

= Hurricane Lenny =

Hurricane Lenny is the second @-@ strongest November Atlantic hurricane on record . It was the twelfth tropical storm , eighth hurricane , and record @-@ breaking fifth Category 4 hurricane in the 1999 Atlantic hurricane season . Lenny formed on November 13 in the western Caribbean Sea and maintained an unprecedented west @-@ to @-@ east track for its entire duration . It attained hurricane status south of Jamaica on November 15 and passed south of Hispaniola and Puerto Rico over the next few days . Lenny rapidly intensified over the northeastern Caribbean on November 17 , attaining peak winds of 155 mph (250 km / h) about 21 mi (34 km) south of Saint Croix in the United States Virgin Islands . It gradually weakened while moving through the Leeward Islands , eventually dissipating on November 23 over the open Atlantic Ocean .

Before moving through the Lesser Antilles , Lenny produced rough surf that killed two people in northern Colombia . Strong winds and rainfall resulted in heavy crop damage in southeastern Puerto Rico . Despite the hurricane 's passage near Saint Croix at peak intensity , damage on the small island was only described as " moderate " , although there was widespread flooding and erosion . Damage in the United States territories totaled about \$ 330 million . The highest precipitation total was 34 @. @ 12 in (867 mm) at the police station on the French side of Saint Martin . On the island , the hurricane killed three people and destroyed more than 200 properties . In nearby Antigua and Barbuda , the hurricane killed one person ; torrential rainfall there contaminated the local water supply . Significant storm damage occurred as far south as Grenada , where high surf isolated towns from the capital city .

= = Meteorological history = =

Hurricane Lenny began as a low @-@ pressure area that was first observed in the southwestern Caribbean Sea on November 8 . It developed an area of convection but remained poorly defined for the next few days . Thunderstorms spread across the region , producing heavy rainfall in portions of Mexico and Central America . On November 13 , the system became better organized ; a Hurricane Hunters flight later that day discovered a surface circulation and winds of about 35 mph (55 km / h) . The data indicated the development of Tropical Depression Sixteen at 1800 UTC , about 175 mi (280 km) south of the Cayman Islands . The depression 's convection was fairly disorganized , and the National Hurricane Center (NHC) did not anticipate any strengthening for three days . For much of its existence , the tropical cyclone maintained a track from west to east across the Caribbean Sea , which was unprecedented in the Atlantic hurricane database . The path resulted from its movement along the southern end of a trough over the western Atlantic Ocean .

After its formation , the depression gradually became better organized ; the NHC upgraded it to Tropical Storm Lenny on November 14 , based on reports from the Hurricane Hunters . When it was first upgraded to a tropical storm , the cyclone already had winds of 65 mph (100 km / h) and a developing eye feature . At 0000 UTC on November 15 , Lenny attained hurricane status about 175 mi (280 km) southwest of Kingston , Jamaica . The quick intensification was unexpected and occurred after a large area of convection blossomed over the center . At the same time , Lenny developed an anticyclone aloft , which provided favorable conditions for the hurricane 's development . After moving east @-@ southeastward during its initial development stages , the hurricane turned more to the east on November 15 . The Hurricane Hunters reported winds of 100 mph (160 km / h) , which indicated that Lenny had become a Category 2 on the Saffir @-@ Simpson Hurricane Scale . However , the cloud pattern subsequently became less organized as the eye disappeared , and Lenny 's winds weakened to 85 mph (140 km / h) while the hurricane passed south of Hispaniola . The NHC noted the deterioration could have been due to a disruption of the storm 's small inner core by " subtle environmental changes " . After the sudden weakening , the Hurricane Hunters reported that the eye had reformed and the hurricane 's winds had reached 100 mph (160 km / h) . At the time , a ridge was expected to build to Lenny 's east and turn the storm northeastward into Puerto Rico 24 hours later .

Beginning on November 16 , Hurricane Lenny underwent a 24 @-@ hour period of rapid deepening

, reaching major hurricane status about 165 mi (265 km) south of the Mona Passage . It developed well @-@ defined banding features , good outflow , and a circular eye that was visible from the radar in San Juan , Puerto Rico . The hurricane continued to become better organized , with an eye 29 mi (46 km) in diameter surrounded by a closed eyewall . Around 1200 UTC on November 17 , Lenny intensified into a Category 4 hurricane while approaching the islands of the northeastern Caribbean . It was the fifth storm of such intensity in the year , setting the record for most Category 4 hurricanes in a season . The hurricane then made its closest approach to Puerto Rico , passing about 75 mi (121 km) southeast of Maunabo . Shortly thereafter , Lenny attained peak winds of 155 mph (250 km / h) while passing 21 mi (33 km) south of the island of Saint Croix in the United States Virgin Islands . This made it the second @-@ strongest hurricane on record to form during the month of November . At the time , Lenny was also one of only four November major hurricanes , but it was later joined by Hurricane Michelle in 2001 and Hurricane Paloma in 2008 . Hurricane Hunters reported Lenny 's peak winds in the southeastern portion of the hurricane ; the group also reported a minimum pressure of 933 mbar , a drop of 34 mbar in 24 hours . In addition , a dropsonde recorded winds of 210 mph (339 km / h) while descending to the surface , the highest dropsonde wind speed recording in a hurricane at the time .

Around the time it peaked in intensity , Lenny 's forward speed decreased in response to light steering currents between two ridges . Despite favorable conditions for strengthening , the hurricane weakened as it turned to an eastward drift , possibly due to the upwelling of cooler waters . Late on November 18 , Lenny 's eye moved over Saint Martin with winds of 125 mph (205 km / h) . After continued weakening , the hurricane struck Anguilla and Saint Barthélemy the next day . It turned southeastward while still drifting , bringing heavy rainfall and strong winds to the islands across the northeastern Caribbean . Late on November 19 , Lenny weakened to tropical storm intensity after increased wind shear exposed the cyclone 's center from the deepest convection . Early on November 20 , the storm made landfall on Anguilla , although by then the center had become difficult to locate . Later that day , the cyclone exited the Caribbean , continuing its southeast track . On November 21 , Lenny turned to the northeast and weakened to a tropical depression . The deep convection was located at least 100 mi (160 km) east of the increasingly elongated center . Lenny turned to the east for the final time early on November 22 , dissipating the next day about 690 mi (1110 km) east of the Lesser Antilles .

= = Preparations = =

Early in Lenny 's duration , a tropical storm warning and hurricane watch were issued for Jamaica . Later , a hurricane watch was issued for the southern coast of Hispaniola , and a tropical storm warning was also issued for the Dominican Republic . Haitian officials declared a state of alert in three southern provinces and allocated about \$ 1 million (1999 USD) in hurricane funds . Residents in flood @-@ prone areas were advised to evacuate in southern Haiti and in the neighboring Dominican Republic .

A hurricane watch was issued for Puerto Rico and the Virgin Islands late on November 15 , which was upgraded to a hurricane warning six hours later . By that time , Lenny was projected to move over Puerto Rico . After Lenny made its closest approach to the island , the hurricane warning was downgraded to a tropical storm warning on November 17 , which was discontinued the following day along with the advisories in the Virgin Islands . In Puerto Rico , the media maintained continuous coverage on the hurricane based on statements and warnings from the San Juan National Weather Service office . Based on the coverage , the public was well informed of the hurricane 's threat to the island . Before the storm and as a result of its impact , around 4 @, @ 700 people evacuated to 191 shelters . This included 1 @, @ 190 residents in Ponce who evacuated to 27 schools , as well as 584 people in western Puerto Rico . Officials closed all schools , banned the sale of alcohol , and ordered a freeze on the price of emergency supplies . The Federal Emergency Management Agency (FEMA) activated six medical assistance teams , three medical support teams , and two advance medical assessment units . The agency stored five days ' worth of food in schools in the U.S. Virgin Islands . Before the hurricane 's arrival , U.S. Virgin Islands governor Charles Wesley Turnbull

declared a state of emergency . In St. Croix , 309 people rode out the storm in shelters . Officials opened eight shelters in the British Virgin Islands . There , airlines and hotels assisted in evacuating tourists from the area .

Governments across the eastern Caribbean issued hurricane warnings as far south as Montserrat . In Anguilla , residents near the coast were advised to evacuate . Schools closed ahead of the storm , and the ferry between the island and Saint Martin was halted and moved to a safe location . In Saint Kitts and Nevis , the National Emergency Management Agency was activated on November 16 . Officials there advised residents living near ghauts to evacuate , and one shelter was located in each district of the country . In addition , stores were open for longer hours to allow people to stock up on supplies . Most businesses and schools were closed in Antigua and Barbuda during the storm , while in Dominica , the airport was closed . Further south , there was little warning for the hurricane in Grenada , and most people left their boats in the water .

= = Impact = =

Across the eastern Caribbean , Hurricane Lenny damaged vital infrastructure , including roads and piers in the tourism @-@ dependent islands . Most of the islands ' tourism areas were on western @-@ facing beaches , many of which were unprepared for the high waves and winds produced by Lenny .

= = = Central Caribbean = = =

Early in its existence , Lenny produced large waves and high tides along the Guajira Peninsula in Colombia , sinking two boats and flooding 1 @,@ 200 houses . There were also reports of flooded businesses and damaged crops . In the country , strong winds on the storm 's fringe killed a man by striking him with a beam . Although there were initial reports of nine people missing , only two were counted in the death toll for mainland Colombia . Two sailors were killed offshore when their yacht was lost in the southern Caribbean Sea .

Along the ABC Islands off the north coast of Venezuela , the hurricane produced 10 @-@ to @-@ 20 ft (3 @-@ to @-@ 6 m) waves along the southwest coastlines . The waves caused heavy beach erosion and coastal damage to properties and boats .

In Jamaica , the hurricane dropped heavy rainfall but left little damage . Rains in the Dominican Republic caused flooding in the country 's southwest portion . Flooding around Les Cayes in southwestern Haiti destroyed 60 percent of the rice , corn , and banana plantations , while high waves wrecked several houses in Cavaillon .

Hurricane Lenny was originally forecast to strike Puerto Rico , although it remained south of the island . Beginning on November 17 , Lenny affected Puerto Rico with gusty winds and heavy rainfall . Rainfall in the days prior to Lenny 's approach left areas susceptible to flooding , which caused many rivers in the northeastern portion of the island to overflow their banks following the storm . Such flooding forced towns to evacuate along the rivers , and also resulted in the closure of secondary and primary highways . The heavy rains also caused mudslides and rockslides . The peak rainfall on the island was 14 @.@ 64 in (372 mm) in Jayuya in central Puerto Rico . Tides in San Juan were about 1 @.@ 8 ft (0 @.@ 55 m) above normal . There , high seas washed a 546 @-@ ft (166 m) freighter ashore . Winds in the Puerto Rican mainland were not significant , gusting to 48 mph (77 km / h) in Ceiba . The storm left 22 @,@ 000 people without power and 103 @,@ 000 people without water . Because of the heavy rainfall , about 200 farmers in southeastern Puerto Rico sustained about \$ 19 million in crop damage (1999 USD) . In the affected region , the heavy rainfall destroyed 80 percent of the vegetables and 50 percent of the plantains . Damage throughout the island totaled \$ 105 million (1999 US) .

= = = Virgin Islands = = =

After passing southeast of Puerto Rico , Hurricane Lenny struck St. Croix in the United States Virgin

Islands , although its strongest winds remained southeast of the island . There , gusts reached 112 mph (180 km / h) , while sustained winds officially peaked around 70 mph (120 km / h) . Strong winds damaged the roofs of many houses in eastern St. Croix and knocked down trees and power lines . The winds left severe damage to vegetation after fruits and vegetables were blown away . Rainfall peaked at 10 @. @ 47 in (266 mm) , which caused widespread flooding of many properties in the island 's western portion . In Frederiksted , the hurricane produced a storm surge of 15 ? 20 ft (4 @. @ 5 ? 6 m) along with high waves that washed out roads and damaged coastal structures . There was also severe beach erosion in western St. Croix ; high waves dumped 6 @. @ 5 ft (2 m) of sand onto coastal roads about 100 ft (30 m) inland , and also washed several boats ashore . The National Weather Service described the damage as " moderate " .

Elsewhere in the U.S. Virgin Islands , Lenny produced a storm surge of about 1 @. @ 8 ft (0 @. @ 55 m) in St. Thomas . Sustained winds on the island reached 53 mph (85 km / h) at the Cyril E. King Airport , with gusts to 70 mph (120 km / h) . On nearby St. John , wind gusts reached 92 mph (148 km / h) . Rains were not as heavy as on St. Croix ; the maximum amounts were 4 @. @ 34 in (110 mm) on St. Thomas and 2 @. @ 95 in (75 mm) on St. John . Both islands reported beach erosion along their southern coastlines . Damage on St. Thomas was minimal , limited to minor flooding and mudslides . The Virgin Islands National Park in St. John reported over \$ 1 @. @ 6 million in damage (1999 USD) . In Puerto Rico and the U.S. Virgin Islands , the hurricane left about \$ 330 million in damage (1999 USD) , but caused no deaths .

In Virgin Gorda in the nearby British Virgin Islands , the hurricane produced sustained winds of 55 mph (89 km / h) , with gusts to 85 mph (137 km / h) . Rainfall amounted to around 4 in (100 mm) and caused a mudslide near Coxheath . High waves eroded a portion of Sir Francis Drake Highway , and the high winds destroyed the roof of an apartment . Property damage in the British Virgin Islands totaled \$ 5 @. @ 6 million (1999 USD) ; however , the damage combined with the loss of tourism and productivity yielded a loss of \$ 22 million to the islands ' economy , or 3 @. @ 1 percent of the gross domestic product .

= = = Lesser Antilles = = =

The eye of Lenny moved over Anguilla , an island located east of the British Virgin Islands . Localized flooding was reported , including in the capital , The Valley , where waters reportedly reached a depth of 14 ft (4 @. @ 3 m) . The hurricane struck only a month after Hurricane Jose had affected the region , causing significant beach erosion along Anguilla 's coastline . Damage from Lenny amounted to \$ 65 @. @ 8 million .

Saint Barthélemy and the SSS Islands , which include Saba , Sint Eustatius , and Saint Martin , were in the path of Hurricane Lenny on November 18 through 19 . On Saint Barthélemy , the hurricane produced record @-@ breaking precipitation of around 15 in (380 mm) . Waves reached 16 ft (4 @. @ 9 m) on the island 's western portion . On Saba , there was an unofficial wind gust of 167 mph (268 km / h) before the instrument blew away . The island sustained damage to several buildings , including airport facilities . The highest precipitation related to the storm occurred at the police station on the French side of Saint Martin , where a total of 34 @. @ 12 in (867 mm) was recorded . This included a record 24 @-@ hour total of 18 @. @ 98 in (482 mm) . On the Dutch side of the island , rainfall peaked at 27 @. @ 56 in (700 mm) in Philipsburg . The rains resulted in mudslides and flooding and were the primary form of impact on the island . For 36 hours , Saint Martin experienced tropical storm conditions , and there were three times when the winds surpassed hurricane force . Sustained winds on the island peaked at 84 mph (135 km / h) at the Princess Juliana International Airport ; these were the highest sustained winds observed on land . The airport also reported a wind gust of 104 mph (167 km / h) .

Due to the hurricane 's unusual track from the west , it produced unparalleled waves of 10 ? 16 ft (3 ? 5 m) along the western coast of St. Martin , which damaged or destroyed many boats . During its passage , Lenny left widespread damage to the infrastructure , including to the airport , harbor , resorts , power utilities , schools , and hospitals . As a result , the three SSS Islands sustained power and telephone outages . There was widespread destruction of the roofs of houses across the

island , and over 200 houses were destroyed . Damage was estimated at \$ 69 million , and there were three deaths on the Dutch side of St. Martin . Two of these deaths were from flying debris , and the other was due to a collapsed roadway .

While passing over Antigua , Hurricane Lenny dropped 18 @. @ 32 in (465 mm) of rain at the V. C. Bird International Airport , while locations in the southern portion recorded over 25 in (640 mm) . The rainfall caused severe flooding in Antigua , resulting in landslides in the northwestern and southern portion of the island . Flooding washed out major roadways , including one bridge . Along the coast , the storm caused severe beach erosion . About 65 percent of Barbuda experienced flooding due to the rainfall and the island 's flat topography . The flooding contaminated the water storage facilities and all private wells . About 95 percent of the crops in Barbuda were destroyed . Damage in the country of Antigua and Barbuda totaled \$ 51 @. @ 3 million , and there was one death .

The hurricane 's waves reached 20 ft (6 @. @ 1 m) along the coasts of Saint Kitts and Nevis , washing up to 600 ft (180 m) inland . Several businesses were flooded , and some beach erosion was reported . The hurricane destroyed 46 homes and damaged 332 others to varying degree . Home damage forced four families to evacuate . Heavy rains caused mudslides on Saint Kitts , and heavy damage occurred in Old Road Town . Damage in the country amounted to \$ 41 @. @ 4 million . In Montserrat , damage was reported along its western coastline . After high waves capsized a boat , a crew of three required rescue . Guadeloupe received record precipitation amounts in some areas , generally ranging from 6 to 12 inches (150 to 300 mm) . On Grande @- @ Terre , the eastern island of Guadeloupe , the hurricane produced a significant wave height of 9 @. @ 8 ft (3 @. @ 0 m) , with estimates as high as 13 ft (4 @. @ 0 m) . The extent of damage was from waves in the western portion of the island and from unrelated flooding inland . There were five deaths in Guadeloupe .

In Dominica , high waves damaged the island 's western coastal highway , leaving the most heavily traveled road temporarily closed . Road closures cut off links between towns on the island . The hurricane destroyed at least 50 homes , including 3 that were washed away by the waves . Hotels along the island 's west coast sustained heavy damage , and across the nation the hurricane 's impact was worse than that from Hurricane Luis four years prior . Damage on the island totaled \$ 21 @. @ 5 million . Rainfall of around 3 in (76 mm) reached as far south as Martinique , where one person was killed . Further south , high waves in Saint Lucia washed away beaches , a seawall , and coastal walkways . At least 40 houses were damaged along the coast , which left several families homeless . Damage in the country totaled \$ 6 @. @ 6 million . In Saint Vincent and the Grenadines , the hurricane washed away four buildings and damaged five others . About 50 people were left homeless in the country .

In western Grenada , high waves affected much of the coastline , destroying 21 small boats and causing significant beach erosion . The waves covered the entire Grand Anse Beach in Saint George Parish . The erosion heavily impacted tourist areas and also threatened the foundation of the runway at the Maurice Bishop International Airport . Storm damage cut off the towns in western Grenada from the capital city of Saint George 's . The cut @- @ off roads resulted in an island @- @ wide fuel shortage . In Saint John Parish , the storm knocked out the water and power supply and forced several families to evacuate their damaged houses . The small island Carriacou , located north of Grenada , sustained damage to the road to its primary airport . At least 10 homes were destroyed in the country , and damage totaled \$ 94 @. @ 6 million ; this represented 27 percent of the island 's gross domestic product . Effects from the storm reached as far south as Trinidad and Tobago . In the country , storm surge caused damage to boats and coastal structures , while beach erosion was reported in Tobago .

= = Aftermath = =

Following heavy damage to the coral reef around Curaçao , workers placed reef balls to assist in replenishing the damaged structure . In Puerto Rico , workers quickly responded to power and water outages . Similarly on Saint Croix , power systems were quickly restored . On November 23 , U.S.

President Bill Clinton declared the U.S. Virgin Islands a disaster area . This allocated federal funding for loans to public and private entities and provided 75 percent of the cost of debris removal . By December 10 , nearly 3 @,@ 000 residents had applied for assistance , mostly on St. Croix . In response , the federal government provided about \$ 480 @,@ 000 to the affected people . The United States Office of Foreign Disaster Assistance provided \$ 185 @,@ 000 , mostly directed toward the United Nations Development Programme , for aid to other islands in the eastern Caribbean . Other agencies , including the Caribbean Development Bank , the United Kingdom 's Department for International Development , and the European Union , provided \$ 1 @.@ 1 million in assistance .

In response to the damage on Saint Martin , officials in the Netherlands Antilles issued an appeal to the European Parliament for assistance from the international community . Due to their small population and area , the small islands of the eastern Caribbean required international funding to repair the damage from the hurricane and return to normal . In Antigua and Barbuda , officials worked quickly to repair roads and clean Barbuda 's water system . However , 20 @,@ 000 people in Antigua remained without water for a week after the hurricane , and the stagnant water caused an increase in mosquitoes . The government of Dominica provided 42 families with temporary shelters . With a loan from the Caribbean Development Bank , the government worked to complete a sea wall along a highway south of its capital Roseau . The Saint Lucian government provided housing to 70 families . In Grenada , workers repaired the road system to allow fuel transportation across the island and began to reclaim land near its airport to mitigate erosion . Regions in Antigua and Grenada were declared disaster areas . Across the eastern Caribbean , local Red Cross offices provided food and shelter to affected citizens . High damage to tourist areas caused a decrease in cruise lines . A damaged hotel in Nevis left 800 people unemployed due to its closure .

Due to its effects , the name Lenny was retired by the World Meteorological Organization and will never again be used for an Atlantic hurricane . The name was replaced with Lee in the 2005 Atlantic hurricane season .