

= Effects of Tropical Storm Allison in Texas =

The effects of Tropical Storm Allison in Texas included 23 deaths caused by extreme flooding . The first storm of the 2001 Atlantic hurricane season , Tropical Storm Allison lasted unusually long for a June storm , remaining tropical or subtropical for 15 days . The storm developed from a tropical wave in the northern Gulf of Mexico on June 4 , 2001 , and struck the northern Texas coast shortly thereafter . It drifted northward through the state , turned back to the south , and re-entered the Gulf of Mexico . The storm continued to the east-northeast , made landfall on Louisiana , then moved across the southeast United States and Mid-Atlantic . Allison was the first storm since Tropical Storm Frances in 1998 to strike the northern Texas coastline .

Tropical Storm Allison was a major flood disaster throughout its path from Texas to the Mid-Atlantic . The worst of the flooding occurred in Houston , Texas , where over 35 inches (890 mm) of rain fell . Allison killed 41 people , of whom 27 drowned . The storm also caused over \$ 5 billion in damage (2001 USD , \$ 6.4 billion 2007 USD) , making Allison the costliest and second-deadliest tropical storm on record in the United States .

= Preparations =

After the storm made landfall , flash flood watches and warnings were issued for numerous areas in eastern Texas . Travel was discouraged due to the threat of flash flood . During the flood event , the National Weather Service in Houston issued 99 flash flood warnings with an average lead time of 40 minutes ; only nine warnings were false alarms .

Shortly after the storm formed , officials in Galveston County , Texas issued a voluntary evacuation for the western end of Galveston Island , as the area was not protected by the Galveston Seawall . The ferry from the island to the Bolivar Peninsula was closed , while voluntary evacuations were issued in Surfside in Brazoria County . Voluntary evacuations were also suggested near Sabine Pass in Jefferson County , Texas , though few left . Also , when the National Hurricane Center issued the first advisory on Allison , officials issued Tropical Storm Warnings from Sargent , Texas to Morgan City , Louisiana , just three hours before tropical storm winds were observed .

= Impact =

Allison made landfall with a storm surge of two to three feet . Combined with waves on top , areas of Galveston Island experienced a wall of water 8 feet (2.5 m) in height , creating overwash along the coastline . The storm caused winds of up to 43 mph (69 km / h) at the Galveston Pier . While Allison was stalling over Texas , it dropped heavy rainfall across the state , including 9.77 inches (248 mm) in Galveston , 12.13 inches (308 mm) in Jamaica Beach , Texas , and other similar totals along the coast . Minimal beach erosion was reported , and impact was minimal near the coast . While moving northward through Texas as a minimal tropical depression , Allison produced minor wind gusts . Shortly after making landfall , the storm spawned a tornado in Manvel of Brazoria County , causing damage to one home . Within hours of making landfall , rainfall totals of 8 to 12 inches (200 to 300 mm) were common in Galveston and Harris County . Flash flooding continued for days , with rainfall amounts across the state peaking at just over 40 inches (1,033 mm) in northwestern Jefferson County . In the Port of Houston , a total of 36.99 inches (940 mm) was reported .

Houston experienced torrential rainfall in a short amount of time . At one site , 6.3 inches (160 mm) fell in just one hour , while 28.5 inches (724 mm) fell in only 12 hours . The six-day rainfall in Houston amounted to 38.6 inches (980 mm) . Two-thirds of the bayous and creeks in Harris County experienced 500-year flood events . Houston Intercontinental Airport , which typically receives 46.07 inches (1170 mm) of rain in a year , experienced 35.7 % of its expected total in the first nine days of June .

The deluge flooded 95,000 automobiles and 73,000 houses throughout Harris County . Tropical Storm Allison destroyed 2,744 homes , leaving 30,000 homeless with

residential damages totaling to \$ 1 @. @ 76 billion (2001 USD , \$ 2 @. @ 05 billion 2007 USD) . Residential neighborhoods inside and to the north of Interstate 610 were hardest hit . Additionally , five of the six bayou systems in downtown Houston were severely flooded . Four of them broke 100 @- @ year high @- @ water records , causing excessive surface run @- @ off .

Several hospitals in the Texas Medical Center , the largest medical complex in the world , experienced severe damage from the storm , which hit quickly and with unexpected fury on a Friday evening . Hospital personnel were forced to evacuate thousands of patients in a major effort that included Coast Guard and Army helicopters . Many of the hospitals had lost all power , including back @- @ up generators , meaning that patients had to be carried down dark stairwells by the staff in temperatures over 100 ° F (38 ° C) . Patients who could not breathe on their own had to be continuously manually ventilated during the evacuation , which lasted hours . Most hospitals lost power and backup power when basements , the area where power and research data were kept , flooded . The Baylor College of Medicine experienced major damage , totaling \$ 495 million (2001 USD , \$ 577 million 2007 USD) . The medical school lost 90 @, @ 000 research animals , 60 @, @ 000 tumor samples , and 25 years of research data . The University of Texas Health Science Center at Houston , across the street , lost thousands of laboratory animals , including expensive genetic @- @ specific mice . Decades of research was lost , including , for many scientists , their life 's work . The UT @- @ Houston gross anatomy lab , cyclotron , and other important facilities were completely destroyed . Throughout the Medical Center , damage totaled to over \$ 2 billion (2001 USD , \$ 2 @. @ 3 billion 2007 USD) . Most were reopened after a month , though it took much longer to become fully operational .

The storm flooded the lower level of the massive law library at the University of Houston Law Center with eight feet of water . An estimated 174 @, @ 000 books and the microfiche collection were destroyed . The Federal Emergency Management Agency (FEMA) gave \$ 21 @. @ 4 million to rebuild the law library collection .

The underground tunnel system , which connects most large office buildings in downtown Houston , was submerged , as were many streets and parking garages adjacent to Buffalo Bayou . In the Houston Theater District , also near Buffalo Bayou in the northern part of downtown , the Houston Ballet , Houston Symphony , Houston Grand Opera , and Alley Theater lost millions of dollars ' worth of costumes , musical instruments , sheet music , archives , props , and other artifacts .

Local television stations ran all @- @ night coverage of the deluge from June 8 through the next day , including KHOU @- @ TV 11 , which was forced to transmit its broadcast to a satellite truck when floodwaters entered its production studio on the Allen Parkway near Studemont / Montrose , near downtown along the banks of Buffalo Bayou . By midnight on June 9 nearly every freeway and major road in the city was under several feet of water , forcing hundreds of motorists to abandon their vehicles for higher ground . Eighteen @- @ wheeled trucks were filmed floating down major freeways and highways , swept along by floodwaters .

Despite massive flooding and damage to entire neighborhoods , there were no drowning deaths in flooded homes . In the area , there were 12 deaths from driving , 6 from walking , 3 from electrocution , and 1 in an elevator . Elsewhere in Texas , a man drowned when swimming in a ditch in Mauriceville . Damage totaled to \$ 5 @. @ 2 billion (2001 USD , \$ 6 billion 2007 USD) throughout Texas .

Though Allison 's flooding was extreme , it was not unprecedented . Tropical Storm Amelia in 1978 dropped over 46 inches (1170 mm) of rainfall in Bluff , Texas , which remains the record highest rainfall for a single storm in the state of Texas . In addition , Tropical Storm Claudette in 1979 and a hurricane in 1921 produced rainfall totals of over 40 inches (1015 mm) .

= = Aftermath = =

Within weeks of the disaster , President George W. Bush declared 28 counties in Texas as disaster areas . The declarations allowed affected citizens to receive aid for temporary housing , emergency home repairs , and other serious disaster @- @ related expenses . The Federal Emergency Management Agency (FEMA) also provided 75 % for the cost of debris removal , emergency

services related to the disaster , and repairing or replacing damaged public facilities , such as roads , bridges and utilities .

A few weeks after Allison , FEMA opened six disaster recovery centers across southeast Texas , which provided recovery information to those who applied for disaster assistance . The American Red Cross and the Salvation Army opened 48 shelters at the peak of need for people driven from their homes , which served nearly 300 @, @ 000 meals . After the extensive damage to Houston hospitals , the U. S. Public Health Service team set up a temporary hospital at the Houston Police Academy . The team of 87 medical personnel served over 1 @, @ 000 patients within two weeks of Allison 's passage . Similarly , the National Disaster Medical System deployed a temporary hospital to Houston with 88 professionals , aiding nearly 500 people . Debris removal , which was initially slow , was aided by FEMA to expedite the removal process . FEMA provided 75 % of the federal cost of the removal . Thirty @-@ five volunteer services provided aid for the flood victims in Texas , including food , clothing , and volunteers to help repair the houses .

After nearly 50 @, @ 000 cars were flooded and ruined , many people attempted to sell the cars across the country without telling of the car 's history . Following the extreme flooding , a mosquito outbreak occurred , though FEMA provided aid to control the problem . Health officials also recommended disinfecting private wells with bleach , due to possible contamination from the severe flooding . Many people took advantage of the flood victims , including fraudulent contractors and suppliers raising the price of goods more than is actually justified .

By six months after the storm , around 120 @, @ 000 Texas citizens applied for federal disaster aid , totaling to \$ 1 @. @ 05 billion (2001 USD , \$ 1 @. @ 22 billion 2007 USD) . Of that amount , 17 % of that was spent for temporary housing . In addition , Disaster Unemployment Assistance totaled to just under \$ 1 million , while business loans totaled to \$ 389 million (2001 USD , \$ 454 million 2007 USD) .