

Monthly Climate Statement – July 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 slightly higher than normal for 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 and international agencies currently classify the state of the ocean and atmosphere as 'ENSO-neutral'.
- The outlook for summer rainfall will be updated from August to November, factoring in any change to the ENSO-related SST pattern during this period.

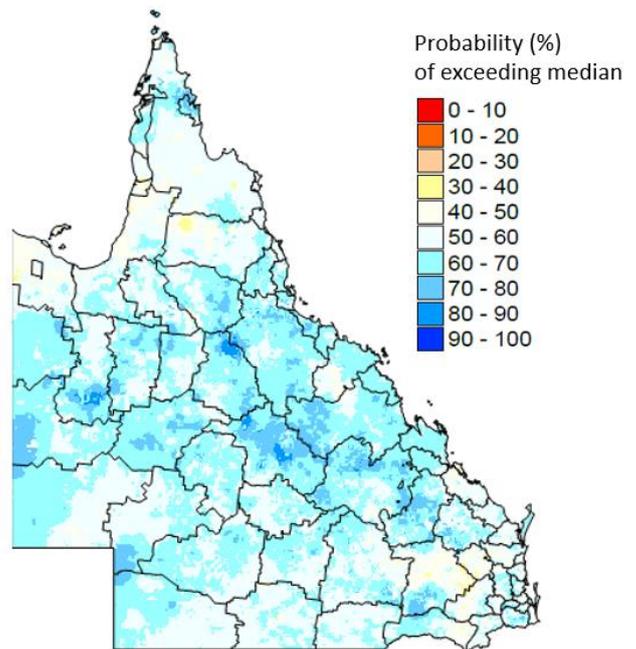
The Department of Environment and Science (DES) monitors sea-surface temperature (SST) anomalies in key regions of the Pacific Ocean over autumn, winter and spring, and provides objective outlooks for summer (November to March) rainfall on this basis. Based on the evolving SST pattern in the Pacific Ocean, **the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is currently slightly higher than normal for 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 begins to strengthen over winter and peaks through spring. DES closely monitors ENSO indices in the lead-up to summer. DES also monitors the SST gradient across the central and south-western Pacific Ocean (i.e. the South Pacific Convergence Zone), which, at this time of year tends to persist and is strongly related to upcoming summer rainfall in Queensland.

Climate scientists monitor several ENSO indices, including the atmospheric Southern Oscillation Index (SOI) and SST anomalies in the central equatorial Pacific Ocean. Having been at more extreme (La Niña) levels last spring and over summer, these key ENSO indices have now returned to near-average values. The most recent three-month SOI value* (+1.5 at the end of June) is much lower than the peak value reached at the end of February (+14.7). Likewise, the most recent three-month Niño 3.4 SST anomaly** (-0.4°C) is much weaker than the recent peak value of -1.3°C at the end of December. The Bureau of Meteorology and international agencies currently classify atmospheric and oceanic conditions as 'ENSO-neutral'.

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. The current DES outlook for summer rainfall in Queensland is based on an objective analysis of SST gradients across key regions of the Pacific Ocean, including those regions related to ENSO. On this basis, the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is currently slightly higher than normal for much of Queensland (see map below). DES will provide updates of the outlook for summer rainfall from August to November, factoring in any change to the ENSO-related SST pattern during this period.

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