Australian Government
Bureau of Meteorology

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SPECIAL CLIMATE STATEMENT 20

A significant rainfall event for central Australia and Queensland

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National Climate Centre
Bureau of Meteorology

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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 28th 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 28th and 1st, then spreading further east into the southern interior on the 1st and 2nd. 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 2nd, and rainfall amounts thereafter were generally unexceptional.

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[1].

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, 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 4th of March, with the annual average for the area ranging from about 200 – 300 mm, while Alice Springs itself approached its annual average (Table 3). It is noteworthy that the rainfall during this

[1] 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.

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period at a number of places was more than double that received for the whole of 2009, which was very dry in central Australia.

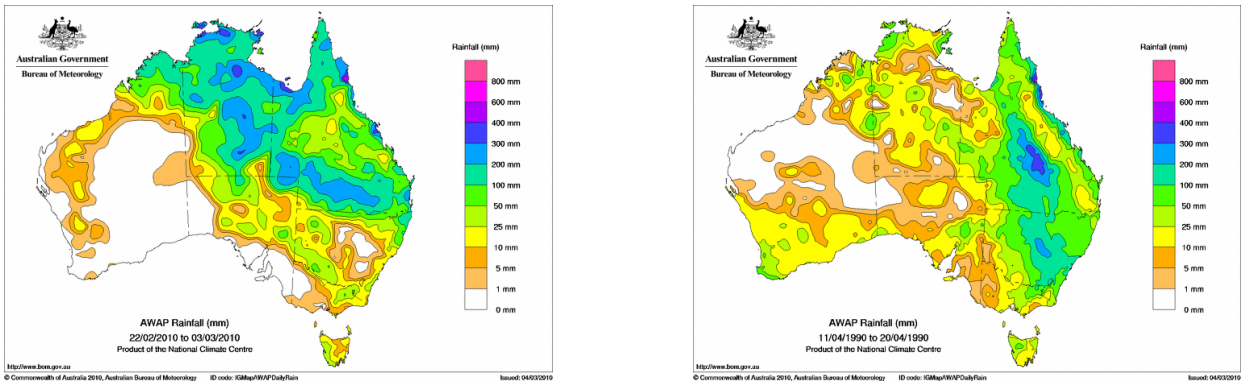

Figure 1. Total rainfall for the 10-day period 22 February – 3 March 2010 (left), and 11-20 April 1990 (right).

During early March the heavy rainfall moved into Queensland. On the 1st 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 2nd 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 1st and 9.2% on the 2nd).

In the 24 hours to 9am on the 1st, 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 2nd, 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 3rd 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.

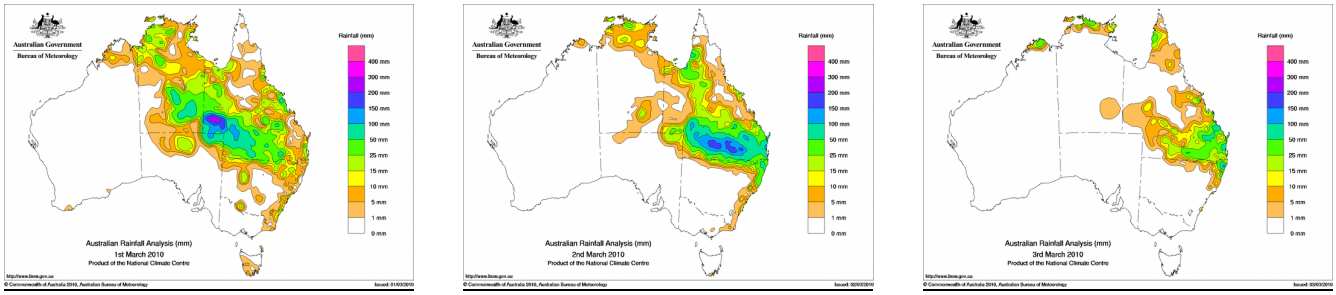

Figure 2. Daily rainfall for 1 (left), 2 (centre) and 3 (right) March 2010.

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

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

Table 2. Locations with 50 or more years of data which had their wettest March day on record during the period 1-2 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 (2.6m) 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.

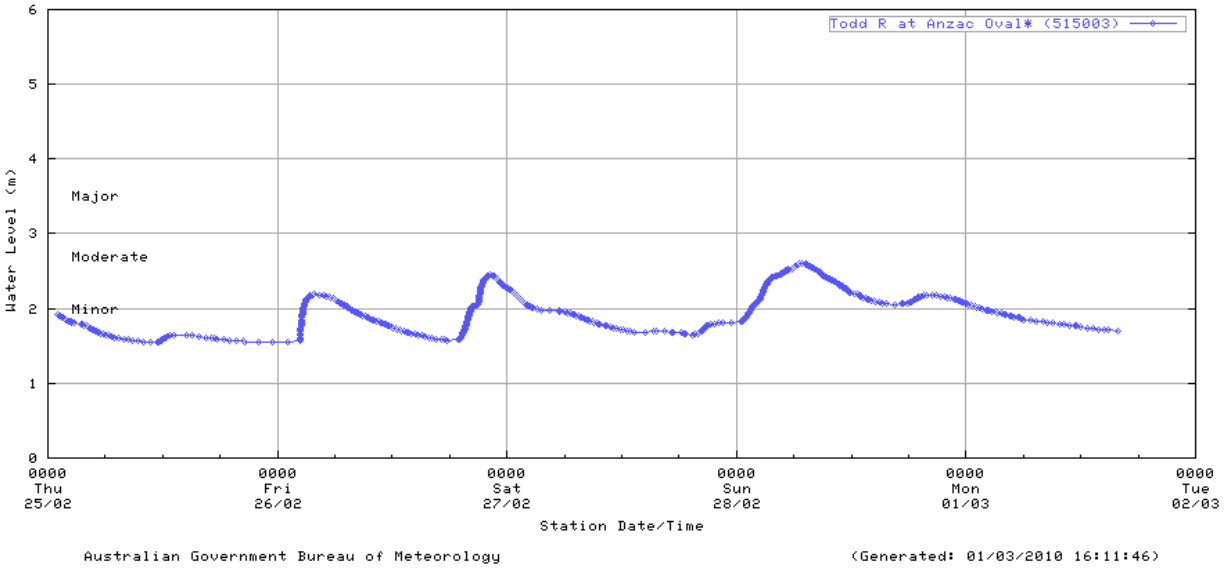

Figure 3. Todd River levels at Anzac Oval (Alice Springs).

Further east, widespread major flooding developed over 2-3 March on many of the rivers of southern inland Queensland (Figure 4). 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.

At the time of writing, record flood heights have occurred at Homeboin (Wallam Creek), Tomoo (Mungallala Creek) and Weribone (Balonne). Further record flood heights are expected in various catchments, in particular the Balonne at St. George (Figure 5), as the flooding moves downstream over the coming days. An update of this statement is expected next week which will include more comprehensive information on flood peaks which have occurred during this event.

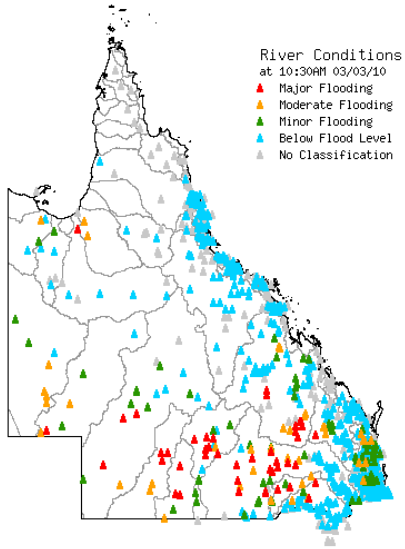

Figure 4. Flood levels in Queensland at 10.30 a.m., 3 March 2010.

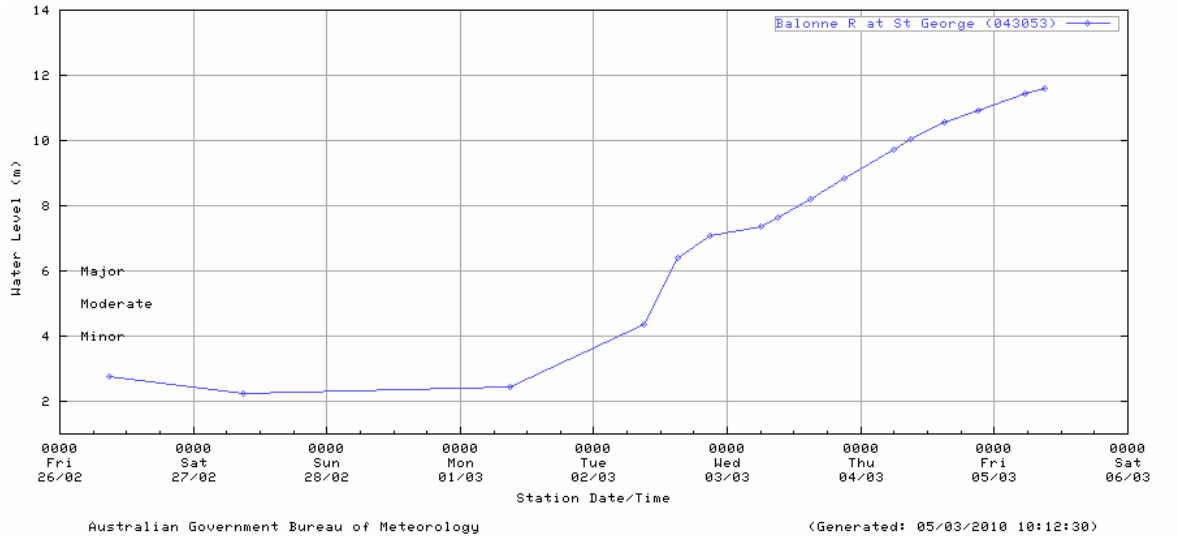

Figure 5. Flood levels for Balonne River at St. George (as of 10.00 a.m., 5 March 2010).

Contacts for further information

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

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An update including further information on flood peaks is expected to be released during the week 8-12 March.