

Agenda 3: Review of May – October 2022 Climate

i. Atmosphere

Presented by: Tile Tofaeono & Philip Malsale

Support from: NIWA, APCC, BoM, Météo-France, SPC

Presentation Outline

- PICO-10 Outlook
- Southern Oscillation Index (SOI)
- WMO MME Model prediction (previous 6 months (MJJ/ASO))
 - Rainfall/Drought
 - Air temperature
- Summary

PICOF-10 OUTLOOK

Tenth Pacific Islands Climate Outlook Forum

November 2021 to April 2022 summary and May to October 2022 climate, ocean and tropical cyclone outlook | Issued: 28 April 2022

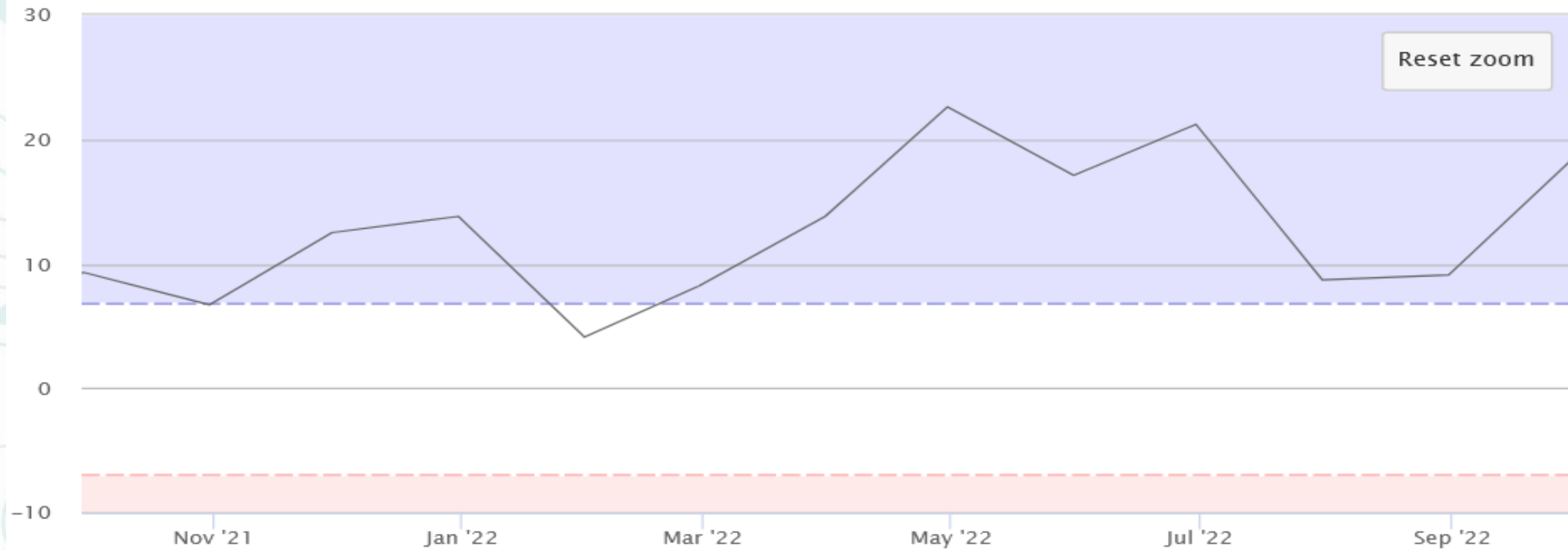
Outlook for May to October 2022

- Climate model outlooks favour ENSO-neutral conditions as the most likely outcome from May to October with a second most likely outcome the continuation of La Niña.
- The continuing influence of La Niña is evident in atmospheric and ocean seasonal forecasts especially for May to July.
- Drier than normal conditions are favoured for the equatorial Pacific. This area of drier than normal conditions extends southeast towards the subtropics of the southern hemisphere. Wetter than normal conditions are favoured for Marshall Islands in the North Pacific and for southern Papua New Guinea (PNG) southeast to the southern Cook Islands in the South Pacific.
- Cooler than normal conditions are predicted along the equator and the off-equatorial South Pacific near and east of the Date Line. Warmer than normal conditions are broadly favoured for region extending northeast and southeast towards the subtropics.
- Models favour the southern Pacific Ocean cooling and ocean heat stress dissipating by May 2022, Coral Bleaching alerts for Papua New Guinea (PNG) persist until July 2022.
- Sea surface temperature (SST) is favoured to below average for May to July across the central equatorial Pacific. Models favour SSTs returning to normal for these island groups around June-July. SSTs remain above average for most of the other PICTs over May-July. For a majority countries these warm conditions prevail but decrease in intensity through August-October.
- Sea level is favoured to be notably higher than normal (>10 cm) over May-July and August-October in the vicinity of PNG, Solomon Islands, northern Vanuatu, northern Fiji and southern Tuvalu.
- A preliminary cyclone outlook for the northwest Pacific is for near-average seasonal activity based on the ongoing, but weakening, La Niña conditions.

- Climate model outlooks favour **ENSO-neutral conditions** as the **most likely outcome from May to October** with a **second most likely outcome is the continuation of La Niña**.
- The continuing influence of La Niña is evident in atmospheric and ocean seasonal forecasts especially for **May to July**.
- **Drier than normal conditions** are favoured for the equatorial Pacific. This area of drier-than-normal conditions extends southeast towards the subtropics of the southern hemisphere. **Wetter than normal conditions** are favoured for the Marshall Islands in the North Pacific and for southern Papua New Guinea (PNG) southeast to the southern Cook Islands in the South Pacific.
- **Cooler than normal conditions** are predicted along the equator and the off-equatorial South Pacific near and east of the Date Line. **Warmer than normal conditions** are broadly favoured for regions extending northeast and southeast towards the subtropics.

Southern Oscillation Index (SOI)

Southern Oscillation Index – monthly



Southern Oscillation Index monthly data												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	+4.1	+8.2	+13.8	+22.6	+17.1	+21.2	+8.7	+9.1	+18.3	-	-	-
2021	+16.5	+11.5	-0.3	+2.0	+3.6	+2.6	+15.9	+4.6	+9.3	+6.7	+12.5	+13.8

At 15 October 2022: 30-day SOI = +21; 90-day SOI = +14

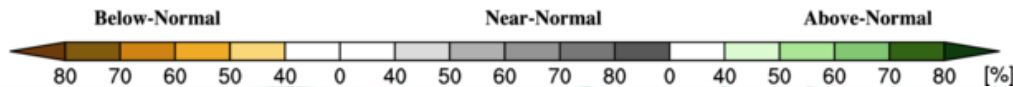
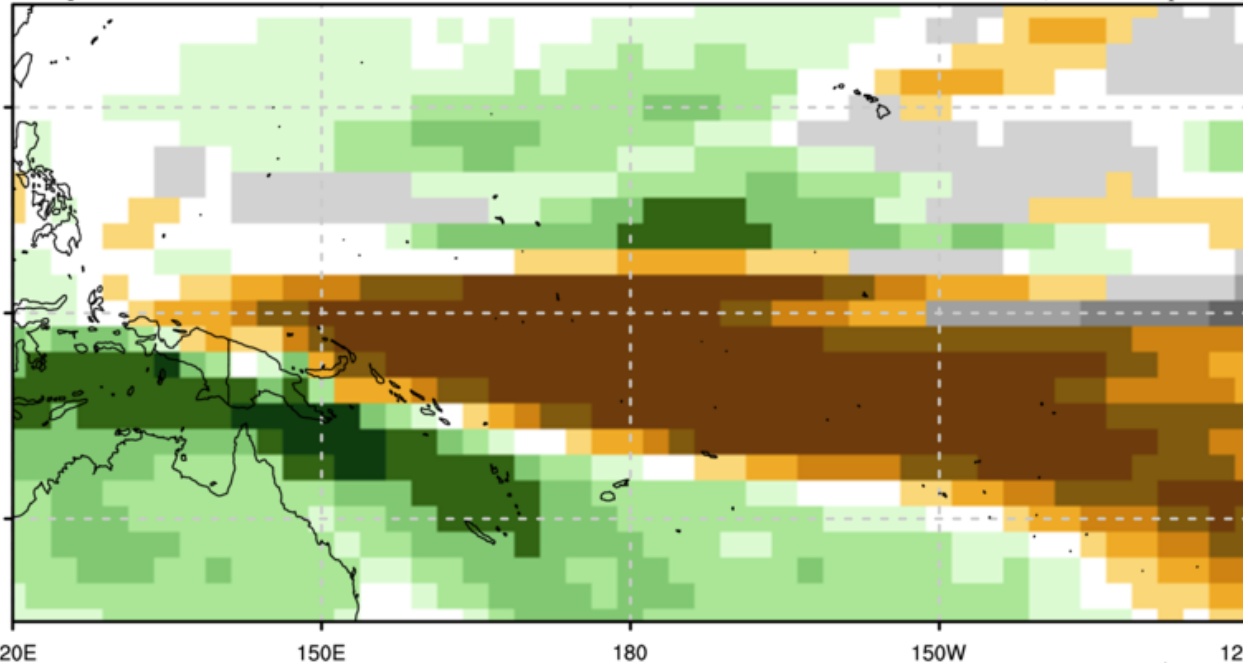
Precipitation Outlook for MJJ & ASO 2022

Probabilistic Multi-Model Ensemble Forecast

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

Precipitation : MJJ2022

(issued on Apr2022)

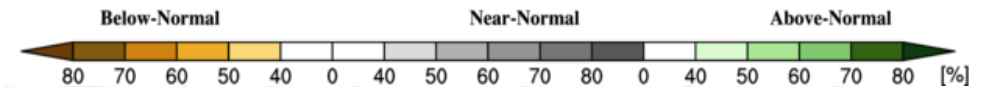
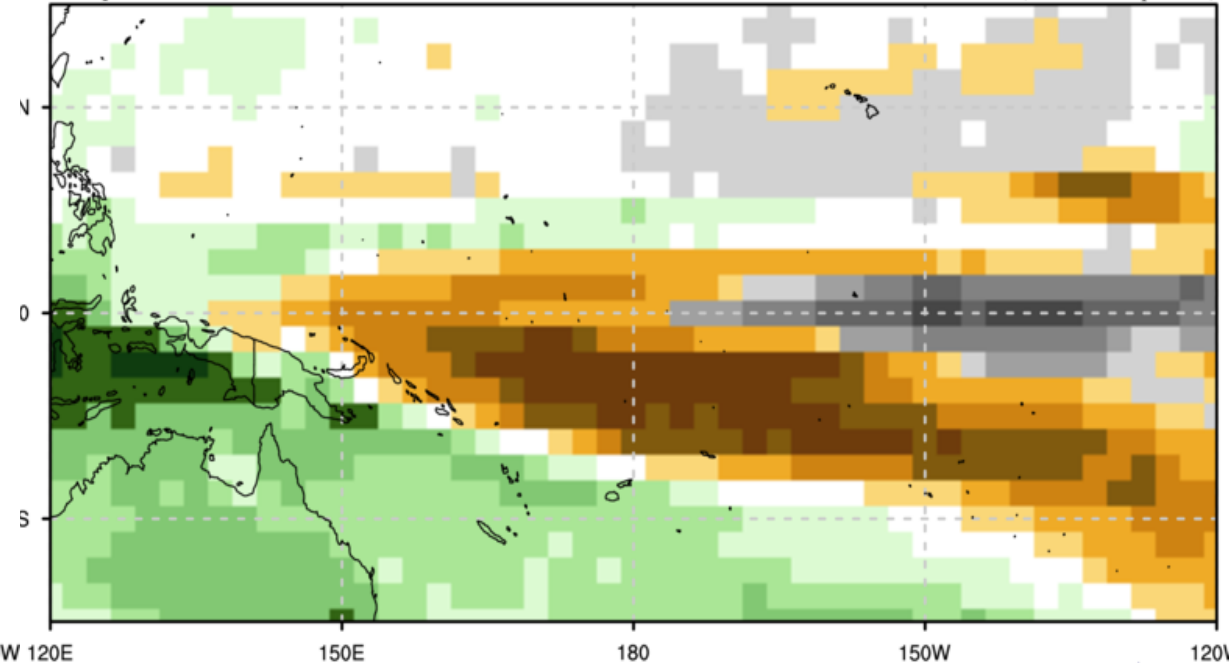


Probabilistic Multi-Model Ensemble Forecast

Beijing, Montreal, Seoul, Tokyo, Washington

Precipitation : ASO2022

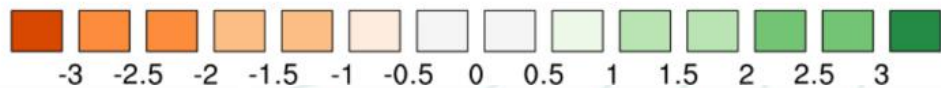
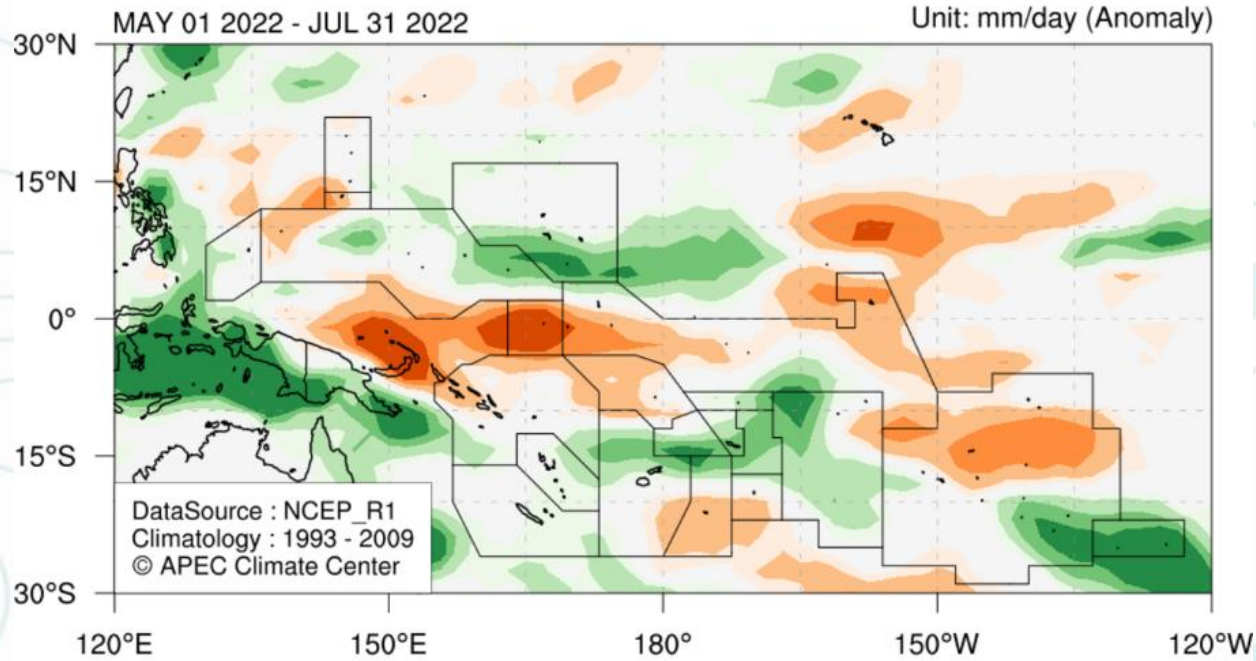
(issued on Apr2022)



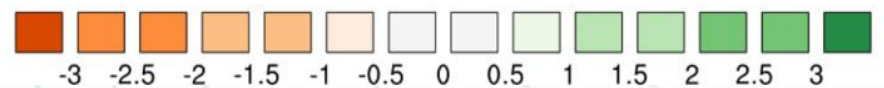
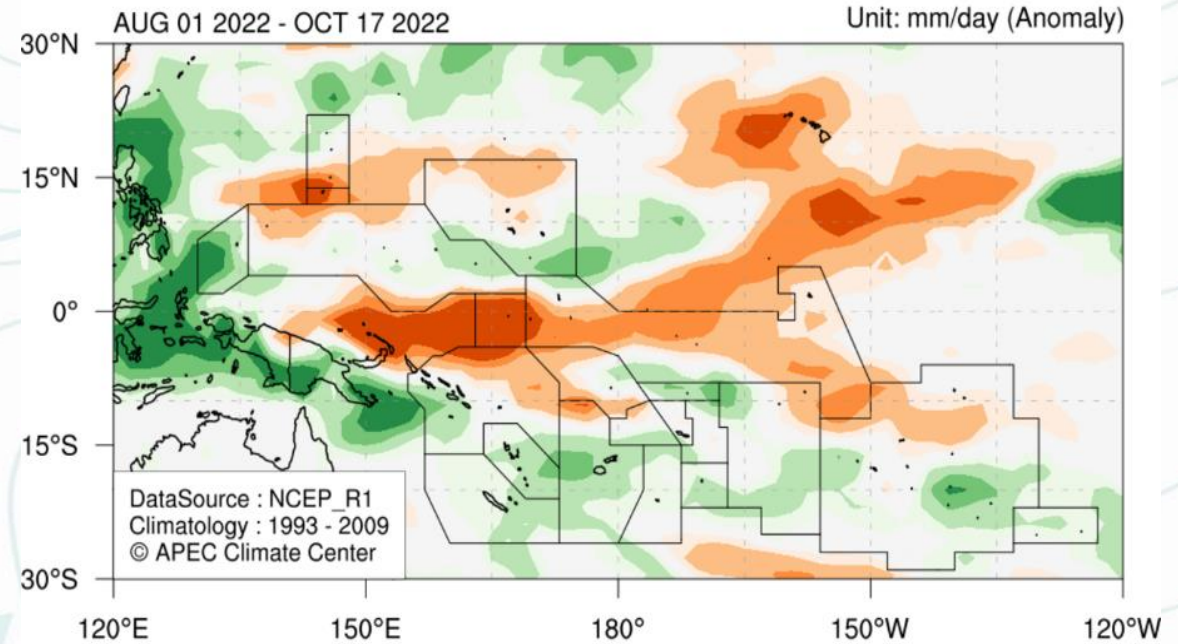
* The observation data period for ASO 2022 is 1 Aug to 17 Oct.

Precipitation Outlook for MJJ & ASO 2022

Precipitation



Precipitation



* The observation data period for ASO 2022 is 1 Aug to 17 Oct.

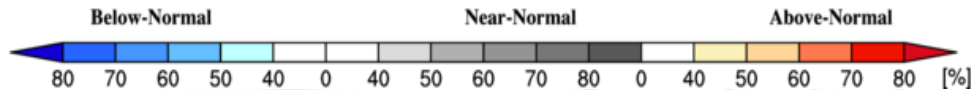
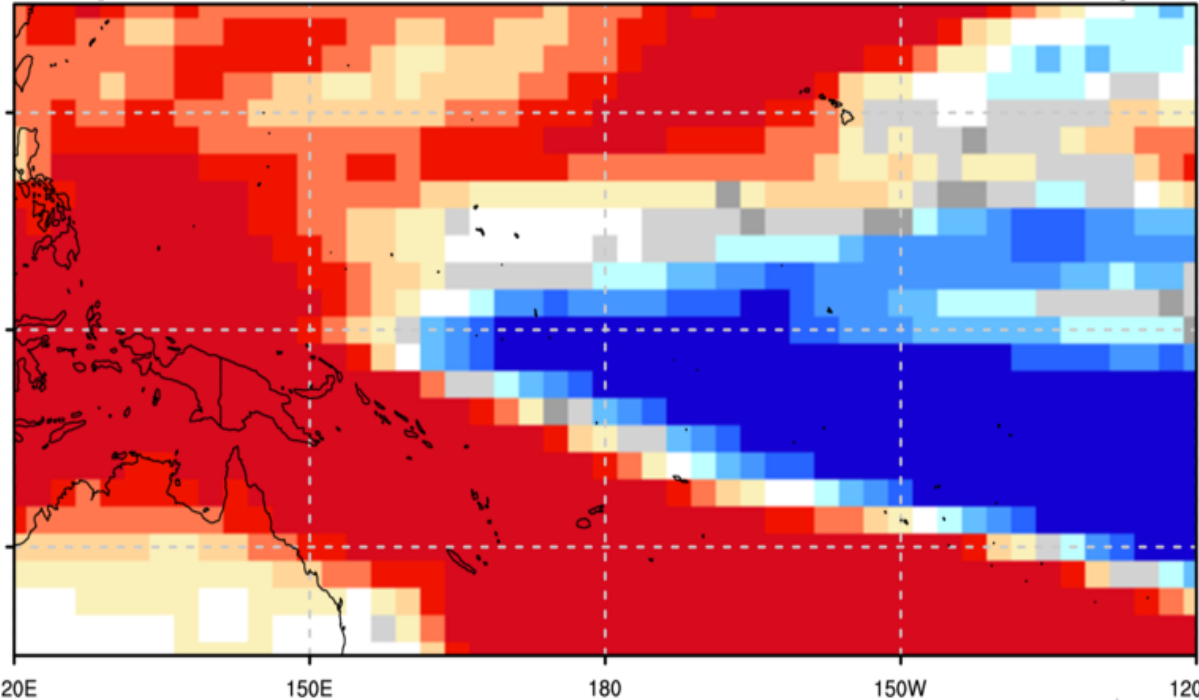
Temperature Outlook for MJJ to ASO 2022

Probabilistic Multi-Model Ensemble Forecast

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

2m Temperature : MJJ2022

(issued on Apr2022)

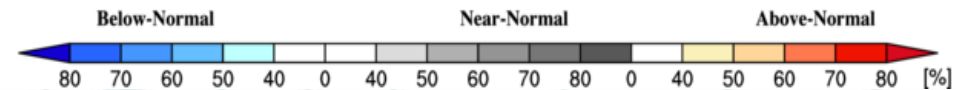
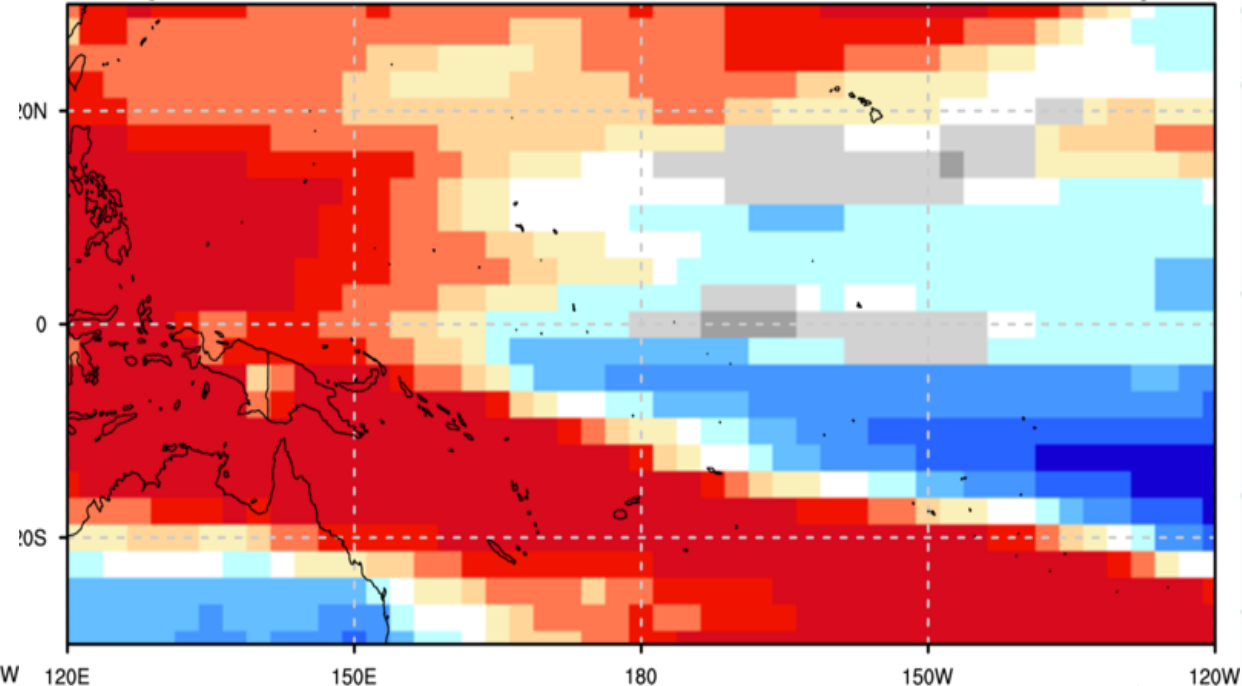


Probabilistic Multi-Model Ensemble Forecast

Beijing, Montreal, Seoul, Tokyo, Washington

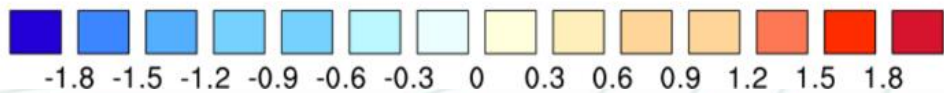
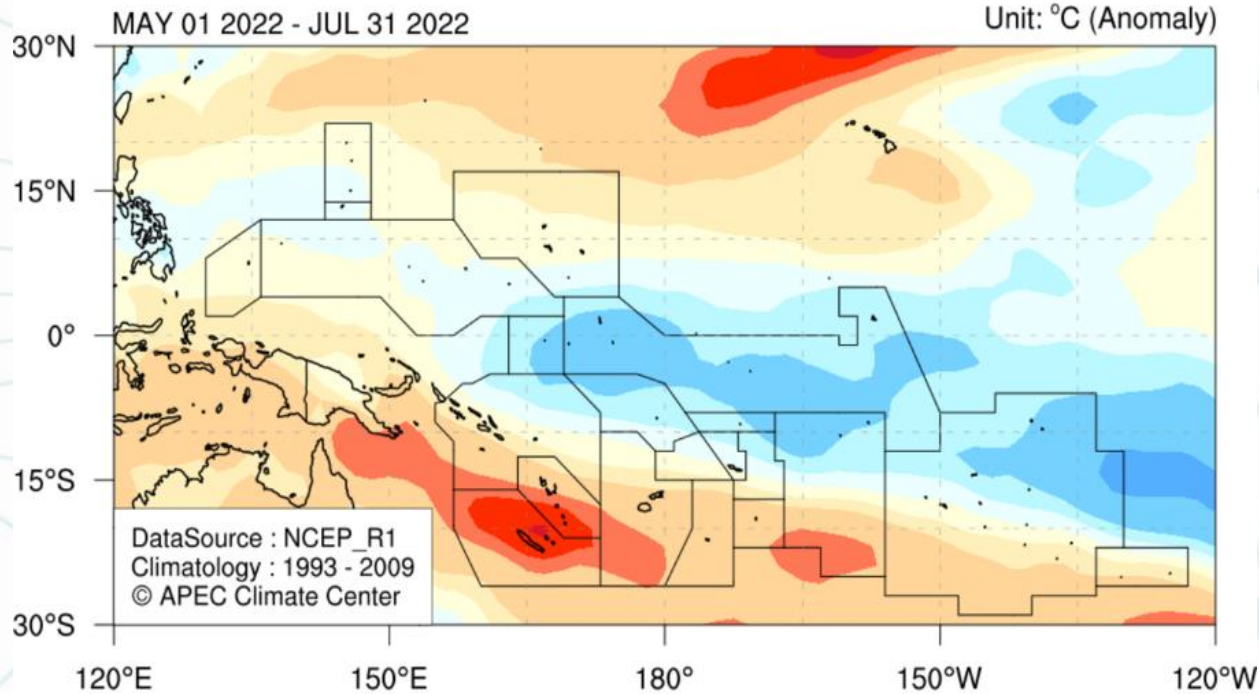
2m Temperature : ASO2022

(issued on Apr2022)

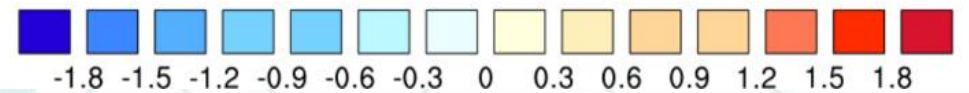
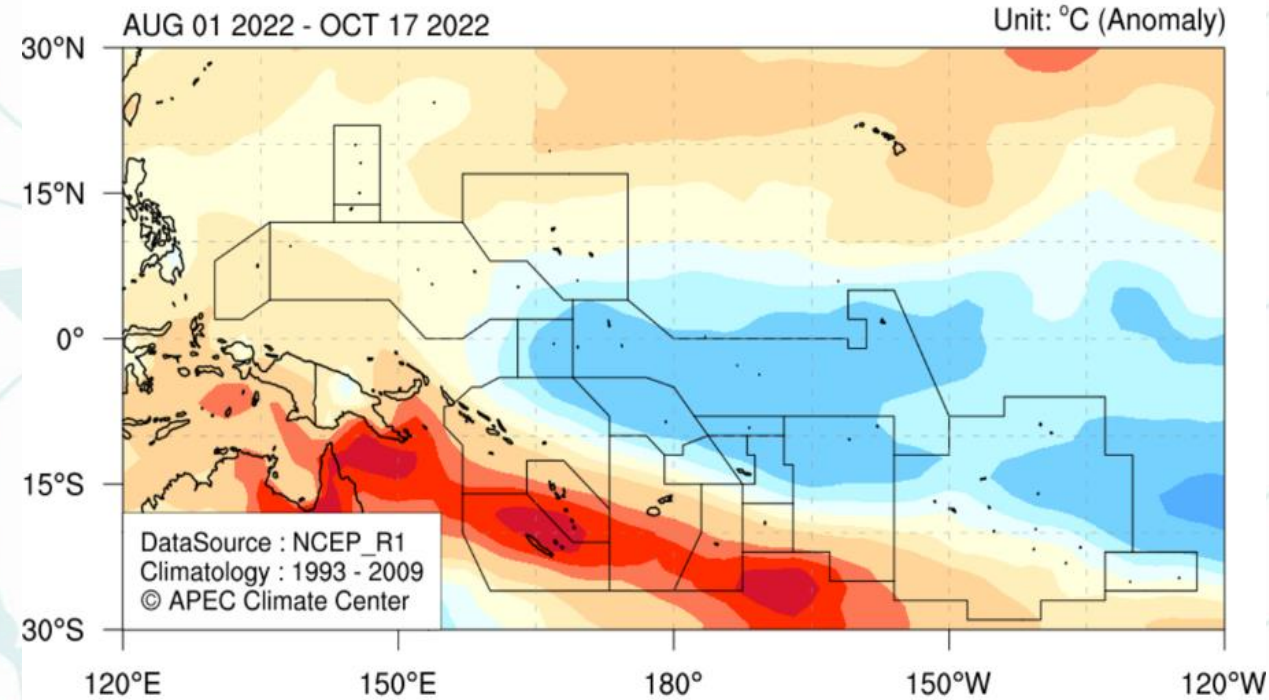


Temperature Outlook for MJJ to ASO 2022

Temperature at 2m



Temperature at 2m



* The observation data period for ASO 2022 is 1 Aug to 17 Oct.

Summary

Outlook Statement (April 2022)

- Climate model outlooks favour **ENSO-neutral conditions** as the **most likely outcome from May to October** with a **second most likely outcome is the continuation of La Niña**.
- The continuing influence of La Niña is evident in atmospheric and ocean seasonal forecasts especially for **May to July**.
- **Drier than normal conditions** are favoured for the **equatorial Pacific**. This area of drier-than-normal conditions extends southeast towards the subtropics of the southern hemisphere. **Wetter than normal conditions** are favoured for the **Marshall Islands in the North Pacific and for southern Papua New Guinea (PNG) southeast to the southern Cook Islands in the South Pacific**.
- **Cooler than normal conditions** are predicted **along the equator and the off-equatorial South Pacific near and east of the Date Line**. **Warmer than normal conditions** are broadly favoured for regions extending northeast and southeast towards the subtropics.

WMO LRF Multi-Model-Ensemble (MME)

- Continuation of La Niña.
 - Sustained positive SOI values above +7 typically indicate La Niña. The September SOI was +18.3, a strong rise of 9 points from the August value of +9.1, and in keeping with the current La Niña.

Rainfall

- Dry conditions spanned over the Islands along the equator. Also, drier conditions straddled the eastern equatorial cold tongue. Wet conditions for southern Papua New Guinea (PNG) southeast to the southern Cook Islands were observed to some extent.

Temperature

- The expected pattern of warmer/cooler than normal conditions was reasonably and well observed.



Kiribati

Vanuatu



Kasis Inape's Post

Kasis Inape
Assistant Director-PNG National Weather Service
1mo

The current drought situation in the country is a cause for concern for all of us due to the impacts it has on our livelihoods. We are hearing stories from parts of Unggai-Bena district of EHP experiencing food shortages and drying up of drinking water wells and creeks, disruption of power supply services in the Highlands, Lae and Madang due to very low water levels at Yonki Dam, power disruptions in the nation's capital due to low water level at the Sirinumu Dam and many others. Please find attached below is the current status update on the drought situation in the country for our information and necessary planning.



PNG

42 · 3 Comments

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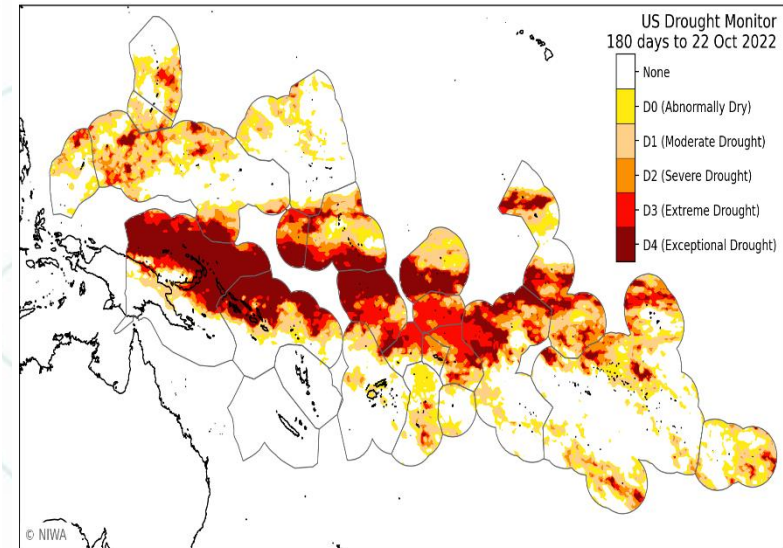
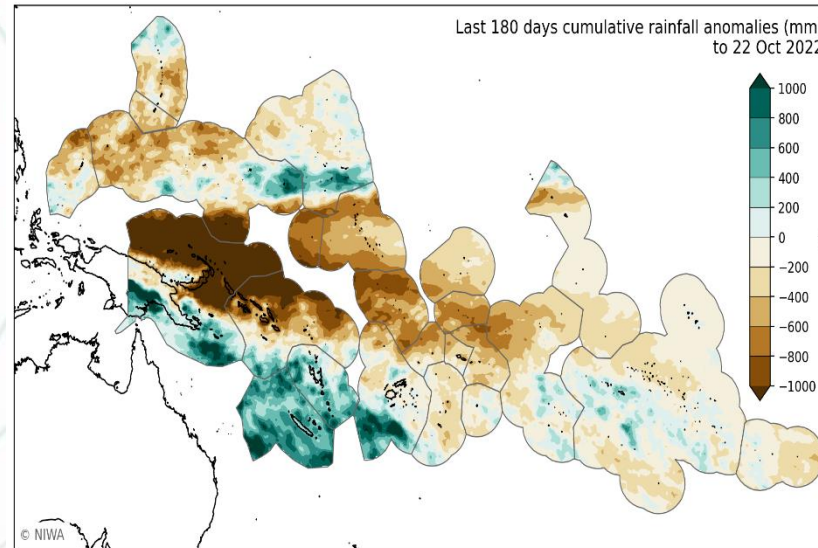
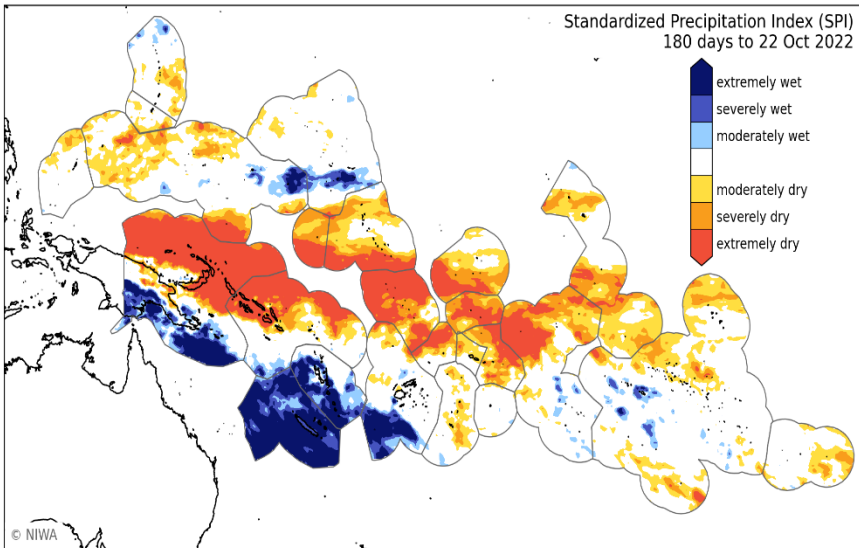
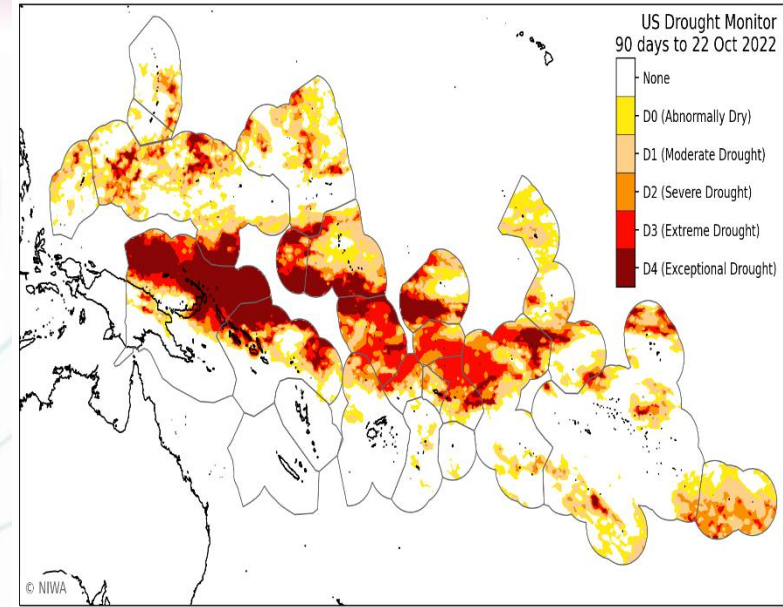
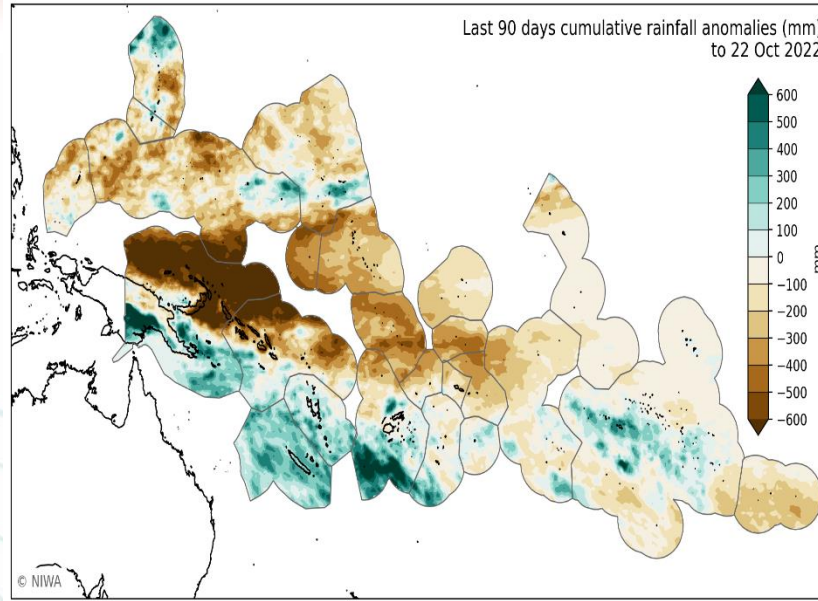
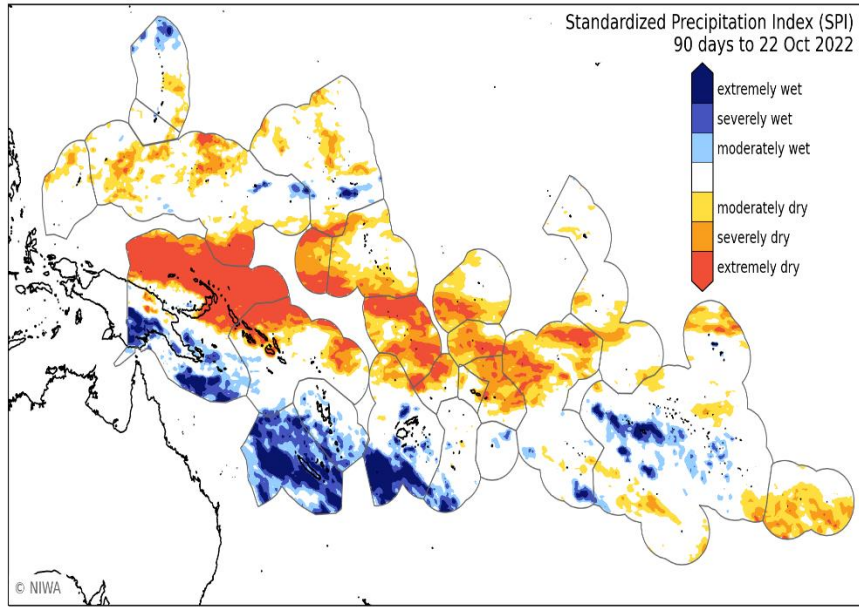




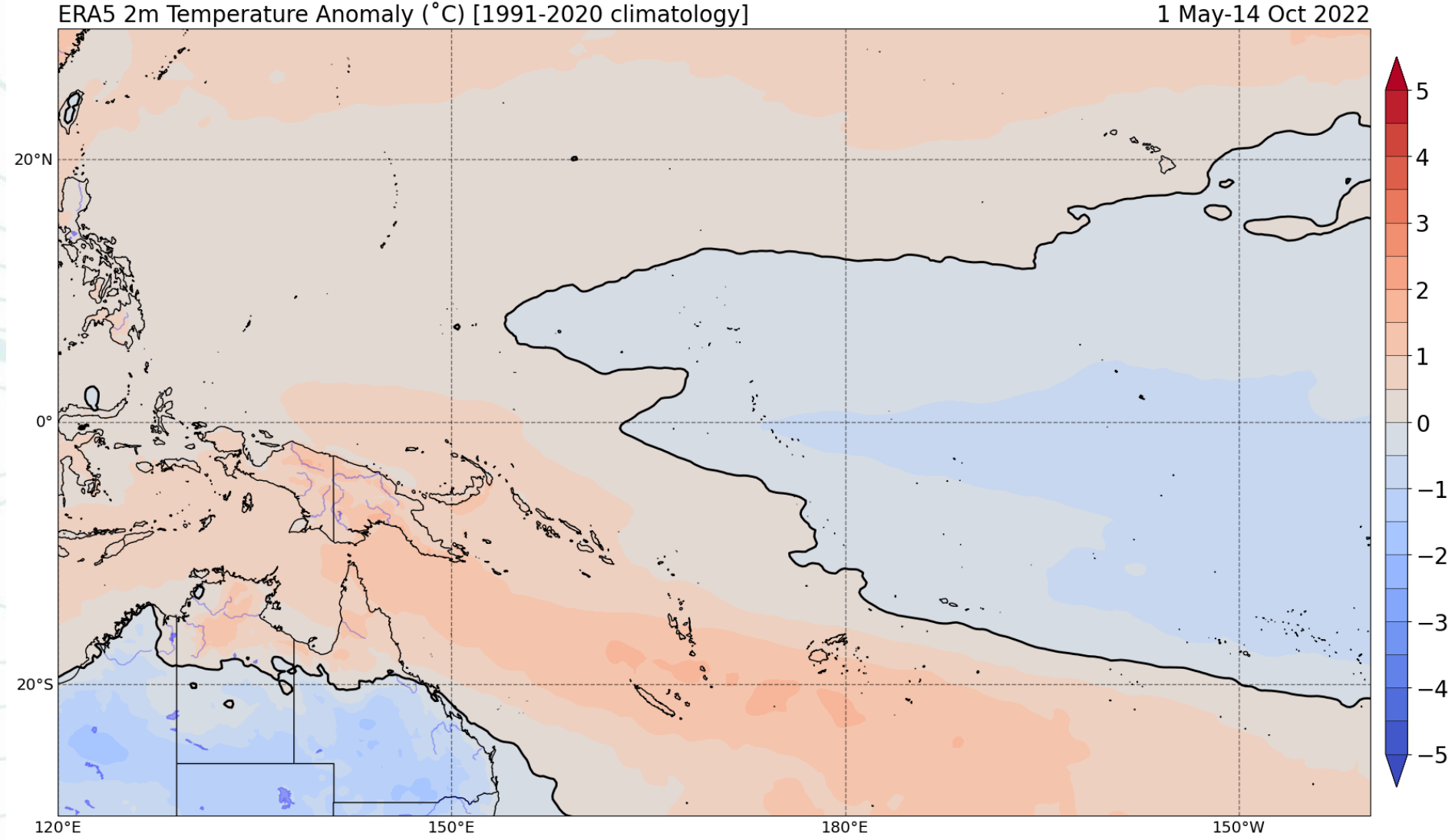
THANK YOU 😊

Supplementary Materials NIWA, BoM & APCC

NIWA – Precipitation/Drought

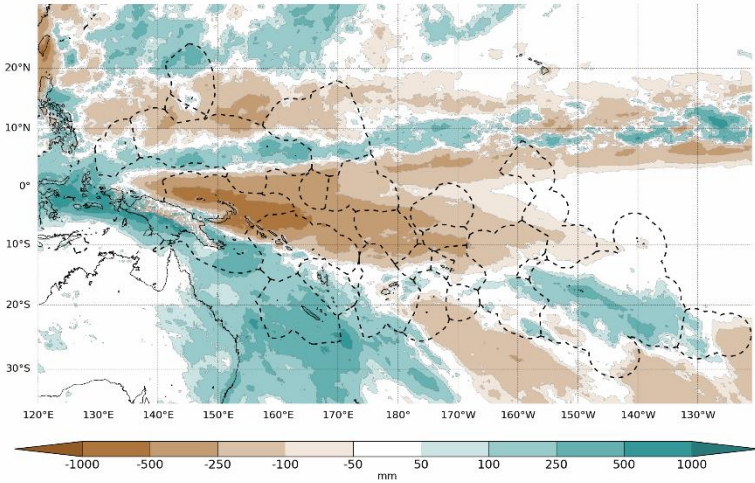


NIWA – Temperature Anomaly



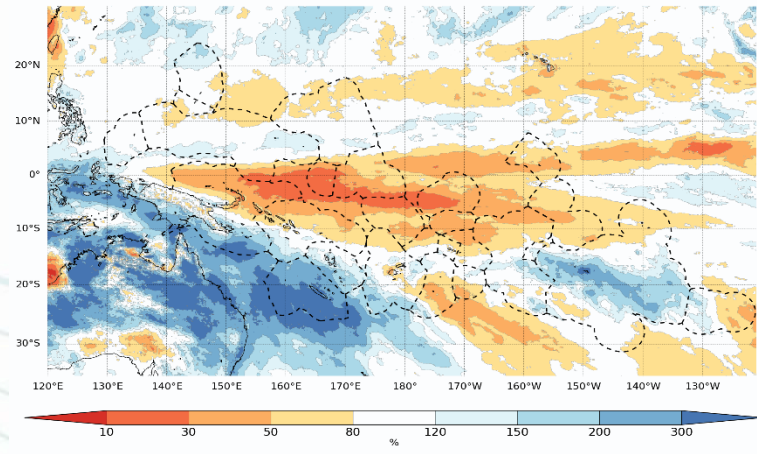
BoM (Precipitation/Drought)

3-month total rainfall anomaly ending September 2022



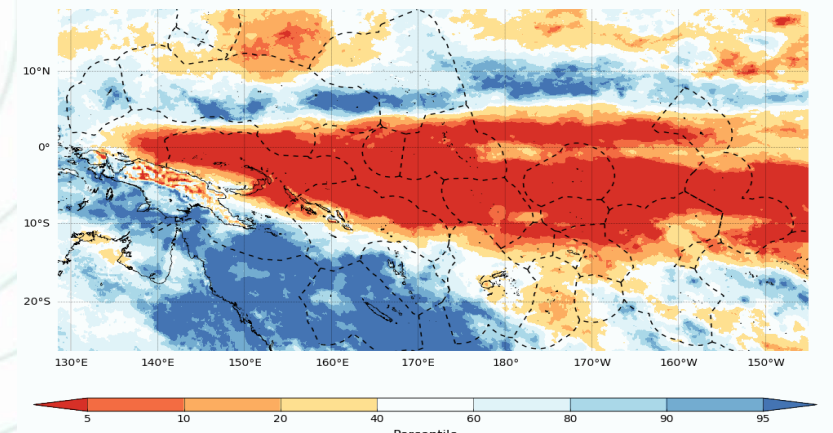
Source: MSWEP Base period: 1980-2021 Map created: 07/10/2022 (UTC)
 © Commonwealth of Australia 2022, Australian Bureau of Meteorology, supported by COSPPac
 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

3-month total rainfall % of normal ending September 2022



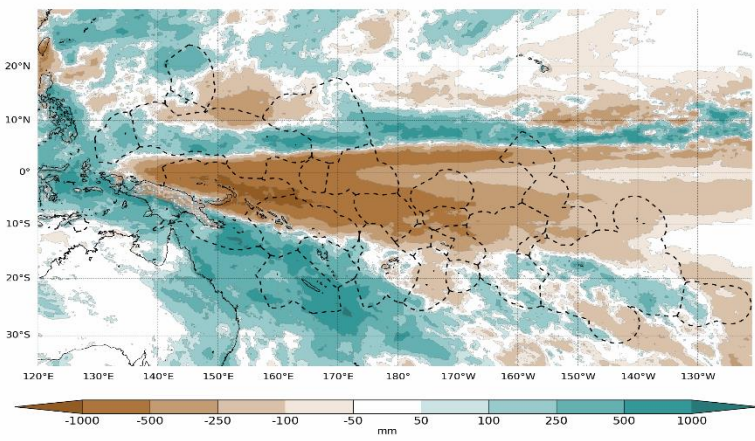
Source: MSWEP Base period: 1980-2021 Map created: 07/10/2022 (UTC)
 © Commonwealth of Australia 2022, Australian Bureau of Meteorology, supported by COSPPac
 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

6-month Percentile to end of September 2022



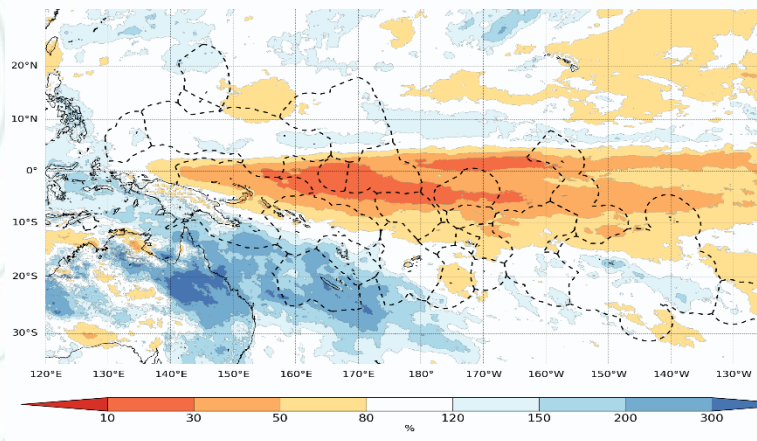
Data source: MSWEP Model Run: 01/09/2022 Base period: 1980-2021
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 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

6-month total rainfall anomaly ending September 2022



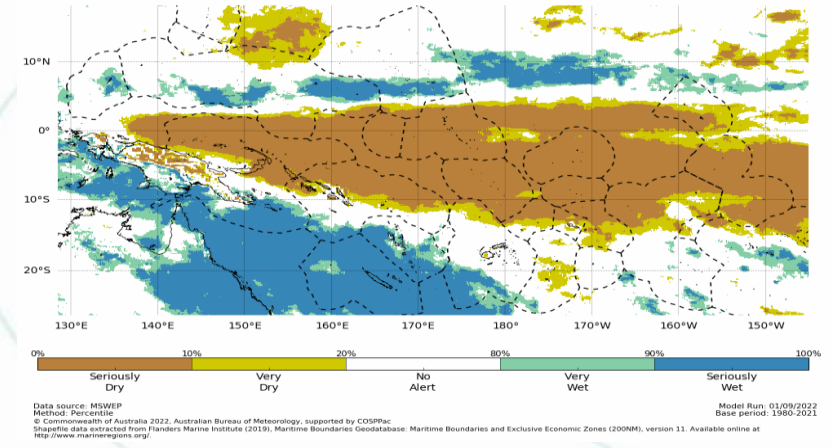
Source: MSWEP Base period: 1980-2021 Map created: 07/10/2022 (UTC)
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 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

6-month total rainfall % of normal ending September 2022



Source: MSWEP Base period: 1980-2021 Map created: 07/10/2022 (UTC)
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 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

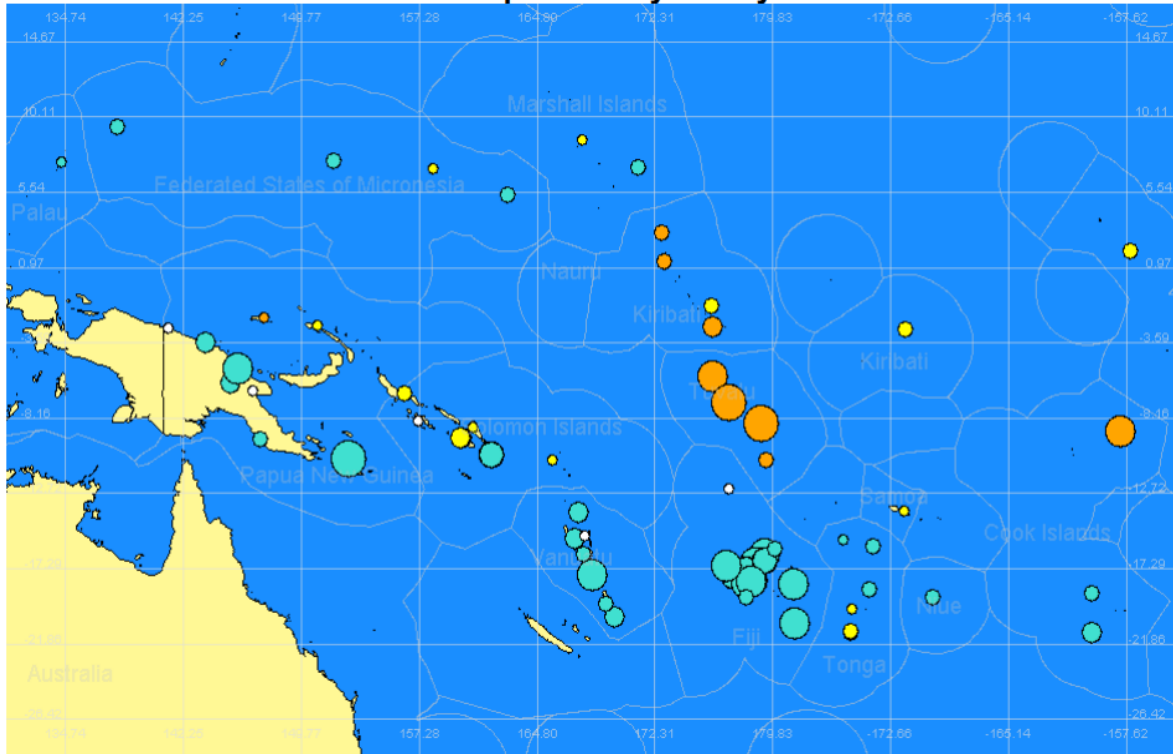
6-month rainfall status to end of September 2022







Data source: MSWEP Method: Percentile Model Run: 01/09/2022 Base period: 1980-2021
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 Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <http://www.maritimerregions.org/>.

SCOPIC

Seasonal Climate Outlook for the period May to July 2022

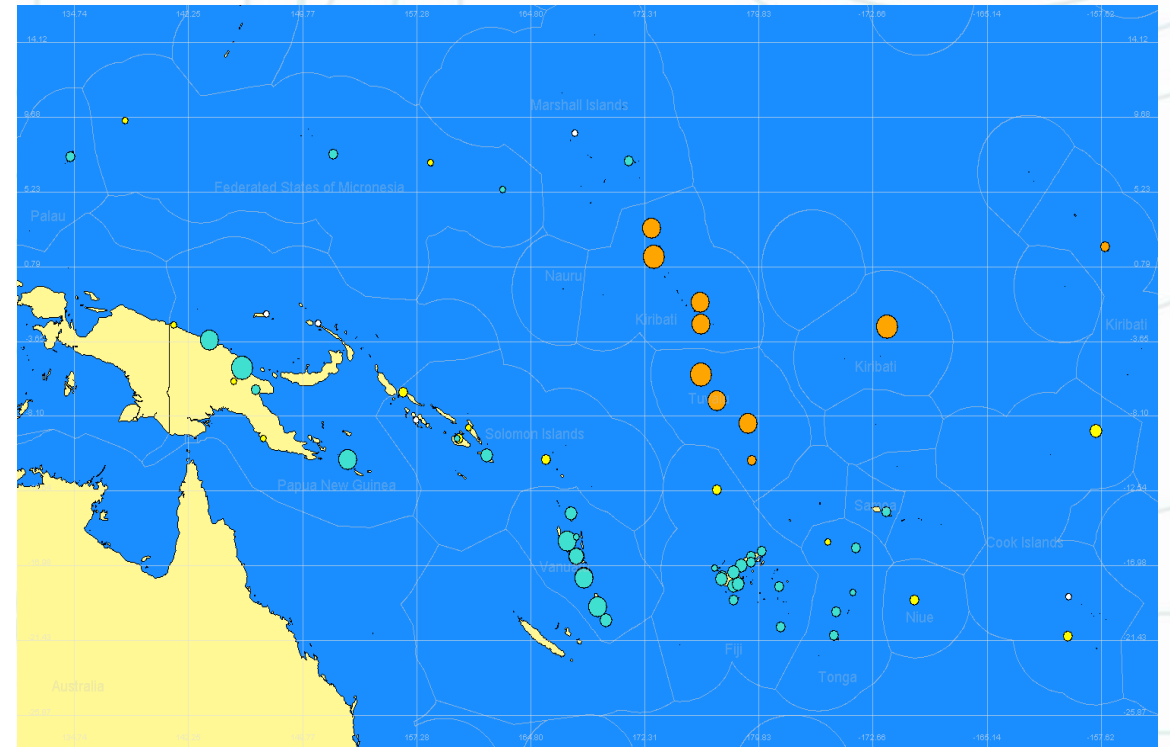


Legend





-  Bias towards below-normal rainfall
-  Bias towards normal rainfall
-  Bias towards above-normal rainfall
-  No bias in forecast (Climatology)

Larger "bubbles" represent higher forecast skill (based on LEPS scores)

Seasonal Climate Outlook for the period August to October 2022

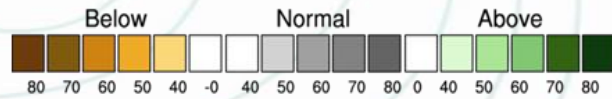
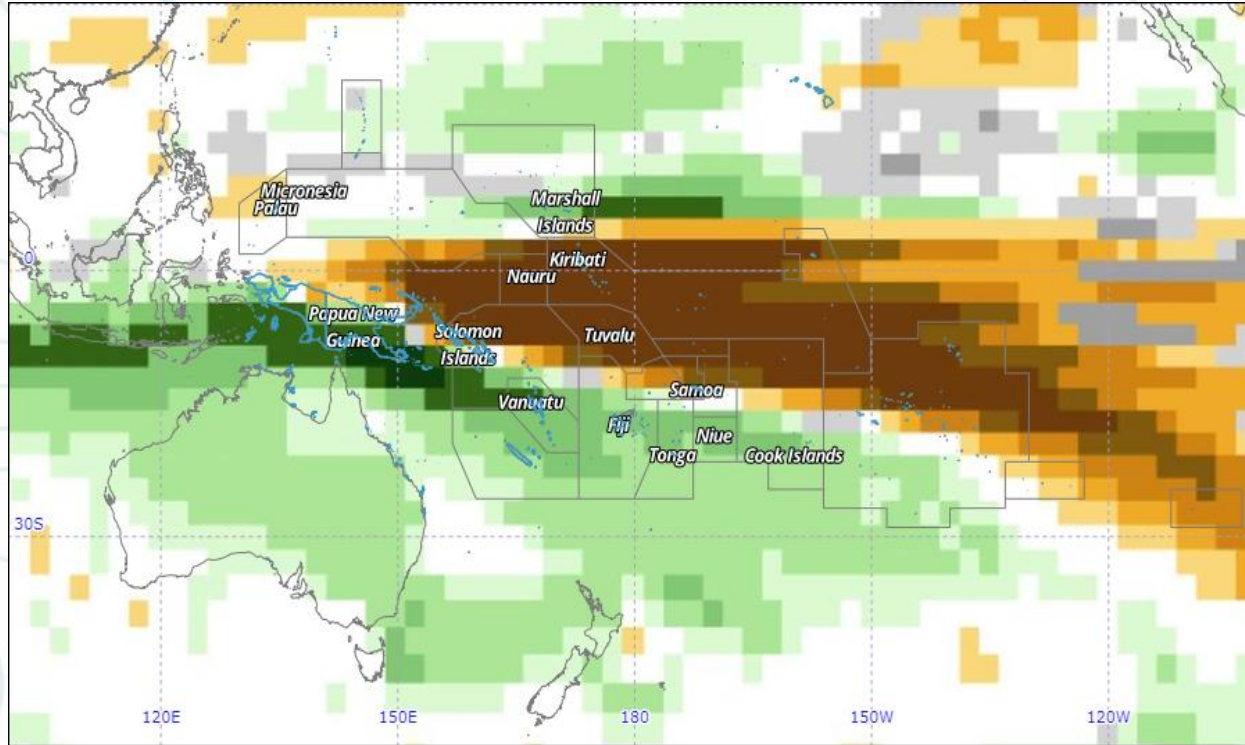


Legend

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APCC

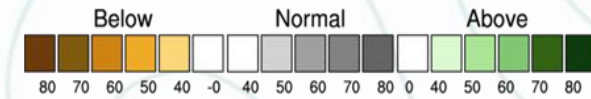
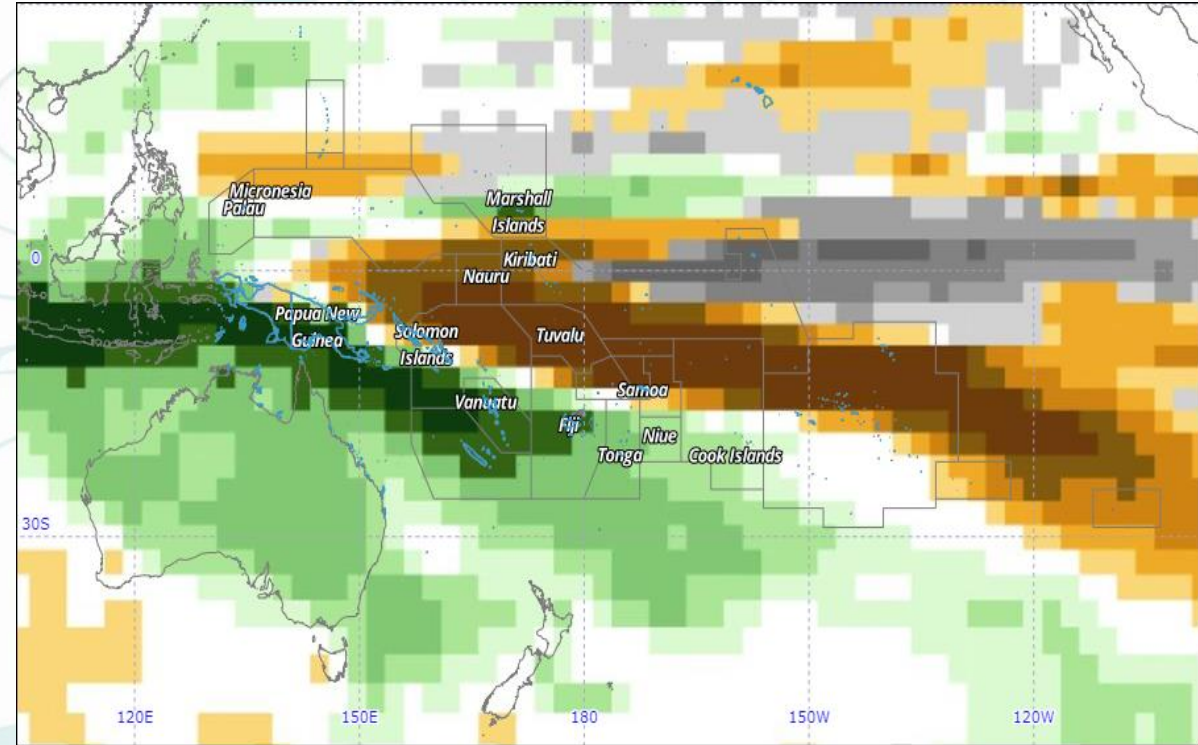


Year: 2022, Season: MJJ, Lead Month: 3, Method: GAUS

Model: APCC, BOM, CMCC, CWB, MSC, NCEP, PNU

Generated using CLIK® (2022-10-24)

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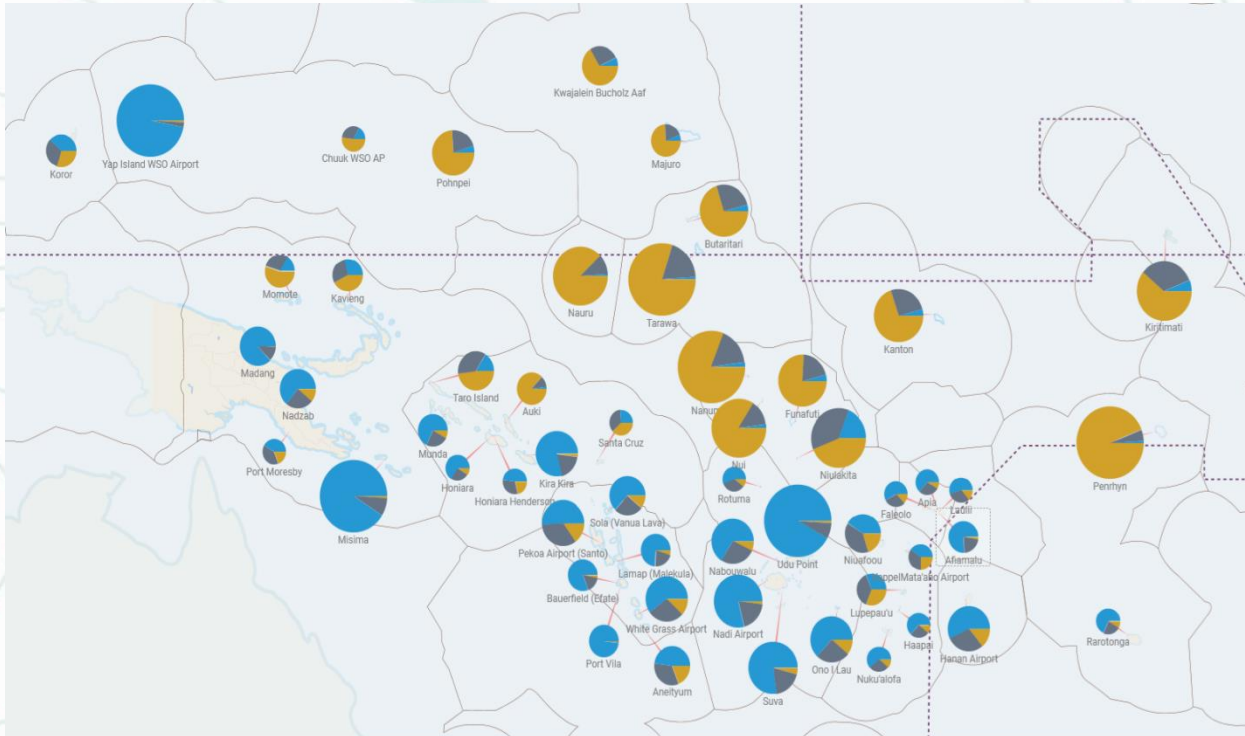
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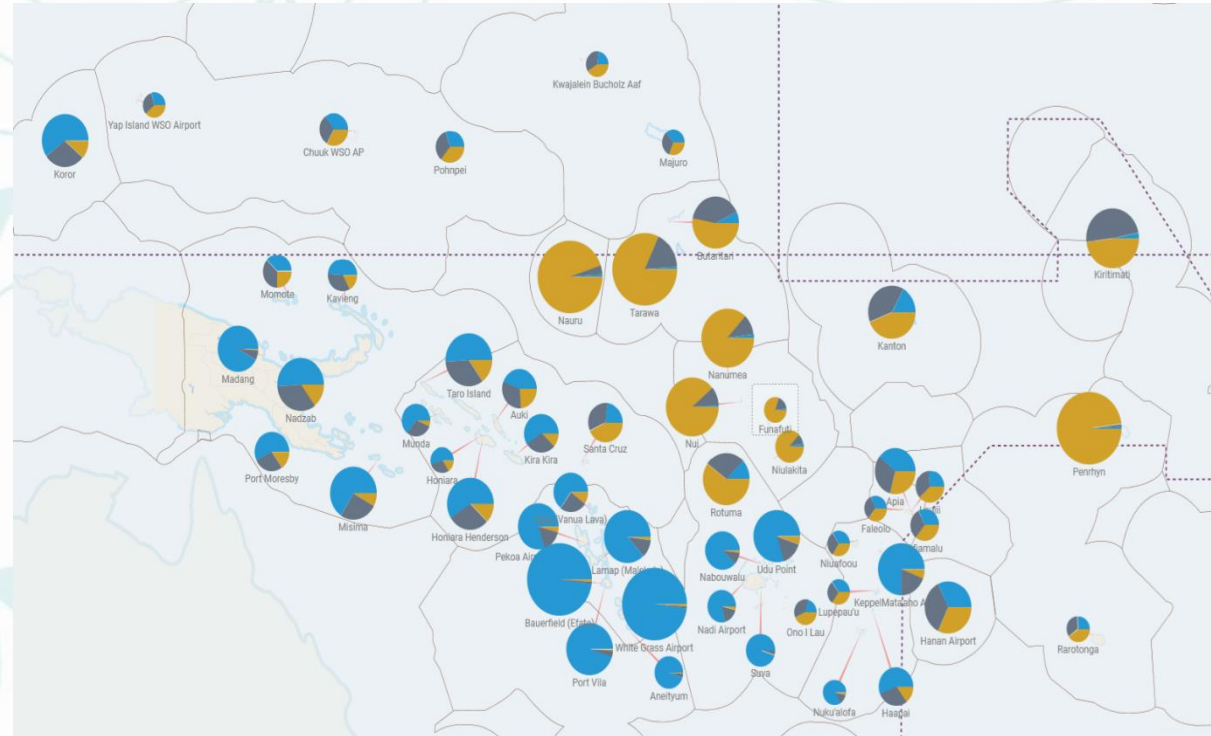
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PICASO - Precipitation

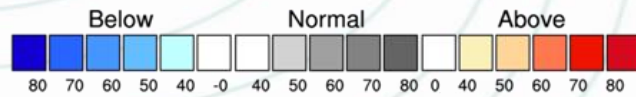
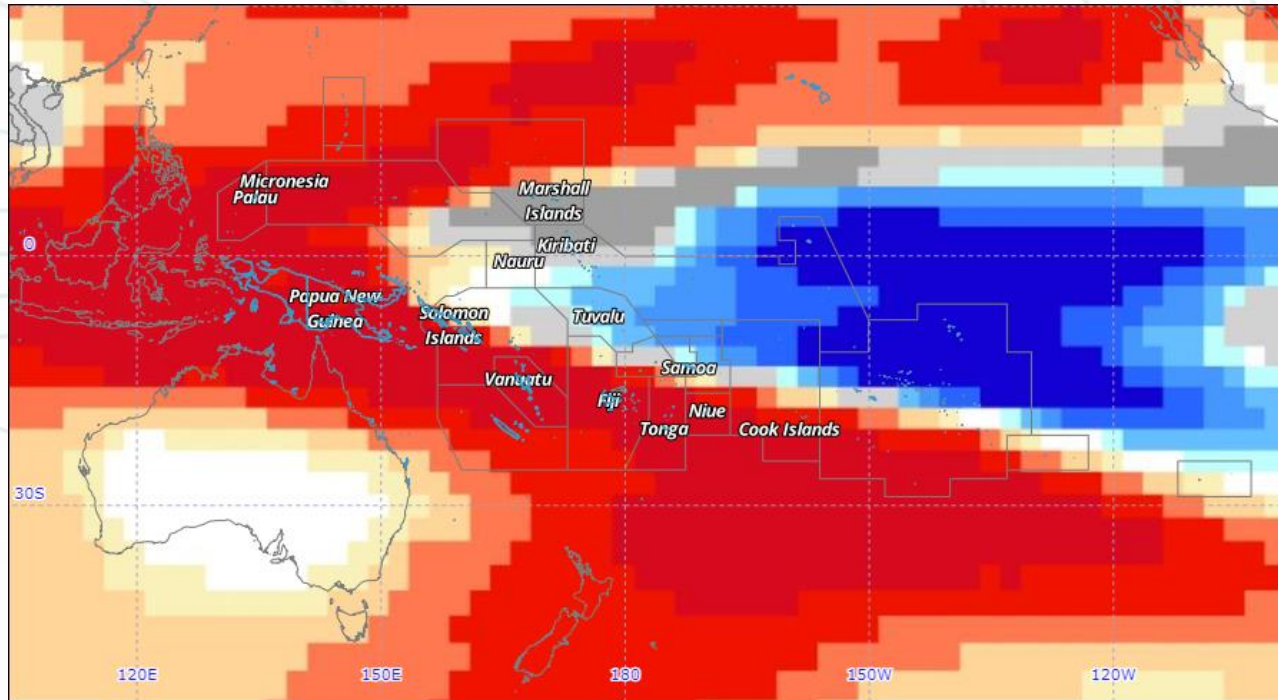


Afiamalu, Samoa 2022 MJJ
 created by PICASO (2022-10-24)

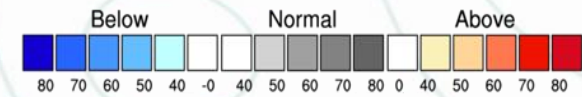
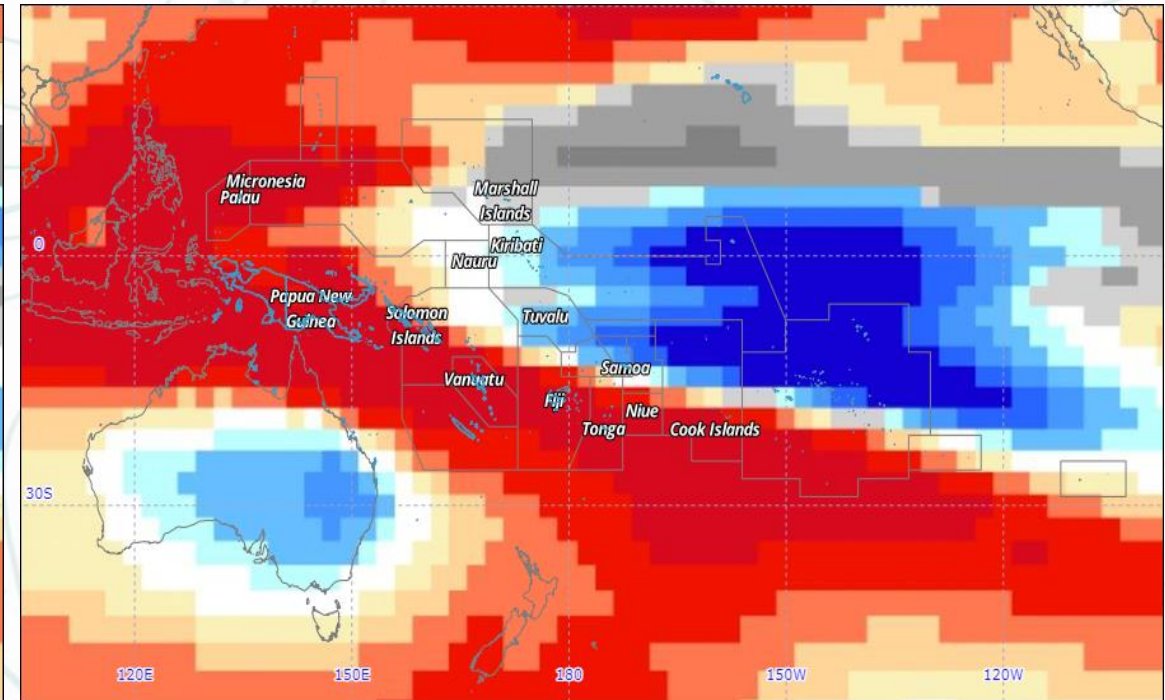


Funafuti, Tuvalu 2022 ASO
 created by PICASO (2022-10-24)

APCC - Temperature



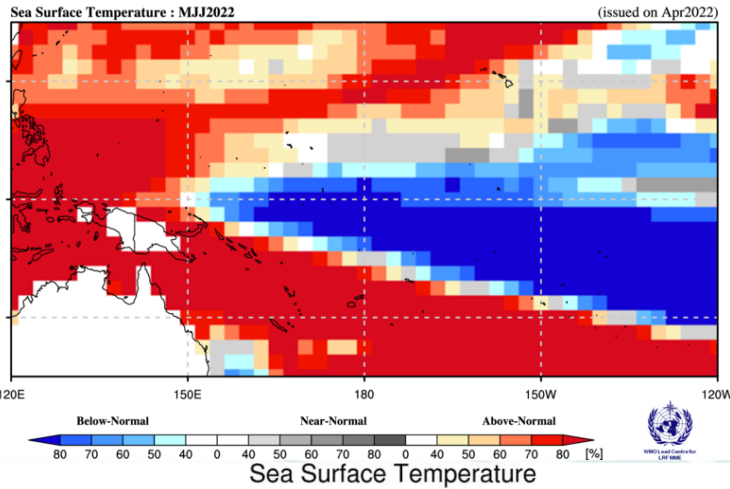
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 Model: APCC, BOM, CMCC, CWB, MSC, NCEP, PNU
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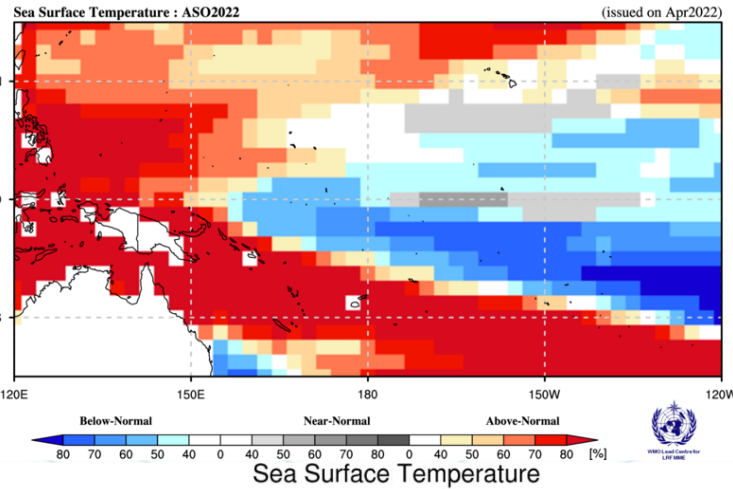
Year: 2022, Season: ASO, Lead Month: 3, Method: GAUS
 Model: APCC, BOM, CMCC, CWB, MSC, NCEP, PNU
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Review & Evaluation of SST Outlook for MJJ to ASO 2022

Probabilistic Multi-Model Ensemble Forecast
Beijing, ECMWF, Exeter, Melbourne, Montreal, Offenbach, Seoul, Tokyo, Toulouse, Washington

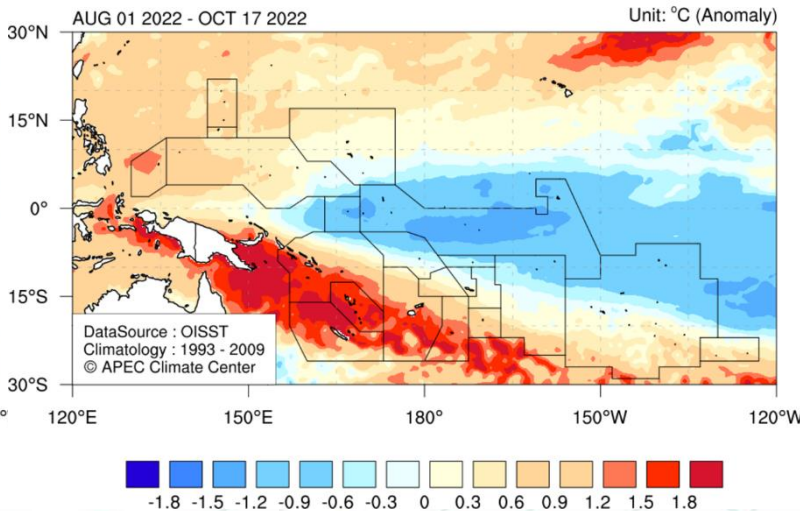
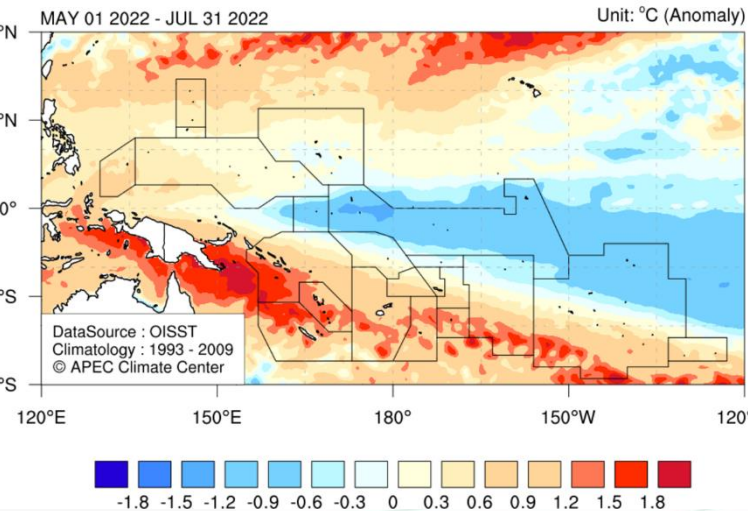


Probabilistic Multi-Model Ensemble Forecast
Beijing, Montreal, Seoul, Tokyo, Washington



Forecast for MJJ to ASO 2022

The pattern of SST is quite similar to the one of 2m Temperature.



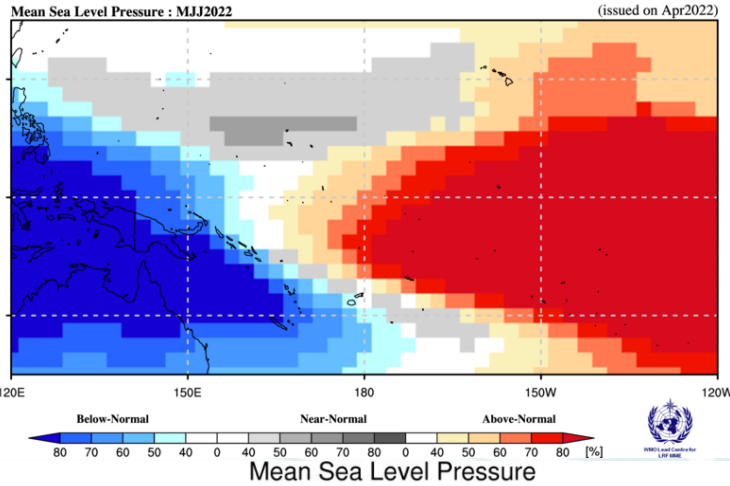
Observation for MJJ to ASO 2022

The expected pattern of warmer/cooler than normal conditions were reasonably well observed.

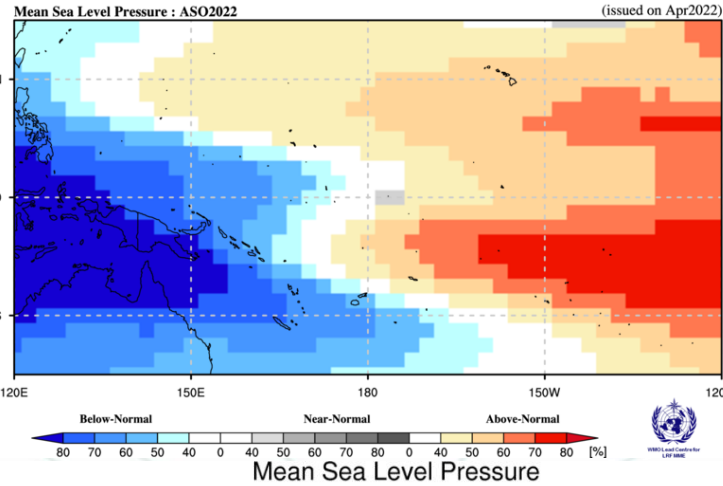
* The observation data period for ASO 2022 is 1 Aug to 17 Oct.

Review & Evaluation of MSLP Outlook for MJJ to ASO 2022

Probabilistic Multi-Model Ensemble Forecast
Beijing, CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Seoul, Tokyo, Toulouse, Washington

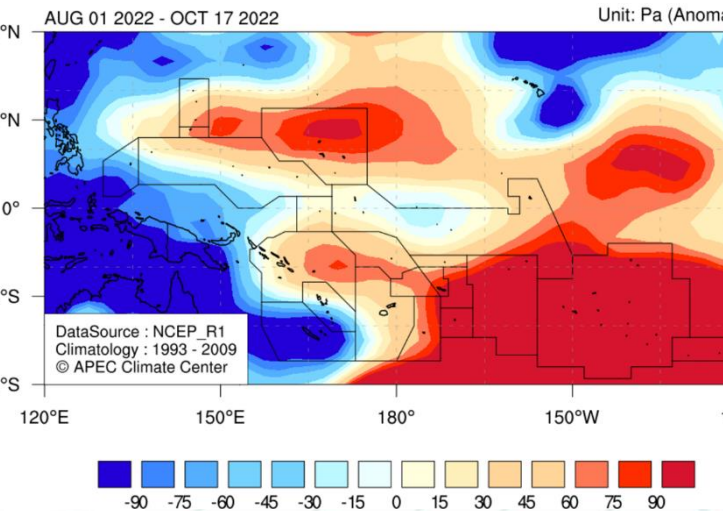
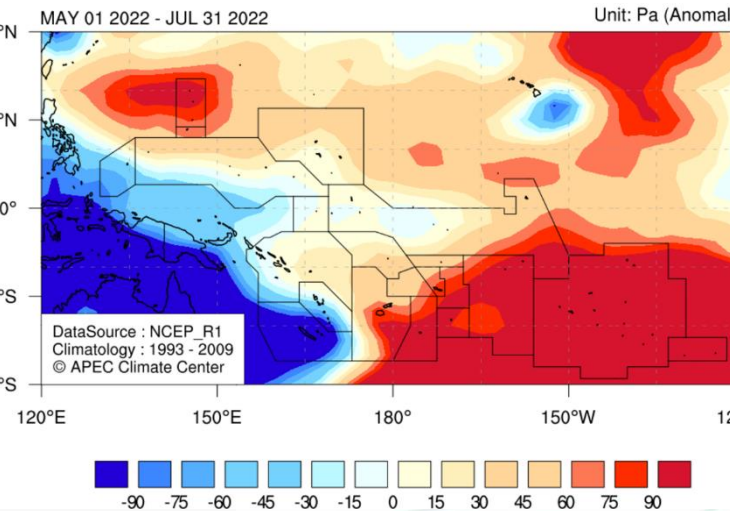


Probabilistic Multi-Model Ensemble Forecast
Beijing, Montreal, Seoul, Tokyo, Washington



Forecast for MJJ to ASO 2022

Negative (positive) pressure anomalies are expected for the western (eastern) tropical Pacific, which reflects negative ENSO phase.



Observation for MJJ to ASO 2022

The dipole pattern of forecast was captured in the observation. The observed high pressure anomalies over Micronesia were not predicted throughout the forecast period.

* The observation data period for ASO 2022 is 1 Aug to 17 Oct.