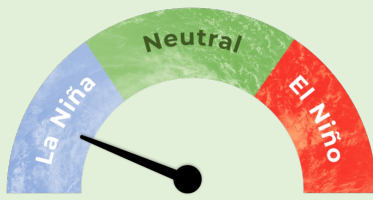


Island Climate Update



ENSO Watch
September 2022

Recent



La Niña

La Niña conditions strengthened in the equatorial Pacific during August.

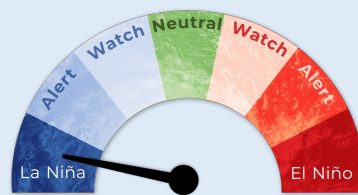
Both sea surface temperatures (SSTs) and the Southern Oscillation Index (SOI) were in the La Niña range.

Very strong trade winds continued during August and additional strengthening of La Niña is likely.

80% chance for **La Niña** conditions during **September – November 2022.**

Chance for **ENSO neutral** conditions during **December 2022 – February 2023**

60%



La Niña Event

Forecast

ENSO situation summary

The NINO3.4 Index anomaly (in the central equatorial Pacific) over the last month (through 31 August) was -1.00°C (climatology: 1991-2020), showing a strong cooling trend compared to July. In the last four decades, only four Augusts had cooler central equatorial Pacific SSTs than 2022, including August 2010, 1999, 1998, and 1988.

The provisional August monthly SOI was +1.3 and +1.7 from June-August (climatology: 1991-2020), both in the La Niña range.

Trade winds across the central equatorial Pacific were much stronger than normal during August by as much 10-15 knots, like July. This fostered the restrengthening of oceanic La Niña. Strong to very strong trade winds are predicted to continue during spring with a high likelihood for cooling seas.

In the subsurface central equatorial Pacific,

substantially cooler than average waters (-3°C to -5°C) persisted and expanded eastward. These cooler waters are expected to migrate toward the surface over the next month or two, leading to further decreases in SSTs. Oceanic La Niña will likely grow stronger by late spring.

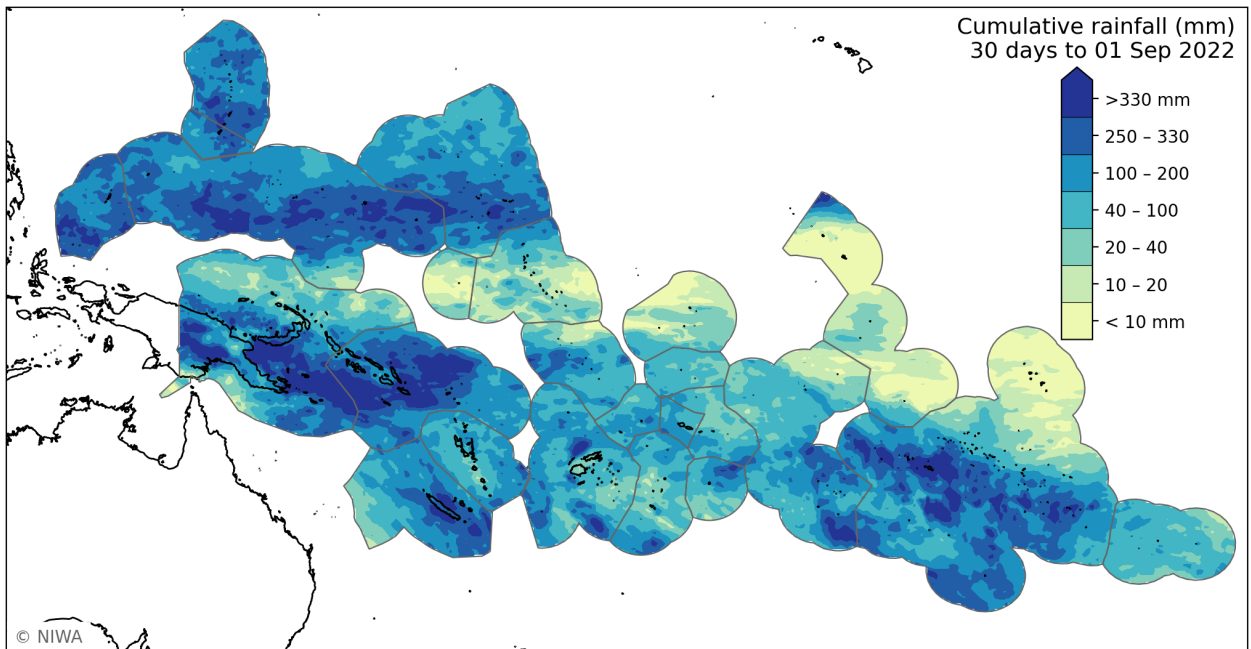
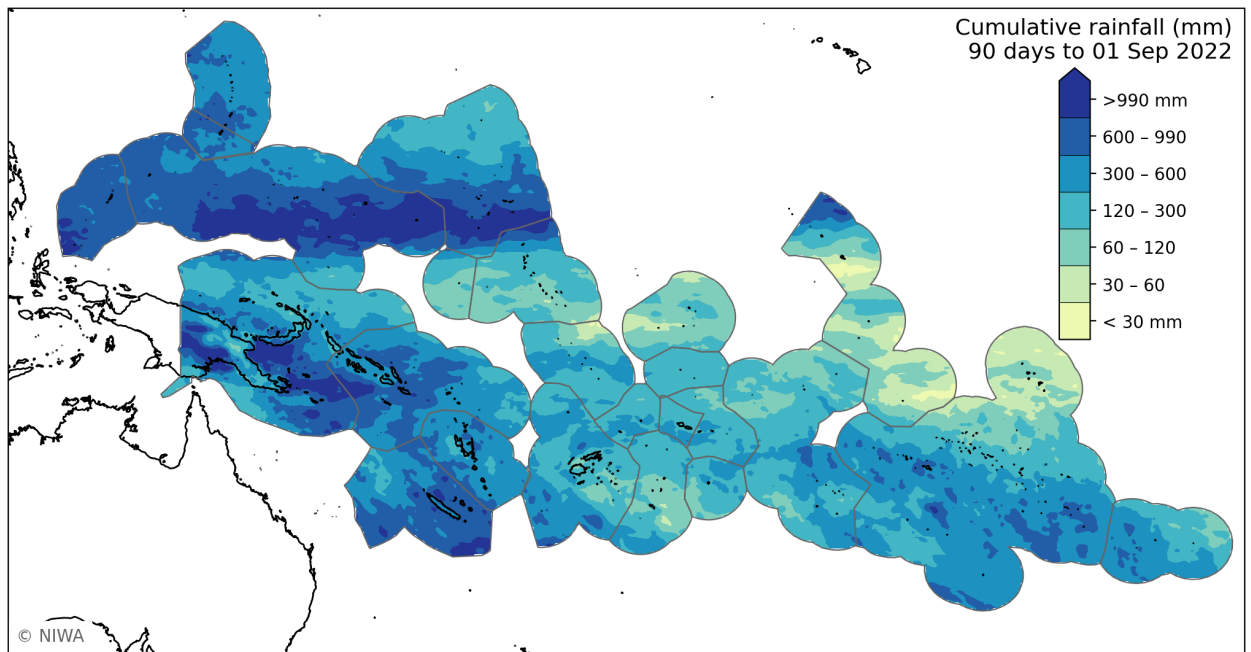
Taking these factors into account, La Niña conditions are very likely to continue during September-November (75-80% chance). During December-February, there is a 55-60% chance for La Niña. A “triple dip” La Niña (three consecutive La Niña events from 2020-2022) is very likely, the first since 1998-2000. It is worth noting that tropical weather patterns during winter 2022 showed relatively strong similarities with those of 1998.

Regional situation summary (1 September 2022)

Rainfall estimates for the last month & three months are shown below. Rainfall was particularly heavy in the western North Pacific and toward the South Pacific sub-tropics with lower amounts near the equator, remaining consistent with La Niña.

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

During August (bottom plot), less than 20 mm of rainfall fell in parts of Nauru, Kiribati, Northern Cook Islands, and Marquesas. Rainfall was heavy (more than 330 mm) about parts of Papua New Guinea (PNG), southern Solomon Islands, New Caledonia, Austral Islands, the Tuamotu Archipelago, and the western North Pacific.

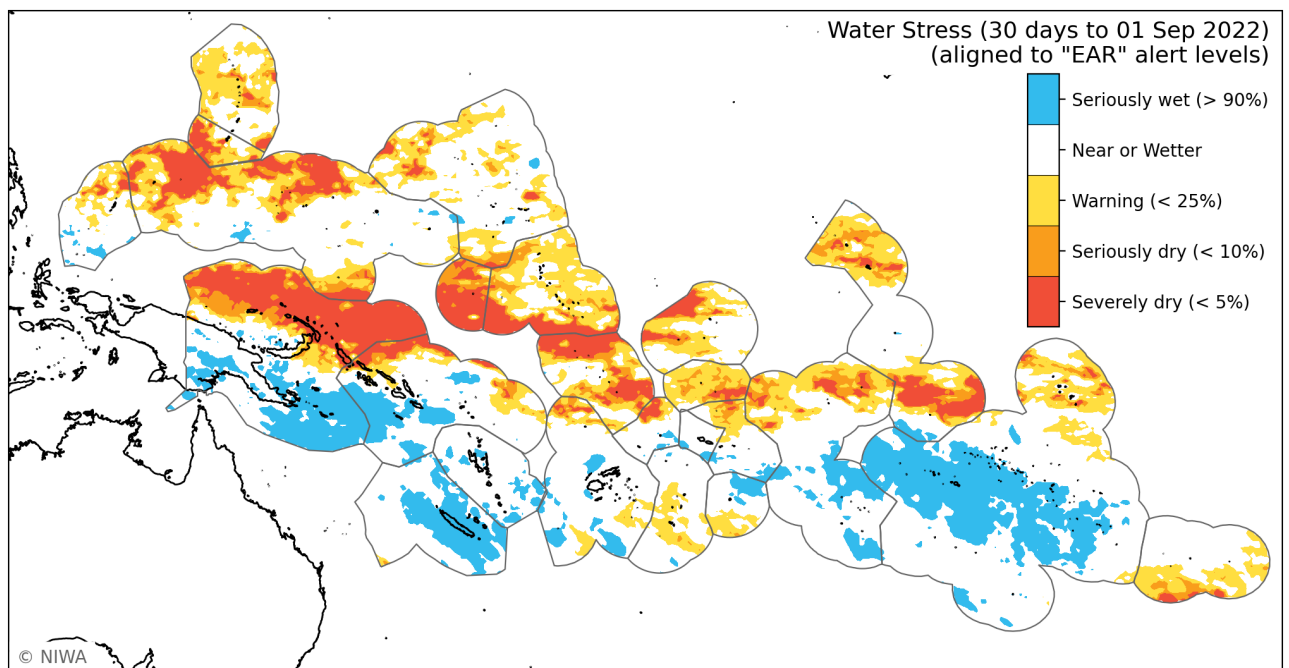
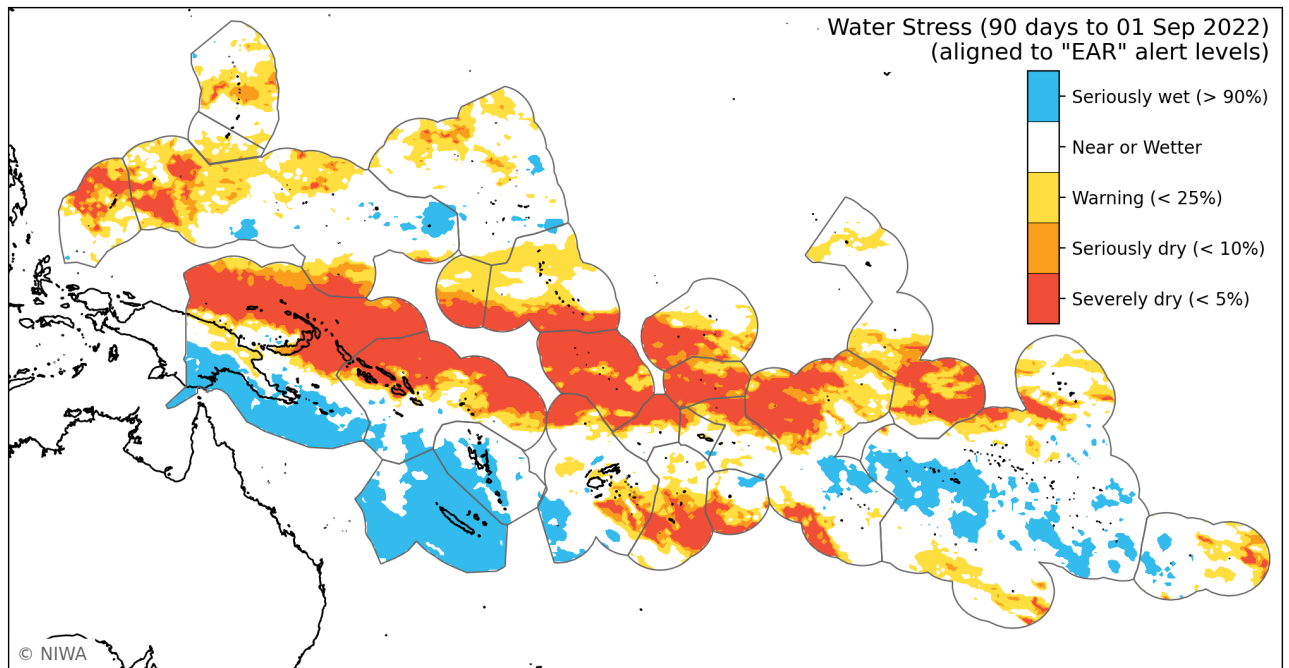


EAR regional situation summary (1 September 2022)

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

During June-August (top plot), severely or seriously dry conditions affected parts of Northern Marianas, western, and southern Federated States of Micronesia (FSM), northern PNG, northern Solomon Islands, parts of Kiribati, Tuvalu, Fiji (Eastern Division), Tonga, Tokelau, and Northern Cook Islands.

During August (bottom plot), severely or seriously dry conditions occurred in many of the same island groups, except Solomon Islands, Fiji, and Tonga where conditions were generally wetter.

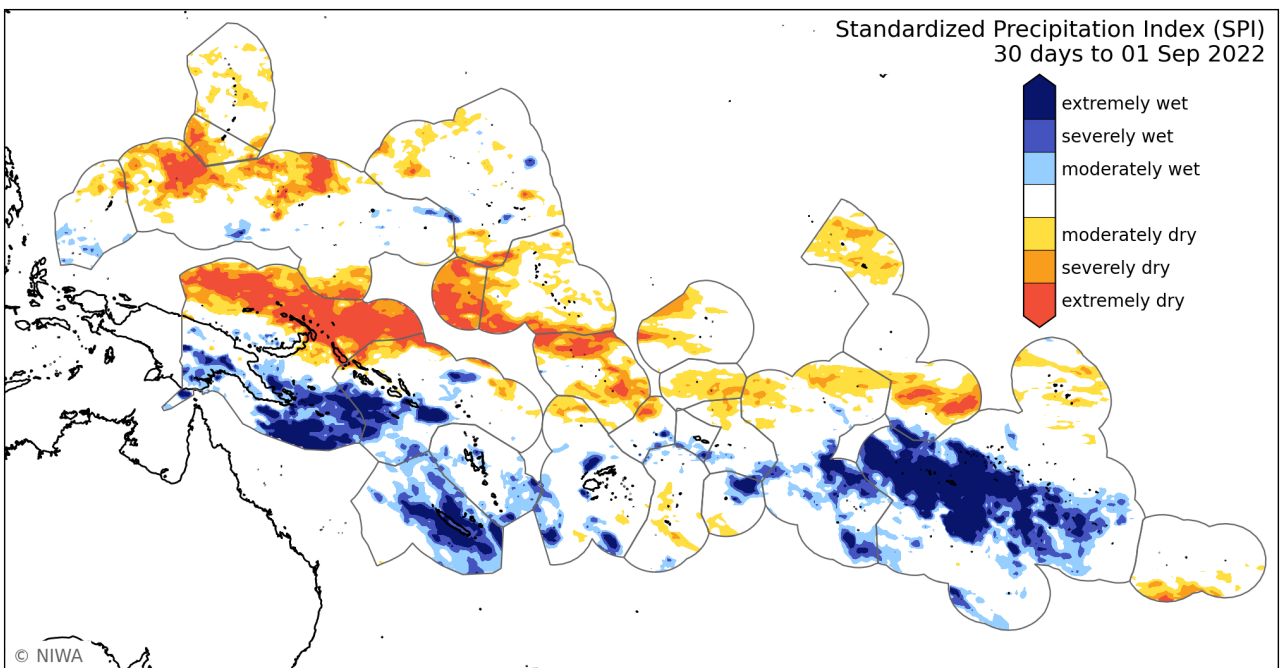
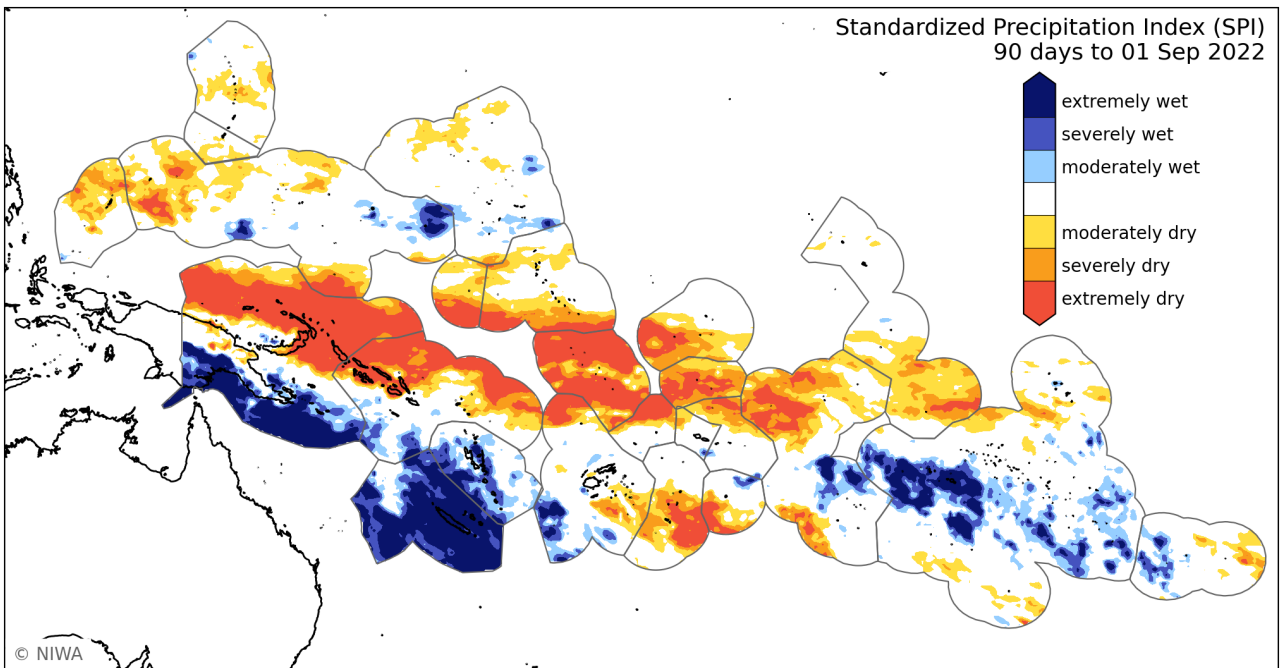


SPI Regional situation summary (1 September 2022)

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

During June-August (top plot), extremely or severely dry conditions occurred in northern PNG, southern FSM, northern Solomons, Kiribati, Tuvalu, Fiji (Eastern Division), Tonga, Tokelau, and Northern Cook Islands.

During August (bottom plot), extremely or severely dry conditions occurred in parts of FSM, northern PNG, and Nauru but generally eased across parts of the Solomon Islands, Kiribati, Fiji, Tonga, and Tokelau. Conversely, conditions were severely wet in southern PNG, New Caledonia, and Tuamotu Archipelago.

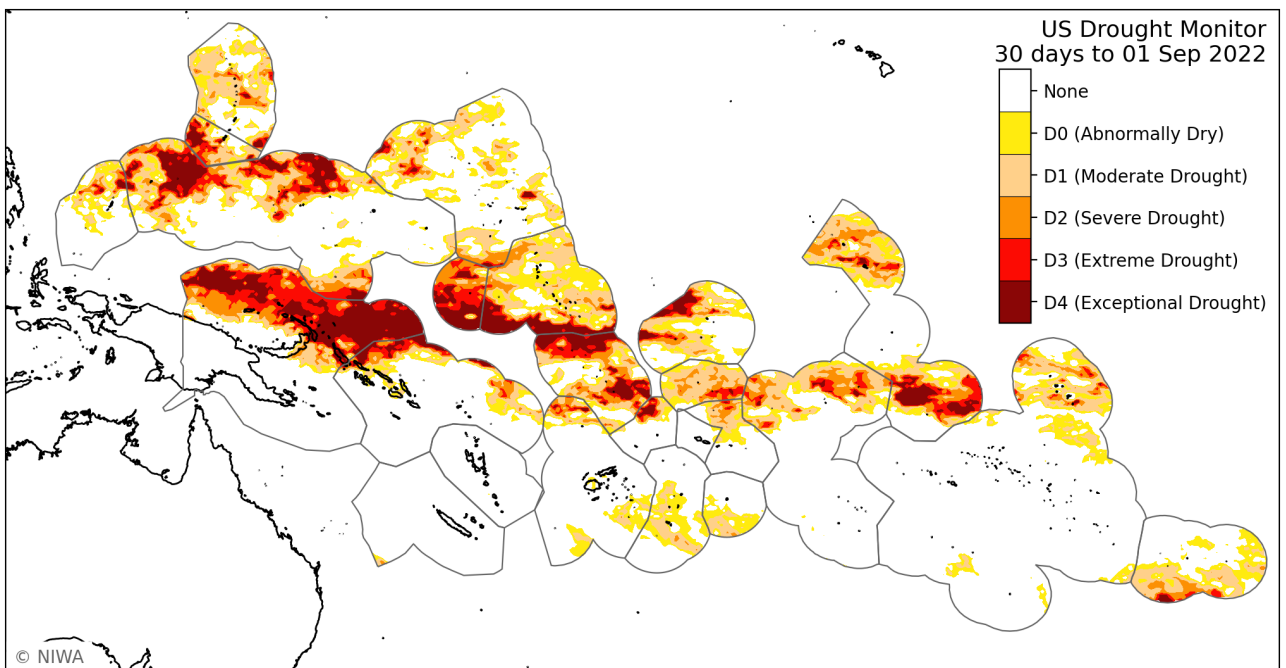
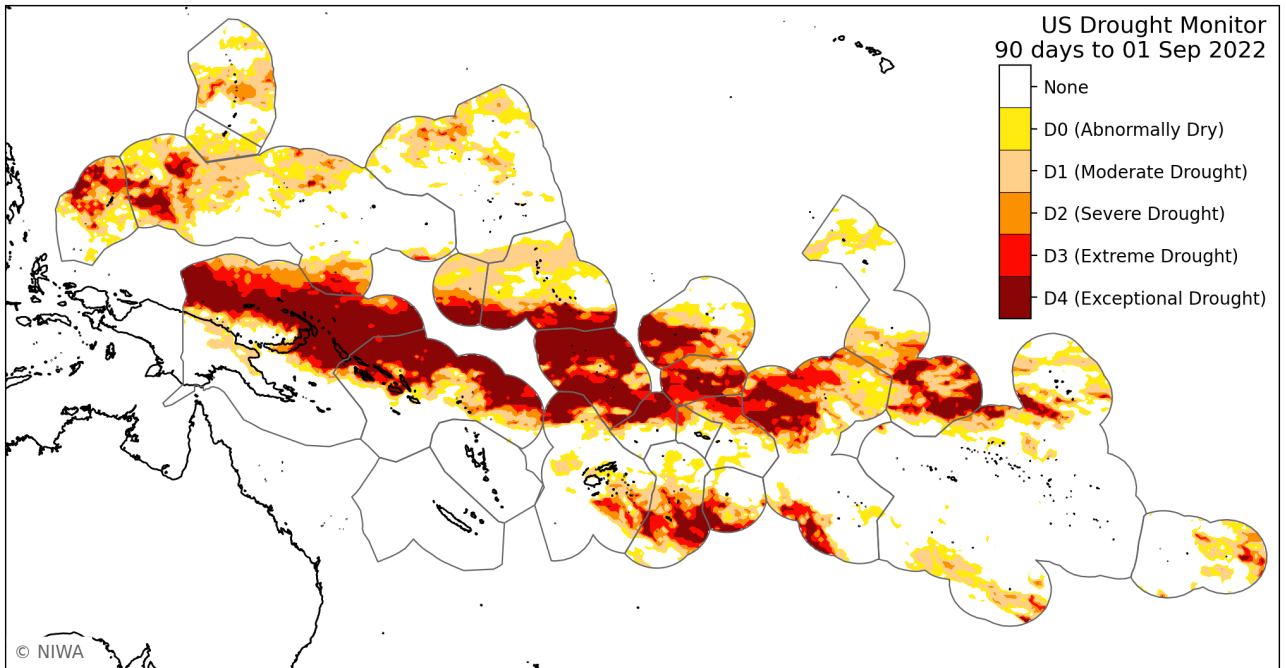


USDM Regional situation summary (1 September 2022)

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

During June-August (top plot), extreme or exceptional drought occurred in parts of Palau and western FSM, northern PNG, northern Solomons, southern Nauru, Kiribati, Tuvalu, Fiji (Eastern Division), Tonga, Tokelau, and Northern Cook Islands.

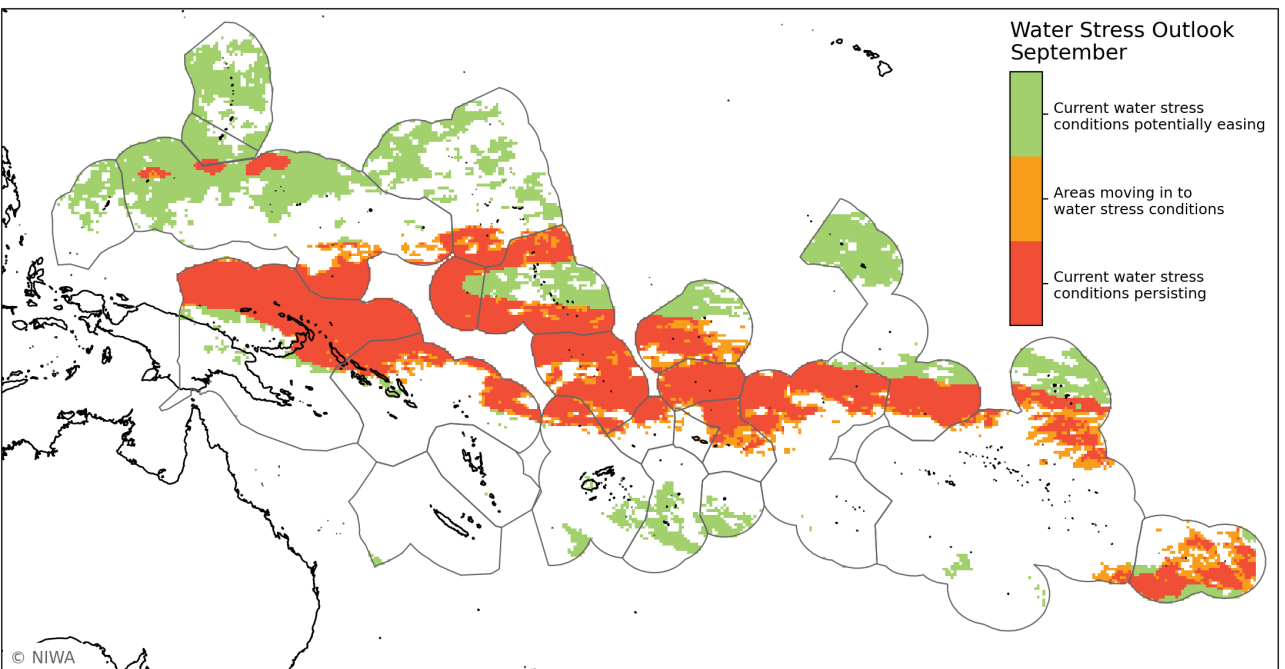
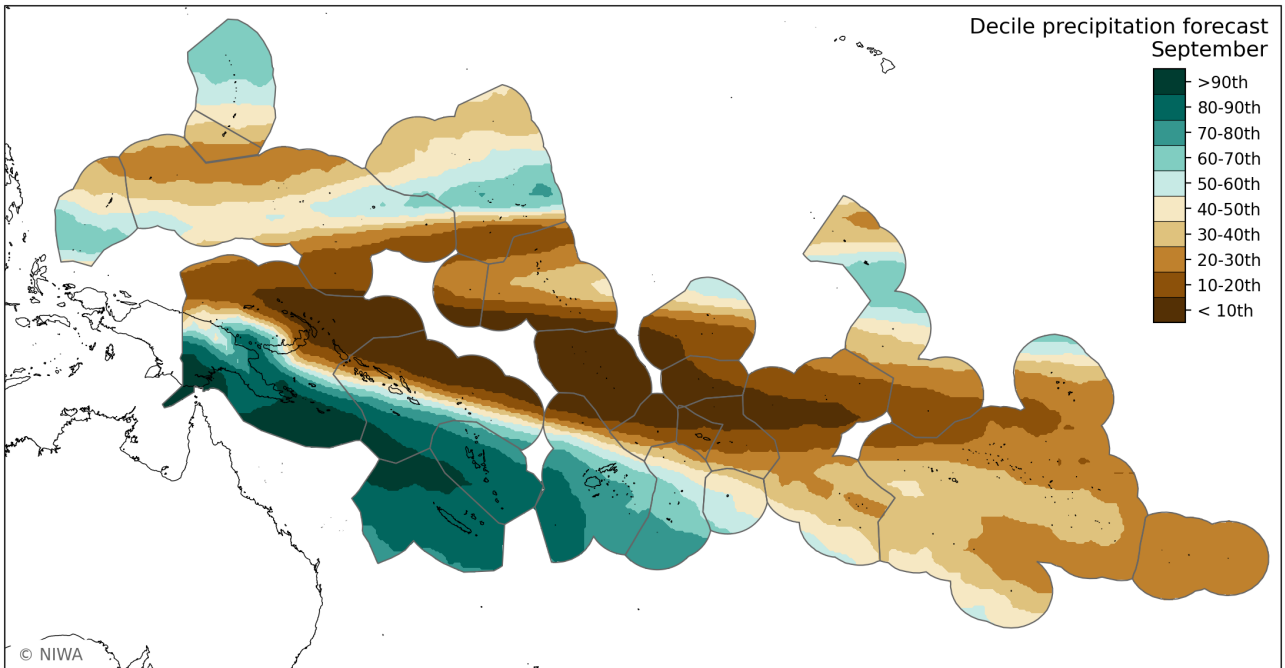
During August (bottom plot), extreme or exceptional drought occurred in parts of Northern Marianas, Guam, and western FSM, and northern PNG, Nauru, Kiribati, Tuvalu, Northern Cook Islands, and Marquesas.



September 2022 forecast summary

During September, there remains a high chance for drier than normal conditions along and extending southeastward of the equator and in parts of the western North Pacific, generally consistent with La Niña. Compared to August, the outlook trended wetter in parts of Kiribati and the southwestern part of the region.

Water stress may ease across several island groups in the western North Pacific and across portions of Kiribati. Water stress may develop in the Pitcairn Islands and persist in other island groups near the equator.

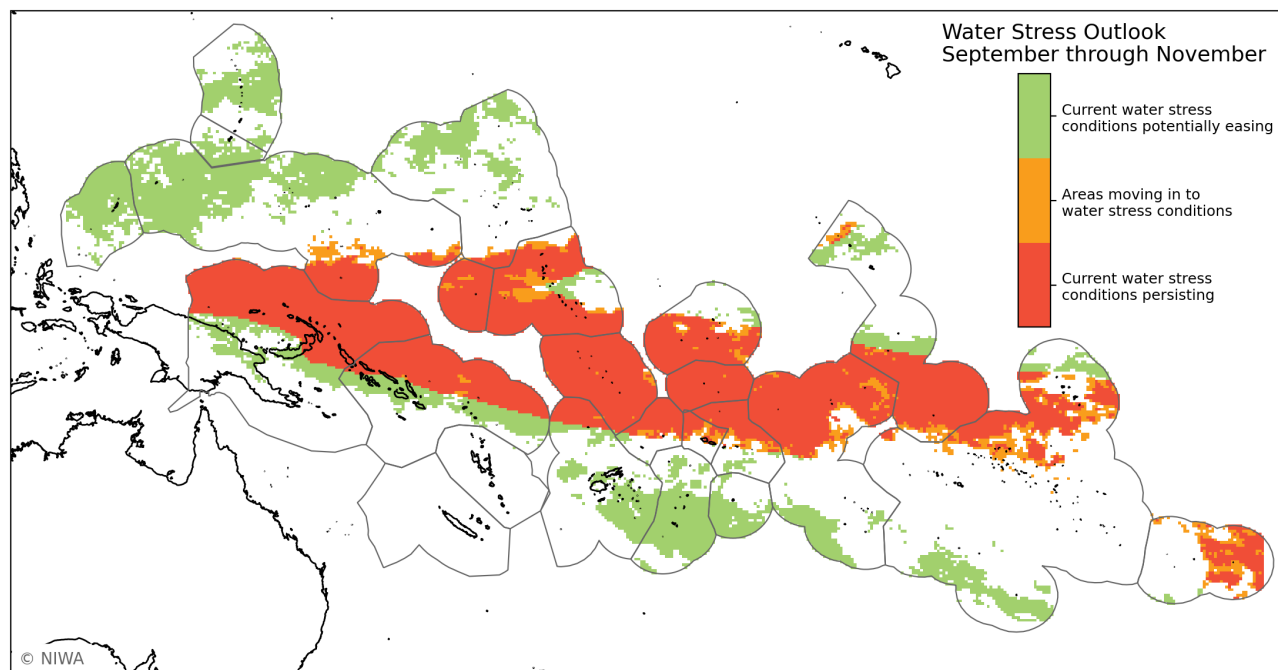
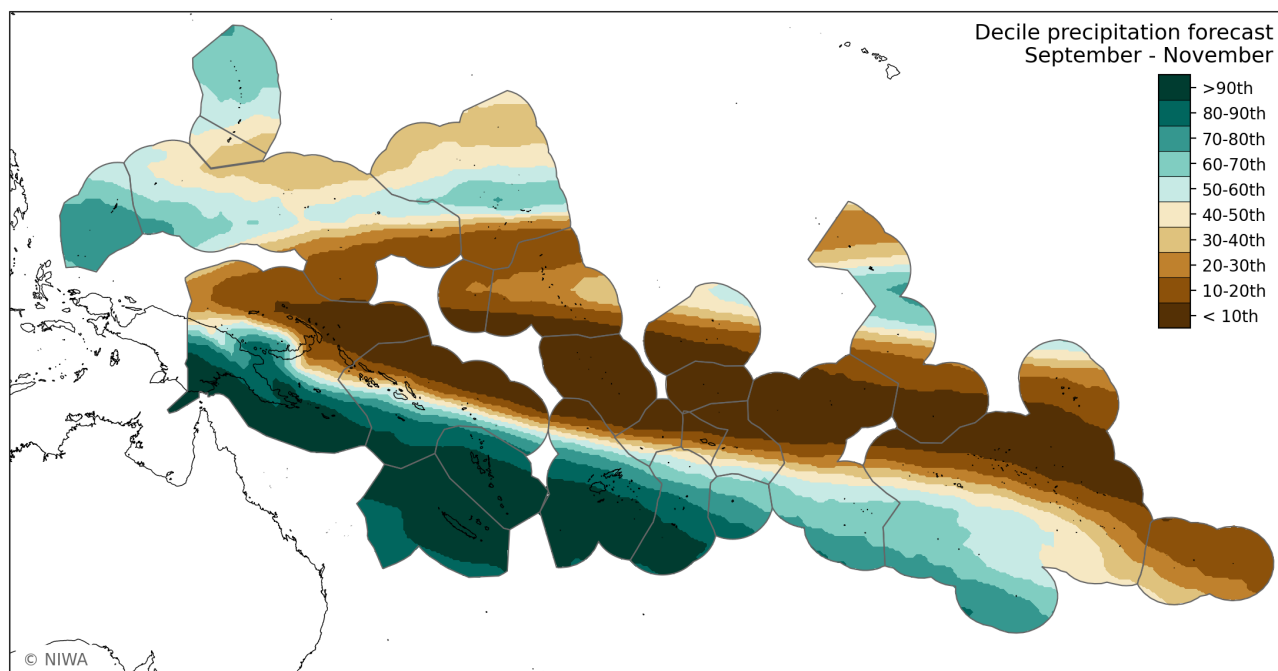


September – November 2022 forecast summary

Seasonal rainfall patterns remain consistent with La Niña, with drier than normal conditions forecast along and extending southeastward of the equator and in parts of the western North Pacific.

Compared to last month, the outlook has trended somewhat wetter in the western North Pacific and southeast of Tonga. The island groups most likely to be drier than normal are southern FSM, southern Marshalls, northern PNG, northern Solomons, Nauru, parts of Kiribati, Tuvalu, Tokelau, Wallis & Futuna, Samoa, American Samoa, Northern Cook Islands, northern French Polynesia, and Pitcairn Islands.

Water stress may persist or develop in many of these same island groups but ease in parts of the western North Pacific, southern PNG, parts of the Solomons, Fiji, and Tonga.

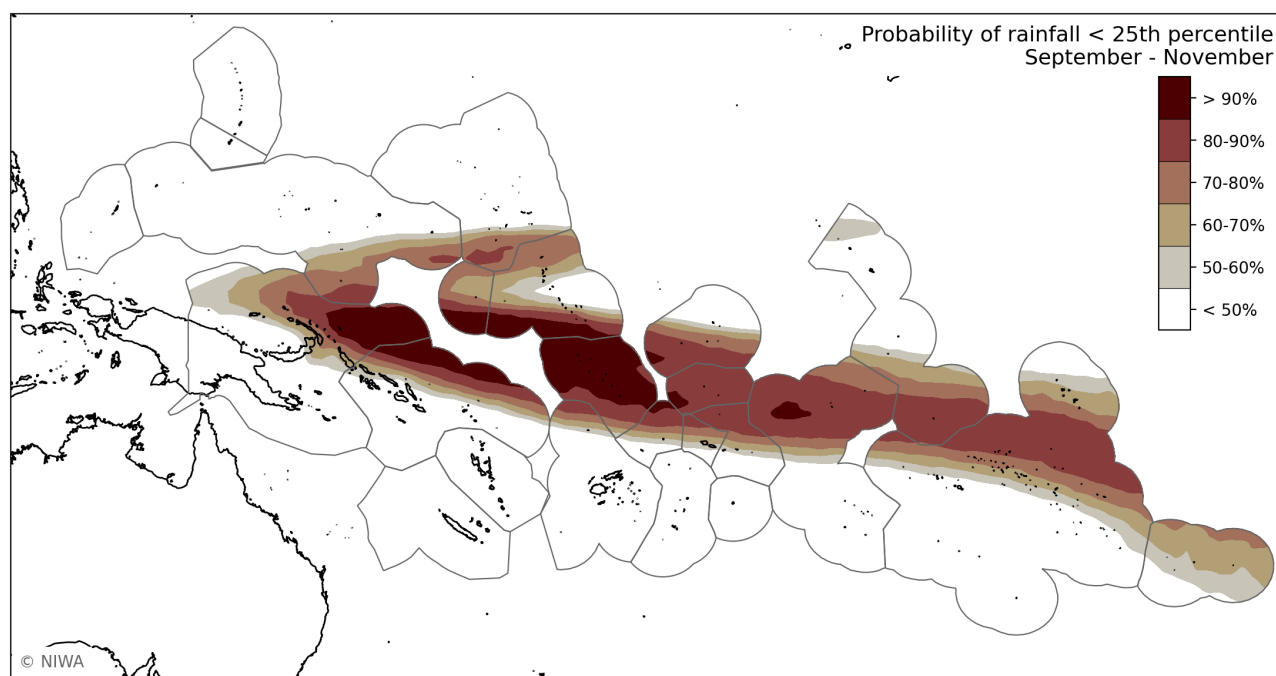
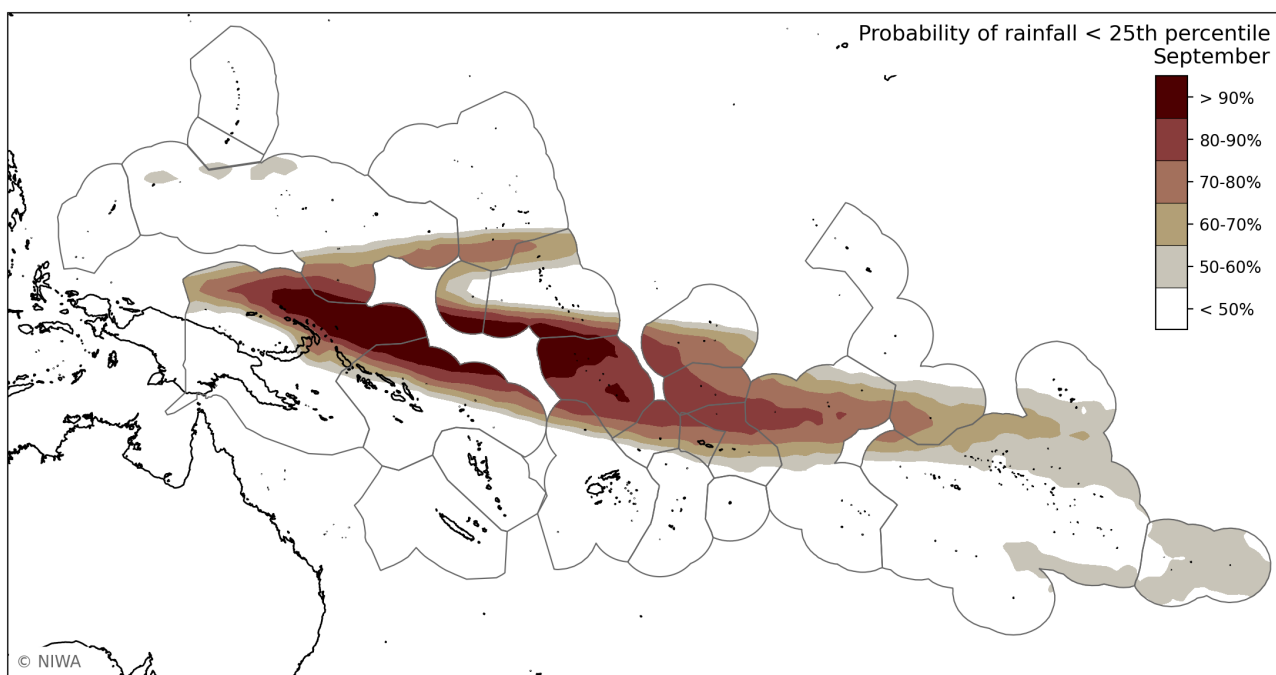


Probabilities of rainfall < 25th percentile

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

For September, very dry conditions are most likely in northern PNG, southern FSM and Marshall Islands, northern Solomons, Nauru, southern Kiribati, Tuvalu, Tokelau, northern Wallis & Futuna, Samoa, American Samoa, Northern Cook Islands, and northern French Polynesia. Odds for dryness also increased in the Pitcairn Islands.

For September-November, very dry conditions are likely in many of these island groups, with chances increasing for southern Kiribati, northern French Polynesia, and the Pitcairn Islands.






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 480+ 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>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 UNDM indices. • A range of probabilistic one to five monthly and seasonal forecast plots updated shortly after the 15th of each month.



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 PRAS2201.

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