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SPECIAL CLIMATE STATEMENT 32

Exceptional rainfall in the east Kimberley region of Western Australia

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Overview

Extreme rainfall was observed over the Kimberley region of Western Australia and adjacent parts of the Northern Territory during the first half of March 2011. Over 300 mm of rain fell between 1 and 16 March across central and eastern regions of the Kimberley with more than 700 mm falling over the Kimberley Plateau, setting new rainfall records for the region. A significant portion of this rainfall occurred during the week ending 14 March (Figure 1) and resulted in extensive flooding, substantial damage to infrastructure, and isolation of communities across the Fitzroy, Ord and Pentecost River catchments.

The heavy rainfall occurred as a result of a very active monsoon across northern Australia, which was present for much of the 2010/11 northern wet season. During the first half of March, the monsoon trough intruded southwards over northern Australia to be located over southern parts of the Kimberley and, combined with a slow moving tropical low, caused a significant monsoonal burst over the east Kimberley and the NT's Victoria and Barkley districts from 8 to 14 March.

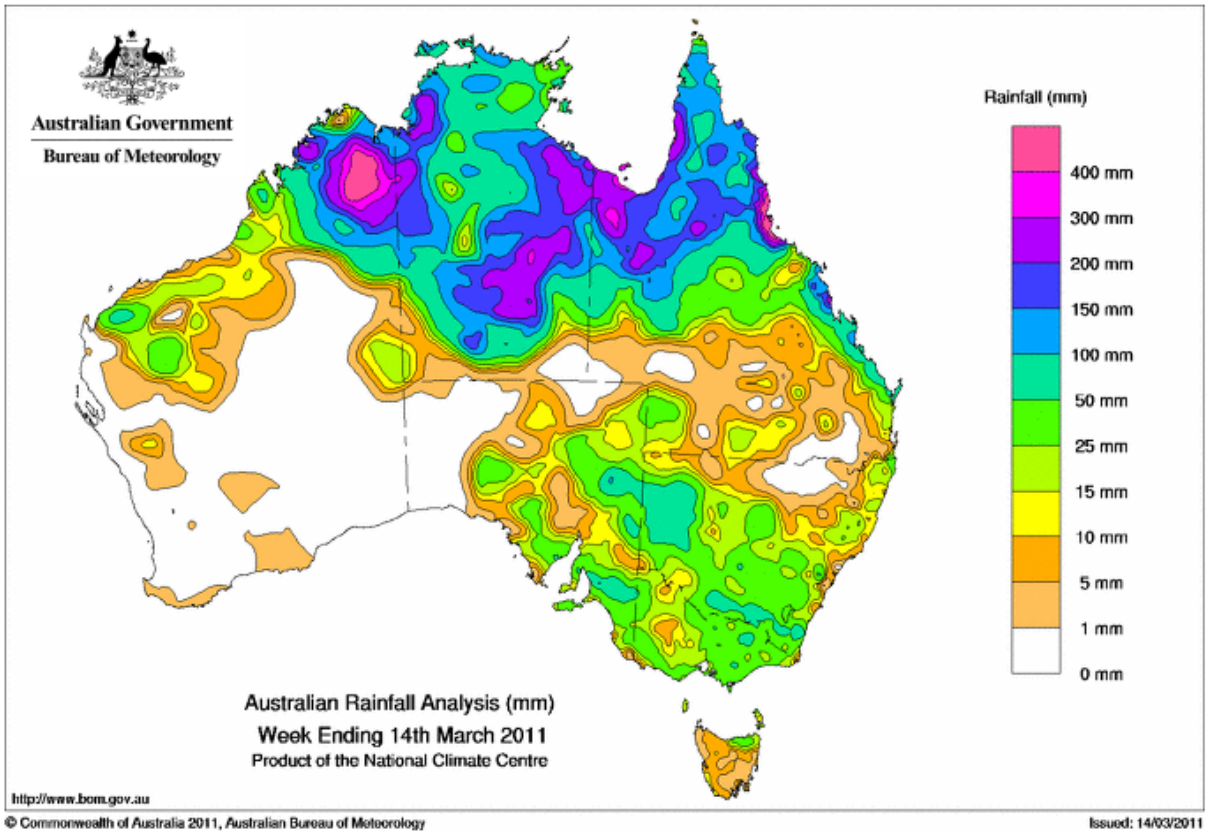

Figure 1: Australian total rainfall map for the week ending 14 March 2011.

Individual station records

Rainfall totals were so high during the monsoonal burst that a number of sites in the Kimberley had surpassed their wettest March on record within the first two weeks of the month, some recorded their wettest week on record, and some sites recorded their highest daily rainfall.

Rainfall totals in the first 16 days of March exceeded 500 mm at several sites, including at Warmun where significant flooding occurred, but the highest total recorded was 739.2 mm at Durack Range. A number of stations exceeded their previous monthly record close to half-

way through the month, whilst Yulmbu had recorded its wettest month on record (Table 1). Moreover, the rainfall during the week from 8 to 14 March alone was enough for Yulmbu to record its highest March rainfall on record.

Station Number	Name	Rainfall (mm)	% of normal	Previous record (mm)	Year	Years of record
002009	Gibb River	482.8	393	418.8	1989	82
002021	Mount Amhurst	317.8	501	285.8	2007	54
002026	Ruby Plains	226.6	421	219.3	2001	68
002030	**Yulmbu**	**695.0**	**924**	**255.1 (Mar)** **562.0 (all)**	**1989** **2002**	**43**
002032	Warmun	502.5	431	453.4	2007	101

Table 1: Stations where 1 to 16 March rainfall totals exceeded March monthly records. Values shown in bold are records for any calendar month.

Particularly high rainfall totals were recorded in the period from 8 to 14 March and a number of stations recorded seven day rainfall totals over 400 mm. The highest was Durack Range with 636.8 mm. Two stations recorded their highest 7 day rainfall totals as a result (Table 2).

Station Number	Name	Rainfall (mm)	Previous record (mm)	Date	Years of record
002032	Warmun	387.8	385.6	11-17 Mar 1922	84
002030	Yulmbu	531.2	396.4	18-24 Feb 2002	43

Table 2: Stations where 8 to 14 March rainfall totals exceeded previous record 7 day totals.

Significant daily rainfall totals were recorded during the monsoonal burst, particularly on 13 and 14 March where many stations recorded over 100 mm. Durack Range registered 212.4 mm in the 24 hours to 9am on the 13th, followed by 351.0 mm in the 24 hours to 9am on the 14th, the two highest daily totals recorded during the event. Rainfall recorded at Durack Range suggests that for periods between 6 hours and 72 hours the intensities were over a 1 in 100 year event. Daily rainfall records were broken at several stations (Table 1).

Station Number	Name	Rainfall (mm)	Date	Previous record (mm)	Date	Years of record
002032	**Warmun**	**181.1**	**14/3**	**155.0 (Mar)** **167.9 (all)**	**30/3/2007** **13/4/1910**	**84**
002012	Halls Creek Airport	132.8	14/3	120.0	7/3/1966	68
002030	Yulmbu	141.0	8/3	86.4	17/3/1960	43
002049	**Sophie Downs**	**160.0**	**14/3**	**126.4 (Mar)** **134.2 (all)**	**2/3/1982** **20/2/2001**	**30**

Table 3: Record daily rainfall totals during March 2011. Values shown in bold are records for any calendar month.

Flooding and associated impacts

Widespread flooding resulting from the persistent heavy rainfall cut roads in the Kimberley, including the Great Northern Highway, isolating Halls Creek and making several other communities inaccessible. Substantial damage to houses occurred in the community of Warmun where the whole community of over 200 people were evacuated and 65 houses were reported destroyed or damaged to the extent that they were no longer habitable. The Fitzroy River peaked at just over 13 metres at Fitzroy Crossing (Figure 2), the highest level since 2003. On the WA/NT border, the Negri River peaked at just over the 11 metre mark at Mistake Creek Homestead (Figure 3). As a result, the Argyle Dam rapidly filled to almost double its February volume, and during the period from 1 to 16 March gained an extra 9,184 GL, bringing it to 190% of its capacity.

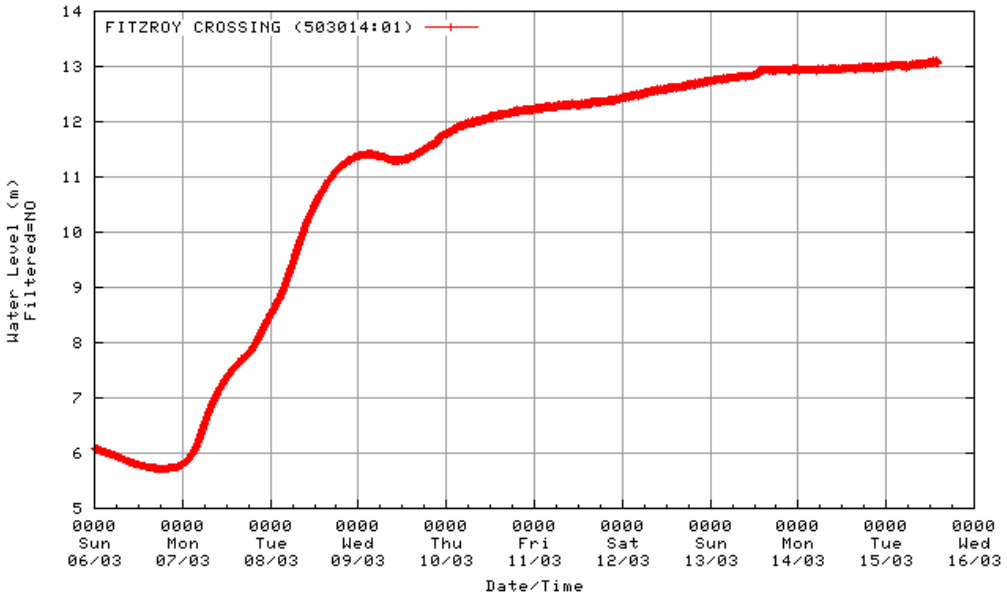

Figure 2: Hydrograph showing water level for the Fitzroy River at Fitzroy Crossing.

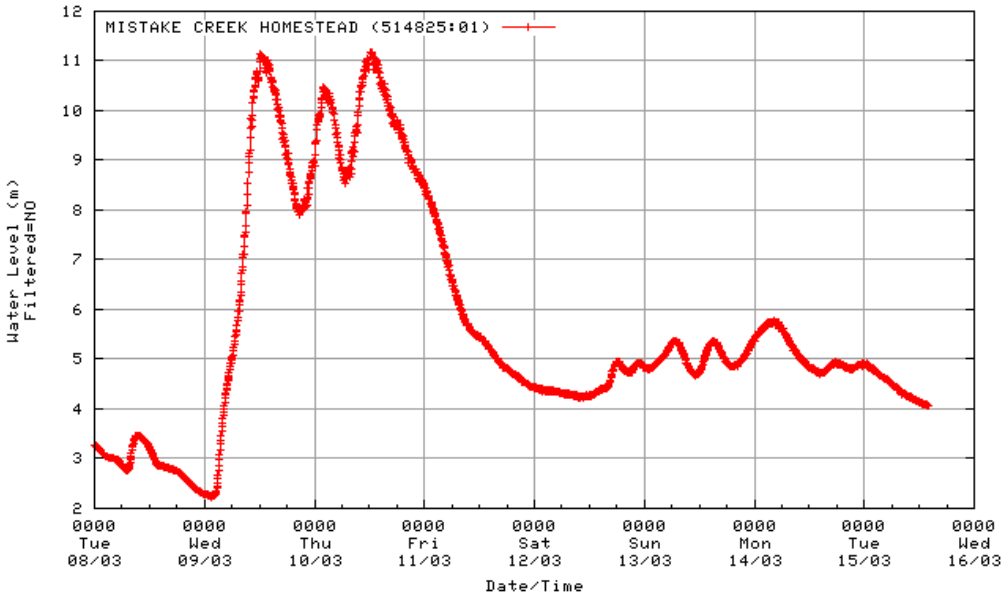

Figure 3: Hydrograph showing water level for the Ord River at Mistake Creek Homestead.

Further Information

This statement is based on information available as of 16 March 2011. Updates of monthly total rainfall can be found in the WA March summary at: http://www.bom.gov.au/climate/current/index.shtml and a more comprehensive summary will be available in the WA March Monthly Weather review at: http://www.bom.gov.au/climate/mwr/.

Reporting of rainfall records in this report has been restricted to sites with 30 years of record or greater.

For further information contact: Glenn Cook or Pat Ward in the WA Climate Services Centre on (08) 9263 2222