In the last 30 years in Western NSW

- Annual rainfall has been relatively stable
- Dry years have occurred nine times and wet years have occurred 10 times
- Monthly rainfall distribution has changed, but patterns are not consistent across the region
- Rainfall has been unreliable across the region year round
- Three-monthly rainfall totals leading into spring have decreased slightly, and variability has increased
- Evaporation has increased in January and February
- There have been more hot days, with more consecutive days above 42 °C

Western NSW at a glance

The Western region covers 31.5 million hectares, of which 91% is under agricultural production. Grazing (sheep, cattle, goats), dryland and irrigated cropping, horticulture (citrus, almonds) and wine and table grapes make up the major agricultural industries in this area. The region contributed $652 million to the Australian economy in 2017–18.

A guide to weather and climate in Western NSW

Primary producers make decisions using their knowledge and expectations of regional weather patterns. The purpose of this guide is to provide an insight into the region’s climate and an understanding of changes that have occurred through recent periods. This information can potentially assist primary producers and rural communities make better informed decisions for their business and livelihoods. This guide is part of a series of guides produced for every Natural Resource Management area around Australia.
Annual rainfall in Western NSW has been stable

Annual rainfall in Western NSW has been stable, decreasing by around 10 mm (2%) from about 300 mm to about 290 mm over the past 30 years (1989–2018) when compared to the previous 30 years (1959–1988).

The charts show annual rainfall (blue bars), with a 10-year running average (solid blue line) for Bourke and Broken Hill. Although the average annual rainfall has remained stable, it still fluctuates from year to year with natural variability.

In the past 30 years (1989–2018), dry years (lowest 30%) have occurred nine times and wet years (highest 30%) have occurred 10 times, while the remaining years were in the average range.

Note the Millennium drought accounted for four of these dry years in the recent period. During the previous 30-year period (1959–1988), dry years occurred seven times and wet years occurred 11 times.

Rainfall reliability maps for the past 30 years (1989–2018) show winter rainfall is marginally more reliable than other seasons, ranging from about 35 mm, up to 95 mm in wetter years.

But overall, rainfall is unreliable across all seasons from year to year (red areas). The region’s south in winter is the only area with moderately reliable rainfall (light blue areas).

Broken Hill goes on average 17 to 18 days between 1 mm or more of rainfall in summer and autumn, and 11 to 12 days in spring, and 12 in winter.

For more information on future projections, visit the Climate Change in Australia website

Want to know more about the guides? Try Frequently Asked Questions at

Western NSW rainfall is unreliable year round

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Monthly rainfall distribution has changed

While overall annual rainfall has remained stable, monthly average rainfall charts for Bourke and Broken Hill show a significant change in rainfall distribution throughout the year between 1989–2018 (orange bars) compared with 1959–1988 (blue bars). Bourke experienced an increase in rainfall in June, November and December, offset by decreases in January, March and August. In Broken Hill, decreases in April, as well as in late winter and early spring have been offset by increases in the February, March and June totals. Seasonally, over the past 30 years, summer rainfall from November to April for Bourke was 208 mm, 6 mm lower than the 214 mm average for the previous 30-year period (1959–1988). However in Broken Hill, summer rainfall increased 32 mm over the same period, from 133 mm to 165 mm. Over the same periods, winter rainfall between May and October remained unchanged for Bourke at 153 mm for both periods, while Broken Hill’s winter rainfall was 11 mm lower, from 137 mm in 1959–1988 to 126 mm in 1989–2018.

For more information on the latest observations and science behind these changes, refer to the State of the Climate Report > www.bom.gov.au/state-of-the-climate/

Evaporation

Evaporation has increased in January and February

The charts show mean monthly evaporation and water balance (rainfall minus evaporation) for Bourke and Broken Hill between 1989-2018 (orange bars) compared with 1959-1988 (blue bars). The warmer months have higher evaporation rates and these have increased by around 10 mm in the past 30 years. The cooler months (June and July) show an increase in evaporation of between four to six mm. September and October show an increase of 7-8 mm over the past 30 years (1989–2018) when compared to the previous 30 years (1959–1988).
Rainfall Timing

Three-monthly rainfall totals leading into spring have decreased slightly

In Western NSW, soil moisture is one of the major considerations in pasture production and summer cropping decisions. Soil moisture levels are largely driven by how much rainfall has been received in the three months leading into spring. The chart shows three-monthly rainfall averages for the two 30-year periods 1959–1988 and 1989–2018. There was a considerable change in rainfall variability from year to year between the two periods, with the range increasing from 95 mm in 1959–1988 to 154 mm in 1989–2018. Despite the increased variability between years, average three-monthly rainfall totals leading into spring decreased only slightly, from 62 mm in 1959–1988, to 57 mm in 1989–2018.

Temperature

Western NSW has experienced more hot days in the past 30 years

The chart shows the annual number of days above 38 °C (red bars), with a 10-year running average (solid red line) for Broken Hill. Broken Hill experienced an average of 18 days per year above 38 °C between 1989–2018, compared to an average of 11 days per year above 38 °C between 1959–1988. In the past 30 years, Broken Hill has experienced temperatures of 45°C four times, in 1990, 2001, 2004, and 2017. Before 1990, the last time the temperature at Broken Hill exceeded 45 degrees was in 1960. In Wilcannia, temperatures exceeding 47 °C have been recorded nine times, eight of those since 2001. Instances of consecutive hot days have also been more frequent in Western NSW in the past 30 years. In 2004, 2009 and 2019, Broken Hill experienced periods of 11 or more days in a row above 38 °C. Wilcannia experienced periods of seven or more days in a row above 42 °C twice in 2004, once in 2009 and twice in 2019. The longest run of days above 42 °C was eight days in 2004.