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FarmLink Research Report 2019

BOM – Regional Weather and Climate Guides

Report Author

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Summary

October 2019 saw the culmination of FarmLink's first project of national significance when the Federal Drought Minister, David Littleproud, released a national set of innovative guides to local climate trends to highlight new production risks and limitations – the Regional Weather and Climate Guides.

FarmLink partnered with the Bureau of Meteorology and CSIRO to deliver the Regional Weather and Climate Guides project – a project that arose as a result of the impact drought was having on farming communities in 2019. It formed part of the Australian Government's Drought Assistance Package, announced by Mr Littleproud in August, 2018. The project aimed to improve the resilience of farming businesses by providing localised facts about the likelihood, severity and duration of key weather variables in regions across the country.

Project Partners

CSIRO

FarmLink
change • adapt • prosper

Funding Partners

Australian Government
Bureau of Meteorology

Introduction

The Climate and Weather Risk Guidelines project delivered 57 bespoke guidelines – one for each of the 57 Natural Resource Management (NRM) regions nationally – to help farmers make decisions about crop planting and stocking levels by better understanding their local climate.

FarmLink's role in the project involved both project support and guideline design.

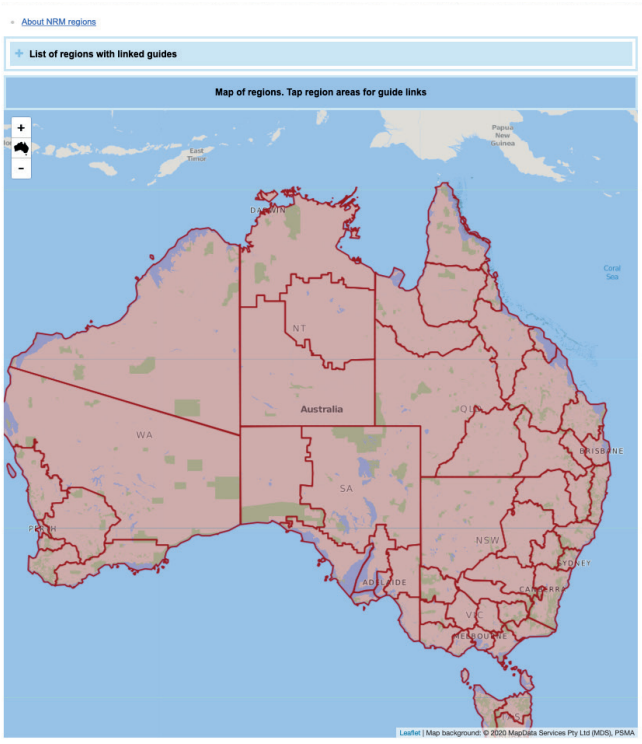
In supporting the project, FarmLink assisted in the design and delivery of a program of stakeholder engagement meetings in each of the 57 NRM regions across Australia. The information collected at the meetings was compiled and, along with historical weather records and scientific analysis, formed the basis of the 57 guidelines.

FarmLink's role in design saw the analysis compiled into a four-page guideline for each region, with an extensive review process following before they were released to the public.

The guides now reside on both the Climate Kelpie and Bureau of Meteorology websites as a legacy for producers right across Australia to be able to access the information to assist in their decision making and farm management.

Climate Kelpie website – http://www.climatekelpie.com.au/index.php/regionalclimateguides/

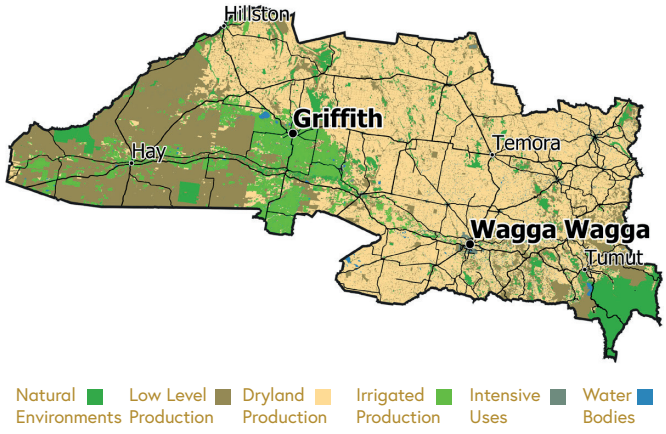
BOM website – http://www.bom.gov.au/climate/climate-guides/



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



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.

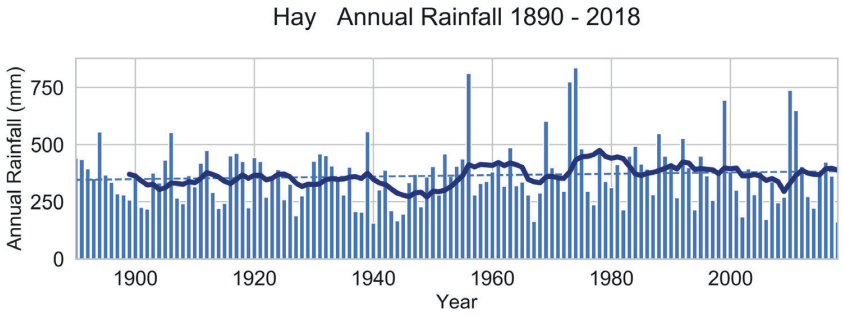
A climate guide for agriculture
Riverina, New South Wales

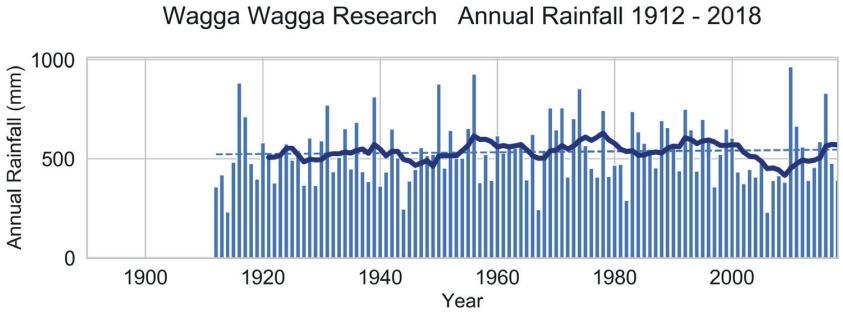
Annual Rainfall

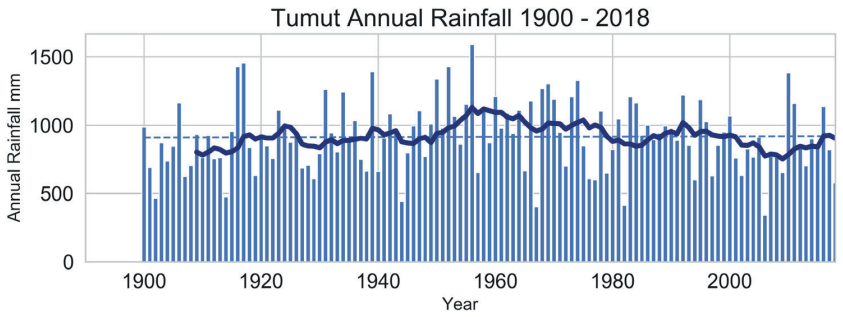
Annual rainfall in the Riverina has been stable

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.





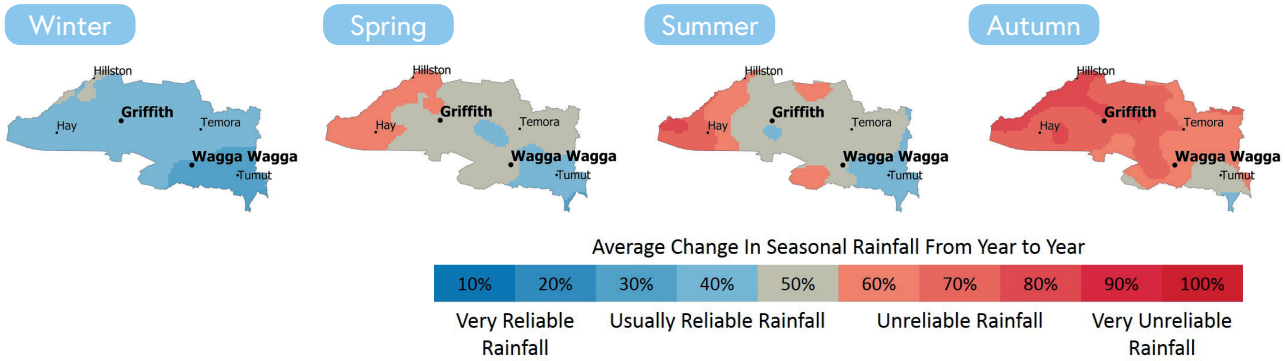


For more information on future projections, visit the Climate Change in Australia website
> www.climatechangeinaustralia.gov.au

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

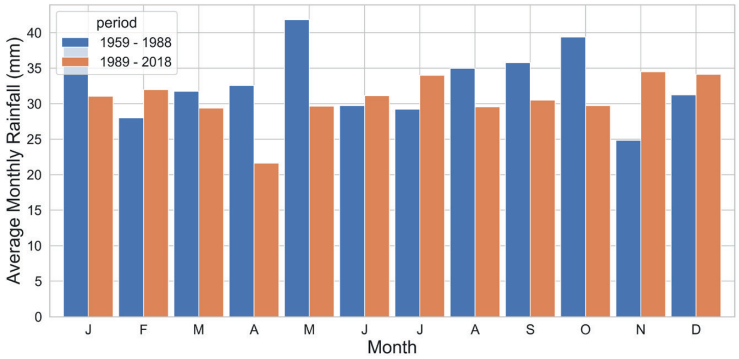


Rainfall Timing

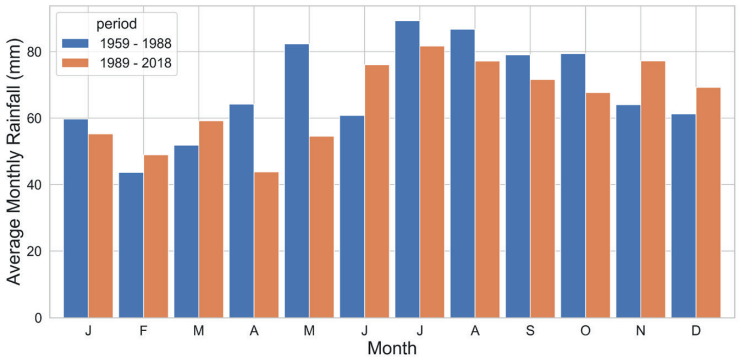
Rainfall has decreased in the autumn and spring months

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

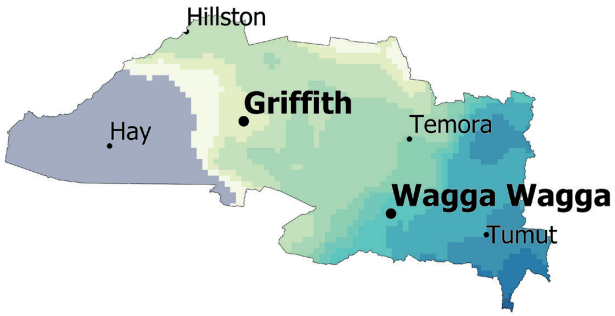


Tumut 30-year Average Rainfall by Month



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/

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 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 Hilston, in the last 30 years, the autumn break has been occurring around one month later than it did in the period 1959-1988.

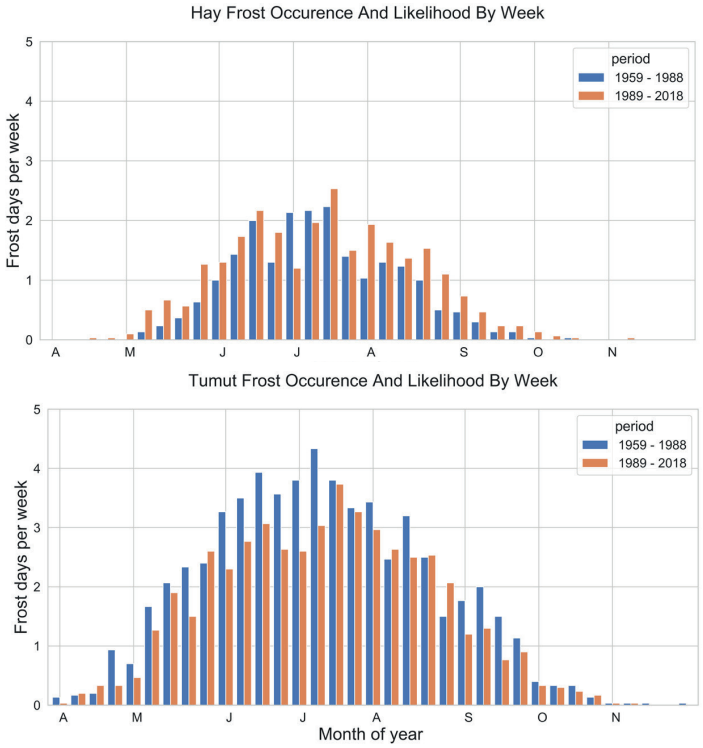
Weeks after 1 April	3	4	5	6	7	8	9	10	11	12	>13	This criteria usually not met by August
Autumn Break Usually Occurred After...	28 April	5 May	12 May	19 May	26 May	2 June	9 June	16 June	23 June	30 June	1 July	

A climate guide for agriculture **Riverina, NSW**

Frost

Later and more frequent frosts

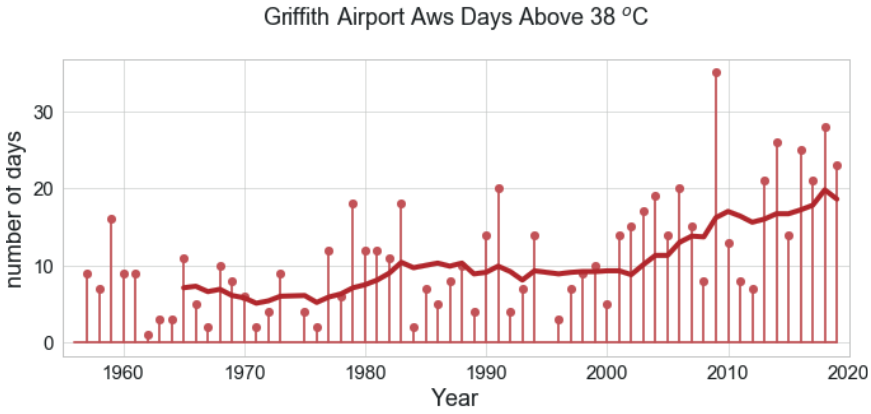
The number of potential frosts increased at Hay and Tumut between 1989–2018 (orange bars) compared to 1959–1988 (blue bars). Frost frequency increased in spring, with an average of five more spring nights in Hay with the potential for frost between 1989–2018 compared to 1959–1988.
Hay's frost risk typically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



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 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