

= Hurricane Chantal (1989) =

Hurricane Chantal was one of three tropical cyclones to make landfall in Texas during the 1989 Atlantic hurricane season . The third named storm and the first hurricane of the season , Chantal slowly developed on July 30 in the southern Gulf of Mexico from a tropical disturbance that was previously within Intertropical Convergence Zone (ITCZ) while near Trinidad and Tobago . While heading north @-@ northwestward , the depression steadily intensified and was upgraded to Tropical Storm Chantal on the following day . Thereafter , Chantal quickly strengthen and became a hurricane on August 1 . After intensifying slightly further , Chantal made landfall near High Island , Texas later that day . The storm quickly weakened upon moving inland and fell to tropical storm intensity a few hours after landfall . Early on August 2 , Chantal weakened to a tropical depression and dissipated over Oklahoma by August 4 .

While making landfall in Texas , the storm produced relatively small tides , with most locations reporting waves less than 4 feet (1 @.@ 2 m) in height . However , some locations experienced extensive beach erosion . In addition , there were numerous rescues made by the U.S. Coast Guard . Due to both rainfall and high winds at least 3 @,@ 000 homes were damaged , and numerous trees and sign were knocked down . Two tornadoes were reported , with one causing the destruction of a shed in Crystal Beach , Texas , and the other knocking over several trees and mobile homes in Iota , Louisiana . Elsewhere , Chantal and its remnants brought light to moderate rainfall to several other states , although affects were minor in other states . Overall , 13 fatalities occurred , all of which due to drowning , and at least \$ 100 million (1989 USD) in damage was reported .

= = Meteorological history = =

The origins of Hurricane Chantal can be tracked back to a tropical disturbance within the Intertropical Convergence Zone near Trinidad and Tobago on July 24 . The system crossed westward over the Caribbean Sea , and there were no signs of organization until July 27 near the coast of Honduras . Despite the predictions for slow development from the tropical weather outlooks , it was possible that the system developed a surface low center near Belize City , Belize late on July 28 . After the system moved inland over the Yucatán Peninsula , it became disorganized , although the National Hurricane Center indicated in the tropical weather outlook that once it moved into the Gulf of Mexico there was potential for development . Although the outflow of the system had appeared impressive on satellite images , the potential for development seemed uncertain , mostly due to the close proximity to land . The storm quickly became better organized based on satellite data and ship reports .

Almost immediately after emerging into the Gulf of Mexico on July 30 , the cloud pattern of system quickly became better organized . Later after emerging into the Gulf of Mexico , ships and satellite images confirmed that Tropical Depression Four had formed offshore of the north coast of the Yucatán Peninsula ; although it was likely that the depression formed 80 miles (129 km) north of the Yucatán Peninsula several hours earlier than confirmed . The following morning after development occurred , the depression had intensified into a tropical storm 575 miles (920 km) southeast of Texas ; the National Hurricane Center assigned it to the name Chantal . Although it became a tropical storm early that morning , the system was not upgraded to a tropical storm until a reconnaissance flight confirmed tropical storm force winds about six hours later , when sustained winds were already 50 mph (85 km / h) . Tropical Storm Chantal rapidly strengthened thereafter , with weather satellites indicating t ? numbers increasing from 2 @.@ 5 to 3 @.@ 5 within twelve hours using the Dvorak technique . Chantal continued to intensify , and headed northwestward at 11 mph (18 km / h) due to weak ridging over Florida .

Later on July 31 , satellite imagery revealed better organization , and another reconnaissance flight found winds at 91 mph (151 km / h) while flying at 1500 feet (457 m) . Based on these observations , it was estimated that Chantal had intensified into a hurricane early on August 1 . Hurricane Chantal continued to intensify , slightly , and attained its peak intensity on August 1 at

1000 UTC , reaching maximum sustained winds of 80 mph (130 km / h) and a minimum barometric pressure of 986 mbar (29 @. @ 1 inHg) . Only three hours thereafter , Hurricane Chantal made landfall near High Island , Texas with winds still at 80 mph (130 km / h) . Chantal rapidly weakened to a tropical storm at 1800 UTC on August 2 , just five hours after landfall , and quickly degenerated to a tropical depression early on August 2 . Tropical Depression continued its course and eventually dissipated over western Oklahoma on August 3 . The remnants of Chantal then moved northward over the Great Plains and was tracked northward over New York , eventually reaching New England and Newfoundland just before Hurricane Dean approached .

= = Preparations = =

At 0000 UTC on July 31 , a tropical storm watch ? indicating tropical storm force winds were possible within 48 hours ? was issued from Port O 'Connor , Texas to the mouth of the Mississippi River . Three hours thereafter , a hurricane warning ? signifying that hurricane @-@ force winds were likely in 24 hours or less ? was issued from Freeport , Texas to Morgan City , Louisiana . A tropical storm warning was simultaneously put into effect from Port O 'Connor , Texas to Mobile , Alabama , significantly overlapping the existing hurricane warning . The tropical storm warning was discontinued at 1000 UTC on August 1 . Six hours later , the hurricane warning issued at 0300 UTC on July 31 was downgraded to a tropical storm warning , before the portion from Port Arthur , Texas to Morgan City , Louisiana was canceled . The remaining portion from Freeport to Port O 'Connor , Texas was discontinued at 0100 UTC on August 2 .

In addition to the tropical cyclone watches and warnings , several other actions were taken as Chantal approached . More than 600 oil workers were moved inland , though a man drowned while attempting to evacuate a rig south of New Orleans , Louisiana . Mayor of Port Arthur Malcolm Grant asked 800 residents to evacuate Sabine Pass , due to potential coastal flooding isolating the area . Shelters were opened at various schools in Port Arthur and Beaumont . In nearby Orange , crews at emergency centers distributed sand bags . About 8 @, @ 500 residents of Cameron Parish , Louisiana evacuated , with at least 67 people taking shelter at a school in Lake Charles . An additional 2 @, @ 500 people fled Grand Isle , as the threat of the only road to the island flooding loomed .

= = Impact = =

Texas bore the brunt of the storm , where strong winds and heavy rainfall damaged about 3 @, @ 000 homes and knocked down numerous trees and signs . Chantal also spawned two tornadoes , one in Crystal Beach , Texas and the other in Acadia Parish , Louisiana ; both of which caused minor damage . Additionally , 13 fatalities occurred , all of them due to drowning ; 11 deaths occurred offshore in the Gulf of Mexico , while the remaining two were reported in east @-@ central Texas . Overall , the storm resulted in at least \$ 100 million (1989 USD) in damage .

= = = Mexico = = =

Prior to becoming a tropical cyclone , the precursor tropical disturbance dropped rainfall on the Yucatán Peninsula of Mexico . The precipitation put out fires burning in the region , which had destroyed up to 370 @, @ 000 acres (150 @, @ 000 ha) of jungle in the two months prior to the tropical disturbance , according to the Agriculture Department of Mexico .

= = = Texas = = =

= = = = Galveston County = = = =

The worst effects from the storm occurred in Galveston County . Waves of 7 feet (2 m) in height

were reported on High Island during Chantal , while Kemah measured tides of 3 @. @ 8 feet (1 @. @ 1 m) , and the Galveston Flagship pier reported 3 @. @ 5 feet (1 m) seas . The high tides eroded more than 1 mile (1 @. @ 6 km) of Texas State Highway 87 , while at least another 15 miles (24 km) of that highway was covered in sand and debris . As a result , the highway was expected to be closed for at least five weeks , though in October 1989 , storm surge from Hurricane Jerry caused more erosion , and no repairs have been made since . In the northern portions of Galveston County , rainfall was generally at least 12 inches (300 mm) , which a peak of 20 inches (510 mm) in Friendswood . Numerous streets in League City , Dickinson , and Friendswood were flooded for more than 24 hours . At least 100 homes in Friendswood were flooded , while water entered 70 % of houses in Dickinson . Severe street flooding and ponding occurred in Galveston , especially in the low @- @ lying areas ; some homes and businesses were damaged , as a result . Overall , 500 homes in the county were flooded .

Strong winds also effected the county , with the highest recorded sustained wind speed being 70 mph (110 km / h) in Galveston ; the highest gust of 83 mph (134 km / h) was reported at the same location . At the National Weather Service Office in Downtown Galveston , sustained winds were 53 mph (85 km / h) and gusts reached 69 mph (111 km / h) . Although winds were strong , associated losses was confined to roof damage at beach homes in Gilchrist and High Island . In addition to strong winds , heavy rainfall , and high tides , the storm also produced one tornado in the county . Rated as an F0 on the Fujita scale , the tornado was spawned in Crystal Beach , where it destroyed a boat shed ; elsewhere , no damage occurred from this twister .

= = = Harris County = = =

Rainfall produced by Chantal in the city of Houston alone varied extensively , with 7 @. @ 14 inches (181 mm) at William P. Hobby Airport after twenty @- @ four hours , and only 1 @. @ 21 inches (31 mm) at George Bush Intercontinental Airport (then known as Houston Intercontinental Airport) in the same time lapse . In the southern portions of Harris County , rainfall totaled ranged from 8 to 12 inches (200 to 300 mm) . Significant amounts of precipitation resulted in flooding , which in turn , caused several hundred emergency crew rescues and damage to at least 500 homes . Strong winds also caused significant effects in the county . In La Porte , where winds gusted to 70 mph (110 km / h) , 40 trees were toppled at a golf course , while a plane was flipped over at the La Porte Municipal Airport . The roof of a mobile home was torn off and a fence and a portable building was destroyed in Highlands . Winds damaged a red cross shelter in Pasadena and blew out several windows at a hospital in Baytown . Throughout the county , high winds destroyed 2 mobile homes and damaged 49 apartments and 24 businesses .

= = = Elsewhere in Texas = = =

Heavy rainfall effected Brazoria County , where precipitation amounts up to 12 inches (300 mm) were reported ; this caused significant flooding , especially in Pearland and Manvel . During the height of the storm , the entire town of Manvel was inundated with water , causing flood damage to at least 100 homes . Additionally , high winds in combination with floods damaged about 500 homes throughout the county . In Chambers County high winds caused two injuries and tore roofing material off of homes and mobile homes ; about 100 homes were effected in the area . 6 inches (150 mm) of rain fell in the southern portions of the county , causing minor flooding . Between 8 and 12 inches (200 and 300 mm) of precipitation was recorded in eastern Fort Bend County . In the city of Fresno , at least 60 homes were flooded and several families were evacuated . After 9 @. @ 7 inches (250 mm) of rain fell in Richmond , local flooding occurred . Several mobile homes in the county also suffered wind damage .

In Brazos County , heavy rainfall caused street flooding in College Station . Precipitation in Collin County reached as high as 16 inches (410 mm) in Clear Lake , though no flood damage was reported . Additionally , two fatalities occurred when two teenage boys were riding a rubber raft , swept into a drainpipe , and subsequently drowned . The highest sustained wind speed recorded in

Jefferson County was 54 mph (87 km / h) at Sea Rim State Park , while the strongest gust was 49 mph (79 km / h) at the Jack Brooks Regional Airport . Winds downed trees and limbs , while also causing minor roof damage . Tides at Sabine Pass were about 3 @. @ 9 feet (1 @. @ 2 m) about mean sea level ; some beach erosion was reported near that location . In Liberty County , winds felled tree limbs , which damaged vehicles and portable buildings .

= = = Elsewhere = = =

One fatality was reported during an oil rig evacuation in the Gulf of Mexico . Ten other people perished when a lifeboat capsized south of Morgan City , Louisiana . Four others on the boat were rescued by the United States Coast Guard . In Louisiana , high tides were only reported at one location , with seas reaching about 4 @. @ 2 feet (1 @. @ 3 m) in Cameron . Winds in the state were also light , with the highest sustained wind speed being 29 mph (47 km / h) along the Lake Pontchartrain Causeway , while the strongest gust was approximately 42 mph (68 km / h) in New Orleans . Rainfall was mostly minimal throughout the state and mainly less than 3 inches (76 mm) , while the highest total recorded as 3 @. @ 84 inches (98 mm) in Amite City . A tornado touched down in Acadia Parish , where it downed trees and removed a mobile home from its foundation . The only known impact in Mississippi was tides of 2 @. @ 6 feet (0 @. @ 79 m) above mean sea level .

Further north in the Midwestern United States , impact was generally minor . Chantal and its remnants dropped mostly light rainfall in the states of Oklahoma , Missouri , Kansas , Iowa , Wisconsin , Illinois , Indiana , and Michigan . Only two of those states ? Illinois and Michigan ? recorded more than 4 inches (100 mm) of precipitation . In Illinois , rainfall in Chicago flooded numerous streets and basements ; Lake Shore Drive and Edens Expressway were briefly closed , as a result . Outside Chicago , minor flooding also occurred along a few creeks and low @- @ lying areas . The rainfall rate of 2 inches (51 mm) per hour in Grand Rapids , Michigan caused the release of about 40 million gallons of untreated sewage into the Grand River . Despite crossing through Ontario and New York , it is unknown if any impact occurred in those two locations . In Vermont , the remnants of Chantal dropped rainfall in excess of 6 inches (150 mm) along the Caledonia , Orange , and Washington county lines . Bridges were knocked down , cars and homes were swept away , and crops were destroyed in the resultant flash floods .