



**Australian Government**  
**Bureau of Meteorology**

**HEAD OFFICE**  
Bureau of Meteorology  
GPO Box 1289 Melbourne VIC 3001 Australia

## **SPECIAL CLIMATE STATEMENT 20**

**A significant rainfall event for central and eastern Australia**

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*National Climate Centre*  
*Bureau of Meteorology*

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Australia's National Meteorological Service

700 Collins Street Docklands Tel: +61 3 9669 4000 Fax: +61 3 9669 4699 [www.bom.gov.au](http://www.bom.gov.au)

ABN 92 637 533 532

## Overview of the event

An exceptional rain event affected central Australia, Queensland and far northern New South Wales during the last week of February and first week of March. The event began on 22 February, when a strong low pressure system developed over the Top End within the monsoon trough. Over the following days the monsoon low tracked south, triggering heavy falls through central and southern parts of the Territory.

From the 28<sup>th</sup> the monsoon low moved eastwards into southwest Queensland, with convergence on its southern and eastern flanks bringing widespread heavy rain, first to southwest Queensland on the 28<sup>th</sup> and 1<sup>st</sup>, then spreading further east into the southern interior on the 1<sup>st</sup> and 2<sup>nd</sup>. Moist easterly flow, combined with a second low which formed off the coast near Fraser Island, also brought heavy rain to coastal regions of southeast Queensland and northeast New South Wales. The main low weakened and drifted south after the 2<sup>nd</sup>. Rainfall amounts were smaller from this point, but remnant moisture from the system continued to provide substantial rain over eastern Australia for the next few days, particularly in Victoria and southern New South Wales over the period 6-8 March. The moisture also contributed to severe thunderstorms which affected parts of the region.

The most remarkable aspect of this event was the area covered by the heavy rainfall and the total volume of rainfall that fell. Daily totals exceeded 100 mm over 1.7% of Australia on 1 March and 1.9% on 2 March. The latter is the largest area of 100 mm-plus daily totals on a single day in the Australian meteorological record, breaking the previous record of 1.7% set on 22 December 1956. 28 February was the wettest day on record for the Northern Territory with an NT-wide average of 29.23 mm, while 2 March set a new record for Queensland with a Statewide average of 31.74 mm<sup>1</sup>.

Over the 10-day period ending 3 March 2010 an estimated 403 cubic kilometres (403,000 gigalitres) of rainfall fell across the NT and QLD. This has resulted in major flooding in most of the catchments of southern inland Queensland. Compared with a notable previous flooding event in the region of comparable extent and severity, April 1990 (Figure 1), peak rainfall amounts have been smaller but heavy rains (10-day totals exceeding 200 mm) have covered a much larger area.

This event has occurred during the declining phase of an El Niño which has been in place since mid-2009. While El Niño is typically associated with dry conditions in eastern Australia in winter and spring, it is not unusual for major rain events to occur during late summer or early autumn during its declining phase, with notable historical examples including those of January 2007, January 1995, March 1983 and February 1973.

## Rainfall

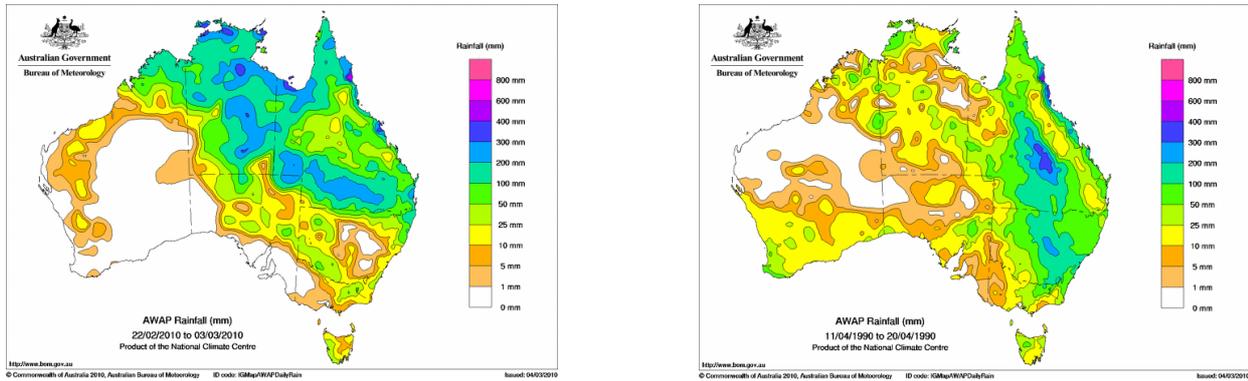
Widespread falls of over 200 mm occurred in central Australia in the last 5 days of February, making it one of the wettest months in the area since January 2001. Heavy rainfall began to occur across the Alice Springs District on Wednesday the 24th, with Alice Springs Airport recording 61.0 mm - its wettest day since 30 January 2001. The rainfall continued throughout the week, and this daily total was exceeded on Sunday the 28th, when another 66.0 mm fell at the airport.

In the Northern Territory, event falls ranged from only 8 mm at Yulara Aero AWS, to widespread 50+ mm totals across the western Alice Springs District. In the east, there were widespread falls of 100 – 200 mm, with Anzac Oval recording the highest event total of 303 mm. A number of stations within the Alice Springs District recorded a year's worth of rainfall in the 11 days ending on the 4<sup>th</sup> of March, with the annual average for the area ranging from about 200 – 300 mm, while Alice

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<sup>1</sup> Daily area-averaged rainfall records extend back to 1941. The previous record for the NT was 28.04 mm on 16 February 1946, while the previous Queensland record was 31.49 mm on 21 May 1981.

Springs itself approached its annual average (Table 3). It is noteworthy that the rainfall during this period at a number of places was more than double that received for the whole of 2009, which was very dry in central Australia.



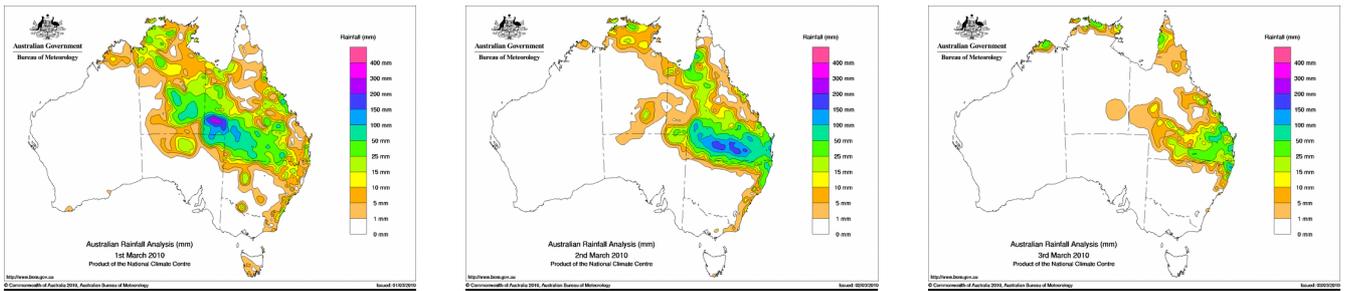
**Figure 1.** Total rainfall for the 10-day period 22 February – 3 March 2010 (left), and 11-20 April 1990 (right).

During early March the heavy rainfall moved into Queensland. On the 1<sup>st</sup> of March the most extreme falls occurred in far western Queensland where falls of over 150 mm occurred in parts, followed by similarly heavy falls on the 2<sup>nd</sup> further east through much of southern inland Queensland, particularly the Warrego and Maranoa districts. 17.1% of Queensland had its wettest March day on record on one of these two days (7.9% on the 1<sup>st</sup> and 9.2% on the 2<sup>nd</sup>).

In the 24 hours to 9am on the 1<sup>st</sup>, the highest daily rainfall total in Queensland was 188 mm at Bedourie Police Station, followed by 168 mm at Birdsville Airport, followed by 163 mm at Glengyle (all in the Lower Western district). These were all new annual extreme daily rainfall totals for these stations (Table 1). Roseberth Station in the Lower Western district also had a new annual extreme daily rainfall total and Windorah Post Office, also in the Lower Western district, had a record March daily rainfall total (Table 2). These daily rainfall totals at Bedourie and Birdsville were near the long-term annual average rainfall totals at these locations – in other words a full year's worth of average rainfall fell on just one day! Birdsville has received 375 mm for the year so far (as of 4 March), more than double its annual average and already enough to rank as its seventh-wettest year on record, and its wettest year since 1974.

In the 24 hours to 9am on the 2<sup>nd</sup>, the highest daily rainfall total in Queensland was 168 mm at Old Cashmere, north of St. George, 165 mm at Mitchell, and 161 mm at Coomera on the Gold Coast.

In the 24 hours to 9am on the 3<sup>rd</sup> the heaviest rainfall shifted to coastal parts with the highest daily rainfall totals being 125 mm at Casino Airport AWS in New South Wales, and 120 mm at Sandy Cape Lighthouse on Fraser Island. Further west, moderate falls continued to add to flooding problems.

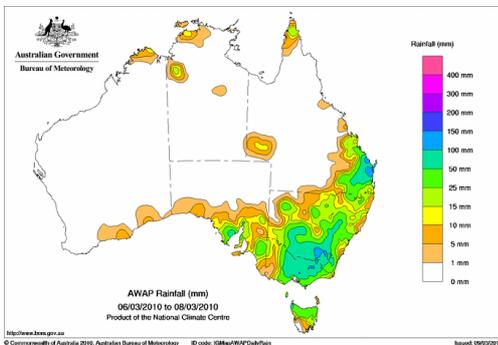


**Figure 2.** Daily rainfall for 1 (left), 2 (centre) and 3 (right) March 2010.

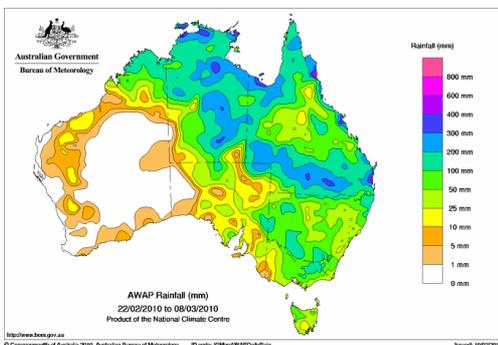
Scattered moderate to heavy rainfalls continued through southern Queensland, New South Wales and Victoria over the following days. There were particularly heavy falls in far western New South Wales on the 5<sup>th</sup>, with 126 mm at Burta, southwest of Broken Hill, and 97 mm at Broken Hill itself.

Over the period 6-8 March there were widespread heavy falls over much of Victoria and southern inland New South Wales, with many areas receiving 50-100 mm over the three days. The heaviest rain was in the ranges of northeast Victoria, and the South-West Slopes region of New South Wales, with some records set (Tables 1 and 2). The heaviest daily total during this event was 127 mm on the 8<sup>th</sup> at the Gurwood Street gauge in Wagga Wagga, with Wagga Wagga Airport receiving 110 mm on the same day, an all-time record for the site. This brought 15-day totals over much of the region to over 100 mm (Figure 4).

There were also numerous severe thunderstorms<sup>2</sup> during this period, with major areas affected including Bendigo on the 5<sup>th</sup>, Melbourne on the 6<sup>th</sup> and the Shepparton region on the 7<sup>th</sup>.



**Figure 3.** Rainfall for the period 6-8 March 2010.



**Figure 4.** Total rainfall for the period 22 February – 8 March 2010.

<sup>2</sup> The severe weather aspects of these thunderstorms will be covered in a separate report to be released at a later date.

Station number	Station name	State	Value (mm)	Date	Previous record (mm)	Years of data
38002/38026	Birdsville Airport	QLD	167.8	1 March	154.9	110
42012	Glenmorgan Post Office	QLD	159.0	2 March	127.0	66
42022	Meandarra Post Office	QLD	152.0	2 March	147.3	63
43035	Surat	QLD	154.0	2 March	153.7	118
44075	Woodlands	QLD	159.6	2 March	153.4	68
45003	South Comongin	QLD	158.0	2 March	142.5	81
72150	Wagga Wagga Airport	NSW	110.2	8 March	104.1	66

**Table 1.** Locations with 50 or more years of data which had their wettest day on record during the period 1-8 March.

Station number	Station name	State	Value (mm)	Date	Previous record	Years of data
35070	Taroom Post Office	QLD	124.8	2 March	119.4	121
38024	Windorah Post Office	QLD	106.2	1 March	102.9	106
42016	Hannaford Post Office	QLD	122.6	2 March	98.0	65
43020	Mitchell Post Office	QLD	165.0	2 March	123.2	115
44038	Glenorie	QLD	147.0	2 March	140.0	69
44050	Morven Post Office	QLD	152.4	2 March	125.2	112
44056	Mungallala	QLD	150.4	2 March	121.9	78
45006	Eromanga – Webber St	QLD	103.0	2 March	101.9	65
45015	Quilpie Airport	QLD	148.1	2 March	102.6	82
73019	Junee	NSW	86.6	8 March	71.4	82
74034	Corowa	NSW	72.5	8 March	53.6	115
86131	Yan Yean	VIC	86.2	8 March	83.8	130

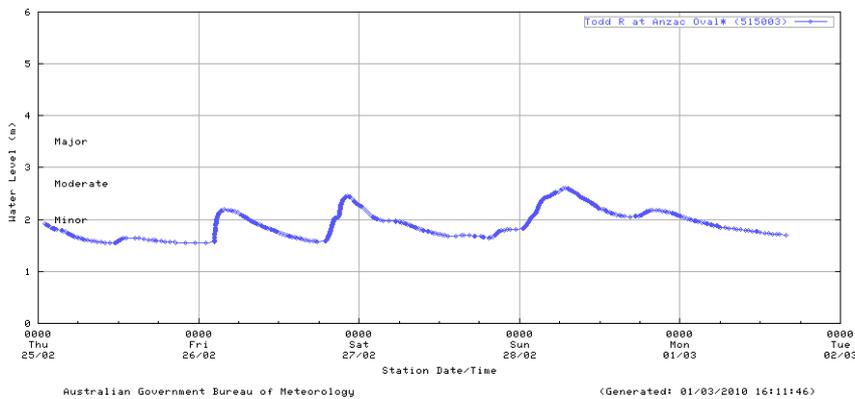
**Table 2.** Locations with 50 or more years of data which had their wettest March day on record during the period 1-8 March.

Station number	Station name	State/Territory	Value (mm)	Annual average
15590	Alice Springs	NT	222.4	279
38002/38026	Birdsville	QLD	259.6	185
38024	Windorah	QLD	246.9	268
43020	Mitchell	QLD	236.4	538
43030/43091	Roma	QLD	169.4	627
43034/43109	St. George	QLD	205.8	543
44021	Charleville	QLD	246.6	472
45015	Quilpie	QLD	245.1	354

**Table 3.** 10-day rainfall totals for 22 February – 3 March at selected locations in comparison with annual average rainfall.

## Flooding

Initial flooding in this event was in the southern Northern Territory. The Todd River commenced flowing on 23 February, and continued to flow into early March. During this event there were four distinct peaks in river height that all exceeded the minor flood level of 2.0 m. The highest of these peaks was 2.6 m, which occurred on 28 February. This river height (2.6 m) along the Todd River at Anzac Oval is typically observed once every 2 – 3 years on average. Flooding was limited as a result of the heaviest rains being concentrated in the lower part of the Todd catchment.



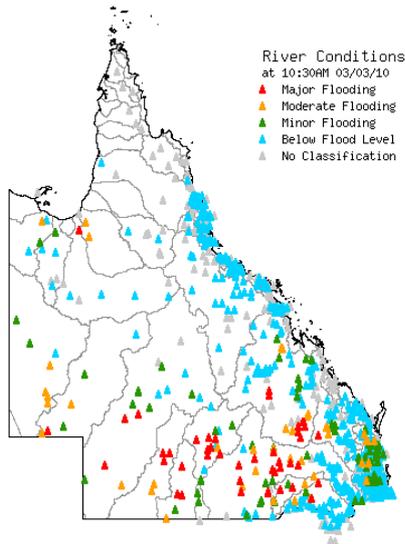
**Figure 5.** Todd River levels at Anzac Oval (Alice Springs).

Further east, widespread major flooding developed over 2-3 March on many of the rivers of southern inland Queensland (Figure 6). Major flooding occurred in the following catchments:

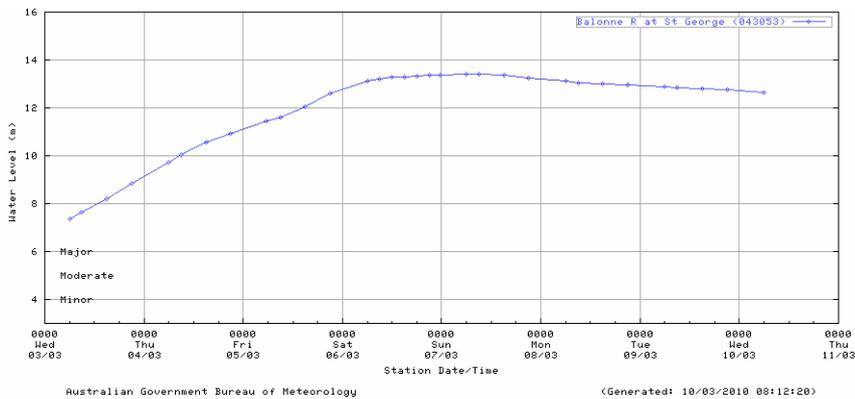
- Diamantina
- Barcoo and Cooper Creek
- Bulloo
- Paroo
- Warrego
- Wallam and Mungallala Creeks
- Maranoa
- Balonne
- Condamine
- Moonie
- Weir
- Dawson

Record flood heights have occurred in a number of catchments (Table 4). Records included the Balonne at St. George (Figure 7) and Surat, the Paroo at Eulo, Wallam Creek at Bollon, and the Moonie at Thallon. The Dawson River at Theodore and Moura reached its highest levels since 1956, and the Warrego at Cunnamulla its highest since 1990.

There was also local flash flooding associated with severe thunderstorms over the 5-8 March period in various parts of southeastern Australia, and some more substantial creek flooding in the Wagga Wagga area on 7-8 March. Further flooding is expected downstream in the Darling basin and its tributaries over the coming weeks.



**Figure 6.** Flood levels in Queensland at 10.30 am, 3 March 2010.



**Figure 7.** Flood levels for Balonne River at St. George (as of 8.00 a.m., 10 March 2010).

<u>Location</u>	<u>River</u>	<u>Peak height (m)</u>	<u>Previous record (m)</u>	<u>Year records began</u>
<u>Eulo</u>	<u>Paroo</u>	<u>6.27</u>	<u>5.99</u>	<u>1890</u>
<u>Bollon</u>	<u>Wallam Creek</u>	<u>1.76</u>	<u>1.53</u>	<u>1977</u>
<u>Surat</u>	<u>Balonne</u>	<u>12.40</u>	<u>12.25</u>	<u>1943</u>
<u>St. George</u>	<u>Balonne</u>	<u>13.39</u>	<u>13.10</u>	<u>1890</u>

**Table 4.** Record flood heights at locations with 30 or more years of data.

Contacts for further information

The following climate meteorologists may be contacted for further information about this event:

Blair Trewin (03-9669 4623, 0413 849 309)

Robyn Duell (03-9669 4671)

For queries specific to particular States/Territories:

Northern Territory: Hakeem Shaik (08-8920 3814)

Queensland: Claire Webb (07-3239 8665)

New South Wales: Clinton Rakich (02-9296 1555)

Victoria: Harvey Stern (03-9669 4949)