= Cyclone Narelle =

Severe Tropical Cyclone Narelle was a Category 4 cyclone in early January 2013 that brought light rains to areas in South Australia suffering from a drought and heat wave . On 4 January , a tropical low developed within a monsoon trough over the Timor Sea . Over the following several days , the system gradually tracked westward and intensified , being classified Tropical Cyclone Narelle on 8 January . Turning southward into a region of low wind shear , Narelle intensified into a severe tropical cyclone on 9 January . Over the following two days , the cyclone 's structure fluctuated , temporarily featuring an eye , before it maintained its organisation and intensified further on 11 January . The storm attained its peak intensity later on 11 January as a Category 4 cyclone with winds of 185 km / h (115 mph) . The following day , Narelle passed approximately 330 km (205 mi) northwest of Exmouth as it moved on a south @-@ southwesterly course . The system steadily weakened and ultimately fell below tropical cyclone strength on 15 January well to the west of Geraldton .

Early in the storm 's existence , Narelle brought strong winds , heavy rain , and high winds to many areas in Indonesia . More than 10 @,@ 000 homes were flooded and many others were damaged by thunderstorms . A total of 14 people were killed by the storm , and 17 others were listed as missing . In Western Australia , scattered strong thunderstorms caused minor damage and produced a possible tornado .

= = Meteorological history = =

On 4 January , a weak area of low pressure developed within a monsoon trough near Timor . The following day , the Joint Typhoon Warning Center (JTWC) began monitoring the system for possible development into a tropical cyclone . Traveling westward , the system was forecast to intensify as it moved into an area highly favouring tropical cyclogenesis with very warm waters (with sea surface temperatures of 30 to 31 ° C (86 to 88 ° F)) and low wind shear . Additionally , a nearby anticyclone provided good outflow for the system . Over the following two days , deep convection gradually built around the low and on 7 January , the Tropical Cyclone Warning Centre (TCWC) in Darwin designated the system as Tropical Low 05U , at which time the storm was situated roughly 135 km (85 mi) south @-@ southeast of Sumba , Indonesia . By this time , the system was tracking west @-@ southwestward around a subtropical ridge , which would dictate the track of the storm for the remainder of its existence . Later on 7 January , the JTWC issued a Tropical Cyclone Formation Alert for the system , indicating that further development of the low into a significant tropical cyclone was anticipated . Just seven hours after this , the JTWC classified the system as a tropical storm and began issuing advisories .

Through the morning of 8 January , weak wind shear hindered development of the system . After enough convection wrapped around the centre of circulation , the Australian Bureau of Meteorology classified the low as Tropical Cyclone Narelle , the second named storm in the western region during the 2012 ? 13 season . Shortly thereafter , intensification quickened as a central dense overcast formed and prominent banding features consolidated . Following the development of an eye early on 9 January , the Bureau of Meteorology upgraded Narelle to a severe tropical cyclone , with winds estimated at 120 km / h (75 mph) . Over the following day , Narelle 's intensity leveled out as it encountered moderate wind shear . Once the shear relaxed , the system resumed strengthening . With conditions more favourable , Narelle redeveloped an eye and its outflow improved . Late on 11 January , Narelle is estimated to have attained its peak intensity with winds of 185 km / h (115 mph) and a barometric pressure of 930 mbar (hPa ; 27 @.@ 46 inHg) . Operationally , the storm was believed to have been slightly stronger , peaking as a Category 5 cyclone on the Australian scale . It was not until a post @-@ storm assessment that the Bureau of Meteorology found Narelle to have been a weaker system at its peak . At the same time , the JTWC assessed the storm to have attained one @-@ minute sustained winds of 215 km / h (130 mph) , ranking it as a Category 4 @-@ equivalent cyclone on the Saffir ? Simpson hurricane scale .

Hours after Narelle reached peak intensity , increasing wind shear caused the storm 's eyewall to

erode and the outflow to become somewhat restricted . By the afternoon of 12 January , the storm 's structure had significantly degraded , with the eye no longer apparent and a marked decrease in cold cloud tops . Later that day , the cyclone made its closest approach to Western Australia , passing approximately 330 km (205 mi) northwest of Exmouth . Despite shear eventually lightening up , the storm 's southerly course brought it over cooler waters , preventing restrengthening . Most of the deep convection shifted to the western side of Narelle 's circulation , though its centre remained well defined . By the evening of 13 January , the storm had weakened below severe tropical cyclone strength . Rapid weakening ensued on 14 January , as the effects of cooler waters and dry air caused the deep convection to dissociate into an area of shallow stratocumulus clouds . Narelle failed to redevelop deep convection and weakened below tropical cyclone status early on 15 January , prompting the Bureau of Meteorology to issue its final bulletin on the cyclone . The system was last observed about 500 km (310 mi) west of Geraldton , where it continued southward away from Australia .

= = Preparations and impact = =

= = = Indonesia = = =

On 9 January , the MV Emeline cargo vessel sank off the coast of Selayar Islands . Of the 17 crewmen , 6 were rescued and 11 others remained missing as of 16 January . Another vessel , the MV Angle , became stranded near West Lombok Regency . By 10 January , Narelle brought strong winds , heavy rains , and rough seas to the province of Bali in Indonesia . Residents and tourists were warned of waves up to 5 m (16 ft) . Ferry service between Bali , West Nusa Tenggara , and Java was suspended , isolating residents in Nusa Penida , Nusa Lembongan , and Nusa Ceningan . Winds from the storm downed many trees and caused severe damage to structures across Bali , especially in the capital city of Denpasar . In Selemadeg Village , one person died after a tree fell on her . Trees and billboards were downed across Jakarta , and three homes were damaged . Flooding in the region closed several roads , leading to traffic delays more than 6 km (3 @.@ 7 mi) long . In Banten , heavy rains caused four major rivers in the province to overflow their banks , leading to flooding in 33 districts . A total of 10 @,@ 470 homes across the province were inundated , and four people were killed . In all , 14 people were killed and 6 others were listed as missing .

= = = Western Australia = = =

After Narelle moved into TCWC Perth 's area of responsibility on 9 January , a cyclone watch was issued for areas between Whim Creek and Coral Bay . A blue alert , the Department of Fire and Emergency Services (DFES) lowest level of readiness , was also issued for areas between Mardie and Whim Creek . The following day , the watch was upgraded to a cyclone warning for all areas and a new watch was issued to the west , encompassing areas as far as Cape Cuvier . The watch was further extended early on 11 January to include areas between Cape Cuvier and Carnarvon . As the storm continued on a more westward path than initially anticipated , the warning area was gradually decreased , with areas east of Roebourne receiving the all clear later on 11 January . The watch area , however , continued to expand and encompassed areas as far east as Denham . As the storm made its closet approach to Western Australia on 13 January , the watches and warnings area were gradually discontinued , with all advisories being discontinued that afternoon .

By 11 January , the Apache Corporation began evacuating all non @-@ essential personnel from oil rigs in the path of the storm . The Rio Tinto Group shut down iron exports at its Dampier and Cape Lambert ports due to rough seas . Across the Pilbara region , the State Emergency Service advised residents to secure loose objects and ensure their emergency kits were stocked . Incident management teams were also established to help people in the wake of the storm . Additionally , urban search and rescue equipment was set up in Karratha . Horizon Power dispatched additional linemen to the most at @-@ risk areas in Narelle 's path to speed up power restoration in the wake

of the storm . In Carnarvon , mango producers picked as much of their fruit as possible before the storm arrived in order to minimize losses .

Along the coast of Western Australia , between Onslow and Busselton , minor storm tides were reported , with a peak rise of 1 @.@ 1 m (3 @.@ 6 ft) in Onslow . This caused flooding in low @-@ lying areas , though no damage was reported in relation to it . In North West Australia , especially around Exmouth , the storm brought gusty winds that downed a few trees and produced as much as 76 mm (3 in) of rain . Between 15 and 16 January , the remnants of the storm brought widespread moisture to southern areas of Western Australia , especially the wheatbelt region , leading to scattered showers and thunderstorms . A total of 39 mm (1 @.@ 5 in) of rain fell in Ravensthorpe , with 22 mm (0 @.@ 87 in) falling in a ten @-@ minute span . A strong storm in Karlgarin produced winds up to 90 km / h (56 mph) that tore the roofs off eight buildings . Losses in the town exceeded A $ 70 @,@ 000 (US $ 74 @,@ 000) . Winds in Lake Grace gusted up to 87 km / h (54 mph) . According to Horizon Power , there was no loss of electricity across Western Australia . A potential tornado touched down near Capel , downing trees along a 400 m (1 @,@ 300 ft) wide swath . In Perth , the storm brought unusually warm , moist air , keeping temperatures from dropping below 27 @.@ 3 ° C (81 @.@ 1 ° F) , making it the warmest January night in 24 years .

= = = Elsewhere = = =

While still off the coast of Western Australia , moisture from Narelle brought scattered rains to South Australia . The heaviest totals were measured in Lameroo at 12 @.@ 8 mm (0 @.@ 50 in) . In many areas , this ended a 28 day dry spell and brought relief amid a severe heat wave . Grape growers in Adelaide Hills also benefited from the rain and cooler temperatures . On 18 January , a French sailor had to abandon his yacht off the coast of Tasmania after its mast broke due to rough weather caused by the remnants of Narelle .