

= Hurricane Gabrielle (2001) =

Hurricane Gabrielle was a North Atlantic hurricane that caused flooding in both Florida and Newfoundland in September 2001 . It developed in the Gulf of Mexico on the same day as the September 11 attacks ; after the attacks , flights were canceled nationwide for two days , and when Gabrielle struck Florida on September 14 , it caused a day of additional cancellations . The storm moved ashore with winds of 70 mph (110 km / h) near Venice , a city located south of the Tampa Bay area . The combination of the winds and heavy rainfall , which peaked at 15 @. @ 1 in (380 mm) in Parrish , left 570 @, @ 000 customers without power along the west coast and 126 @, @ 000 customers without power on the east coast . The storm caused about \$ 230 million (2001 USD) in damage in Florida . In the Gulf of Mexico , high waves contributed to two deaths , one of which was indirect ; there was also a death due to flooding in Winter Haven .

After crossing the state , Gabrielle had the appearance of an occluded frontal low or subtropical cyclone ; this was after the convection decreased near the center . However , Gabrielle gradually re @- @ intensified and became a hurricane on September 17 as it passed northwest of Bermuda . The hurricane reached peak winds of 80 mph (130 km / h) , but weakened subsequently due to wind shear . Gabrielle transitioned into an extratropical cyclone on September 19 , and later that day it passed just southeast of Newfoundland . The storm produced record rainfall that caused what was described the " worst flooding in 100 years " in St. John 's . Several roads and houses were flooded in the region . The extratropical remnants of Gabrielle continued to the northeast and dissipated on September 21 .

= = Meteorological history = =

On September 5 , a weak low- to mid @- @ level trough was nearly stationary a short distance off the southeastern coastline of the United States . It remained stationary for several days , before developing a low @- @ level circulation over Florida by September 9 . The system moved into the Gulf of Mexico , and by September 11 , the low and its associated convection were well @- @ organized enough for the National Hurricane Center (NHC) to classify it as Tropical Depression Eight . By that time , the system was located about 170 mi (270 km) west @- @ northwest of Key West , Florida . Located in an environment of weak steering currents , the depression drifted to the west @- @ southwest after forming . Northerly wind shear and the presence of a nearby upper @- @ level low initially prevented further organization , leaving the center of the depression poorly ? defined with minimal convection . The depression gradually became better organized while it slowly executed a small counter @- @ clockwise loop . Early on September 12 , the system developed increased banding features over the eastern half of its circulation . By early on September 13 , the upper level outflow over the depression became much more conducive for intensification , although the circulation remained broad and weak . Shortly thereafter , deep convection developed and persisted near the center , and at 1200 UTC on September 13 , the depression intensified into Tropical Storm Gabrielle while located about 200 miles (320 km) southwest of Venice , Florida .

Under the influence of a mid @- @ level trough , Gabrielle accelerated northeastward and quickly intensified , despite increasing amounts of westerly wind shear . Its center reformed several times under the deep convection , and on September 14 Gabrielle made landfall near Venice with winds of 70 mph (110 km / h) . At the time , Hurricane Hunters reported gusts to hurricane force , and the National Hurricane Center indicated the possibility that Gabrielle made landfall as a hurricane . Land interaction and vertical wind shear quickly weakened Gabrielle over land ; its convection decreased markedly with the strongest remaining convection remaining well to the northeast of the center . The storm reached the Atlantic Ocean with winds of 45 mph (72 km / h) about 18 hours after it made landfall ; by that time , one forecaster at the National Hurricane Center remarked that the storm resembled an occluded frontal low , with a large circulation devoid of convection in a non @- @ symmetric wind field . Another forecaster likened the storm to a subtropical cyclone , due to dry air continuing to limit organization .

On September 15 , convection gradually developed closer to the center , though operationally

forecasters were unsure whether the convection was in association with Gabrielle or to a cold front to its west . A Hurricane Hunters flight into the system reported the center of Gabrielle became elongated , resembling a trough , and one forecaster considered the storm on the verge of becoming an extratropical cyclone . Shortly thereafter , convection increased near the center as the storm became stronger and better organized . Despite strong amounts of wind shear , Gabrielle intensified to attain hurricane status early on September 17 while located about 350 mi (560 km) to the west of Bermuda . Continuing northeastward , the hurricane strengthened slightly further to reach peak winds of 80 mph (130 km / h) about 230 miles (370 km) northwest of Bermuda . Shortly thereafter , a banding eye briefly developed in the center of the convection . Increased wind shear eventually diminished the convection , and Gabrielle weakened to tropical storm status September 18 . By early on September 19 , wind shear dissipated nearly all of the associated deep convection , and Gabrielle transitioned into an extratropical cyclone about 350 miles (560 km) south of Newfoundland . The extratropical remnant continued to the northeast , passing a short distance southeast of Newfoundland before restrengthening to reach winds of 75 mph (121 km / h) . The storm weakened , and on September 21 the extratropical remnant of Gabrielle merged with another extratropical storm over the far northern Atlantic Ocean .

= = Preparations = =

Shortly after Gabrielle became a tropical storm , the National Hurricane Center issued a tropical storm warning from Craig Key through the Dry Tortugas in the Florida Keys and along the Florida west coast from Flamingo to the mouth of the Suwannee River . Additionally , a hurricane watch was issued from Chokoloskee to Tarpon Springs . On September 14 , a tropical storm warning was issued for Lake Okeechobee and the Florida east coast from Jupiter to Saint Augustine . Due to the storm , schools in six counties along the west coast were closed . All aircraft from MacDill Air Force Base were evacuated to Kansas as a precaution . Gabrielle struck Florida three days after the September 11 attacks , after which all flights nationwide were canceled for two days . Flights resumed the day Gabrielle moved ashore , with the exception of Sarasota @-@ Bradenton International Airport which closed due to the inclement weather . In the Tampa area , two major bridges closed due to the storm . Disney World closed three water parks and several rides .

The government of Bermuda issued a gale warning for the island before changing it to a tropical storm warning on September 16 .

The Newfoundland Weather Center issued severe weather warnings for portions of Atlantic Canada prior to the arrival of the extratropical remnant of Gabrielle . Rough sea warnings were issued for waters off of the Avalon Peninsula of eastern Newfoundland , and fishermen were recommended to remain away from the sea .

= = Impact = =

= = United States = =

While the storm was moving east across the Gulf of Mexico , Gabrielle produced rip currents along the coast of Alabama , killing one man in Orange Beach . High surf along the Florida Panhandle destroyed a retaining wall in Pensacola Beach . In the Florida Keys , there was an indirect drowning death of a man who fell off his boat ; this was due to a combination of high seas , engine failure , and intoxication . Upon making landfall , Gabrielle produced moderate winds along coastal areas of western Florida , with sustained winds of 58 mph (93 km / h) at Venice . The same station reported a wind gust of 73 mph (117 km / h) . High tides from rough waves and the storm surge reached 6 @. @ 2 feet (1 @. @ 9 m) , the highest tide since 1926 . The tide flooded the northern shoreline of Charlotte Harbor and at the entrance to the Peace River , while further to the south a surge of greater than 3 feet (0 @. @ 91 m) inundated the barrier island at Fort Myers Beach and flooded some cars . Beach erosion was common in the areas where the storm surge was greatest .

In Lee County , tropical storm @-@ force winds damaged many roofs , although damage was primarily due to flooding . Along the coast , high storm tides severely damaged about 100 homes and lightly damaged 500 other homes . In nearby Charlotte County , several homes were flooded along Gasparilla Island . Strong winds in Sarasota and Manatee counties downed trees and power lines , and across western Florida , 570 @,@ 000 electric customers lost power . In Brandon , high winds damaged the roof of a motel , forcing 100 people to evacuate . High rainfall in Pasco County flooded a portion of U.S. Route 301 . Along the west coast of Florida , Gabrielle spawned four weak tornadoes . In Everglades City , sustained winds reached 51 mph (82 km / h) , with gusts to 70 mph (110 km / h) .

While crossing the state , Gabrielle interacted with a decaying cold front , which produced intense rainfall . The highest total was 15 @.@ 1 in (380 mm) in Parrish along the west coast . Jacksonville reported 6 @.@ 32 in (161 mm) in a 24 ? hour period . In Winter Springs , a boy drowned after being swept away by a flooded stream . In Volusia , the rains flooded about 30 homes or apartments , and roads in several counties were closed . After moving across the state , the storm produced locally strong winds along the Atlantic Florida coastline , peaking at 59 mph (95 km / h) at Saint Augustine . High wind gusts left about 126 @,@ 000 homes and businesses without power in eastern Florida . Rainbands spawned five tornadoes , one of which damaged six mobile homes in Cocoa . Along the coast in Brevard and Volusia , high storm tides and waves produced significant beach erosion .

Overall , Gabrielle caused an estimated \$ 230 million in damage in Florida . There were 18 tornadoes in the state , and three deaths related to the storm . Heavy rainfall extended into Georgia ; a station in Brunswick reported a total of 3 @.@ 84 in (98 mm) . In South Carolina , high winds and tides produced coastal flooding in Garden City .

= = = Bermuda and Canada = = =

In Bermuda , the combination of Gabrielle and the cold front to its west dropped about 1 @.@ 8 in (46 mm) of precipitation in a four @-@ day period . Wind gusts peaked at 55 mph (89 km / h) in an outer rainband .

While extratropical , the remnants of Gabrielle passed a short distance south of Newfoundland , the second cyclone in less than a week to affect the area . The storm produced moderately strong wind gusts of over 60 mph (100 km) across the southern portion of the island , including a peak gust of 80 mph (130 km / h) at Cape Race . Seas reached 36 ft (11 m) in height . The remnant of Gabrielle dropped heavy rainfall in a short amount of time across Newfoundland , with one station at Cape Race recording 1 @.@ 9 in (48 mm) in just one hour . This set the all time 6 ? hour precipitation record at St. John 's , with a total of 3 @.@ 54 in (90 mm) . In a 24 ? hour period , the St. John 's airport recorded 4 @.@ 67 in (118 @.@ 6 mm) , which was only 0 @.@ 1 in (2 @.@ 6 mm) less than the existing record . Rainfall peaked at 6 @.@ 9 in (175 mm) at the Memorial University of Newfoundland in St. John 's .

In St. John 's , the rainfall caused severe flooding , and the mayor of the city considered Gabrielle " the worst storm in 100 years " . The flooding washed out two roads and flooded 20 others , forcing several closures . The rains flooded the basements of houses with several feet of water , affecting at least four homes . Flooding damage closed 15 schools and affected 45 businesses . There were multiple reports of sewers unable to accompany the excess of water . Hurricane @-@ force wind gusts forced the cancellation of flights and left thousands without power , telephone , or heat . Dangerous conditions caused Canada Post to cancel delivery on the day of the storm . Hundreds of homes and buildings were damaged by the passage of Gabrielle , resulting in several million dollars in damage .

= = Aftermath = =

Despite the flooding in Florida , the heavy rainfall proved beneficial in alleviating drought conditions . By late September , water levels in 18 counties in southwestern Florida were within the normal

range for the first time in 18 months . On September 28 , the head of the Federal Emergency Management Agency declared seven Florida counties as disaster areas ; this allocated federal funding for debris removal and repairing damaged public facilities . After the storm 's passage , there were more than 32 @, @ 000 insurance claims for homes , and 10 @, @ 000 claims for damaged cars .

In response to the flooding in St. John 's , Newfoundland , the city mayor activated the city 's Emergency Preparedness Program . On September 27 , about a week after the passage of the storm , the Emergency Measures Organization began accepting applications for flood @-@ related damage . By about a month after the storm , 169 applications were processed , with an additional 1 @, @ 762 received by the Emergency Measures Organization . Eligibility for the disaster assistance included restoration to property or household items of an essential nature . A few days after the passage of the storm , the government of Newfoundland appealed to the federal government for federal disaster relief fund ; the government later approved . Ultimately , disaster relief assistance totaled \$ 6 @. @ 3 million (2001 CAD) , primarily to individual assistance .