

= Cyclone Helen (2008) =

Tropical Cyclone Helen was the first tropical cyclone to bring gale @-@ force winds to Darwin , Australia since 1985 . The fourth named storm of the 2007 ? 08 Australian region cyclone season , Helen developed out of a weak area of low pressure in late December over the Top End region of Australia . Generally tracking westward , the system eventually intensified into a tropical cyclone and was given the name Helen on 2 January . By this time , it was situated over the Joseph Bonaparte Gulf and was beginning to retrograde eastward . Late on 4 January , the storm made landfall near Channel Point with winds of 95 km / h (60 mph) though rapidly weakened to a tropical low within 12 hours . Gradually accelerating , the remnants of Helen moved over the Gulf of Carpentaria before striking land again on 6 January . The system was last noted over the Cape York Peninsula on 7 January .

From late December through 6 January , Helen and its precursor low produced significant rainfall over the Northern Territory , generally amounting between 100 and 200 mm (3 @.@ 9 and 7 @.@ 9 in) . One person drowned in the Victoria River after his car was swept away in a flood . As a tropical cyclone , Helen produced significant wind gusts across the Top End , peaking at 120 km / h (75 mph) , downing thousands of trees . In Darwin , roughly 15 @,@ 000 people were without power due to the storm , more than 100 of which remained so four days after the storm . Overall losses from the storm reached A \$ 1 @.@ 3 million (US \$ 1 @.@ 1 million) with an additional A \$ 1 million (US \$ 882 @,@ 000) in cleanup costs .

= = Meteorological history = =

As early as autumn 2007 , long @-@ range forecast models indicated that a La Niña would develop by December of that year . In general , this event results in increased sea surface temperatures near Australia . Following this , a strong Madden ? Julian oscillation phase took shape , leading to the development of Tropical Cyclone Melanie off the coast of Western Australia and an area of low pressure over the Top End by 28 December . Situated over land , the system initially embedded within a disorganised trough and to intensify as it slowly tracked eastward . By 30 December , it separated itself from the trough and travelled towards the west . The following day , the interaction between the two systems allowed the low to significantly deepen , attaining a barometric pressure of 993 mbar (hPa ; 29 @.@ 32 inHg) . This strengthening was short @-@ lived as wind shear over the low increased , displacing convection from its centre .

By 2 January , the weak low moved over the Joseph Bonaparte Gulf where it slowly developed over the following day . Once over water , the Joint Typhoon Warning Center (JTWC) designated the system as Tropical Depression 09S . As organisation improved , a mid @-@ level subtropical ridge over Western Australia pushed the system westward , away from the Kimberley coast . Steadily strengthening , the low attained gale @-@ force winds near its centre during the morning of 4 January and was subsequently named Helen by the Bureau of Meteorology . Shortly thereafter , a strong westerly monsoon flow to the north caused Helen to turn eastward , back towards land . Intensification continued up until landfall , by which time Helen had attained Category 2 status on the Australian tropical cyclone intensity scale . Maximum ten @-@ minute sustained winds reached 95 km / h (60 mph) and the storm 's barometric pressure decreased to 975 mbar (hPa ; 28 @.@ 79 inHg) . The JTWC assessed Helen to have been slightly weaker , with peak winds estimated at 85 km / h (50 mph) .

Around 10 : 00 pm local time on 4 January , the centre of Tropical Cyclone Helen made landfall near Channel Point . As it moved ashore , the storm developed an eye ; however , this feature began breaking apart once overland and the eyewall merged into the system 's feeder bands . Roughly 12 hours after landfall , Helen weakened to a tropical low before moving over the Gulf of Carpentaria late on 5 January . Due to an increase in forward motion , the system was unable to regenerate sufficient convection to be reclassified a tropical cyclone before making a second landfall along the Cape York Peninsula . Once overland again , the remnants of Helen abruptly slowed and were last noted on 7 January in the same region .

= = Preparations = =

Starting in late December , widespread rains produced by the precursor to Helen prompted the issuance of flood warnings throughout the Top End region . Prior to the arrival of Cyclone Helen on 4 January , the Bureau of Meteorology issued cyclone warnings for areas between the Mitchell Plateau , in Western Australia , to Cape Hotham in the Northern Territory . According to local officials , flooding was the greatest concern from the storm rather than wind damage . The warning area was later condensed to encompass areas from Wadeye to Cape Hotham , including Darwin and the Tiwi Islands . By 6 January , warnings were issued for the western coast of the Cape York Peninsula between Karumba and Weipa as the remnants of Helen were forecast to regain storm intensity .

In light of Helen 's approach in the Top End region , the Compass Resources mining company suspended construction of a new mine in Batchelor . Mining at the Ranger Uranium Mine maintained by Energy Resources of Australia was also suspended until the storm passed . The George Brown Darwin Botanic Gardens and Territory Wildlife Park were also closed for the duration of the storm . Residents in the Aboriginal community of Wadeye were strongly advised to take precautions for the storm . Following the issuance of a cyclone warning in Darwin , local shelters were opened to the public . At the Darwin International Airport , all incoming and outgoing flights through Jetstar Airways were cancelled while Tiger Airways rescheduled their flights and no changes were made by Qantas . Darwin Harbour was mostly shut down as seas became too rough to sail in . Schools and day cares within a 50 km (31 mi) radius of the city were closed on 4 January .

= = Impact and aftermath = =

Throughout the Top End region , the precursor to Helen resulted in a prolonged period of moderate rains over a relatively large area . These rains caused the Victoria River to swell over its banks and flood nearby areas . On 4 January , a car with three people was swept away by the river ; two of the passengers managed to escape and swim to shore , but the third person remained trapped . Aerial searches were made later that day for him , though he was later declared dead . After becoming a tropical cyclone , the storm produced additional moderate to heavy rainfall , generally totaling between 100 and 200 mm (3 @. @ 9 and 7 @. @ 9 in) . Between 1 and 6 January , a total of 174 @. @ 6 mm (6 @. @ 87 in) of rain fell in Darwin . These rains affected two additional major rivers in the area : the Adelaide and Katherine rivers . Near where the storm made landfall , wind gusts up to 120 km / h (75 mph) were recorded ; Darwin recorded a maximum wind gust of 102 km / h (63 mph) as Helen moved by the city .

Near Channel Point , the cyclone brought a storm surge of 2 to 3 m (6 @. @ 6 to 9 @. @ 8 ft) , barely surpassing the highest astronomical tide in a few areas . In some cases , waves over topped sand dunes but no damage took place . Roughly 10 @-@ 15 % of trees in open areas were snapped or uprooted by high winds . Only two structures sustained direct wind damage while several others were struck by downed trees . Damage was more widespread in Darwin where roughly 15 @, @ 000 homes , 60 % of the city 's residences , were left without power . Approximately 1 @, @ 500 trees were downed in the city , falling on roads , homes and power lines . In the days following the storm 's passage , the Adelaide and Katherine rivers continued to rise , of which the former exceeded minor flood levels . In the harbour , seven vessels washed ashore , each sustaining minor damage . Losses caused by the storm was placed at A \$ 1 @. @ 3 million (US \$ 1 @. @ 1 million) .

The day after Helen passed through , cleanup efforts began as power crews had to remove downed trees before fixing power lines . The main power lines in the city were restored within 24 hours and rural areas were stated to have their power back within a day or two . Two days after the storm , 500 homes remained without electricity and frustrated residents were further angered after discovering that the Power and Water agency was in control of tree removal and not emergency services . With the power company in charge of clearing downed trees , they stated that their crews would only be

dealing with cases involved power lines . Residents with trees in their yards or even on their homes were told to contact private contractors to remove them . By 9 January , more than 100 homes were still without power in northern Darwin , resulting in angry outcries from those still left in the dark . Cleanup efforts dragged on for more than two months as debris was still present in Darwin in March . Removal of tree stumps took through at least mid @-@ April as the cost to remove downed trees exceeded A \$ 1 million (US \$ 882 @, @ 000) . Due to the damage wrought by Helen , its name was retired following its usage . However , it was not replaced by any particular name as a new naming scheme was implemented the following season .