The Rangelands region of Western Australia covers around 226.7 million hectares, of which 40% is under agricultural production. Grazing cattle make up around 80% of the region’s agricultural output, with some broadacre cropping, horticulture and wool production. The region contributed around $564 million to the Australian economy in 2017–18. This guide covers the northern Rangelands.

In the last 30 years in the northern Rangelands
- Annual rainfall has increased by 21%
- Wet season rainfall has increased
- Dry years have occurred four times and wet years 15 times
- Rainfall has been reliable in the north east
- False starts to the wet season have occurred
- Evaporation rates have decreased
- There have been more hot days, with more consecutive days above 42 °C

The Rangelands at a glance
The Rangelands region of Western Australia covers around 226.7 million hectares, of which 40% is under agricultural production. Grazing cattle make up around 80% of the region’s agricultural output, with some broadacre cropping, horticulture and wool production. The region contributed around $564 million to the Australian economy in 2017–18. This guide covers the northern Rangelands.

A guide to weather and climate in the Rangelands
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 the northern Rangelands has increased by 21%

Annual (July to June) rainfall in the northern Rangelands has increased by around 80 mm (21%) from about 430 mm to about 510 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 Derby and Wyndham.

In the past 30 years (1989–2018), dry years (lowest 30%) have occurred three times and wet years (highest 30%) have occurred 16 times, while the remaining years were in the average range. During the previous 30-year period (1959–1988), drier wet seasons occurred seven times and wetter wet seasons occurred nine times.

Rainfall reliability maps for the past 30 years (1989–2018) show wet season rainfall has been moderately reliable in the north east of the region (blue areas) around Broome and Halls Creek, with about 130 mm difference from one year to the next. This represents around 33% of the wet season average. It has been less reliable through the centre of the region around Marble Bar and Port Hedland (beige and light red areas) and in the western and southern parts of the northern Rangelands, rainfall is unreliable year round.

For more information on future projections, visit the Climate Change in Australia website > www.climatechangeinaustralia.gov.au


Northern Rangelands rainfall has been reliable in the north east

Rainfall reliability maps for the past 30 years (1989–2018) show wet season rainfall has been moderately reliable in the north east of the region (blue areas) around Broome and Halls Creek, with about 130 mm difference from one year to the next. This represents around 33% of the wet season average. It has been less reliable through the centre of the region around Marble Bar and Port Hedland (beige and light red areas) and in the western and southern parts of the northern Rangelands, rainfall is unreliable year round.
There has been an increase in wet season rainfall

Wet season rainfall increased at Halls Creek and Broome between 1989–2018 (orange bars) compared with 1959–1988 (blue bars). Over the past 30 years, summer rainfall (October to March inclusive) for Broome was 645 mm, 114 mm higher than the 531 mm average for the previous 30-year period (1959–1988). For Halls Creek, wet season rainfall increased 106 mm over the same period, from 500 mm in 1959–1988 to 606 mm in 1989–2018. Over the same 30-year periods, dry season rainfall from April to September was 80 mm at Broome, 11 mm higher than the 69 mm average for 1959–1988. At Halls Creek, dry season rainfall decreased by 13 mm, from 59 mm to 46 mm.

Early wet season rainfall is not always reliable

Across the northern Rangelands the beginning of the wet season can be defined as the date of accumulation of 50 mm of rainfall after the dry season. In the Kimberley region, north of Halls Creek, wet season rainfall typically begins within the first week of November (blue colours on the map). Derby and Broome usually see the first signs of the wet season rainfall a few weeks later in mid-December. This roughly aligns with the beginning of the Man-gala season of the Yawuru seasonal calendar.

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 rates have decreased

The graphs show the mean monthly evaporation and water balance (rainfall minus evaporation) between 1989-2018 (orange bars) compared with 1959-1988 (blue bars). At Halls Creek and Marble Bar (not shown) over the past 30 years (1989-2018), evaporation rates decreased slightly across the year when compared to the previous 30 years (1959-1988).

Northern Rangelands have experienced more hot days in the past 30 years

The chart shows the annual number of days above 42 °C (red bars) for Halls Creek. Halls Creek experienced an average of two days per year above 42 °C between 1989–2018, compared to an average of one day per year above 42 °C between 1959–1988. Since 1989, temperatures of 44 °C have been recorded for Halls Creek three times, in 2009, 2016 and 2018. Before 1989, a temperature of 44 °C was recorded at Halls Creek only once, in 1988. Instances of consecutive days above 42 °C have also been more frequent in the past 30 years. In 2009 and twice in 2018, Halls Creek experienced periods of four days in a row above 42 °C. A run of four or more days in a row above 42 °C is unusual at Halls Creek and had only been recorded once before, in 1985.