

Outlook: Ocean temperature, Coral Bleaching and Sea level

[Zulfikar Begg (SPC), John Marra
(NOAA) and Grant Smith (BoM)]

Outline of Presentation

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

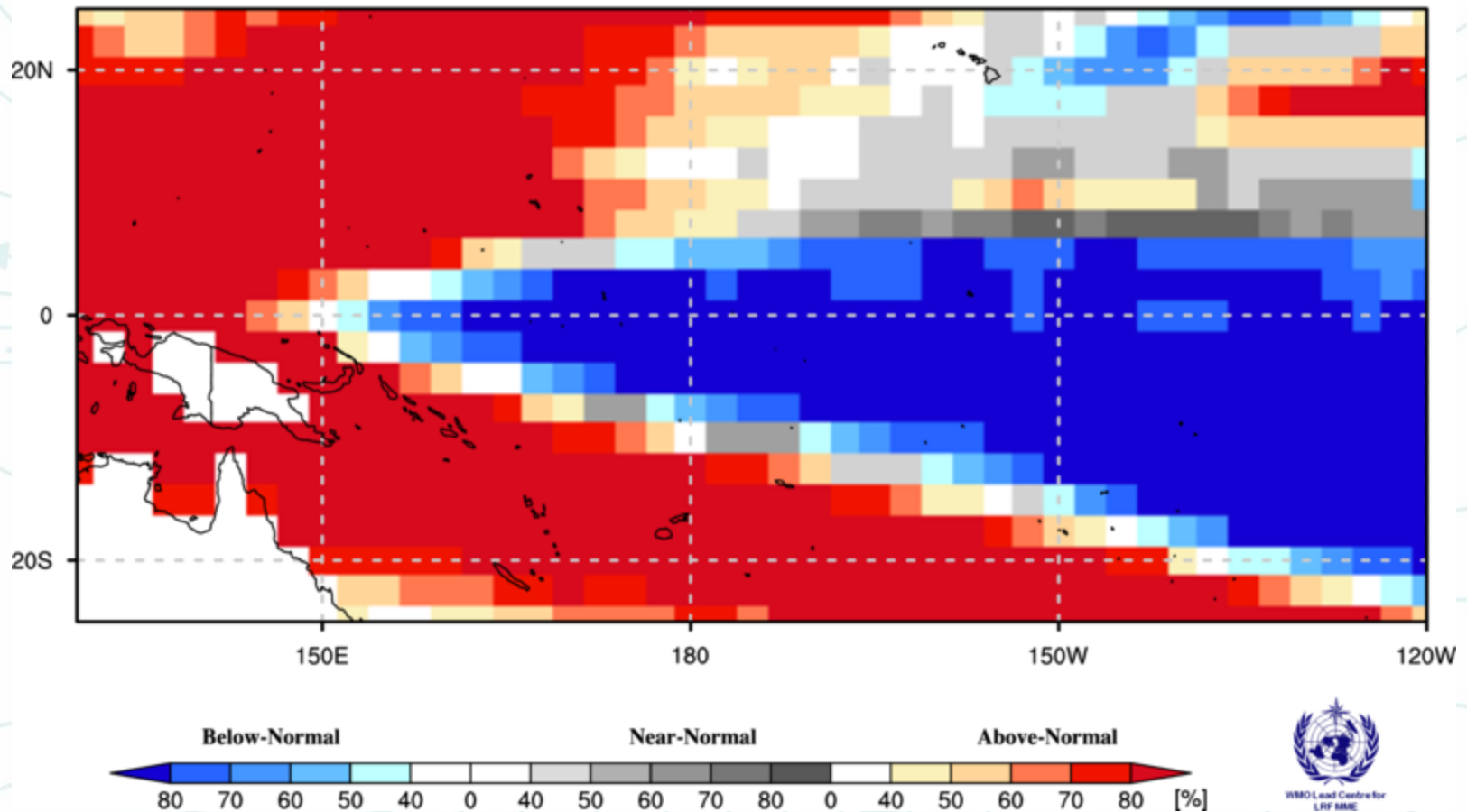
WMO-MME- 3 Month SST

Probabilistic Multi-Model Ensemble Forecast

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

Sea Surface Temperature : NDJ2021

(issued on Oct2021)



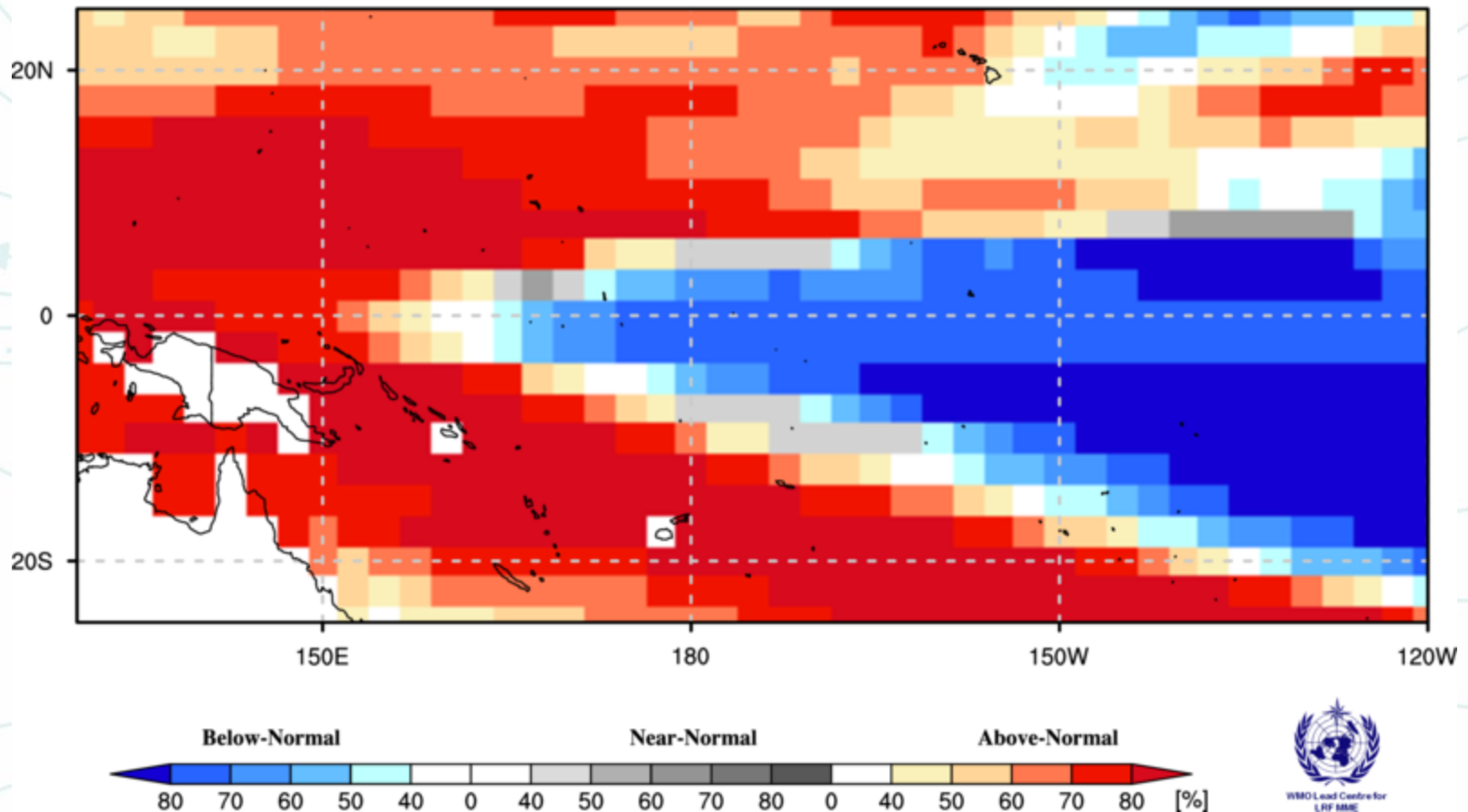
WMO-MME- 6 Month SST

Probabilistic Multi-Model Ensemble Forecast

Beijing, Montreal, Seoul, Washington

Sea Surface Temperature : NDJFMA2021

(issued on Oct2021)

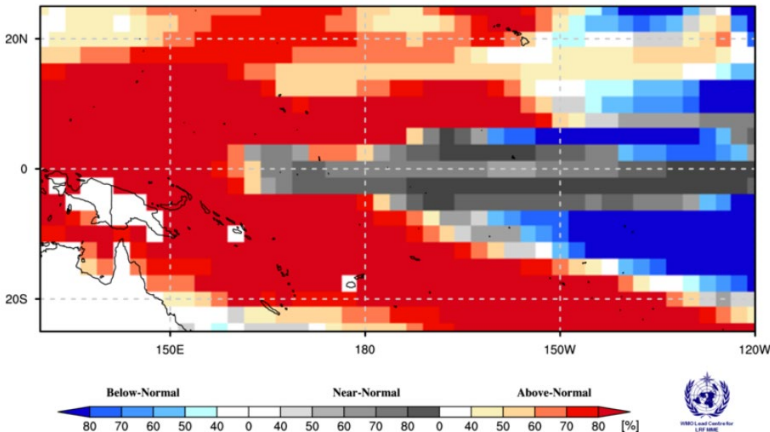


Individual Model –SST: 6 months

Probabilistic Multi-Model Ensemble Forecast
Beijing

Sea Surface Temperature : NDJFMA2021

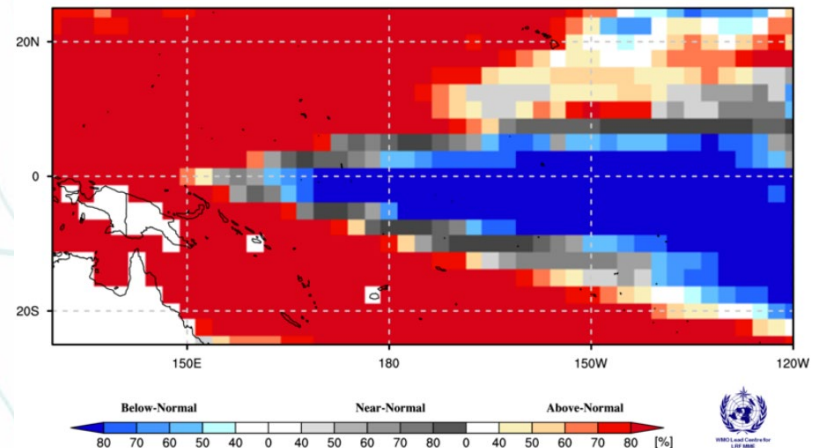
(issued on Oct2021)



Probabilistic Multi-Model Ensemble Forecast
Seoul

Sea Surface Temperature : NDJFMA2021

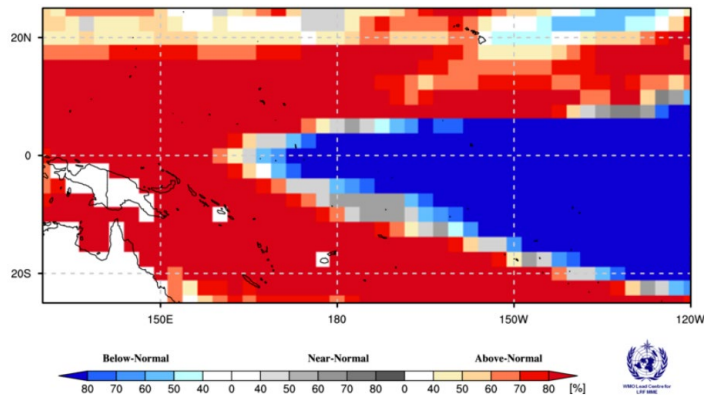
(issued on Oct2021)



Probabilistic Multi-Model Ensemble Forecast
Washington

Sea Surface Temperature : NDJFMA2021

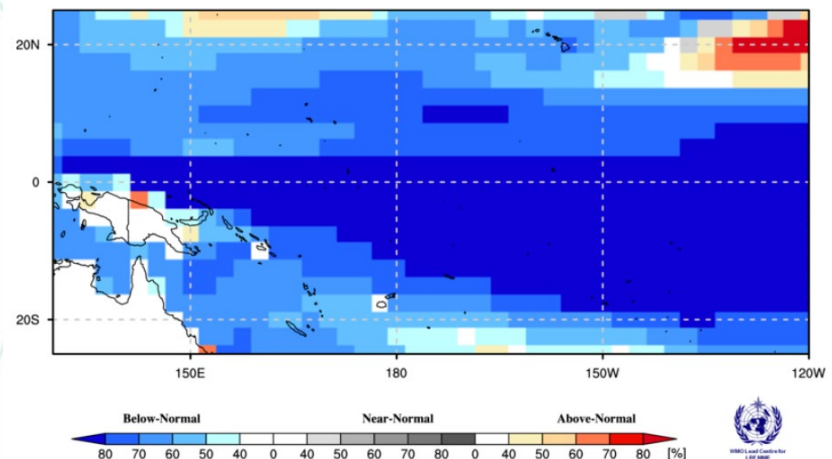
(issued on Oct2021)



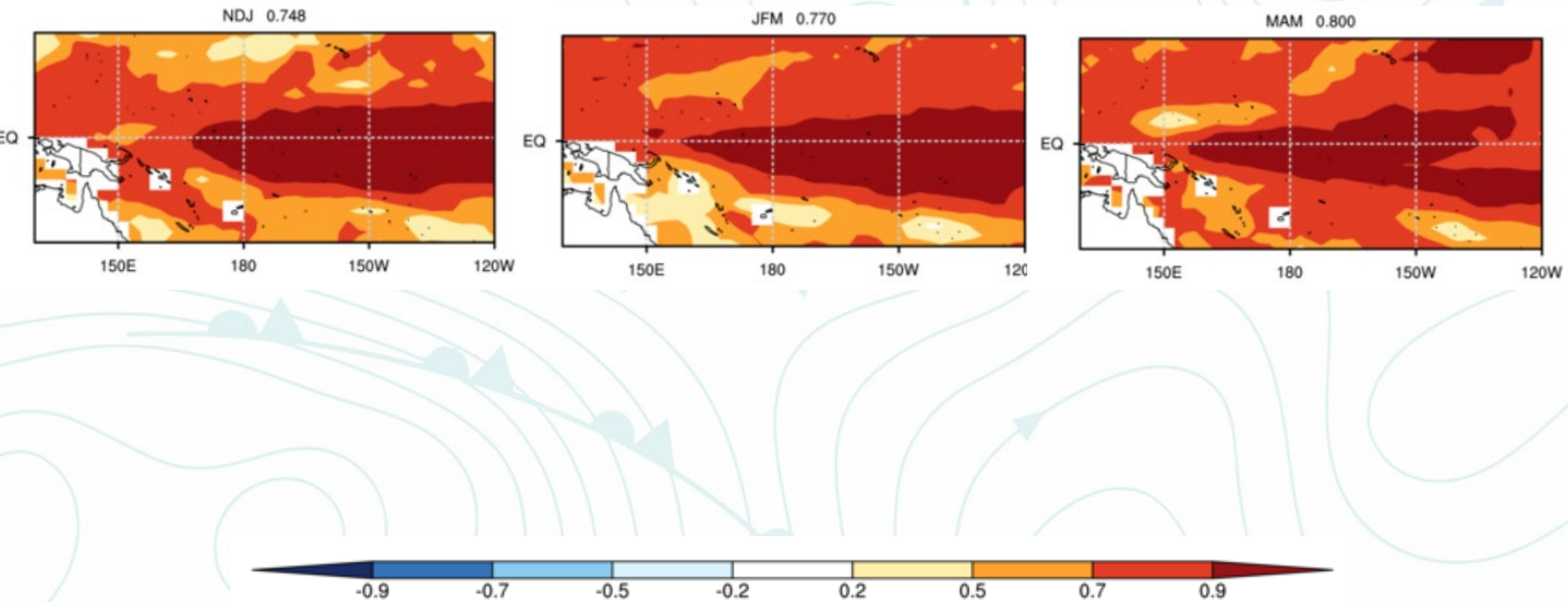
Probabilistic Multi-Model Ensemble Forecast
Montreal

Sea Surface Temperature : NDJFMA2021

(issued on Oct2021)

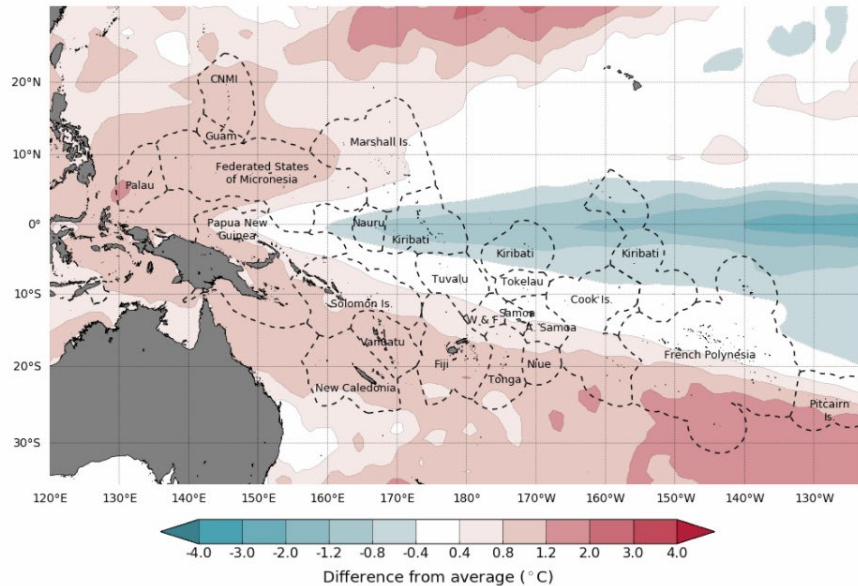


Skill

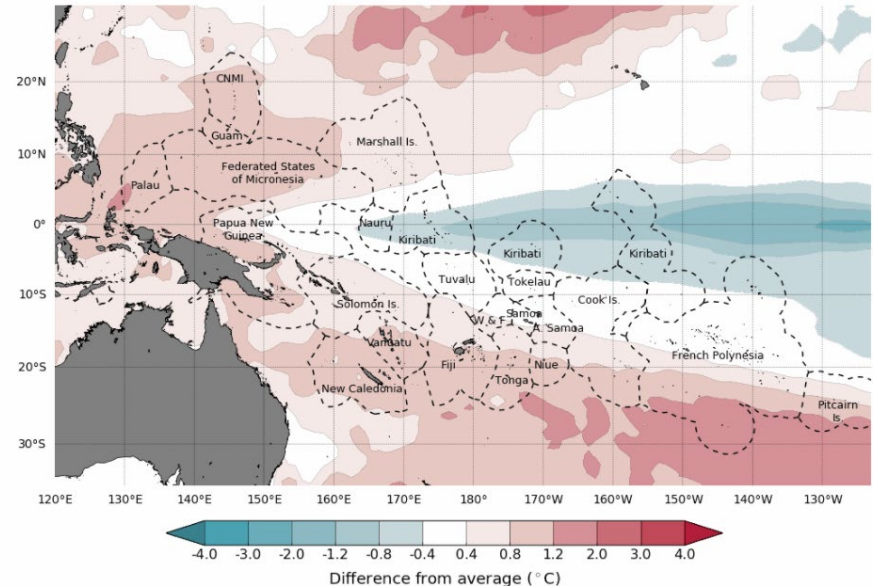


ACCESS-S: SST Anomalies

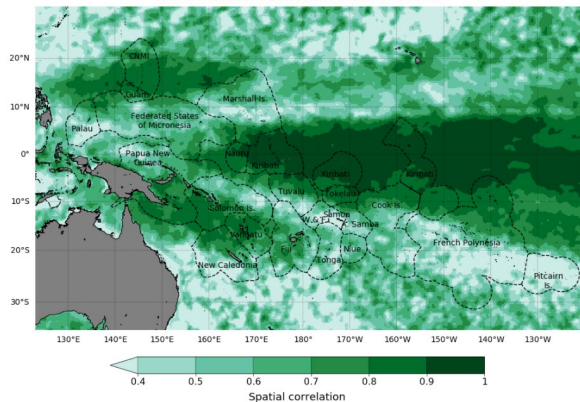
Difference from average sea surface temperature forecast for November 2021 to January 2022



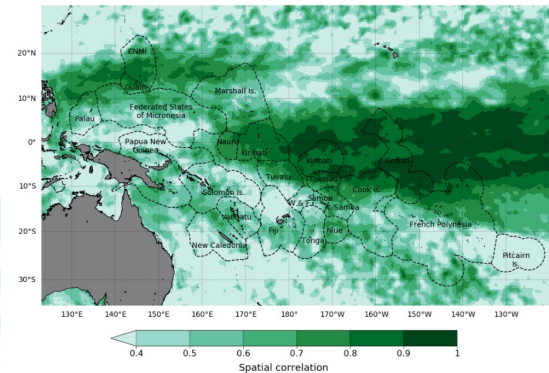
Difference from average sea surface temperature forecast for December 2021 to February 2022



NDJ sea surface temperature anomaly spatial correlation.
Period: Seasonal. Initialisation date: 9th October



DJF sea surface temperature anomaly spatial correlation.
Period: Seasonal. Initialisation date: 9th October



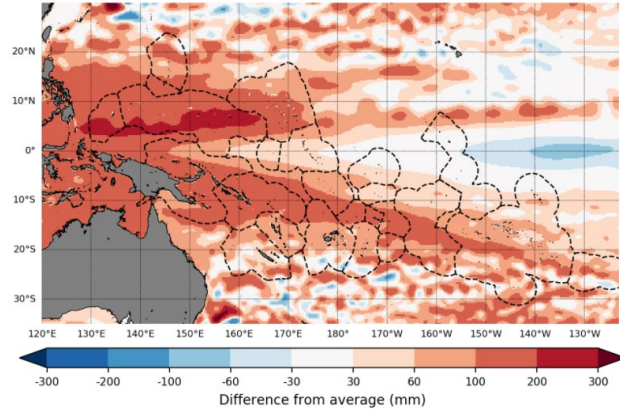
Skill

Sea Level Anomaly

ACCESS-S1

UoH

Difference from average sea surface height forecast for
October 2021 to December 2021

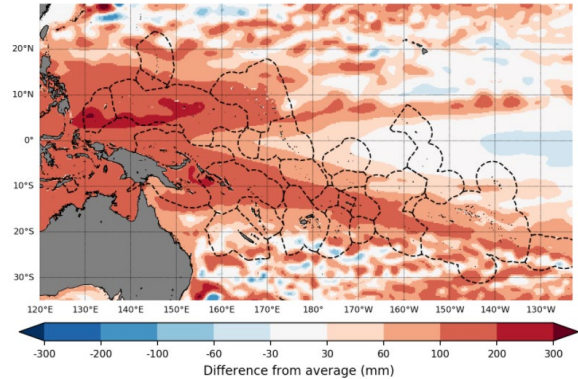


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Model: ACCESS-S1
Base Period: 1990-2012

Model Run: 27/09/2021
Issued: Map not issued

Difference from average sea surface height forecast for
November 2021 to January 2022

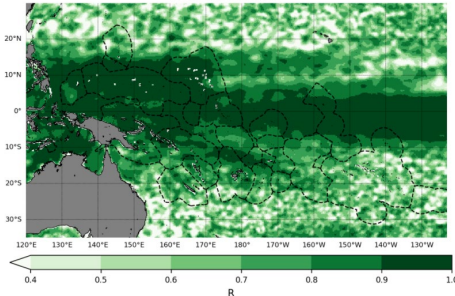


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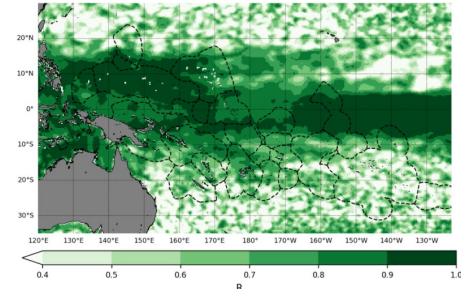
Model: ACCESS-S1
Base Period: 1990-2012

Model Run: 27/09/2021
Issued: Map not issued

Difference from average sea surface height spatial correlation
October to December



Difference from average sea surface height spatial correlation
November to January



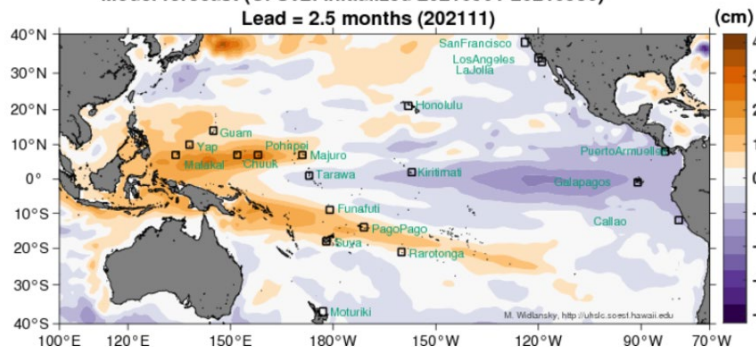
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Model: ACCESS-S1

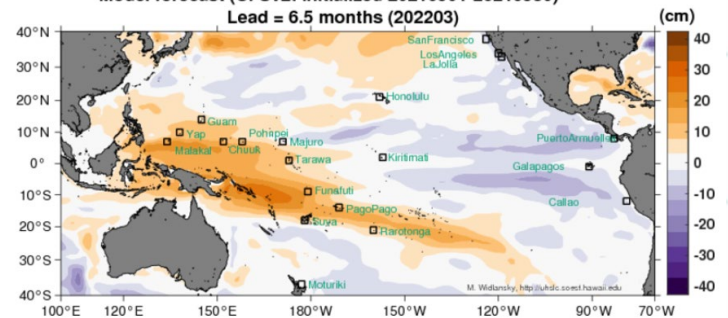
Model Run: 25/09/2021

Skill

Model forecast (CFSv2: initialized 20210901-20210930)
Lead = 2.5 months (202111)



Model forecast (CFSv2: initialized 20210901-20210930)
Lead = 6.5 months (202203)



Highest Tides

FSM-Pohnpei

10 highest tides for 2022		
Date	Time	Height (m)
17-May	3:34	1.61
18-May	4:11	1.6
24-Dec	15:47	1.59
3-Jan	15:40	1.59
15-Jun	3:23	1.58

PNG-PM

10 highest tides for 2022		
Date	Time	Height (m)
1-Feb	9:36	2.91
31-Jan	8:55	2.89
1-Mar	8:37	2.88
11-Aug	21:12	2.86
2-Mar	9:10	2.85

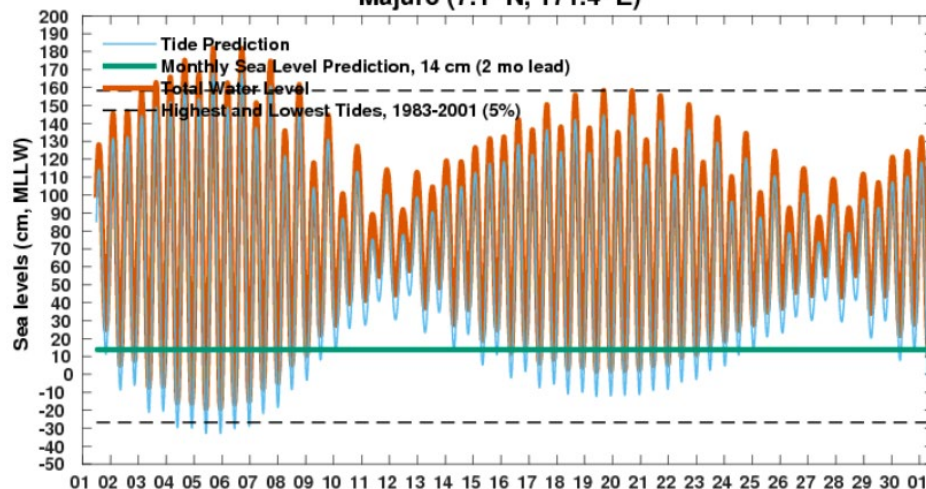
KI-Betio

10 highest tides for 2021		
Date	Time	Height (m)
5-Nov	16:39	2.93
6-Nov	17:17	2.91
4-Dec	16:24	2.91
5-Dec	17:08	2.89

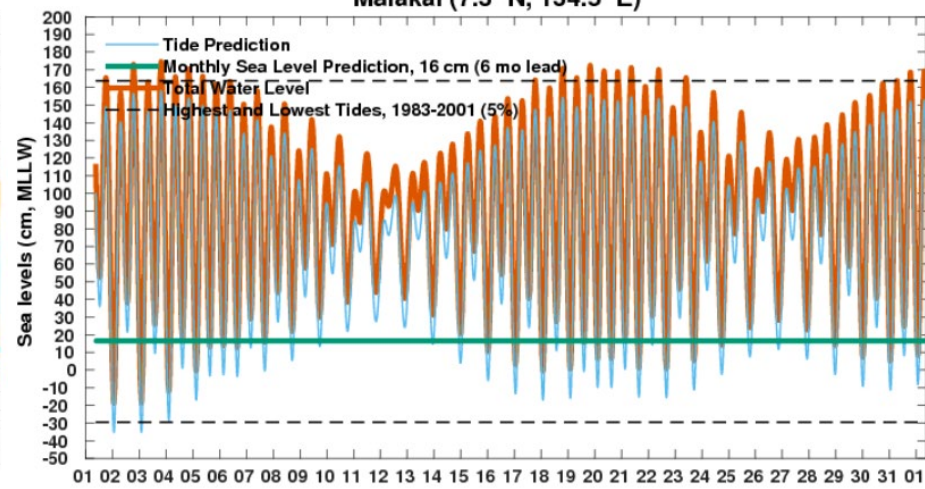
Funafuti

10 highest tides for 2022		
Date	Time	Height (m)
3-Jan	17:01	2.67
1-Feb	16:58	2.65
2-Feb	17:36	2.65
24-Dec	17:10	2.65

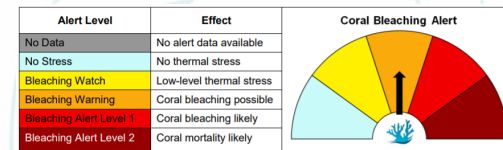
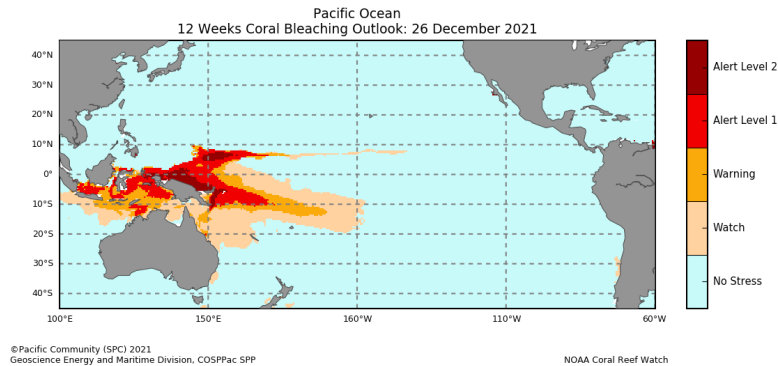
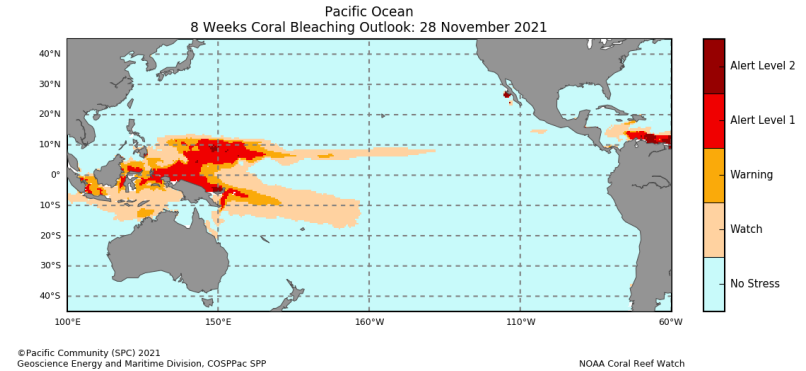
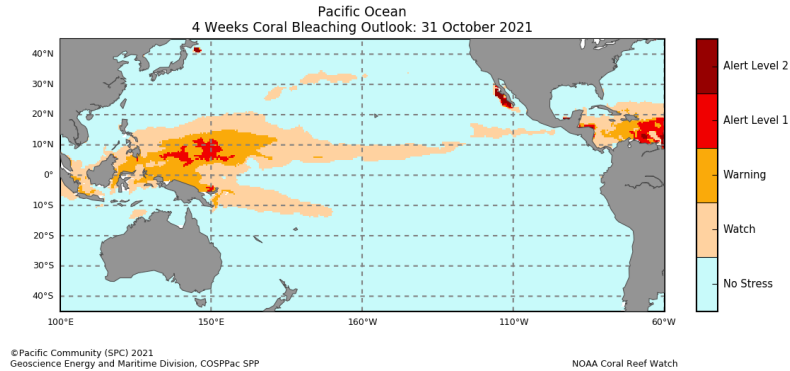
Majuro (7.1°N, 171.4°E)



Malakal (7.3°N, 134.5°E)



Coral Bleaching



Coral Bleaching

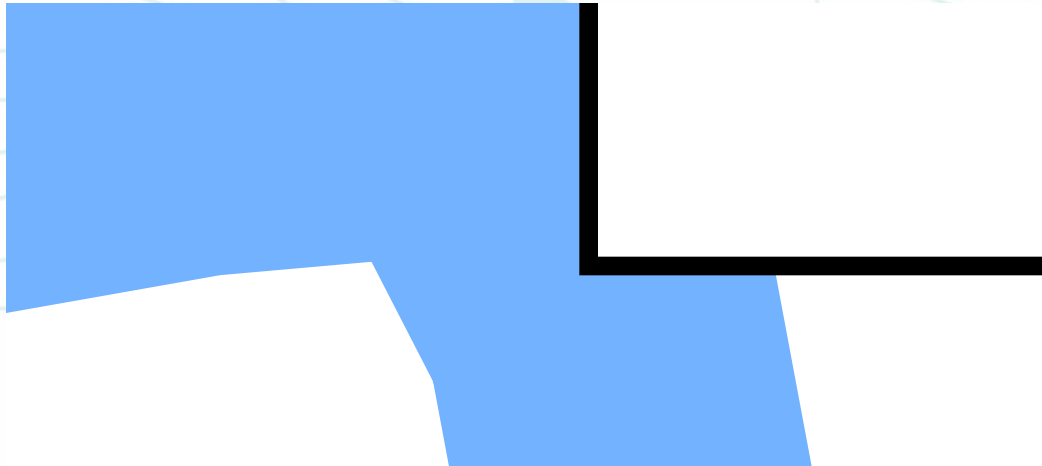
- Bleaching can also be caused by:
 - freshwater inflows
 - salinity changes
 - nutrient pollution
 - intense light



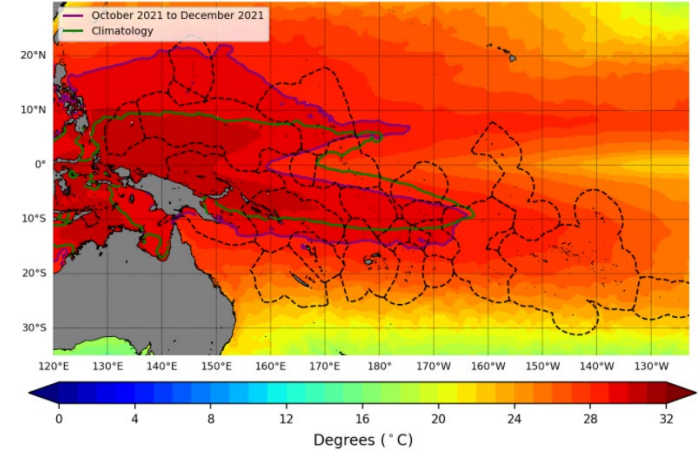
Airport Reef, Tutuila, American Samoa

https://coralreefwatch.noaa.gov/satellite/analyses_guidance/global_coral_bleaching_2014-17_status.php

Fisheries Convergence zone



Sea surface temperature forecast for
October 2021 to December 2021

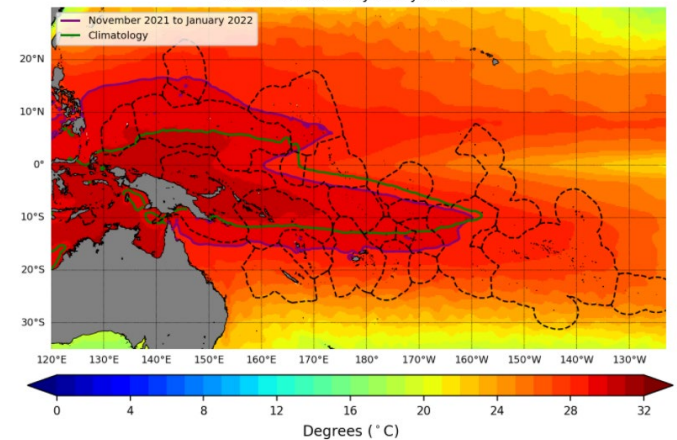


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Model: ACCESS-S1
Base Period: 1990-2012

Model Run: 27/09/2021
Issued: Map not issued

Sea surface temperature forecast for
November 2021 to January 2022



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Model: ACCESS-S1
Base Period: 1990-2012

Model Run: 27/09/2021
Issued: Map not issued

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. Palau, FSM >20cm
- Countries to be aware of higher tides
- Coral Beaching on alert levels for PNG, FSM, RMI
- Fisheries convergence zone slightly expands eastward

The background features a complex pattern of thin, teal-colored wavy lines that resemble topographical contour lines or fluid flow paths. These lines are interspersed with small, solid teal circles and triangles, some of which are positioned along the lines, suggesting a vector field or a series of data points. The overall aesthetic is clean and modern, with a light teal color palette.

Thank you/Vinaka