

= Hurricane Gustav ( 2002 ) =

Hurricane Gustav was a Category 2 hurricane that paralleled the East Coast of the United States in September 2002 during the 2002 Atlantic hurricane season . It was the seventh named storm and first hurricane of the season . Initially a subtropical depression north of the Bahamas , Gustav passed slightly to the east of the Outer Banks of North Carolina as a tropical storm before moving northeastward and making two landfalls in Atlantic Canada as a Category 1 hurricane . The storm was responsible for one death and \$ 100 @, @ 000 in damage , mostly in North Carolina . The interaction between Gustav and a non @-@ tropical system produced strong winds that caused an additional \$ 240 @, @ 000 ( 2002 USD ) in damage in New England , but this damage was not directly attributed to the hurricane .

Gustav spent the early part of its existence as a subtropical storm , and was the first such storm to be named from the current lists by the National Hurricane Center . Previously , subtropical storms were not given names . The cyclone was also the latest @-@ forming first hurricane of the season since 1941 .

= = Meteorological history = =

An area of disturbed weather in association with a weak surface trough and a stronger upper @-@ level trough between the Bahamas and Bermuda developed on September 6 . High pressure ridging strengthened by Tropical Storm Fay caused the trough to become more organized and close off into a broad non @-@ tropical low on September 7 . By September 8 , the system had developed enough convection near its center of circulation to be classified Subtropical Depression Eight while located southeast of Cape Hatteras , North Carolina . Later that day , data from a Hurricane Hunter reconnaissance aircraft indicated that the system had strengthened into a subtropical storm , and the depression was upgraded to Subtropical Storm Gustav .

Gustav moved erratically to the west @-@ northwest toward the North Carolina @-@ South Carolina border over the next two days , it slowly strengthened , acquiring more tropical characteristics . On September 10 , a poorly organized band of stronger winds developed around the center , and Gustav was designated a fully tropical storm shortly before turning toward the north and brushing Cape Hatteras , then accelerating toward the northeast and away from the coast . On September 11 , while under the influence of a non @-@ tropical system over New England , Gustav quickly strengthened into a hurricane , in a process similar to the intensification of Hurricane Michael in 2000 . Gustav reached its peak intensity of 100 mph ( 160 km / h ) later that day .

The hurricane began to slowly weaken and lose tropical characteristics on early September 12 as it moved over colder waters and encountered increasing wind shear . However , the storm was moving quickly enough to make landfall over Cape Breton , Nova Scotia as a Category 1 hurricane on September 12 . Later that morning , Gustav made a second landfall in Newfoundland and became extratropical shortly after . The extratropical low continued moving slowly to the northeast before dissipating over the Labrador Sea on September 15 .

= = Preparations = =

On September 8 , forecasters at the National Hurricane Center predicted that Gustav would approach the North Carolina coast , and issued a tropical storm watch from Cape Fear to the North Carolina ? Virginia border . The tropical storm watch was upgraded to a tropical storm warning on September 9 , and a new tropical storm watch was issued later that day for areas of southeastern Virginia , from the North Carolina ? Virginia border to New Point Comfort . The new watch was upgraded to a tropical storm warning on September 10 . As Gustav began to turn to the northeast and away from the Mid @-@ Atlantic coast , the tropical storm warnings were gradually discontinued . The last warning was discontinued on September 11 .

As Gustav approached Atlantic Canada , Environment Canada and the Canadian Hurricane Centre issued heavy rain and wind warnings for southern New Brunswick , Prince Edward Island , Nova

Scotia , and Newfoundland .

= = Impact = =

= = = North Carolina and Virginia = = =

Although the center of Gustav passed just to the east of Cape Hatteras , areas of North Carolina and southeastern Virginia experienced heavy rain and tropical storm force winds . Parts of the Outer Banks received 2 ? 5 inches ( 50 ? 125 mm ) of rain and winds of up to 50 mph ( 80 km / h ) , and the Coast Guard station at Cape Hatteras reported a wind gust of 78 mph ( 125 km / h ) . The storm produced storm surges of 3 ? 6 feet ( 1 @. @ 8 m ) along the Outer Banks , and 1 ? 3 feet ( 0 @. @ 91 m ) along the southeastern coast of Virginia . These surges , combined with strong winds and high sea swells , resulted in minor flooding , mainly in Ocracoke and Hatteras Village , North Carolina . A weak waterspout also touched down on Silver Lake near Ocracoke and moved onshore , but only minor roof damage was reported . Sporadic power outages were also reported . One person died after suffering injuries in the high surf , and 40 other people had to be rescued from riptides and storm surges . Damage in the region amounted to \$ 100 @, @ 000 ( 2002 USD ) .

= = = New Jersey = = =

Although the center of Gustav remained well offshore , the difference in pressure between it and a high pressure area over the central United States caused strong winds in areas of New Jersey on September 11 . Wind gusts ranged from 35 ? 45 mph ( 55 ? 70 km / h ) , with stronger winds reported near the coast . A maximum wind gust of 60 mph ( 100 km / h ) was reported at Keansburg . The strong winds downed trees and power lines throughout the eastern half of the state , damaging homes and blocking streets . At least 14 @, @ 000 homes in the vicinity of Burlington and Ocean Counties were left without power . In West Windsor Township , a man was killed when the upper section of a concrete wall he was working on blew over and crushed him . The other death occurred in West Amwell Township , where a tree limb fell on two elderly women , killing one and injuring the other . Elsewhere , while there were reports of trees falling on vehicles , no other serious injuries or deaths were reported .

= = = New York and New England = = =

The interaction between Gustav and the non @-@ tropical system caused strong winds that affected areas of coastal New England , mainly in eastern New York and Massachusetts . Some areas reported storm @-@ force wind gusts of over 55 mph ( 90 km / h ) , and a maximum wind gust of 67 mph ( 108 km / h ) was reported by a weather spotter in Catskill , New York . Wind gusts of up to 50 mph ( 80 km / h ) were reported in areas of Massachusetts . The winds downed trees and power lines , and several homes and cars were damaged by fallen trees . Over 29 @, @ 000 homes were left without power in eastern New York , and 19 @, @ 000 homes lost power in Massachusetts . In all , the winds caused \$ 240 @, @ 000 ( 2002 USD ) in damage , but this damage was not directly attributed to Gustav in the National Hurricane Center 's analysis .

In the New York City area , a peak wind gust of 60 mph ( 100 km / h ) was reported at John F. Kennedy International Airport . The winds caused some minor roof damage to buildings , and forced officials in New York City to cordon off parts of Manhattan as debris ranging from wrapping paper to crushed soda cans was blown about . This debris injured four people , one critically , and disrupted a 9 / 11 memorial service , though it continued as planned .

Sustained winds of 25 ? 35 mph ( 40 ? 55 km / h ) , with gusts up to 55 mph ( 90 km / h ) , were reported throughout Long Island . Damage on the island was mainly limited to downed trees and power lines , although the Long Island Power Authority reported that at least 93 @, @ 000 homes lost power during the day on September 11 . One person was killed when his boat capsized in the

Long Island Sound .

== Atlantic Canada ==

Despite gradually losing its tropical characteristics , Gustav brought heavy rain , storm and hurricane force winds , and storm surges to areas of Atlantic Canada for several days . Strong winds knocked down trees and damaged docks in Nova Scotia , and a wind gust of 75 mph ( 122 km / h ) was reported on Sable Island . Gusts to over 60 mph ( 100 km / h ) were reported in Newfoundland for several days after the center of Gustav moved out of the area . Rainfall amounts generally ranged from 0 @. @ 3 ? 2 @. @ 7 inches ( 10 ? 70 mm ) , with a maximum of 4 inches ( 102 mm ) in Ashdale , Nova Scotia . Several locations set new daily rainfall records . Localized flooding was reported in areas of Prince Edward Island , and 4 @, @ 000 people in Halifax , Nova Scotia and Charlottetown , Prince Edward Island were left without power . Despite the heavy rain and wind , there were no reports of deaths or significant damage in Atlantic Canada .

== Naming and records ==

Gustav was the first subtropical storm to be given a name from the current name lists by the National Hurricane Center . Prior to the 2002 season , Atlantic subtropical storms were either not named or given a number from a separate numbering list than tropical cyclones .

When Gustav attained hurricane status on September 11 , it became the latest first hurricane to form in any season since the 1941 season , when the first hurricane developed on September 16 . According to climatology , an average of three hurricanes form by September 11 of each year .