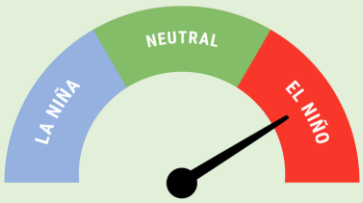
Island Climate Update

NIWA
Taihoro Nukurangi

ENSO Watch
March 2024

Recent



El Niño

The El Niño event is now past its peak oceanic intensity and it is likely to weaken further during March.

The Southern Oscillation Index (SOI) was -0.4 from December-February, in the neutral range.

Tropical Pacific Ocean sea surface temperatures (SSTs) were still within the range of a strong El Niño during February.

Forecast

80% chance for **El Niño** conditions to continue through **April 2024**

Chance for **neutral** conditions developing during **May-July 2024** **70%**

ENSO neutral

ENSO situation summary

El Niño continued during February and has around an 80% chance of persisting through April. However, ENSO neutral conditions are favoured to develop during May-July 2024.

The monthly NINO3.4 Index anomaly (in the central equatorial Pacific) at the end of February was +1.55˚C, within the range of a strong El Niño (classified when the NINO3.4 Index is greater than +1.5˚C). Although the current El Niño event is past its peak oceanic intensity, atmospheric patterns will likely continue to show El Niño-like tendencies in the months ahead.

The Southern Oscillation Index (SOI) was in the El Niño range during February (-1.1) and the neutral range during December-February (-0.4). This suggests that El Niño's reflection in the atmosphere has been atypical, particularly considering the oceanic intensity.

Trade wind strength was was slightly below normal across most of the equatorial Pacific during February and greatly reduced from normal in the off-equatorial South Pacific, where winds blew from the west.

During mid-March, an area of enhanced trade winds is forecast in the west-central equatorial Pacific, a reversal of February's pattern and the one that dominated over recent months.

In February, the subsurface equatorial Pacific was cooler than average below 100 m depth across most of the basin. Above average temperatures were confined to the upper 50-100 m. Upper-oceanic heat content returned to near normal values in the equatorial Pacific aside from the far eastern part of the Pacific, suggesting that the 'cool pool' of sub-surface water had significantly eroded warmth associated with El Niño.

A marine heatwave remains active between Vanuatu and Fiji, as well as island groups farther east including the northern Cook Islands.

During mid-March, a pulse of the Madden-Julian Oscillation may increase the chance for tropical cyclone development between Vanuatu and the Coral Sea. With an El Niño event ongoing, all met services should remain vigilant.

Island Climate Update
Rainfall Watch

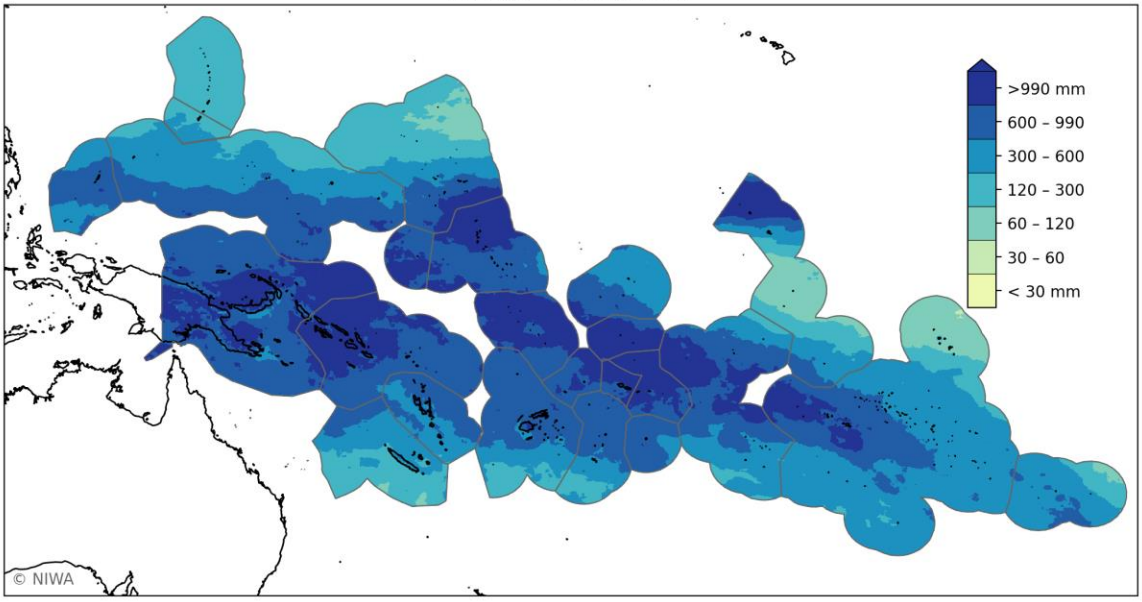
Regional situation summary (1 March 2024)

Rainfall summaries for the last month and three months are shown below.

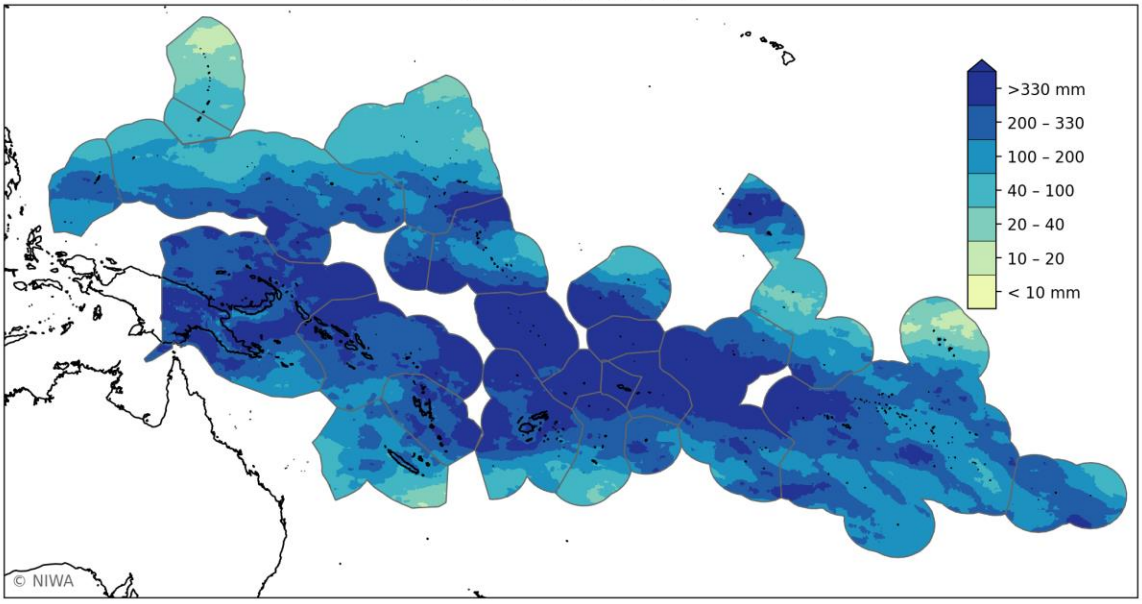
During December-February (top plot), over 990 mm of rain fell across parts of the southern Marshall Islands, parts of Papua New Guinea (PNG), the Solomon Islands, Nauru, Kiribati (Gilbert Islands and northern Line Islands), Tuvalu, Tokelau, Samoa, American Samoa, northern Cook Islands, and Society Islands. Less than 60 mm of rain was not observed in any island groups during December-February.

During February (bottom plot), over 330 mm of rain fell across parts of southern Federated States of Micronesia (FSM), southern Marshall Islands, PNG, Solomon Islands, Vanuatu, Tuvalu, Tokelau, Phoenix Islands, northern Line Islands, Fiji, northern Tonga, Wallis & Futuna, Samoa, American Samoa, northern and southern Cook Islands, and Society Islands. Less than 40 mm of rain fell in part of the Northern Marianas and Marquesas.

Cumulative rainfall (mm), source: MSWEP 2.8.0
90 days to 01 Mar 2024



Cumulative rainfall (mm), source: MSWEP 2.8.0
30 days to 01 Mar 2024



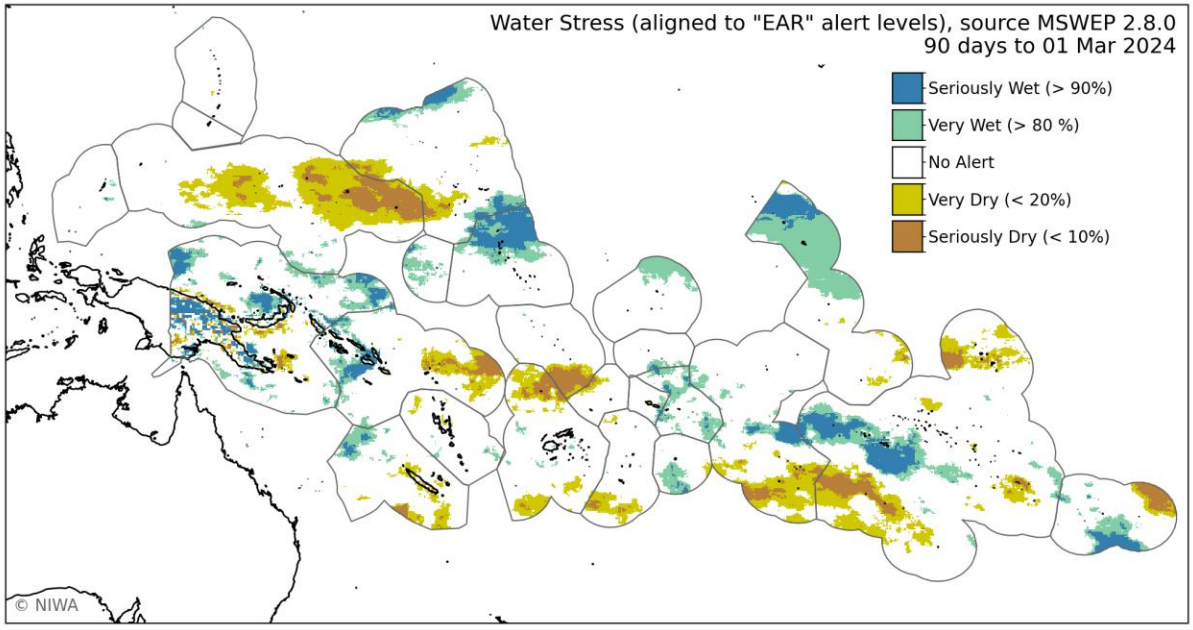
Island Climate Update
Water Stress Watch

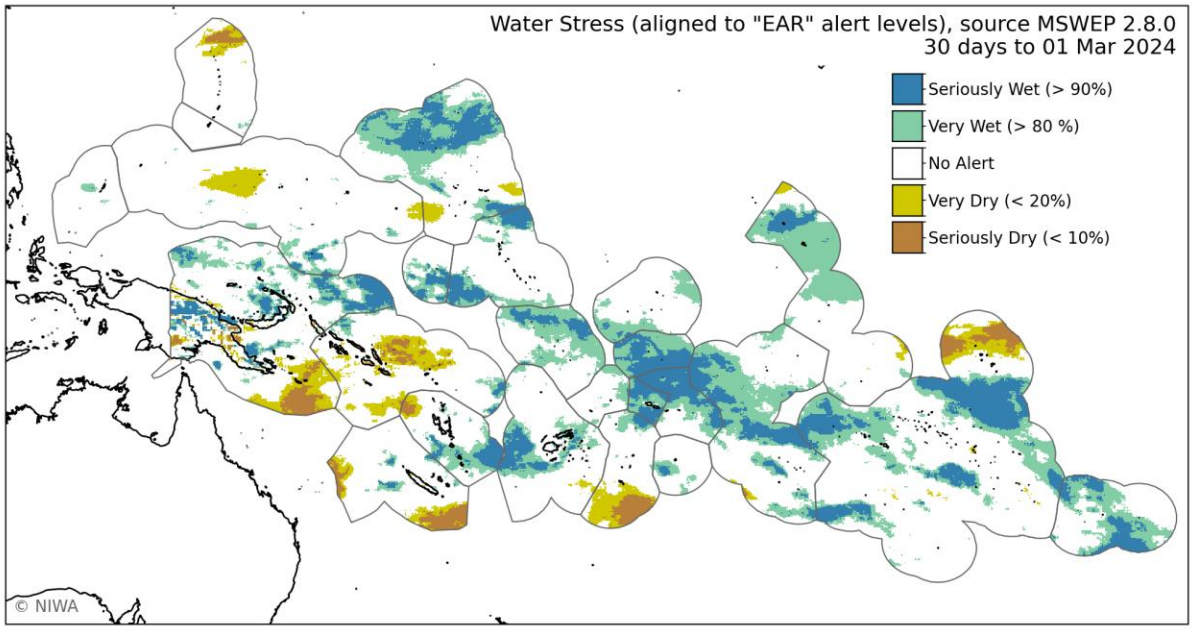
EAR regional situation summary (1 March 2024)

The regional thresholds for cumulative rainfall over the last 90 and 30 days are shown in the plots below.

During December-February (top plot), seriously or very dry conditions affected parts of FSM, southern Marshall Islands, PNG, eastern Solomon Islands, New Caledonia, northern Fiji, southern Cook Islands, Austral Islands, eastern Tuamotu archipelago, and Marquesas.

During February (bottom plot), seriously or very dry conditions affected parts of the Northern Marianas, FSM, PNG, Solomon Islands, southern Tonga, and Marquesas.





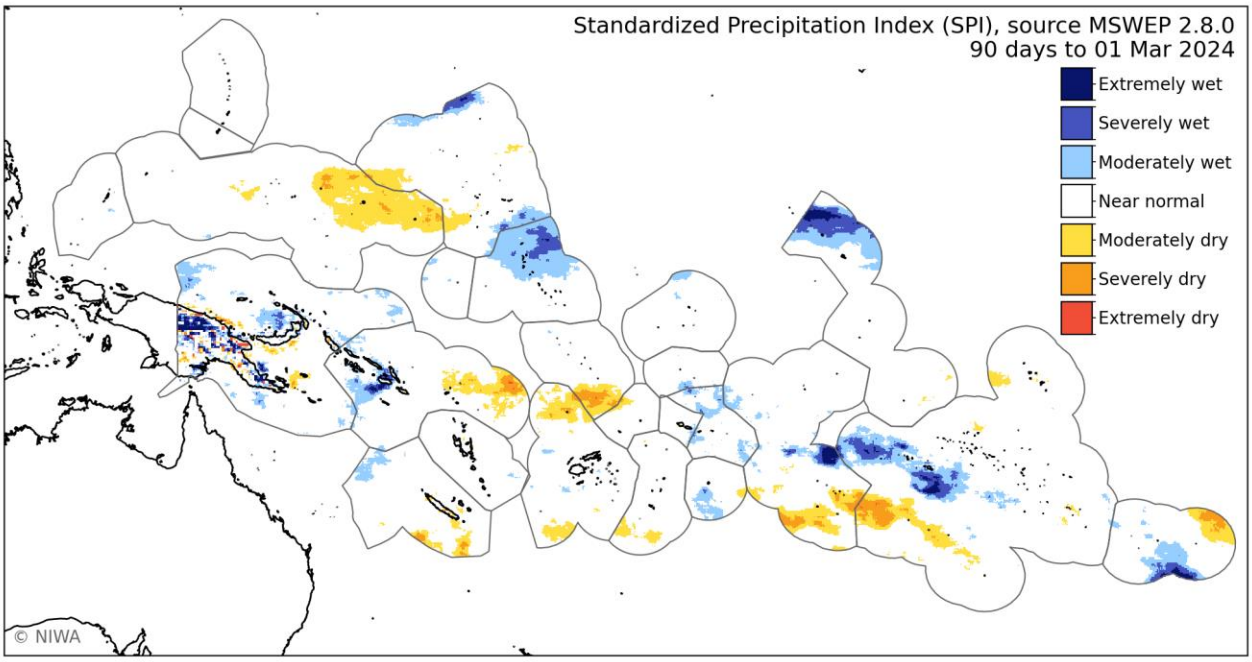
Island Climate Update
Water Stress Watch

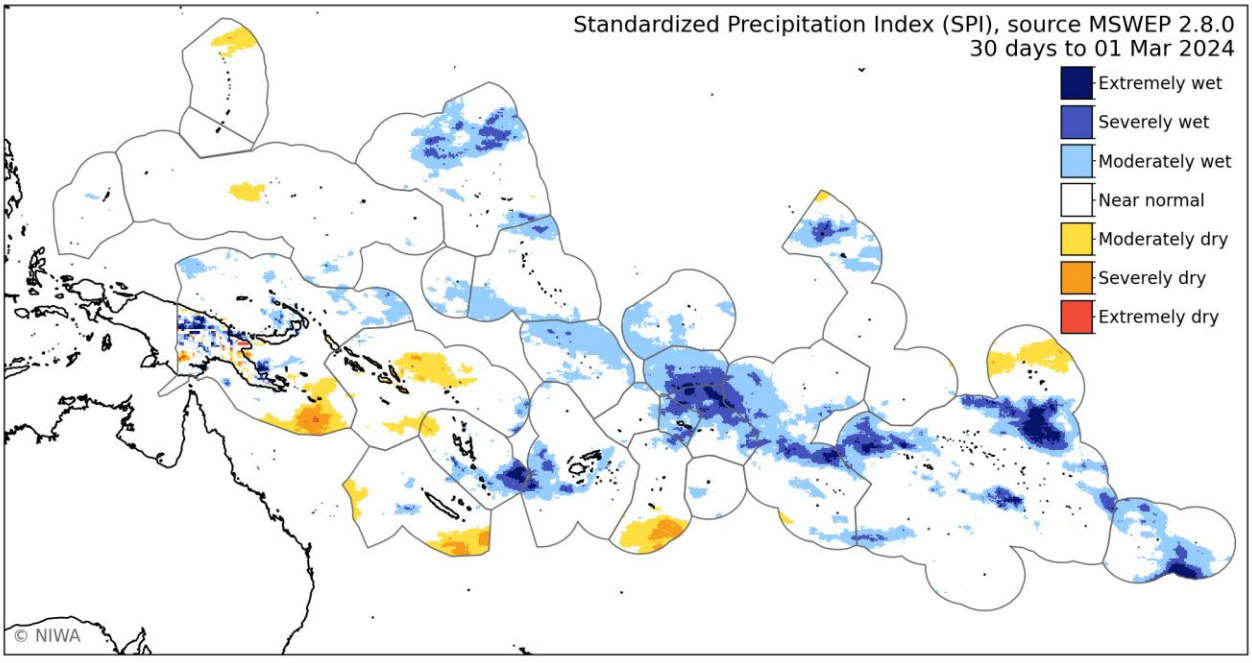
SPI Regional situation summary (1 March 2024)

The Standardized Precipitation Index (SPI) thresholds for cumulative rainfall over the last 90 and 30 days are shown in the plots below.

During December-February (top plot), extremely or severely dry conditions occurred in parts of PNG, northern Fiji, Tuvalu, southern Cook Islands, and Austral Islands.

During February (bottom plot), extremely or severely dry conditions occurred in parts of PNG and the Solomon Islands.





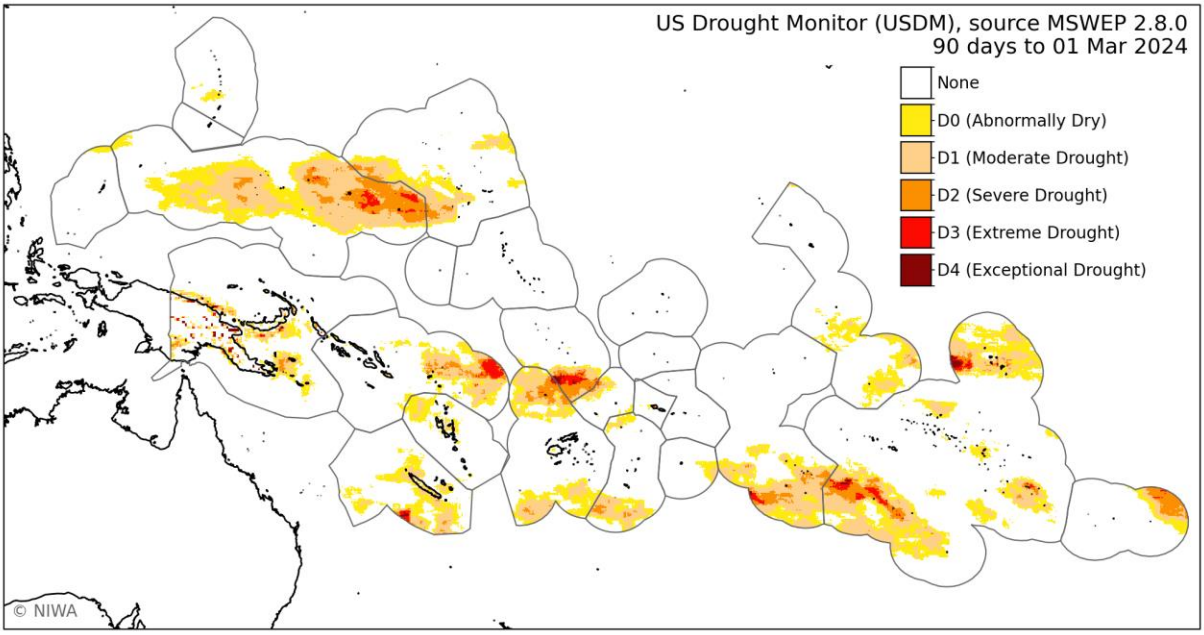
Island Climate Update
Water Stress Watch

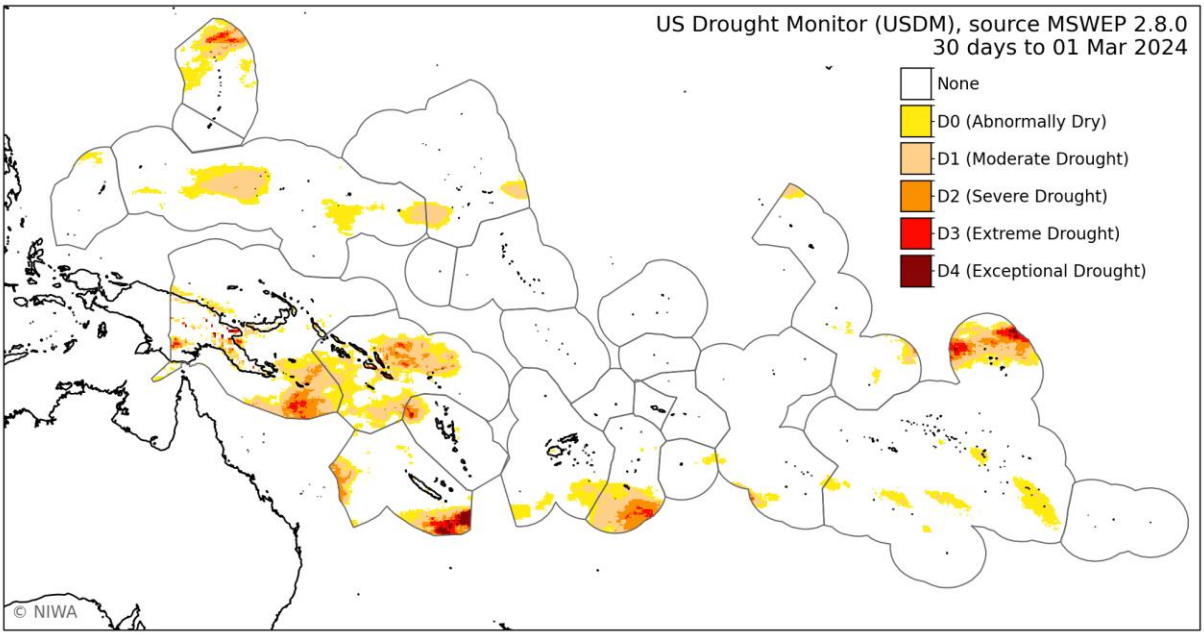
USDM Regional situation summary (1 March 2024)

The US Drought Monitor Index (USDM) levels for cumulative rainfall over the last 90 and 30 days are shown in the plots below.

During December-February (top plot), extreme or exceptional drought occurred in parts of FSM, PNG, Austral Islands, eastern Tuamotu archipelago, and Marquesas.

During February (bottom plot), extreme or exceptional drought occurred in parts of PNG, Solomon Islands, and Marquesas.





Island Climate Update
Water Stress Outlook

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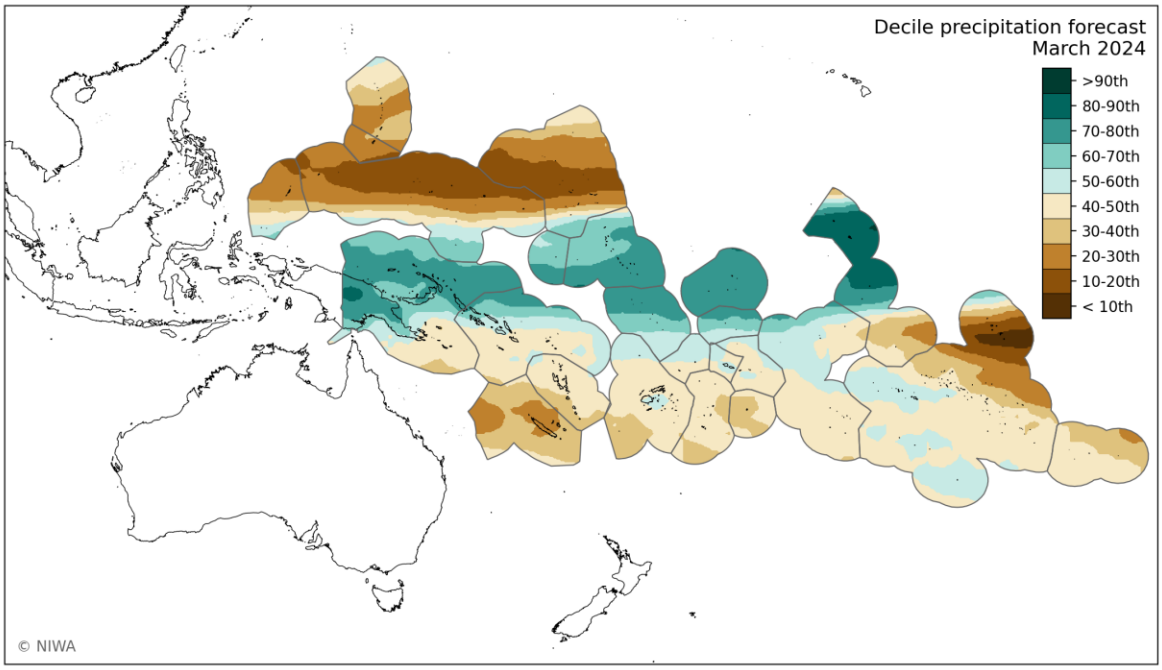
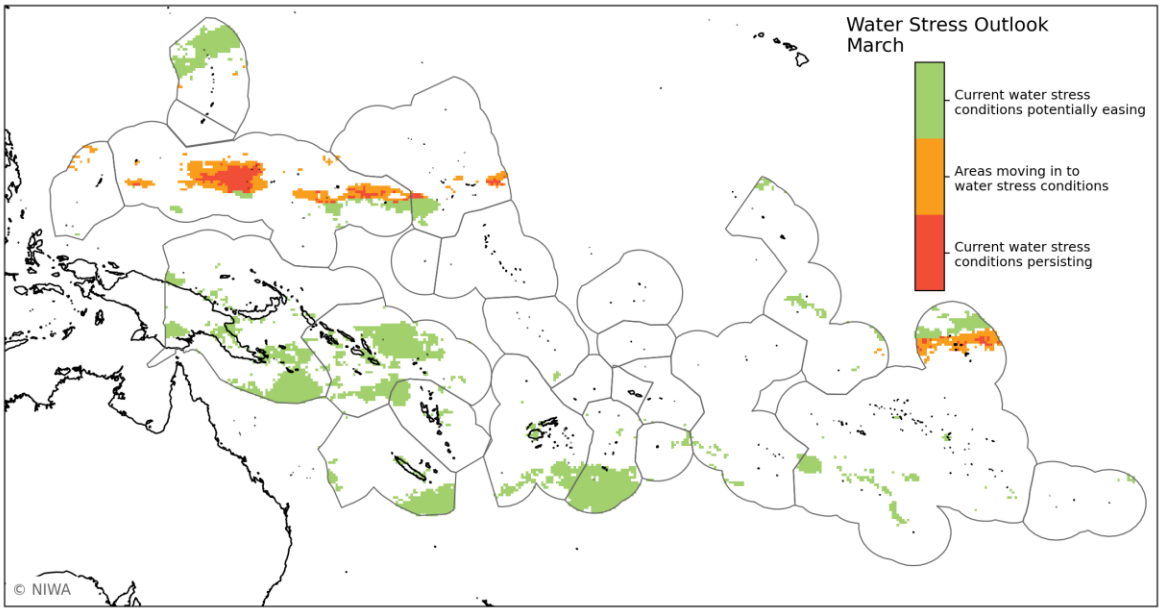
March 2024 forecast summary

During March, below normal rainfall is favoured in Palau, Guam, Northern Marianas, FSM, Marshall Islands, southern PNG, southern Solomon Islands, New Caledonia, Vanuatu, Fiji, Wallis & Futuna, American Samoa, Tonga, Niue, southern Cook Islands, Austral Islands, Marquesas, Tuamotu Archipelago, and Pitcairn Islands.

Above normal rainfall is favoured in much of PNG, northern Solomon Islands, Nauru, Kiribati, Tuvalu, Tokelau, northern Cook Islands, and Society Islands.

Water stress conditions may persist or develop in parts of FSM, Marshall Islands, and Marquesas.





Island Climate Update
Water Stress Outlook

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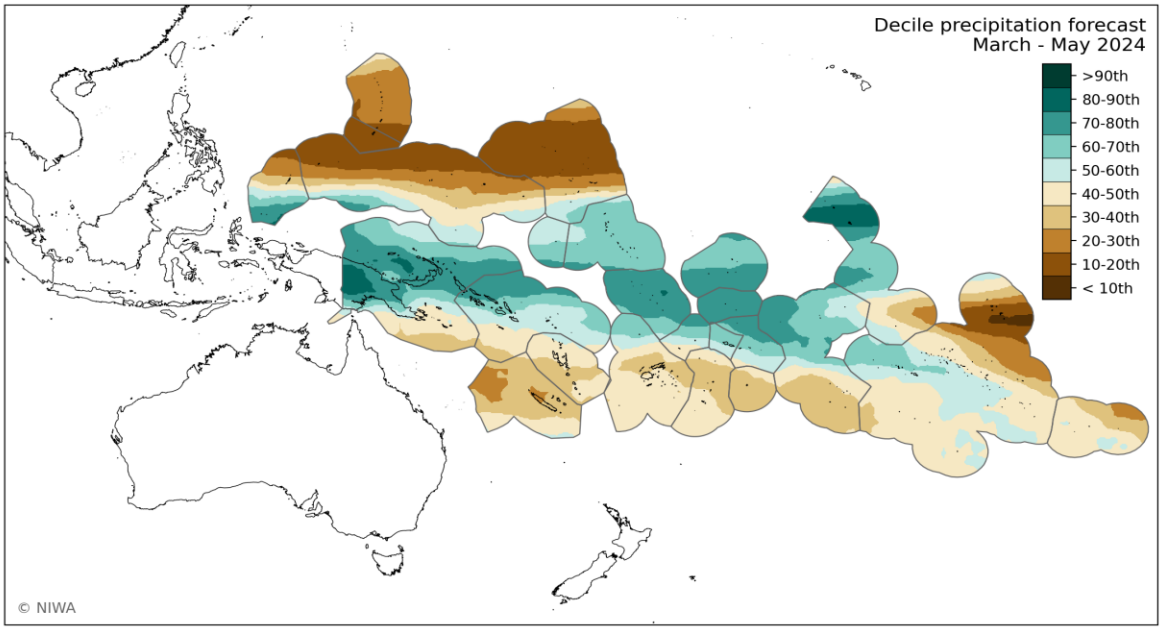
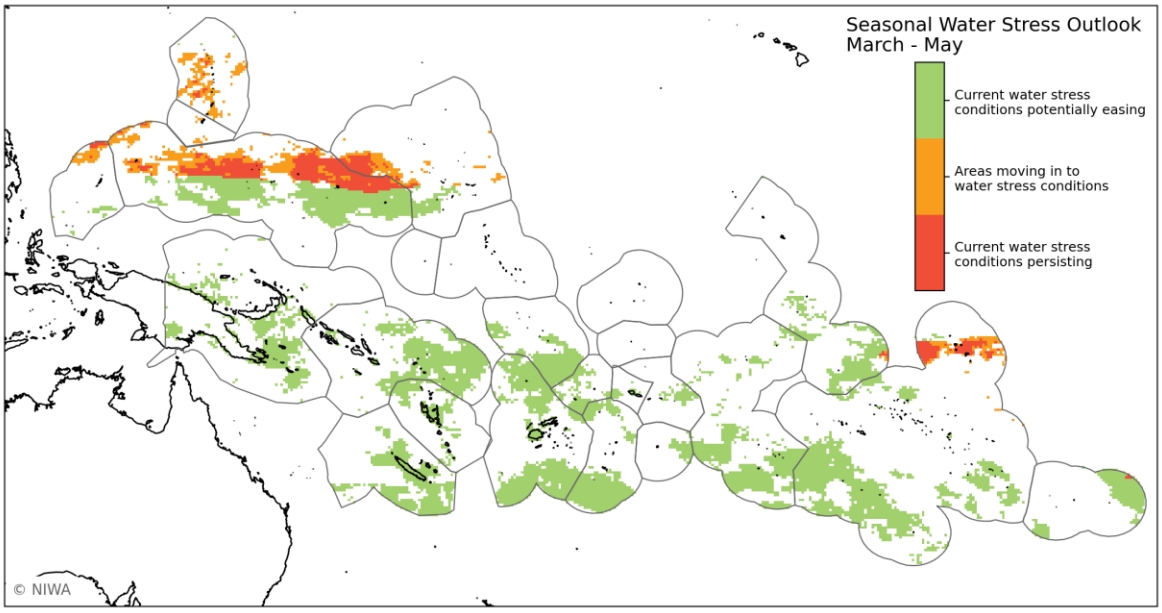
March-May 2024 forecast summary

During March-May, below normal rainfall is favoured in Palau, Guam, Northern Marianas, FSM, Marshall Islands, far southern PNG, New Caledonia, Vanuatu, Fiji, Tonga, Niue, southern Cook Islands, Austral Islands, Marquesas, northern Tuamotu Archipelago, and Pitcairn Islands.

Above normal rainfall is favoured in southern Palau, southern FSM, southern Marshall Islands, much of PNG and the Solomon Islands, Nauru, Kiribati, Tuvalu, Tokelau, northern Fiji, northern Wallis & Futuna, Samoa, American Samoan, northern Cook Islands, Society Islands, Austral Islands, and southern Tuamotu Archipelago.

Water stress conditions may persist or develop in parts of FSM, Guam, Northern Marianas, and Marquesas.





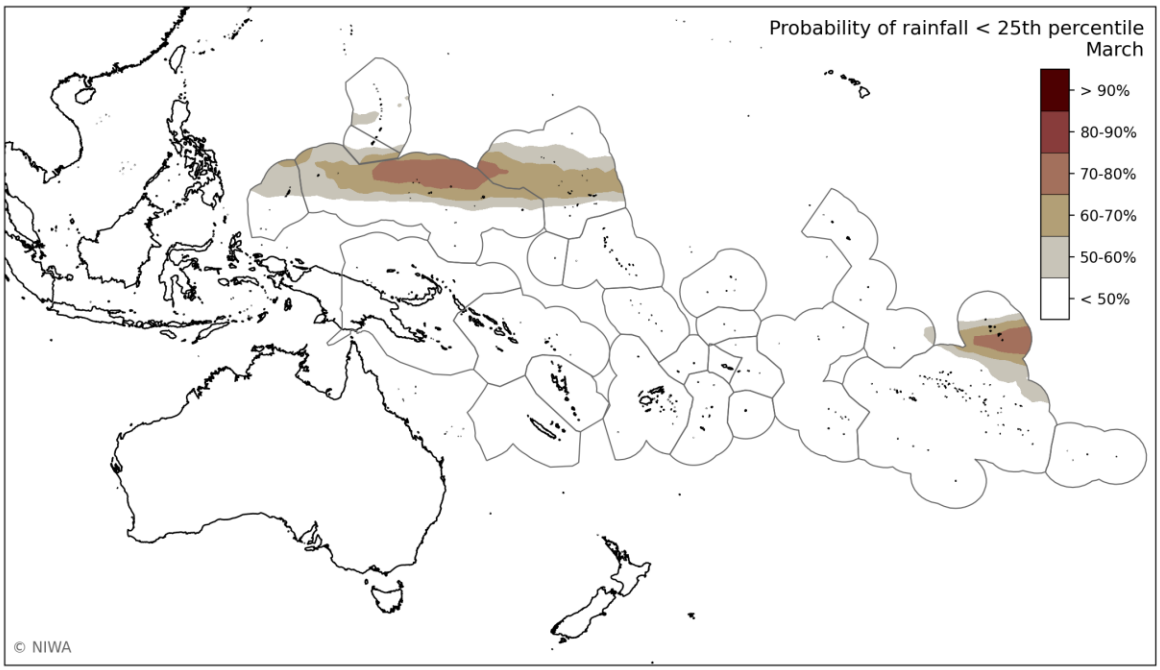
Island Climate Update
Water Stress Outlook

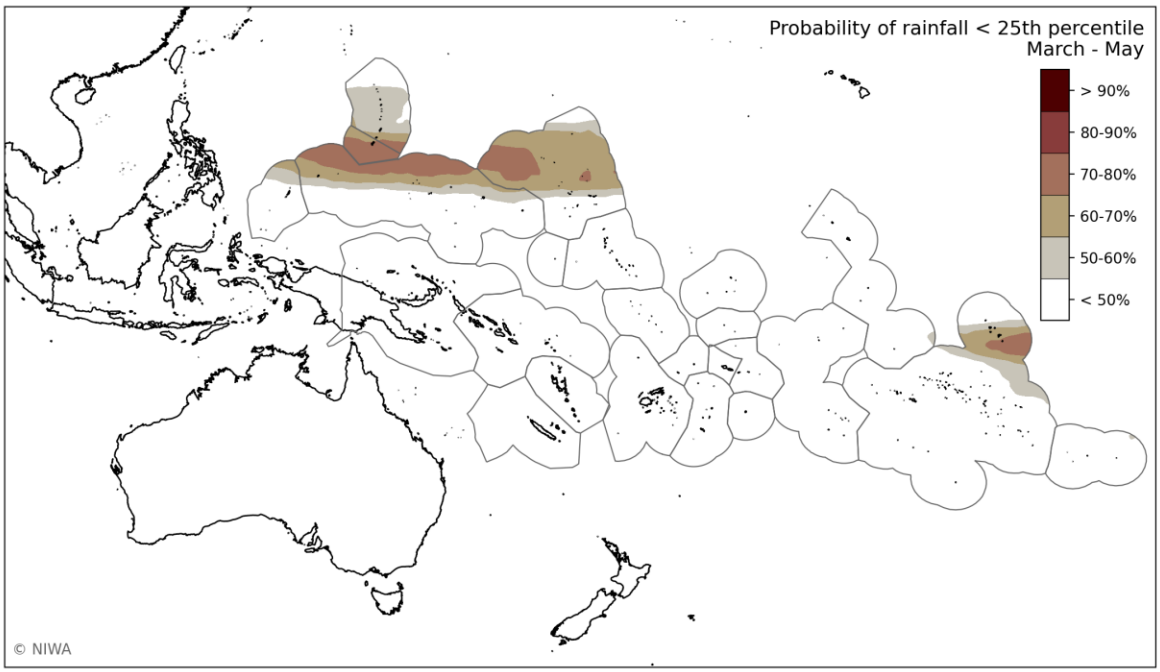
Probabilities of rainfall < 25th percentile

The probability (likelihood) of very dry conditions with cumulative rainfall being less than the 25th percentile for March (top plot) and for the season March-May (bottom plot) are shown.

For March, the highest chances for very dry conditions are across parts of Palau, FSM, Marshall Islands, and Marquesas.

For March-May, the highest chances for very dry conditions are across the Northern Marianas, Guam, parts of FSM and Marshall Islands, and Marquesas.





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About

Understanding the Island Climate Update bulletin

The ICU utilises rainfall data from the Multi-Source Weighted-Ensemble Precipitation (MSWEP) and a multi-model ensemble forecast utilising 550+ members derived from nine global climate models available from the Copernicus Data Store.

Bulletin page	Description
Rainfall watch	Rainfall plots are derived from MSWEP data. Regional rainfall accumulation is shown for the last 30 days (1 month) and 90 days (3 months).
Water stress watch	Plots are derived from MSWEP data. Different Pacific Island Meteorological Services use different approaches to defining drought and water stress. Hence current regional water stress classifications are shown for the Early Action Rainfall (Page 3), Standard Precipitation Index (Page 4) and US Drought Monitoring (Page 5) alert levels for the last 90 and 30 days of accumulated rainfall.
Water stress outlook	Outlook water stress classifications are based on both the satellite rainfall data and a multi-model ensemble forecast derived from nine global climate models for the next month and three months. The top plots on each page show the rainfall decile band for the next 1 and 3 months for which the cumulative probability derived from the multi-model ensemble forecasts reaches 50%. The bottom plots bring together conditions over the past 3 months and forecast conditions over the next month: • Current water stress conditions potentially easing: Past 3 month accumulation less than 25th percentile. 1 month / seasonal accumulation forecast greater than 25th percentile. • Areas moving in to water stress: Past 3 month accumulation between the 40th and 25th percentile. 1 month / seasonal accumulation forecast less than 25th percentile. • Current water stress conditions persisting: Past 3 month accumulation less than 25th percentile. 1 month / seasonal accumulation forecast less than 25th percentile. The final page shows the probability that forecast rainfall over the next 1 or 3 months is within the lowest 25% of cumulative rainfall over the same period (a measure of the confidence in a low rainfall forecast).
Online Resources	**Additional regional and country-level resources are available online**: • Daily updated plots for 30, 60, 90, 180 and 365 day: accumulative rainfall, number of dry days, number of days since last rainfall > 1 mm, EAR, SPI and USDM indices. • A range of probabilistic one to five monthly and seasonal forecast plots updated around the 11th of each month. • Click here for the imagery and here for the underlying data.

WMO

NIWA is the Network co-lead for the WMO RA V Regional Climate Centre Node on Long Range Forecast and consortium member for nodes on Climate Monitoring, Operational Data Services and Training.

Development and production of the ICU is supported by NIWA Strategic Science Investment Funding under contract PRAS2401.

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