






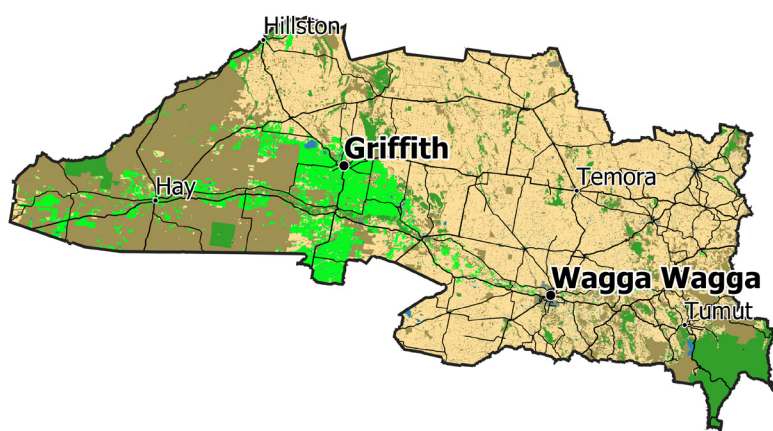




# Regional Weather and Climate Guide

## In the last 30 years in the Riverina

-  Annual rainfall has been relatively stable
-  Rainfall has decreased in the autumn and spring months
-  Winter rainfall has been reliable; autumn has been unreliable
-  Dry years have occurred 10 times and wet years have occurred 11 times
-  The autumn break usually occurs by mid-May around Wagga and Temora, mid-June around Griffith, and often does not occur at all in most years around Hay in the west
-  Across the region, spring frosts have been more common and have been occurring later, except in the high country around Tumut
-  There have been more hot days, with more instances of consecutive days above 38 °C



■ Natural Environments  
 ■ Low Level Production  
 ■ Dryland Production  
 ■ Irrigated Production  
 ■ Intensive Uses  
 ■ Water Bodies

## The Riverina at a glance

The Riverina region covers almost 5.7 million hectares, of which 79% is under agricultural production. Grazing is the dominant land use (39%). It is a leading producer of wheat, canola, orchard fruits and almonds, as well as livestock, grapes, vegetables, dairy and forestry. The region is one of the most productive and agriculturally diverse areas of Australia, contributing \$2.98 billion to the Australian economy in 2017–18.

## A guide to weather and climate in the Riverina

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.



A climate guide for agriculture  
**Riverina, New South Wales**





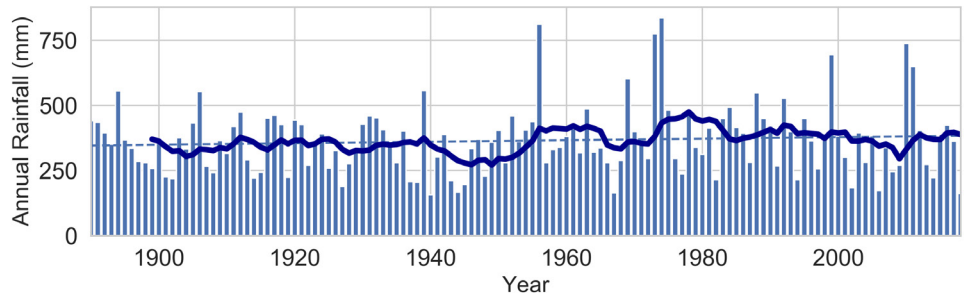
# Annual Rainfall

## Annual rainfall in the Riverina has been stable

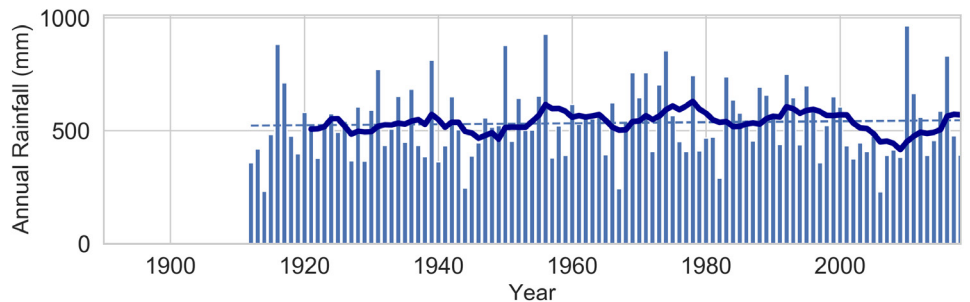
Annual rainfall in the Riverina has remained relatively stable over the past 30 years (1989–2018), decreasing by around 20 mm (4%) from about 520 mm to about 500 mm when compared to the previous 30 years (1959–1988). The charts show annual rainfall (blue bars) with a 10-year running average (solid blue line) for Hay, Wagga, Tumut. Although the average annual rainfall has remained stable, it still fluctuates from year to year with natural variability.

In the past 30 years, dry years (lowest 30%) have occurred 10 times, and wet years (highest 30%) have occurred 11 times, while the remaining years were in the average range. Note the Millennium drought accounted for six of these dry years. During the previous 30-year period (1959–1988), dry years occurred six times and wet years occurred 11 times.

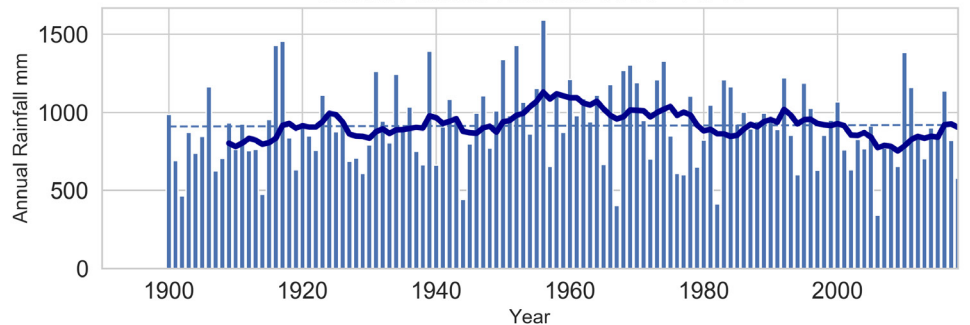
Hay Annual Rainfall 1890 - 2018



Wagga Wagga Research Annual Rainfall 1912 - 2018



Tumut Annual Rainfall 1900 - 2018

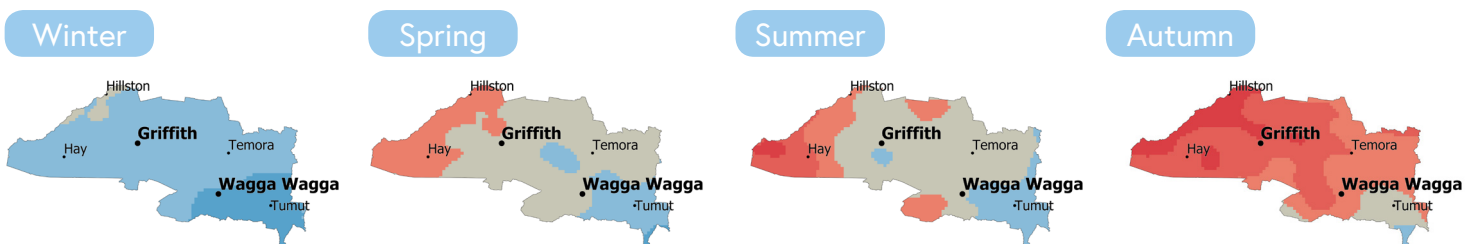


For more information on future projections, visit the Climate Change in Australia website > [www.climatechangeinaustralia.gov.au](http://www.climatechangeinaustralia.gov.au)

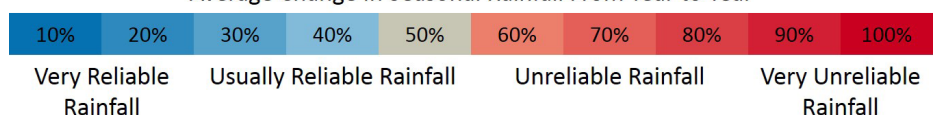
Want to know more about the guides? Try Frequently Asked Questions at > [www.bom.gov.au/climate/climate-guides/](http://www.bom.gov.au/climate/climate-guides/)

## Winter rainfall is reliable; autumn is unreliable

Rainfall reliability maps for the past 30 years (1989–2018) show winter rainfall has been moderately reliable across the region (light blue areas), usually changing by about 50 mm from year to year. This is in contrast to spring and summer rainfall, which have been less reliable (red areas), especially in the western region around Hay. Autumn rainfall has been unreliable across the entire region (red areas).



Average Change In Seasonal Rainfall From Year to Year

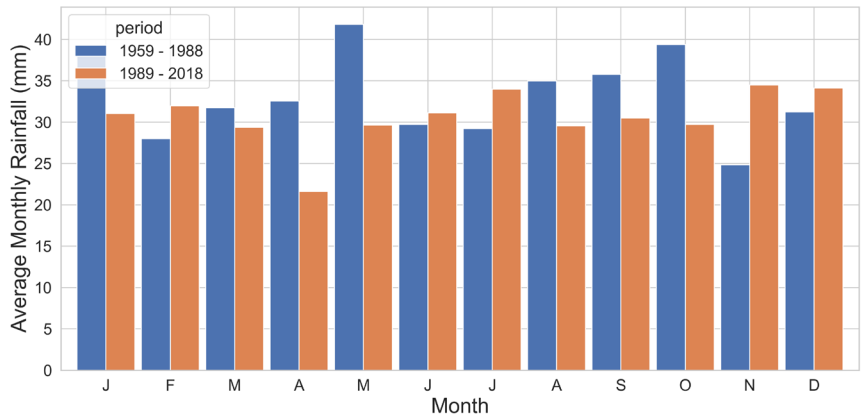




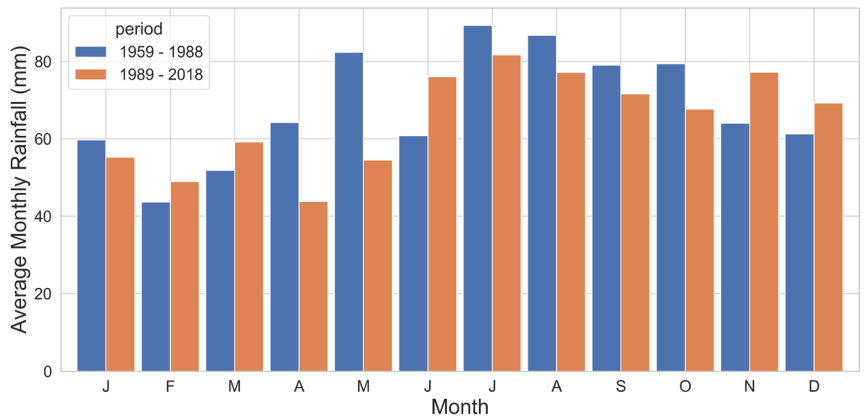
## Rainfall has decreased in the autumn and spring months

Rainfall in the autumn and spring months decreased at Hay and Tumut between 1989–2018 (orange bars) compared with 1959–1988 (blue bars). Over the past 30 years, winter rainfall between April and October was 206 mm at Hay, 37 mm lower than the 243 mm average for the previous 30-year period (1959–1988). For Tumut, winter rainfall decreased 99 mm over the same period.

### Hay 30-year Average Rainfall by Month

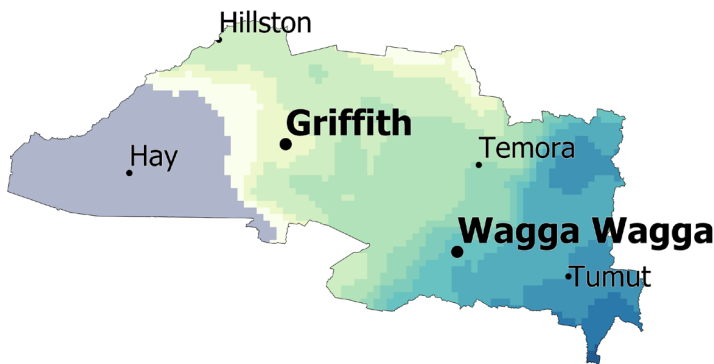


### Tumut 30-year Average Rainfall by Month



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/](http://www.bom.gov.au/state-of-the-climate/)

## Timing of the autumn break in the Riverina region



In the Riverina, the autumn break can be defined as at least 25 mm over three days prior to the commencement of sowing. The map shows that over the past 30 years (1989–2018) the break typically occurs by the last week of April and first week of May in the east around Tumut (blue to green areas), and not until June and through to July from Wagga Wagga to Griffith (light green to yellow areas). It may not occur at all in most years around Hay in the west (grey). In the central west of the region, around Griffith and Hillston, in the last 30 years, the autumn break has been occurring around one month later than it did in the period 1959–1988.

Weeks after 1 April	3	4	5	6	7	8	9	10	11	12	>13	This criteria usually not met by August
Autumn Break Usually Occurred After...	28 April	5 May	12 May	19 May	26 May	2 June	9 June	16 June	23 June	30 June	1 July	





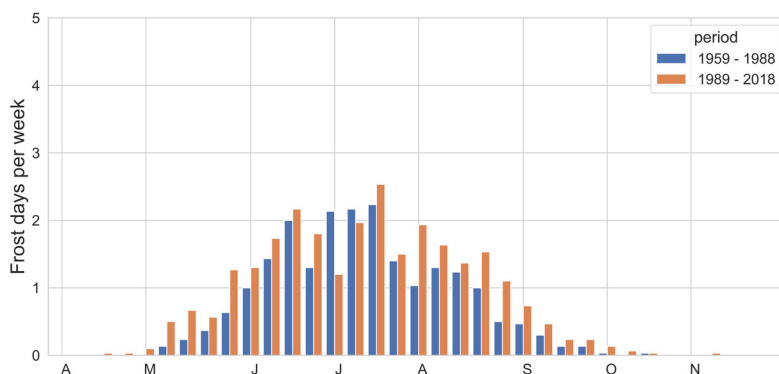
## Frost

### Later and more frequent frosts

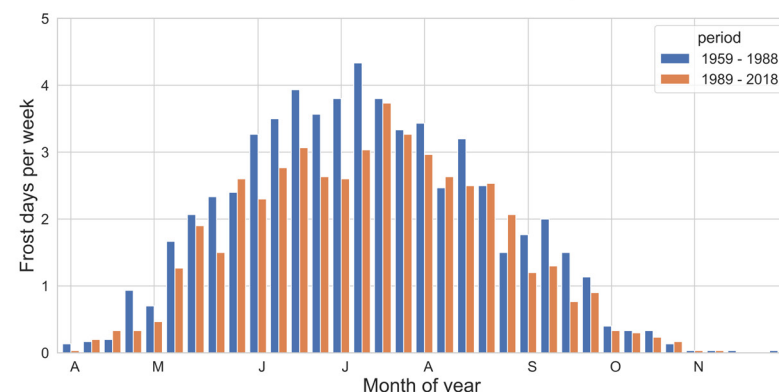
The number of potential frosts increased at Hay and Tumut between 1989–2018 (orange bars) compared to 1959–1988 (blue bars). Frost frequency increased in spring, with an average of five more spring nights in Hay with the potential for frost between 1989–2018 compared to 1959–1988.

Hay's frost risk typically ends by mid-September, although it can experience frosts well into October. Hay has experienced one potential frost night in November in the last 30 years. Because Tumut is in the high country, the frost profile there is quite different to the rest of the region. The frost risk usually extends into November, but overall the number of spring frosts at Tumut has decreased. More frosty nights tend to occur through dry winter and spring periods, when soil moisture is low, and cloud cover infrequent.

Hay Frost Occurrence And Likelihood By Week



Tumut Frost Occurrence And Likelihood By Week



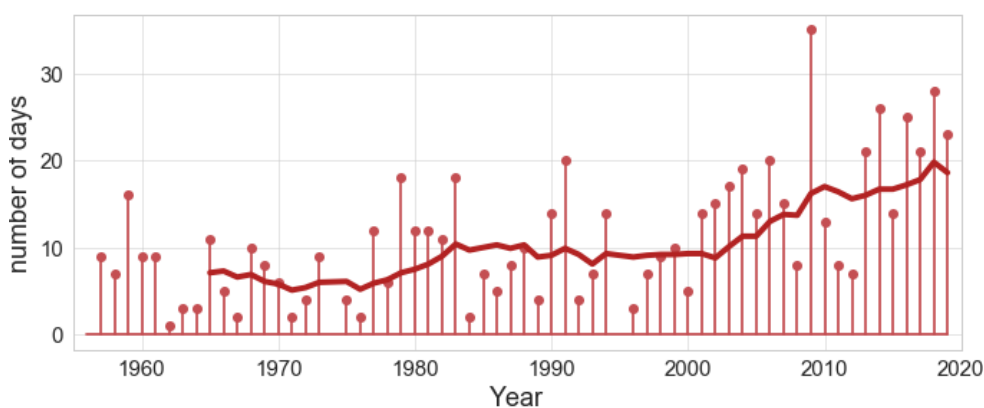
## Temperature

### The Riverina 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 Griffith. Griffith experienced an average of 14 days per year above 38 °C between 1989–2018, compared to an average of eight days per year above 38 °C between 1959–1988. Other locations around the region showed a similar pattern.

Over the last 30 years, unprecedented temperatures of 45 °C have been recorded at Griffith 15 times. Instances of consecutive days per year above 38 °C have also

Griffith Airport Aws Days Above 38 °C



been more frequent in the past 30 years. In 2004, 2006, 2009, 2016 and 2019, Griffith experienced five periods of seven or more days

in a row above 38 °C. A run of seven or more days above 38 °C had happened only twice prior to 2004.

Regional Weather and Climate Guides are produced as a partnership between Bureau of Meteorology, CSIRO and FarmLink



© 2019 Bureau of Meteorology and the CSIRO. The information contained in this publication cannot be reproduced without the written permission of Bureau of Meteorology and the CSIRO. Requests and enquiries concerning reproduction and rights should be addressed to the Bureau of Meteorology. **DISCLAIMER:** The information contained in this publication is offered by the Bureau of Meteorology and CSIRO solely to provide general information. While all due care has been taken in compiling the information, the Bureau of Meteorology and CSIRO and its employees, accept no liability resulting from the interpretation or use of the information. Information contained in this document is subject to change without notice.