

= Effects of Hurricane Katrina in Florida =

The effects of Hurricane Katrina in Florida were in both in the southern portion of the state and in the panhandle . After developing on August 23 , Katrina made landfall near the border of Broward and Miami @-@ Dade counties with 80 mph (130 km / h) winds on August 25 . While it was crossing the state , the hurricane 's convection was asymmetrical , primarily located to the south and east of the center . As a result , high rainfall totals occurred in the Miami area , peaking at 16 @.@ 43 in (417 mm) in Perrine . The rains caused flooding , and the combination of rains and winds downed trees and power lines , leaving 1 @.@ 45 million people without power . Damage in South Florida was estimated at \$ 523 million (2005 USD) , mostly as a result of crop damage . Further south , the hurricane spawned a tornado in the Florida Keys . In the island chain , Katrina dropped heavy rainfall and gusty winds .

After emerging from the state , Katrina intensified into one of the strongest Atlantic hurricanes , becoming a Category 5 on the Saffir @-@ Simpson Hurricane Scale . It moved ashore in Louisiana and Mississippi , although the hurricane 's outer periphery produced a 5 @.@ 37 ft (1 @.@ 64 m) storm surge in Pensacola along the panhandle . High waves caused beach erosion and closed nearby roadways . There were five tornadoes in northwestern Florida . Damage was estimated along the panhandle at \$ 100 million . Throughout the state , the hurricane killed 14 people , of which 6 were directly related to the storm 's effects . Due to damage from Katrina , 11 Florida counties were declared federal disaster areas .

= = Background = =

Hurricane Katrina developed as Tropical Depression Twelve over the Bahamas on August 23 , partially from the remains of Tropical Depression Ten . As it moved slowly northwestward , it developed organized convection , or thunderstorms , and it intensified into a tropical storm on August 24 . A building ridge turned Katrina to the west , bringing it over the Gulf Stream . With warm waters and favorable outflow , the storm continued strengthening . At around 2100 UTC on August 25 , Katrina attained hurricane status , based on observations from the Hurricane Hunters . Intensification of the ridge to its north caused the hurricane to turn to the west @-@ southwest , and as it approached the Florida coastline Katrina developed a well @-@ defined eye . At 2230 UTC on August 25 , Katrina made landfall near the border of Miami @-@ Dade and Broward counties with winds of around 80 mph (130 km / h) . The hurricane moved southwestward and crossed Florida in about six hours , during which its eye became better defined . During its passage , northerly wind shear shifted the deepest convection to the south and east of the center , and Katrina briefly weakened to a tropical storm before emerging into the Gulf of Mexico early on August 26 . After emerging from the state , Katrina intensified into one of the strongest Atlantic hurricanes , becoming a Category 5 on the Saffir @-@ Simpson Hurricane Scale . Katrina ultimately moved ashore in southeastern Louisiana on August 29 , where it caused severe storm surge flooding and catastrophic damage ; it dissipated the following day .

In the preceding 2004 season , Florida was affected by four hurricanes , including hurricanes Frances and Jeanne which hit Martin County and caused billions in damage .

= = Preparations = =

About nine hours after the system developed on August 24 , the National Hurricane Center (NHC) issued a tropical storm watch from the Seven Mile Bridge to Vero Beach . Later that day , the watch was upgraded to a tropical storm warning and hurricane watch from Florida City to Vero Beach after the storm 's intensification became apparent . About 25 hours before Katrina made landfall , the tropical storm watch was extended northward to Titusville , and a tropical storm warning and a hurricane watch was issued for Lake Okeechobee . Early on August 25 , a hurricane warning was issued from Florida City to Vero Beach and for Lake Okeechobee . In southeastern Florida , the lead time for the hurricane watch and warning occurred 31 @.@ 5 and 19 @.@ 5 hours before landfall ,

respectively ; both were 16 @. @ 5 hours less than the desired lead time . A tropical storm warning was also issued from Florida Key , southward through the Florida Keys to the Dry Tortugas , and northward along the western coast to Longboat Key . The warning in the Florida Keys occurred only nine hours before the onset of tropical storm force winds .

On August 25 , Florida 's Emergency Operations Center was activated in Tallahassee to monitor the progress of the hurricane . Before Katrina moved ashore , schools and businesses were closed in the Miami area . Cruise ships altered their paths due to seaports in southeastern Florida closing . Officials in Miami @-@ Dade County advised residents in mobile homes or with special needs to evacuate . To the north in Broward County , residents east of the Intracoastal Waterway or in mobile homes were advised to leave their homes . Evacuation orders were issued for offshore islands in Palm Beach County , and for residents in mobile homes south of Lantana Road . Shelters were opened across the region . Officials closed the Miami International Airport , Fort Lauderdale ? Hollywood International Airport , Key West International Airport , and Florida Keys Marathon Airport due to the storm . In Monroe and Collier counties , schools were closed , and a shelter was opened in Immokalee .

While Katrina was intensifying as a major hurricane on August 28 , the NHC issued a tropical storm warning and hurricane watch from the Alabama border to Destin along the panhandle . The warning was later extended to Indian Pass . Officials issued a mandatory evacuation for portions of Walton , Gulf , Franklin , and Wakulla counties .

= = Impact = =

Overall , Hurricane Katrina killed 14 people in the state , of which 6 were directly related to the storm . Six of the indirect deaths were in South Florida , of which three were from carbon monoxide poisoning caused by generators , one was due to a vehicle accident , one occurred during debris cleanup , and one was associated with a lack of electricity . At least five people were injured due to carbon monoxide poisoning . Overall damage totaled \$ 623 million (2005 USD) .

= = = Miami area = = =

While moving across Florida , Katrina had an asymmetric area of thunderstorms , which placed the strongest winds and rainfall over Miami @-@ Dade County . The highest precipitation total related to hurricane in the United States was 16 @. @ 43 in (417 mm) in Perrine , or about halfway between Miami and Homestead . Of the total , 15 @. @ 10 in (384 mm) fell in 24 hours . During its passage , the eye of the hurricane moved directly over the office of the National Hurricane Center , which reported a wind gust of 87 mph (140 km / h) . The strongest sustained winds in Florida was a report of 72 mph (116 km / h) on the roof of the Rosenstiel School of Marine and Atmospheric Science in Virginia Key . The same station recorded a gust of 94 mph (151 km / h) . Unofficially , wind gusts reached 97 mph (156 km / h) at Homestead General Aviation Airport . The hurricane 's accompanying storm surge was small , estimated at around 2 ft (0 @. @ 61 m) . Consequentially , there was minor beach erosion and isolated coastal flooding .

The heavy rainfall flooded neighborhoods in the area , damaging over 100 houses . The storm left about 1 @. @ 4 million people without power in Palm Beach , Broward , and Miami @-@ Dade counties . In Broward County north of Katrina 's first landfall , the hurricane dropped light rainfall , ranging from 2 to 4 in (51 to 102 mm) . Downed trees killed three people in the county . Train and bus service was disrupted in the Miami area . Property damage was estimated at \$ 100 million . Widespread flooding affected crop nurseries and greenhouses , and crop damage totaled \$ 423 million . Three people drowned in Miami @-@ Dade County , two of whom on boats .

= = = Florida Keys and Monroe County = = =

Katrina weakened into a tropical storm while moving across Monroe County . Tides reached 3 to 5 ft (0 @. @ 91 to 1 @. @ 52 m) in mainland Monroe County , which flooded several houses and

vehicles in Flamingo in Everglades National Park . Most of the Florida Keys reported tropical storm @-@ force winds . A station on Key West reported sustained winds of 61 mph (98 km / h) , with gusts to 74 mph (119 km / h) . While the storm passed to its north , the city reported a storm surge of about 2 ft (0 @.@ 61 m) . The storm 's outer rainbands spawned an F2 tornado in Marathon on August 26 , which damaged an airport hangar and several homes . This was one of only six F2 tornadoes in the Florida Keys since 1950 . Similar to the Miami area , Katrina dropped heavy rainfall in the Florida Keys , reaching 10 @.@ 05 in (255 mm) in Key West . In the area , the storm left about 5 @,@ 000 people without power . After Katrina re @-@ intensified into a hurricane , a station on the Dry Tortugas reported sustained winds of 82 mph (132 km / h) , with gusts to 105 mph (169 km / h) .

= = = Elsewhere in Florida = = =

Light rains and winds spread into the Melbourne National Weather Service region . Kennedy Space Center reported wind gusts to 46 mph (74 km / h) , although there was no damage or erosion in the area . In southwestern Florida , the storm produced a storm surge of 1 @.@ 13 ft (0 @.@ 34 m) in St. Petersburg . In the central portion of the state , some areas for pasture were flooded due to outer rainbands .

= = = Florida panhandle = = =

After striking southeastern Louisiana , Hurricane Katrina made its final landfall in Mississippi , during which it produced a storm surge of about 5 @.@ 37 ft (1 @.@ 64 m) in Pensacola . The hurricane struck months after Hurricane Dennis affected the same area . In St. Marks , the surge flooded several businesses , and in Walton County , high tides flooded several roads , including portions of U.S. Highways 98 and 331 . The storm caused moderate to severe beach erosion along the gulf coast , and washed sand onto many coastal roads . Winds along the Florida panhandle peaked at 56 mph (90 km / h) in Pensacola , with gusts to 71 mph (114 km / h) . High winds briefly closed the Interstate 10 bridge over Escambia Bay in Pensacola . The outer rainbands of the hurricane spawned five tornadoes , all of them weak and not very damaging . Rainfall along the panhandle reached 7 @.@ 80 in (198 mm) in Philpot , which caused flooding .

The winds caused damage to some trees and structures and there was some minor flooding in the panhandle . There were two indirect fatalities from Katrina in Walton County as a result of a traffic accident . Along the Florida panhandle , 77 @,@ 000 customers lost power . Damage along the panhandle was estimated at \$ 100 million .

= = Aftermath = =

On August 28 , or about three days after Katrina struck the state , President George W. Bush declared a disaster area for Miami @-@ Dade and Broward counties , which allocated federal funding for debris removal and other emergency services . Three days later , Monroe County was also declared a disaster areas , and on the same day the three counties were designated to receive funding for public assistance ; this included aid to repair roads and bridges , water control facilities , public buildings , and recreation areas . The declaration was determined after the Federal Emergency Management Agency (FEMA) sent 20 State Emergency Response Teams to determine the extent of damage . After Hurricane Katrina struck the Gulf Coast , President Bush declared a disaster area for seven counties along the Florida panhandle on September 6 ; the counties were Bay , Escambia , Franklin , Gulf , Okaloosa , Santa Rosa , and Walton . In addition , Collier County in southwestern Florida was added to the list of disaster areas .

In the two months after Katrina struck south Florida , Hurricane Rita brushed the region in late September with tropical storm @-@ force winds and flooding rains . In late October , Hurricane Wilma struck southwestern Florida as a major hurricane , affecting the Miami area with hurricane @-@ force winds that left 98 % of south Florida without power . Including Hurricane Dennis in July ,

FEMA provided \$ 1 billion in public assistance to Florida residents in association with the four hurricanes in 2005 .