

# Outlook: Ocean temperature, Coral Bleaching and Sea level

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Smith (BoM)]

# Outline of Presentation

- WMO LRFMME SST
- SLA/Tides
- Coral Bleaching
- Fisheries convergence zone
- Key messages

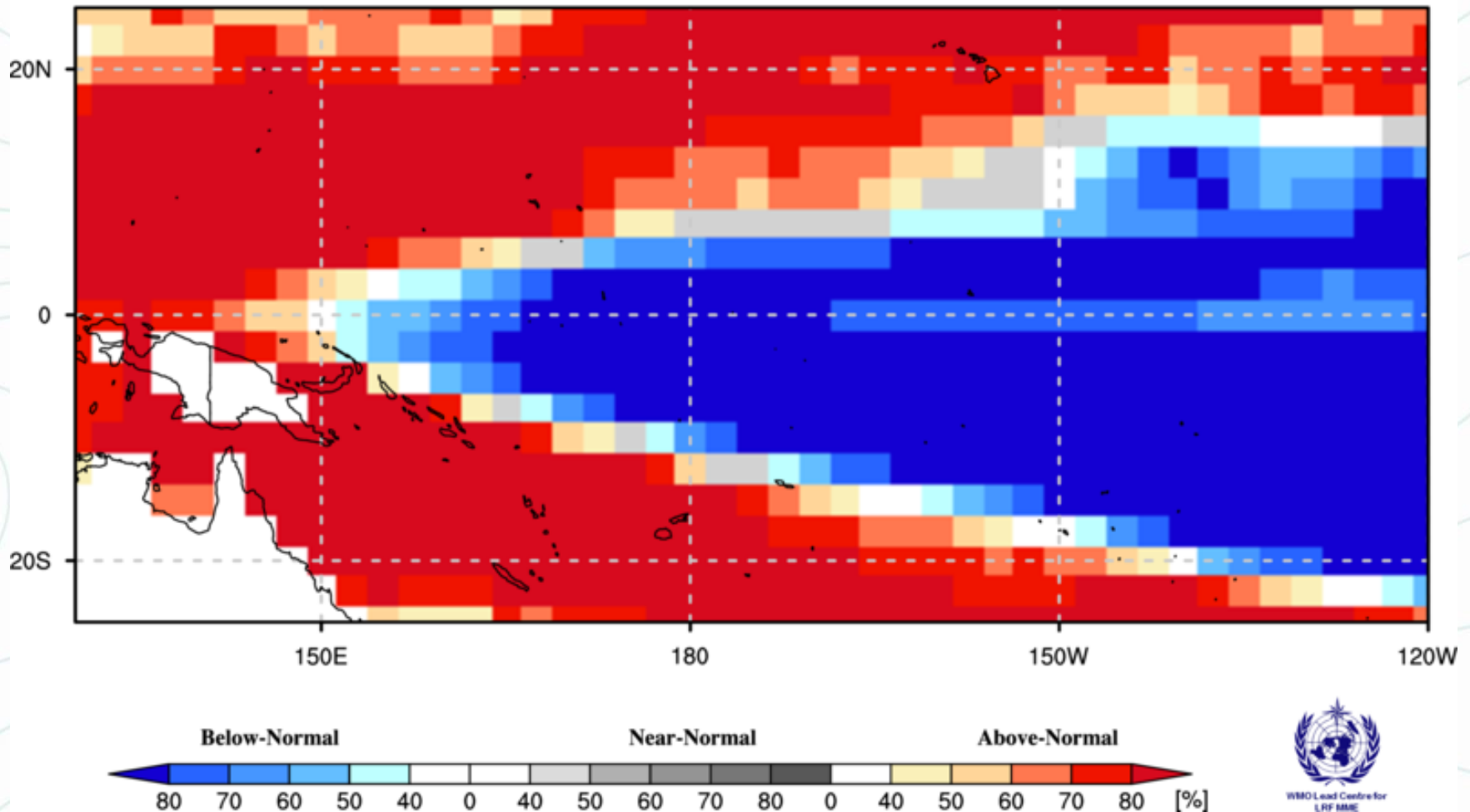
# WMO-MME- 3 Month SST

## Probabilistic Multi-Model Ensemble Forecast

Beijing, CMCC, Exeter, Melbourne, Montreal, Offenbach, Seoul, Tokyo, Toulouse, Washington

Sea Surface Temperature : NDJ2022

(issued on Oct2022)

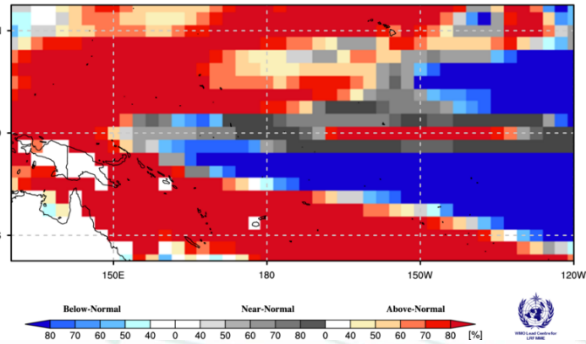


# Individual Model – SST: 3 months

Probabilistic Multi-Model Ensemble Forecast  
Beijing

Sea Surface Temperature : NDJ2022

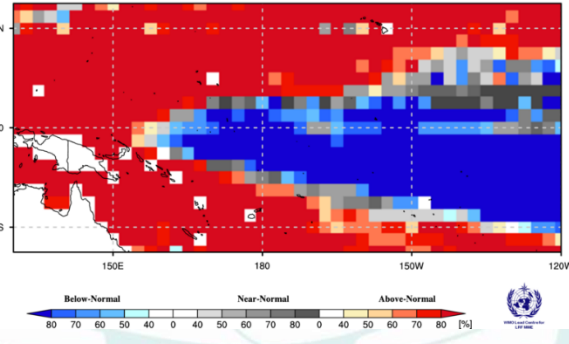
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Melbourne

Sea Surface Temperature : NDJ2022

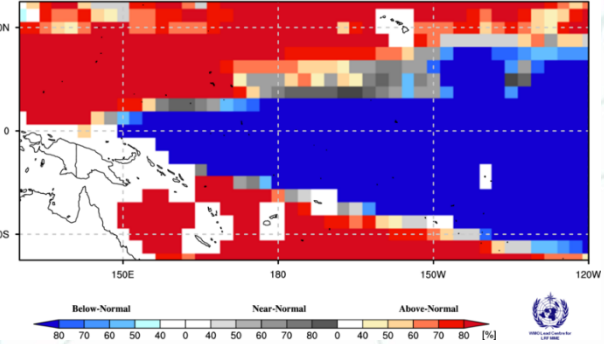
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Tokyo

Sea Surface Temperature : NDJ2022

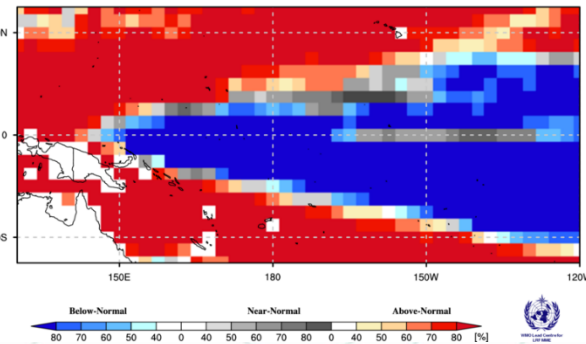
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
CMCC

Sea Surface Temperature : NDJ2022

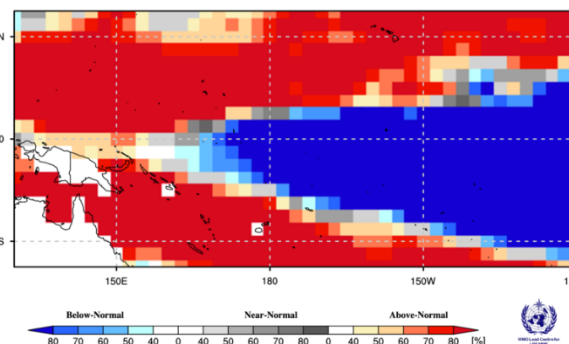
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Washington

Sea Surface Temperature : NDJ2022

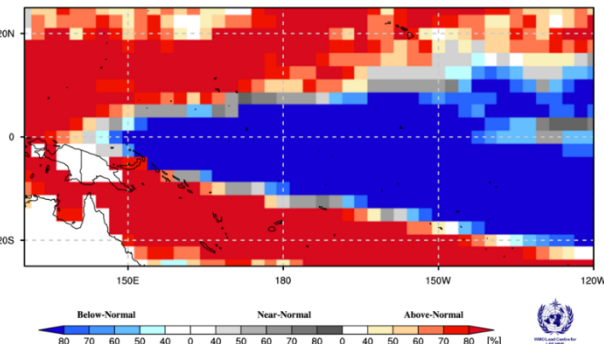
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Toulouse

Sea Surface Temperature : NDJ2022

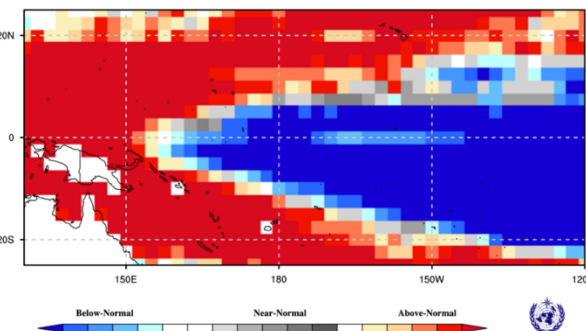
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Seoul

Sea Surface Temperature : NDJ2022

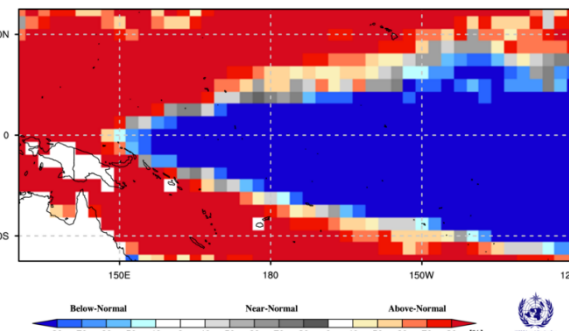
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Exeter

Sea Surface Temperature : NDJ2022

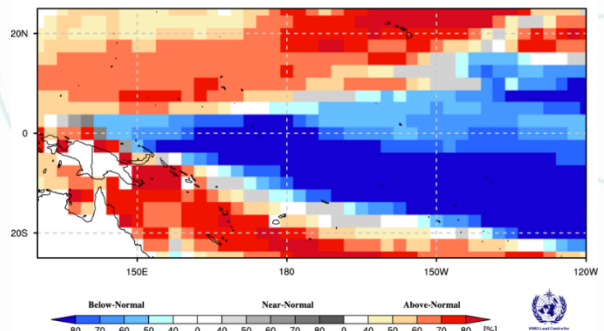
(issued on Oct2022)



Probabilistic Multi-Model Ensemble Forecast  
Montreal

Sea Surface Temperature : NDJ2022

(issued on Oct2022)





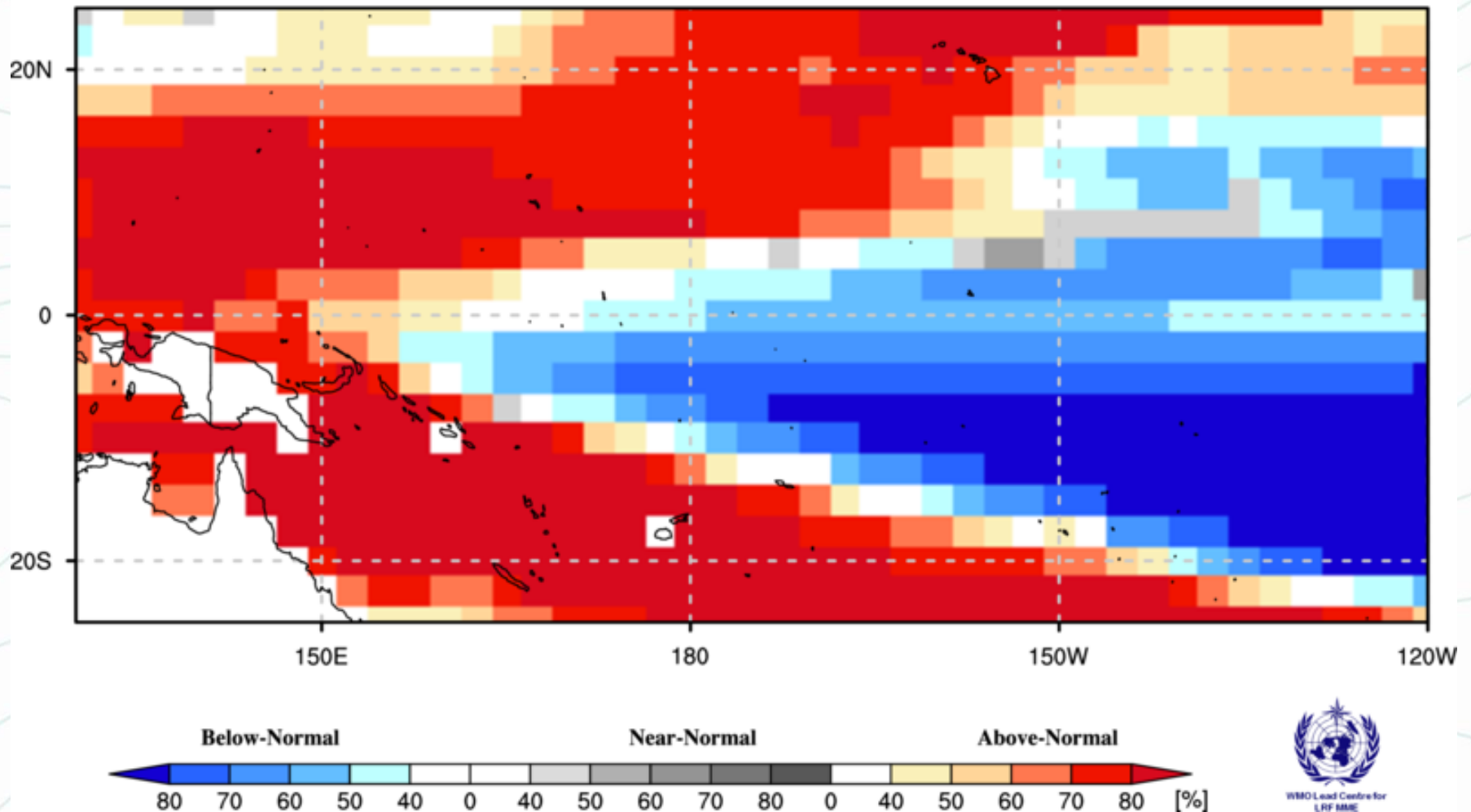
# WMO-MME- 6 Month SST

**Probabilistic Multi-Model Ensemble Forecast**

Beijing, Montreal, Seoul, Tokyo, Washington

**Sea Surface Temperature : NDJFMA2022**

(issued on Oct2022)



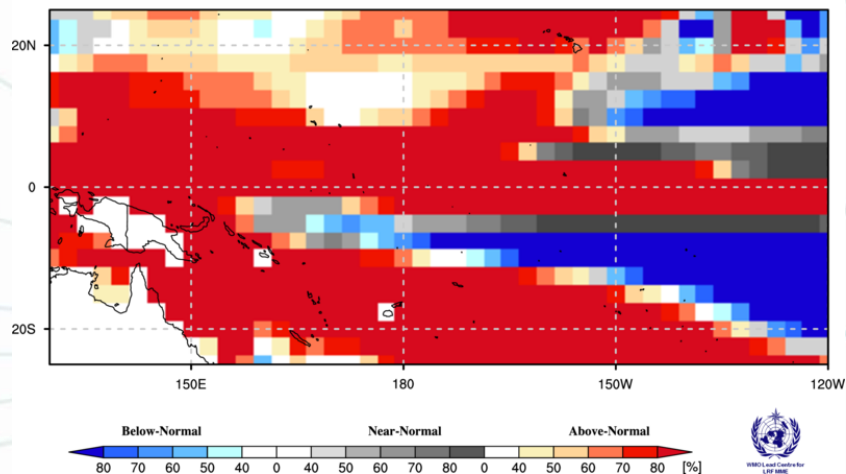
# Individual Model –SST: 6 months

Probabilistic Multi-Model Ensemble Forecast

Beijing

Sea Surface Temperature : NDJFMA2022

(issued on Oct2022)



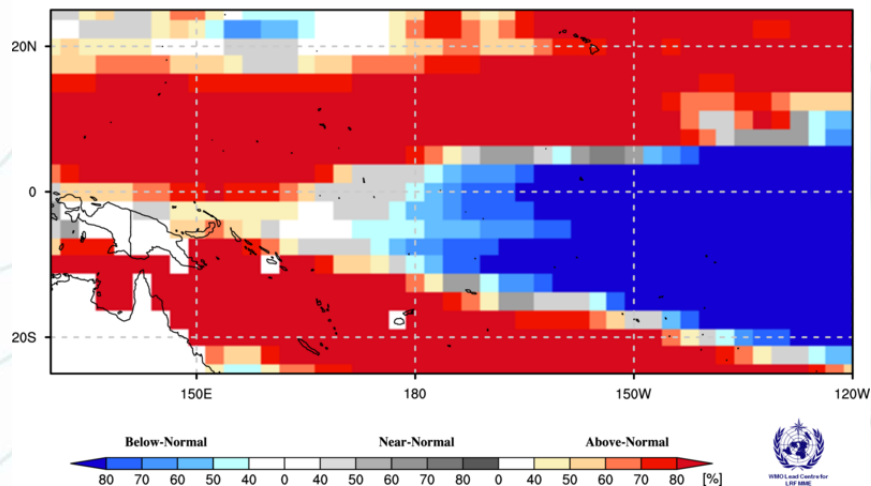
WMO's Lead Centre for LWP R&D

Probabilistic Multi-Model Ensemble Forecast

Washington

Sea Surface Temperature : NDJFMA2022

(issued on Oct2022)



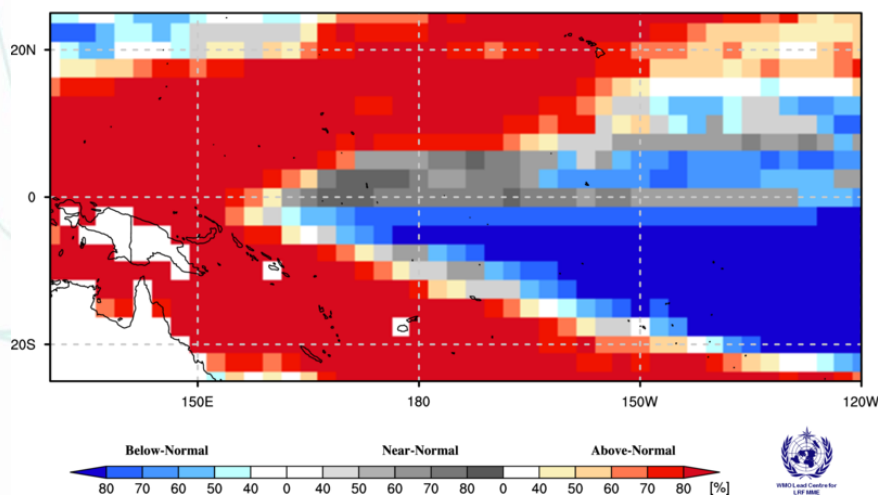
WMO's Lead Centre for LWP R&D

Probabilistic Multi-Model Ensemble Forecast

Seoul

Sea Surface Temperature : NDJFMA2022

(issued on Oct2022)



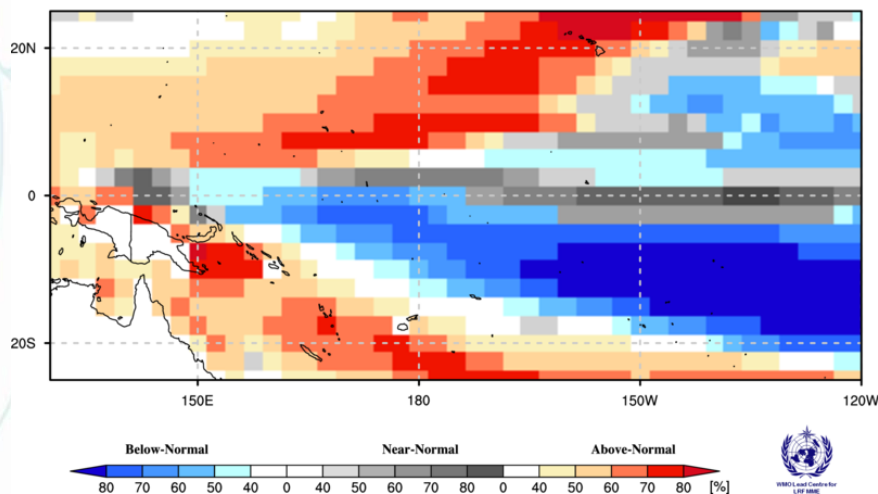
WMO's Lead Centre for LWP R&D

Probabilistic Multi-Model Ensemble Forecast

Montreal

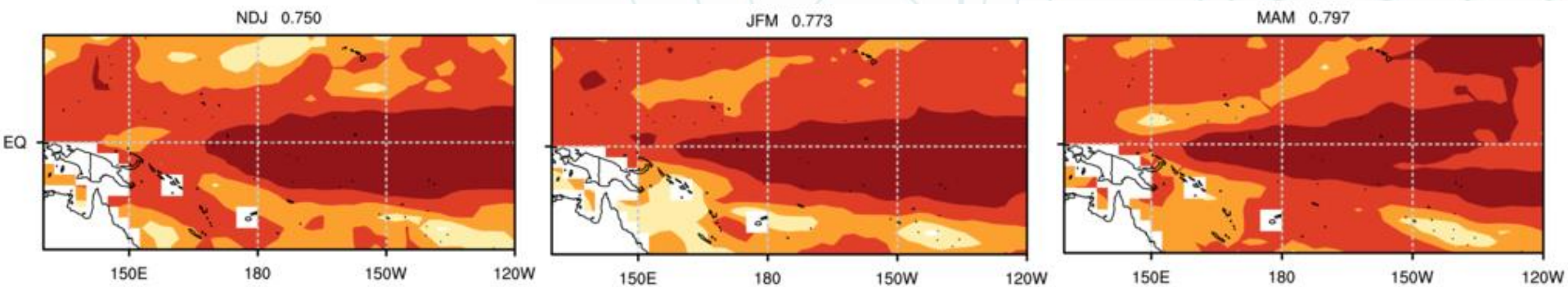
Sea Surface Temperature : NDJFMA2022

(issued on Oct2022)



WMO's Lead Centre for LWP R&D

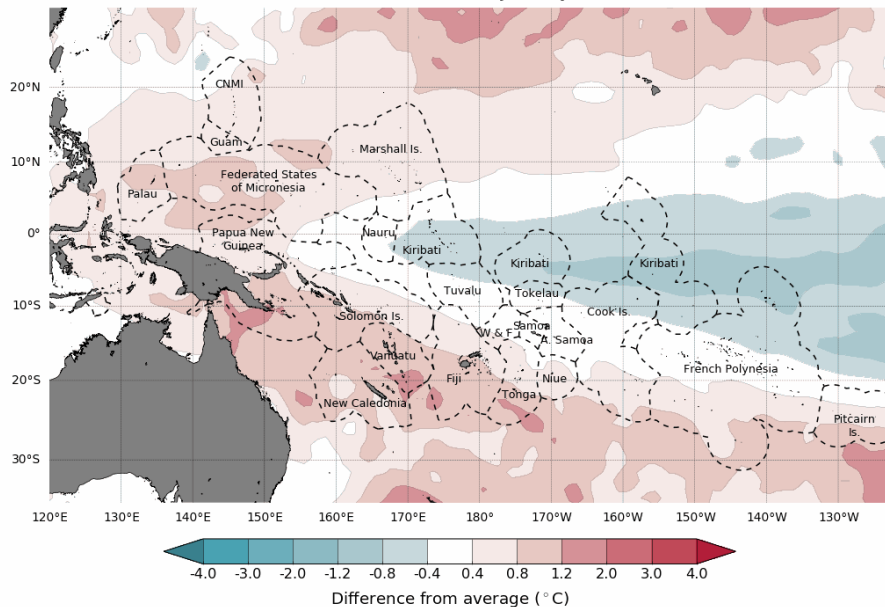
# Skill



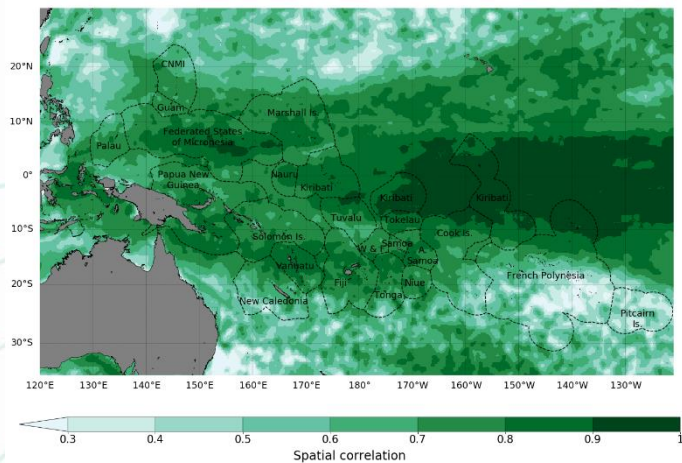


# ACCESS-S: SST Anomalies

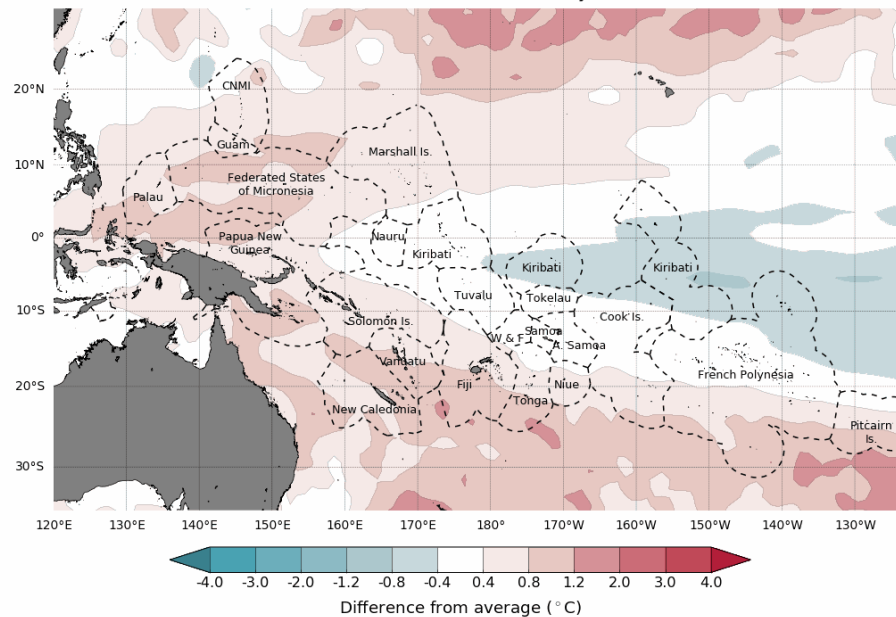
Difference from average sea surface temperature forecast for November 2022 to January 2023



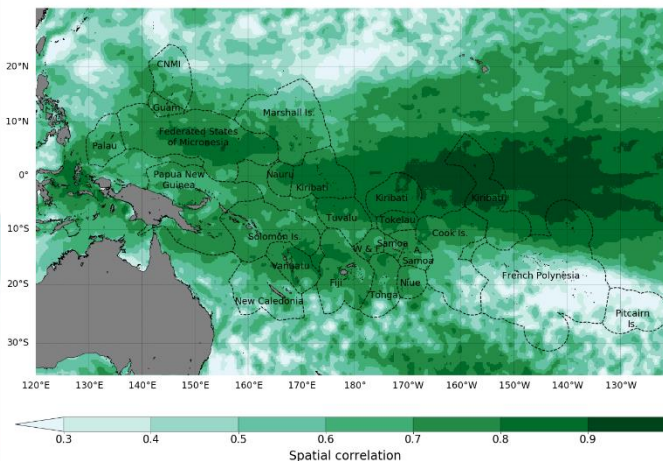
Spatial correlation of seasonal sea surface temperature anomaly for November - January. Lead time: 1 month



Difference from average sea surface temperature forecast for December 2022 to February 2023



Spatial correlation of seasonal sea surface temperature anomaly for December - February. Lead time: 2 months

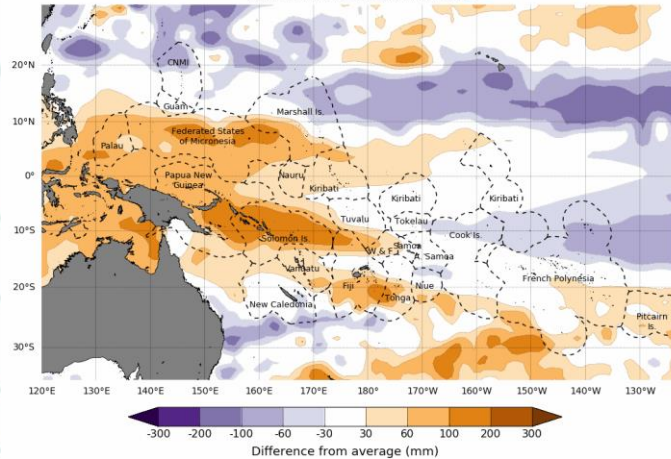


Skill

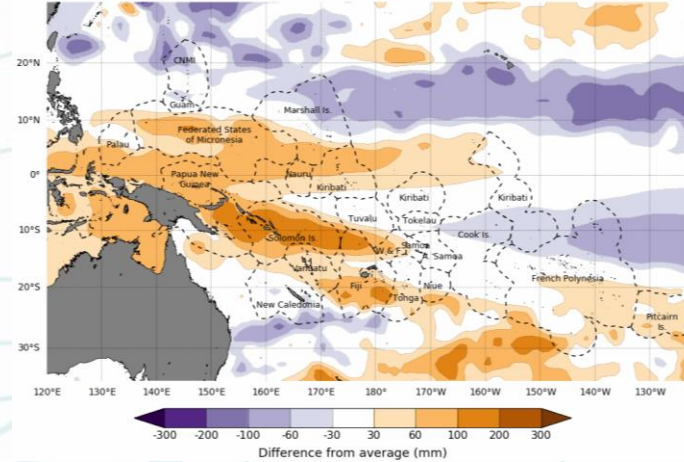


# Sea Level Anomaly

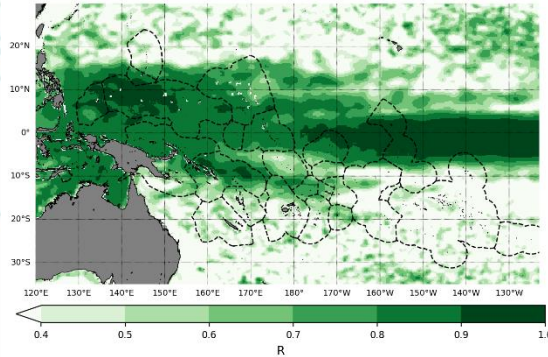
Difference from average sea surface height forecast for  
November 2022 to January 2023



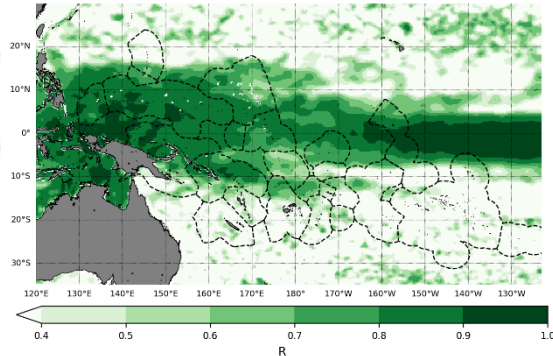
Difference from average sea surface height forecast for  
December 2022 to February 2023



Difference from average sea surface height spatial correlation  
October to December

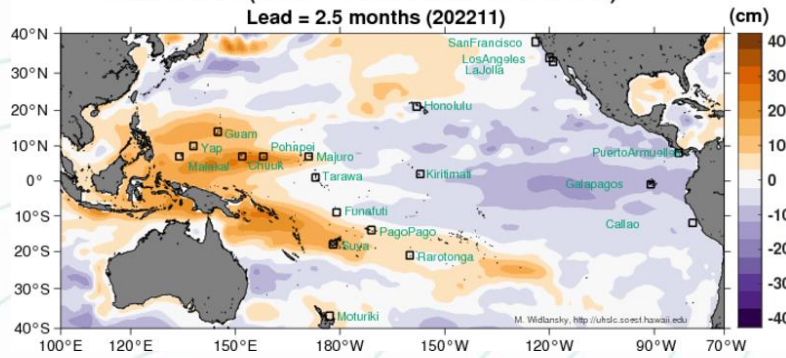


Difference from average sea surface height spatial correlation  
November to January

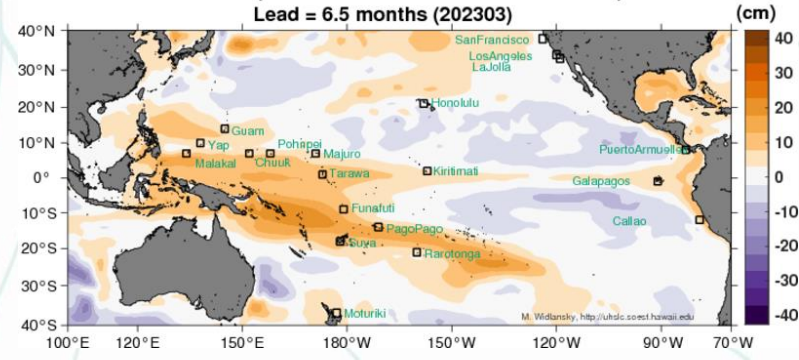


Skill

Model forecast (CFSv2: initialized 20220901-20220930)  
Lead = 2.5 months (202211)



Model forecast (CFSv2: initialized 20220901-20220930)  
Lead = 6.5 months (202303)



ACCESS-S1

UoH

# Highest Tides

## FSM-Pohnpei

Highest Tide for 2023		
Date	Time	Height (m)
22-Jan	15:48	1.61
20-Feb	15:40	1.61
7-May	03:47	1.56
Highest Tide for 2022		
Date	Time	Height (m)
24-Dec	15:47	1.59
25-Nov	15:48	1.58
25-Dec	16:30	1.57

## PNG-PM

Highest Tide for 2023		
Date	Time	Height (m)
20-Feb	9:24	2.99
22-Jan	9:47	2.93
20-Mar	8:20	2.92

## RMI-Majuro

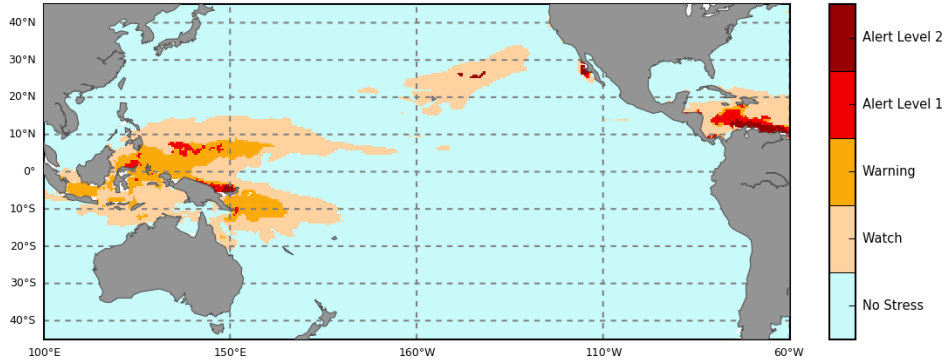
Highest Tide for 2023		
Date	Time	Height (m)
21-Feb	17:26	2.26
1-Sep	05:00	2.20
21-Mar	16:28	2.21

## TV - Funafuti

Highest Tide for 2023		
Date	Time	Height (m)
20-Feb	17:18	3.30
21-Mar	16:58	3.25
22-Jan	17:18	3.34
Highest Tide for 2022		
Date	Time	Height (m)
24-Dec	17:37	3.14

# Coral Bleaching

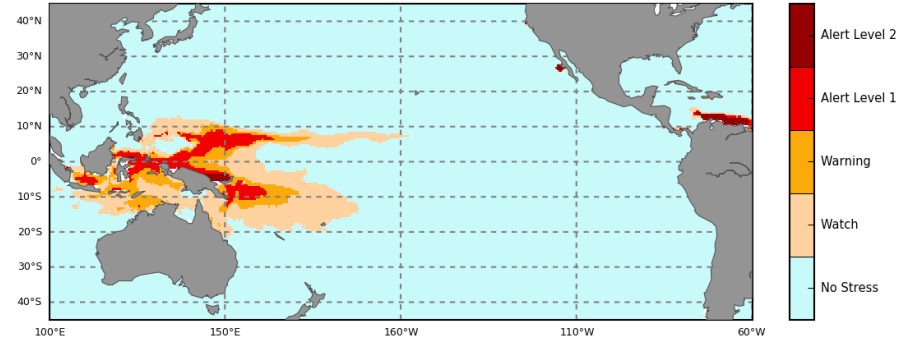
Pacific Ocean  
4 Weeks Coral Bleaching Outlook: 13 November 2022



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Australian Bureau of Meteorology, COSPPac COMP

NOAA Coral Reef Watch

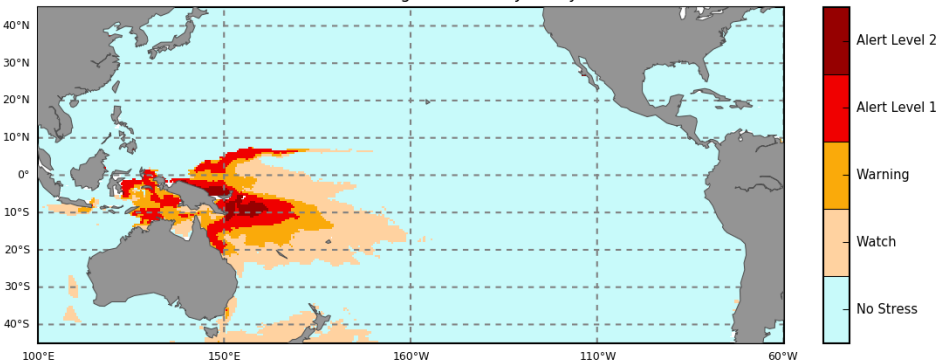
Pacific Ocean  
8 Weeks Coral Bleaching Outlook: 04 December 2022



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NOAA Coral Reef Watch

Pacific Ocean  
12 Weeks Coral Bleaching Outlook: 01 January 2023



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NOAA Coral Reef Watch

Alert Level	Effect	<b>Coral Bleaching Alert</b> 
No Data	No alert data available	
No Stress	No thermal stress	
Bleaching Watch	Low-level thermal stress	
Bleaching Warning	Coral bleaching possible	
Bleaching Alert Level 1	Coral bleaching likely	
Bleaching Alert Level 2	Coral mortality likely	



# Coral Bleaching

- Bleaching can also be caused by:
  - freshwater inflows
  - salinity changes
  - nutrient pollution
  - intense light

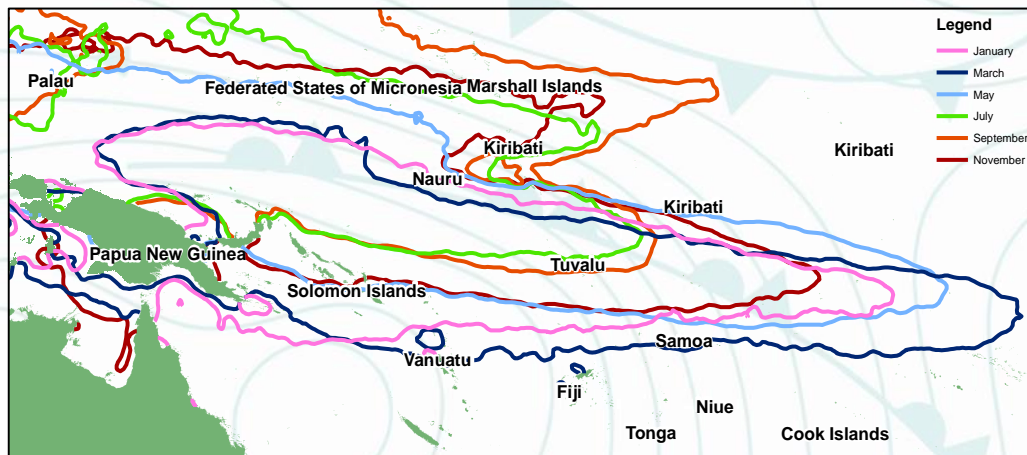


Airport Reef, Tutuila, American Samoa

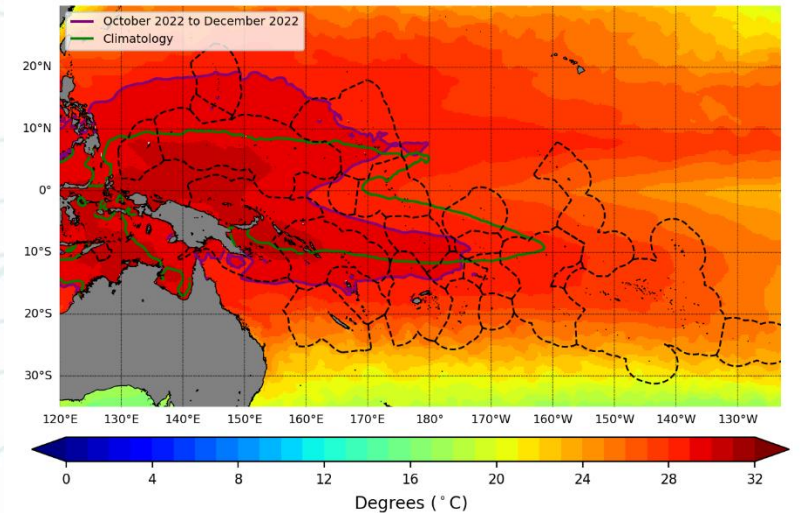
[https://coralreefwatch.noaa.gov/satellite/analyses\\_guidance/global\\_coral\\_bleaching\\_2014-17\\_status.php](https://coralreefwatch.noaa.gov/satellite/analyses_guidance/global_coral_bleaching_2014-17_status.php)



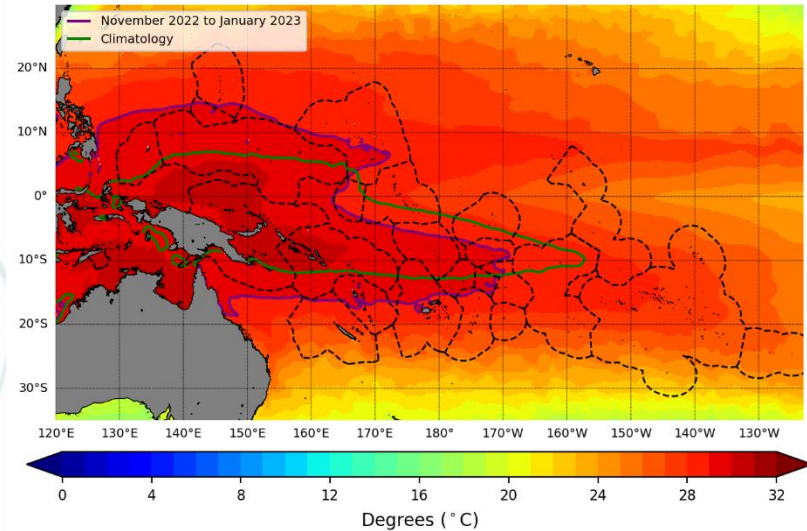
# Fisheries Convergence Zone



Sea surface temperature forecast for October 2022 to December 2022



Sea surface temperature forecast for November 2022 to January 2023



# Key Messages:

- Warmer than normal for most countries in the west, including COSPPac partner countries in the south. Cooler along the equator towards the east.
- Sea level favoured to be higher than normal for most countries.
- Coral Beaching on alert levels for PNG, FSM, Palau
- Fisheries convergence zone is likely to sit further west compared to average in the tropical Pacific, and extend further southward and northward in the far western Pacific

The background features a complex pattern of thin, teal-colored wavy lines that flow across the frame. Interspersed among these lines are several small, teal-colored arrows pointing in various directions, some following the curves of the lines. The overall effect is a sense of movement and organic flow.

Thank you/Vinaka