

= Hurricane Danielle (1998) =

Hurricane Danielle resulted in minor damage throughout its duration as a tropical cyclone in late August and early September 1998 . The fourth named storm and second hurricane of the annual hurricane season , Danielle originated from a tropical wave that emerged off the western coast of Africa on August 21 . Tracking generally west @-@ northwestward , the disturbance was initially disorganized ; under favorable atmospheric conditions , shower and thunderstorm activity began to consolidate around a low @-@ pressure center . Following a series of satellite intensity estimates , the system was upgraded to Tropical Depression Four during the pre @-@ dawn hours of August 24 , and further to Tropical Storm Danielle that afternoon . Moving around the southern periphery of the Azores High located in the northeastern Atlantic , quick intensification to hurricane status occurred early on August 25 . By 0600 UTC the following day , Danielle reached an initial peak intensity of 105 mph (165 km / h) , a Category 2 hurricane . Increased wind shear from a nearby trough encroached on further development later that day , and subsequently led to slight weakening . By 1200 UTC on August 27 , despite continued unfavorable conditions , Danielle reached a second peak intensity equal to the first . Weakening once ensued late on August 27 in addition to the days following , and Danielle was a low @-@ end Category 1 hurricane by August 31 as its forward speed slowed .

As the cyclone reached the western periphery of the ridge that steered it across the Atlantic for much of its existence , it began yet another period of intensification , and once again attained a peak intensity as a Category 2 hurricane . Passing northwest of Bermuda , Danielle weakened to Category 1 hurricane strength , but for a final time intensified into a 105 mph (165 km / h) tropical cyclone thereafter . As the cyclone passed over increasingly cool sea surface temperatures and became intertwined in a baroclinic zone , it began to undergo an extratropical transition . At 0000 UTC on September 4 , Danielle was no longer considered a tropical cyclone , despite retaining hurricane @-@ force winds . Several days later , the remnants of Danielle merged with a larger extratropical low and became indistinguishable . As a tropical cyclone , it produced heavy rainfall in Puerto Rico and the Lesser Antilles , leading to flooding . Tropical storm @-@ force winds were observed in Bermuda even though the cyclone passed well northwest of the island . During Danielle 's transition to an extratropical cyclone , it produced light rain and led to minor beach erosion in Newfoundland . The larger extratropical low that merged with the system resulted in large waves off the coast of the United Kingdom , leading to major beach erosion and coastal flooding . Overall , no fatalities were reported with the system and it caused an estimated \$ 50 @,@ 000 (1998 USD) in damage .

= = Meteorological history = =

The origins of Hurricane Danielle trace back to a tropical wave that emerged off the western coast of Africa and into the eastern Atlantic Ocean early on August 21 . Tracking west @-@ northwestward , the National Hurricane Center (NHC) began Dvorak satellite intensity estimates later that morning following the consolidation of convection ? shower and thunderstorm activity ? near the system 's center . Favorable atmospheric conditions led to further organization , and it is estimated that the disturbance intensified into a tropical depression by 0600 UTC on August 24 , while located roughly 690 miles (1 @,@ 110 km) west @-@ southwest of the Cape Verde Islands . Operationally , the National Hurricane Center initiated advisories at 1530 UTC and noted that the depression was already on the verge of tropical storm intensity . The depression was upgraded to Tropical Storm Danielle later on August 24 following an increase in organization on satellite imagery .

As the cyclone moved northwestward along the southern periphery of the Azores High , it began a period of rapid deepening in which a " pinhole " eye became distinguishable on satellite imagery ; on this basis , Danielle was upgraded to a hurricane at 1200 UTC on August 25 . At the time , Danielle was a compact system , with tropical storm force winds spanning only 115 miles (185 km) from the center . Although the NHC was fairly certain that the storm would continue west @-@

northwestward , a veer north or south of the forecast track seemed plausible due to the influence of an upper @-@ level low to the west @-@ northwest of Danielle . Nonetheless , the storm continued its west @-@ northwest track . At 0600 UTC on August 26 , Danielle attained its maximum sustained wind speed of 105 mph (165 km / h) , one of four peak intensities . Although the eye became obscured and southeasterly vertical wind shear increased late on August 26 , the National Hurricane Center did not indicate weakening and instead predicted that Danielle would reach winds of 120 mph (195 km / h) by late on August 27 . Early on August 27 , a United States Air Force reconnaissance aircraft flight reported surface winds of 80 mph (130 km / h) , though post @-@ analysis indicates that the intensity of the storm was underestimated .

The storm briefly re @-@ strengthened slightly on August 27 , reaching its maximum sustained wind speed of 105 mph (165 km / h) for the second time at 1200 UTC . Vertical wind shear persisted and Danielle soon began to weaken again . Later on August 27 , the National Hurricane Center predicted that the storm would travel along the periphery of an anticyclone centered just east of Bermuda , which would keep the storm away from the East Coast of the United States . Despite being in an apparently favorable environment , Danielle continued to slowly weaken , as the forecast for decreasing wind shear did not initially materialize . Additionally , upwelling from Hurricane Bonnie roughly a week earlier contributed to a decrease in strength . Although the storm weakened further , reconnaissance aircraft observations on August 29 concluded that the structure of Danielle had improved compared to the previous day . By early on August 30 , Danielle had weakened to the extent that it was only a minimal hurricane , with maximum winds of 75 mph (120 km / h) at the time . On August 30 , the National Hurricane Center noted that Danielle would soon leave the upwelling track left by Bonnie , and likely lead to intensification . Thus , the possibility of re @-@ strengthening increased , though predictions only showed gradual intensification .

By early on August 31 , an increase in sustained winds , a decrease in barometric pressure , and a 23 miles (37 km) wide eye observed by reconnaissance aircraft all suggested that Danielle was beginning to intensify . On August 31 , the anticyclone near Bermuda caused Danielle to curve northeastward , away from the East Coast of the United States . Later that day , a significant increase in intensity led the storm to again reach its maximum sustained wind speed of 105 mph (165 km / h) . On September 1 , there was significant uncertainty in the future intensity of Danielle , as a shortwave trough located northeast of the storm would either enhance outflow , causing strengthening , or increase wind shear , resulting in weakening . At 1500 UTC on September 1 , it was predicted that Danielle would strengthen slightly before weakening and becoming extratropical by September 3 . Three hours later , Danielle reached its maximum sustained wind speed of 105 mph (165 km / h) for the fourth and final time .

Early on September 2 , the storm weakened again and was downgraded to a Category 1 hurricane . At 0600 UTC on September 3 , Danielle reached its minimum barometric pressure of 960 mb (hPa ; 28 @-@ 35 inHg) , although sustained winds were only 80 mph (130 km / h) at the time . As late as 1500 UTC on September 3 , satellite imagery indicated that Danielle was retaining tropical characteristics . The National Hurricane Center did not forecast any further weakening before the extratropical transition , but instead mentioned the possibility of baroclinic strengthening . Late on September 3 , the final advisory was issued on the transitioning storm . Danielle officially transitioned into an extratropical cyclone at 0000 UTC on September 4 according to a post @-@ season report from the NHC , while located east @-@ southeast of Newfoundland . The remnants of Danielle traversed east and eventually northeastward across the Atlantic Ocean . It produced rough seas in the British Isles on September 6 before merging with an extratropical low pressure area north of Ireland on September 8 .

= = Preparations and impact = =

Shortly after formation , Danielle was considered a potential threat to the Lesser Antilles , with the National Hurricane Center noting that " any deviation to the left of the track would bring Danielle closer [to] the Leeward Islands . " However , Danielle bypassed far enough north of the Lesser Antilles to prevent any tropical storm or hurricane watches or warnings . Several days later , the

storm was considered a possible threat to Florida by local newspapers , though the National Hurricane Center accurately predicted a re @-@ curvature from the United States mainland well in advance . At 1500 UTC on September 1 , at which time Danielle was situated northeast of the Bahamas , a tropical storm warning was issued for Bermuda ; this was later cancelled after Danielle passed northwest of the island .

The outer bands of Danielle produced heavy rainfall in Puerto Rico , causing street flooding and landslides in Bayamón , Guaynabo , Toa Alta , and Vega Alta ; several streams overflowed their banks , causing additional flooding . In a neighborhood of Bayamón , one house was damaged after a wall collapsed . Losses in Puerto Rico totaled to approximately \$ 50 @,@ 000 (1998 USD) . Hurricane Bonnie ripped an artificial reef composed of tires offshore Atlantic Beach , North Carolina in late August . Danielle washed numerous of these loose tires ashore , especially on Emerald Isle . As a result , the Governor of North Carolina , Jim Hunt , requested prison labor and the National Guard to clean up beaches from Brunswick County to Carteret County . Instead of resulting in further erosion in the aftermath of Bonnie farther up along the coast , Danielle led to a 1 mile (1 @.@ 6 km) increase in sand along the New Jersey coastline . In Bermuda , sustained winds of 39 mph (63 km / h) and a gust of 54 mph (87 km / h) were reported on September 2 . Offshore Atlantic Canada , wave heights reached as high as 82 feet (25 m) . However , other than light rainfall in Newfoundland , the storm caused no impact in Canada . Tori Murden , an American attempting to become the first woman to solo row across the Atlantic Ocean , encountered rough seas from the storm and its remnants . By September 7 , Murden sent out a distress signal and was rescued by the Independent Spirit later that day .

While passing near the British Isles on September 6 as an extratropical storm , Danielle produced severe sea conditions on the western part of the isles . Major beach erosion was observed , and many people required rescuing . Coastal portions of Cornwall were evacuated as high waves inundated many homes , and an all @-@ terrain police vehicle was shoved into the sea by a rogue wave in the Isles of Scilly . An 11 ? year @-@ old boy and his father were trapped in a sea cave on the north coast of Cornwall due to rough surf . Two other men from Port Isaac also became isolated in the same location after their boat capsized . All four were eventually rescued by a helicopter that hovered near the entrance of the sea cave . At the West Sands Caravan Park near Selsey , West Sussex , twelve families were evacuated to higher ground . A yacht filled with eight people ran aground near Calshot ; they required rescuing by the Solent Coastguards . Flash flooding was reported throughout Wiltshire , especially in the city of Melksham . Numerous motorists were left stranded in inundated streets , while water entered several homes , store basements , a fire station , and the Cooper Avon Tyre Factory .