

= Tropical Storm Debby (2012) =

Tropical Storm Debby caused extensive flooding in North Florida and Central Florida during late June 2012 . The fourth tropical cyclone and named storm of the 2012 Atlantic hurricane season , Debby developed from a trough of low pressure in the central Gulf of Mexico on June 23 . The formation into a tropical storm was the earliest formation on record of the fourth named storm within the Atlantic basin until this record was beaten by Tropical Storm Danielle in 2016 . Despite a projected track toward landfall in Louisiana or Texas , the storm headed the opposite direction , moving slowly north @-@ northeast and northeastward . The storm slowly strengthened , and at 1800 UTC on June 25 , attained its peak intensity with maximum sustained winds of 65 mph (100 km / h) . Dry air , westerly wind shear , and upwelling of cold waters prevented further intensification over the next 24 hours . Instead , Debby weakened , and by late on June 26 , it was a minimal tropical storm . At 2100 UTC , the storm made landfall near Steinhatchee , Florida with winds of 40 mph (65 km / h) . Once inland , the system continued to weaken while crossing Florida , and dissipated shortly after emerging into the Atlantic on June 27 .

The storm dropped immense amounts of precipitation near its path . Rainfall peaked at 28 @.@ 78 inches (731 mm) in Curtis Mill , Florida , located in southwestern Wakulla County . The Sopchoppy River , which reached its record height , flooded at least 400 structures in Wakulla County . Additionally , the Suwannee River reached its highest level since Hurricane Dora in 1964 . Further south in Pasco County , the Anclote River and Pithlachascotee River overflowed , flooding communities with " head deep " water and causing damage to 106 homes . An additional 587 homes were inundated after the Black Creek overflowed in Clay County . Several roads and highways in North Florida were left impassable , including Interstate 10 and U.S. Route 90 . U.S. Routes 19 and 98 were also inundated by coastal flooding . In Central and South Florida , damage was primarily caused by tornadoes , one of which caused a fatality . Overall , Debby caused at least \$ 250 million in losses and 10 deaths , 8 in Florida and 1 each in Alabama and South Carolina .

= = Meteorological history = =

During mid @-@ June , the Intertropical Convergence Zone (ITCZ) made its annual migration northward into the southern Gulf of Mexico . Coinciding with a Madden ? Julian oscillation , a weak surface low pressure area developed on June 19 , and subsequently moved inland over the Yucatán Peninsula . While the system crossed the peninsula , a tropical wave moved through the northwestern Caribbean Sea on June 18 . The wave reached the Gulf of Mexico on June 20 and merged with the low a few days later , spawning a trough of low pressure on June 22 . Located in the southeastern Gulf of Mexico , moderate vertical wind shear caused the system to remain disorganized . Nonetheless , Air Force Reserve Hurricane Hunter aircraft indicated that the trough acquired a low @-@ level circulation on June 23 , while ships in the area reported tropical storm force winds . Thus , it is estimated that Tropical Storm Debby developed at 1200 UTC on June 23 , centered about 290 miles (470 km) south of mouth of the Mississippi River .

Becoming a tropical storm on June 23 , Debby became the earliest fourth named storm in the Atlantic basin , surpassing the old record set by Hurricane Dennis on July 5 , 2005 , however with 2016 's Danielle the record was beaten by three days . Initially , Debby was predicted to curve westward and potentially threaten Texas . A deepening trough would curve the storm westward , while wind shear was predicted to decrease . Although the storm generated very cold cloud tops , much of the convection was located more than 100 miles (160 km) from the center and still displaced to the east . By 1200 UTC on June 24 , the forecast path was shifted from east @-@ central Texas to southeastern Louisiana . Despite persistent wind shear , Debby was strengthening and around that time , the storm attained its maximum sustained wind speed of 65 mph (100 km / h) . Later on June 24 , the National Hurricane Center noted in its next advisory that this " is a very difficult and highly uncertain forecast " , citing Debby 's slow movement and widespread computer forecast models .

The forecast track for Debby was shifted significantly to the east late on June 24 , and it was

predicted that the storm would move northward and make landfall near Panama City , Florida . Based on a dropsonde estimate , Debby attained its minimum barometric pressure of 990 mbar (29 inHg) at 0000 UTC on June 25 . However , the storm began to weaken due to increasing wind shear , drier air , and upwelling of cold water , caused by Debby 's slow movement . It was initially composed of multiple small swirls , but consolidated into one well @-@ defined low @-@ level circulation by early on June 25 . Due to its excessively slow movement and no prediction for acceleration , the National Hurricane Center remarked that , " the cyclone does not seem to be going anywhere anytime soon . " A burst in deep convection occurred later on June 25 , though adverse environmental conditions prevented re @-@ intensification . Debby began curving east @-@ northeastward and began to speed up on June 26 , in response to a mid @-@ latitude trough digging into the western Atlantic Ocean . While approaching the Florida Big Bend , Debby produced only a small area of deep convection on satellite imagery .

At 2100 UTC June 26 , Debby made landfall near Steinhatchee , Florida with winds of 40 mph (65 km / h) . The storm weakened quickly after moving inland , and by early on June 27 , it was downgraded to a tropical depression , while located about 35 miles (56 km) north of Gainesville , Florida . Debby maintained tropical cyclone status while crossing Florida , but degenerated into a trough of low pressure by 1800 UTC on June 27 . In the final advisory issued by the National Hurricane Center three hours later , the agency noted that Debby could eventually reacquire tropical characteristics . After its dissipation , however , the remnants did not regenerate into a tropical cyclone , but re @-@ developed a new center of circulation and strengthened slightly due to baroclinic conditions . As it accelerated northward , Debby 's remnants became increasingly frontal in nature , and once again degenerated into an open trough at 1800 UTC on June 30 ; at this time , the disturbance was located south of Newfoundland .

= = Preparations = =

Upon development of Debby on June 23 , a tropical storm warning was issued from the mouth of the Pearl River to Morgan City , Louisiana , excluding New Orleans or Lake Pontchartrain . On the following day , a separate tropical storm warning was put into effect from the Mississippi and Alabama border to the mouth of the Ochlockonee River in Florida . At 1500 UTC on June 24 , the tropical storm warning was extended to the mouth of the Suwannee River . Simultaneously , a tropical storm watch was issued from the Suwannee River to Anclote Key . These were all canceled at 1500 UTC on June 25 , though a tropical storm warning was then implemented from Destin to Englewood , Florida . Early on June 26 , a tropical storm warning was issued from Mexico Beach to Englewood , Florida . By 2100 UTC that day , the tropical storm warning was extended to the mouth of Steinhatchee River in Florida . This was discontinued after Debby became a tropical depression .

Several additional preparations took place in addition to tropical cyclone warnings and watches . According to the Federal government of the United States , nearly 25 % of crude oil and natural gas production in the Gulf of Mexico was shutdown . In Louisiana , Governor Bobby Jindal declared a state of emergency . On June 24 , voluntary evacuations were issued for several areas in northwest Florida during the approach of the storm , especially Taylor and Wakulla Counties . Governor of Florida Rick Scott also declared a state of emergency on June 25 . Additionally , mandatory evacuations were issued for St. George Island , Alligator Point , and other low @-@ lying areas of Franklin County .

= = Impact = =

Throughout the Southeastern United States , nine people were killed in relation to Tropical Storm Debby . Of these , seven took place in Florida and one each in Alabama and South Carolina . Throughout Central and South Florida , the outerbands of the storm spawned 13 tornadoes : five in Collier County , two in Glades County , one in Hardee County , two in Highlands County , one in Miami @-@ Dade County , and two in Palm Beach County . Overall , losses from the storm were estimated to have reached at least \$ 250 million .

== = Florida == =

== = = North Florida and Panhandle == = =

Throughout June 25 , an intense complex of thunderstorms developed to the north of Debby 's center and produced torrential rains over the Florida Panhandle for much of the day . Many areas received rainfall in excess of 15 inches (380 mm) . Precipitation peaked at 28 @. @ 78 inches (731 mm) in Curtis Mill , which is located in Wakulla County . In Panacea , a Mesonet station recorded a 24 ? hour rainfall of 20 @. @ 63 inches (524 mm) . Rainfall caused numerous small creeks , streams , and rivers to rapidly exceed their banks and flood adjacent communities . The Sopchoppy River crested at 36 @. @ 8 feet (11 @. @ 2 m) , which was a record height . Numerous homes were flooded , some up to the second story . Two bridges were damaged , and numerous roads around the county were washed out or closed . Over 400 structures were affected by flooding , including more than 170 mobile homes and nearly 200 single @- @ family residences . Of these structures , 40 were destroyed , 61 had major flood damage , 41 suffered minor flood damage , and 271 were affected by flooding . Additionally , coastal flooding impacted the county , with a storm surge of 4 feet (1 @. @ 2 m) and tides up 6 @. @ 5 feet (2 @. @ 0 m) in St. Marks . Numerous roads were underwater and several area businesses received water intrusion in that city . U.S. Route 98 was over @- @ washed just north of St. Marks . As a result , mandatory evacuations were ordered south of U.S. Route 98 and around the Sopchoppy River . In total , 67 people required rescuing . Losses throughout the county were assessed at \$ 9 @. @ 09 million .

The storm also produced adverse effects in Franklin County . In Apalachicola , a gust of 65 mph (105 km / h) was observed as well as 6 @. @ 03 inches (153 mm) of rainfall on June 24 , resulting in widespread flash flooding . The John Gorrie Memorial Bridge connecting Apalachicola to Eastpoint was closed on June 24 due to high winds . A wind gust of 66 mph (106 km / h) was reported at the Apalachicola Regional Airport . The St. George Island Bridge , a 4 miles (6 @. @ 4 km) bridge connecting Eastpoint to St. George Island over the Apalachicola Bay , was also closed on June 24 due to high winds . The bridge was opened later that day as both St. George Island and Alligator Point were put under a mandatory evacuation , requiring all people to leave immediately , and those remaining on the islands subject to arrest . St. George Island , a popular resort community and tourist destination , lost all power on June 24 due to high winds destroying three power poles in the Apalachicola Bay ; a Progress Energy spokesperson stated that it could be days before power was restored because the conditions are too unsafe for workers . In Bay County , moderate beach erosion occurred , with a storm surge reaching 1 @. @ 5 feet (0 @. @ 46 m) and storm tide of 2 @. @ 42 feet (0 @. @ 74 m) in Panama City . Flooding forced the closure of a few roads in Jefferson County , including U.S. Route 27 west of U.S. Route 19 .

In Madison County , one house was surrounded by in overflowing retention pond near the city of Madison . State Road 51 in Lafayette County flooded , caused by the Steinhatchee River exceeding its banks . In Dixie County , several roads north of Cross City experienced flooding , while water entered at least 40 homes along the Steinhatchee River . Moderate coastal flooding occurred in Horseshoe Beach , due to an estimated storm surge of 4 feet (1 @. @ 2 m) , with tides reaching 7 feet (2 @. @ 1 m) above normal . Water entered several homes near the coast and surrounded outbuildings by up to 1 @. @ 5 feet (0 @. @ 46 m) . In Columbia County , preliminary losses were placed in excess of \$ 20 million as of July 3 and did not take into account hundreds of homes that remained flooded at the time . Several bridges were washed out due to the heavy rain ; both U.S. Route 319 and U.S. Route 98 were closed due to flooding . In Suwannee County , the Suwannee River at Live Oak reached its highest crest since Hurricane Dora in 1964 . Gainesville received its second @- @ highest daily rain total of 6 @. @ 95 inches (177 mm) on June 24 . In Marion County , up to 10 @. @ 25 inches (260 mm) of rain was reported near Fellowship . As a result , State Road 40 was closed due to high water . Additionally , as many as 52 sinkholes were reported to have formed along roadways in the county . Flooding also occurred in Duval County . The public reported

that water entered a home on Rose Street in Jacksonville . Streets were flooded in Orange Park , and water approached the doors of houses , forcing some residents to evacuate . The St. Marys River reached historic heights and flooded a lot homes in Baker and Nassau Counties .

= = = = Central Florida = = = =

In Levy County , tropical storm force winds were felt along the coast . Heavy rainfall was reported across the county , with the CoCoRaHS site near Chiefland of receiving 13 @. @ 42 inches (341 mm) . At Cedar Key , tides reached 6 @. @ 78 feet (2 @. @ 07 m) mean lower low water on June 25 . The highest storm surge was estimated to have peaked at 4 @. @ 49 feet (1 @. @ 37 m) mean lower low water . A few buildings were flooded by the storm surge at Cedar Key and Yankeetown . In total , damage to public property was approximately \$ 175 @, @ 000 . Rainfall was generally above 9 inches (230 mm) across Citrus County , and peaked at 12 @. @ 07 inches (307 mm) near Hernando . Several homes were flooded with 1 to 3 feet (0 @. @ 30 to 0 @. @ 91 m) of water . Significant street flooding was reported at Kings Bay , while several streets were inundated by up to 2 feet (0 @. @ 61 m) of water in Homosassa . Overall , damage was minor , reaching about \$ 127 @, @ 000 . The storm dropped heavy rainfall in Hernando County , with 15 @. @ 53 inches (394 mm) in Spring Hill . A portion of State Road 589 was shutdown between State Road 50 and U.S. Route 98 , with as much as 5 feet (1 @. @ 5 m) of standing water on that stretch of the highway . Along the Anclote and Pithlachascotee Rivers in Pasco County , emergency managers ordered mandatory evacuations for 14 @, @ 000 ? 20 @, @ 000 people as the rivers rose dramatically . The Anclote River rose from 9 ft (2 @. @ 7 m) to 27 ft (8 @. @ 2 m) , well above major flood stage , leaving surrounding areas in " head @-@ deep " water . At least 106 homes in the county were damaged by flood waters . Additionally , a tornado near New Port Richey caused major damage to five homes . Throughout the county , damage to private property was \$ 1 @. @ 5 million , while public property losses were estimated at \$ 26 million .

A man drowned near Lake Dorr in Lake County after his canoe capsized along a river in Ocala National Forest . In Polk County , a woman died after her car hydroplaned on a flooded road . Another person drowned on a river in the after his canoe capsized ; however , it is unknown whether or not his death was attributable to Debby . Throughout Polk County , 115 homes were damaged , mainly as a result of tornadoes , and losses were estimated at \$ 5 million . A tornado in Hardee County felled several trees and damaged a tractor and a barn . In Glades County , one tornado caused minor roof damage to a barn in Muce , while the other resulted in no effects . In Highlands County , four homes were destroyed and twenty @-@ four more were damaged to varying degrees by two tornadoes . Losses in the county reached approximately \$ 1 @. @ 4 million . Several homes were damaged by the two twisters in Highlands County , with one resulting in a fatality near Venus . In St. Petersburg , a gust of 45 mph (72 km / h) was observed , while 1 @. @ 88 inches (48 mm) of rain fell in a one @-@ hour period . With the substantial loss of beaches , tourism in the region is expected to suffer significantly . Portions of Upham Beach in Pinellas County were completely eroded up to the seawall and other areas in that county had lost 20 to 30 ft (6 @. @ 1 to 9 @. @ 1 m) of sand . On Treasure Island , coastal dunes were eroded by 10 to 15 ft (3 @. @ 0 to 4 @. @ 6 m) . In Pass @-@ a @-@ Grille , Debby 's storm surge flooded coastal hotels with ankle @-@ deep water as the dunes were washed away . Throughout St. Pete Beach , 30 ? 40 homes were damaged by a tornado spawned by Debby . Losses throughout the city were estimated at \$ 1 @. @ 5 million . In Hillsborough County , wind gusts of 39 to 51 mph (63 to 82 km / h) were measured at MacDill Air Force Base . Rainfall was at least 5 inches (130 mm) across much of the county and peaked at 11 @. @ 91 inches (303 mm) near Citrus Park . The storm damage 74 buildings , 6 of which were destroyed . The highest storm surge was estimated to have reached 4 @. @ 07 feet (1 @. @ 24 m) in height . As a result , portions of Bay Shore Boulevard were inundated for three days .

On Anna Maria Island in Manatee County , water reached the retention walls of several condos , some of which were undermined , allowing water to enter beach @-@ side pools . The most significant losses were on the south side of the island where up to half of the dunes were lost . In

Sarasota County , as much as 10 @. @ 9 inches (280 mm) of rain fell near the city of Sarasota . Wind and floods damaged 52 structures , with losses reaching \$ 540 @, @ 000 . At Lido Beach , high water flooded a parking lot . Damage to area beaches from erosion was estimated at \$ 1 @. @ 9 million . A state of emergency was declared due to storm surge damage in the county . The first tornado in Collier County caused minor roof damage to a few structures near Naples on June 23 . A second tornado in the county later that day broke light poles and snapped tree limbs in North Naples , with one person being injured by a falling branch . Three others twisters were spawned in Collier County on June 24 , though damage was no more than a few downed trees . The Charlotte County Airport recorded a 55 mph (89 km / h) wind gust , while the highest rainfall total was 5 @. @ 25 inches (133 mm) near Englewood . Damage reached \$ 2 @. @ 5 million and was mostly from beach erosion and coastal flooding . In Lee County , rainfall peaked at 4 @. @ 95 inches (126 mm) in Cape Coral . Rough tides and storm surge caused beach erosion and coastal flooding , especially at Captiva and Sanibel Islands . The county suffered approximately \$ 2 @. @ 3 million in losses .

= = = South Florida and Elsewhere = = =

At the Palm Beach International Airport in West Palm Beach , 1 @. @ 51 inches (38 mm) of precipitation fell in only one hour . Further south in Pompano Beach , 4 @. @ 32 inches (110 mm) of rain was reported in a 24 @- @ hour period . A tornado in Palm Beach County damaged a few houses and some vegetation in Lake Worth . The other twister in Palm Beach County snapped some trees , blew a gate across a street , and broke a railroad crossing arm . A waterspout offshore Miami @- @ Dade County moved inland near Golden Beach and twisted three gates and blew open a garage door . Offshore in the Gulf of Mexico , nine oil production platforms and one drilling rig were damaged . Overall , United States oil production decreased by 2 % . On June 25 , 44 % of the daily oil and 33 % of the daily natural gas production in the Gulf of Mexico was shut down . The following day , companies began returning employees to platforms and production was rapidly restored . A man in Orange Beach , Alabama drowned after being swept away by heavy surf . Off the coast of South Carolina , one person went missing and is presumed dead after rescuers failed to find him after several days . Heavy rainfall from Debby extended northward into southern Georgia , peaking at 12 @. @ 7 inches (320 mm) in Fargo . Localized and isolated flooding occurred in nearby Lowndes County , with up to 1 foot (0 @. @ 30 m) of water in the parking lot at a Sonny 's restaurant in Lake Park . The remnants of Debby passed about 90 miles (140 km) north of Bermuda on June 29 and produced tropical storm force winds on the island , but caused no damage .

= = Aftermath = =

Following the storm , President of the United States Barack Obama issued a disaster declaration for Baker , Bradford , Citrus , Clay , Columbia , Duval , Franklin , Gilchrist , Hernando , Highlands , Hillsborough , Lafayette , Manatee , Nassau , Pasco , Pinellas , Polk , Sarasota , Suwannee , Taylor , Union , and Wakulla Counties of Florida . In Citrus County , total individual assistance of \$ 127 @, @ 000 was paid out to 140 residents , including \$ 112 @, @ 000 in damage to housing . A total of 1 @, @ 671 applications for individual assistance were filed in Pinellas County , totaling \$ 900 @, @ 000 .