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Bureau of Meteorology

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SPECIAL CLIMATE STATEMENT 29

Extreme rainfall recorded in the Greater Darwin Region

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*Northern Territory Climate Services Centre
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Overview

Between February 15th and February 17th 2011, parts of the Darwin – Daly district experienced heavy rain, breaking numerous records. Late in the day on the 13th of February a tropical low pressure system developed over Australia’s Top End, centred about 50 km north of Katherine. As this system moved to the northwest, exceptionally wet conditions began to develop over Darwin and rural areas, becoming notably intense late on the 15th. It was about this same time that the system curved northeast and emerged over Darwin Harbour. Conditions were ripe for the tropical low to intensify as it moved over the warm ocean waters. The circulation of the system was well developed and evident up to 500 hPa, displaced slightly to the north-northwest at the middle levels, and strongly divergent at the 200 hPa level. The low pressure system became Tropical Cyclone Carlos, of category 1 intensity, while over Darwin Harbour on the 16th. The cyclone remained slow moving over the city of Darwin for more than 24 hours. By early on the 17th, the system had moved southeast of Darwin and was downgraded to a tropical low. Due primarily to the slow movement of the storm, several rainfall records were broken in this three day period.

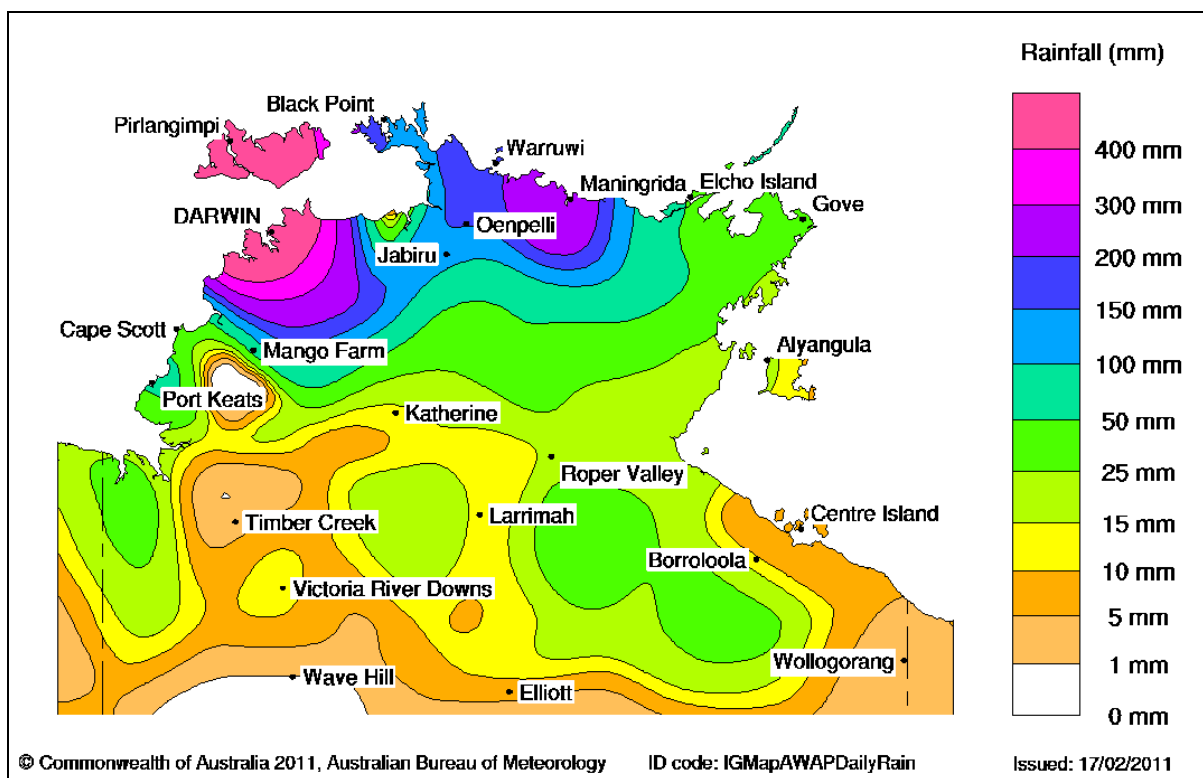


Figure 1. Top End 3-day rainfall totals for 15th February 2011 to 17th February 2011.

Rainfall at Darwin Airport

Darwin Airport recorded 367.6 mm of rain on the 24 hour period to 9 am on the 16th February. The previous highest 24 hour rainfall for Darwin Airport was recorded on the 3rd of January 1997, when Tropical Cyclone Rachel brought 290.4 mm of rain. Darwin Airport 3-day total (15th to 17th February 2011) was 684.8 mm, breaking the previous 3-day record established between 8th December 1998 and 10th December 1998, when Tropical Cyclone Thelma brought 462.0 mm of rain. Back in December 1974, Darwin Airport only picked up 337.8 mm of rain in the 3-day period around tropical Cyclone Tracy. Moreover, so far this month, Darwin Airport has accumulated 849.8 mm of rain, breaking the previous monthly February record of 814.5 mm set in 1969.

Rainfall at other individual locations

To 9 am on the 16th February 2011, nearly all recording stations around the Greater Darwin region experienced their highest 24 hour period on record: Leanyer* recorded 344.2 mm, Channel Island recorded 311.2 mm and Palmerston 300.0 mm. New 3-day rainfall records were also set with Channel Island receiving the highest 3-day rainfall accumulation: 808.1 mm in the 3-day period to 9 am on the 17th February 2011. During the same 3-day period, Fort Hill Wharf recorded 781 mm and 732.4 mm were recorded in Leanyer*. Further inland, The Chase picked up 505.4 mm, 513.8 mm were recorded in Palmerston and 330.8 mm at Batchelor Aerodrome.

Station Number	Name	Total rainfall (mm)	Previous highest	Years of records
14009	Channel Island	311.2	290.2 on 13 Dec 2009	35
14015	Darwin Airport	367.6	290.4 on 03 Jan 1997	70
14167	Stokes Hill	288.4	273.6 on 13 Dec 2009	18
14210	Palmerston	300.0	295.7 on 03 Jan 1997	23
14246	Leanyer*	344.2	271.4 on 03 Jan 1997	20

Table 1 Sites which recorded their highest 24 hour period on record on the 16 February 2011.

Station Number	Name	Total rainfall (mm)	Previous highest	Years of records
14009	Channel Island	808.1	549.7 in Feb 2011	35
14015	Darwin Airport	684.8	462.0 in Dec 1998	70
14167	Stokes Hill	640.4	447.2 in Feb 2011	18
14183	Darwin River Dam	453.2	395.4 in Dec 2009	39
14246	Leanyer*	732.4	553.2 in Feb 2001	20

Table 2 Sites which recorded their highest 3-day period on record.

Maximum temperature records

Four stations measured record low maximum temperatures during this rainfall event. Darwin Airport recorded a maximum temperature of only 24.8 °C on the 15th which is the lowest February maximum temperature on record (previous record 25.6 °C on the 3rd February 1956). This was also the lowest maximum temperature recorded so far this wet season. The other locations that measured record lowest February maximum temperatures during this event were: Batchelor with 23.9 °C on the 16th (previous record 25.2 °C on the 3rd February 2004), Black Point which recorded 27.9 °C on the 14th (previous record 28.2 °C on the 16th February 1999) and Dum In Mirrie with 26.1 °C on the 15th (previous record 26.7 °C on the 19th February 2008).

2010/2011 wet season rainfall

Overall, the 2010/2011 wet season has been wetter than normal across the Top End, largely due to the influence of the La Nina weather pattern. Up to 9 am 17th February 2011, Darwin Airport has received 2233.4 mm of rain since the official wet season began on the 1st of October 2010. This amount exceeds the average wet season rainfall of 1666.2 mm and is just 266 mm shy of the record set in 1997/1998. So far this places the 2010/2011 wet season as the 5th wettest, with two months still to go.

Summary

Exceptional rainfall amounts fell across the Darwin-Daly district, especially in Darwin and surrounding rural areas, from the 15th through to the 17th of February 2011, associated with Tropical Cyclone Carlos. Several records were broken including the highest daily rainfall at Darwin Airport with 367.6 mm on the 16th and highest 3-day total at Darwin Airport with 684.8 mm measured. Many recording stations around the Greater Darwin region recorded their highest 24 hour rainfall to 9 am on the 16th. Due to these heavy rains coming on the back of an already above average wet season, the 2010/2011 wet season is likely to end up the wettest on record.

Station Number	Name	Total rainfall (mm)	Previous highest	Years of records
14009	Channel Island	311.2	158.8 on 16 in 1938	35
14015	Darwin Airport	367.6	250.2 on 18 in 1955	70
14041	Middle Point	142.0	88.8 on 17 in 2009	10
14167	Stokes Hill	288.4	148.3 on 06 in 1969	18
14170	Larrakeyah	234.6	210.5 on 20 in 2008	32
14183	Darwin River Dam	216.0	115.0 on 14 in 1975	39
14210	Palmerston	300.0	245.0 on 22 in 1997	23
14219	McMinns Lagoon	205.0	135.4 on 23 in 1997	34
14222	Elizabeth Valley	158.7	121.4 on 17 in 2003	21
14226	Humpty Doo Collard Road	214.2	144.4 on 23 in 1997	30
14227	Karama	191.7	190.8 on 22 in 1997	22
14246	Leanyer*	344.2	179.2 on 20 in 2008	20
14259	Shoal Bay	284.2	210.4 on 22 in 1997	15
14264	Territory Wildlife Park	173.0	108.2 on 18 in 2009	17
14265	CSIRO Berrimah	192.4	181.0 on 20 in 2008	17
14272	Batchelor Aero	165.2	150.0 on 12 in 2002	15

Table 3 Sites which recorded their highest 24 hour period on record for February during this event.

Contacts for further information

For further information contact: Todd Smith in the NT Climate Services Centre on (08) 8920 3800.

* Please note: Leanyer recorded 344.2 mm before the rain gauge overflowed on the morning of the 16th February; therefore the value is an underestimate of the actual rain in Leanyer on the 24h period up to 9 am on the 16th February 2011.