

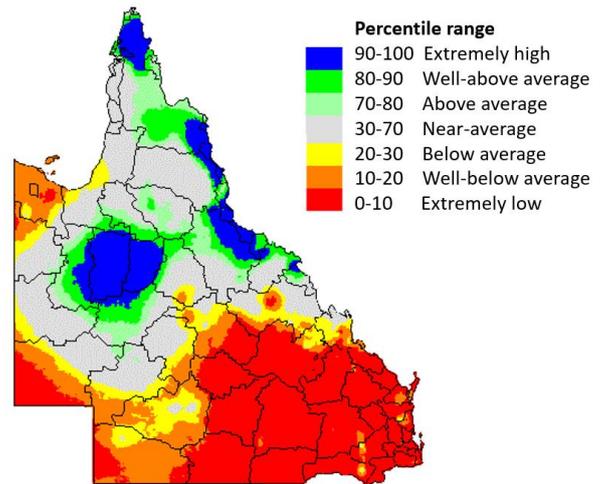
Monthly Climate Statement – March 2019

Key messages

- The El Niño-Southern Oscillation (ENSO) has remained in an 'ENSO-neutral' state over summer.
- Depending on location in Queensland, rainfall over the last three-month period (December to February) has ranged from extremely high to extremely low.
- Key ENSO indices, at this time of year, do not provide a reliable indication of upcoming seasonal rainfall.
- Instead, during March, DES monitors an unrelated extra-tropical SST pattern and, on this basis, will provide an initial long-lead outlook for summer rainfall next month.

(December to February) has ranged from extremely high to extremely low depending on location in Queensland (see map below).

Queensland rainfall percentiles December 2018 to February 2019



Rainfall percentile base period: 1890 to current

Summary as at 11 March 2019

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. **The Climate Variability Unit of DES will provide an initial outlook for summer rainfall next month, in the April Monthly Climate Statement.**

Rainfall in Queensland over spring and summer is influenced by the El Niño-Southern Oscillation (ENSO) – a coupled atmospheric and oceanic phenomenon which is strongly persistent during this period. National and international agencies monitor key ENSO indices, including the SOI and SST anomalies in the central equatorial Pacific. Over the last three-month period (December to February), SSTs in the central equatorial Pacific Ocean have been warmer than average (+0.7°C) leading some international agencies (e.g. NOAA in the USA) to classify current oceanic conditions as being in an 'El Niño' state. However, during this period, the SOI averaged -2.6, remaining well within 'ENSO-neutral' thresholds (between -6 and +6). The Australian Bureau of Meteorology, in classifying ENSO conditions, considers a range of oceanic and atmospheric indicators and, as noted, has classified current conditions as being 'ENSO-neutral'.

Under 'ENSO-neutral' conditions, spring and summer rainfall in Queensland has ranged from very low to very high. So far this summer, the northern monsoon season has been quite active. Tropical cyclones 'Owen' and 'Penny' brought high rainfall to parts of north Queensland in mid-December and early January respectively. Persistent monsoonal activity over the first two weeks of February resulted in extensive flooding across coastal and inland parts of northern Queensland. As a result, rainfall over the last three months

El Niño and La Niña events tend to break down in autumn leading to what is known as the 'autumn predictability gap'. At this time of year, key ENSO indices, including the Southern Oscillation Index (SOI) and SST anomalies in the central equatorial Pacific, do not provide a reliable indication of rainfall for the season ahead.

As noted, DES will provide an initial outlook for summer rainfall in April. This long-lead outlook will be based on an extra-tropical SST pattern, which is unrelated to the ENSO signal at this time of year. Updated outlooks will be provided from June to November, taking into account the evolving ENSO-related SST pattern during this period.

The 'autumn predictability gap'

El Niño and La Niña events tend to form in the austral winter or spring, persist through summer and break down in autumn. Seasonal outlooks are possible due to the persistence of the ENSO signal, and associated rainfall and climate patterns, over spring and summer. The lack of persistence of the ENSO signal from autumn to winter leads to low predictability, known as the 'autumn predictability gap' or 'autumn predictability barrier'.

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