

= Tropical Storm Bill ( 2003 ) =

Tropical Storm Bill was a tropical storm that affected the Gulf Coast of the United States in the summer of 2003 . The second storm of the 2003 Atlantic hurricane season , Bill developed from a tropical wave on June 29 to the north of the Yucatán Peninsula . It slowly organized as it moved northward , and reached a peak of 60 mph ( 95 km / h ) shortly before making landfall in south @-@ central Louisiana . Bill quickly weakened over land , and as it accelerated to the northeast , moisture from the storm , combined with cold air from an approaching cold front , produced an outbreak of 34 tornadoes . Bill became extratropical on July 2 , and was absorbed by the cold front later that day .

Upon making landfall on Louisiana , the storm produced a moderate storm surge , causing tidal flooding . In a city in the northeastern portion of the state , the surge breached a levee , which flooded many homes in the town . Moderate winds combined with wet soil knocked down trees , which then hit a few houses and power lines , and left hundreds of thousands without electric power . Two people drowned from rough surf in Florida . Further inland , tornadoes from the storm produced localized moderate damage . Throughout its path , Tropical Storm Bill caused around \$ 50 million in damage ( 2003 USD , \$ 64 @. @ 3 million 2016 USD ) and four deaths .

= = Meteorological history = =

A tropical wave developed scattered convection in the central Caribbean Sea on June 24 , while interacting with an upper @-@ level low . It moved slowly northwestward , and remained disorganized due to strong upper level wind shear . Late on June 27 , the convection became slightly better organized around a broad low pressure area , though land interaction prevented further development as it moved towards the Yucatán Peninsula . The area of low pressure became better defined over the central Yucatán Peninsula , and after the system turned to the northwest , convection quickly organized while located over the warm waters of the Gulf of Mexico . On June 29 , following the development of a closed circulation , the system organized into Tropical Depression Three while located about 40 miles ( 60 km ) north of Progreso , Yucatán .

The depression quickly strengthened to become Tropical Storm Bill later on June 29 . Operationally , the National Hurricane Center did not begin issuing advisories until it attained tropical storm status . Initially , the system resembled a subtropical cyclone , with the strongest winds and deep convection located far from the center , though it was classified tropical due to its tropical origins . The storm steadily intensified as wind shear decreased , and early forecasts from the National Hurricane Center mentioned the possibility of Bill intensifying to hurricane status if the low level circulation organized beneath the area of deepest convection . Bill turned to the north @-@ northwest , and later to the north , as it moved around the periphery of a ridge of high pressure . On June 30 , Tropical Storm Bill reached a peak intensity of 60 mph ( 95 km / h ) , one hour before making landfall in southwestern Terrebonne Parish , Louisiana . It moved onshore at peak intensity , and quickly weakened to a depression over land as it accelerated to the northeast . Bill remained a tropical cyclone as it moved through the southeast United States , until it became attached to an approaching cold front on July 2 near the Tennessee / Virginia border . The remnant extratropical storm was absorbed by the cold front on July 3 near central Virginia , while the remnant low pressure area continued northeastward until reaching the Atlantic Ocean later on July 3 .

= = Preparations = =

Shortly after forming , the National Hurricane Center issued a tropical storm watch from the southern end of Galveston Island to Morgan City , Louisiana . As a more northward motion occurred , the watch was canceled and replaced with a tropical storm warning from High Island , Texas to Pascagoula , Mississippi . Shortly before the storm made landfall , the warning was discontinued between High Island and Cameron , Louisiana . The National Hurricane Center briefly issued a hurricane watch from Intracoastal City to Morgan City , Louisiana , but it was discontinued when Tropical Storm Bill failed to strengthen . Prior the storm making landfall , local National Weather

Service offices issued flash flood watches and a tornado watch for large portions of the Gulf Coast .

The threat of Tropical Storm Bill caused 41 oil platforms and 11 oil rigs to evacuate . This resulted in a loss of production of over 71 trillion barrels (  $1 \times 10^{13} \text{ m}^3$  ) of oil and 610 million cubic feet (  $17 \times 10^9 \text{ m}^3$  ) of gas .

The American Red Cross mobilized workers and brought food , water , and other supplies to Louisiana prior to the storm 's arrival . At the request of Louisiana emergency management officials , the organization opened two shelters for residents in low lying areas . Several floodgates in New Orleans were closed before the storm made landfall , and many universities and government offices were closed as well . Parishes along the coastline closed summer camps and prepared sand bags , boats , and high wheeled vehicles . Officials declared a voluntary evacuation for Grand Isle , though few residents heeded the recommendation . Louisiana Governor Mike Foster declared a statewide state of emergency to easily make state resources available , and Mississippi Governor Ronnie Musgrove made a similar declaration for Harrison , Hancock , and Jackson Counties , where shelters were also opened . Officials in Mississippi ordered the evacuation of flood prone areas in anticipation for a moderate storm surge and above normal tides .

= = Impact = =

Bill caused four direct deaths along its path , as well as minor to moderate damage . Damage estimates totaled to over \$ 50 million ( 2003 USD , \$ 55 million 2007 USD ) , primarily as a result of flooding or tornadic damage . Throughout its path , Bill spawned 34 tornadoes , ranking it fourteenth in the list of North Atlantic hurricanes generating the most tornadoes . The tornado outbreak was caused by wind shear , moist air from the storm , and cool air from an approaching cold front . In spite of the large numbers of tornadoes , most were weak and short lived . Prior to forming , the storm produced rainfall along coastal areas of Mexico along the Bay of Campeche , peaking at nearly 4 inches ( 100 mm ) in Yucatán , and over 3 inches ( 75 mm ) in Campeche .

= = = Western Gulf Coast = = =

The outer bands of Bill dropped light rain across southeastern Texas , peaking at 1.07 inches ( 27 mm ) in Jamaica Beach . Sustained winds from the storm remained weak , and peak wind gusts were 20 mph ( 32 km / h ) in eastern Galveston County . Upon making landfall , Bill caused a storm surge of up to 3.81 feet ( 1.17 m ) at Pleasure Pier . Effects in Texas were minimal , limited to minor beach erosion on the Bolivar Peninsula .

A moderate storm surge accompanied Tropical Storm Bill as it made landfall on Louisiana . In the state , the maximum reported surge was 5.8 feet ( 1.77 m ) , and it occurred at the Louisiana Universities Marine Consortium facility in Chauvin . In Montegut , the surge breached a levee still was damaged from the effects of Hurricane Lili 9 months before . The breach flooded many homes in the town , forcing the evacuation of an entire neighborhood . As a result , 150 homes in the town were damaged , with half of them severely . The storm surge affected numerous low lying cities in southeastern Louisiana by flooding roadways , including the only road to Grand Isle , stranding residents and visitors . The road was opened a day after the storm as floodwaters receded . The floodwaters entered a few homes and businesses in St. Tammany Parish . Damage from the storm surge totaled to \$ 4.1 million ( 2003 USD ) . Rough waves sank two boats offshore , though their occupants were rescued .

The tornado outbreak associated with the storm began with an F0 in St. Bernard Parish that destroyed a boat house . A short lived F1 tornado touched down in Reserve , striking a private high school , where it destroyed one half of one classroom and damaged several others . Later , the F1 tornado passed through a trailer park and severely damaged or destroyed 20 trailers . One trailer with a woman and three children was lifted into the air and dropped 30 feet ( 9.1 m ) away ; although all four occupants were injured none of them was wounded seriously . Damage from the tornado amounted to \$ 2 million ( 2003 USD , \$ 2.57 million 2016 USD ) . A third tornado , rated an F0 , struck Orleans Parish , damaging a car and a portion of a roof .

Winds of 35 to 45 mph ( 55 to 70 km / h ) were common across southeastern Louisiana , with the highest sustained wind being 53 mph ( 85 km / h ) in Chauvin and a peak gust of 62 mph ( 100 km / h ) on the northern end of the Lake Pontchartrain Causeway . The winds knocked trees and tree branches into power lines , leaving 224 @, @ 000 residents without power . The storm dropped moderate to heavy amounts of precipitation , peaking at 10 @. @ 2 inches ( 259 mm ) at a location 6 miles ( 9 @. @ 6 km ) south of Folsom . The rainfall led to flash flooding , which inundated roads and cars and overwhelmed local drainage capacities . The rainfall also led to overflowed rivers and creeks , resulting in flooding along the Tangipahoa River in southern Tangipahoa Parish , and the Bogue Falaya and Tchefuncte River in St. Tammany Parish . The Bogue Falaya River crested at 57 feet ( 17 @. @ 4 m ) on July 1 , 12 feet ( 3 @. @ 7 m ) above flood stage , which became a record for the recording station . The flooding damaged several structures and roadways . Less severe river flooding occurred in Washington and Livingston Parishes . In all , damage in Louisiana totaled to \$ 44 million ( 2003 USD , \$ 56 @. @ 6 million 2016 USD ) .

= = = Eastern Gulf Coast = = =

Upon making landfall , Bill produced a peak storm surge of 4 @. @ 99 feet ( 1 @. @ 5 m ) in Waveland , Mississippi . The storm surge led to beach erosion , damage to piers , and flooded roadways , with damage from the surge amounting to around \$ 1 million ( 2003 USD , \$ 1 @. @ 29 million 2016 USD ) . The maximum sustained wind from the storm recorded in Mississippi was 43 mph ( 69 km / h ) , at the Gulfport @- @ Biloxi International Airport , while the airport and Keesler Air Force Base both reported a peak wind gust of 52 mph ( 84 km / h ) . Tropical Storm Bill dropped moderate to heavy rainfall across the state , peaking at 9 @. @ 49 inches ( 241 mm ) in Van Cleave . The moderate wind gusts , along with the saturated ground , downed trees in several locations . 34 roads in Pike and Walthall Counties were blocked by fallen trees , and two homes were damaged . Additionally , power outages were reported near the coast . The rainfall flooded streets in various portions of the state and led to overflowed rivers . An overflowed creek in Pearl River County flooded structures and roadways . The outer rainbands of Bill produced a weak tornado that touched down briefly in Waveland , blowing down several trees which resulted in minor damage to roofs . Statewide damage accrued to \$ 5 million ( 2003 USD , \$ 6 @. @ 43 million 2016 USD ) , primarily from flooding .

As Tropical Storm Bill made landfall on Louisiana , its effects were felt in the Alabama coast as well , as heavy surf and tidal flooding pounded the coastline of the state . High waters closed a road to Dauphin Island and portions of a road along Mobile Bay . Bill dropped over 3 inches ( 25 mm ) of rain across the southern half of Alabama , with isolated locations receiving over 8 inches ( 205 mm ) . Due to wet conditions for months preceding the storm , rainfall from Bill led to flash flooding in many counties . The deluge led to overflowed rivers and streams , and left several roadways temporarily impassable from high floodwaters . Saturated grounds and wind gusts of 30 to 35 mph ( 45 to 55 km / h ) downed numerous trees . Many downed trees landed on power lines , which caused power outages for around 19 @, @ 000 people . One downed tree destroyed a car , and another damaged a roof of a house . In Lee County , a man was required to be rescued after driving through high flood waters . Roadway flooding resulted in a few minor traffic accidents . Also , the outer bands of the storm spawned an F1 tornado in Crenshaw County . Early in its path , it was narrow , and damage was limited to downed trees , two destroyed sheds , and a few houses experiencing light shingle damage or damage from fallen trees . Later , it expanded to reach a width of 1 @, @ 800 feet ( 548 m ) as it moved northwestward . The tornado destroyed the roofs of two houses , one of which experienced damage to its walls . The tornado dissipated eight minutes after its 3 mile ( 5 km ) path began , resulting in \$ 200 @, @ 000 in damage ( 2003 USD , \$ 257 thousand 2016 USD ) and only slight injuries . A second tornado , rated F0 in the Fujita scale , occurred in southwestern Montgomery County . A small tornado with a width of only 180 feet ( 55 m ) , it moved to the northwest and tore down a few trees that fell onto a mobile home , a house , and two cars . The tornado dissipated six minutes after its 5 mile ( 8 km ) path began . Throughout Alabama , Tropical Storm Bill caused around \$ 300 @, @ 000 in damage ( 2003 USD , \$ 386 thousand 2016

USD ) .

Rainfall from the storm began affecting Florida a few days before the storm formed , and locations in the southern portion of the state received over 3 inches ( 75 mm ) of rain . Along the Florida Panhandle , Bill dropped over 8 inches ( 205 mm ) of rain as it made landfall , closing several roads or leaving them impassable due to flooding . A stationary line of thunderstorms in Okaloosa County produced downpours of up to 6 inches ( 150 mm ) in one hour , resulting in flash flooding which washed out a portion of a bridge . In Bay County , heavy rainfall and flooding damaged 40 homes , while several residents in an apartment in Parker needed to be rescued by boat from the floodwaters . Rough surf produced by the storm killed two swimmers at Panama City Beach , while a dozen had to be rescued . Part of the tornado outbreak spawned by the storm extended into northern Florida . Damage in Florida totaled to around \$ 1 million ( 2003 USD , \$ 1 @.@ 29 million 2016 USD ) .

= = = Southeastern U.S. = = =

Tropical Storm Bill dropped light rainfall of around 1 inch ( 25 mm ) in northeastern Arkansas and southeastern Missouri , and over 5 inches ( 125 mm ) in isolated parts of eastern Tennessee . The storm also produced moderate rainfall in northwestern Georgia , which peaked at 7 @.@ 1 inches ( 180 mm ) in Monroe . Areas in southeastern Georgia received generally around 1 inch ( 25 mm ) , although some coastal areas did not receive any precipitation from the storm . Rainfall resulted in flooding in numerous locations around the Atlanta metropolitan area , leaving some roads impassable or closed . The combination of moist air from the south , cool temperatures from a cold front to the north , and low pressures led to the development of supercells throughout Georgia and South Carolina , several of which produced tornadoes . An F1 tornado touched down 3 miles ( 5 km ) north @.@ northeast of Pennington ; first it passed through a farm , causing severe damage to two dairy sheds , a John Deere tractor , and three metal storage buildings . The tornado destroyed a hay barn , a carport , and a car inside the carport as well , while also causing a tree to fall and kill one cow . The tornado passed through a forested area , where it toppled or sheared off hundreds of trees . As it entered a more urban area , it downed 30 isolated trees , some of which fell on a portion of Interstate 20 , temporarily closing the roadway . The tornado damaged seven houses , primarily to roof damage , although one experienced damage to several windows , while another had a utility trailer and a car damaged by fallen trees ; a commercial building was damaged as well . An F2 tornado was reported in Clito , which knocked down trees and damaged mobile homes . Severe thunderstorms from the remnants of Bill caused considerable damage to a house near Louisville and knocked down several trees . Moreover , a tornado was briefly associated with the storms . Bill also caused thunderstorms in Kite which uprooted several trees onto a car and a house . One man in Atlanta died due to a falling tree . Damage in Georgia totaled to \$ 244 @,@ 500 ( 2003 USD , \$ 315 thousand 2016 USD ) .

The tornado outbreak spawned by Bill was the greatest in the Charleston , South Carolina National Weather Service area since the outbreak provoked by Hurricane Earl in 1998 . One such tornado was an F1 that struck Hampton , which uprooted trees and downed power lines . The tornado severely damaged a Dollar General store , while several houses were damaged from fallen trees . An F1 tornado also touched down near Smoaks , which uprooted several trees , resulted in a crush car due to a fallen tree , caused severe roof damage to a mobile home , and killed one dog . The storm produced heavy rainfall in the northern portion of the state , with some locations reporting over 7 inches ( 175 mm ) . The rainfall resulted in flash flooding in areas , which caused some damage .

In North Carolina , the remnants of the storm dropped around 5 inches ( 125 mm ) in the east @.@ central part of the state , while the southwestern portion of the state received totals of over 7 inches ( 175 mm ) . In Raleigh , a boy drowned from the floodwaters . The tornado outbreak from the storm extended into North Carolina , though specifics are unknown . Bill produced light to moderate precipitation in the Mid @.@ Atlantic , including over 5 inches ( 125 mm ) in central Virginia . In Virginia , a line of thunderstorms from the system produced small amounts of hail in Falls Church . The tornado outbreak associated with Bill ended in New Jersey ; a narrow F0 tornado briefly

touched down in a marsh near Goshen . The tornado remained away from the city , and caused no damage or injuries .

= = Aftermath = =

By one day after the storm , power companies restored electricity to 151 @, @ 000 customers . Citizens in Montegut circulated a petition for a class @-@ action lawsuit in response to the levee failure . The American Red Cross set up a church in Reserve as an emergency shelter . Only five people stayed the first night , resulting in the organization to convert it to a family services center . Over 100 families asked for food assistance . The Red Cross also set up a shelter in Houma , where 14 people stayed .