Monthly Climate Statement — February 2013

Key messages

- Extensive areas of inland Queensland have been dry to extremely dry so far this summer (November to January).
- Conversely, much of central coastal and south-eastern Queensland has received well-above average rainfall for November to January, primarily due to high rainfall totals associated with ex-tropical cyclone 'Oswald' in late January.
- There is an equal likelihood of above-median and below-median rainfall over the next three-month period (February to April).
- Seasonal forecasts are least reliable leading into autumn - a period known as the 'autumn predictability gap'.

Findings for February 2013

The Science Delivery Division of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) notes that **there is an equal likelihood of above-median and below-median rainfall over the next three-month period (February to April).**

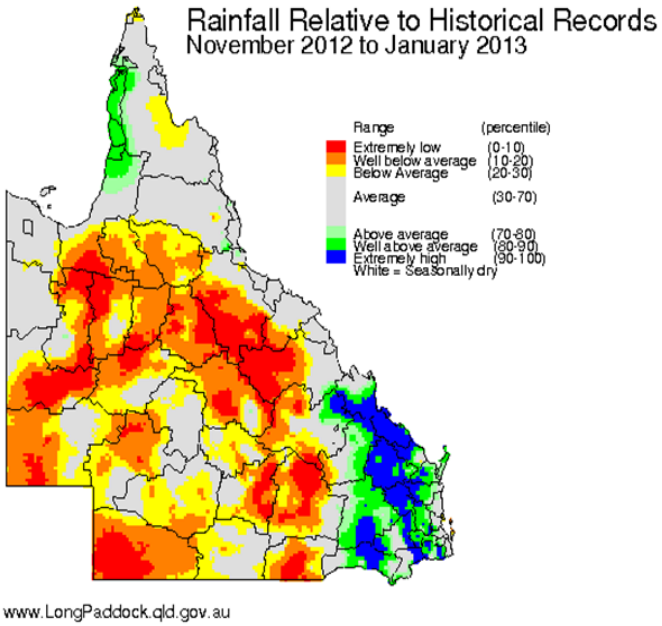
Seasonal forecasts are based on the current and projected state of the El Niño-Southern Oscillation (ENSO) phenomenon and on factors which alter the impact of ENSO on Queensland rainfall (e.g. the Pacific Decadal Oscillation (PDO)). This time of year is known as the 'autumn predictability gap' when ENSO-based forecasts are least reliable.

On 21 January, tropical cyclone 'Oswald' made land-fall in Far North Queensland, after which it was downgraded to an ex-tropical cyclone. Over the following week, 'Oswald' tracked along much of central coastal and south-eastern Queensland, bringing high rainfall and damaging winds to much of the east coast, particularly the Burnett catchment (see BoM Special Climate Statement). The possibility remains of more tropical cyclones making land-fall over Queensland before the end of the current cyclone season (November to April).

The SOI, a key atmospheric measure of ENSO, rose from a slightly negative value (-7.4) in December, to a near-zero value (-0.3) in January, remaining within the 'ENSO-neutral' range. Furthermore, observed sea-surface temperature anomalies in the key Niño 3.4 region of the central equatorial Pacific remained near-average (-0.4 ºC) in January. The majority of international global climate models and those surveyed by the Bureau of Meteorology ('ENSO Wrap-Up' 29 January) suggest that sea-surface temperatures in the tropical Pacific Ocean are most likely to remain within the 'ENSO-neutral' range leading into autumn.

The autumn predictability gap

El Niño and La Niña events tend to form in winter or spring, persist through summer and break down in autumn. Seasonal outlooks are based on the persistence of these events and their associated rainfall and climate patterns. Seasonal outlooks are therefore least reliable leading into autumn when El Niño or La Niña events tend to break down. This period is known as the 'autumn predictability gap'.



Rainfall outlook

There are various approaches used to provide rainfall outlooks. These approaches tend to differ in terms of the components of the climate system that are considered and, for this reason, each approach may convey a different outlook, particularly for specific locations.

DSITIA produces two statistical climate risk assessment schemes. They are:

- the experimental SPOTA-1 scheme, which integrates sea-surface temperature information, including indices of ENSO and the PDO; and
- the SOI Phase scheme, which relies solely on the SOI, an atmospheric measure of ENSO.

The experimental SPOTA-1 scheme provides long-lead probabilities of summer (November to March) rainfall for Queensland from mid-April through to mid-November each year. The final assessment of rainfall probabilities for the 2012/13 summer, based on the experimental SPOTA-1 scheme as at 1 November 2012, indicated that decile 3 to 7 rainfall is most likely for much of Queensland this summer (November to March). This assessment is based, in part, on an index of March sea-surface temperature anomalies which reflected a 'cool' state of the PDO. This assessment also takes into account a monthly ENSO index, based on the sea-surface temperature gradient (west to east) across the South Pacific Convergence Zone (i.e. between eastern Australia and the central Pacific).

DSITIA's SOI Phase scheme provides probabilities of rainfall for the coming three-month season based on SOI values over the previous two months. The SOI Phase scheme currently indicates that the probability of above-median rainfall across most of Queensland is 40 to 60 per cent for the next three-month period (February to April). This analysis is based on the SOI being in a 'Rapidly Rising' phase at the end of January, as discussed further in the Commentary on Rainfall Based on 'Phases' of the SOI.

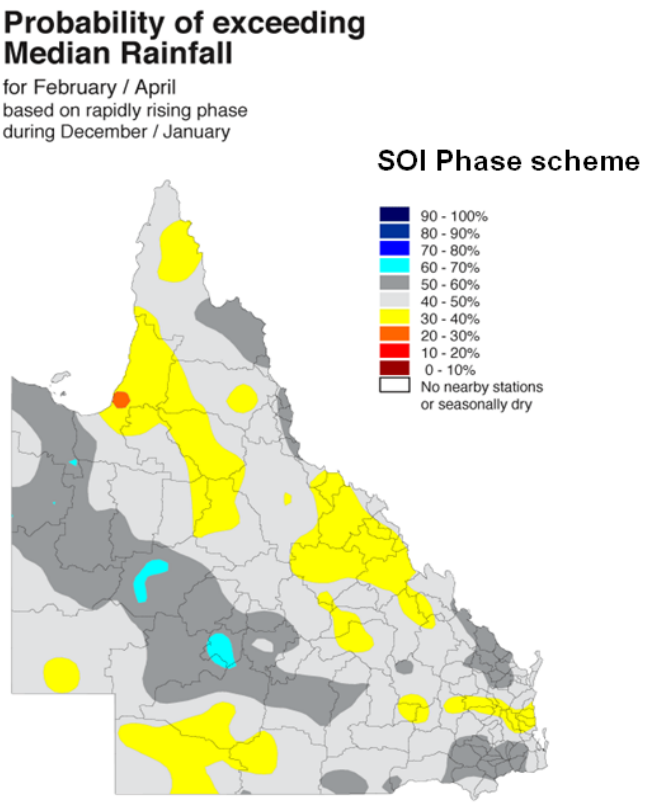
The SPOTA-1 and SOI Phase schemes indicate probabilities based on historical relationships. It is important that the probabilistic nature of seasonal outlooks is understood and long-term risk management is undertaken. For example, if an outlook indicates a 70 per cent probability of above-median rainfall, this also means there is a 30 per cent probability of below-median rainfall.

An increased risk of above- or below-median rainfall in Queensland will not necessarily result in above- or below-median rainfall occurring throughout all of the state (see Australia's Variable Rainfall poster, or the Department's archive of historical rainfall maps).

Each of the above schemes may have their own particular following. Although such schemes cannot provide outlooks with absolute certainty, users of the information who follow a skilful scheme should benefit from doing so in the long-term. Users should consider the historical track record of any scheme, and such historical information is becoming increasingly available.

DSITIA's Long Paddock website provides the historical archive of SPOTA-1 reports and past commentaries on the SOI Phase scheme. Users should also consider the wide range of information available each month describing the current state of the ocean/climate system, for example the 'ENSO Wrap-Up'.

ENSO influences other climate variables apart from rainfall (e.g. temperature, pan evaporation and vapour pressure). This means that the impact of ENSO on crop or pasture growth can be stronger than on rainfall alone. The impact of ENSO on pasture growth is also dependent upon current pasture condition and soil water status. DSITIA's AussieGRASS model takes these factors into account in producing seasonal pasture growth probabilities.



For more information, please visit **www.longpaddock.qld.gov.au/seasonalclimateoutlook** or contact **ken.a.day@science.dsitia.qld.gov.au**.