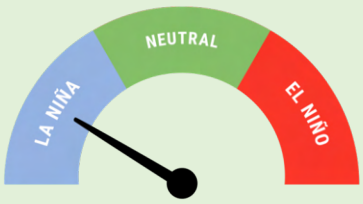
Island Climate Update

NIWA
Taihoro Nukurangi

ENSO Watch
November 2022

Recent



La Niña

Moderate La Niña conditions continued in the equatorial Pacific during October.

Both sea surface temperatures (SSTs) and the Southern Oscillation Index (SOI) were in the La Niña range.

Trade winds were much stronger than normal during October, maintaining a moderate La Niña strength.

Forecast

85% chance for **La Niña** conditions during **November 2022 – January 2023.**

Chance for **ENSO Neutral** conditions during **February-April 2023** **60%**

La Niña Event

ENSO situation summary

The NINO3.4 Index anomaly (in the central equatorial Pacific) over the last month was -0.80˚C (climatology: 1991-2020), in the La Niña range for the third consecutive month.

The October monthly SOI was +1.8 and +1.6 from August-October (climatology: 1991-2020), both well within the La Niña range.

Trade winds were much stronger than normal across the central and western equatorial Pacific during October, maintaining a moderate La Niña strength.

In the subsurface central equatorial Pacific, October conditions mirrored those of September. Sub-surface anomalies of -3˚C to -5˚C spanned from just below the surface in the east to 150 m depth in the central. This was juxtaposed by a particularly strong West Pacific warm pool.

La Niña conditions are most likely to continue during November-January (85% chance). During February-April, ENSO neutral conditions are most likely (60% chance).

NIWA's analysis indicates that a moderate La Niña event is ongoing and is expected to last through the first half of summer with an easing possible during late summer and/or autumn. This is the first "triple dip" La Niña (three consecutive La Niña events from 2020-2022) since 1998-2000.

Island Climate Update

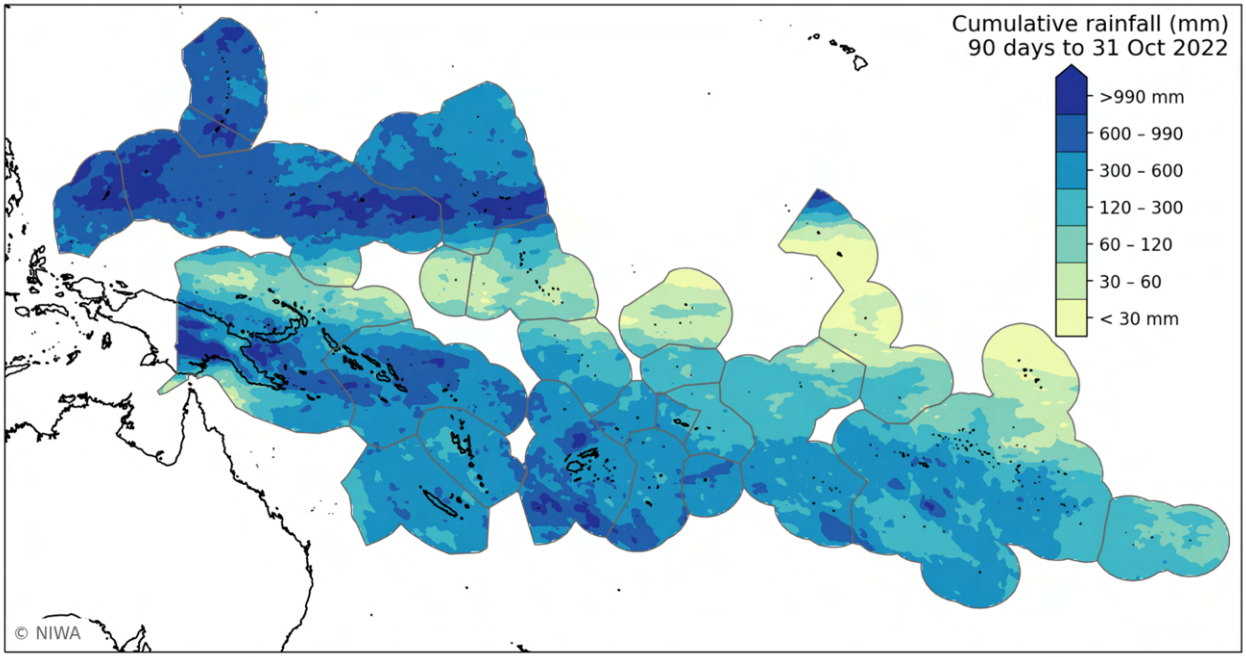
Rainfall Watch

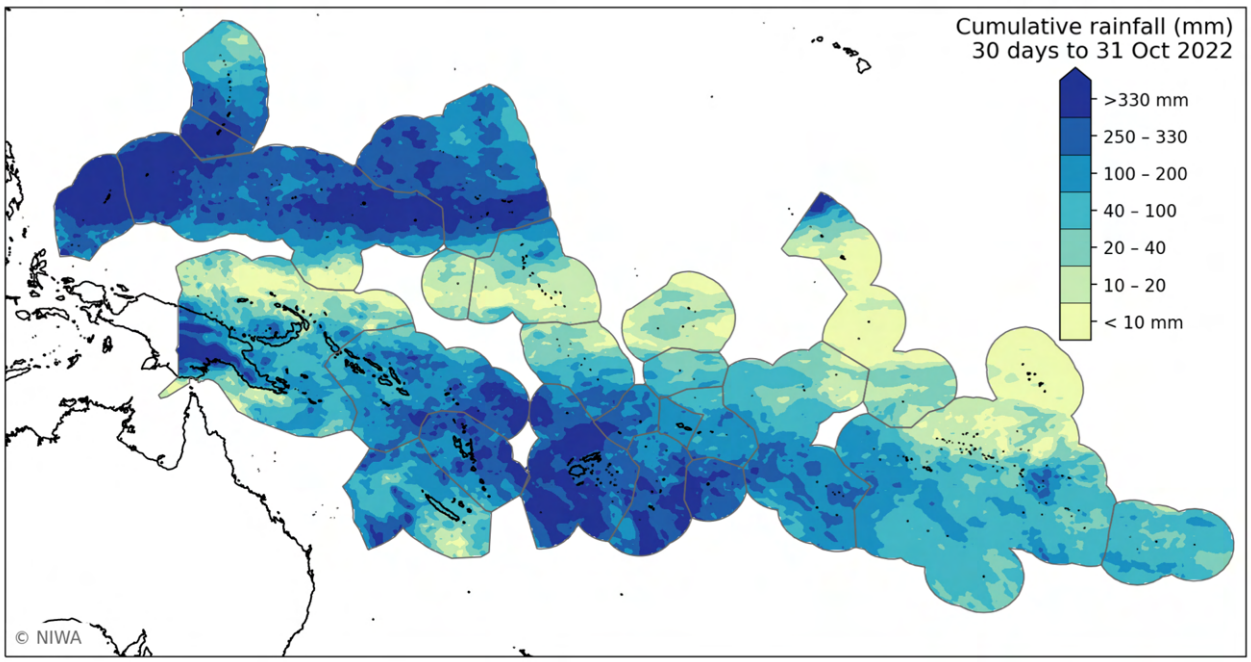
Regional situation summary (1 November 2022)

Rainfall estimates for the last month and three months are shown below. Low rainfall occurred around the equator with higher amounts in Micronesia and for island groups toward the sub-tropics.

During August-October (top plot), less than 60 mm of rainfall fell in parts of Nauru, Kiribati (Gilbert, Phoenix and Line Islands), and Marquesas. More than 600 mm of rainfall fell in Micronesia, as well as southern Papua New Guinea (PNG).

During October (bottom plot), less than 20 mm of rainfall fell in parts of northern PNG, southern Federated States of Micronesia (FSM), Nauru, Kiribati (Gilbert, Phoenix and Line Islands), Marquesas, northern Cook Islands, and northern Tuamotu Islands. Heavier totals of more than 330 mm occurred in Micronesia, southern PNG, Vanuatu, and Fiji.





Island Climate Update
Water Stress Watch

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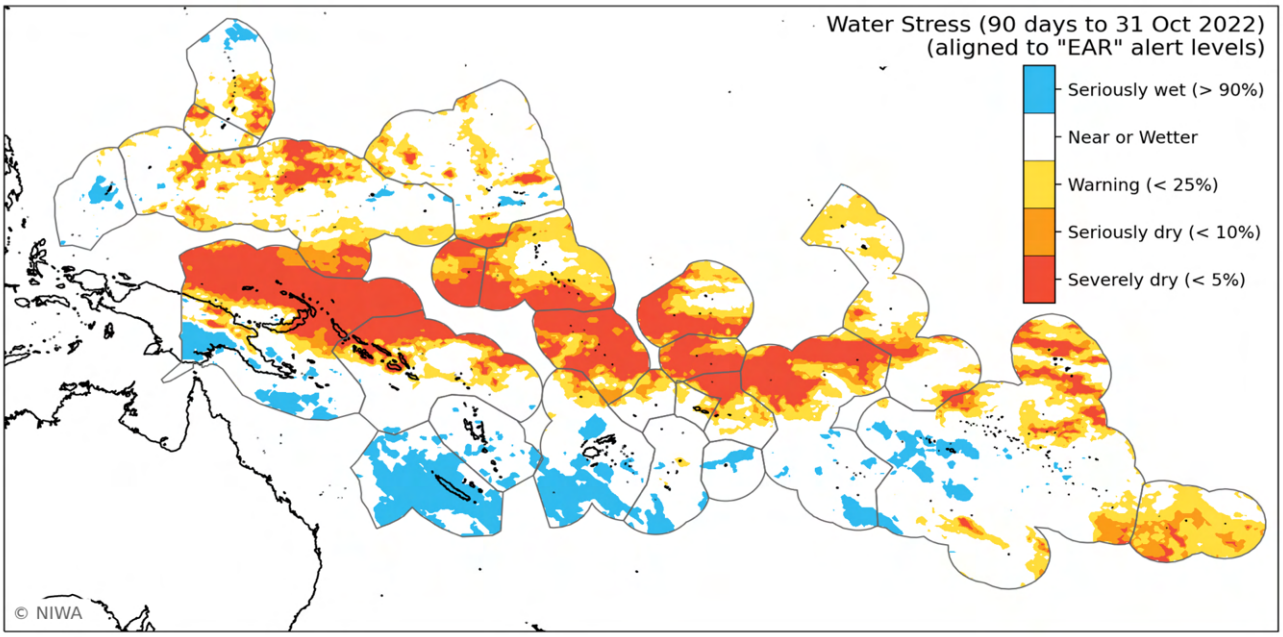
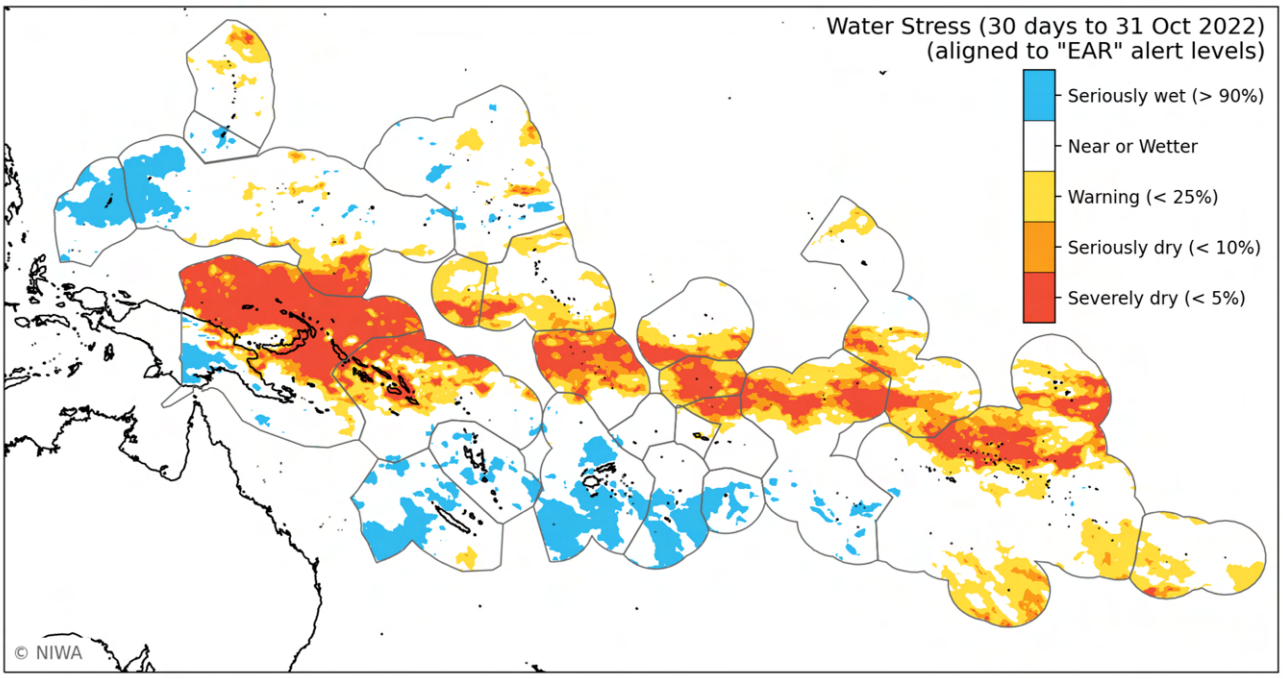
EAR regional situation summary (1 November 2022)

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 Marianas, parts of FSM, northern PNG, Solomon Islands, Nauru, Kiribati (Phoenix and Gilbert Islands), Tuvalu, Tokelau, Samoa, American Samoa, Northern Cook Islands, Marquesas, northern Tuamotu/Gambier Islands, and Pitcairn Islands.

During October (bottom plot), severely or seriously dry conditions occurred in many of the same island groups. Conditions were wetter than last month in Tonga.





Island Climate Update

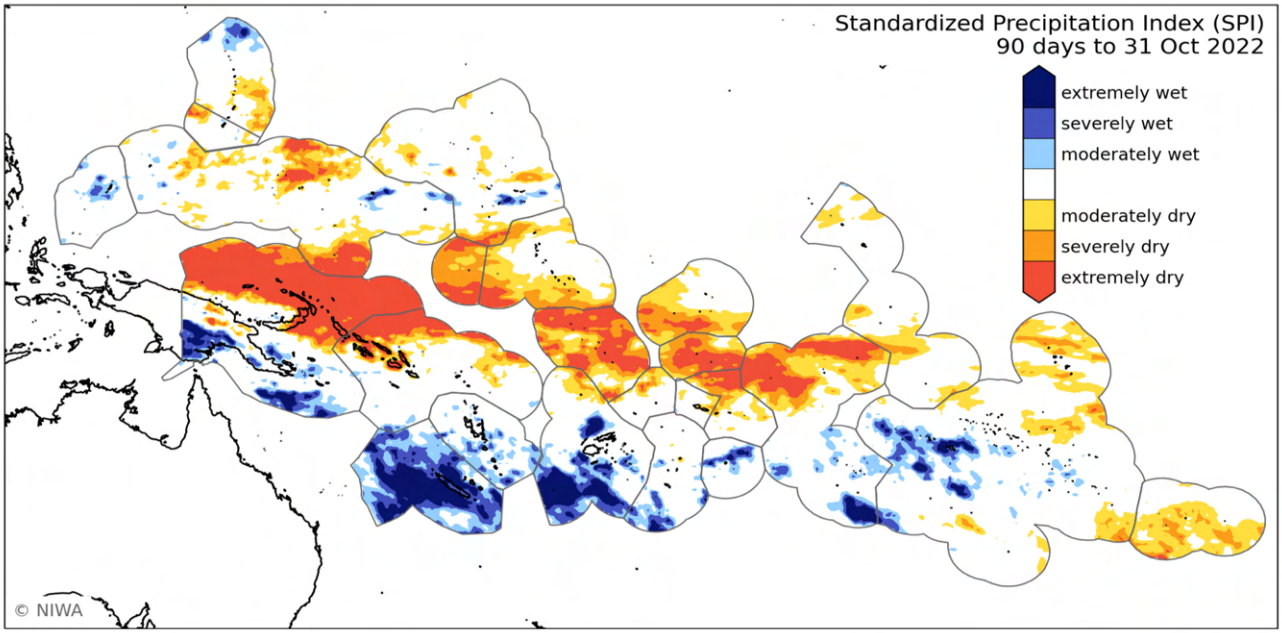
Water Stress Watch

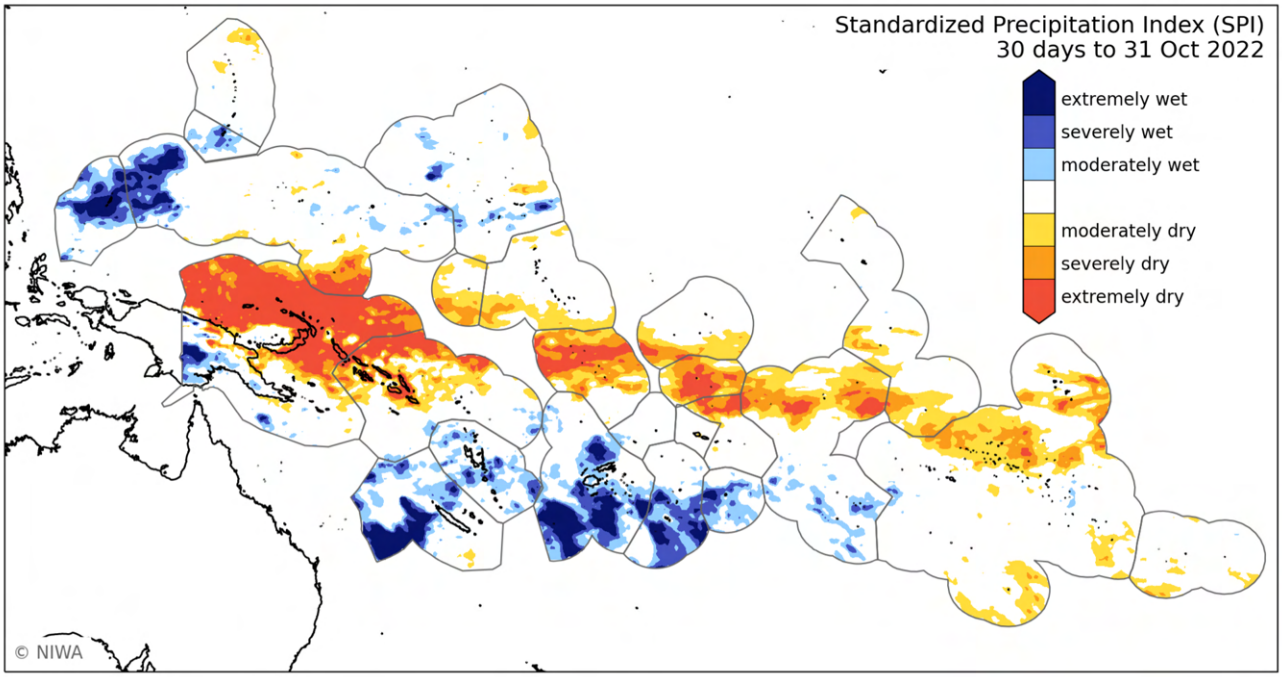
SPI Regional situation summary (1 November 2022)

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 FSM, northern PNG, Solomon Islands, Nauru, Kiribati (Gilbert and Phoenix Islands), Tuvalu, Tokelau, American Samoa, Northern Cook Islands, Marquesas, and Pitcairn Islands. Extremely wet conditions were observed in southern PNG, New Caledonia and parts of Fiji.

During October (bottom plot), extremely or severely dry conditions occurred in southern FSM, northern PNG, Solomon Islands, Tuvalu, Tokelau, Northern Cook Islands, Marquesas, and northern Tuamotu/Gambier Islands.





Island Climate Update

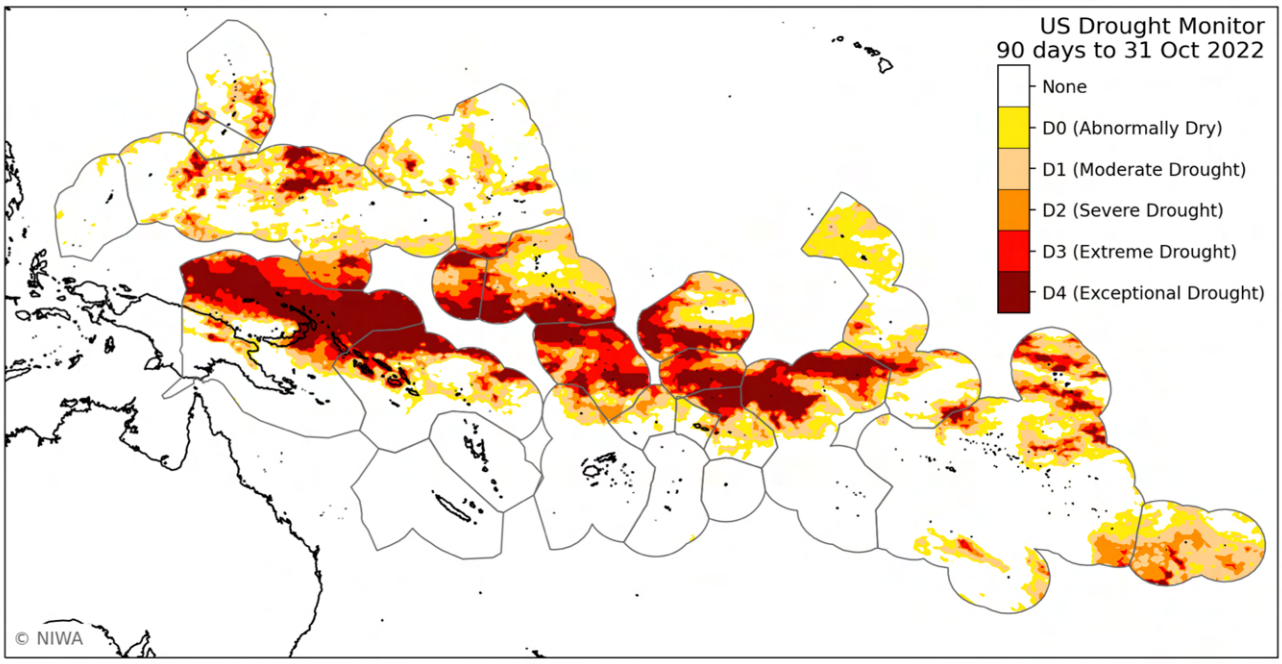
Water Stress Watch

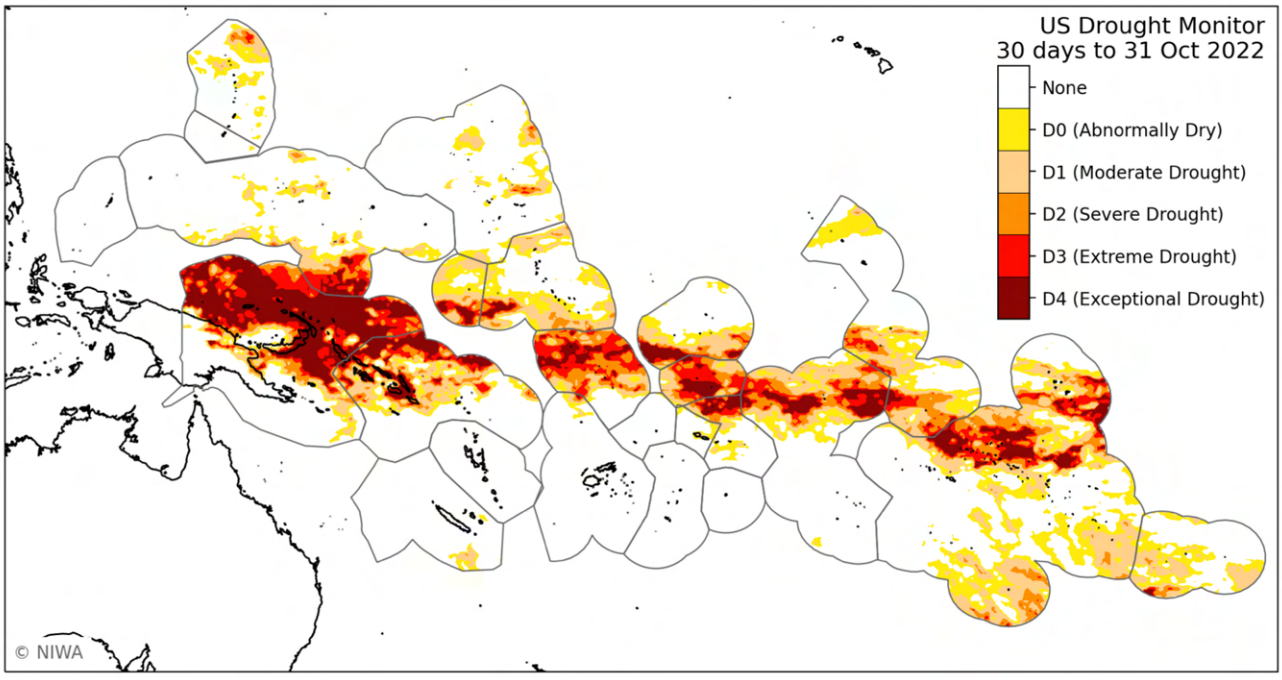
USDM Regional situation summary (1 November 2022)

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 FSM, northern PNG, northern Solomon Islands, Nauru, Kiribati (Gilbert Islands), Tuvalu, Tokelau, Samoa and American Samoa, Northern Cook Islands, Marquesas, northern Tuamotu/Gambier Islands, and Pitcairn Islands.

During October (bottom plot), extreme or exceptional drought occurred in many of the same island groups, but FSM, Marshalls, Kiribati (Gilbert Islands), and Pitcairn Islands were not as dry.





Island Climate Update

Water Stress Outlook

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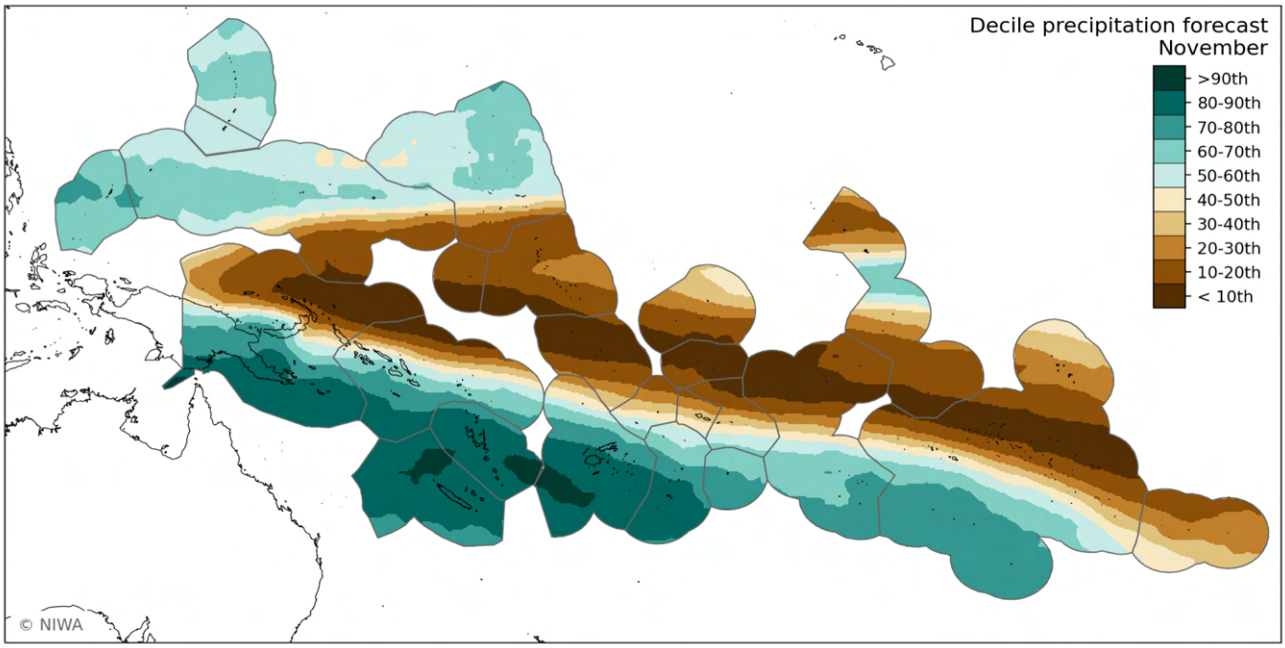
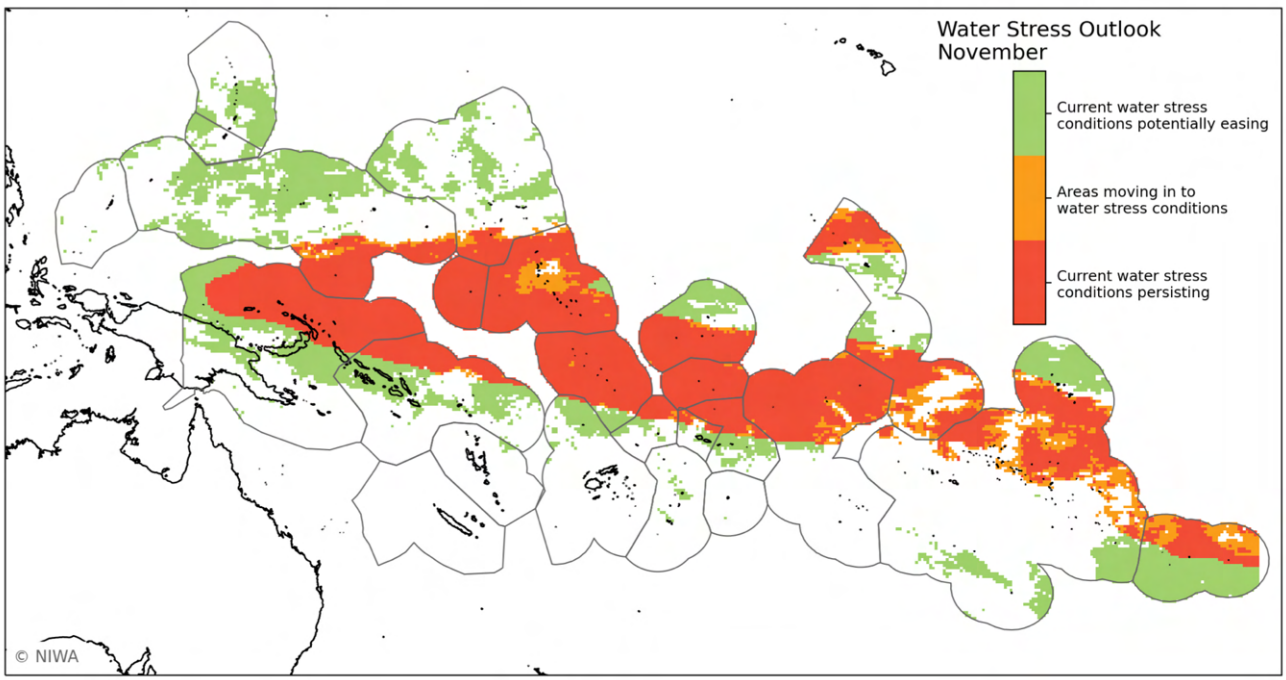
November 2022 forecast summary

During November, there is a high chance for drier than normal conditions along and extending southeastward of the equator. Compared to October, the outlook is trending a bit drier in Kiribati (Line Islands), and Marquesas. Extremely wet conditions (>80th percentile) are forecast for southern PNG, New Caledonia, Vanuatu, Fiji and Tonga.

Water stress is forecast to continue for northern PNG, southern FSM, Nauru, Kiribati (Gilbert, Phoenix and parts of Line Islands) southern Marshall Islands, Tuvalu, Tokelau, parts of American Samoa, parts of Northern Cook Islands, parts of Tuamotu/Gambier Islands and parts of Pitcairn Islands.





Island Climate Update

Water Stress Outlook

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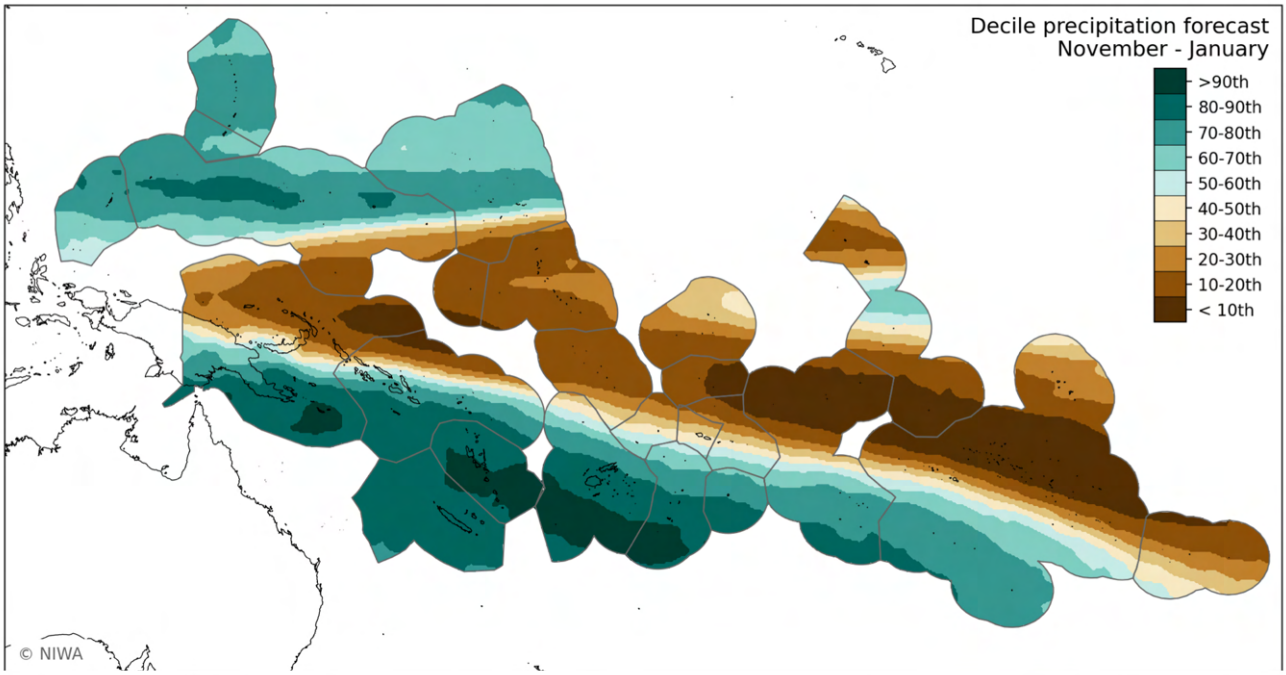
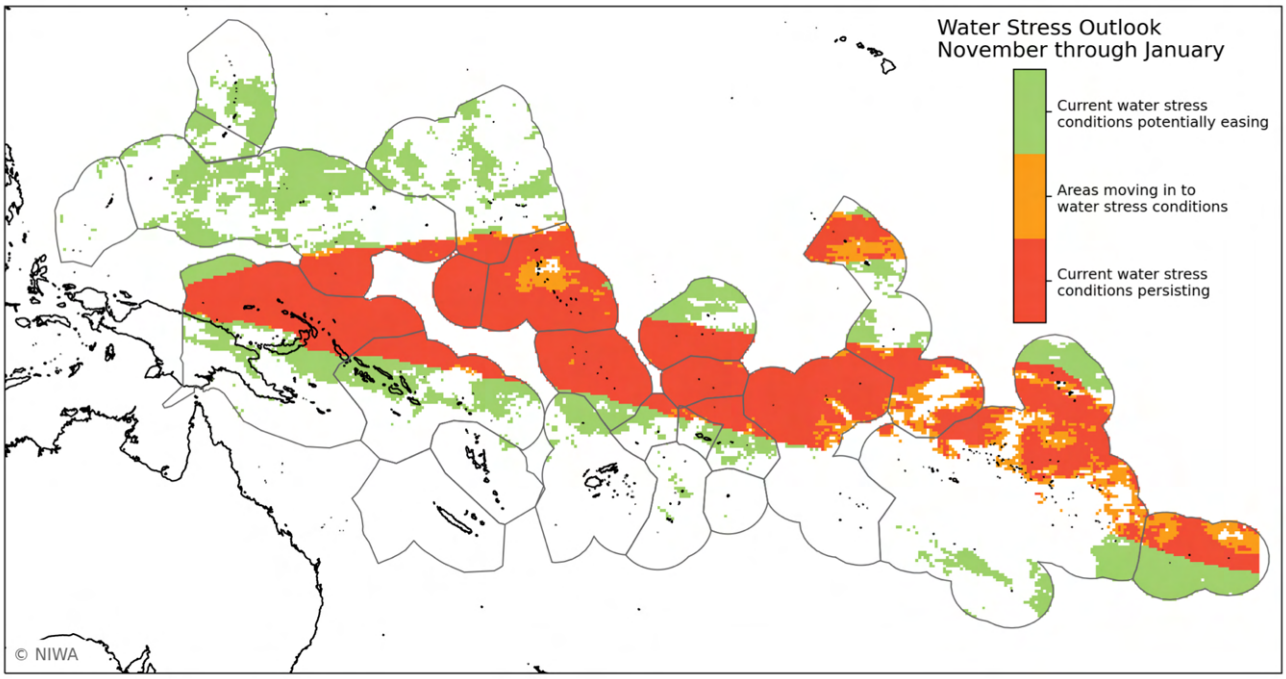
November 2022 – January 2023 forecast summary

During November-January, there is a high chance for drier than normal conditions for island groups along the equator. Extremely wet conditions (>80th percentile) are forecast for parts of FSM, southern PNG, southern Solomon Islands, Vanuatu, New Caledonia, Fiji, and Tonga.

Water stress is expected to persist in many of the same areas as what is expected in November, but may start to develop in parts of Kiribati (Gilbert Islands and Line Islands) and parts of Tuamotu/Gambier Islands.





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Water Stress Outlook

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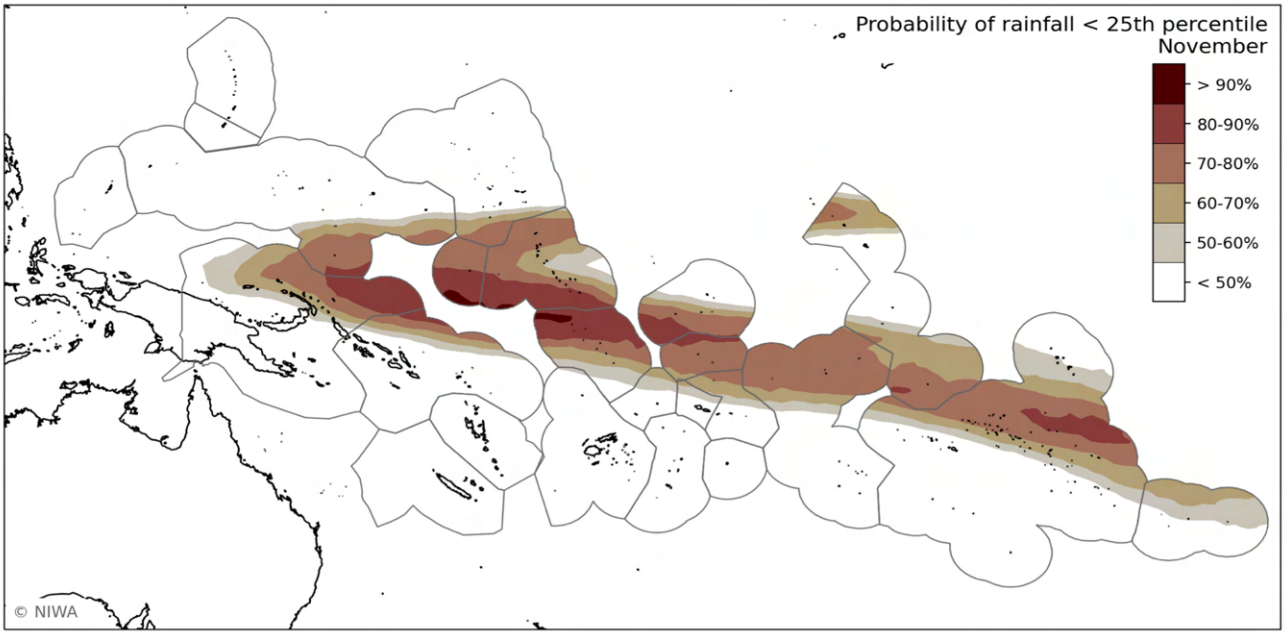
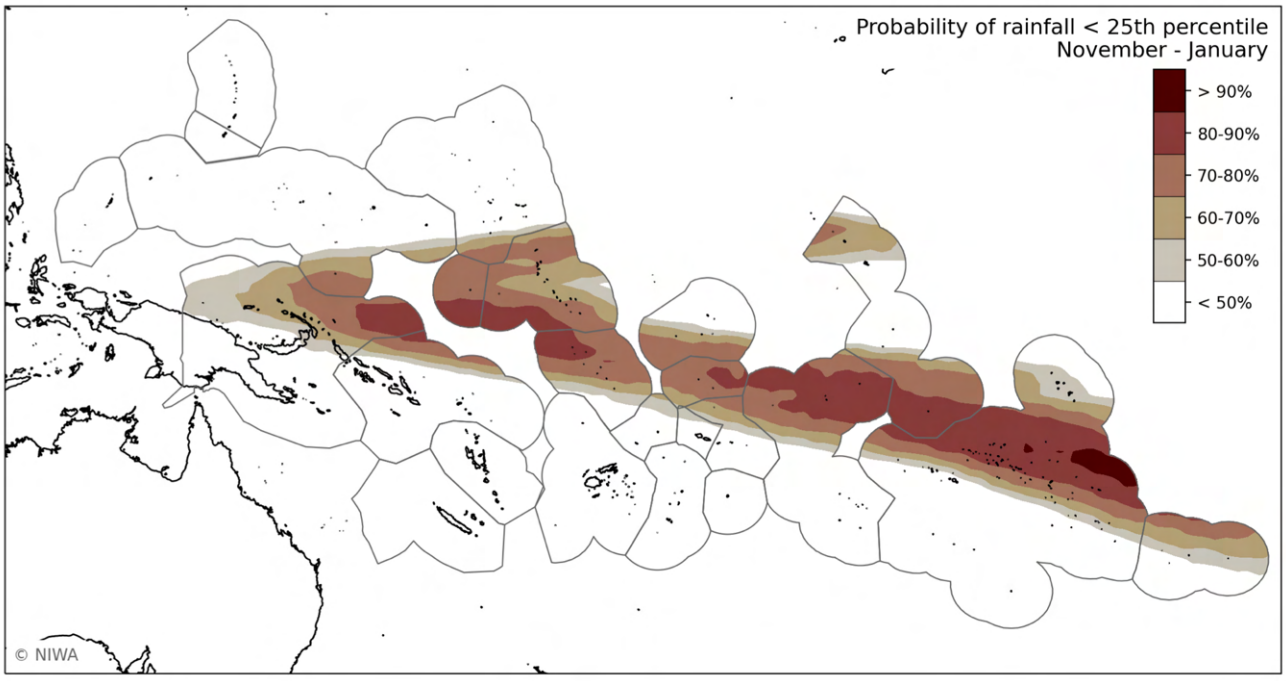
Probabilities of rainfall < 25th percentile

The probability (likelihood) of 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, very dry conditions are favoured in southern FSM, northern PNG, Nauru, Kiribati (Gilbert and Phoenix Islands), Tuvalu, and northern Tuamotu/Gambier Islands. However, since October the odds for dryness slightly lowered for pockets of northern PNG, southern FSM, Nauru, Kiribati (Gilbert and Phoenix Islands), Tokelau, and Northern Cook Islands.

For November-January, very dry conditions are likely in many of the same groups, with chances increasing for Northern Cook Islands, southern Line Islands, and northern French Polynesia.





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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	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. **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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