tropical cyclones is likely (65% likelihood) in the western South Pacific region this season, with model accuracy historically being moderate.
- A close-to-average to below-average number of tropical cyclones is expected for the eastern South Pacific, but model accuracy is historically very low for this region.



# The Bureau – South Pacific TC outlook Nov-Apr 2022-23

## About the outlooks

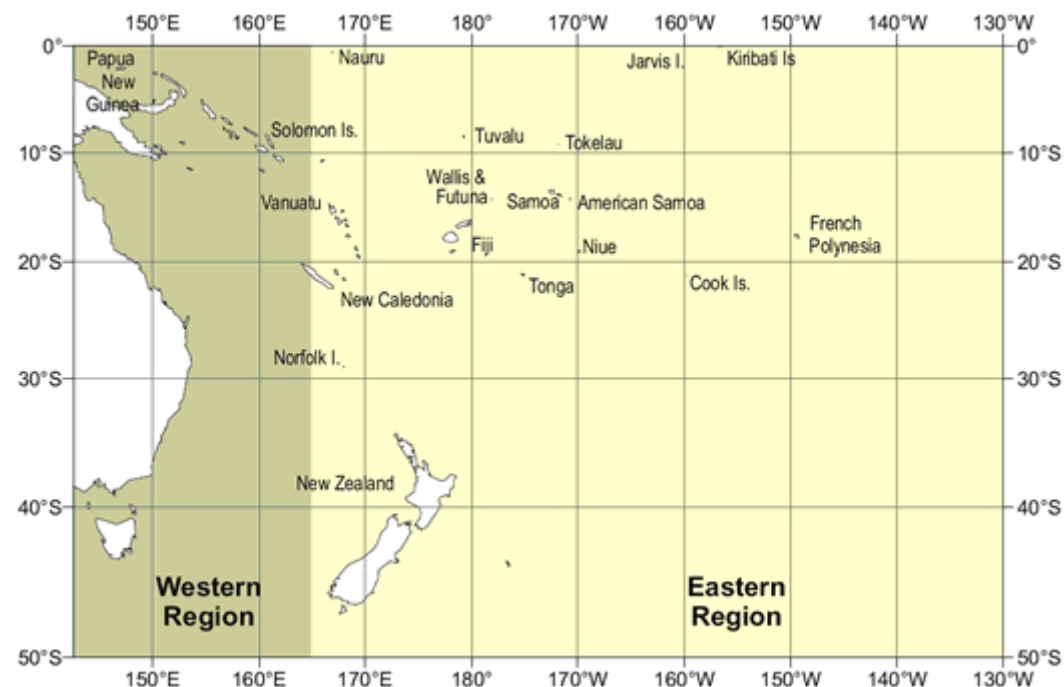
This outlook uses the statistical relationships between tropical cyclone numbers and two indicators: the Southern Oscillation Index (SOI) and the Niño3.4 sea surface temperature anomaly. These two indicators provide a measure of the atmospheric and oceanic state, respectively, of El Niño-Southern Oscillation (ENSO).

The July, August and September SOI and NINO3.4 values were used in making the tropical cyclone season outlook.

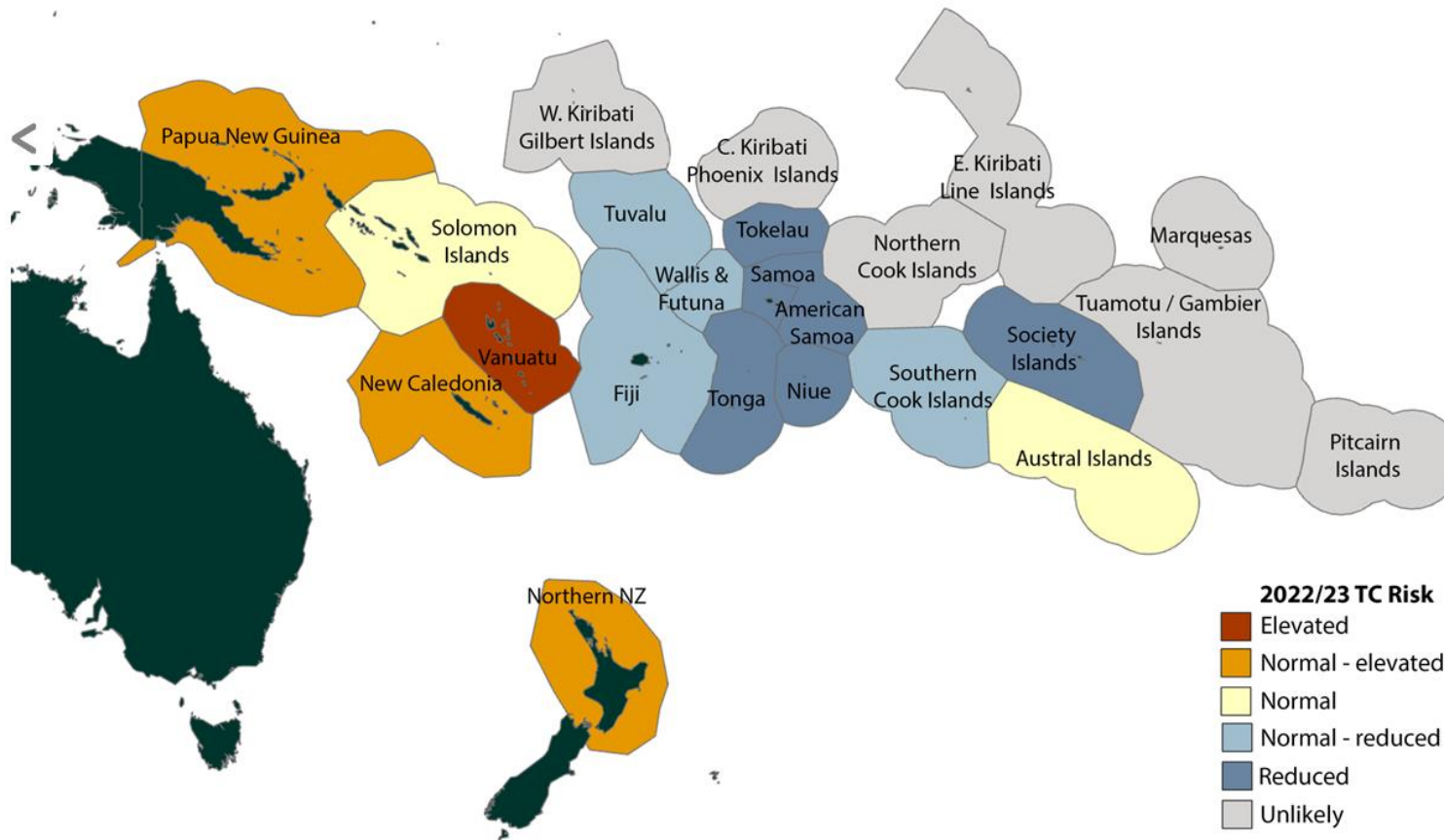
2022	July	August	September
SOI	8.7	9.1	18.3
NINO3.4 SST	-0.70 °C	-0.98 °C	-1.09 °C

## 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.



# NIWA – TC outlook Nov-Apr 2022-23



TCO-2022-Fig1

Elevated TC activity is expected in and around the Coral Sea and the north/central Tasman Sea during the full season from November - April.

The risk of impacts from a TC are expected to be higher across that maritime region and around Vanuatu.

Reduced TC activity is expected east of the International Date Line

**Link to outlook video:**

<https://youtu.be/DLLwQ1ftjdU>



# NIWA – TC outlook Nov-Apr 2022-23

Table 1: Island Climate Update (ICU) consensus outlook for November 2022-April 2023 tropical cyclone activity based on combining NIWA analogue model, international dynamical climate model and TCO-SP deterministic statistical model outlook results. Indications for upcoming TC activity based on these joint methods that cover the SW Pacific basin for the 2022/23 season are stated in the “ICU Consensus” column and are also shown in Figure 1. Expected TC numbers are based on the NIWA analogue method (see Table 2) and supported by the TCO-SP deterministic method.

<i>TC activity</i>	<i>NIWA</i>	<i>International</i>		<i>TCO-SP</i>	<i>ICU</i>
<i>2022/23</i>	<i>Analogue</i>	<i>Dynamical</i>		<i>Deterministic</i>	<i>Consensus</i>
<u>SP Basin</u>	Normal-Elevated	Normal	*	Normal	Normal
Solomon Is.	Normal	Normal	1	Normal	Normal
Papua New Guinea	Normal-Elevated	Normal		Elevated	Normal-Elevated
N. New Zealand	Normal-Elevated	Normal		Normal	Normal-Elevated
Vanuatu	Elevated	Elevated		Normal	Elevated
New Caledonia	Normal-Elevated	Elevated		Normal	Normal-Elevated
Tonga	Reduced	Reduced		Reduced	Reduced
Fiji	Normal-Reduced	Normal-Reduced		Normal	Normal-Reduced
Wallis & Futuna	Reduced	Reduced	2	Reduced	Reduced
Tokelau	Reduced	Reduced		Reduced	Reduced

NIWA maps based on consensus guidance.

Combination of NIWA analogue method, International dynamical outlook and TCO-SPO outlook.

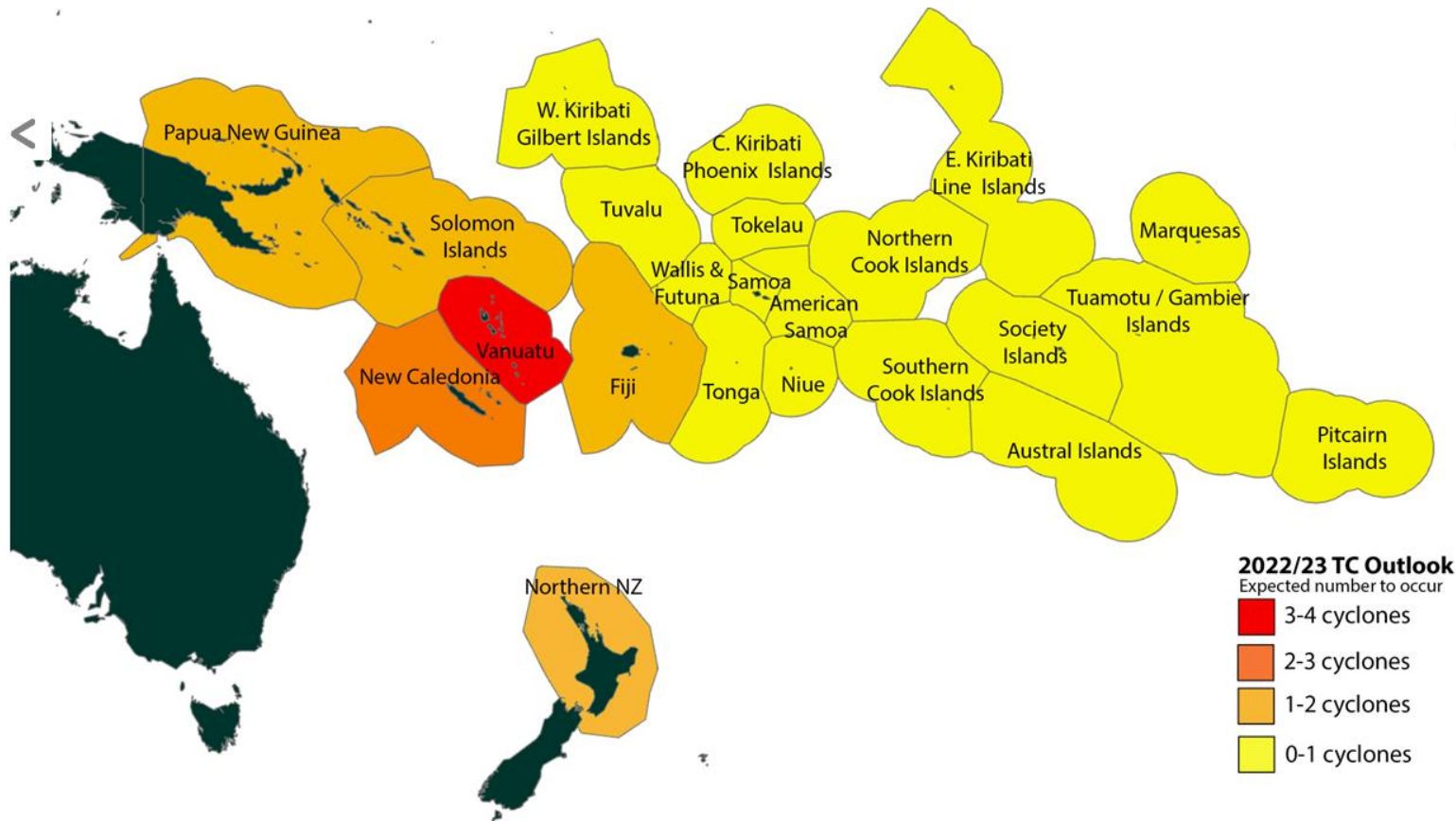
Analogues are selected by looking at the recent state of the ENSO system: SOI averaged over the last 3 months & NINO34 over the last 5 months.

These two indices are standardised to compute a “Coupled ENSO Index” (CEI) (Gergis and Fowler, 2005).

The CEI value for September is then compared to historical years back to 1969. Years with very similar values are considered analogues.



# NIWA – consensus TC outlook Nov-Apr 2022-23



TCO-2022-Fig1B

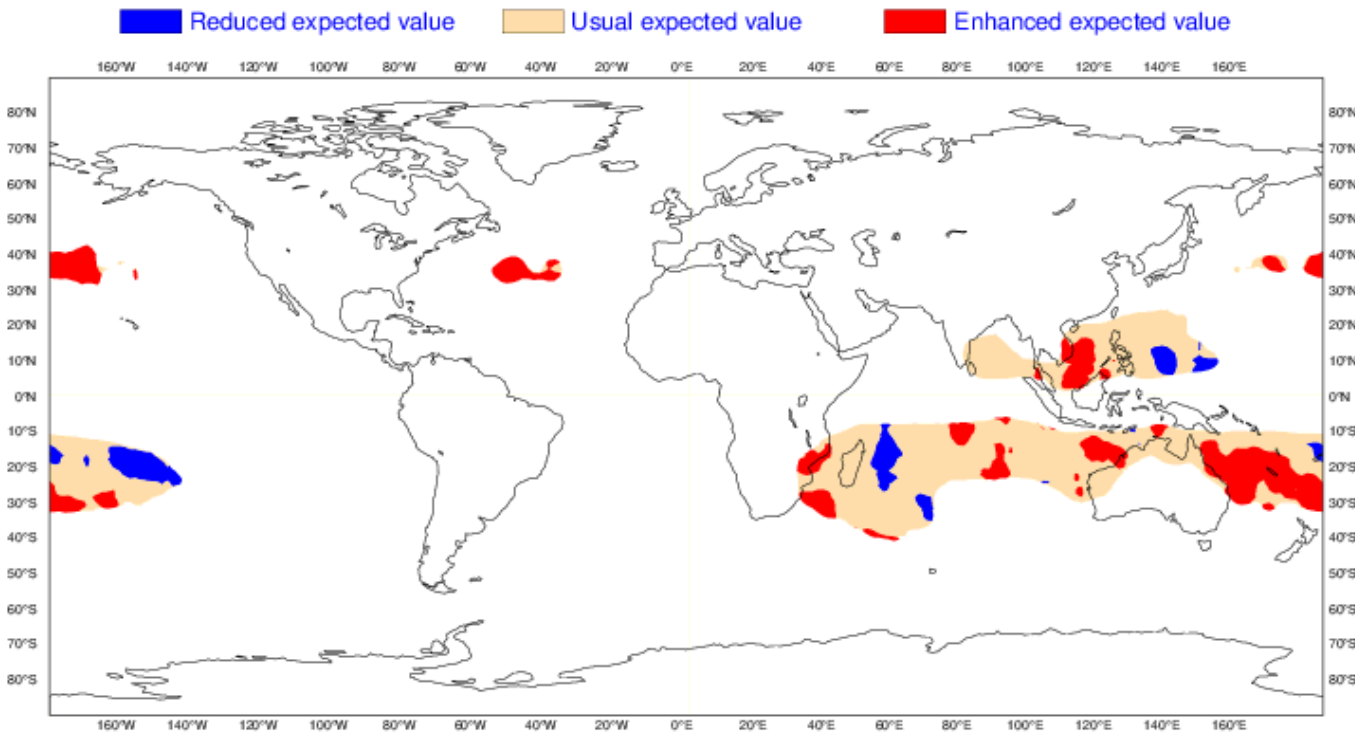
- Vanuatu and New Caledonia typically experience the greatest TC activity. For this season, elevated TC activity is expected for areas around the Coral Sea and Vanuatu.
- Normal or elevated activity is expected for New Caledonia and Papua New Guinea. The Solomon Islands and Austral Islands are expected to have normal TC activity.
- Near normal or below normal TC activity is expected for Fiji, Tuvalu, and the southern Cook Islands. Below normal TC activity is forecast for Tuvalu and most other islands near or to the east of the International Date Line.
- At least three severe TCs reaching Category 3 or higher might occur anywhere across the region, so all communities should remain prepared.



# ECMWF – TC outlook Nov-Apr 2022-23

ECMWF Seasonal Forecast  
Standardized Tropical Storm Density  
Forecast start reference is 01/10/2022  
Ensemble size = 51, climate size = 575

SEAS5  
NDJFMA 2022/23  
Climate (initial dates) = 1993-2015



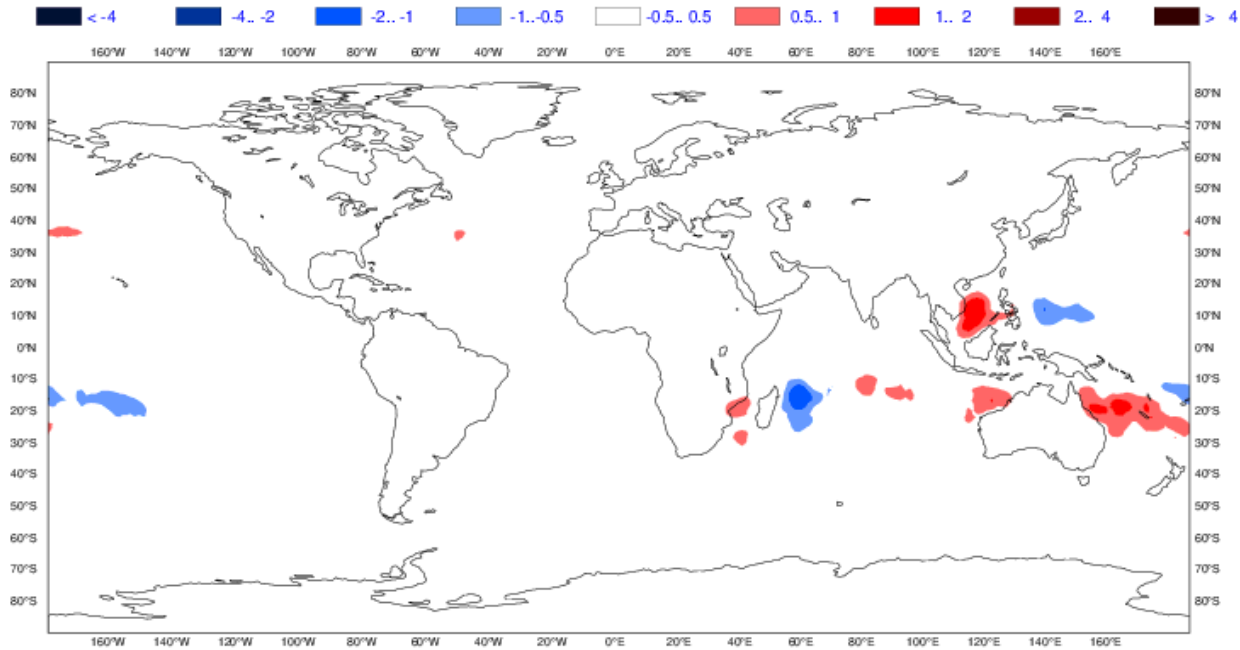
- Reduced numbers of tropical cyclones in the Northwest Pacific;
- Enhanced numbers of tropical cyclones in the western South Pacific (Vanuatu-New Caledonia) and in the sub-tropics south and east of Vanuatu;
- Reduced numbers of tropical cyclones in the eastern South Pacific around Fiji-Tonga, Cook Is.-French Polynesia region.



# ECMWF – TC outlook Nov-Apr 2022-23

ECMWF Seasonal Forecast  
Tropical Storm Density Anomaly  
Forecast start reference is 01/10/2022  
Ensemble size = 51, climate size = 575

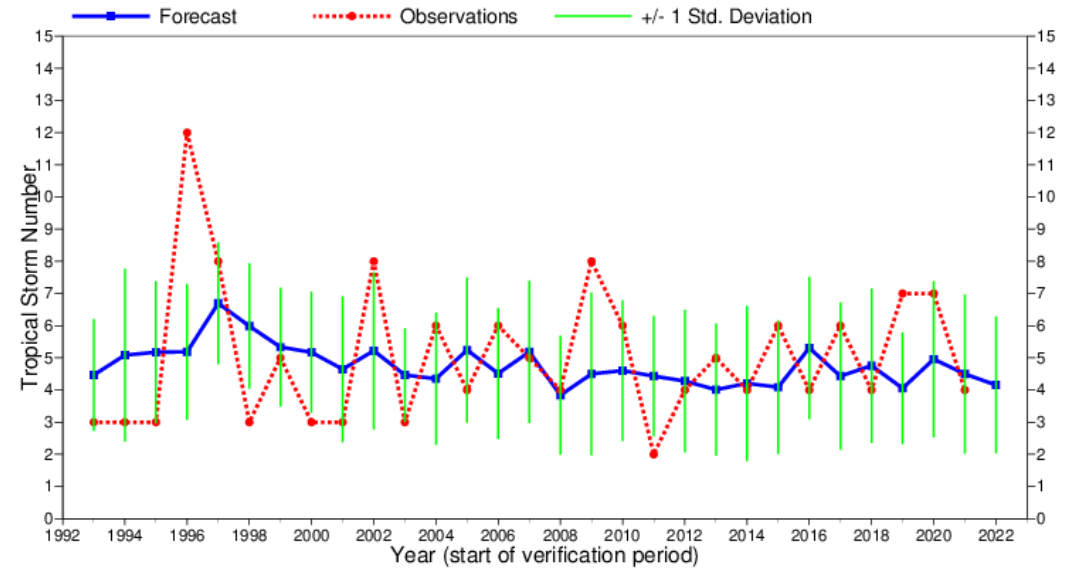
SEAS5  
NDJFMA 2022/23  
Climate (initial dates) = 1993-2015



ECMWF Seasonal Forecast  
South Pacific Tropical Storm Frequency  
Forecast start reference is 01/10/YYYY  
Calibration period (initial dates) = 1993-2021  
Ensemble size = 25 (real time = 51)

SEAS5  
NDJFMA

Correlation= 0.14( 0.54)  
RMS Error= 2.16( 2.22)





# ECMWF – TC outlook Nov-Apr 2022-23

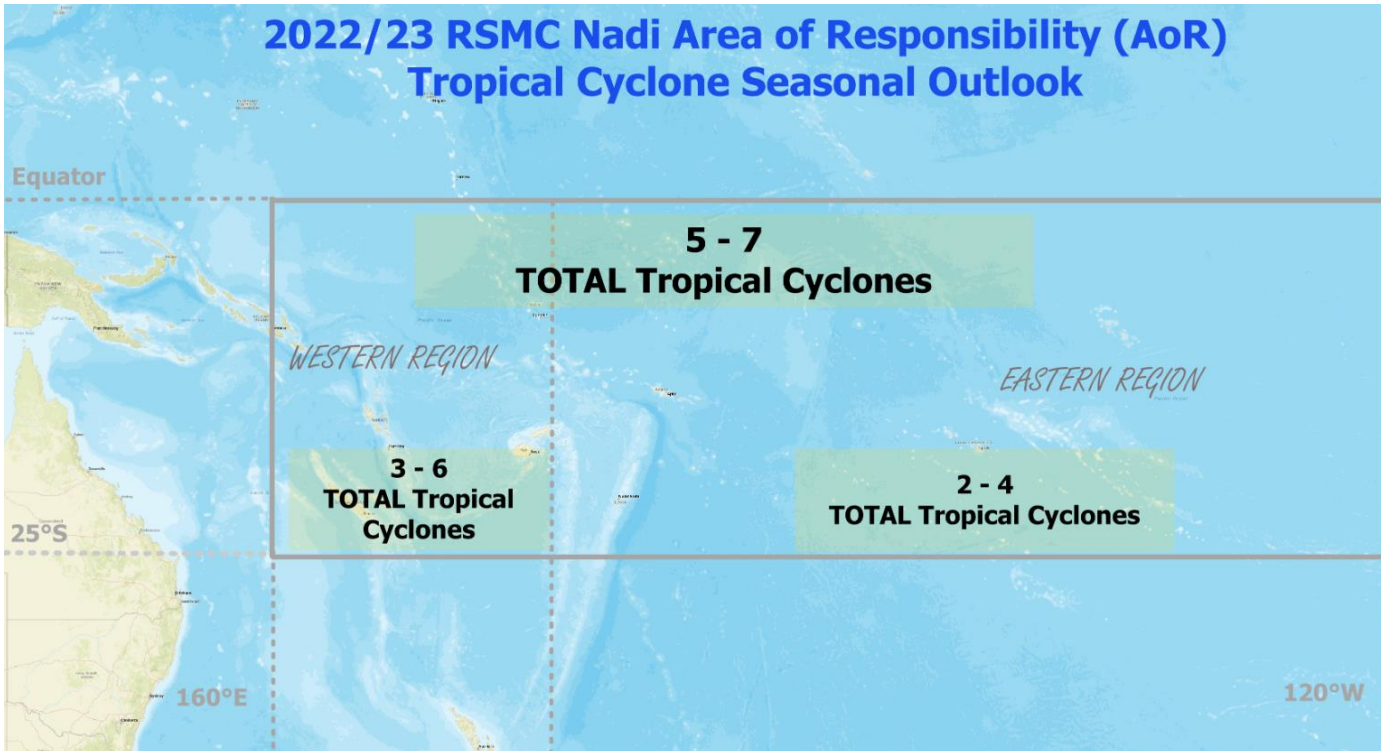
The screenshot shows the ECMWF Charts website interface. At the top, there are browser tabs and the URL [charts.ecmwf.int](https://charts.ecmwf.int). The main navigation bar includes the ECMWF logo and 'Charts' text. Below this is a search bar and a filter sidebar on the left. The sidebar has sections for 'Range' (Medium (15 days), Extended (42 days), Long (Months)), 'Type' (Forecasts, Verification), 'Component' (Surface, Atmosphere), 'Product type' (High resolution forecast (HRES), Ensemble forecast (ENS), Combined (ENS + HRES), Extreme forecast index, Point-based products), and 'Parameters' (Wind). The main content area displays a grid of eight weather forecast charts, each with a 'Latest forecast' label and an 'ADD TO CHARTSET' button. The charts include: 1. Mean sea level pressure and 850 hPa wind speed; 2. 500 hPa geopotential height and 850 hPa temperature; 3. 2 m temperature and 30 m wind; 4. 100 m wind and mean sea level pressure; 5. Mean sea level pressure and 200 hPa wind; 6. Rain and mean sea level pressure; 7. Total cloud cover; 8. Vorticity and 700 hPa wind. Each chart shows a map of the tropical region with various meteorological data overlays.

Look this up yourself!!

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



# RSMC Nadi TC outlook Nov-Apr 2022-23



- Five to seven TCs are expected. On average, around seven TCs affect the RSMC Nadi-TCC AoR per season. Thus, average or below average number of TCs.
- On average, around four TCs affect west of Dateline and around three affect east of Dateline per season. Tropical cyclone numbers to the west of Dateline in the RSMC-Nadi TCC AoR is likely to be three to six or average to above average TC activities, while numbers to the east is likely to be two to four TCs or average this season.
- For severe TCs (Category 3 or above), average or below average severe TCs are anticipated this season, with one to four severe TCs expected. On average, around three severe TCs affect the RSMC Nadi-TCC AoR per season.
- TC outlook is greatly driven by the return of....La Nina event...persist until end of the 2022.



# Multi-week TC outlooks – from the Bureau

Bureau home > Climate > Pacific > Outlooks

## Global and Pacific ACCESS-S outlooks and Pacific climate monitoring

Outlooks issued on Thursdays, one and two week outlooks also issued on Mondays

[About ACCESS-S](#) | [About GPCs](#) | [About RCCs](#)

Seasonal and inter-annual climate variability poses a major risk to many parts of our global society, the economy and the environment. The risks are particularly significant for Pacific Island Countries and are compounded by human caused climate change which interacts with natural climate variability. This website provides dynamical model-based seasonal and sub-seasonal outlooks and satellite-based climate monitoring with an emphasis on the western Pacific region.



World Meteorological Organization (WMO)

Global Producing Centre (GPC) for Long-Range Forecasts

RA-V Pacific Regional Climate Centre (RCC)  
Network Co-lead for Node on LRF and Consortium member for Node on Climate Monitoring



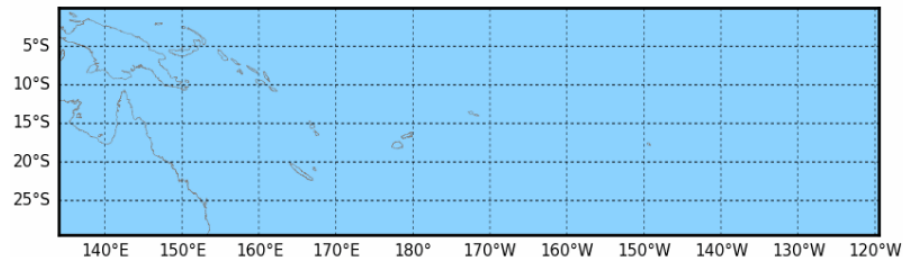
Development supported by DFAT-funded COSPPac and WMO-funded CREWS

Category: Tropical cyclones  
 Domain: South Pacific  
 Period: Week  
 Variable: Difference from  
 Archive: Operatic  
 2  
 Large

### Related links

- Download files
- Download global NetCDF data
- Download guidance documents
- BoM Climate Driver Update
- Southern Hemisphere Tropical Cyclone Data Portal
- Pacific Climate Change Data Portal
- COSPPac Ocean Portal

Difference from normal chance of Tropical Cyclone's in the South Pacific  
Forecast period: 26/10/2022 - 01/11/2022



- 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



## Nouvelle-Calédonie

Météo et climat



Accueil
Prévisions
Mer
Observations
Climat
Agriculture
Aviation
Cyclone

Phénomènes en cours
Bulletin
Saison en cours
Historique des cyclones
Consignes de sécurité
Coin des experts

Nouvelle-Calédonie > Cyclone > Coin des experts

**Vigilance météorologique**  
 → Consultez la carte



Pas de PM



Activité cyclonique

### Actualités

- 
> Bilan de l'épisode pluvieux du 15 au 18 août 2022
- 
> Bilan de l'hiver austral et prévisions pour les mois à venir

→ Toutes les actualités

### Prévision statistique d'activité cyclonique hebdomadaire dans l'hémisphère Sud

**Avertissement :**

Ces prévisions ne constituent pas un système d'alerte pour le public mais visent à donner une estimation du risque cyclonique dans les semaines à venir. La compréhension de ces prévisions probabilistes peut ne pas être évidente pour un internaute non averti et requiert la lecture de la documentation associée.

Cette estimation s'appuie sur l'état présent de quelques grandes composantes du système climatique, connu pour influencer l'activité cyclonique. C'est un élément à prendre en compte pour évaluer le risque cyclonique dans les semaines à venir. Pour réaliser une analyse complète, on pourra également s'appuyer sur les prévisions des modèles numériques de prévision du temps et l'occurrence éventuelle de cyclone au moment considéré (en particulier pour la première semaine de prévision).

Toutefois, ce type d'analyse ne peut pas permettre de conclure de manière certaine qu'un cyclone se produira ou non mais peut permettre de déterminer des périodes et régions qui sont favorables aux phénomènes cycloniques.

Pour des informations sur les alertes cycloniques en cours en Nouvelle-Calédonie, consultez la rubrique [Cyclone/phénomène en cours](#).

**Prévisions**

Cliquez ci-dessous pour afficher les graphes



TC occurrence from 23/11/2010 to 29/11/2010 (week 3)

Total probability



occurrence prob. (%)

Week 1  
Week 2  
Week 3

Les dates correspondent au début de chaque semaine de prévision

Les cartes disponibles ici présentent la probabilité prévue qu'au moins un cyclone se produise (i.e. occurrence, incluant toute sa trajectoire) ou se forme (i.e. genèse d'un nouveau cyclone) durant les semaines à venir (appelées week 1, week 2 et week 3) sur une grille de plusieurs régions qui se superposent.

A noter : on désigne ici par cyclone, une dépression tropicale d'intensité modérée, forte ou un cyclone tropical.



**Ville de NOUMÉA**

Avec le soutien financier de l'État et de la province Sud




### Photo de la semaine



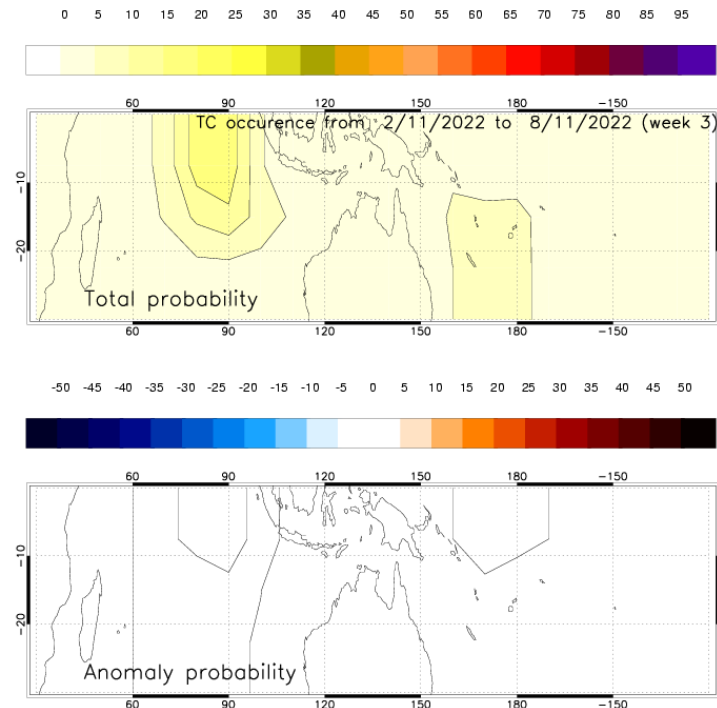
Course avec les dauphins

Jérémie Vetter

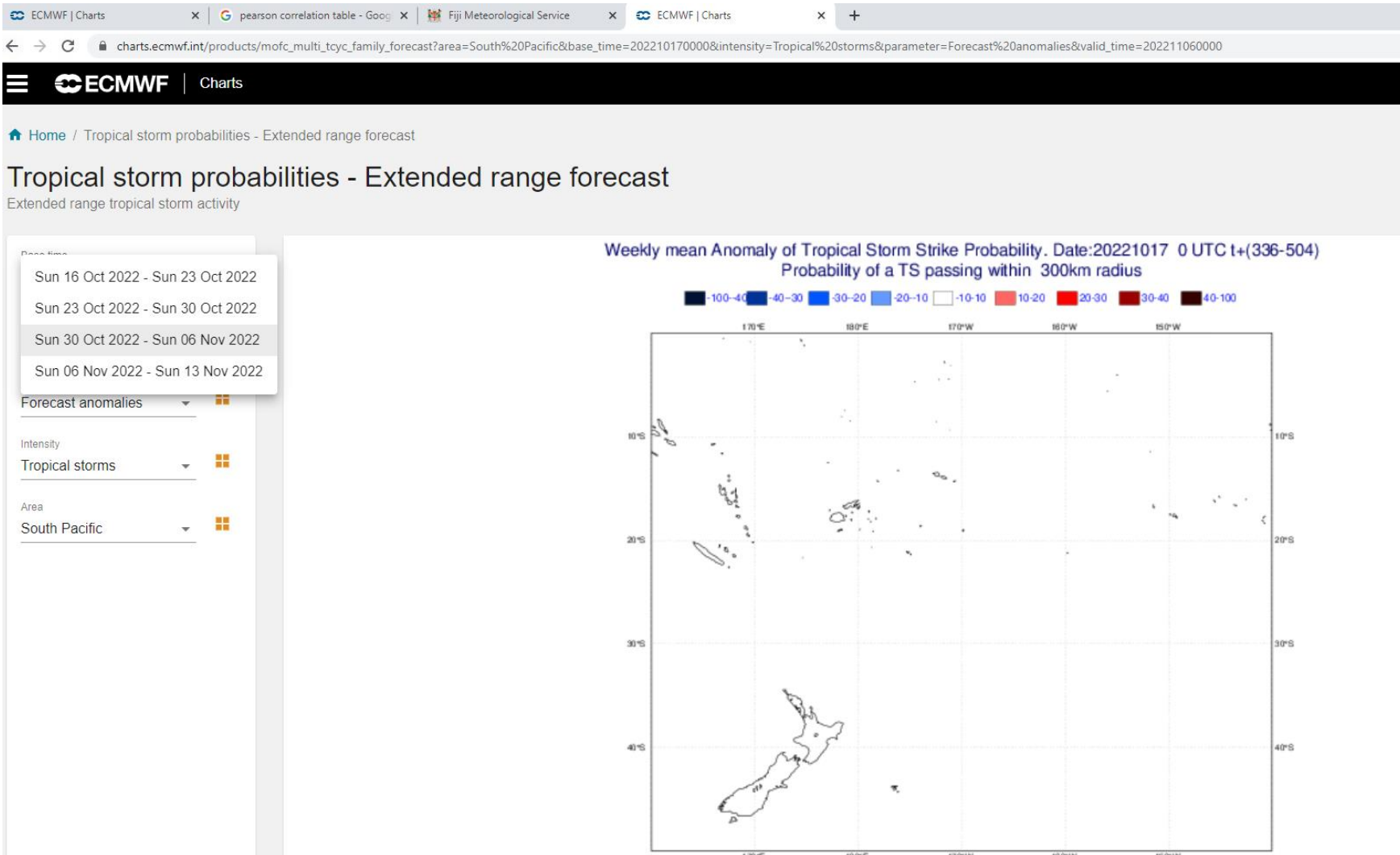
→ Consulter la galerie



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



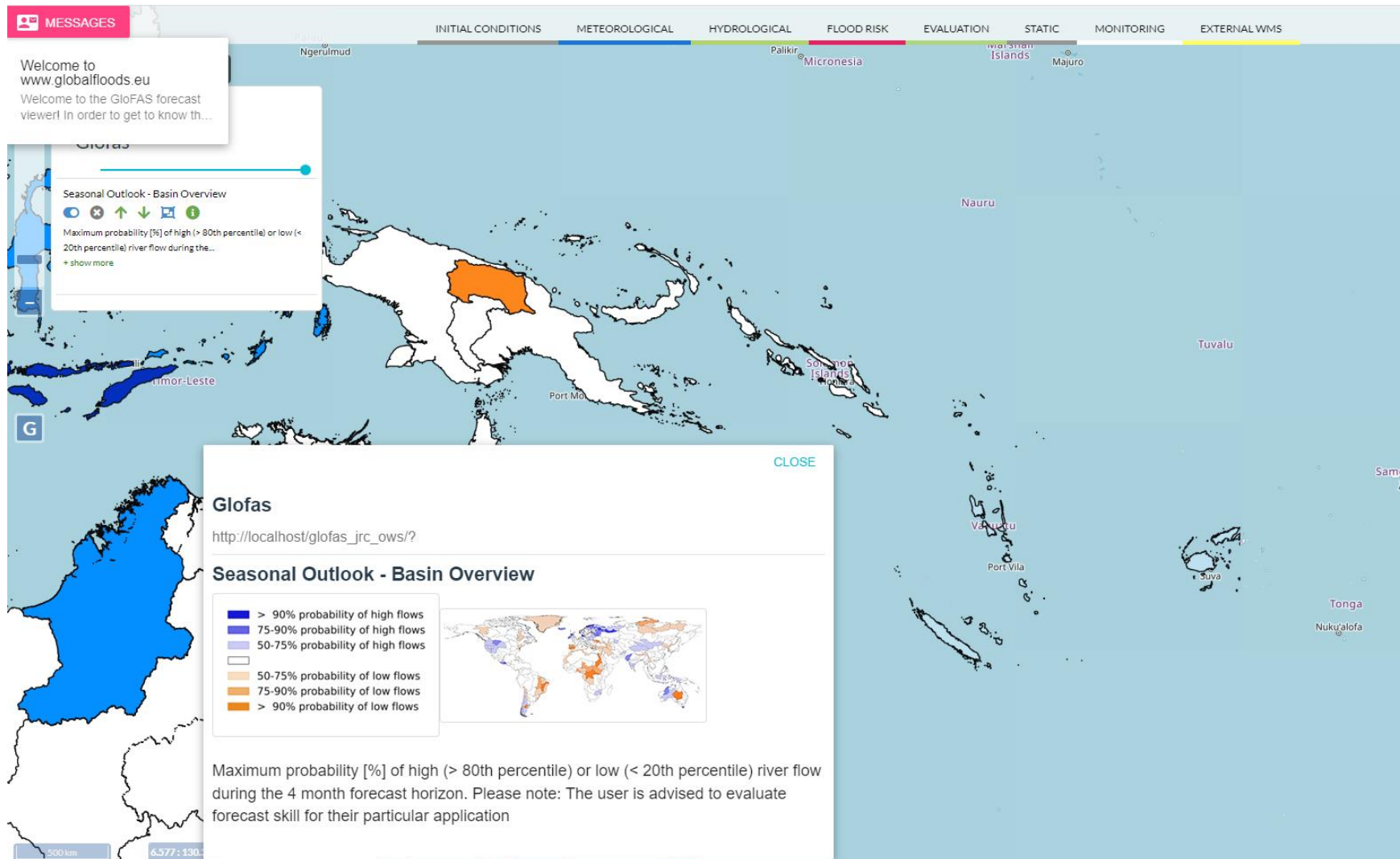
# Multi-week TC outlooks – from ECMWF



- 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



# Copernicus flood system seasonal basin outlook



- Source = <https://www.globalfloods.eu/glofas-forecasting/>
- For Vanuatu, New Caledonia and Fiji there is a 50-75% chance of high flows
- High flows > 80% percentile
- In other words 50-75% chance river flows will be in the upper 20% of historical river flows over the next four months



## Summary slide

- An established La Niña in the tropical Pacific Ocean has influenced the Northwest Pacific and South Pacific tropical cyclone outlook.
- Northwest Pacific tropical storm activity is likely to be below average west of the Dateline.
- South Pacific tropical cyclone season extends from November to April. Vanuatu and New Caledonia typically experience greatest TC activity.
- Above-average numbers of tropical cyclones are likely in the Coral Sea and western South Pacific region this season. Near average to below-average numbers of tropical cyclones favoured further east. At least three severe TCs reaching Category 3 or higher may occur anywhere across the region.
- It does not take a severe TC to produce severe impacts. Flooding rainfall can occur with a weaker or former TC especially when high flows are present due to recent wetter than normal conditions. All communities should remain vigilant, monitor tide

predictions and follow forecast information provided by their National Meteorological and Hydrological Service (NMHS).





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Thank you