

= Hurricane Alice (June 1954) =

Hurricane Alice was the second @-@ strongest Atlantic hurricane to make landfall in the month of June since reliable records began in the 1850s . While not a major hurricane , the storm was linked to catastrophic flooding in southern Texas and northern Mexico , especially along the Rio Grande and its tributaries . The third tropical cyclone and first hurricane of the 1954 Atlantic hurricane season , Alice was one of two storms to receive the same name that year , the other being an unusual post @-@ season hurricane that persisted into the new year of 1955 , becoming one of only two January hurricanes on record (the other having formed in 1938) . The first Alice developed rather suddenly on June 24 over the Bay of Campeche , though it may well have formed earlier but went undetected due to limited surface weather observations . Moving northwestward , Alice strengthened rapidly as it neared the Mexican coastline , becoming a hurricane early the next day . By midday on June 25 , the hurricane reached peak winds of 110 miles per hour (177 km / h) before moving inland well south of the U.S. ? Mexico border . The storm struck an area with few inhabitants and caused relatively minimal impacts from wind near the point of landfall and in southern Texas .

As it moved inland , however , Alice produced prolific rains along and near the Rio Grande , resulting in some of the worst flooding ever seen in parts of northern Mexico and southern Texas ; in some areas , the flooding amounted to a one @-@ in @-@ 2 @,@ 000 @-@ year event . The Pecos River crested at 96 @.@ 24 ft (29 @.@ 33 m) , which joined with the Rio Grande to produce significant flooding . The floods destroyed bridges and dikes and flooded many cities along the inner reaches of the river , which reached its highest water levels since 1865 . As the river overflowed its banks , floods breached the dikes at Piedras Negras , Coahuila , destroying large sections of the town . Other communities in Mexico reported significant flood damage . In the United States , damage was heaviest in Ozona , Texas , where the floods killed 15 people and caused \$ 2 million in damage (1954 USD) . Rainfall peaked at over 24 @.@ 07 in (611 mm) , most of which fell in a 24 ? hour period . In all , flooding from Hurricane Alice killed at least 55 people , including 17 in the U.S. and 38 in Mexico , though many deaths in rural Mexico may have gone unreported ; the total death toll could have exceeded 150 .

= = Meteorological history = =

At 12 : 00 UTC on June 24 , 1954 , a moderate tropical storm formed about 270 miles (435 km) east of Tampico , Tamaulipas , with winds of 60 miles per hour (97 km / h) . In 2015 , NOAA researchers working on reanalysis with the Hurricane Research Division examined observations to determine whether Alice formed earlier , but were unsuccessful due to sparse surface weather observations over the Bay of Campeche . The first observation of gale @-@ force winds occurred at 18 : 00 UTC on June 24 , when a ship reported 60 @-@ mile @-@ per @-@ hour (97 km / h) winds and an atmospheric pressure of 999 millibars (29 @.@ 50 inHg) , indicating a well @-@ developed cyclone in the area . Based on these data , scientists concluded that Alice likely formed earlier than indicated , but went undetected until that day . Regardless , Alice steadily intensified almost immediately upon detection as it headed northwestward , strengthening into the equivalent of a Category 1 hurricane on the Saffir @-@ Simpson hurricane wind scale by 00 : 00 UTC on June 25 . Early on that day , a ship calibrated the rapid strengthening of the storm , measuring winds of 85 mph (137 km / h) at 08 : 17 UTC . As Alice neared the coast of Mexico , reconnaissance aircraft known as Hurricane Hunters began tracking the eye of the hurricane , but apparently did not penetrate the center of the storm . They did , however , provide information about the position of the storm .

The storm continued to intensify rapidly as it approached the coastline south of the United States ? Mexico border . Based on aircraft observations , research suggests that Alice made landfall about 60 mi (97 km) south of Matamoros , Tamaulipas , at 14 : 00 UTC on June 25 . The storm affected a thinly populated segment of the Mexican coastline , and few observations were available to determine the strength of the hurricane . One report , taken about 100 mi (161 km) south of

Brownsville , Texas , suggested top winds of at least 70 to 80 mph (113 to 129 km / h) . Prior to scientific reexamination , HURDAT ? the official database containing tracks and intensities of cyclones in the North Atlantic and Eastern North Pacific regions ? listed top winds of 80 mph (129 km / h) at landfall in Mexico . However , a radiosonde , launched from Brownsville in time for the 12 : 00 UTC observation , recorded winds of 150 mph (241 km / h) from the southeast at 3 @, @ 000 feet (914 m) in elevation . Based on this measurement , which may have represented winds in the eyewall , researchers determined that Hurricane Alice was likely significantly stronger at landfall than previously assessed . They analyzed Alice as having struck Mexico with winds of 110 mph (177 km / h) , while noting the great uncertainty and the possibility that the storm may have even been much stronger than this . The central pressure in the eye was probably 975 mb (28 @. @ 79 inHg) or lower , as corroborated by observations well inland in Texas . Therefore , Alice was at least equivalent to a high @- @ end Category 2 hurricane at landfall and conceivably could have attained major hurricane status .

After hitting land , Hurricane Alice gradually weakened as it approximately followed the Rio Grande , crossing into southern Texas near La Grulla just before 00 : 00 UTC on June 26 . The storm by then had weakened back to a moderate tropical storm with winds of 60 mph (97 km / h) , but it still produced gale @- @ force winds in several communities across southern Texas ; a few areas in Texas may have even experienced hurricane @- @ force winds for brief periods before the storm entered the state , but there are no observations to confirm such winds . The storm likely caused winds of at least 70 mph (113 km / h) in southern Texas . As it crossed into Texas , Tropical Storm Alice curved more to the north @- @ northwest early on June 26 before assuming a sharp bend back westward later in the day . The storm degenerated into a tropical depression by 18 : 00 UTC and dissipated early on June 27 near the Big Bend National Park in Texas .

= = Impact = =

Before Alice moved ashore , about 50 Girl Scouts at a camp were evacuated to a center in Brownsville , Texas . The residents of Padre Island were also evacuated . Residents in the storm 's path were unprepared due to the storm forming suddenly . The United States Coast Guard spread the word about the storm by traversing the coast and advising residents to seek shelter . Officials at the U.S. Weather Bureau posted northwest storm warnings for the Brownsville area , recommending that small boats to stay at harbor . Damages along the coastline at the point of landfall were relatively light . Winds in Brownsville reached 62 mph (100 km / h) , which created flying debris that injured one man . Moderate to strong gales affected the Rio Grande Valley inland over southern Texas . Across the border , minor damage was reported in Matamoros , Tamaulipas , and one person there was killed by a fallen power line . A few shrimp fishing boats were driven ashore by heavy winds . Although later there was severe flooding further inland , a dam along the Rio Grande prevented significant flooding in the Brownsville area .

Most of the damage resulting from Alice was caused by heavy rain in the inland areas of Texas , Tamaulipas and Coahuila ; damage was exacerbated in these areas by drought conditions that rendered the soil especially vulnerable to erosion . Estimates of peak rainfall within 12 hours vary from 22 inches (56 cm) to 26 inches (132 cm) , and a total of 35 inches (89 cm) of rain fell in 24 hours , approaching the world record that had been set by an unnamed hurricane in Texas in 1921 . However , a 2010 report on the storm 's rainfall indicated a maximum of 24 @. @ 07 in (611 mm) near Pandale , of which 16 @. @ 02 in (407 mm) fell in a 24 ? hour period .

The peak rainfall occurred in a small area centered near the Pecos River . A location along the Johnson Draw reported 11 in (280 mm) of rainfall after receiving minimal precipitation in the previous three years . In addition , some locals in western Texas experienced rainfall from Alice that exceed yearly averages . This contributed to significant flooding along the Pecos River , reaching a flood stage of 55 ft (17 m) in Pandale . The flooding swept away a group of fishermen in Sheffield as well as at a location 10 mi (16 km) north of Pandale , killing four . Downstream , the river crested at 96 @. @ 24 ft (29 @. @ 33 m) , which washed out a highway and three railroad bridges . A temporary bridge was built between Eagle Pass and Piedro Negro by July 10 , or two weeks after

the storm . The destroyed rail lines stranded a Sunset Limited train , which prompted the passengers to evacuate to nearby Langtry . The flooding also stranded a Southern Pacific train , whose occupants were later evacuated by helicopters . The peak river crest corresponded to a discharge rate of $948 \text{ @ } 000 \text{ ft}^3 / \text{s}$ ($26 \text{ @ } 800 \text{ m}^3 / \text{s}$) , which the International Boundary and Water Commission remarked was " probably the greatest rate of runoff for a watershed of [that] size in the United States . " Heavy rain fell across all of southern Texas and northern Mexico as a result of Alice , causing flash floods in inland areas . Ozona , Texas was the town most affected by the floods , sustaining \$ 2 million in damage (1954 USD) , as well as 15 deaths . Early on the morning of June 25 , a " wall of water " as high as 30 feet (9 @ 2 m) poured out of a dry gully and overwhelmed most of the town . Roughly a third of Ozona had to be evacuated , and many livestock there were killed . About 500 families were left homeless in the town . United States military helicopters worked to rescue people trapped by the floodwaters . In all , at least seven towns experienced flooding from the storm on either side of the border , including Lamesa and Laredo , Texas which were badly damaged by flash floods .

The Rio Grande rose well above flood level at the cities of Eagle Pass , Texas and Piedras Negras , Coahuila . While the city of Eagle Pass was evacuated , Piedras Negras was not . Both cities were completely flooded , and the dike intended to protect Piedras Negras from floods was washed away . At least 38 people (some sources say 39) were killed in Piedras Negras after the dike collapsed . In Eagle Pass , the commercial sector was flooded by over 8 ft (2 @ 4 m) of waters , which let heavy losses . Before the storm began producing heavy rainfall , officials anticipated moderate river flooding that would peak at less than the flood of 1948 . The river crested at Laredo , Texas , where waters reached a peak of 62 @ 2 feet (19 m) , at least 10 feet (3 m) above the previous record flood . High waters caused the water treatment plants to fail there , which prevented the safe delivery of fresh water until July 1 . The International Bridge connecting Laredo and Nuevo Laredo was swept away . Although severe damage occurred in the latter city , no deaths were recorded in either city due to evacuations . Flooding along the Rio Grande was the highest since 1865 , and was considered a 1 in 2000 year event . About 12 @ 000 people were evacuated from nearby Ciudad Acuña following the flood . There , the floods left heavy damage .

Estimates for total death toll range from 55 to 153 . Death toll estimates for Texas range from 17 to 38 , though official records indicate that the 38 deaths occurred in Mexico rather than Texas . Estimates of the deaths in Mexico , where records are less complete , vary more widely . Several of the deaths in Texas were homeless people attempting to enter the United States , and as a result their deaths were not counted . Monetary damage figures are not available , but it is known that flooding from Alice caused considerable damage to crops , primarily cotton .

= = Aftermath and records = =

While Alice left almost unprecedented flooding in its wake , the storm itself was not an unheard @-@ of occurrence : a similar storm in 1921 , which followed a comparative track , caused significant flooding in Texas as well , albeit not in the same areas affected by the floods of 1954 . Following the devastation left by Alice , members of the U.S. Air Force , Navy , and Army flew 21 helicopters with over 81 tons of relief supplies to the affected people of Mexico and Texas , including food , water , medicine , and clothing . The disastrous flooding caused by Hurricane Alice along the Rio Grande accelerated the joint US ? Mexico Amistad Dam project , a series of flood control dams designed to prevent similar catastrophes in the future . The project , in the planning stages for decades before the storm , was finally begun in 1960 .

Leftover waters from the storm led to an increase in mosquitoes in Texas , which prompted a widespread application of larvicide via airplane . On July 1 , the flood areas of southern Texas were declared a major disaster area . This followed a delivery of 2 flood specialists , 20 laborers , 2 portable water treatment plants , 7 trucks , and a quantity of insecticides and water treatment tablets . Residents in Laredo , Texas provided citizens of its neighboring city Nuevo Laredo , Mexico with food and water . The Mexican government provided temporary homes for the affected citizens of the flood . American officials distributed typhoid vaccinations , water purification tablets , and

insecticides to the American cities along the Rio Grande . Safe water was eventually restored to Laredo , Texas on July 12 . All emergency work related to the disaster was finished by September 3 .

Besides flooding , Hurricane Alice was also notable for another reason : it made landfall with some of the strongest winds in a June hurricane on record . With top winds of 110 mph (177 km / h) , the cyclone was the second @-@ strongest Atlantic hurricane to make landfall in the month of June , behind only Hurricane Audrey in 1957 , which made landfall in Louisiana with winds of 145 mph (233 km / h) . The storm was somewhat analogous to Hurricane Alex , which also affected the same region in 2010 with winds of 110 mph (177 km / h) , though Alex made landfall in early July .