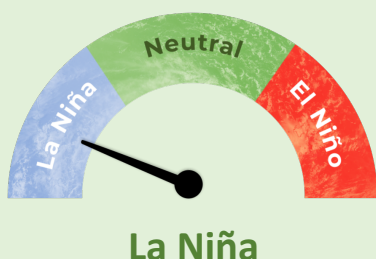


Island Climate Update



ENSO Watch
January 2022

Recent



During December:

- La Niña conditions were observed in the equatorial Pacific.
- Sea surface temperatures (anomaly of -0.68°C) were near the La Niña threshold in the central equatorial Pacific.
- The Southern Oscillation Index (SOI) was $+1.3$, in the La Niña range.

80% chance for **La Niña** conditions during **January – March 2022.**

Chance for **ENSO neutral** conditions during **April - June 2022.**

70%



Forecast

ENSO situation summary

The NINO3.4 Index anomaly (in the central equatorial Pacific) over the last month was -0.68°C , near the La Niña threshold. The monthly Southern Oscillation Index (SOI) was $+1.3$ and the three-month average SOI was $+1.0$, both in the La Niña range.

Upper-oceanic heat content continued to be below normal in the central and eastern equatorial Pacific, associated with the peak of a La Niña event. In the subsurface, anomalies of -1°C to -2°C continued at depth in the central and east. In the west, a substantial warm pool of water ($+3^{\circ}\text{C}$ to $+4^{\circ}\text{C}$) developed between 150-200 m depth.

The Southwest Pacific Convergence Zone was again displaced southwest of its climatological position, over northern PNG to about New Caledonia or Fiji, consistent with La Niña.

La Niña conditions remain favoured during January-March (80% chance). Between April-June, there is a 70% chance for the re-emergence of ENSO neutral conditions.

During July-September, ENSO neutral is favoured at a 50% chance.

On 10 December, Tropical Cyclone Ruby formed in the Coral Sea. The system strengthened into a high-end category 2 system, with sustained winds of 110 km/h just before making landfall on northwestern New Caledonia on 14 December. Gusts as high as 162 km/h lashed parts of the Island as hundreds of homes lost power. 405 mm of rainfall was recorded over 48 hours at Kouaoua, in Northern Province in New Caledonia. In addition to Ruby, there have been three other cyclones in the basin so far this season, with 9-12 expected in total.

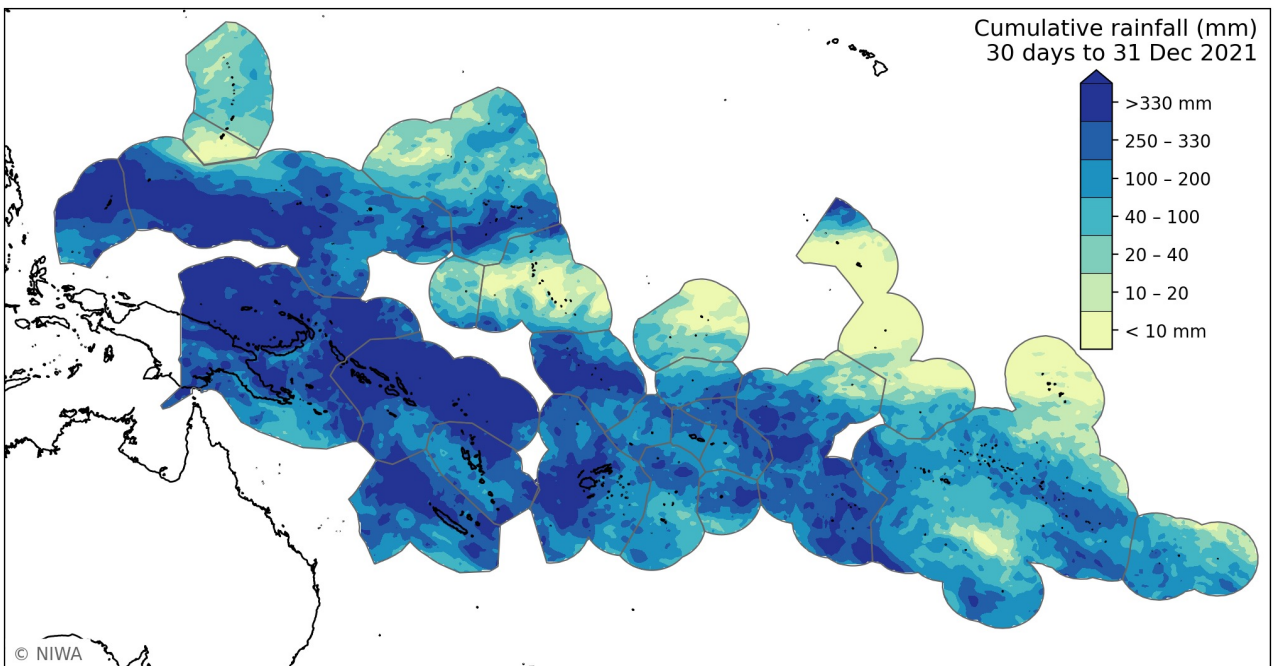
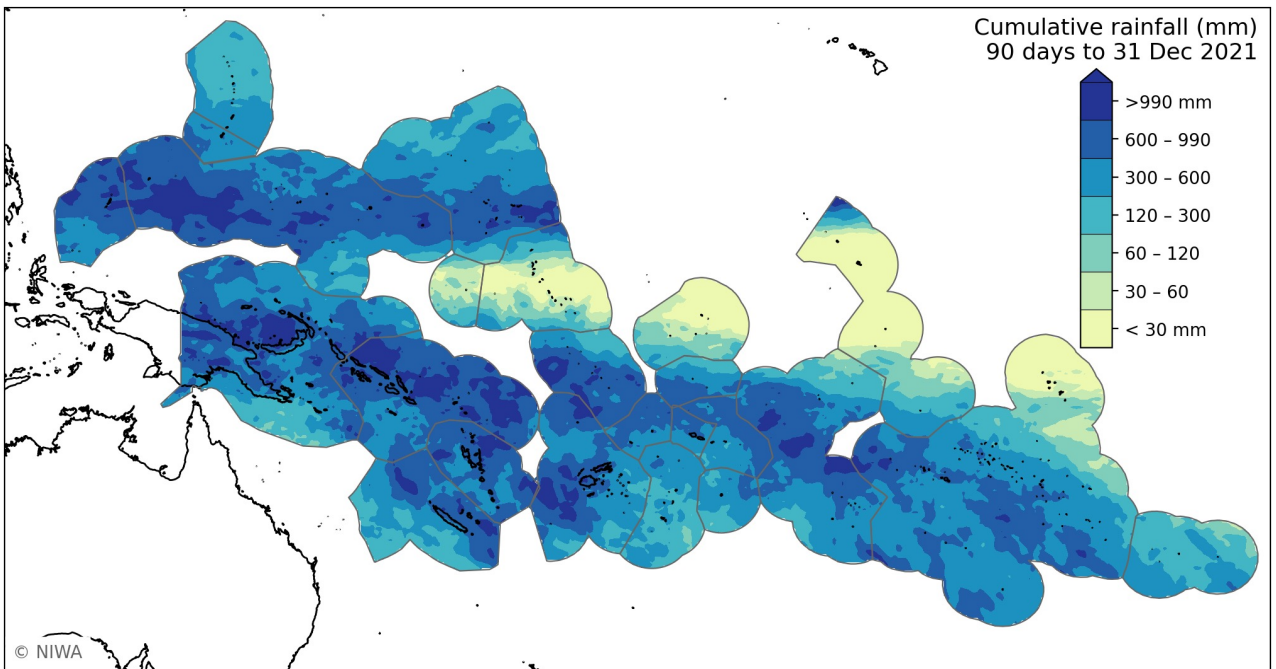
The MJO is currently over the western Pacific and is predicted to pulse across the Pacific again in mid-to-late January. This gives an elevated change of tropical cyclone formation in the region during this time.

Regional situation summary (31 December 2021)

La Niña-like rainfall patterns continued across the tropical Pacific, with less rainfall near the equator and more rainfall toward the sub-tropics.

During December, generally less than 30 mm of rain was observed in much of Kiribati (central Gilbert, northern Phoenix & Line Islands) and northern islands of Marquesas. 30-60 mm was observed in parts of Nauru. These same islands have also experienced low rainfall during the last three months.

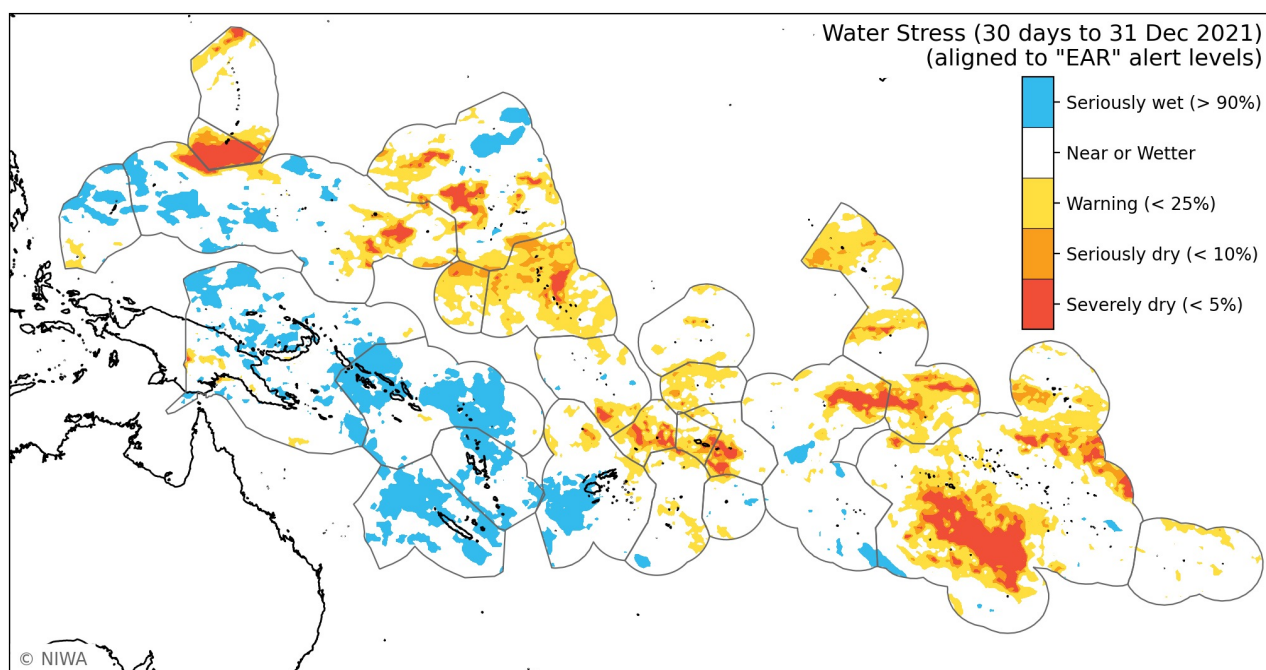
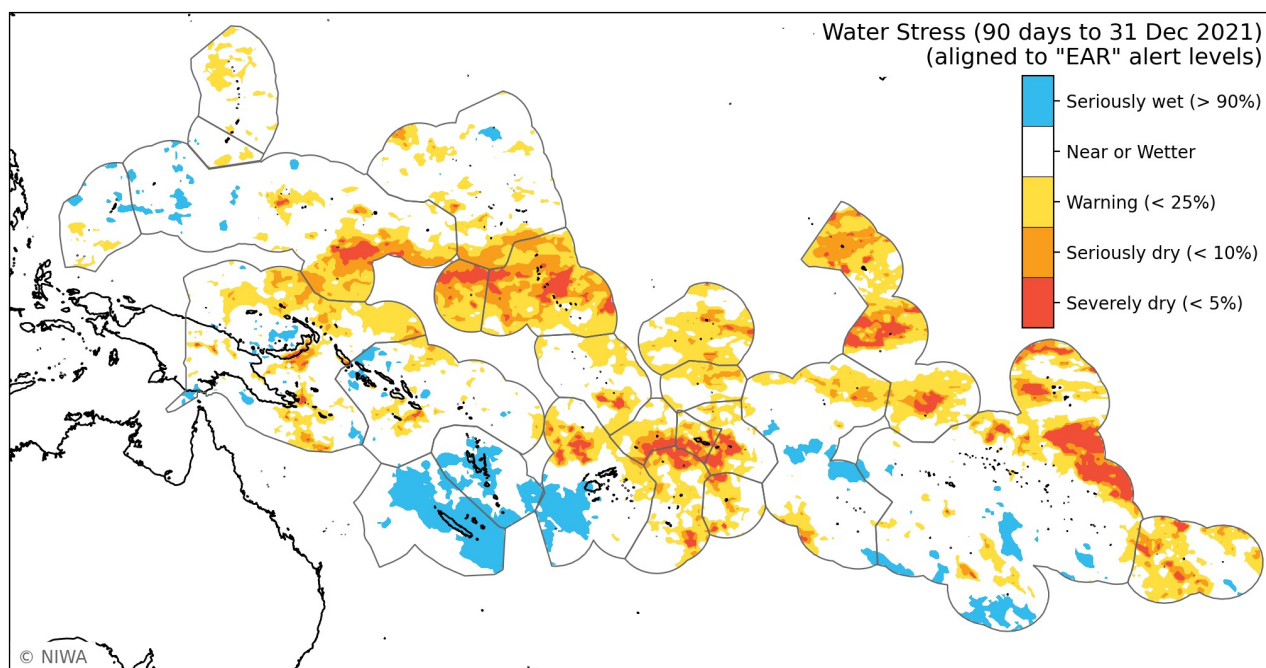
Conversely, more than 330 mm of rain fell during December across large parts of Palau, FSM, Papua New Guinea, Solomon Islands, New Caledonia, Vanuatu, Fiji, Tuvalu, and isolated parts of the Cook Islands.



Regional situation summary (31 December 2021)

Alert levels (aligned with the Early Action Rainfall thresholds) for cumulative rainfall over the last 90 and 30 days are shown in the plots below. Seriously (< 5th percentile) and severely dry (< 10th percentile) conditions were observed in December around Guam, eastern FSM, southern Marshall Islands, Kiribati (Gilbert & Line Islands), Wallis & Futuna, Samoa, American Samoa, Northern Cook Islands, and parts of French Polynesia.

Over the last three months, seriously or severely dry conditions affected eastern FSM, parts of Papua New Guinea, Nauru, Kiribati (Gilbert, Phoenix & Line Islands), northern Fiji, Tuvalu, Wallis & Futuna, American Samoa, Samoa, Tonga, Niue, Northern Cook Islands, northern French Polynesia, and Pitcairn Islands.

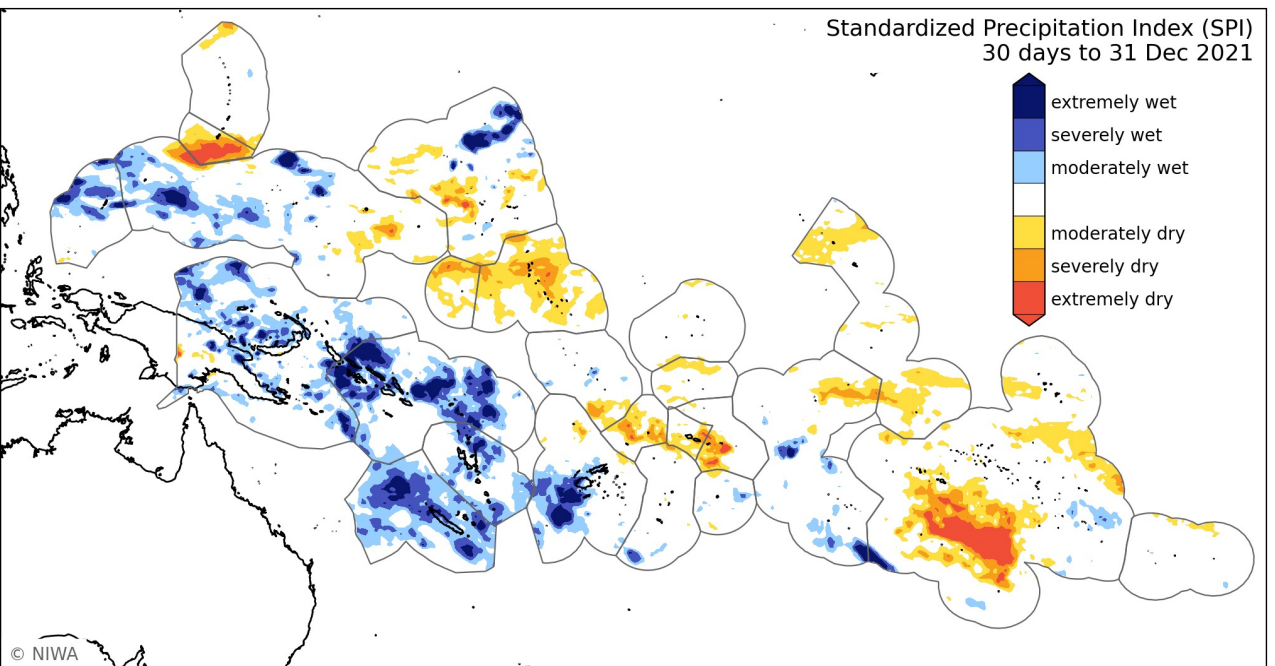
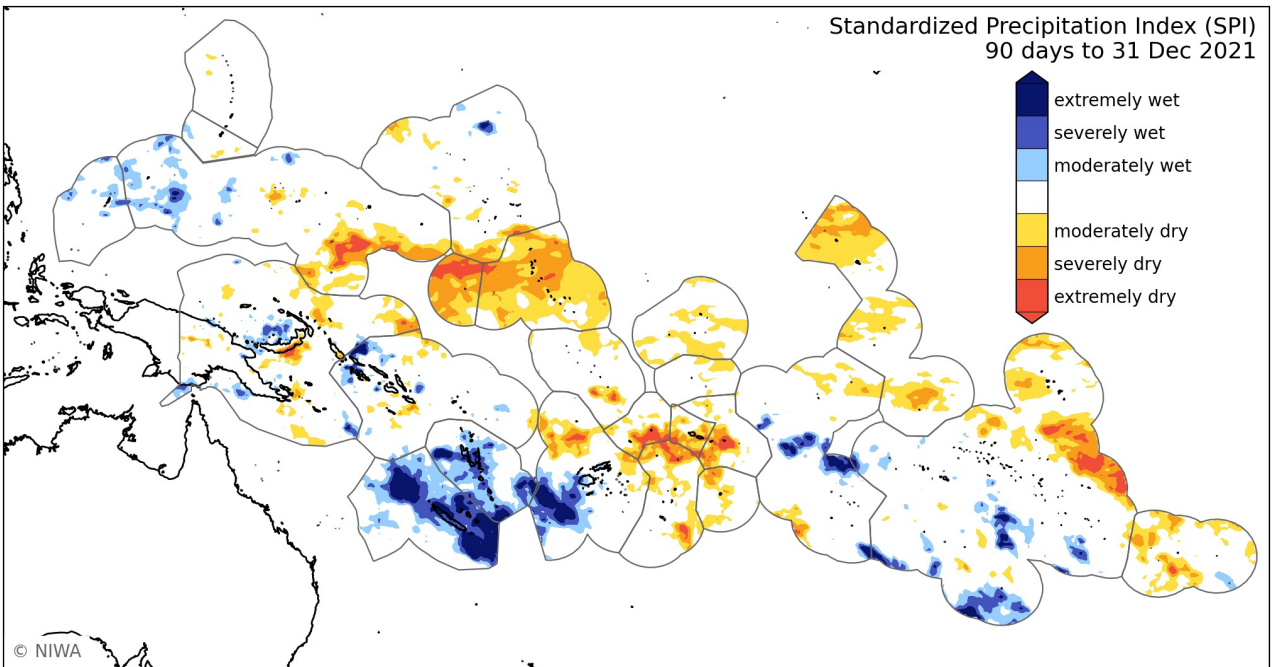


SPI Regional situation summary (31 December 2021)

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

During December, extremely and severely dry conditions were observed for Guam, parts of the Marshall Islands, Kiribati (Gilbert Islands), American Samoa, Samoa, and central French Polynesia.

Drier conditions over last 3 months occurred in many of the same island groups, but also included eastern parts of Papua New Guinea, Nauru, parts of northern Fiji, Kiribati (northern Line Islands) and northern-eastern parts of French Polynesia.

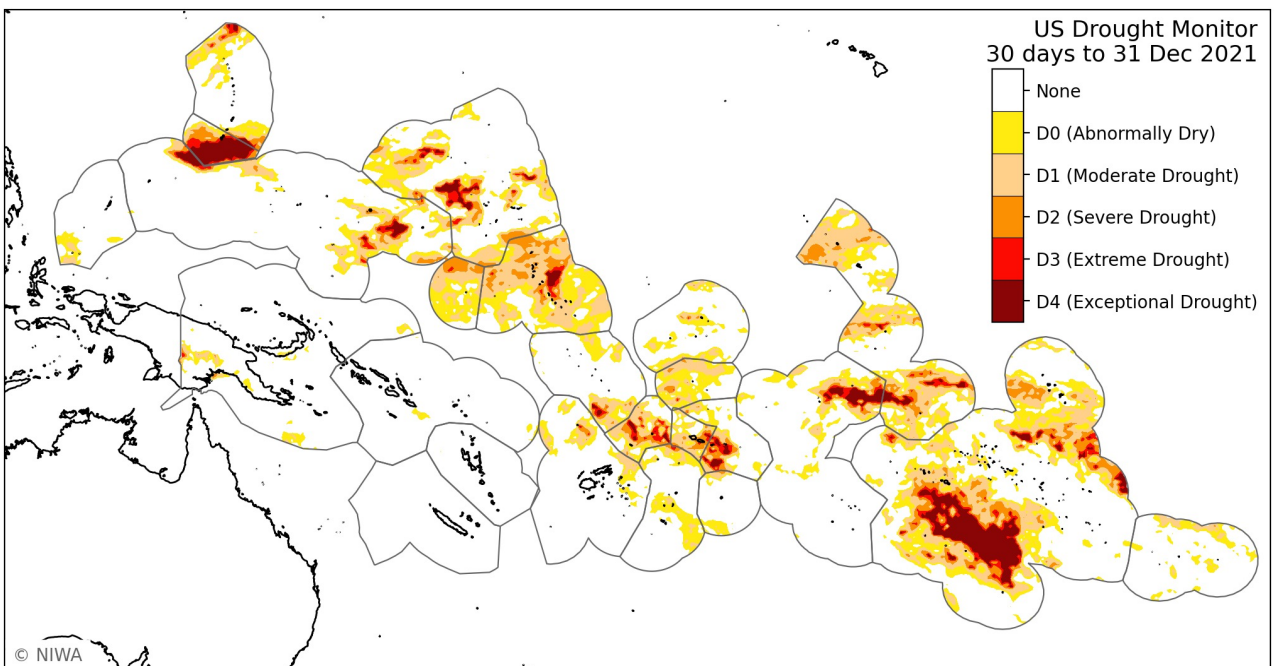
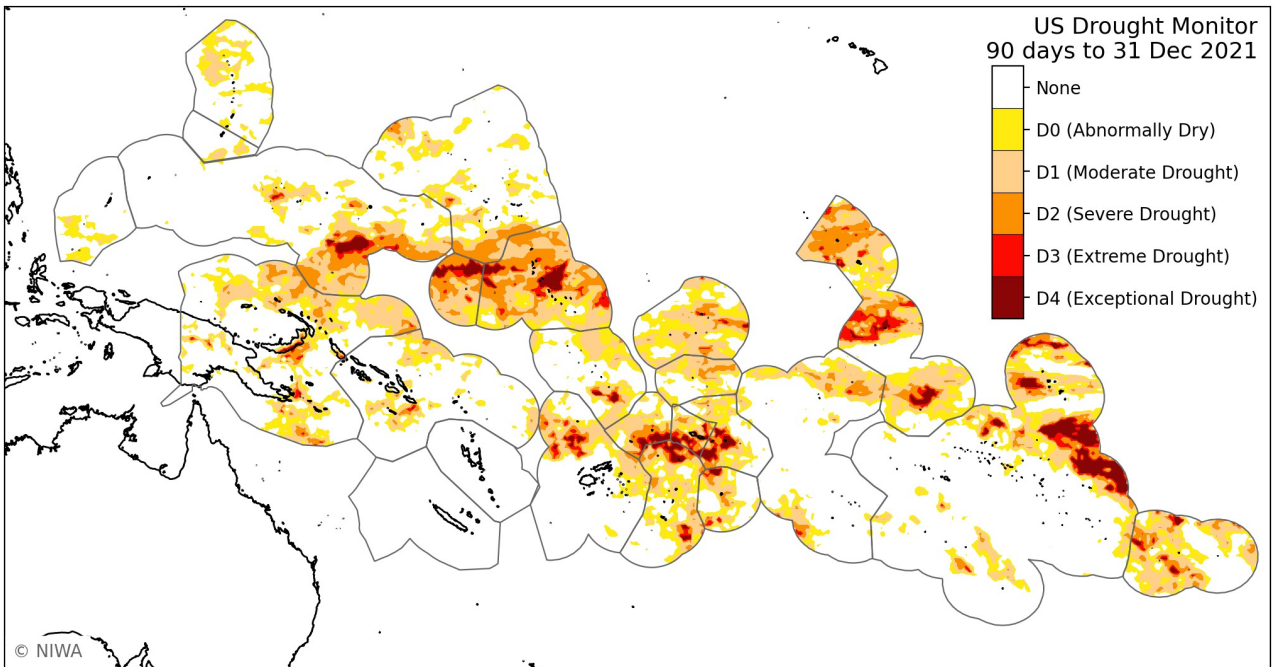


USDM Regional situation summary (31 December 2021)

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

During December, extreme and exceptional drought conditions was observed over Guam, parts of FSM and Marshall Islands, Kiribati (Gilbert & southern Line Islands), parts of Samoa and American Samoa, parts of the Northern Cook Islands, and parts of the Society and Tubuai Islands in French Polynesia.

Over the last 3 months, extreme and exceptional drought was most pronounced for eastern FSM, parts of PNG, Nauru, Kiribati (Gilbert & Line Islands), southern Tuvalu, northern Fiji, Samoa, American Samoa, northern Tonga, Niue, northern French Polynesia, and Pitcairn Islands.



Island Climate Update

Water Stress Outlook

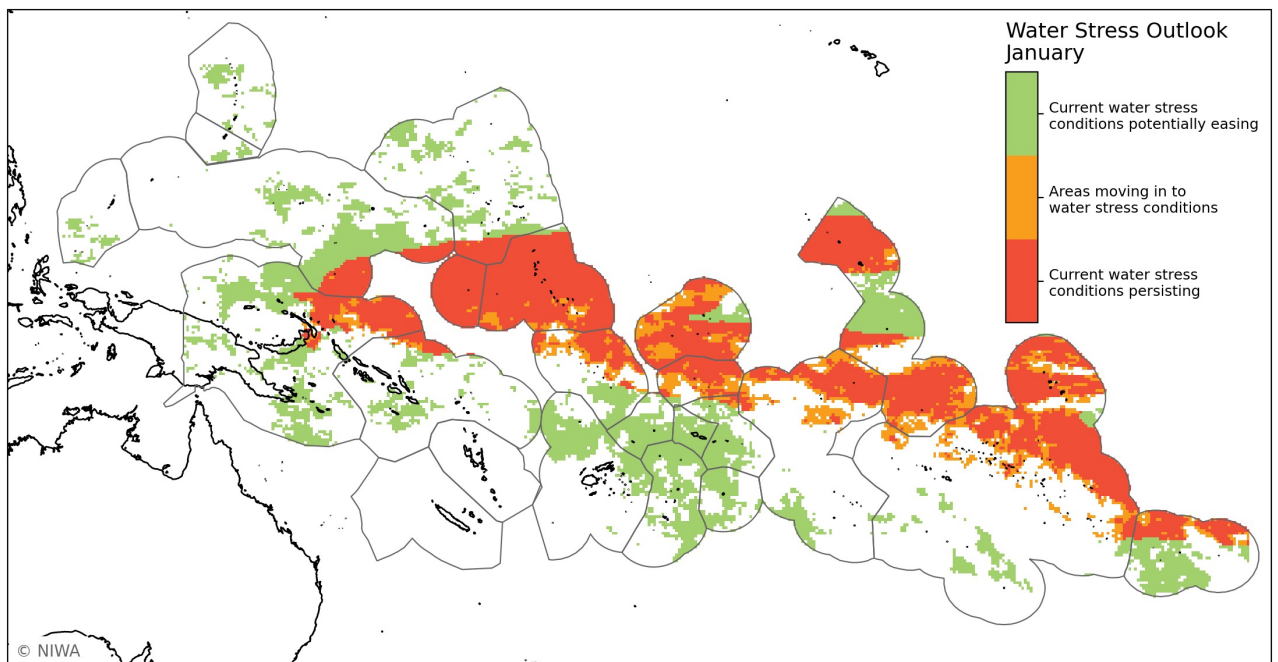
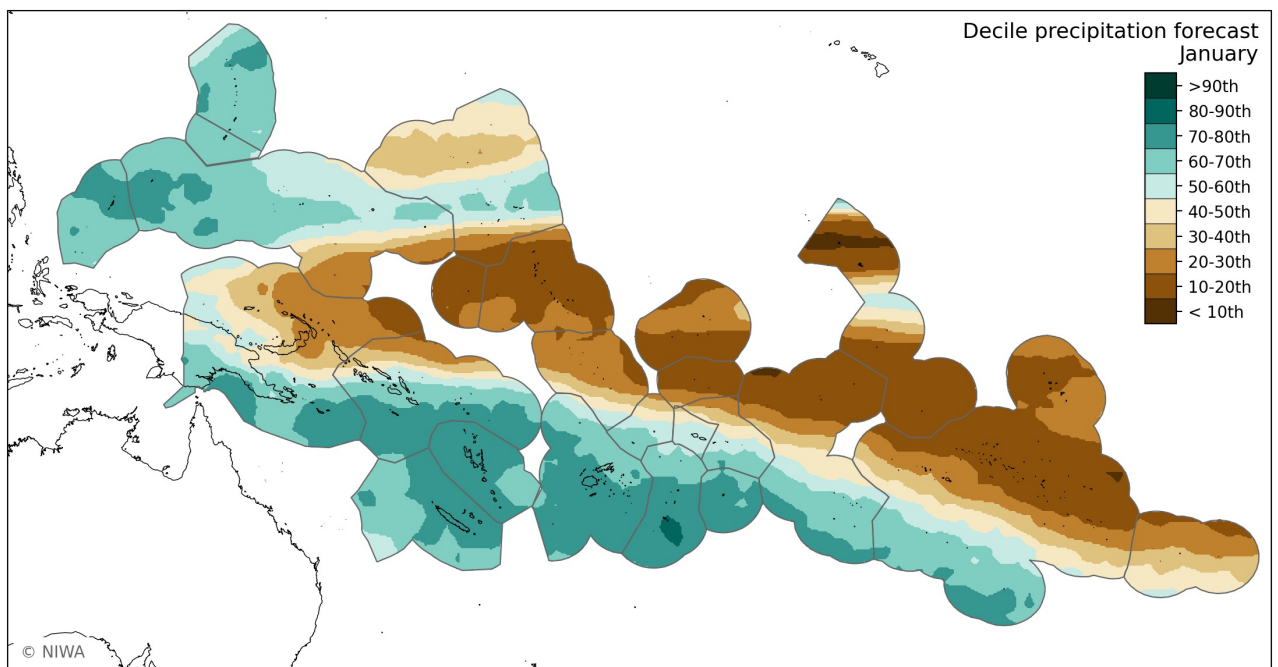


January 2022 forecast summary

Drier than normal conditions are expected to occur along and extending southeastward of the equator during January.

The island groups most likely to experience drier than normal conditions include eastern PNG, southern FSM, Nauru, southern Marshall Islands, Kiribati (Gilbert, Phoenix & Line Islands), Tuvalu, Tokelau, Northern Cook Islands, northern and central French Polynesia, and Pitcairn Islands.

Water stress may continue for eastern PNG, southern FSM, Guam, southern Marshall Islands, Kiribati (Gilbert, Phoenix & Line Islands), northern Tuvalu, Tokelau, Northern Cook Islands, northern French Polynesia, and northern Pitcairn Islands.

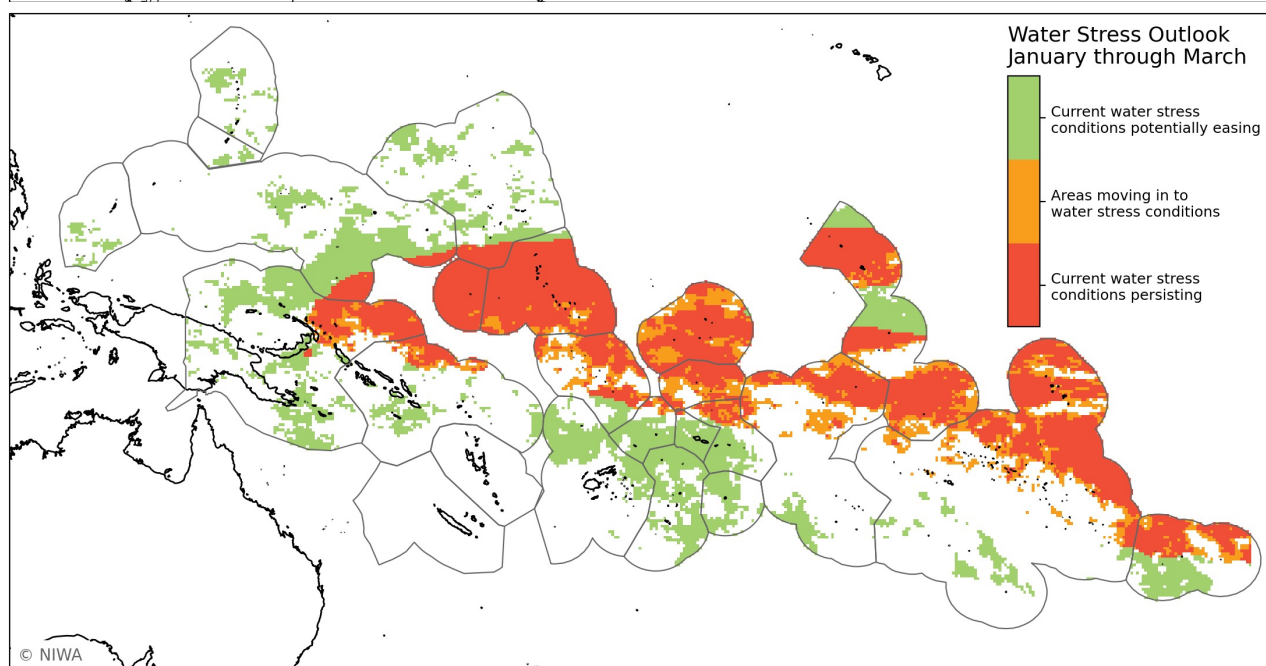
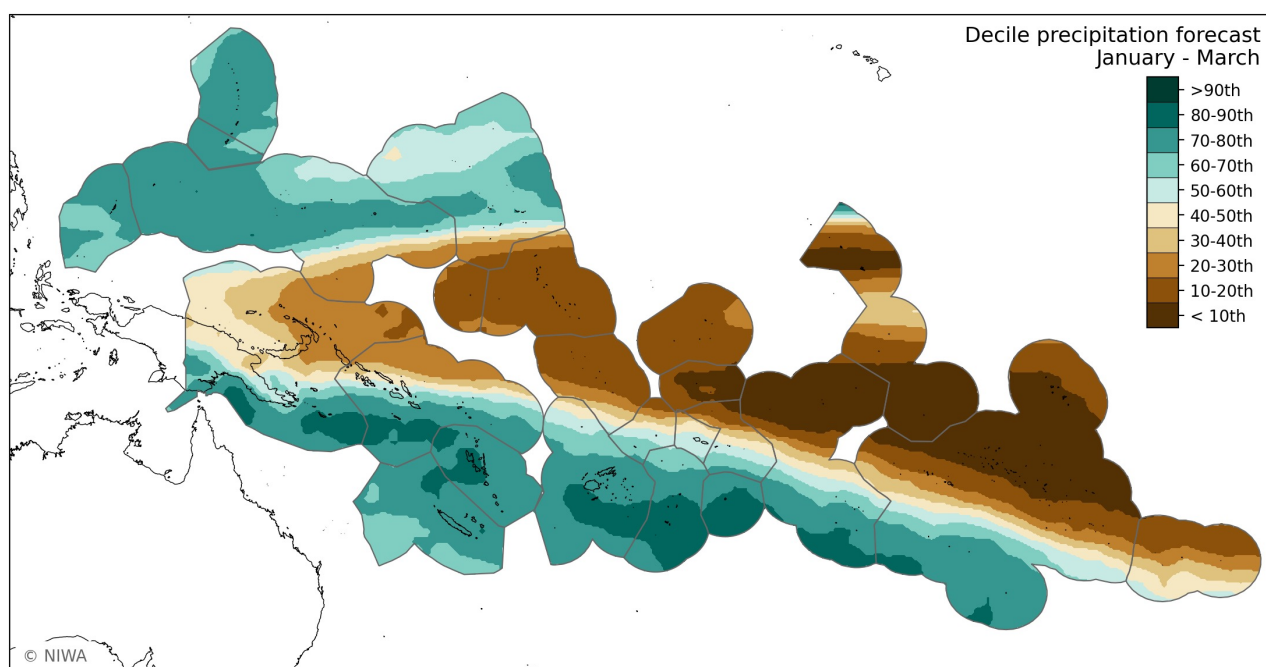


January – March 2022 forecast summary

Seasonal rainfall patterns are forecast to be similar to the next month, as influenced by La Niña in the equatorial Pacific.

Compared to December, reduced seasonal is more pronounced. The same island groups that are most likely to experience drier than normal conditions in the next 30 days are also likely to experience drier than normal conditions in the next 90 days.

The same island groups that are most likely to experience water stress conditions in the next 30 days are also likely to experience water stress in the next 90 days.

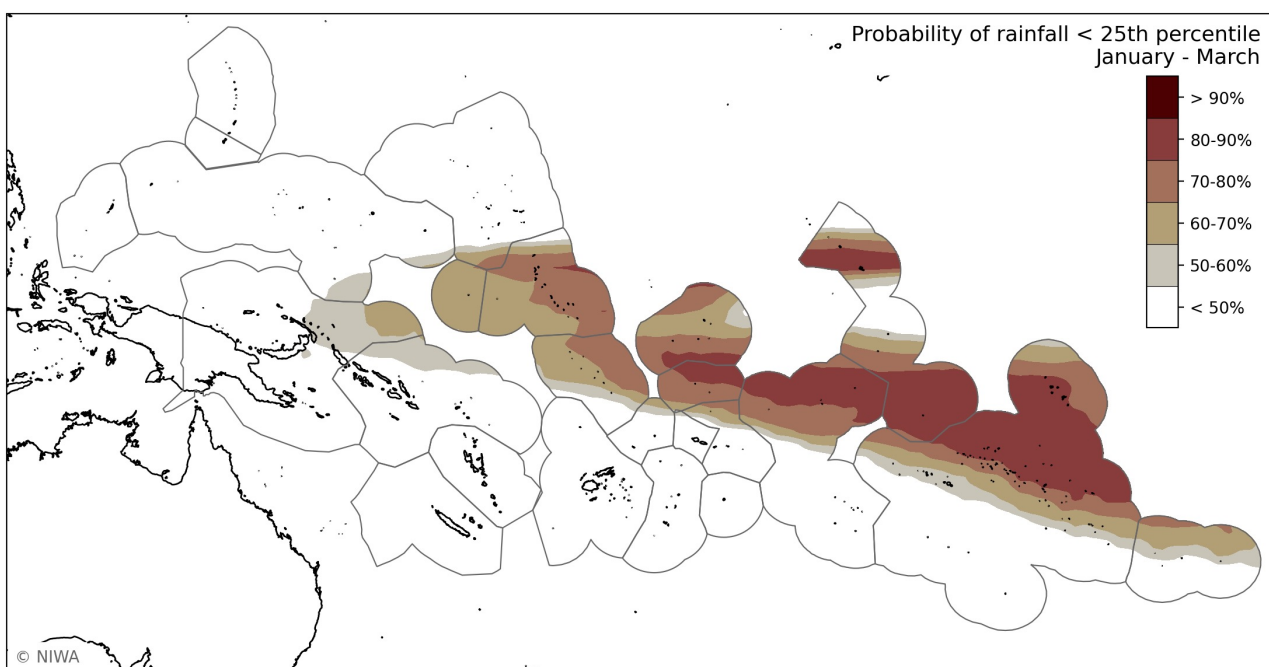
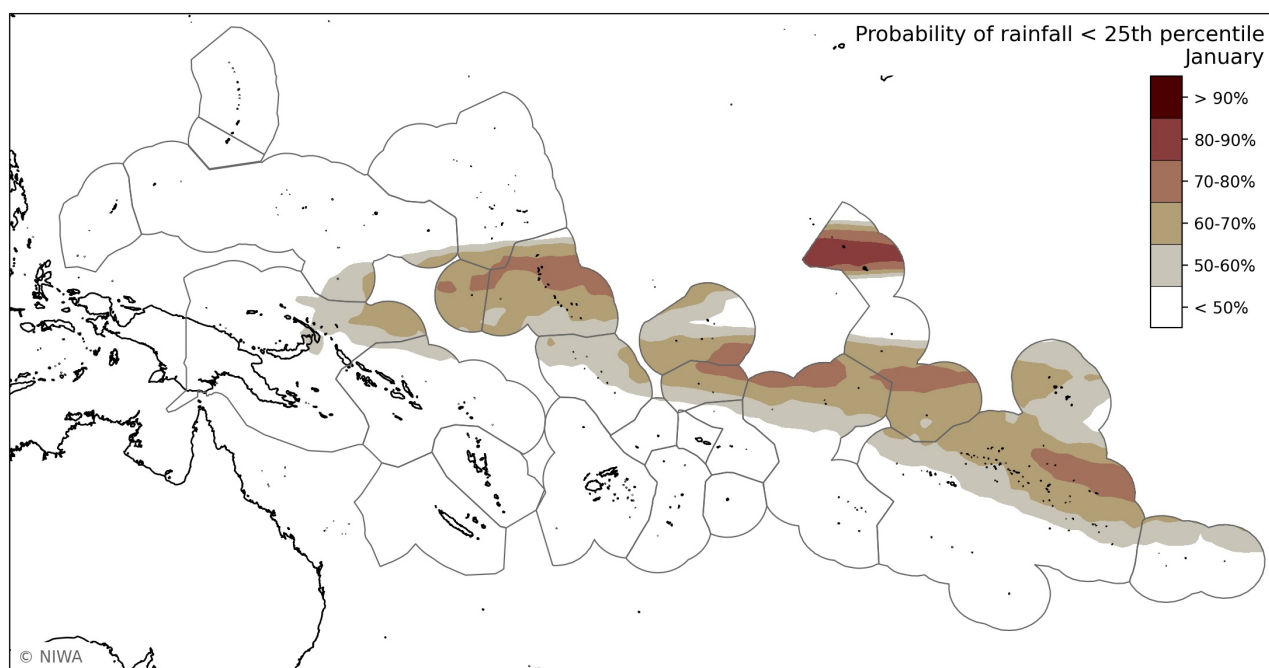


Probabilities of rainfall < 25th percentile

The probability (likelihood) of dry conditions with cumulative rainfall being less than the 25th percentile for December and for the season (December through February) are shown.

For January, very dry conditions are likely for portions of eastern Papua New Guinea, southern Marshall Islands, Nauru, Kirabati (Gilbert, Phoenix & Line Islands), northern Tuvalu, Tokelau, and parts of French Polynesia.

For January-March, very dry conditions are likely for many of the same island groups mentioned above, but also highly likely (>80%) for portions of Kiribati (Phoenix & Line Islands), Northern Cook Islands, and parts of French Polynesia.



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>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 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.

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