

= Hurricane Debra (1959) =

Hurricane Debra was a destructive tropical cyclone that developed during the 1959 Atlantic hurricane season . The fifth tropical storm and third hurricane of the season , Debra originated from the interaction of a cold @-@ core low and a tropical wave on July 15 . The system was designated a tropical depression on July 23 when it was south of Louisiana and meandered westward while it swiftly intensified into a tropical storm along the Gulf Coast of the United States . A turn towards the northwest became evident as it attained Category 1 hurricane status on the Saffir ? Simpson Hurricane Scale the following day while it organized into a developed storm . As the hurricane curved northward at a slow forward speed , strength was maintained as it approached the coast of Texas as a minimal hurricane . It came ashore during the evening of July 24 local time (0000 UTC on July 25) between Freeport and Galveston , Texas . It rapidly weakened into a tropical storm and later a depression as it moved inland , and dissipated on July 28 while it turned northwestward . The remnant moisture later sparked upper @-@ level thunderstorms in late July and early August .

Prior to Debra 's arrival in Texas , numerous hurricane warnings were issued and at least 8 @,@ 600 individuals evacuated . Torrential rains were produced in southeastern Texas , which led to widespread flooding on highways . Sea vessels took the brunt of the storm , with many having become stranded or damaged . Forms of transportation such as air , rail , and road were significantly interrupted or even shut down . High winds from the storm caused expansive damage to buildings , windows , signs , and roofs . The hurricane resulted in 11 injuries but no deaths , and approximately 90 cattle drowned . Damage in Texas ' Brazoria , Galveston , and Harris counties surmounted \$ 6 @.@ 685 million , and total damage from the storm reached \$ 7 million . In the aftermath , the Weather Bureau was criticized for the lack of warning ; the bureau 's chief , Stephen Lichtblau , maintained that it was fortunate that any warnings were issued , and those that were had been delivered in a timely manner .

= = Meteorological history = =

Debra 's origins were from an area of convection over the western Bahamas and Florida related to an upper @-@ tropospheric cold @-@ core low and a tropical wave on July 15 . Whilst under the influence of a subtropical ridge ? or a belt of high pressure ? it slowly meandered southwestward and arrived into the Gulf of Mexico on July 20 . A weak surface circulation was observed near 1900 EST (0100 UTC on July 21) which was affected by an inverted trough as they turned westward . The system 's circulation remained indistinct until July 23 as winds of 22 ? 30 knots consorted with squalls adjacent to the coasts of Louisiana and Texas .

The storm attained tropical characteristics near 0000 UTC while situated south of Louisiana and was subsequently designated a tropical depression . Ship communications off the coast on July 24 relayed winds of 23 ? 50 knots and a barometric pressure of 1007 @.@ 5 mbar (29 @.@ 75 inHg) , which indicated it was a tropical storm on the Saffir ? Simpson Hurricane Scale . Radar imagery taken near 0733 CST (1333 UTC) from a Dow Chemical plant in Freeport , Texas evidenced that Debra was a full @-@ fledged Category 1 hurricane on the scale , with a prominent spiral appearance that was not perceived by the radar the previous afternoon .

As the result of a polar trough aloft in the central United States , Debra curved northward though its winds shifted southward , defying the earlier prediction of a bend west @-@ northwest to northwest . A reconnaissance flight determined the location of its center during the mid @-@ morning , and the hurricane made landfall near its peak intensity between Freeport and Galveston , Texas during the evening of July 24 local time (0000 UTC on July 25) . It rapidly weakened on July 26 while it arched west @-@ northwest , though it maintained tropical characteristics until its dissipation on July 28 over central Oklahoma while the system progressed north @-@ northwestward . As it moved inland , moisture along its eastern fringe converged with a front to its northeast , causing heavy rains that were confined to limited areas in northeast Louisiana and southern Arkansas ; they eventually traversed east @-@ northeastward over northern Mississippi , Tennessee , and Kentucky . Moisture and instability from Debra led to high @-@ level thunderstorms in Montana and northern Idaho on

July 31 and August 1 .

Hurricane Debra 's development near the coast was unusual , complicating forecasting in addition to its rapid intensification and abnormal direction . The lack of ship reports and incorrect information received from those that were received further complicated Debra 's forecasts . However , due to its formation close to the coast , Debra had inadequate time to cause a greater storm surge . Debra 's floods accounted for most of the month 's rainfall .

= = Preparations = =

The Weather Bureau in New Orleans , Louisiana issued small craft warnings at 1230 UTC on July 24 stretching from Port O 'Connor to High Island , Texas , while " whole gale warnings " were posted from Port O 'Connor to Matagorda , Texas with regular gale warnings extending north to Freeport , Texas at 1500 UTC . A hurricane warning was later declared for areas between Matagorda to High Island at 2130 UTC , which was published at 2200 UTC . Warnings were widely distributed through radio services (including KGBC , KILE , KTLW , WBRZ , and KIOX) , newspapers , bulletin boards , telegraph via the Western Union , regional teleprinters , the Chamber of Commerce 's storm board , and storm warning displays . Several thousand citizens sought shelter at public facilities , including schools and courthouses . Approximately 1 @, @ 000 inhabitants of Surfside Beach evacuated amid the threat of Debra . Between two and three thousand fled to Angleton , and another 1 @, @ 000 fled to Freeport . An estimate said that at least 2 @, @ 500 people left the Galveston Bay area ; another 1 @, @ 100 stayed in the Brazoria County Courthouse and 1 @, @ 000 residents took shelter in public buildings in Galveston . Numerous others moved from resort towns into other areas .

= = Impact = =

= = = Texas = = =

The highest reported winds were estimated at 80 ? 90 mph (130 ? 150 km / h) , with gusts up to 105 mph (165 km / h) at the Brazos River floodgates near Freeport . Tides were 3 feet (0 @. @ 91 m) to 5 feet (1 @. @ 5 m) at Galveston Bay ; Morgan Point measured the highest tides , at 7 @. @ 9 feet (2 @. @ 4 m) above normal . Overall , the storm surge was about 7 feet (2 @. @ 1 m) high ; near Harrisburg , Houston , its height was approximately 9 @. @ 6 feet (2 @. @ 9 m) ; around the Kemah @- @ Seabrook area , the storm surge was 7 feet (2 @. @ 1 m) , while along the Dickinson Bayou they were 7 feet (2 @. @ 1 m) to 9 feet (2 @. @ 7 m) above average . Alongside the Gulf Coast , especially in Texas , there were widespread measurements of heavy rainfall , which included a total of 15 @. @ 89 inches (404 mm) at Orange , Texas , which led to the inundation low @- @ lying streets ; this total was the highest attributed to Debra . A daily rainfall record of 3 @. @ 62 inches (92 mm) was achieved at Beaumont , and hurricane @- @ force winds stretched 100 miles (160 km) inland .

The simultaneous occurrence of a storm surge and heavy rainfall wrought by Debra led to widespread flooding on highways , including that on Highway 75 northwest of Galveston on July 25 which caused the detachment of Galveston Island from the mainland for several hours . Other major roadways flooded were Highway 6 between Hitchcock and Galveston ; Highway 146 from Kemah to Seabrook ; and Farm Road 518 extending from Kemah through League City . An unconfirmed report indicated that a funnel cloud briefly touched down roughly 40 miles (64 km) northwest of Brownsville / South Padre Island International Airport at approximately 0027 UTC , though no damage occurred .

The majority of private piers situated upon the western and northern ends of Galveston Bay were destroyed as a result of Debra 's storm surge . Damage primarily constituted to roofs , glass , sign boards , antennas , and certain sea vessels ; abundant damage was caused by rising waters due to torrential rains . Approximately 90 cattle were killed on the western edge of Galveston Island .

Furniture was thrown from the luxury Buccaneer Hotel into its swimming pool , shattering a large window . In Fort Worth , the entrance to the Tabernacle Baptist Church was completely destroyed , with its remnants littering the adjacent road . The largest quantity of damage to sea vessels was consolidated near the Kemah @-@ Baytown area . Widespread damage from winds and tides was evident in the Hitchcock area , where three men were rescued after attempting to endure the hurricane at a fishing camp , although they were later rescued . In the Houston area , damage was limited to power lines and downed trees . At the former Houston International Airport , air transport was terminated , and water transportation was impeded as vast ships remained in ports . Onlookers were advised not to touch downed power lines , and electricity was knocked out at a hospital and roads were immersed in floodwaters . Most rail and road traffic in Houston was significantly interrupted .

One person went missing in Texas City , and several others were unaccounted for at other areas . There , damage to houses and other structures totaled several hundreds of thousands of dollars . Although 16 shops were damaged , no homes suffered any damage . Crop damage in Brazoria County also reached hundreds of thousands of dollars . A boat captain was hurt when his vessel crashed into a rock jetty under waves of 15 feet (4 @. @ 6 m) . A tower 75 feet (23 m) tall utilized for the purpose of hoisting storm warning flags in Freeport was demolished , and damage within the city involved broken windows and roof shingles , in addition to the power outages that occurred . Automobiles were blown onto the city 's roads , and Second Street , the city 's primary street , was below 3 @. @ 5 feet (1 @. @ 1 m) of floodwaters ; the costs of the overall effects from Debra in Freeport were estimated at \$ 300 @, @ 000 , although then @-@ mayor Jim Russell claimed that damage could reach \$ 1 @. @ 5 million . Damage at La Marque (then known as Lamarque) totaled to as much as \$ 1 million . Reports asserted that one person was engulfed and died offshore the Freeport area , but they were unconfirmed ; another individual and their daughter previously listed as missing in the city were discovered at Houston . Several other individuals were reported as missing , including four on a vessel offshore Freeport and one in Texas City . Another two were unaccounted for in Green Lake . A night club at Clute burst into flames during the hurricane and winds created the possibility of the blaze spreading , although it was dealt with after several firemen came to the location . Debra destroyed approximately 1 @, @ 000 piers of a small size at La Porte .

A shrimp boat and two other watercraft were known to be in difficult situations , while another sent out a distress call claiming that the boat 's fuel tank had dismantled from it and its crew was anticipating an explosion . A Coast Guard aircraft searched for the shrimping boat Rosina after it had began to dismantle while a Coast Guard buoy identified as the Blackthorn probed for the Cain Hoy , although the three on board the Rosina were later recovered . All vessels reported as missing were recovered by the Coast Guard on July 25 . A ship known as Hope with a crew of three was thrown ashore 35 miles (56 km) southeast of Freeport , but the United States Coast Guard was incapable of rescuing the craft and its shipmembers . Tornadoes touched down near the then @-@ Jefferson County Airport , Sebastian , and Kenedy , with the first associated with the precursor to Debra .

In all , damage in Brazoria , Galveston , and the eastern part of Harris counties totaled \$ 6 @. @ 7 million , while damage elsewhere increased the total to \$ 7 million . 10 people suffered minor injuries in Brazoria County , in addition to one off the coast .

= = = Elsewhere = = =

In Oklahoma , torrential rainfall produced floods in small areas of the state , especially the southeast , east- , north- , and north @-@ central portions of the state . Two tornadoes touched down in Kiowa and Caddo counties , with the prior tracking 20 miles (32 km) , resulting in minimal damage . In Stillwater , three consecutive hours of torrential rains led to an inundation of 8 inches (200 mm) as observed by the Oklahoma Highway Patrol . Heavy rainfall also occurred in Louisiana , Mississippi , Arkansas , Alabama , Missouri , Illinois , Indiana , Kentucky , and Ohio . Debra sparked high @-@ level thunderstorms in Montana and northern Idaho , eventually leading to wildfires .

= = Aftermath = =

An editorial published in the Houston Chronicle criticized the lack of warnings prior to Hurricane Debra 's arrival in Texas , alleging that with radar , aircraft , and communication systems , the Weather Bureau should have been able to give a warning well in advance of the storm . The article remarked that the Bureau " seemed almost as uninformed as the ordinary citizen " in regards to the forecasting . The chief of the Weather Bureau , Stephen Lichtblau , fired back , saying that " we were fortunate to get a warning . " He continued " had [the Weather Bureau] not had ... [such] equipment they are complaining about , we could have [released] nothing , " and maintained that warnings were issued promptly . When repairs in Calhoun County , Texas were completed in 1961 , Hurricane Carla struck shortly thereafter in September .