

= Tropical Storm Felice =

Tropical Storm Felice was a modest tropical cyclone that lightly impacted parts of the Gulf Coast of the United States in mid @-@ September 1970 . Spawned by an upper @-@ level trough over the Bahamas , the system crossed the Florida Keys and entered the Gulf of Mexico , where it gradually began to strengthen . Felice was a disorganized storm for its entire duration , plagued by dry air , a lack of deep thunderstorm activity , and an ill @-@ defined center of circulation , but nevertheless managed to peak as a high @-@ end tropical storm with winds just below Category 1 hurricane strength . Tracking northwestward , the storm brushed southern Louisiana on September 15 before making landfall northeast of Galveston , Texas , late that same day . Once ashore , Felice quickly deteriorated as it recurved into the central United States . While over southeastern Oklahoma , however , its remnants still closely resembled a formidable tropical cyclone .

In advance of the cyclone , officials prompted residents in vulnerable communities to leave their homes , and temporary storm shelters were established . However , the effects from Felice were generally light . Beneficial rains fell over parts of southern Florida , while sections of coastal Louisiana experienced minimal gale @-@ force winds and above @-@ normal tides . Winds gusting to 55 mph (89 km / h) at Galveston ? and estimated near 70 mph (110 km / h) elsewhere ? caused scattered power outages and minor tree damage , while heavy rainfall totaling over 6 in (150 mm) triggered some street flooding . Felice delayed the local rice harvest and damaged some hay that had been cut before the storm . Significant precipitation and gusty winds accompanied the system into northern Texas and Oklahoma . Overall , the storm left no fatalities or widespread property damage anywhere along its path .

= = Meteorological history = =

Developing as a tropical depression near Nassau in the Bahamas on September 12 , Felice had its origins in a persistent upper @-@ level trough over the area . The nascent depression tracked slowly toward the west @-@ southwest without much intensification , ultimately passing just north of Key West , Florida as it entered the Gulf of Mexico . Over the open waters of the Gulf , the system accelerated toward the west @-@ northwest along the southern periphery of a large ridge of high pressure to the north . While reconnaissance aircraft data on the storm suggested that the depression strengthened into a tropical storm midday on September 14 , the official Atlantic tropical cyclone database known as HURDAT indicates the disturbance attained tropical storm status at 0000 UTC on September 15 .

Despite continued gradual intensification , Felice remained disorganized as it approached the northern Gulf Coast at forward speeds of up to 20 mph (32 km / h) . The storm 's center came within range of the weather radar site at New Orleans , Louisiana , resulting in close observation of the storm 's progress . Felice suffered from restricted outflow and a nebulous circulation , marked by the appearance of two centers . Near daybreak on September 15 , a more distinct center had apparently formed 100 mi (160 km) to the west @-@ northwest of the storm 's initial core , which reportedly dissipated . Operationally , forecasters at the National Hurricane Center believed a surge of southerly inflow transported a significant amount of atmospheric vorticity away from the old center of low pressure , allowing for a new surface @-@ based circulation to form . Indeed , a special off @-@ hour advisory was issued to identify the storm 's new location . However , post @-@ season analysis of Felice determined that due to the cyclone 's disheveled nature , as well as technical problems at the time of observation , the center relocation could not be conclusively proven ; as a result , the official storm path does not reflect any significant jogs .

Felice moved nearly parallel to the southern coast of Louisiana as it began to show signs of improved structure . It reached its peak intensity as a high @-@ end tropical storm with winds of 70 mph (110 km / h) at 0000 UTC on September 16 , while located about 100 mi south of Lafayette . Dry continental air from the north likely prevented Felice from reaching Category 1 hurricane strength . Even as a strong tropical storm , Felice lacked deep convection typical of mature tropical cyclones . Shortly after peaking , Felice moved ashore at High Island , Texas ? about 30 mi (48 km

) to the northeast of Galveston ? during the evening hours of September 15 local time . The storm rapidly deteriorated once over land and slowed in forward speed . Curving toward the northwest , Felice passed near Houston and weakened into a tropical depression . The diminishing system turned northward through north @-@ central Texas late on September 16 and entered southeastern Oklahoma by September 17 .

Although Felice officially dissipated at 1200 UTC on September 17 , its remnants retained a structure very similar to that of a healthy tropical cyclone , as depicted by radar imagery from the National Severe Storms Laboratory in Norman . Distinct rainbands harbored a noticeable eye feature , which passed about 90 mi (140 km) southeast of Norman . Two aircraft flew into the area to collect data on the unique storm ; notably , they found the system still had a warm core compared to its environment . Throughout the day on September 17 , the remnants of Felice continued to weaken . The residual surface low recurved toward the east @-@ northeast over Oklahoma and Arkansas before fully dissipating after September 19 .

= = Preparations and impact = =

As Felice neared the coast , gale warnings were in effect from Morgan City , Louisiana , to Galveston , while a hurricane watch extended from Morgan City to Port O 'Connor , Texas . Small craft advisories were also posted , cautioning light vessels to remain in port . All coastal advisories were discontinued by the early hours of September 16 . Residents in the path of the storm generally evacuated in a timely manner . Over 3 @, @ 000 fled the storm in Cameron Parish , Louisiana ; around half of the residents in the low @-@ lying southern part of the parish had already left before the mandatory evacuation was ordered . Farther west , one of two evacuation routes out of Sabine Pass , Texas had been rendered unusable a few days before the storm when a bridge was damaged in a maritime accident . As the remaining highway was considered susceptible to coastal flooding , officials quickly worked to evacuate 1 @, @ 300 people in Sabine Pass before the storm 's approach . The American Red Cross converted nine public schools into temporary storm shelters in and around Beaumont . Shelters were also set up in Houston and Baton Rouge , Louisiana , though they generally went unused . The post offices in Sabine Pass , Gilchrist , and Port Bolivar transferred money orders , first @-@ class parcels and postage stamps to the Beaumont office as a safety precaution .

While crossing the Florida Keys on September 13 , the depression dropped modest but beneficial rainfall , generally totaling 1 to 3 in (25 to 75 mm) , over the southern Florida Peninsula . The highest tides associated with Felice ran 3 @. @ 9 ft (1 @. @ 2 m) above normal at Cameron , Louisiana . Rainfall in Louisiana was light , peaking at around 2 @. @ 5 in (65 mm) in areas closest to the storm 's path . Coastal locations experienced gusty winds , occasionally blowing gale @-@ force ; an anemometer at Grand Chenier recorded northeasterly gusts up to 42 mph (68 km / h) on the evening of September 15 . Though the winds may have had an impact on the quality of sugar cane crops in extreme southern areas of the state , no flooding or property damage was reported .

Felice crossed the coast accompanied by appreciable rainfall , gusty winds , and heightened tides . At Crystal Beach , near where Felice made landfall , there was reportedly a distinct lull in the wind and rain coinciding with the storm 's poorly defined eye . Weather observers in Gilchrist and Humble estimated gusts at 70 mph (110 km / h) from the east and southwest , respectively . Galveston endured sustained winds of 43 mph (69 km / h) and gusts as high as 55 mph (89 km / h) . The storm uprooted some newly planted palm trees in the city ; one tree struck a parked car . Isolated power outages affected parts of the area , including the east side of Galveston after an electrical transformer was hit by lightning . Elsewhere , Felice brought down numerous tree limbs and damaged utility lines . In Washington County to the north , the storm damaged trees and shrubs . Winds gusted to 46 mph (74 km / h) at Houston .

Heavy rains , accumulating 6 @. @ 73 in (171 mm) , triggered minor urban flooding in downtown Galveston . Moderate to heavy rainfall affected a broad area along the storm 's path , with several reports of 5 in (130 mm) or more . The precipitation resulted in a few instances of inconsequential flooding , but often proved beneficial as it helped relieve dry conditions throughout eastern Texas .

Rice and hay crops sustained minor damage , the harvest of the former delayed by about a week . Along the coast , storm tides peaked at 3 @. @ 0 ft (0 @. @ 91 m) above normal , with several reports of 2 and 3 @- @ ft deviations . As the weakening storm proceeded inland , it continued to drop heavy rainfall . Over 6 in (150 mm) of rain fell over Denton County in northern Texas . In southeastern Oklahoma , the remnants of Felice produced rainfall rates up to 2 in (50 mm) per hour , contributing to totals over 4 in (100 mm) . Relatively strong winds , peaking around 50 mph (80 km / h) , occurred near the remnant center of circulation . The system continued to generate showers and thunderstorms over the central Mississippi River Valley , producing a swath of 3 inch or greater rainfall totals across northern Arkansas .