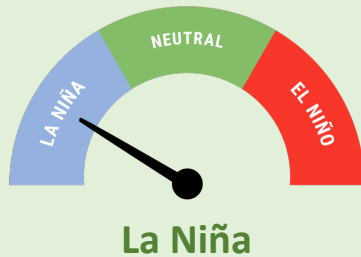


Island Climate Update



ENSO Watch
October 2022

Recent



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

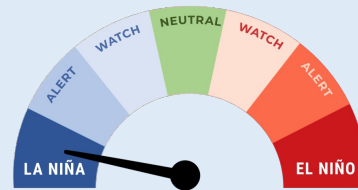
Both sea surface temperatures (SSTs) and the Southern Oscillation Index (SOI) were in the La Niña range.

Strong trade winds continued during September and additional strengthening of La Niña is likely.

85% chance for **La Niña** conditions during **October – December 2022.**

Chance for **La Niña** conditions during **January – March 2023**

50%



La Niña Event

Forecast

ENSO situation summary

The NINO3.4 Index anomaly (in the central equatorial Pacific) over the last month (through 30 September) was -0.93°C (climatology: 1991-2020). In the last four decades, only four Septembers had cooler central equatorial Pacific SSTs than 2022, including September 2010, 1999, 1998, and 1988.

The September monthly SOI was +1.4 and +1.7 from July-September (climatology: 1991-2020), both well within the La Niña range.

Trade winds were stronger than normal across the central equatorial Pacific and off-equatorial South Pacific during September. This helped to maintain the moderate La Niña.

In the subsurface central equatorial Pacific, cold anomalies intensified during September, particularly east of the Date Line. The thermocline was located near the surface in eastern part of the basin,

consistent with La Niña conditions. Sub-surface anomalies of -3°C to -5°C are expected to continue to push toward the surface, likely resulting in further cooling of the ocean surface and additional strengthening of La Niña.

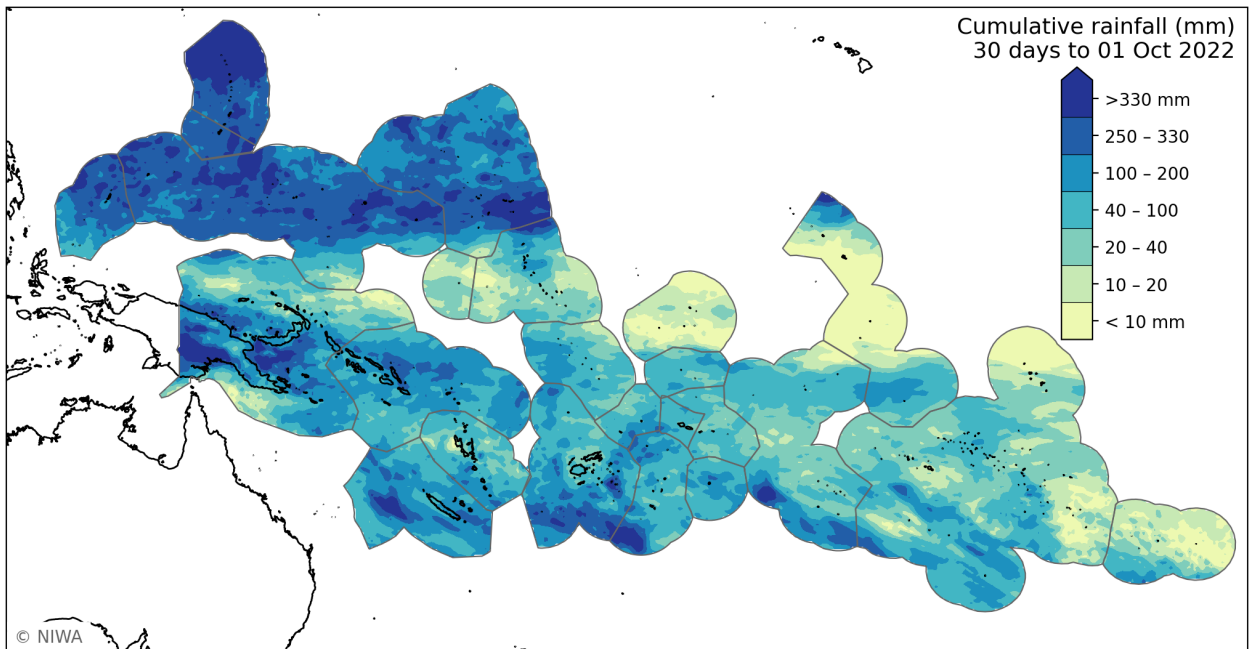
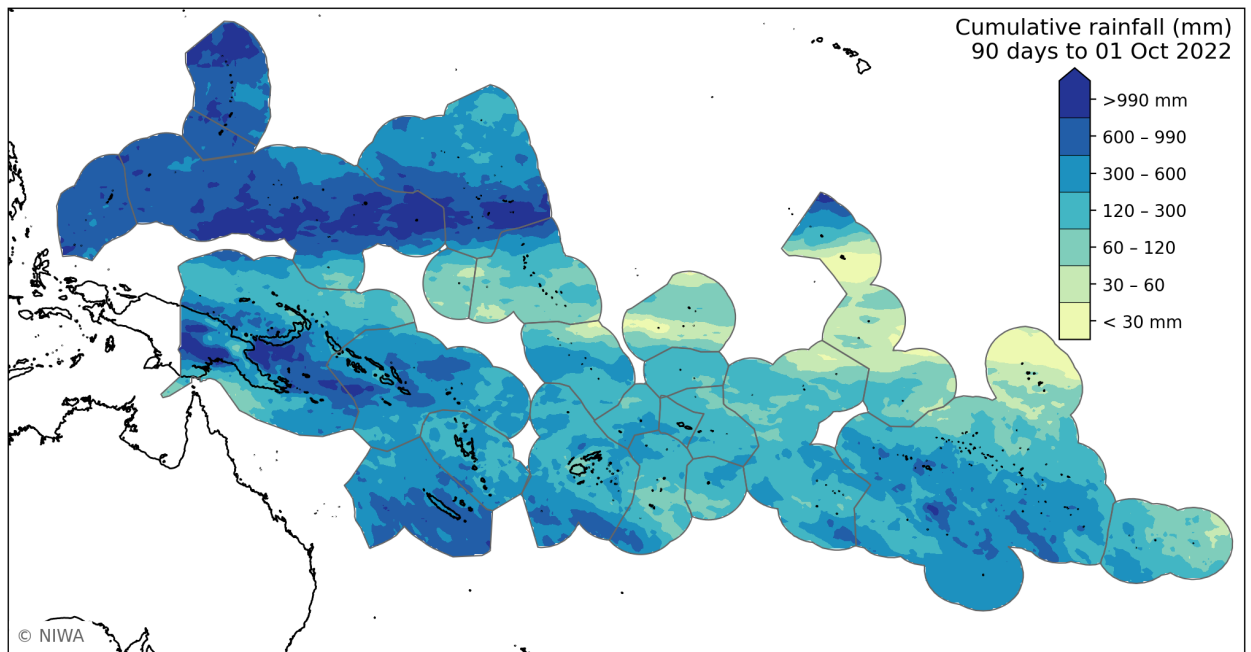
La Niña conditions are most likely to continue during October-December (80-85% chance), an increase of about 10% compared to last month. During January-March, La Niña and ENSO neutral are about equally likely (45-50% chance). This “triple dip” (3rd consecutive) La Niña will affect rainfall, temperatures (air and sea), sea level, and tropical cyclone activity in the Southwest Pacific in the coming months. The tropical cyclone outlook will be released during mid-October.

Regional situation summary (1 October 2022)

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

During July-September (top plot), less than 120 mm of rainfall fell in parts of Nauru, Kiribati, northern Tuvalu, Fiji, Tonga, and Marquesas.

During September (bottom plot), less than 20 mm of rainfall fell in parts of northern Papua New Guinea (PNG), far northern Vanuatu, Kiribati (Phoenix and Line Islands), northern Marquesas, parts of the Tuamotu Archipelago, and Pitcairn Islands. Heavier totals of more than 330 mm occurred in the western North Pacific and toward the sub-tropics.

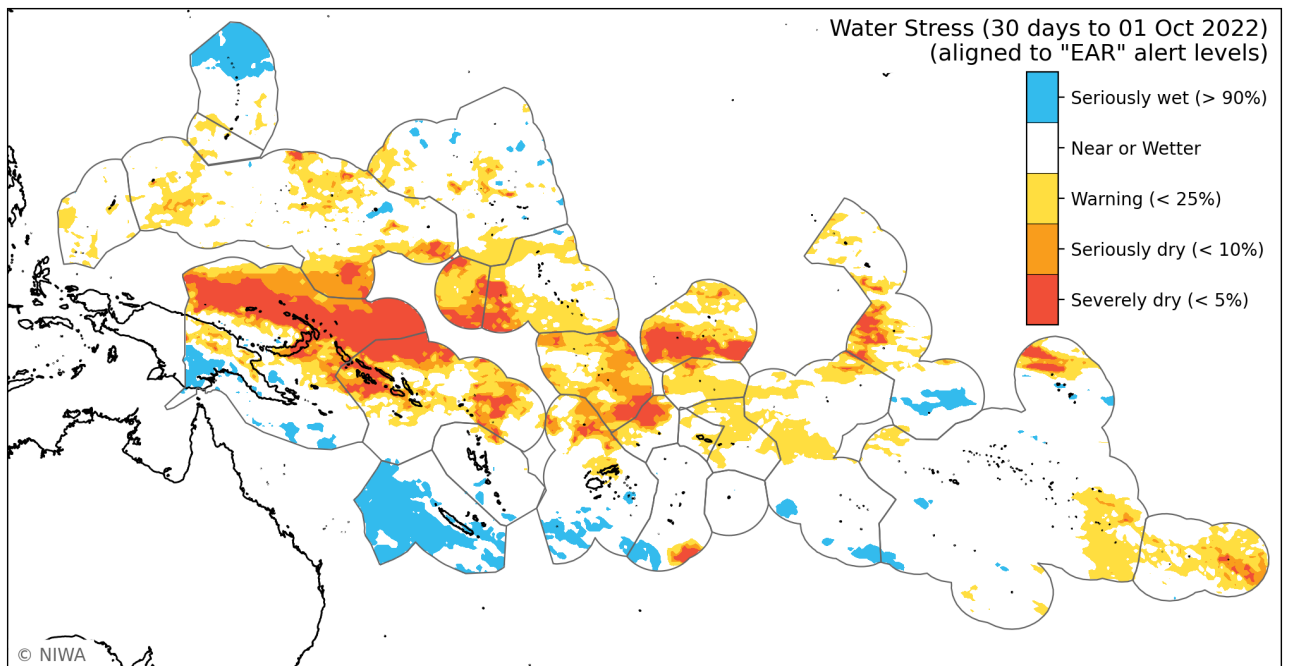
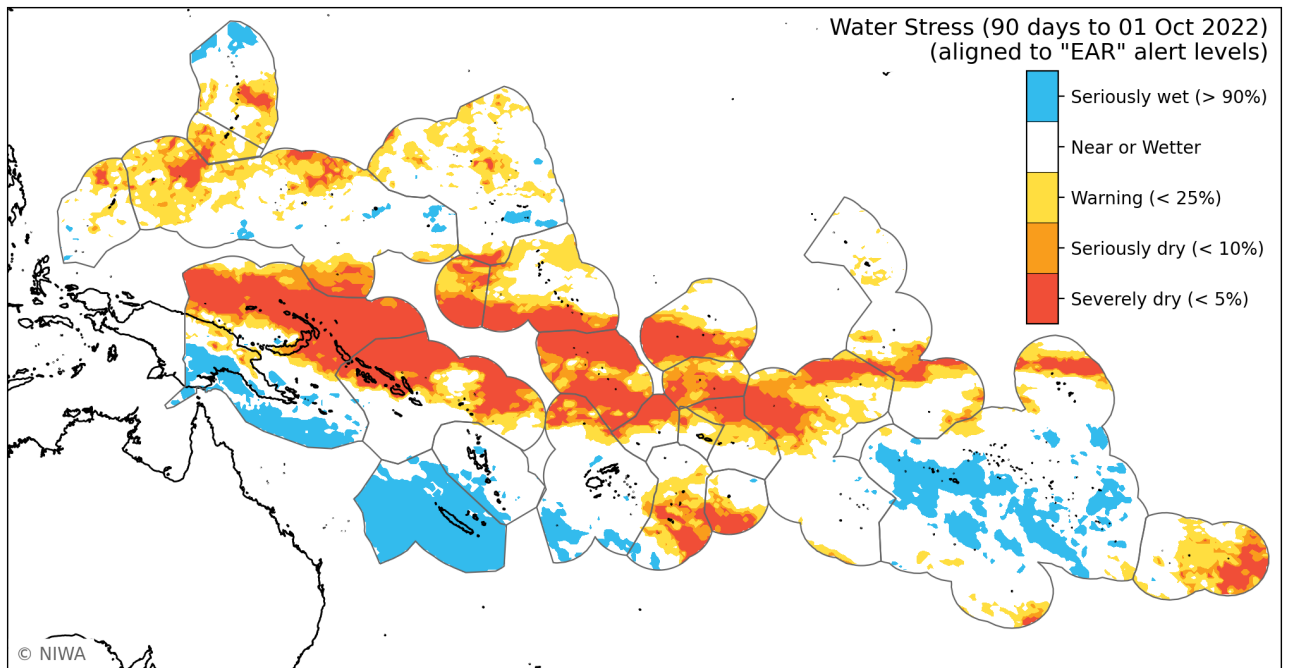


EAR regional situation summary (1 October 2022)

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

During July-September (top plot), severely or seriously dry conditions affected parts of Northern Marianas, parts of the Federated States of Micronesia (FSM), northern PNG, northern Solomon Islands, Nauru, parts of Kiribati, Tuvalu, Tokelau, Tonga, Northern Cook Islands, and Pitcairn Islands.

During September (bottom plot), severely or seriously dry conditions occurred in many of the same island groups. Conditions were wetter than last month in the North Pacific, Tonga, and the central Line Islands.

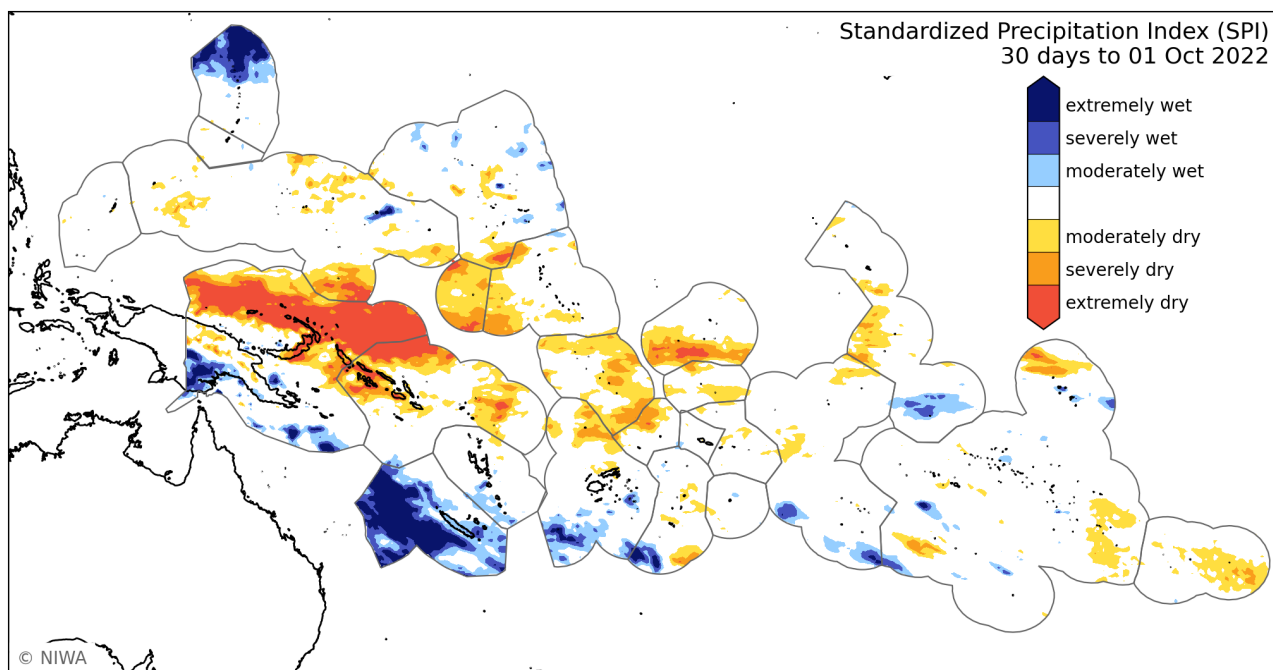
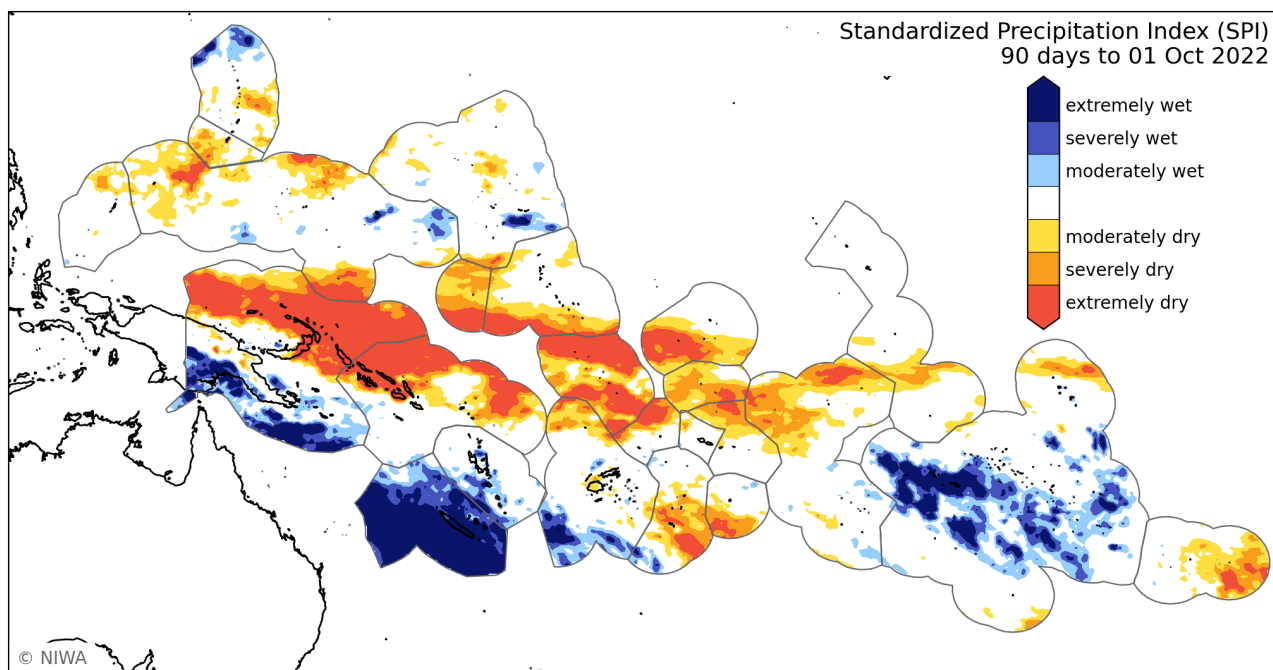


SPI Regional situation summary (1 October 2022)

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

During July-September (top plot), extremely or severely dry conditions occurred in parts of FSM, northern PNG, northern Solomons, Nauru, Kiribati (Gilbert and Phoenix Islands), Tuvalu, Tokelau, Tonga, Northern Cook Islands, and eastern Pitcairn Islands.

During September (bottom plot), extremely or severely dry conditions occurred in southern FSM, northern PNG, northern Solomons, Nauru, Tuvalu, and Kiribati (Gilbert Islands).

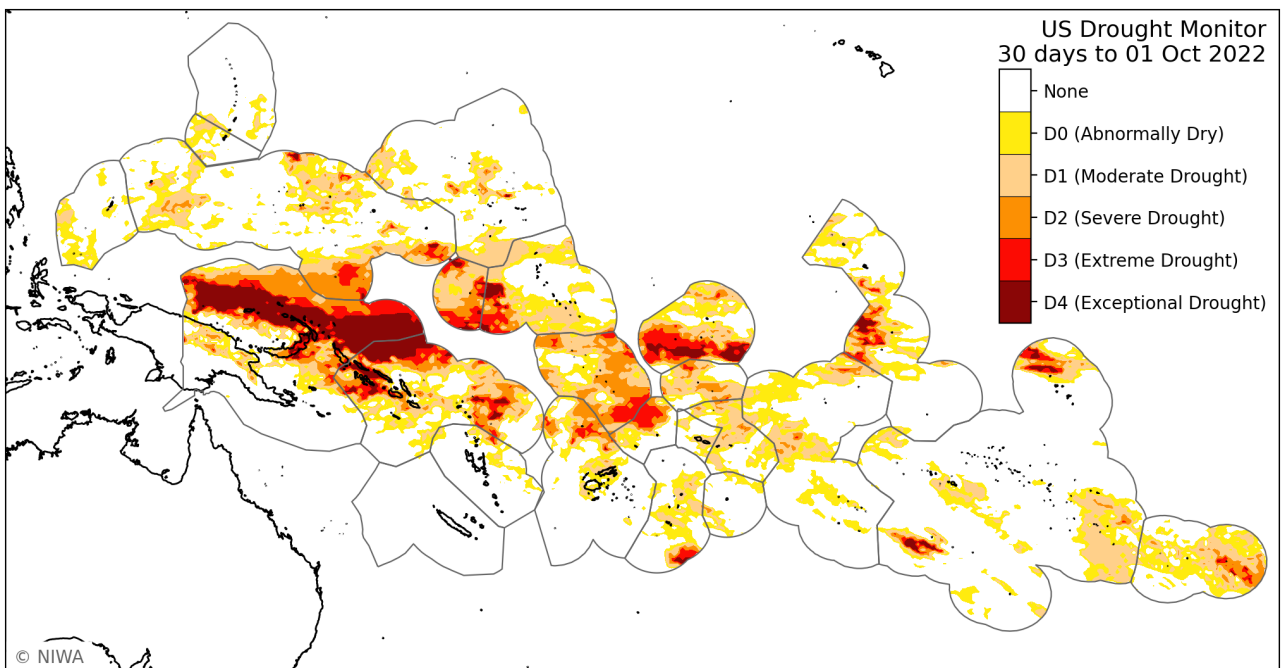
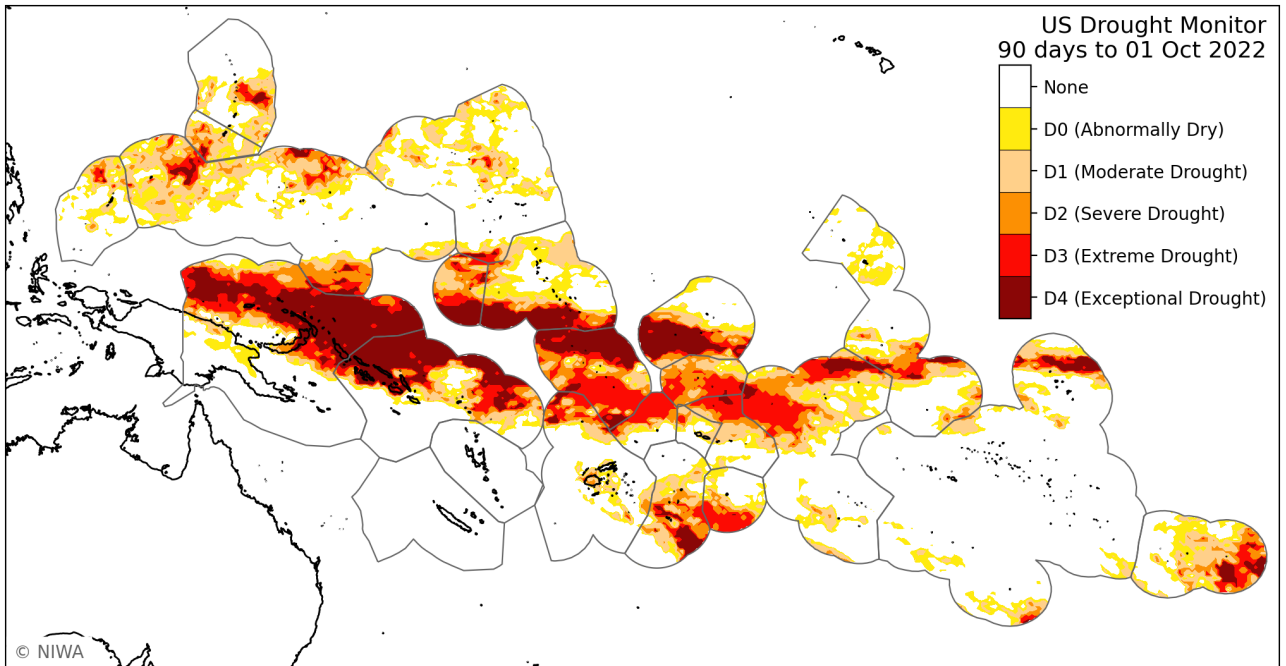


USDM Regional situation summary (1 October 2022)

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

During July-September (top plot), extreme or exceptional drought occurred in parts Northern Marianas, FSM, northern PNG, northern Solomons, Nauru, Kiribati, Tuvalu, Tokelau, Tonga, Northern Cook Islands, and Pitcairn Islands.

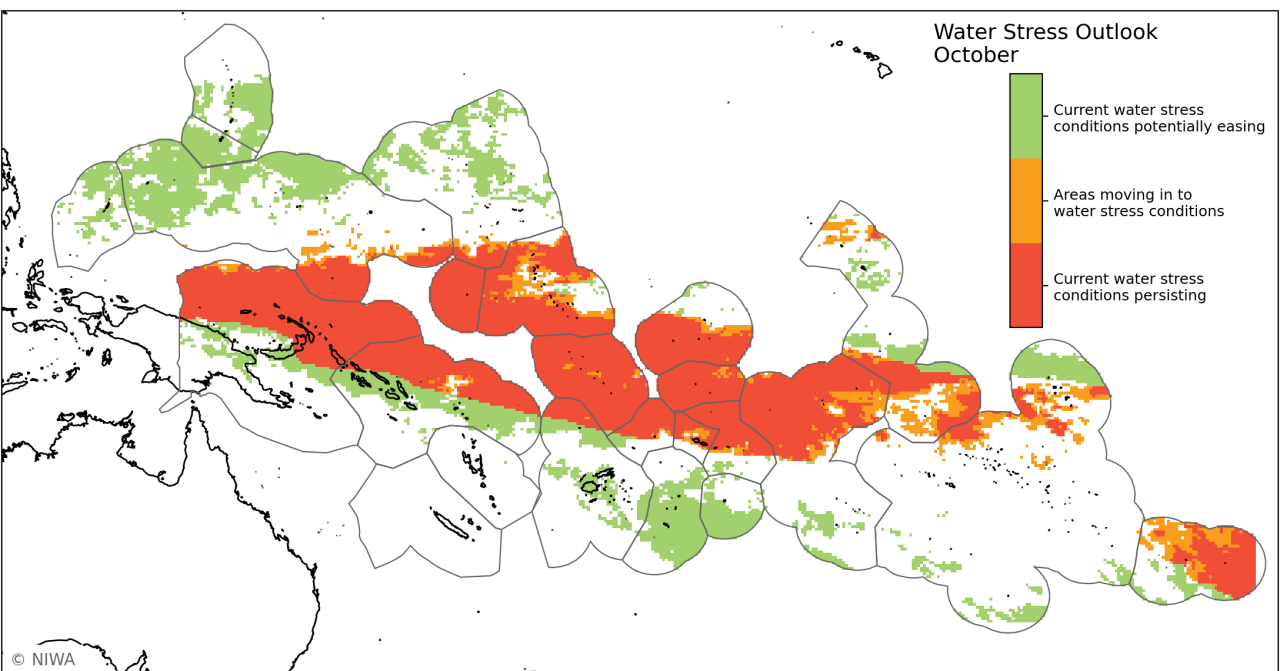
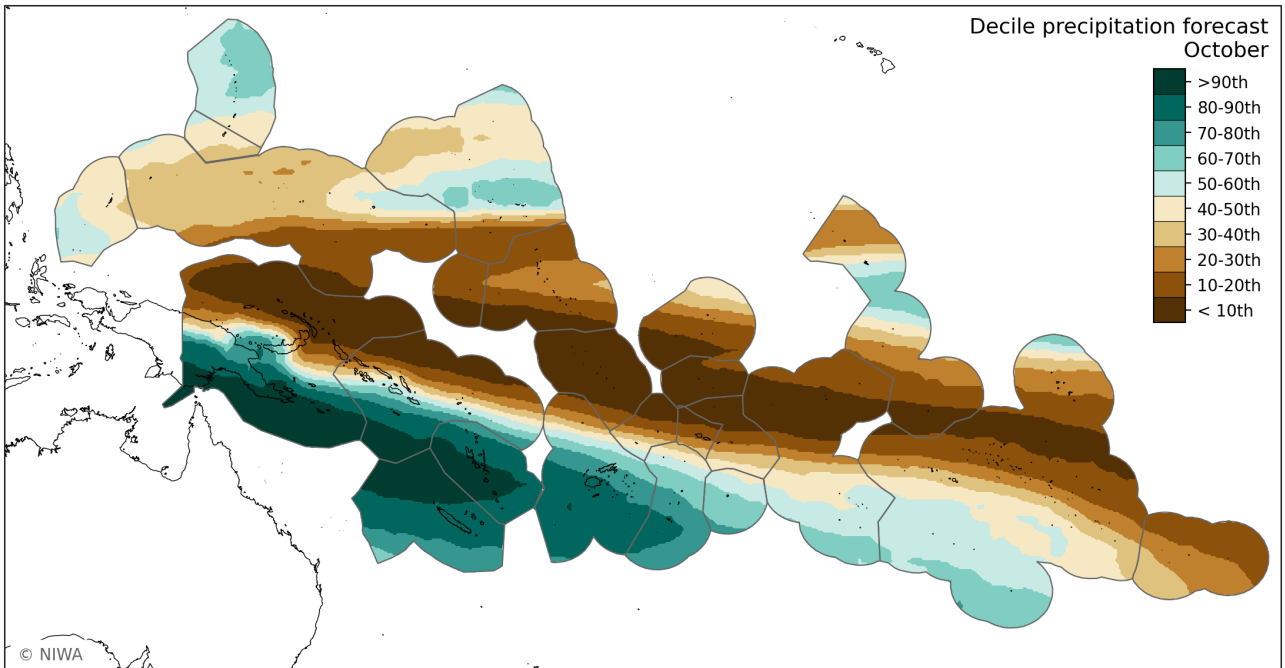
During September (bottom plot), extreme or exceptional drought occurred in many of the same island groups, but Northern Marianas, Kiribati (Gilberts), Tonga, and Northern Cook Islands weren't quite as dry.



October 2022 forecast summary

During October, there is a high chance for drier than normal conditions along and extending southeastward of the equator and in parts of the western North Pacific. Compared to September, the outlook is trending a bit drier in Kiribati, Northern Cook Islands, and northern French Polynesia. Wetter conditions are forecast for parts of the Solomon Islands, and for most island groups extending southeastward to Austral Islands.

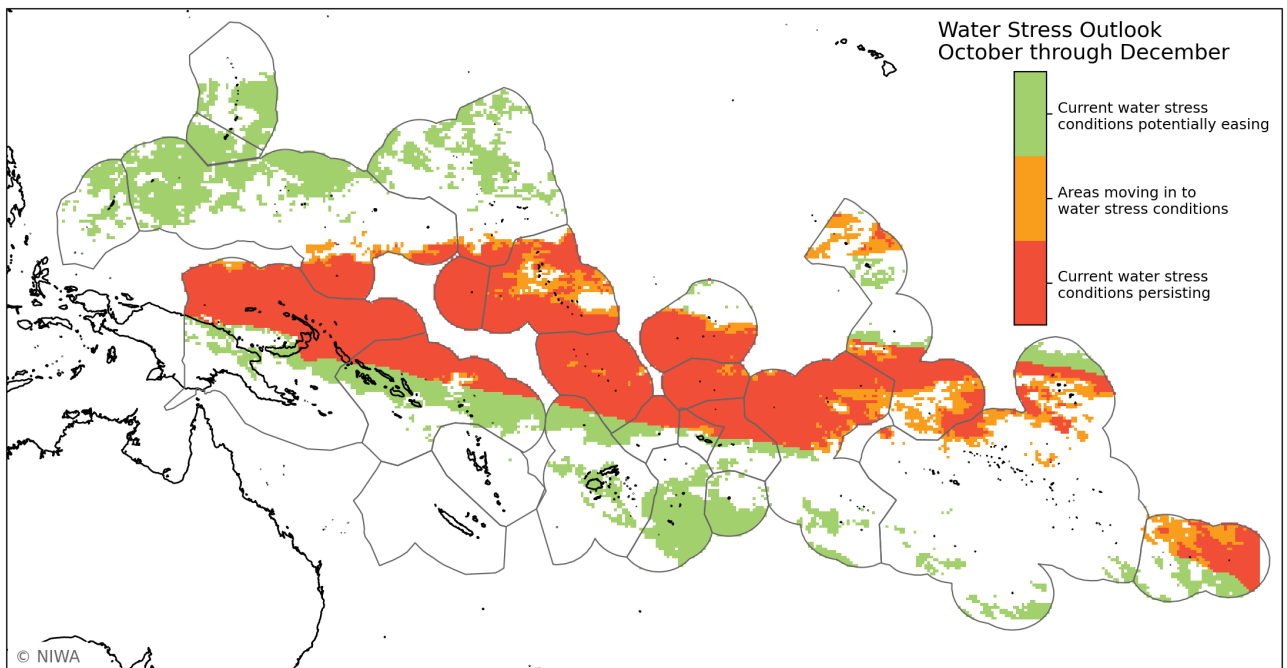
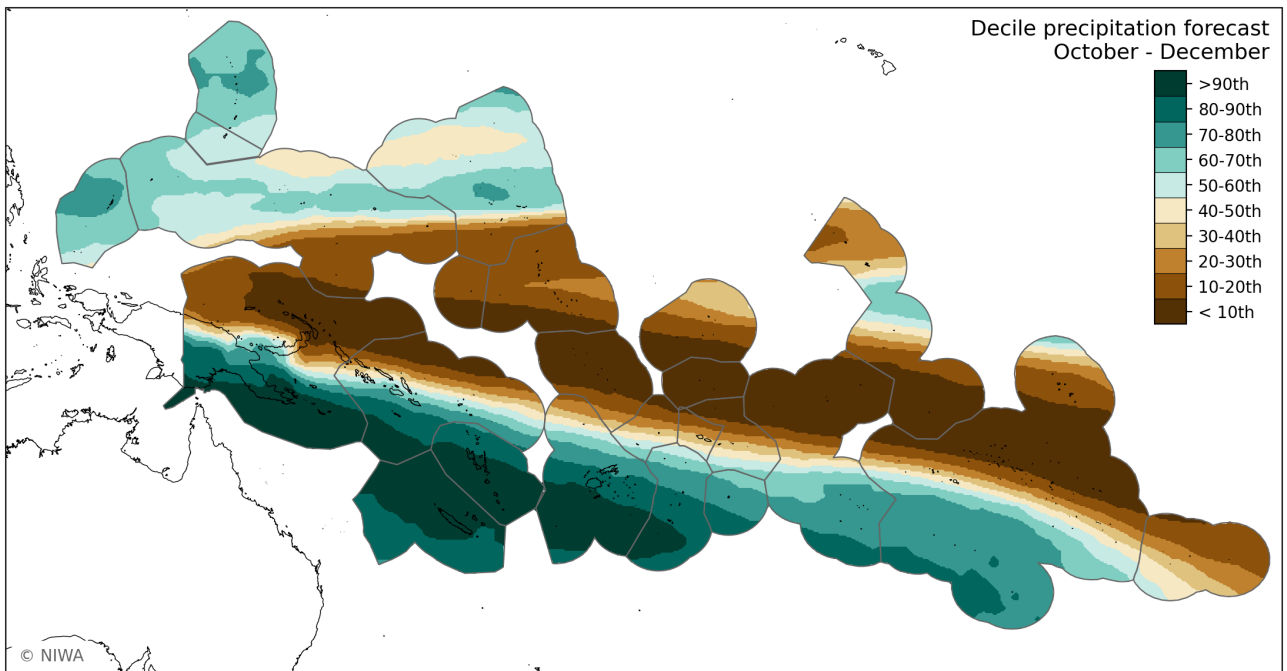
Water stress is forecast to continue for many island groups along the equator, although some easing is shown for Kiribati (Line Islands). Water stress may continue to develop in the Pitcairn Islands, southern Kiribati, and parts of northern French Polynesia, while easing in small parts of PNG and northern Solomons.



October – December 2022 forecast summary

During October-December, there is a high chance for drier than normal conditions for island groups along the equator. Compared to last month, the outlook has generally trended drier for Kiribati except for portions of the central Line Islands. Wetter forecast trends are being shown for parts of the western North Pacific, Solomons, and in most island groups extending southeastward of PNG.

Water stress is expected to persist for much of the equatorial belt, building in Kiribati, parts of the Northern Cook Islands, northern French Polynesia, and Pitcairn Islands. An easing of water stress is possible in parts of the western North Pacific, small pockets of PNG and Solomons, and Tonga.

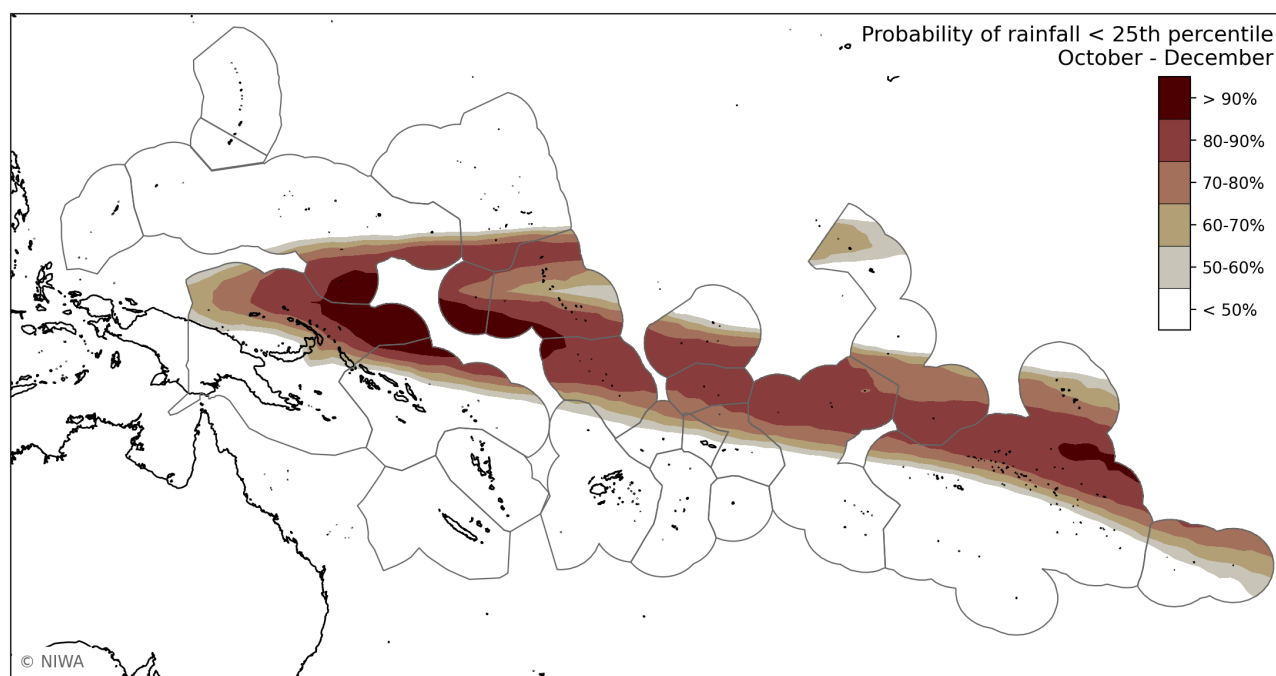
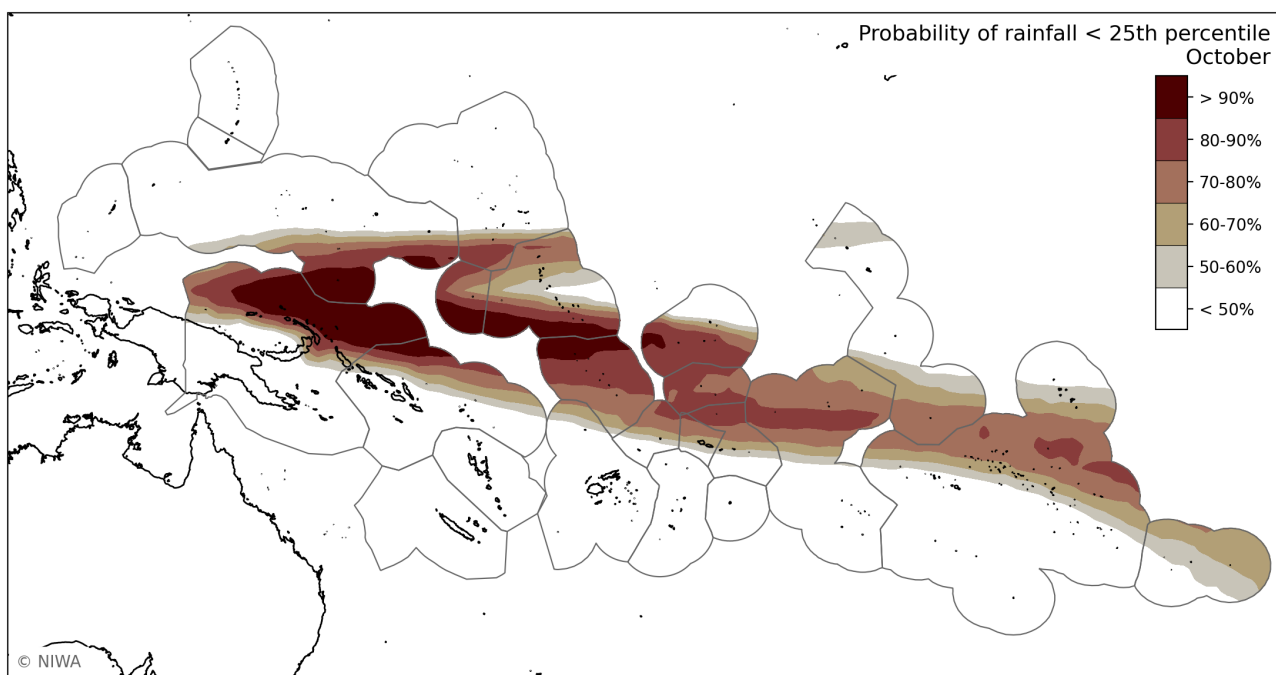


Probabilities of rainfall < 25th percentile

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

For October, very dry conditions are favoured for island groups near the equator. The odds for dryness expanded in southern FSM, Kiribati, Northern Cook Islands, northern French Polynesia, and parts of Pitcairn Islands. The odds for dryness slightly lowered for pockets of Solomons, Wallis & Futuna, Samoa, and American Samoa.

For October-December, very dry conditions are likely in many of the same groups, with chances increasing for Kiribati, northern French Polynesia, and Pitcairn Islands but decreasing for Wallis & Futuna, Samoa, and American Samoa.





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>



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 UNDM 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.

WMO

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