

= 1963 Atlantic hurricane season =

The 1963 Atlantic hurricane season featured one of the deadliest tropical cyclones on record in the Atlantic basin : Hurricane Flora . The season officially began on June 15 , and lasted until November 15 . These dates conventionally delimit the period of each year when most tropical cyclones form in the Atlantic basin . It was a near @-@ average season in terms of tropical storms , with a total of nine named storms . The first system , Hurricane Arlene , developed between Cape Verde and the Lesser Antilles on July 31 . The storm later impacted Bermuda , where strong winds resulted in about \$ 300 @,@ 000 (1963 USD) in damage . Other storms such as hurricanes Beulah and Debra , as well as an unnamed tropical storm , did not impact land . During the month of September , Hurricane Cindy caused wind damage and flooding in Texas , leaving three deaths and approximately \$ 12 @.@ 5 million in damage . Hurricane Edith passed through the Lesser Antilles and the eastern Greater Antilles , causing 10 deaths and about \$ 43 million in damage , most of which occurred on Martinique .

The most significant storm of the season was Hurricane Flora , which peaked as a Category 4 hurricane on the Saffir ? Simpson hurricane wind scale . Drifting slowly and executing a cyclonic loop , Flora dropped very heavy rainfall in the Greater Antilles , including over 100 in (2 @,@ 500 mm) in Cuba . Extreme flooding ensued , leaving behind at least 7 @,@ 193 fatalities and about \$ 773 @.@ 4 million in damage . Flora is thus listed among the deadliest Atlantic hurricanes on record . In October , Hurricane Ginny moved erratically offshore the Southeastern United States , though eventually , the extratropical remnants struck Nova Scotia . Ginny caused at least three deaths and \$ 400 @,@ 000 in damage in the United States alone . The final cyclone , Tropical Storm Helena , caused five deaths and over \$ 500 @,@ 000 in damage on Guadeloupe . Overall , the storms in this season caused at least 7 @,@ 225 deaths and about \$ 830 @.@ 1 million in damage .

= = Season summary = =

The 1963 hurricane season officially began on June 15 and ended on November 15 . It was a near @-@ average with nine tropical storms , slightly less than the 1950 ? 2000 average of 9 @.@ 6 named storms . Seven of these reached hurricane status , which is above the 1950 ? 2000 average of 5 @.@ 9 . Furthermore , two storms reached major hurricane status , which is Category 3 or higher on the Saffir ? Simpson hurricane wind scale . Early in the season , activity was suppressed by an abnormally intense trough offshore the East Coast of the United States as well as strong westerly winds . Later , tropical cyclone formation occurred more often after a portion of the trough weakened and easterly flow increased across much of the Atlantic . A total of four hurricanes made landfall during the season , causing at least 7 @,@ 225 deaths and \$ 830 @.@ 1 million in damage . Hurricane Ginny and Tropical Storm Helena also caused damage and deaths , despite remaining offshore and then after becoming extratropical .

Tropical cyclogenesis began late , with Hurricane Arlene developing on July 31 . Another system formed in August , Hurricane Beulah . September was much more active , with an unnamed tropical storm , as well as hurricanes Cindy , Debra , Edith , and Flora all developing in that month . Flora was the most intense tropical cyclone of the season , peaking as a Category 4 hurricane with winds of 145 mph (230 km / h) and a minimum barometric pressure of 940 mbar (27 @.@ 76 inHg) . There were two other system in October , Hurricane Ginny and Tropical Storm Helena ; the latter dissipated on October 29 .

The season 's activity was reflected with an above average accumulated cyclone energy (ACE) rating of 118 . ACE is , broadly speaking , a measure of the power of the hurricane multiplied by the length of time it existed , so storms that last a long time , as well as particularly strong hurricanes , have high ACEs . It is only calculated for full advisories on tropical systems at or exceeding 39 mph (63 km / h) , which is tropical storm strength . Subtropical cyclones are excluded from the total .

= = Storms = =

== Hurricane Arlene ==

A cloud mass developed into the first tropical depression of the season at 18 : 00 UTC on July 31 while located about halfway between the Lesser Antilles and Cape Verde . It headed west , becoming a tropical storm on August 2 . Arlene soon rapidly intensified , acquiring 100 mph (155 km / h) maximum sustained winds ? ranking it as a Category 2 hurricane ? later that day . However , lack of outflow caused it to weaken to a tropical depression by August 4 . The storm failed to significantly reorganize until August 7 , by which time it restrengthened into a tropical storm . The following day , Arlene re @-@ intensified into a hurricane before passing directly over Bermuda . Several hours after passing the island , the hurricane reached its peak intensity with winds of 105 mph (165 km / h) and a barometric pressure of 969 mbar (28 @.@ 6 inHg) . On August 11 , Arlene transitioned into an extratropical cyclone before being absorbed by another cyclone later that day .

Along its track , several hurricane warnings and watches were issued for the Leeward Islands ; however , no damage was reported on any of the islands . The storm has its greatest impact in Bermuda , where high winds and near @-@ record rainfall of 6 @.@ 05 inches (154 mm) downed trees , power lines , and caused flooding . Damages across the island amounted to \$ 300 @,@ 000 (1963 USD) .

== Hurricane Beulah ==

On August 20 , a tropical wave developed into a tropical depression while situated about 635 mi (1 @,@ 020 km) north @-@ northwest of Cayenne , French Guiana . Moving west @-@ northwestward , the depression strengthened into Tropical Storm Beulah around 06 : 00 UTC on the following day . Later on August 21 , the first reconnaissance aircraft flight into the storm observed winds of 52 mph (84 km / h) and a barometric pressure of 1 @,@ 005 mbar (29 @.@ 68 inHg) . A subsequent flight into Beulah on August 22 recorded a well @-@ defined eye , winds of 78 mph (126 km / h) , and a barometric pressure of 994 mbar (29 @.@ 35 inHg) . As a result , the storm was upgraded to a Category 1 hurricane around 12 : 00 UTC . Shortly thereafter , Beulah curved north @-@ northwestward and continued to deepen . Early on August 23 , it strengthened into a Category 2 hurricane .

The storm intensified into a Category 3 hurricane by early on August 24 , at which time Beulah attained its peak intensity with maximum sustained winds of 120 mph (195 km / h) and a minimum barometric pressure of 958 mbar (28 @.@ 29 inHg) . Radar imagery depicted an elliptical eye with a diameter of 20 to 30 mi (32 to 48 km) . The hurricane turned to the north , where an anticyclone that was favoring development to its south caused unfavorable conditions . Beulah weakened to a minimal hurricane , but briefly re @-@ intensified into a Category 2 hurricane before racing to the northeast under the influence of an upper @-@ level trough offshore the East Coast of the United States . Early on August 28 , the hurricane transitioned into an extratropical cyclone about 250 mi (400 km) east of Newfoundland .

== Tropical Storm Three ==

As early as September 8 , ships north of Puerto Rico reported a weak circulation . Drifting northward , the system developed tropical depression by 06 : 00 UTC on September 10 , while situated about 150 mi (240 km) southwest of Bermuda . The cyclone was subtropical in nature , fueled by both latent heat and instability from contrasting cool and warm air masses . While passing Bermuda later on September 10 , sustained wind speeds of 25 mph (40 km / h) and decrease in barometric pressure were observed . The system moved east @-@ northeastward and strengthening into a tropical storm early the following day . By late on September 12 , the storm attained its peak intensity with maximum winds of 60 mph (95 km / h) and a minimum barometric pressure of 992 mbar (29 @.@ 3 inHg) . Around that time , the Freiburg observed winds of 78 mph

(126 km / h) . Thereafter , the system accelerated ahead of a cold front and became extratropical on September 14 , while located about 725 mi (1 167 km) north northwest of Corvo Island in the Azores . The extratropical remnants moved rapidly eastward , until dissipating well west of Ireland early on September 15 .

== Hurricane Cindy ==

In mid September , a trough of low pressure was situated in the Gulf of Mexico . The system developed into Tropical Storm Cindy at 12 : 00 UTC on September 16 , while located about 210 mi (340 km) south of Cameron , Louisiana . Cindy strengthened quickly while moving north northwestward and reached hurricane intensity early on September 17 . Around that time , the storm attained its peak intensity with maximum winds of 80 mph (130 km / h) and a minimum pressure of 996 mbar (29 .41 inHg) . Shortly after 12 : 00 UTC on September 17 , Cindy made landfall near High Island , Texas , with winds of 75 mph (120 km / h) . Early on September 18 , the hurricane weakened to a tropical storm and further to a tropical depression about six hours later . Turning southwest , the depression dissipated at 00 : 00 UTC on September 20 .

In southwestern Louisiana , over 15 in (380 mm) of rain fell in some areas . Rice crops were flooded , causing about \$ 360 000 in damage . However , the precipitation was described as more beneficial than detrimental . Along the coast , tides inundated roads leading to Cameron and Holly Beach . A man drowned offshore Cameron while evacuating from an oil rig . The storm brought flooding to the southeastern Texas , particularly in and around Port Arthur . Two people drowned in the Port Acres area . Water entered 4 000 homes across Jefferson , Newton , and Orange counties . In Oklahoma , flooding in Guthrie prompted 300 residents to flee their homes ; water intruded into 25 businesses and 35 homes . Overall , Cindy caused about \$ 12 .5 million in damage , of which \$ 11 .7 million stemmed from property damage .

== Hurricane Debra ==

On September 19 , a westward moving tropical wave became a tropical depression about 900 mi (1 400 km) east of the southwestern most islands of Cape Verde . Initially , the depression moved west northwestward and remained weak . Despite the system 's intensity at the time , a reconnaissance aircraft flight observed a radar eye on September 20 . While curving northward early on September 21 , the depression intensified into Tropical Storm Debra . Several hours later , Debra became a Category 1 hurricane . The cyclone peaked with maximum sustained winds of 75 mph (120 km / h) and a minimum barometric pressure of 999 mbar (29 .50 inHg) late on September 22 . Debra soon began weakening and fell to tropical storm status early the following day . The system began losing extratropical characteristics and was absorbed by an extratropical low late on September 24 , while located about halfway between Bermuda and Flores Island in the Azores .

== Hurricane Edith ==

An Intertropical Convergence Zone (ITCZ) disturbance developed into a tropical depression while east of the Windward Islands on September 23 . The depression strengthened into Tropical Storm Edith the next day . Only six hours later , Edith reached hurricane status . Edith fluctuated between Category 1 and 2 status as it moved west northwest ; its central pressure was analyzed at 978 mbar (28 .88 inHg) on September 24 . After striking Saint Lucia on September 25 , the storm traversed the eastern Caribbean Sea . Curving north northwest on September 26 , Edith made landfall near La Romana , Dominican Republic , early on the following day as a minimal hurricane . Interaction with land and an upper level trough caused Edith to weaken to a tropical storm on September 28 and to a tropical depression by the next day . The storm dissipated just east of the Bahamas on September 29 .

In Martinique , a wind gust of 127 mph (204 km / h) was observed at Le Lamentin Airport ; tides

about 8 ft (2 @. @ 4 m) above normal and heavy rainfall impacted the island . Throughout the island , about 6 @, @ 000 homes were demolished and 13 @, @ 000 other were severely impacted . Agriculture suffered significantly , with bananas and other food crops destroyed , while sugar cane experienced significant damage . Winds up to 80 mph (130 km / h) caused significant damage on Dominica and strong winds on Saint Lucia ruined about half of the island 's banana crop . In Puerto Rico , the storm brought heavy rainfall to the southwest corner of the island and abnormally high tides to the south coast . Several beach front properties were badly damaged , particularly in the Salinas municipality . Overall , Edith caused 10 deaths , all on Martinique , and approximately \$ 46 @. @ 6 million in damage .

= = = Hurricane Flora = = =

On September 26 , another tropical depression developed from the ITCZ about 755 mi (1 @, @ 215 km) southwest of the Cape Verde Islands . After remaining weak for several days , it rapidly organized on September 29 into Tropical Storm Flora . Quickly strengthening , Flora passed over Tobago on September 30 with winds of 120 mph (190 km / h) . Curving west @- @ northwestward , Flora peaked as a Category 4 hurricane with winds of 145 mph (230 km / h) on October 3 . Early the next day , the hurricane made landfall in southwestern Haiti at the same intensity . Flora briefly re @- @ emerged into the Caribbean Sea on October 4 , where the storm weakened to a Category 3 . Late on October 4 , the cyclone made landfall near San Antonio del Sur , Cuba , with winds of 125 mph (200 km / h) . A ridge to the north caused Flora to stall and move erratically over eastern Cuba for four days , and Flora eventually emerged into the Atlantic Ocean on October 8 as a weakened storm . After passing over the southeastern Bahamas early on October 9 , Flora began to restrengthen and became a major hurricane again on the next day . Thereafter , Flora continued northeastward and gradually weakened , falling to Category 1 intensity on October 11 . Flora gradually lost convection and became extratropical on October 12 while located 270 mi (430 km) east @- @ southeast of Cape Race , Newfoundland . The extratropical remnants dissipated the next day .

In Trinidad and Tobago , abnormally high tides capsized six ships in Scarborough harbor , while strong winds caused severe effects to coconut , banana , and cocoa plantations , with 50 % of the coconut trees destroyed and 11 % severely damaged . About 2 @, @ 750 houses were destroyed , while 3 @, @ 500 others were impacted . The hurricane killed 24 people and resulted in \$ 30 @. @ 1 million damage . Six additional drowning fatalities occurred in Grenada . The slow movement of the storm resulted in record rainfall totals for the Greater Antilles . In Dominican Republic , over 3 @, @ 800 sq mi (9 @, @ 800 km²) of land was flooded . Bridges and roads were significantly damaged , with many roads left unpassable for several months . The hurricane caused about \$ 60 million in damage and over 400 deaths . In Haiti , flash floods washed out large sections of several towns , while mudslides buried some entire cities . In most areas , crops were entirely destroyed . Additionally , the combination of rough waves and strong winds destroyed three entire communities . About 3 @, @ 500 people were confirmed dead and damaged ranged \$ 125 million and \$ 180 million . In Cuba , the storm dropped 100 @. @ 39 in (2 @, @ 550 mm) of rainfall at Santiago de Cuba . Nearly all crops in southeastern Cuba were affected by strong winds and flooding . Many citizens were left stranded at the tops of their houses . Several entire houses were swept away by the flooding , and many roads and bridges were destroyed , resulting in major disruptions to communications . Throughout the country , the hurricane destroyed as many as 30 @, @ 000 dwellings . Flora left at least 1 @, @ 750 fatalities and \$ 500 million in damage in Cuba . Overall , Hurricane Flora caused at least 7 @, @ 193 deaths and over \$ 783 @. @ 4 million in damage .

= = = Hurricane Ginny = = =

On October 16 , a tropical depression formed near Turks and Caicos from the interaction of a trough and a tropical wave , although the system was not very tropical due to cold air . It moved to the north and northwest , becoming Tropical Storm Ginny on October 19 . The next day it attained

hurricane status , and approached North Carolina before looping to the southwest due to a ridge over New England . By October 22 , Ginny crossed the Gulf Stream and intensified , developing an eye . It briefly weakened to a tropical storm the next day while approaching Florida , but regained hurricane intensity within ten hours . Ahead of an advancing trough , Ginny turned sharply northward and later northeastward , paralleling the coast of the Southeastern United States . For eight days , the storm was within 250 mi (400 km) of the United States coastline . Moving farther offshore , Ginny gradually intensified to reach peak winds of 110 mph (175 km / h) on October 29 . Later that day , it became extratropical before striking southwestern Nova Scotia ; its remnants dissipated on October 30 over the Gulf of Saint Lawrence .

Early in its existence , Ginny dropped heavy rainfall across the Dominican Republic and the Bahamas . In Florida and Georgia , Ginny produced above normal tides that caused minor damage and beach erosion . Rainfall was beneficial in South Carolina , and in North Carolina , high tides caused minor flooding and destroyed one house . In Massachusetts , wind gusts reached 76 mph (122 km / h) in Nantucket , and 1 @, @ 000 homes lost power in Chatham . Ginny was the latest hurricane on record to affect Maine during a calendar year . During its passage , the storm brought an influx of cold air that produced up to 4 ft (1 @. @ 2 m) of snow in northern Maine , killing two people . Offshore , many boats were damaged or ripped from their moorings ; one person died from a heart attack while trying to rescue his boat . Damage from Ginny in the United States was estimated at \$ 400 @, @ 000 . In Canada , high winds downed trees and caused power outages , leaving the entirety of Prince Edward Island without power .

= = = Tropical Storm Helena = = =

A tropical wave accompanied by a large area of convection moved westward in late October . On October 25 , the wave spawned a tropical depression , based on ship and Hurricane Hunter reports of southwest winds and heavy rainfall . Although poorly defined , the system gradually intensified and became Tropical Storm Helena . On October 26 , the storm reached peak winds of 50 mph (85 km / h) , before quickly weakening when it passed between Dominica and Guadeloupe , potentially due to their high terrain . Helena was a weak tropical depression upon entering the eastern Caribbean Sea , but re @- @ intensified into a tropical storm after turning to the north on October 27 . Its slow , erratic movement and failure to intensify was due to a weak trough across the region . While passing near Antigua , the storm developed an intense rainband that produced winds of 58 mph (93 km / h) , as measured by reconnaissance aircraft between Dominica and Guadeloupe . However , Helena again weakened into a tropical depression on October 29 and dissipated shortly thereafter .

The threat of Helena prompted the San Juan Weather Bureau to issue a hurricane watch and later gale warnings for portions of the Lesser Antilles . On the Guadeloupe , the storm left 500 people homeless , killed 5 people , and seriously injured 14 others . Several boats were heavily damaged or sank . Damage was estimated at \$ 500 @, @ 000 .

= = Storm names = =

The following names were used for named storms (tropical storms and hurricanes) that formed in the North Atlantic in 1963 . Storms were named Ginny and Helena for the first time in 1963 . The name Flora was later retired . Names that were not assigned are marked in gray .