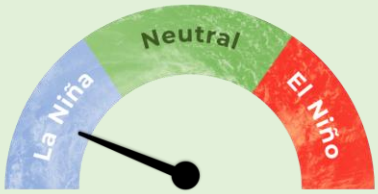
# Island Climate Update

NIWA
Taihoro Nukurangi

## ENSO Watch
March 2022

## Recent




**La Niña**

La Niña conditions continued in the equatorial Pacific during February but weakened compared to January.

Sea surface temperatures were near the La Niña threshold in the central equatorial Pacific during February, on -0.60˚C.

The Southern Oscillation Index (SOI) was +0.8 for December-February, near the La Niña threshold.

## Forecast

**60%** chance for **La Niña** conditions during **March – May 2022.**

Chance for **ENSO neutral** conditions during **June - August 2022.** **60%**


**La Niña Event**

## ENSO situation summary

The NINO3.4 Index anomaly (in the central Pacific) during February was -0.60˚C, near the La Niña threshold. The monthly Southern Oscillation Index (SOI) was +0.7 and the three-month average SOI was +0.8, the latter near the La Niña threshold.

Upper-oceanic heat content increased in the western and central Pacific for the second consecutive month. For the first time since June 2021, conditions in the upper 300 meters of the equatorial Pacific were generally warmer than average, signalling that the La Niña event is nearing its end.

In the subsurface equatorial Pacific, a warm pool of water continued to push eastward and progressed closer to the surface. This will likely spell the end of oceanic La Niña conditions by May.

La Niña conditions will likely give way to ENSO neutral conditions between April-June (60% chance). Between June-August, ENSO neutral is favoured at a 60% chance. ENSO neutral is also favoured from September-November (45% chance).

Suppressed convection over the western Pacific during the first half of March will reduce the risk for tropical cyclone activity. There may be an increased risk for cyclone development later in the month, particularly in the western part of the basin near New Caledonia and Vanuatu. The cyclone season runs through April. So far, five tropical cyclones have formed.

# Island Climate Update
## Rainfall Watch

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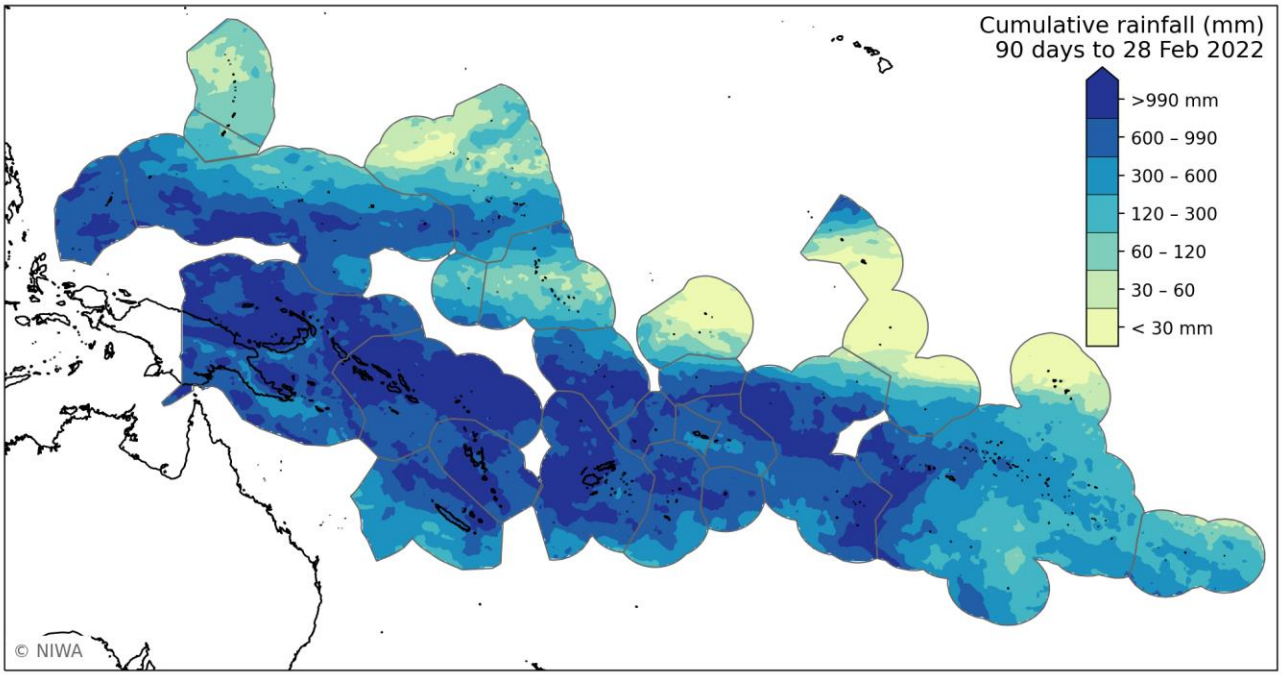
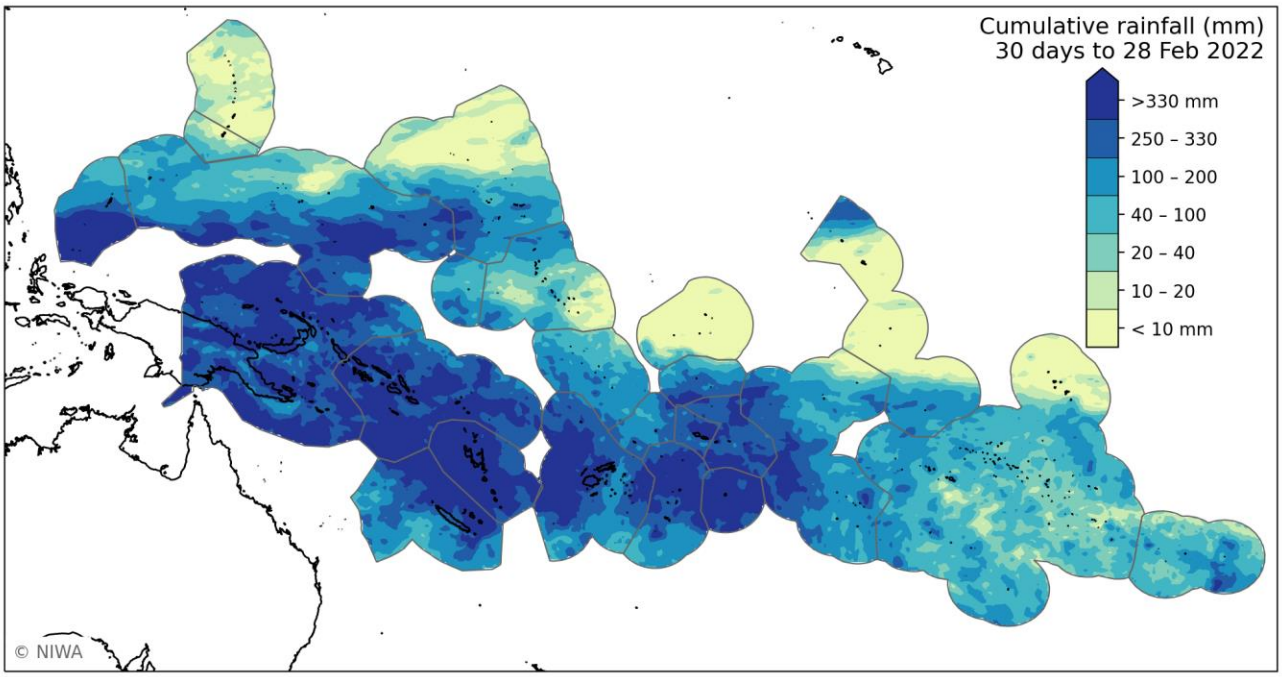
## Regional situation summary (28 February 2022)

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

During February, particularly heavy rainfall totals (>300 mm) fell in parts of Papua New Guinea, Solomon Islands, New Caledonia, and Fiji as a result of several tropical disturbances, including Tropical Cyclone Dovi.

Less than 20 mm of rain was observed in parts of the Northern Marianas, northern Marshall Islands, the Phoenix and Line Islands of Kiribati, and parts of Marquesas during February. These same islands have also experienced low rainfall during the last three months.



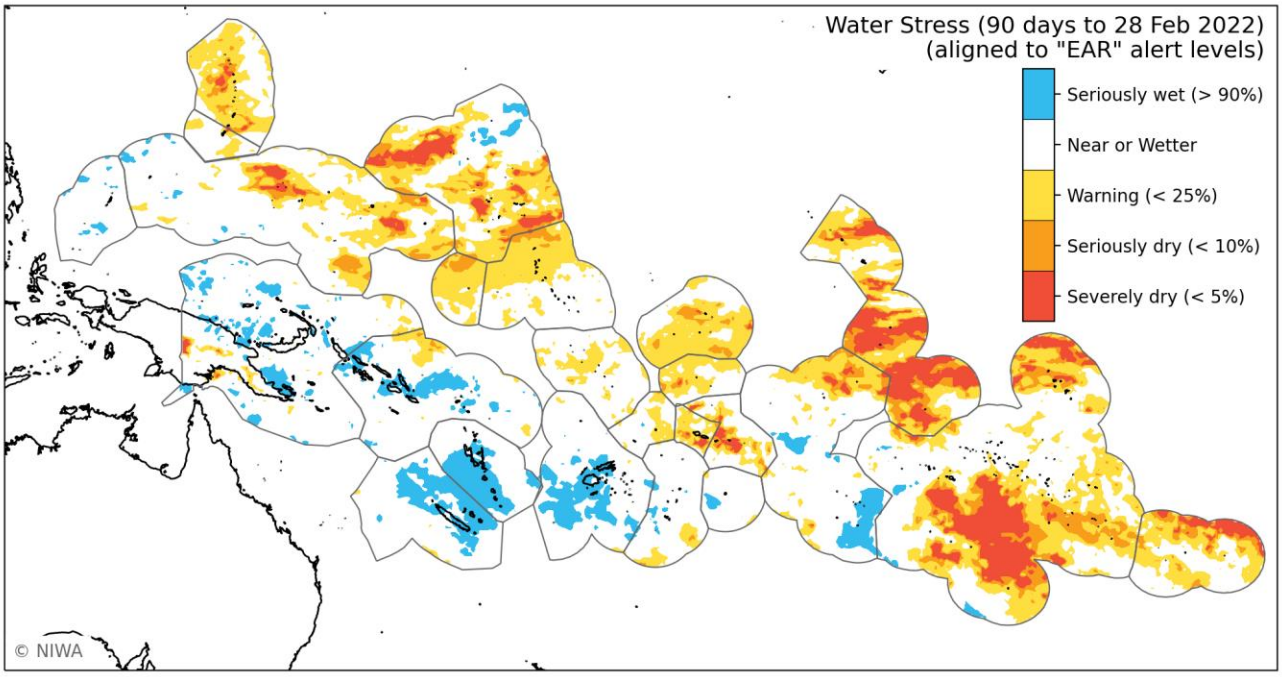
# Island Climate Update
## Water Stress Watch

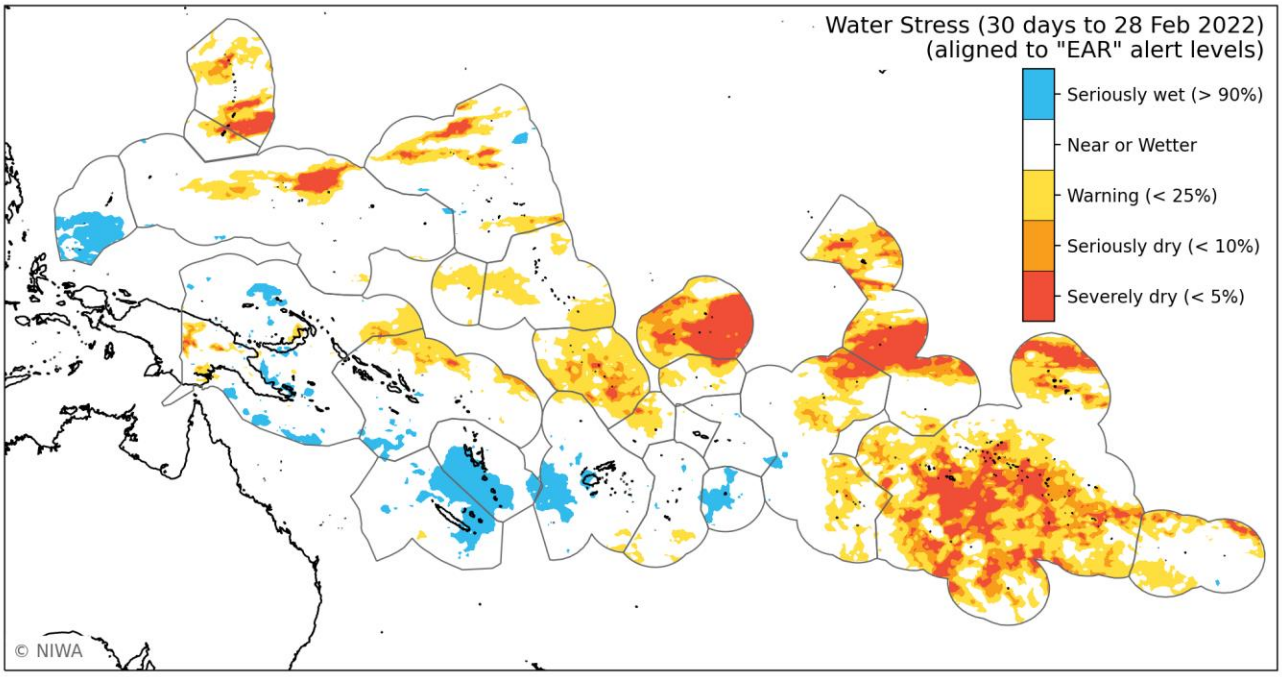
## EAR regional situation summary (28 February 2022)

The regional 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 parts of the northern Marianas, eastern FSM, parts of the the Marshall Islands, Samoa, American Samoa, the Line Islands of Kiribati, and Marquesas.

Over the last three months, seriously or severely dry conditions affected parts of the Northern Marianas, FSM, the Marshall Islands, Tuvalu, Kiribati, Marquesas, and the Tuamotu Archipelago.



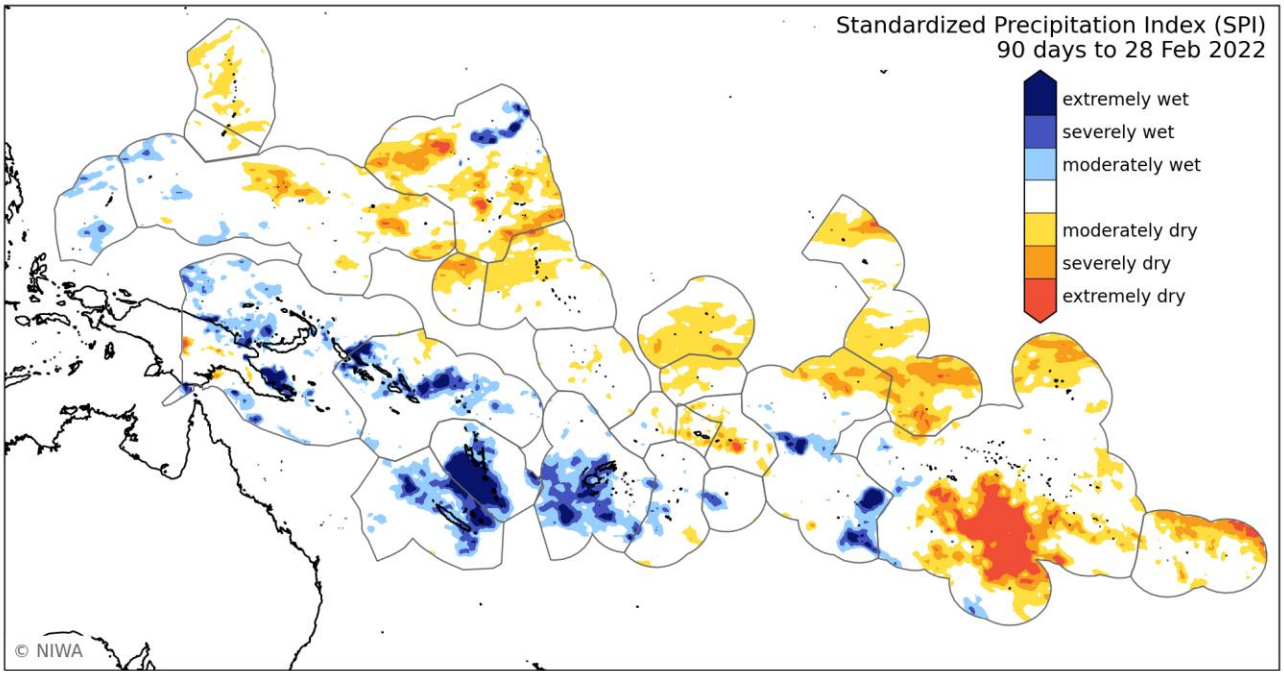
# Island Climate Update
## Water Stress Watch

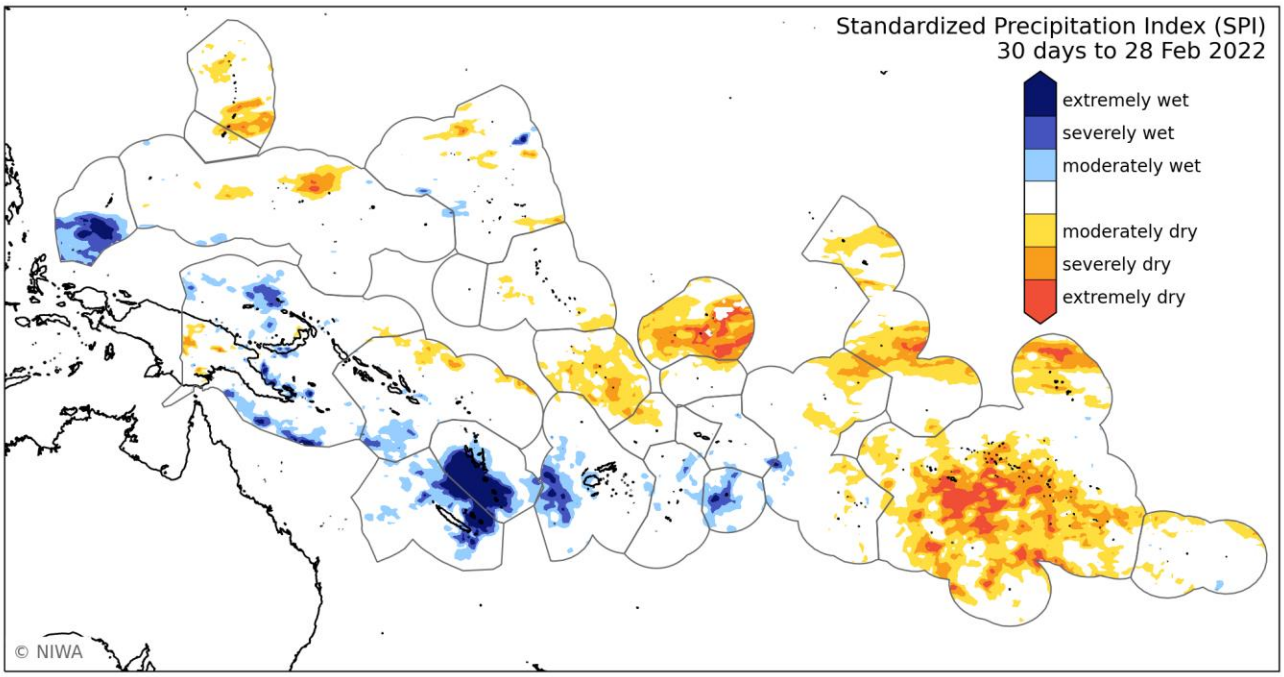
## SPI Regional situation summary (28 February 2022)

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

During February, extremely or severely dry conditions were observed in parts of the Northern Marianas, FSM, Tuvalu, Kiribati, Marquesas, and the Tuamotu Archipelago.

Over the last 3 months, the driest conditions were found in FSM, Northern Marianas, Tuvalu, American Samoa, the Line Islands of Kiribati, Marquesas, and the Tuamotu Archipelago.



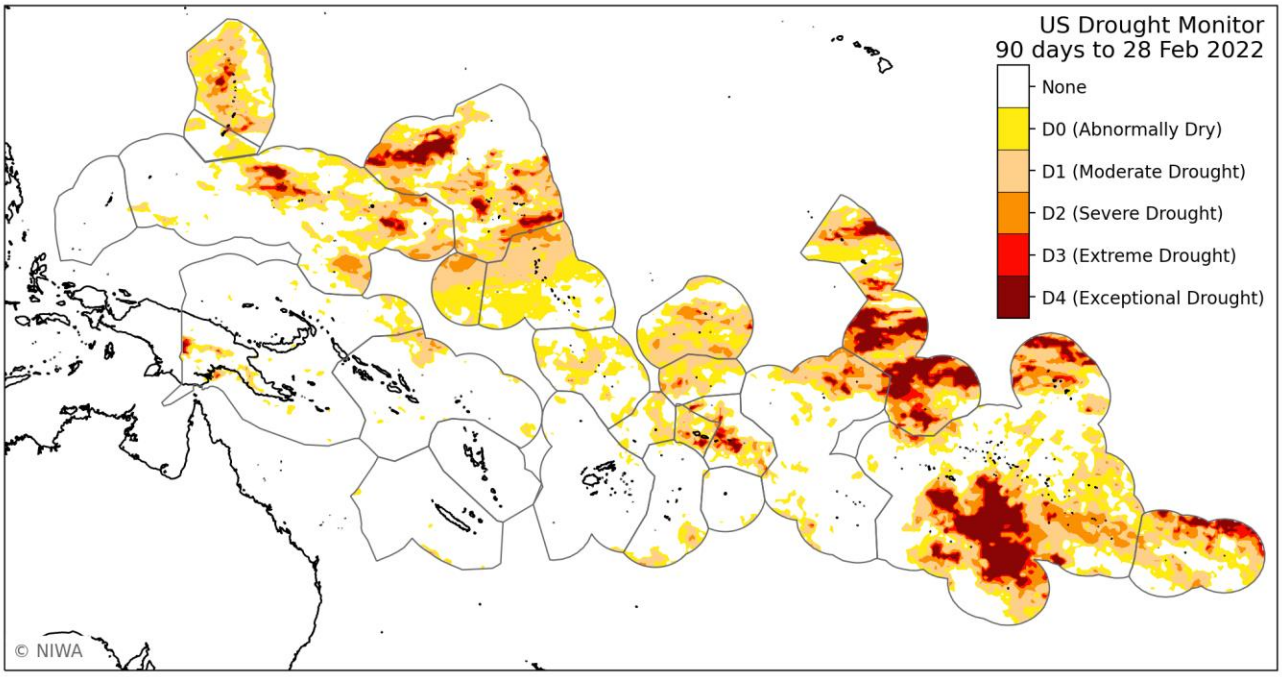
# Island Climate Update
## Water Stress Watch

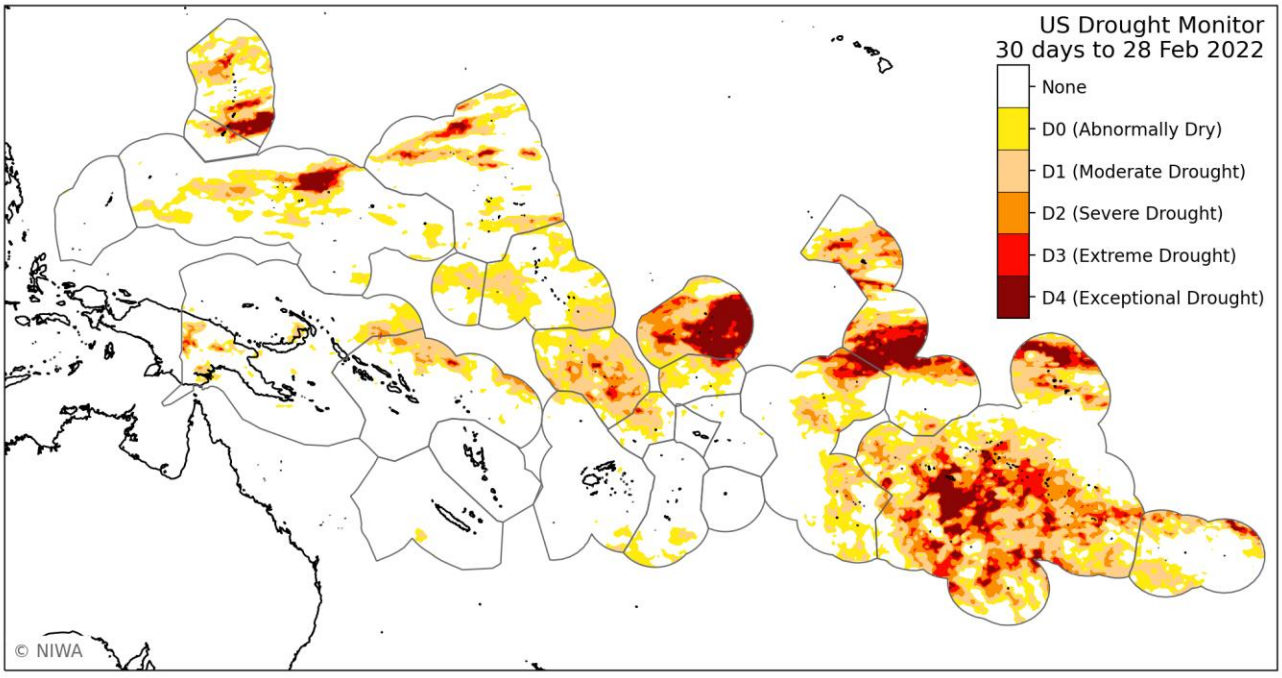
## USDM Regional situation summary (28 February 2022)

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

During February, extreme or exceptional drought was observed over parts of the Northern Marianas, FSM, Marshall Islands, Tuvalu, Kiribati, Marquesas, and the Tuamotu Archipelago.

Over the last 3 months, extreme or exceptional drought was most pronounced for Northern Marianas, FSM, Marshall Islands, Kiribati, Samoa, American Samoa, Marquesas, and the Tuamotu Archipelago.



# Island Climate Update
## Water Stress Outlook

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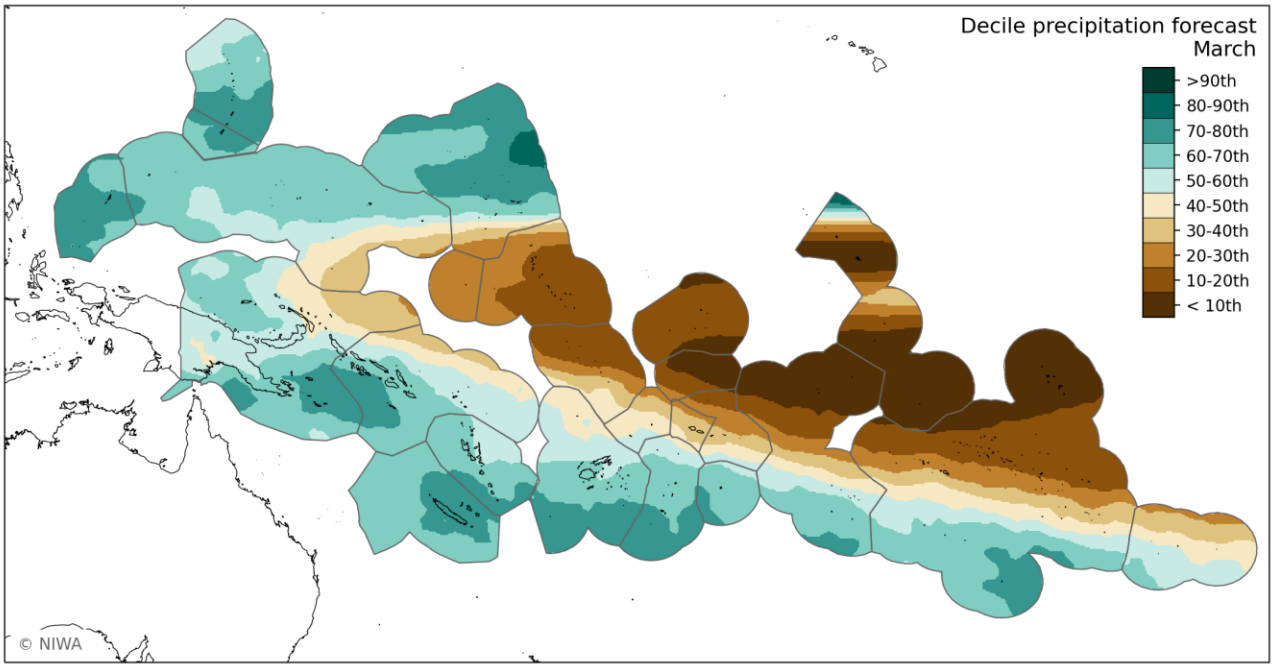
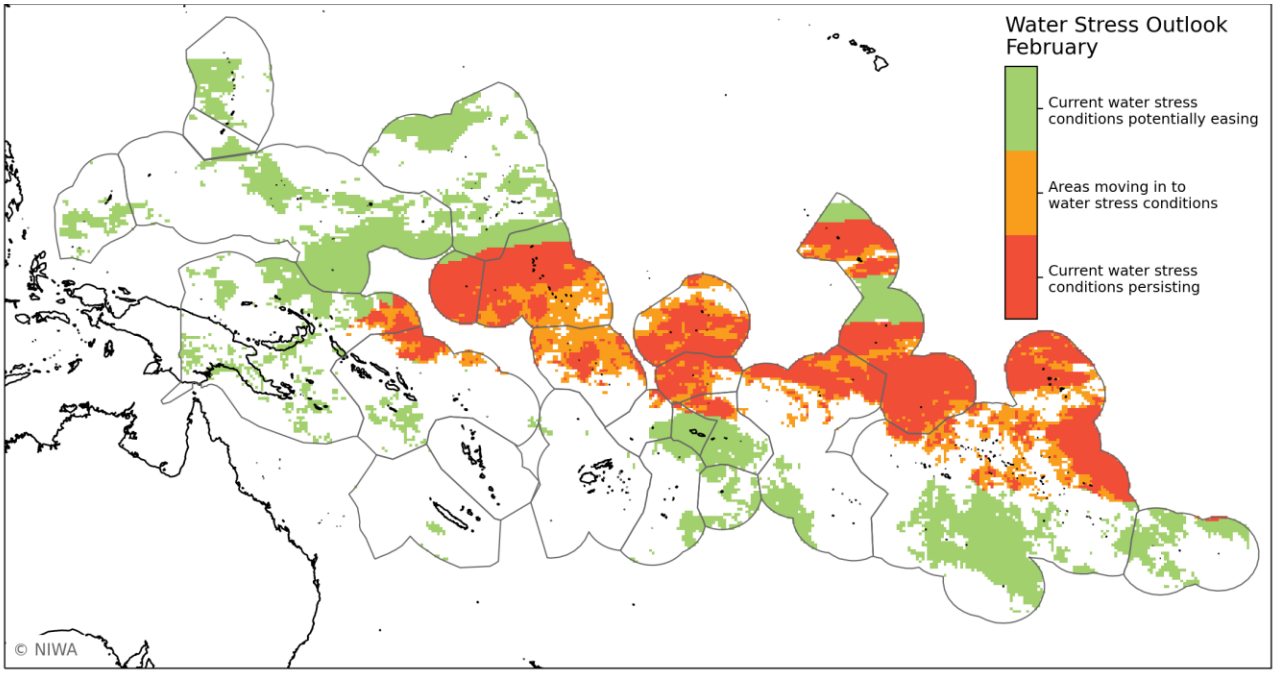
## March 2022 forecast summary

Drier than normal conditions are likely to occur along and extending southeastward of the equator during March, consistent with the continuation of La Niña conditions.

The island groups most likely to experience drier than normal conditions include Nauru, Kiribati, Tokelau, Marquesas, and the Tuamotu Archipelago. Water stress may continue for Nauru, parts of Kiribati, Tuvalu, Tokelau, parts of the Northern Cook Islands, and parts of French Polynesia, but ease for Samoa and American Samoa.

Wetter than normal conditions are most likely for island groups north of the equator in the western Pacific, and most island groups extending southeastward of PNG.



# Island Climate Update
## Water Stress Outlook

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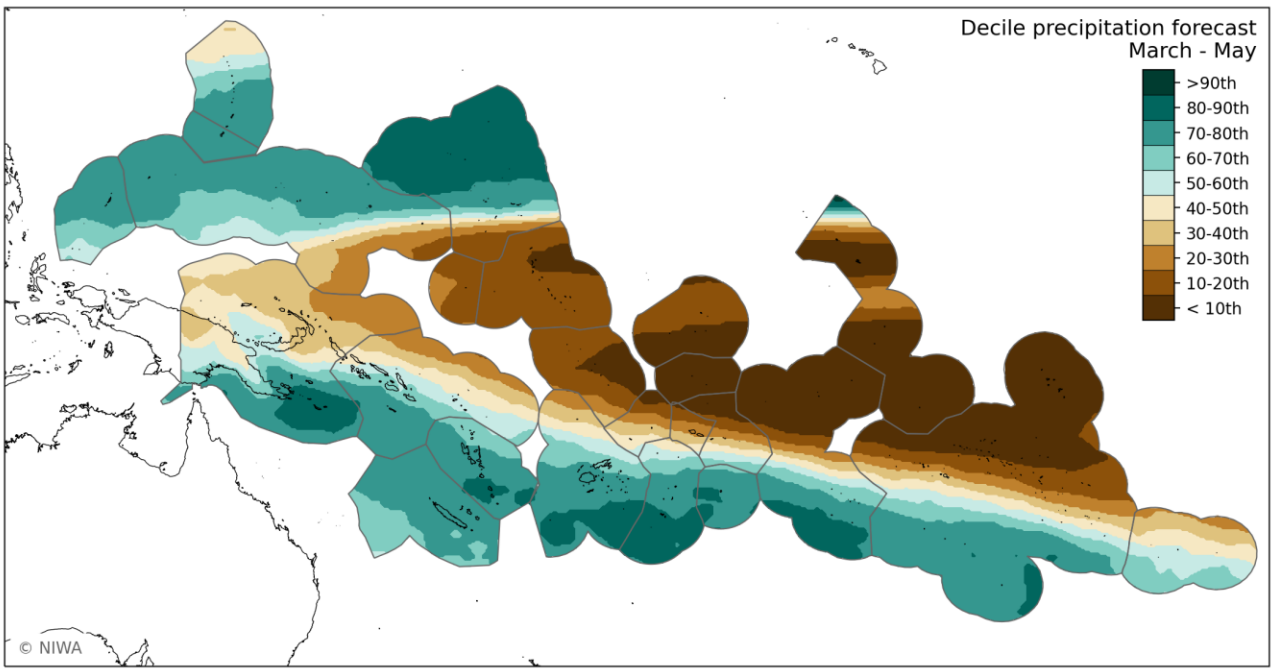
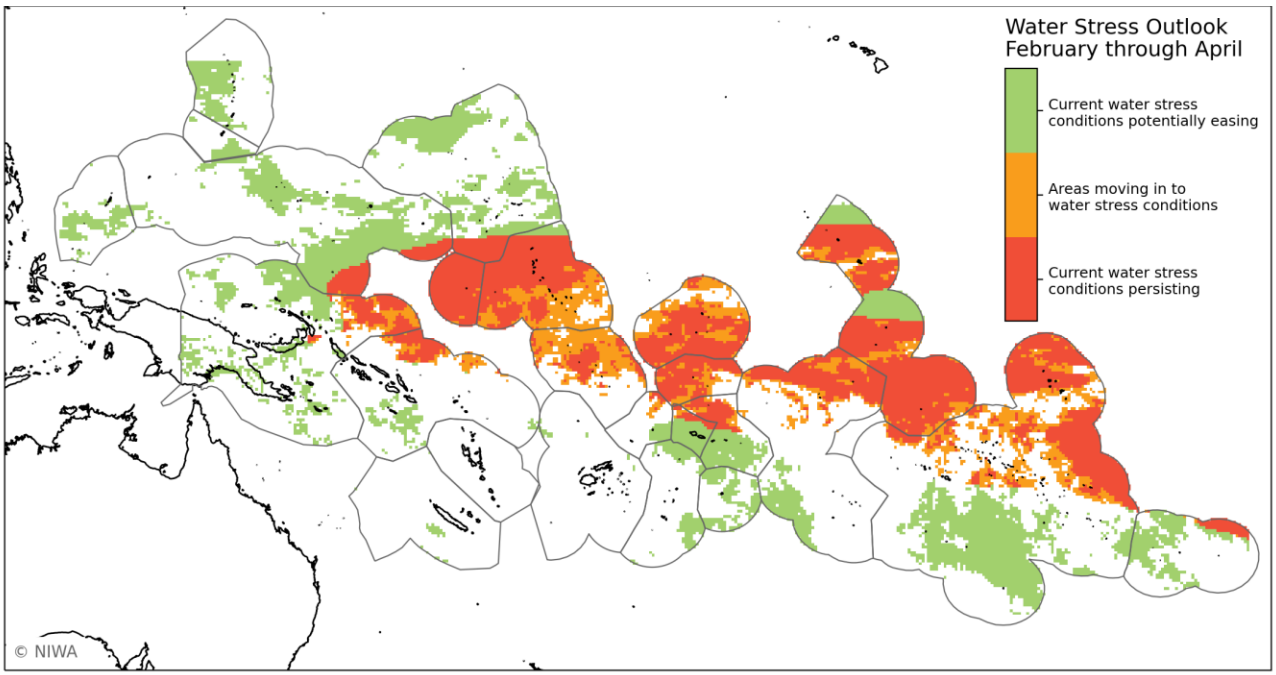
## March – May 2022 forecast summary

Seasonal rainfall patterns are consistent with the continuation of La Niña conditions.

Several island groups have an elevated chance for a drier than normal March-May: eastern PNG, Nauru, Kiribati, Tuvalu, Tokelau, Wallis & Futuna, Samoa, American Samoa, Northern Cook Islands, Marquesas and the northern part of the Tuamotu Archipelago. Seasonal water stress hotspots may develop or persist over many of these same island groups.

Like the outlook for March, wetter than normal conditions are most likely for island groups north of the equator in the western Pacific, and most island groups extending southeastward of PNG.



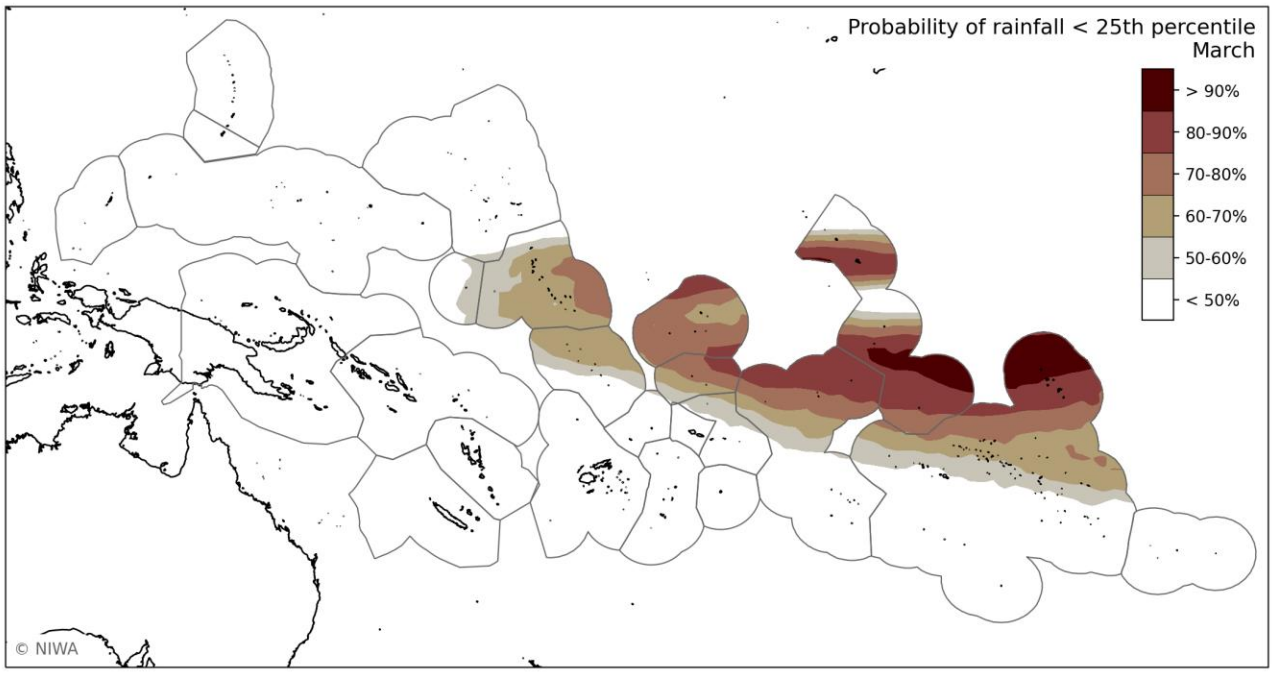
# Island Climate Update
## Water Stress Outlook

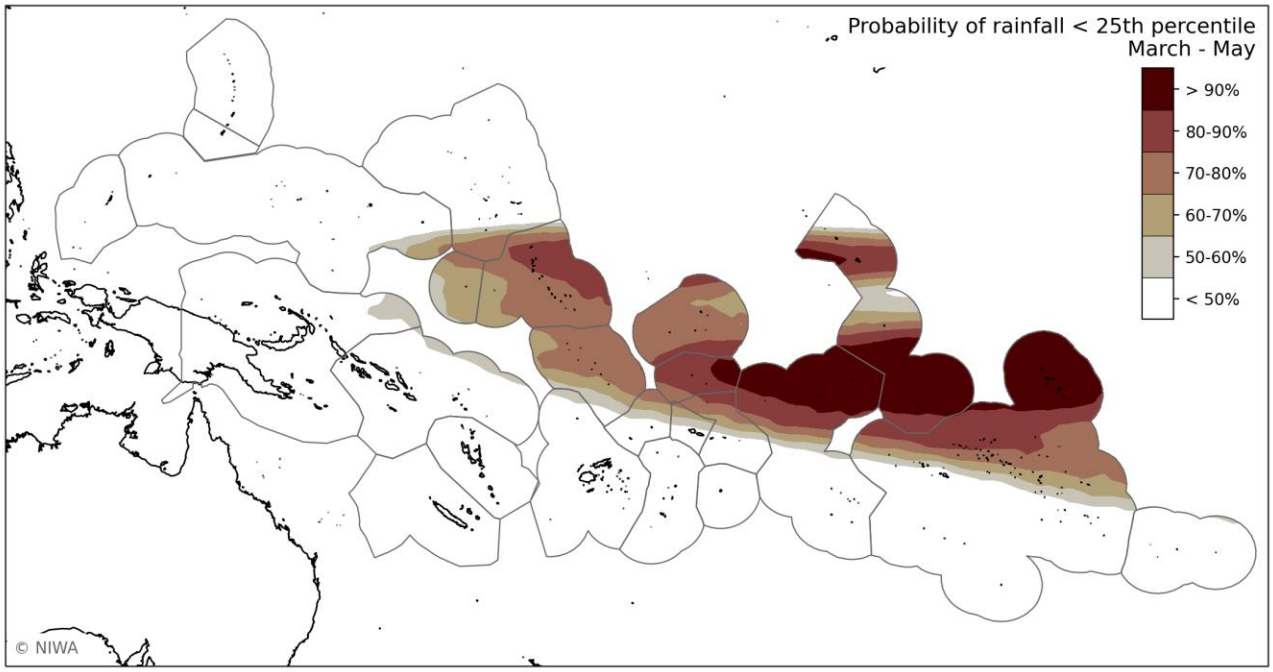
## Probabilities of rainfall < 25th percentile

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

For March, very dry conditions are most likely for parts of Kiribati, Tuvalu, Tokelau, the Northern Cook Islands, Marquesas, and the northern Tuamotu Archipelago.

For March-May, very dry conditions are likely for many of the same island groups mentioned above, but also Nauru and the southern Marshall Islands.



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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 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** | 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.<br>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%.<br>The bottom plots bring together conditions over the past 3 months and forecast conditions over the next month:<br>• Current water stress conditions potentially easing: Past 3 month accumulation less than 25$^{th}$ percentile. 1 month / seasonal accumulation forecast greater than 25$^{th}$ percentile.<br>• Areas moving in to water stress: Past 3 month accumulation between the 40$^{th}$ and 25$^{th}$ percentile. 1 month / seasonal accumulation forecast less than 25$^{th}$ percentile.<br>• Current water stress conditions persisting: Past 3 month accumulation less than 25$^{th}$ percentile. 1 month / seasonal accumulation forecast less than 25$^{th}$ percentile.<br>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:<br>• 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.<br>• A range of probabilistic one to five monthly and seasonal forecast plots updated shortly after the 15$^{th}$ of each month. |

WMO

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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