

Monthly Climate Statement – October 2021

Key messages

- The Science and Technology Division of DES considers that the probability of exceeding median rainfall for the coming summer (November to March) is currently higher-than-normal across much of Queensland.
- The current long-lead outlook for summer rainfall is based on sea-surface temperature (SST) anomalies across the Pacific Ocean, including regions related to the El Niño-Southern Oscillation (ENSO).
- The Bureau of Meteorology's ENSO Outlook has been revised from 'La Niña Watch' to 'La Niña Alert'.
- DES will provide a final outlook for summer rainfall in November, factoring in any change to the ENSO-related SST pattern during October.

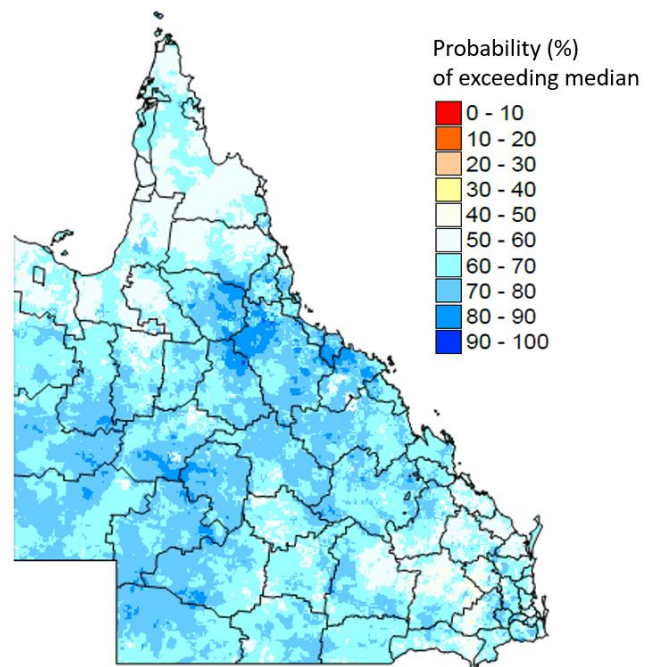
The Department of Environment and Science (DES) monitors sea-surface temperature (SST) anomalies in key regions of the Pacific Ocean over autumn, winter and spring, and provides objective outlooks for summer (November to March) rainfall on this basis. Based on the evolving SST pattern in the Pacific Ocean, **the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is currently higher-than-normal across much of Queensland.**

The most closely monitored driver of Queensland rainfall is the El Niño-Southern Oscillation (ENSO) phenomenon. The relationship between ENSO indices and subsequent Queensland summer rainfall is strongest in spring. In recent months, ENSO-related conditions in both the atmosphere and ocean have been showing signs that a La Niña climate pattern may be developing. This month, the Bureau of Meteorology has revised its ENSO Outlook from 'La Niña Watch' to 'La Niña Alert'.

Climate scientists monitor several ENSO indices, including the atmospheric Southern Oscillation Index (SOI) and SST anomalies in the central equatorial Pacific Ocean. The most recent three-month average Niño SST anomaly* is slightly cooler than average (-0.3°C for July to September) and has remained within ENSO-neutral thresholds. However, the most recent three-month average SOI value** is quite positive ($+10.0$ for July to September). Most climate models currently project further cooling of SSTs in the central equatorial Pacific over spring, which would also support a positive SOI and further development toward a La Niña climate pattern.

ENSO-related SST anomalies in the central equatorial Pacific tend to 'lock in' over the winter, spring and summer seasons. This persistence provides a basis for seasonal forecasting. DES also monitors the SST gradient across the central and south-western Pacific Ocean (i.e. the South Pacific Convergence Zone), to establish rainfall probabilities for the coming summer. The current DES outlook for summer rainfall in Queensland (see map below) is based on an objective analysis of SST gradients across key regions of the Pacific Ocean, including those regions related to ENSO. DES will provide a final outlook for summer rainfall in November, factoring in any change to the ENSO-related SST pattern during October. This outlook, whilst based on historical relationships, is also consistent with recent outlooks based on climate modelling constructed by the Bureau of Meteorology and international climate agencies.

Probability of exceeding median summer rainfall for November 2021 – March 2022, as at 1 October 2021



Readers are cautioned that seasonal outlooks are expressed in terms of probabilities. Even though an outcome has a high probability of occurring based on historical records, a less likely outcome may still occur in any given year. For more information, please contact Ken Day at: ken.a.day@des.qld.gov.au.

* www.cpc.ncep.noaa.gov/data/indices (monthly OISST.v2 1991-2020 base period)
 ** www.longpaddock.qld.gov.au/soi/soi-data-files (monthly SOI 1887-1989 base period)