

## Tropical Low 11U and Monsoonal Flow

Northern Territory and Western Australia Office

26 January to 1 February 2018

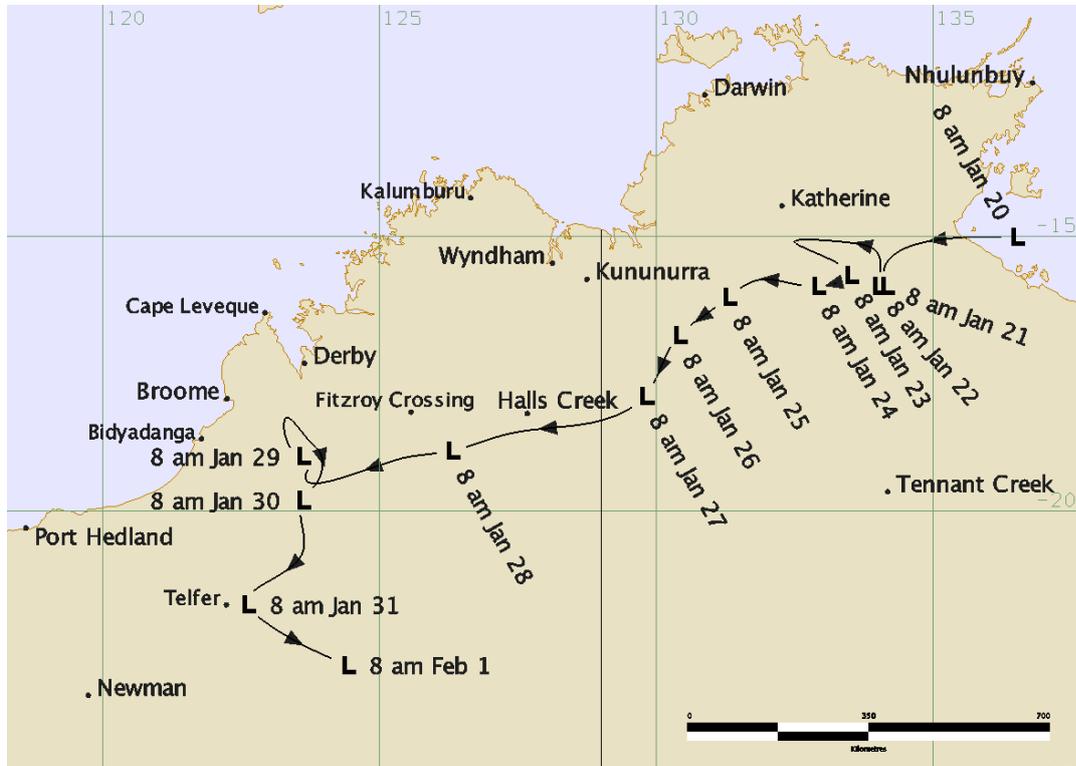


Figure 1: Track of Tropical Low (11U).

Tropical Low 11U was an intense monsoonal low, which traversed over land across northern parts of the Northern Territory and Western Australia in late January 2018. A vigorous monsoonal flow developed in conjunction with the low and this combination brought heavy rainfall, damaging winds and flooding across the Top End and northern parts of Western Australia during the last few weeks of January 2018.

A tropical low was first identified on 20 January 2018 over the western Gulf of Carpentaria. The system deepened as it moved generally west to southwest over land across the base of the Top End of the Northern Territory, crossing into Western Australia on the afternoon of 27 January.

The system continued to intensify as it moved west southwest across the southern Kimberley before becoming slow moving on 29 and 30 January over the southwest Kimberley between 120 and 200 kilometres southeast of Broome, reaching its peak intensity overnight on 29 January. From 30 January, the system started to weaken and moved generally towards the south though central WA.

A strong and vigorous monsoonal flow also developed across the Top End of the Northern Territory and northern parts of Western Australia between 27 and 30 January.

Gales (sustained winds greater than 62 kilometres per hour (km/h)) were recorded at Broome Airport between 29 January 7:36 pm AWST and 30 January 12:15 am AWST, peaking at 78 km/h. Broome Port recorded gales at times on 28 and 29 January before the automatic weather station

(AWS) stopped reporting. Derby Aerodrome also recorded gales early morning of 30 January for about 2 hours.

In the associated monsoon flow, offshore weather stations at Troughton Island, Adele Island and Browse Island recorded gales for periods between 28 and 30 January. The maximum wind gust observed was 111 km/h at Adele Island at 2:45 am AWST 29 January.

Heavy rainfall was observed across the Top End and Carpentaria district. Bing Bong Port (211mm on 23 January) and McArthur River Mine Airport (196.4mm on 25 January) both recorded their highest daily January rainfall on record. This contributed to a total of 608mm falling at Bing Bong Port in the four days to 9 am ACST 23 January. Other stations that recorded new highest January daily rainfall records were Middle Point with 214.4mm (113mm in 3 hours), McMinns Lagoon (280mm), Noonamah (228.4mm) and Elizabeth Valley (223.4mm) all being recorded in the 24 hours to 9am ACST 28 January.

Heavy rainfall fell across the Kimberley, east Pilbara and North Interior districts between 26 and 31 January. As the low became slow moving during 29 and 30 January, very heavy rainfall was recorded across the southwest Kimberley. In the 24 hours to 9 am AWST 30 January, West Roebuck recorded 448.8 mm and Broome Airport 439.4 mm. This contributed to large event totals with Broome Airport recording 697.2 mm in the five days to 9 am AWST 31 January, setting a new record for a five day period (previous record was 667.4 mm between 27 to 31 January 1978). Broome Airport also recorded its highest monthly rainfall with a total of 942.2 mm for January 2018 (previous record was 910.8 mm in January 1997).

Other notable rainfall totals (6 days to 9 am AWST 1 February 2018) include West Roebuck with 788.8 mm, Country Downs 522.2 mm, Bidyandanga 329.0 mm and Derby Main Roads 329.0 mm.

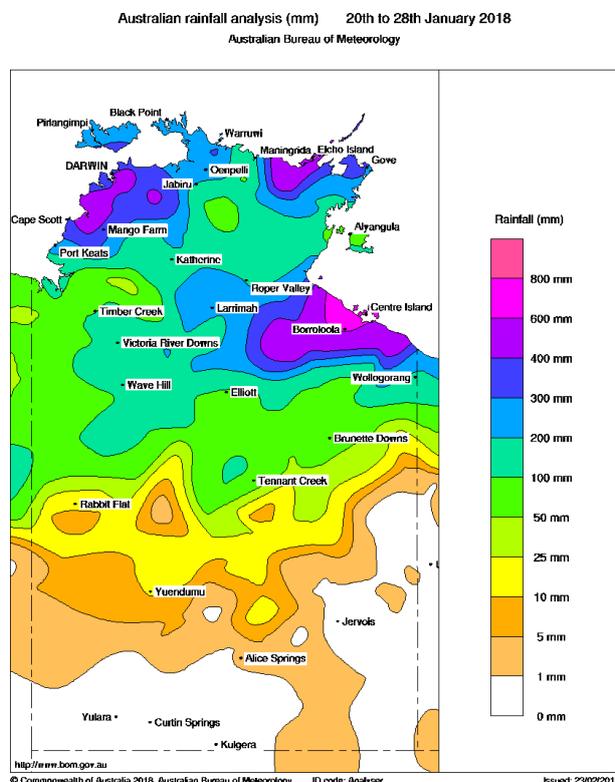


Figure 2: Rainfall Totals (mm) 20 January to 28 January 2018 across the NT.

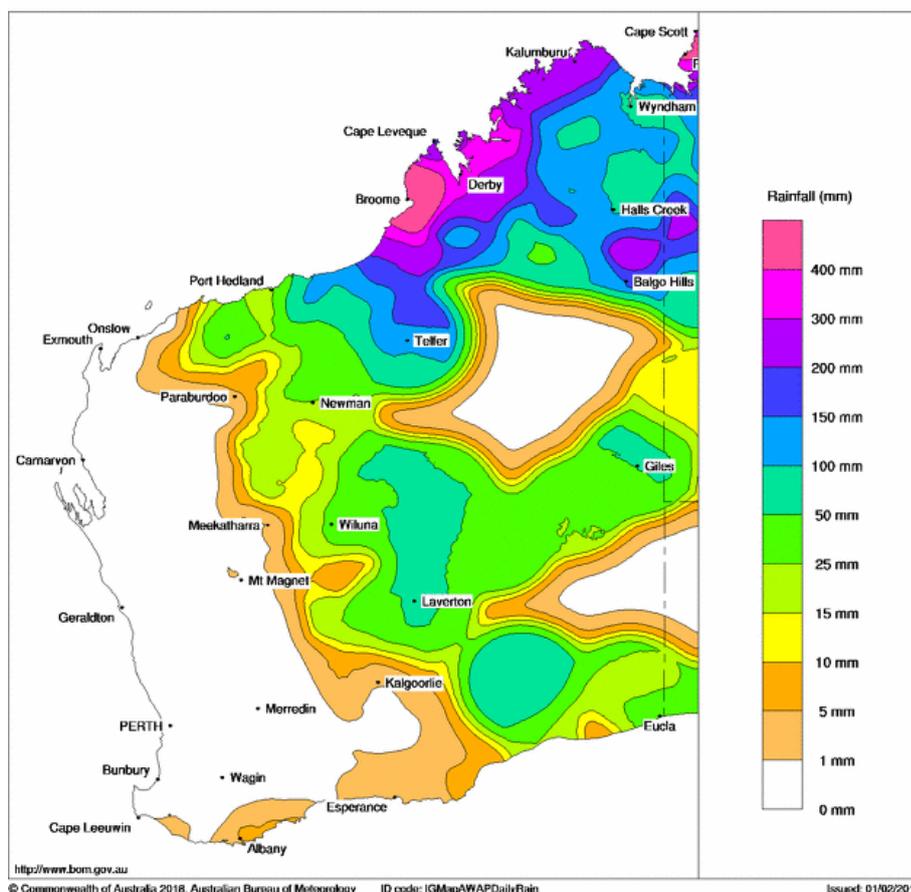


Figure 3: Rainfall Totals (mm) 26 January to 1 February 2018 across WA.

Tides generally didn't exceed the astronomical tide (HAT). However, with persistent onshore winds across the Top End and Kimberley coast over numerous days, Darwin, Broome and Wyndham recorded tides up to 60cm above the predicted tides.

Northern Territory Emergency Service (NTES) received 90 calls on 27 and 28 January while Northern Territory Police received 25-30 calls. Across the Top End, monsoonal squall lines uprooted large trees around Darwin, causing power outages across large parts of the rural area and Tiwi Islands. The evacuation of the community of Nauiyu on the Daly River started on 29 January as a result of a major flood warning, while 900 residents of Marrakai were isolated due to flooding. The Daly River peaked at 14.83m around midday on 31 January. The Western Australia Department of Fire and Emergency (DFES) had 81 call outs in Broome for the event. Across the west Kimberley, felled trees, roof damage and minor structural damage were reported. Several communities and people in the west Kimberley were isolated due to flooded roads.



Figure 4: Flooding in Broome (courtesy of David Murray).

A flood watch was first issued for the Carpentaria Coastal Rivers at 12:53 pm ACST on 22 January with a minor flood warning for the McArthur River issued on 25 January. The watch was extended to the North West and Bonaparte Coastal Rivers on 23 January with the first flood warning for the Daly River issued at 5:15 pm ACST on 27 January. The flood warning was finalised at 8:59 am ACST 9 February. Flood warnings were also issued for the Adelaide River and Katherine River (Gorge Road).

Flood warnings were first issued at 11:02 pm AWST 27 January 2018 for the West Kimberley District. A flood watch soon followed covering the East Kimberley and the Fitzroy River catchment. As the low moved from east to west the flood watch extended to the Sandy Desert and flood warnings included the North Kimberley District placing the entire Kimberley region in either flood watch or warning.

Heavy rainfall in the Fitzroy River catchment triggered Moderate then Minor Flood warnings for the Fitzroy River catchment. A number of 1% AEP rainfall totals (3-12 hour return) resulted in some flood peak timing revisions but the Fitzroy River remained below the moderate flood level throughout the event.

As the low progressed into the Sandy Desert, southwards through the Interior and eventually departing the state offshore, multiple flood watches were issued for areas receiving rainfall from the decaying low. Flood Warnings ceased on Saturday 3 February.

A Severe Weather Warning for Heavy Rainfall, Damaging Winds and Abnormally High Tides for the Carpentaria District was first issued at 9:14 am ACST 19 January. Subsequent warnings were issued for the Barkly, Arnhem, Daly, Tiwi and Gregory Districts as the low moved west. Several Severe Thunderstorm Warnings for destructive winds were also issued on 28 and 29 January for the Darwin and rural area. The Severe Weather Warning was cancelled at 9:34 am ACST 31 January. A second Severe Weather Warning for Damaging Surf for the Daly and Tiwi Districts was first issued at 12:10 pm ACST 25 January and continued until 31 January.

A Severe Weather Warning for Damaging Winds and Heavy Rainfall for the Kimberley district was first issued at 11:07 am AWST 27 January 2018. Subsequent warnings were issued regularly for the

Kimberley, east Pilbara, North Interior and South Interior districts until conditions eased. The Severe Weather Warning was cancelled at 10:23 am AWST 31 January 2018

The warning also included sustained gales along coastal areas between the NT/WA border and Broome, locally destructive gusts in thunderstorms and higher than normal tides between Wallal and the NT/WA border.



Figure 5: Vegetation damage in Darwin (courtesy of Billy Lynch)