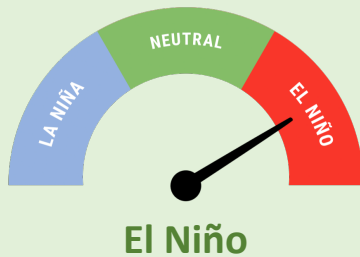


Island Climate Update



ENSO Watch
November 2023

Recent



El Niño continued during October and will likely intensify during the next three months.

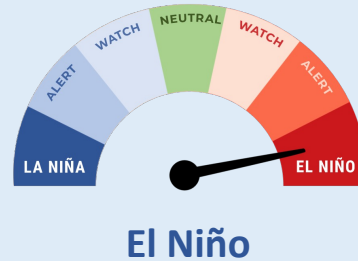
The Southern Oscillation Index (SOI) was -0.9 from August-October, near the El Niño threshold.

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

100% chance for El Niño conditions to continue through **January 2024**

Chance for El Niño conditions persisting during **February-April 2024**

90%



Forecast

ENSO situation summary

El Niño continued during October and will likely intensify during the next three months. El Niño has around a 100% chance of persisting during through January 2024.

The monthly NINO3.4 Index anomaly (in the central equatorial Pacific) at the end of October was +1.60°C, within the range of a strong El Niño (classified when the NINO3.4 Index is greater than 1.5°C). The October 2023 NINO3.4 Index is exceeded by 2015, 1997, and 1982 with data back to 1981. From an oceanic perspective, this El Niño continues to rank with the most significant events in recent decades.

The Southern Oscillation Index (SOI) was near the El Niño threshold from August-October (-0.9) but on the El Niño side of neutral territory during October (-0.4), suggestive of an El Niño event that is displaying unusual atmospheric tendencies, which is unusual considering its oceanic strength.

Trade wind strength was below or well below

normal in the Pacific during October, particularly just north of the equator. In parts of the region, this qualified as a Westerly Wind Burst (WWB). This WWB will be responsible for the eastward propagation of warm sea water along the equator through the end of the year, via an oceanic Kelvin Wave.

In the sub-surface eastern equatorial Pacific Ocean, anomalies of +3°C to +6°C were occurring in the upper 100 metres in the east as of late October. A new area of anomalies greater than 3°C developed in the west-central equatorial Pacific during the month, in response to a downwelling oceanic Kelvin Wave. This will transfer ocean heat eastward on the time horizon of the next 1-2 months, lending credence to the models that suggest a peak El Niño strength in early 2024.

The associated abnormally warm water, sitting near and north of both Vanuatu and Fiji, may be a common genesis zone for tropical cyclone activity in the months ahead. Extra vigilance around early tropical cyclone activity is encouraged.

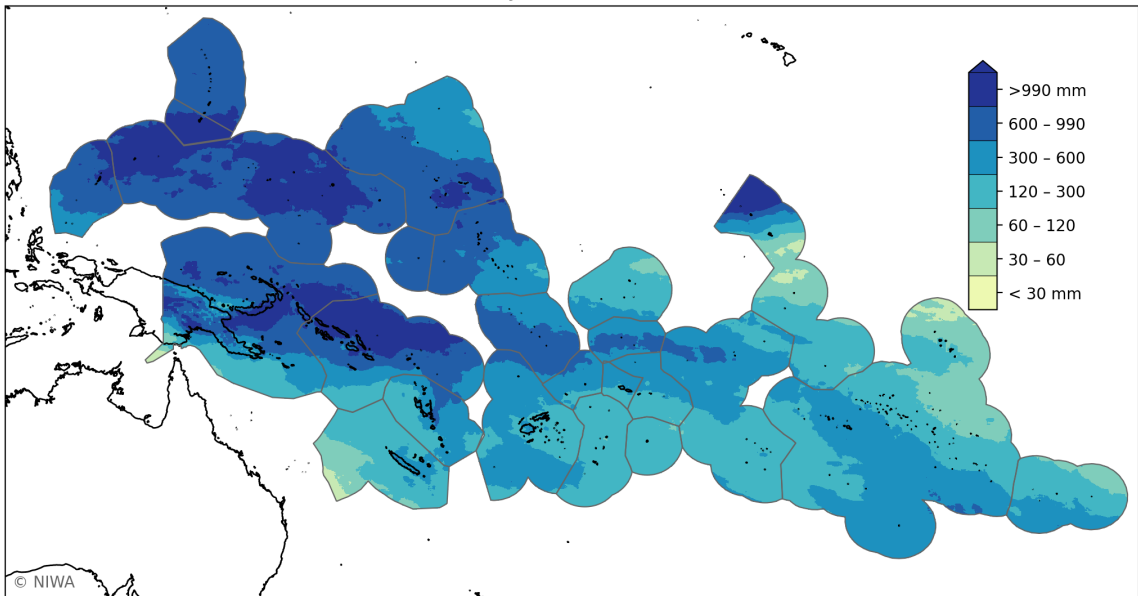
Regional situation summary (1 November 2023)

Satellite-derived rainfall summaries for the last month and three months are shown below.

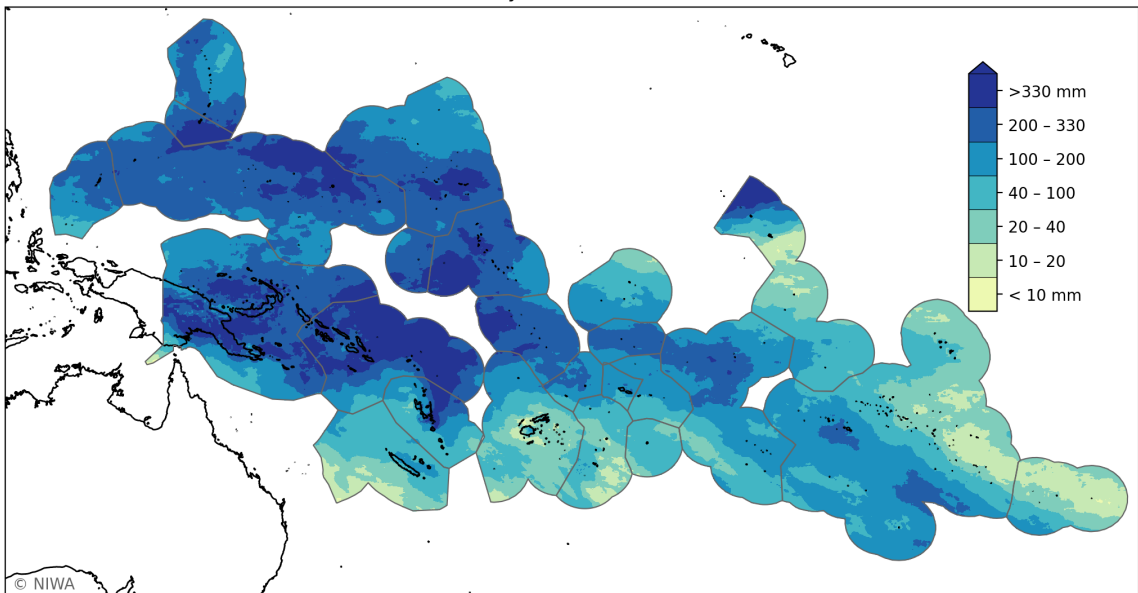
During August-October (top plot), over 990 mm of rain fell across parts of Palau, Federated States of Micronesia (FSM), Guam, parts of the Marshall Islands, parts of Papua New Guinea (PNG), the northern Solomon Islands, and the northern Line Islands.

During October (bottom plot), less than 40 mm of rain fell in parts of Fiji, Tonga, and the eastern Tuamotu Archipelago. Over 330 mm fell across Guam, parts of FSM, parts of the Marshall Islands, northern Gilbert Islands, PNG, the Solomon Islands, Tuvalu, and the northern Line Islands.

Cumulative rainfall (mm), source: MSWEP 2.8.0
90 days to 01 Nov 2023



Cumulative rainfall (mm), source: MSWEP 2.8.0
30 days to 01 Nov 2023

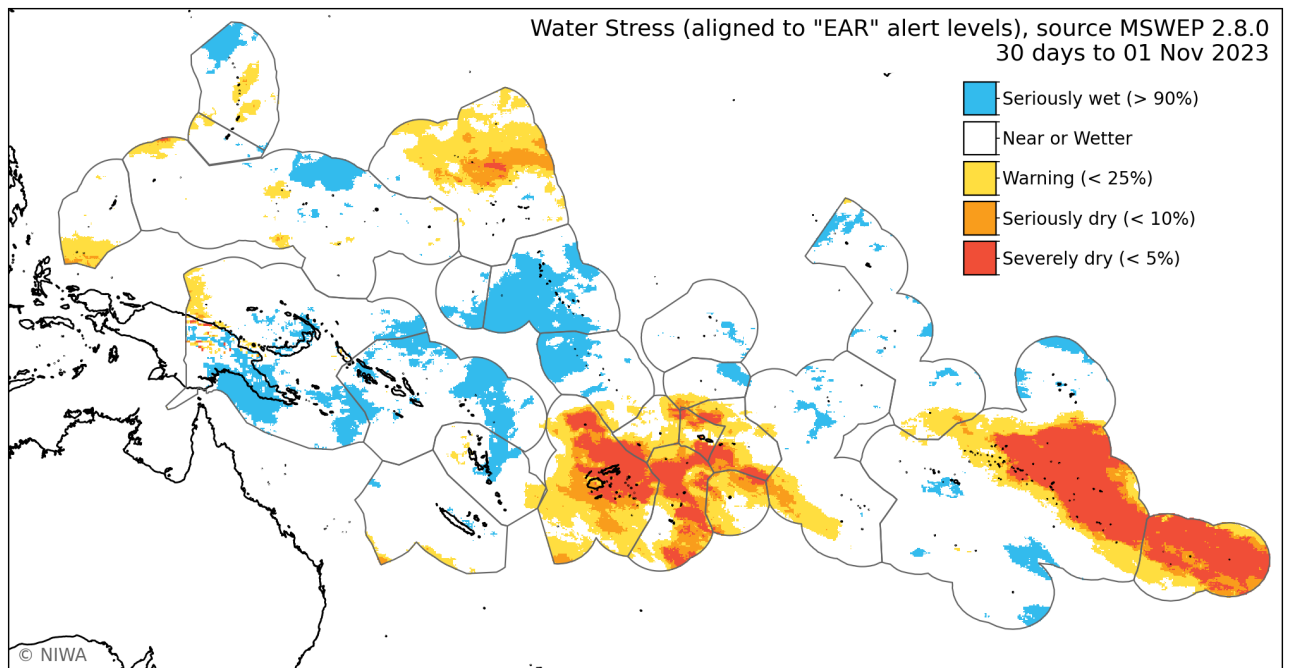
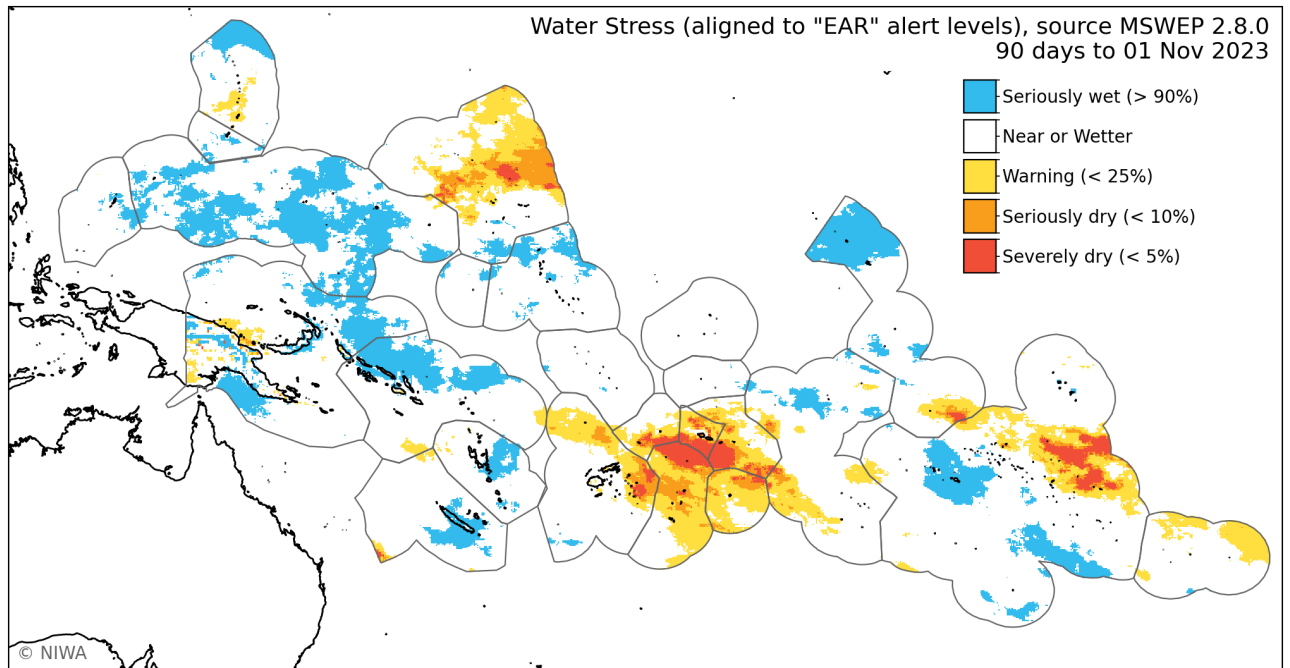


EAR regional situation summary (1 November 2023)

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

During August-October (top plot), severely or seriously dry conditions affected parts of the Marshall Islands, eastern Fiji, Tonga, Wallis & Futuna, Samoa, American Samoa, and northern Tuamotu Archipelago.

During October (bottom plot), severely or seriously dry conditions affected the Marshall Islands, pockets of western PNG, Fiji, Tonga, Wallis & Futuna, Samoa, American Samoa, Tuamotu Archipelago, and Pitcairn Islands.

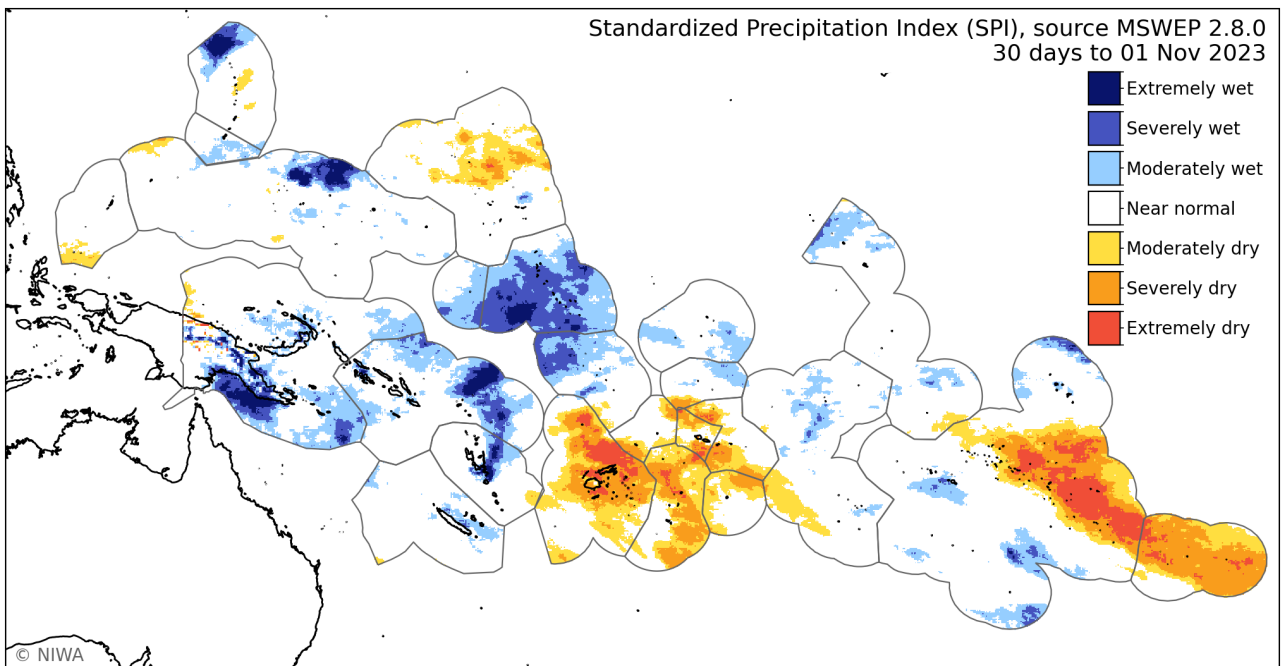
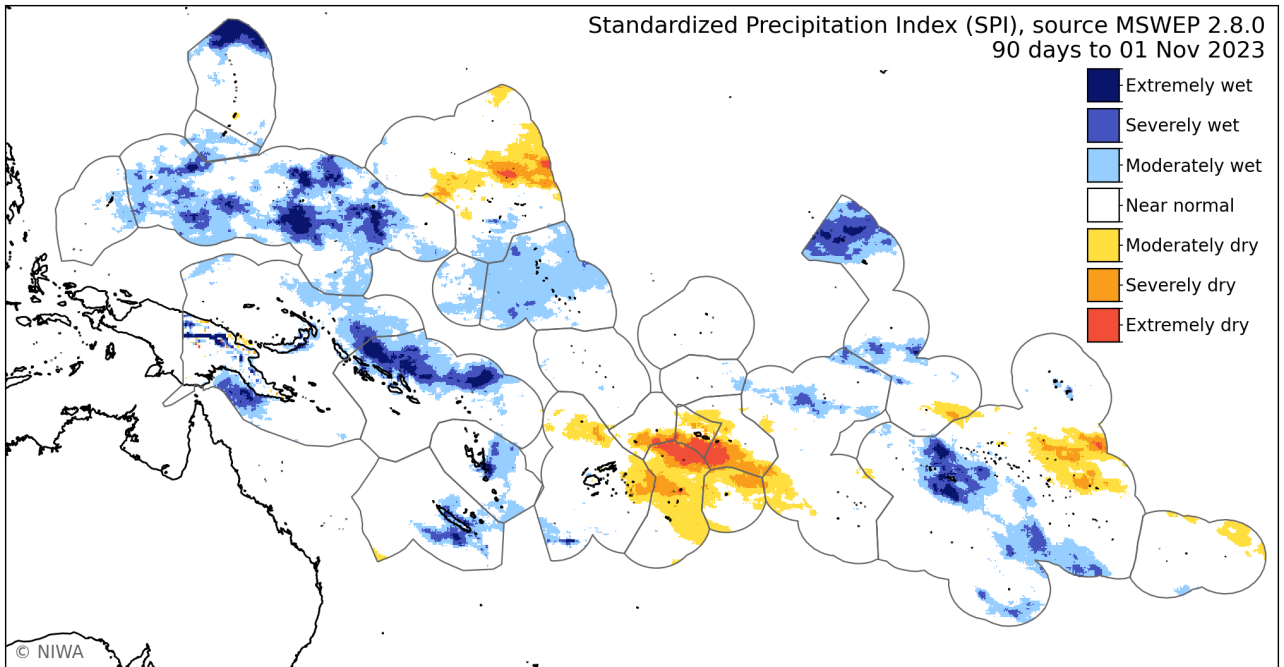


SPI Regional situation summary (1 November 2023)

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

During August-October (top plot), extremely or severely dry conditions occurred in parts of the Marshall Islands, eastern Fiji, Tonga, Wallis & Futuna, Samoa, American Samoa, and parts of the northern Tuamotu Archipelago.

During October (bottom plot), extremely or severely dry conditions occurred in parts of the Marshall Islands, pockets of western PNG, Fiji, Tonga, Wallis & Futuna, American Samoa, Tuamotu Archipelago, and Pitcairn Islands.

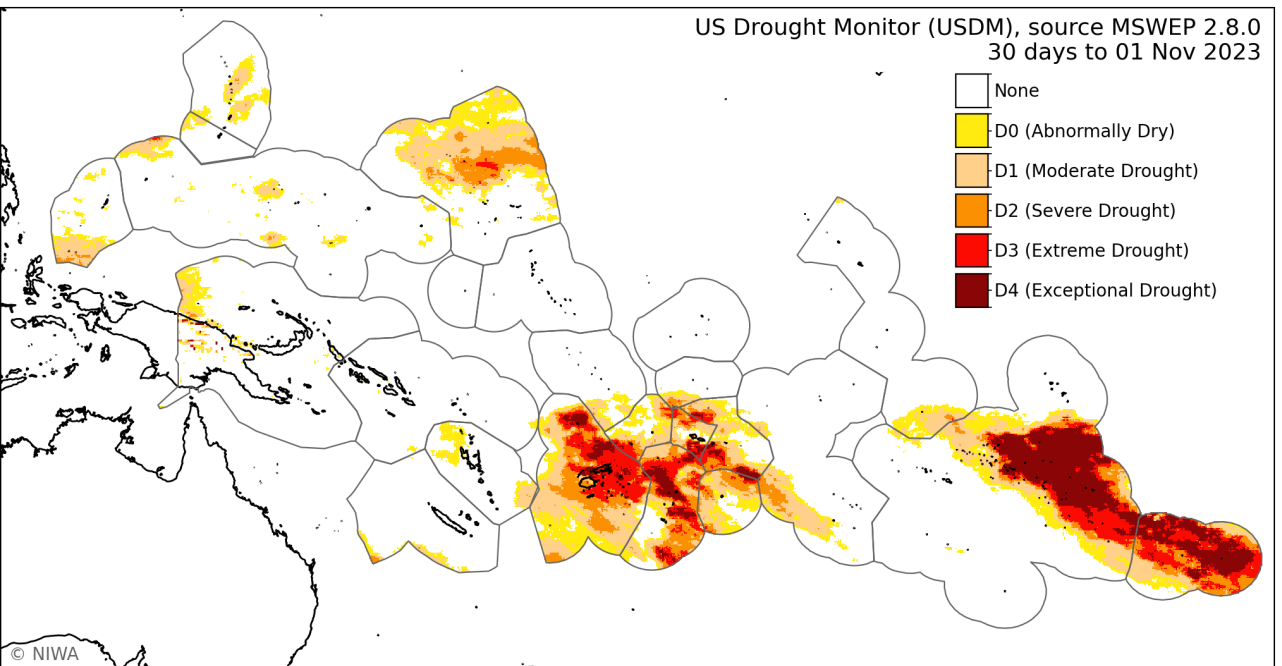
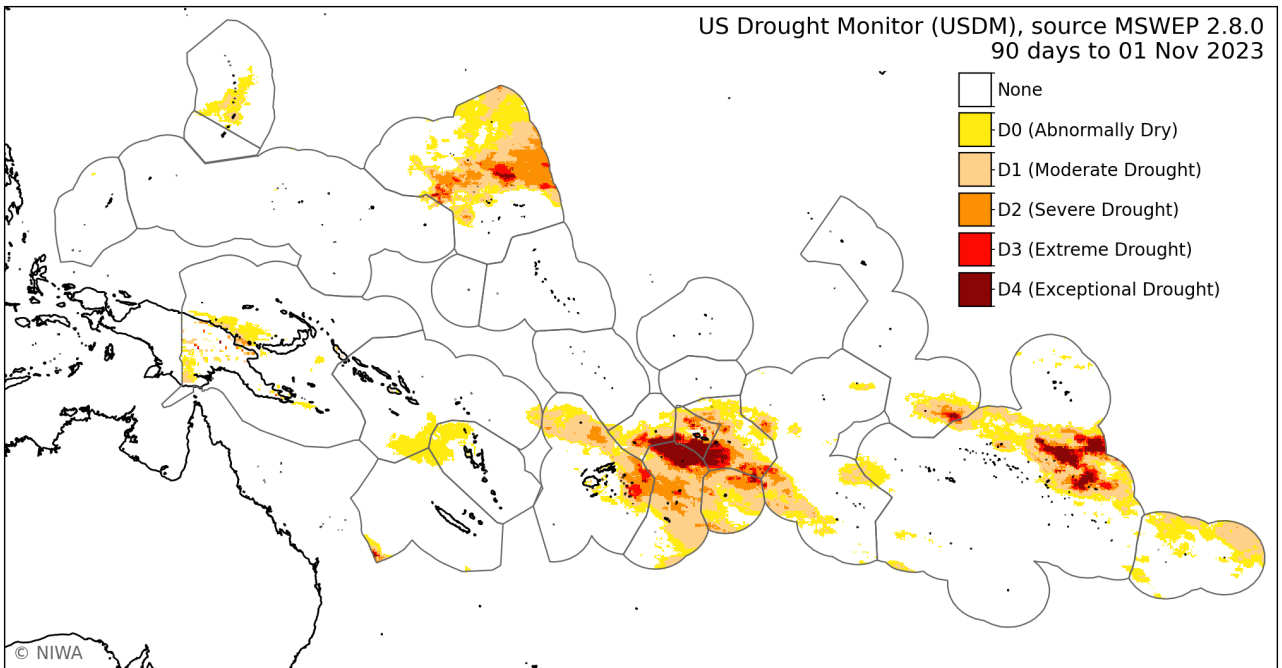


USDM Regional situation summary (1 November 2023)

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

During August-October (top plot), extreme or exceptional drought occurred in parts of the Marshall Islands, eastern Fiji, Tonga, Wallis & Futuna, Samoa, American Samoa, and northern Tuamotu Archipelago.

During October (bottom plot), extreme or exceptional drought occurred in parts of Marshall Islands, Fiji, Wallis & Futuna, Tonga, Samoa, American Samoa, northern Tuamotu Archipelago, and Pitcairn Islands.

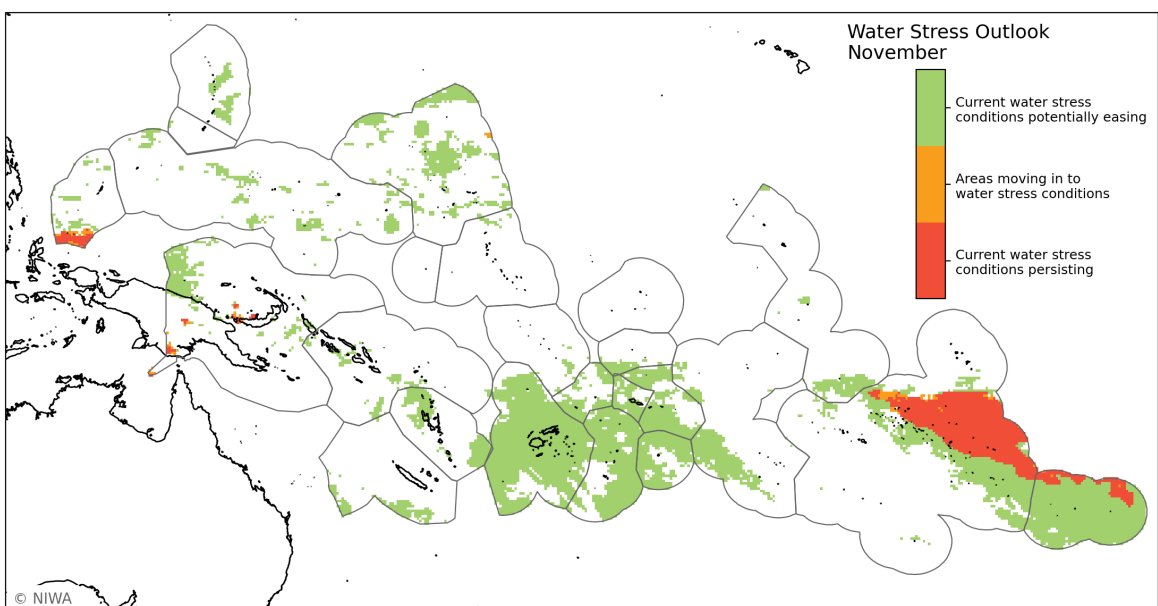
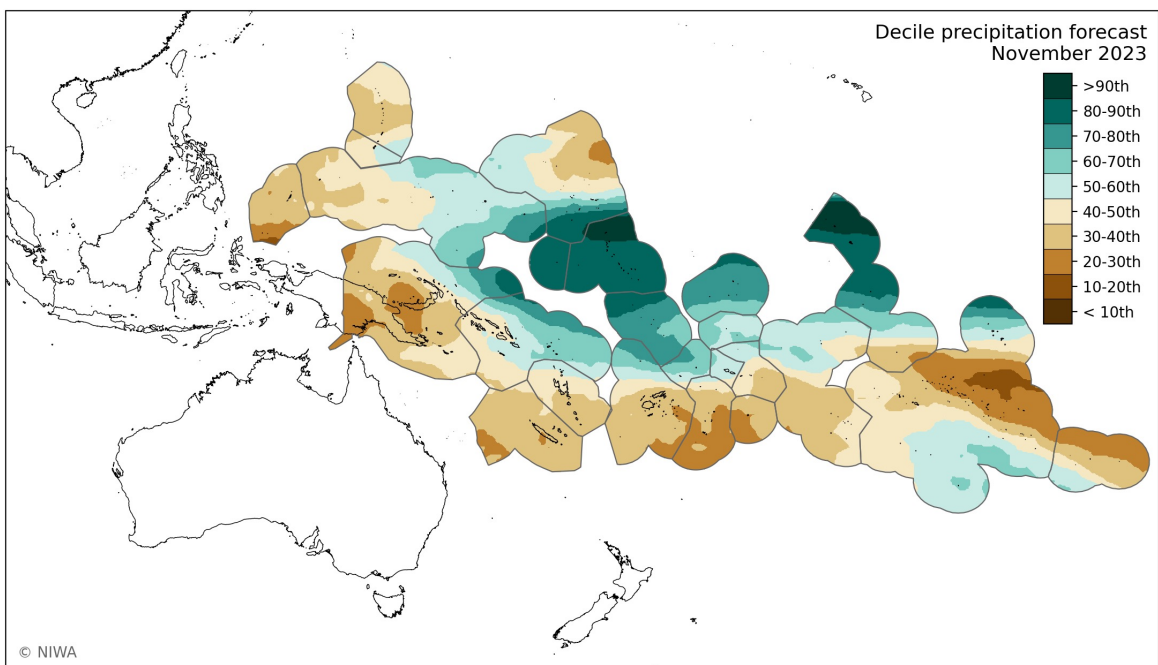


November 2023 forecast summary

During November, below normal rainfall is favoured in Northern Marianas, Palau, western FSM, parts of Marshall Islands, PNG, New Caledonia, Vanuatu, Fiji, Tonga, Niue, American Samoa, Southern Cook Islands, Society Islands, Tuamotu Archipelago, and Pitcairn Islands.

Above normal rainfall is favoured in eastern FSM, Nauru, most of Kiribati, Tuvalu, Tokelau, Wallis & Futuna, and the eastern Austral Islands.

Water stress conditions may persist or develop in parts of far southern Palau, Papua New Guinea (PNG), and Tuamotu Archipelago.

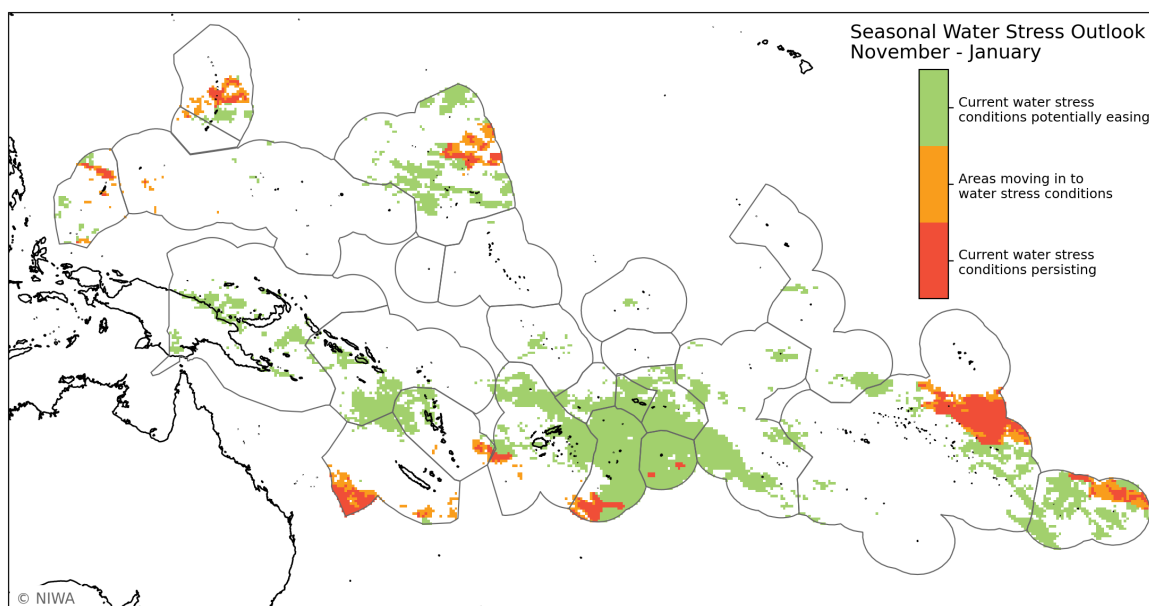
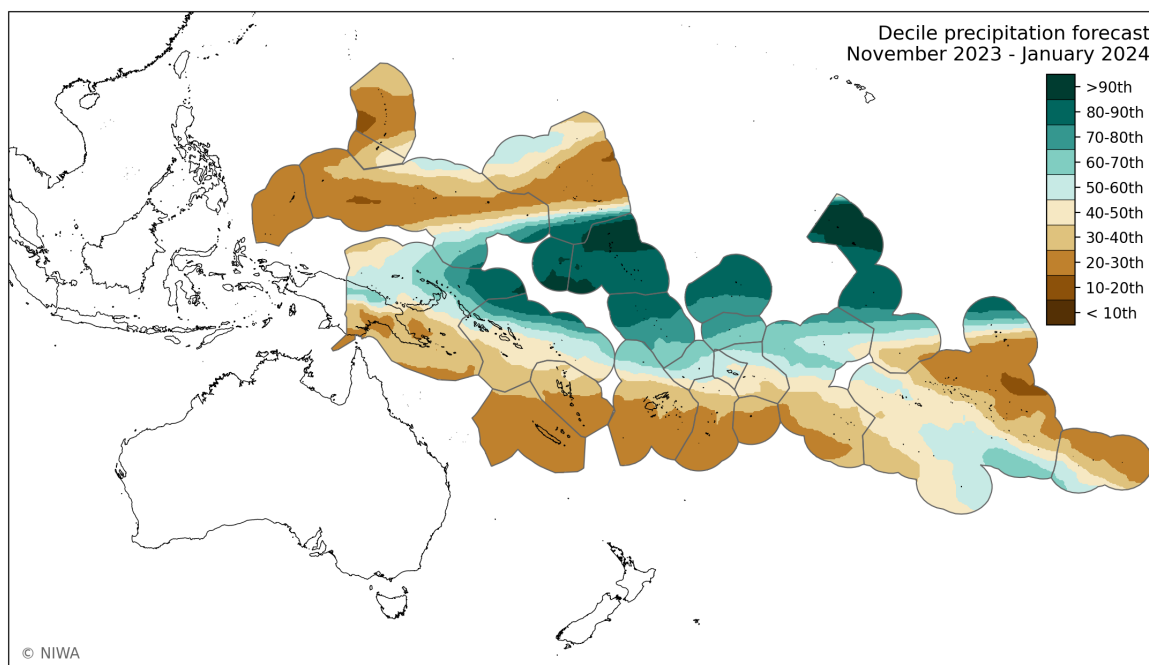


November 2023-January 2024 forecast summary

During November-January, below normal rainfall is favoured across Northern Marianas, Guam, Palau, most of FSM, northern Marshall Islands, southern PNG, New Caledonia, Vanuatu, Fiji, Tonga, Niue, Southern Cook Islands, southern Marquesas, northern and eastern Tuamotu Archipelago, and Pitcairn Islands.

Above normal rainfall is forecast in southern FSM, southern Marshall Islands, northern PNG, northern Solomon Islands, Nauru, Kiribati (Gilbert, Phoenix, and northern Line Islands), Tuvalu, Tokelau, Wallis & Futuna, Northern Cook Islands, and northern Marquesas.

Water stress conditions may persist or develop in parts of the Northern Marianas, Palau, Marshall Islands, and Tuamotu Archipelago.

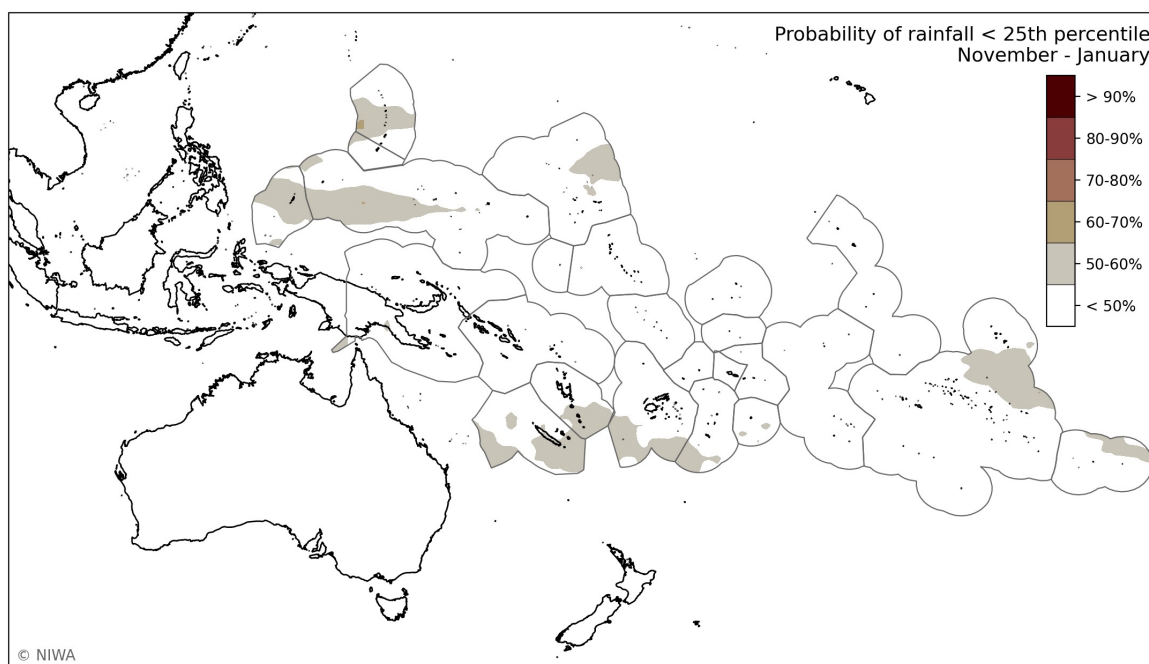
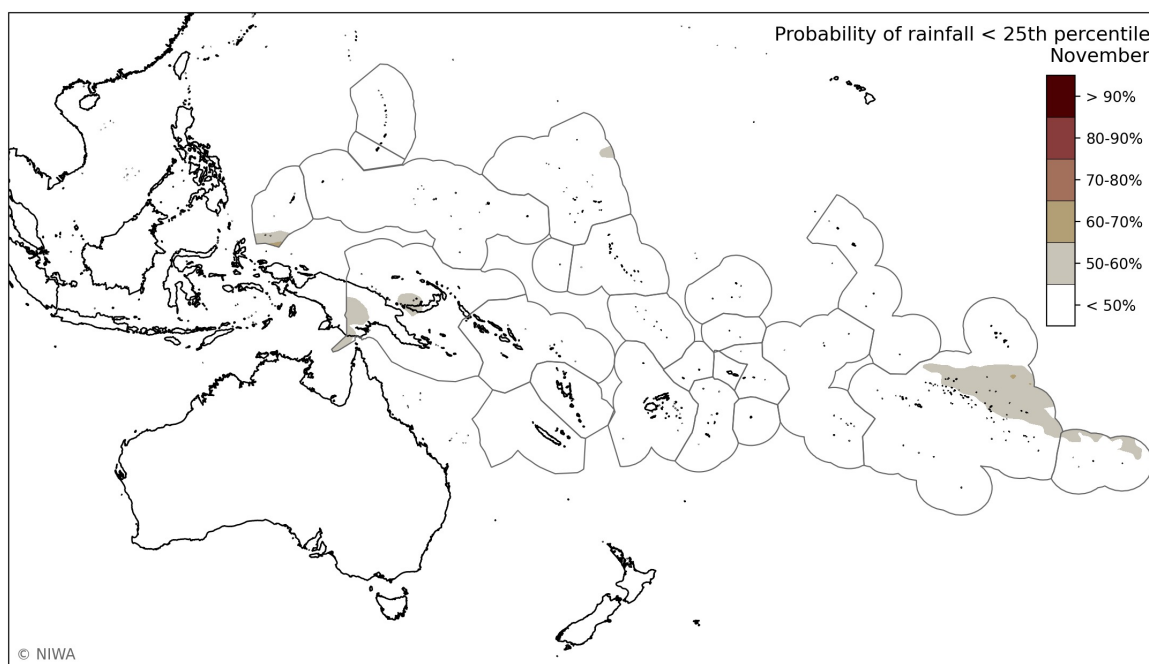


Probabilities of rainfall < 25th percentile

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

For November, the highest chances for very dry conditions are confined to portions of southern Palau, PNG and the Tuamotu Archipelago.

For November-January, very dry conditions may affect parts of the Northern Marianas, Palau, western FSM, pockets of PNG, New Caledonia, southern Vanuatu, parts of Fiji, parts of the Tuamotu Archipelago, and southern Marquesas.



Island Climate Update



About

Understanding the Island Climate Update bulletin

The ICU utilises satellite rainfall data from the [NASA GPM-IMERG](#) and a multi-model ensemble forecast utilising 550+ members derived from nine Global Climate Models available from the [Copernicus Climate Data Store](#).

Bulletin page	Description
Rainfall watch	Rainfall plots are derived from NASA GPM-IMERG satellite rainfall 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 NASA GPM-IMERG satellite rainfall 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	<p>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.</p> <p>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%.</p> <p>The bottom plots bring together conditions over the past 3 months and forecast conditions over the next month:</p> <ul style="list-style-type: none"> • 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. <p>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).</p>
<p>Online Resources</p>	<p>Additional regional and country-level resources are available online:</p> <ul style="list-style-type: none"> • 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. Click here for the imagery and here for the underlying data. • A range of probabilistic one to five monthly and seasonal forecast plots updated shortly after the 15th of each month. Imagery and data to be made available soon.



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.

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