

Monthly Climate Statement – November 2021

Key messages

- Values of key oceanic and atmospheric ENSO indices are now bordering on La Niña thresholds.
- The Science and Technology Division of DES considers that the probability of exceeding median rainfall for the coming summer (November to March) is higher-than-normal across most of Queensland.
- The 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).

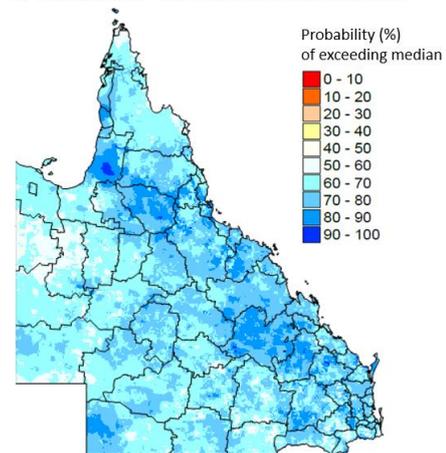
The Department of Environment and Science (DES) monitors sea-surface temperature (SST) anomalies in key regions of the Pacific Ocean over autumn, winter and spring, and provides objective outlooks for summer (November to March) rainfall on this basis. Based on the evolving SST pattern in the Pacific Ocean, **the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is higher-than-normal across most 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. The Bureau of Meteorology's ENSO Outlook is currently at '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. Values of these indices are now bordering on La Niña thresholds. The three-month average SOI value* remains quite positive (+7.1 for August to October). The SST anomaly in the Niño 3.4 region** has cooled over the last three-month period, that is, from -0.4°C in August to -0.8°C in October. Most climate models currently project further cooling of SSTs in the central equatorial Pacific over summer.

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 summer. The 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. This outlook is based on historical relationships and is consistent with recent outlooks based on climate modelling by the Bureau of Meteorology and international climate agencies.

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



As regular readers of this Monthly Climate Statement will appreciate, DES climate scientists calculate rainfall probabilities for the coming summer season on a continual basis from April through to November each year. With the summer season now having commenced, the above outlook is the final update of this information for 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.longpaddock.qld.gov.au/soi/soi-data-files (monthly SOI 1887-1989 base period)
** www.cpc.ncep.noaa.gov/data/indices (monthly OISST.v2 1991-2020 base period)