

= Hurricane Lili (1996) =

Hurricane Lili was a relatively long-lived hurricane of the 1996 Atlantic hurricane season that affected countries from Central America to the United Kingdom . Lili formed on October 14 from a tropical wave , which emerged from the coast of west Africa on October 4 . After the storm formed , further strengthening of Lili was gradual , first to tropical storm status on October 16 and then to hurricane status on October 17 . The next day , Lili struck Cuba and moved across the central portion of the island , the first hurricane to hit the country since Hurricane Kate in 1985 . After emerging into the Atlantic Ocean , the hurricane accelerated northeastward , briefly peaking as a category 3 hurricane on the Saffir-Simpson Hurricane Scale near the Bahamas . For almost an entire week , Hurricane Lili oscillated in intensity while fluctuating several times in forward speed . About two weeks passed before Lili transitioned into an extratropical storm north of the Azores on October 27 , which subsequently moved across Ireland and Great Britain .

Early in its duration , Lili caused flooding in Central America that left thousands homeless and killed 14 people . Damage was heaviest in Cuba , mostly due to the hurricane's heavy rainfall which totaled 29 to 41 in (747 mm) . The hurricane affected 11 Cuban provinces , damaging 92 ,000 542 houses and destroying another 6 ,000 369 . The rains heavily damaged the sugar cane and banana crops , and overall damage in the country was estimated at \$ 362 million (1996 USD) . After 269 ,000 995 people were evacuated in advance of Lili , there were no deaths in the country . In nearby Florida , one person died after being swept into a drain during the storm's heavy rains . Moisture from Lili also fueled a storm that struck the northeastern United States , which contributed indirectly to a death when a man in Maine tried driving across a flooded roadway . Damage in the Bahamas was not severe , limited to some damaged roofs and downed trees . When the remnants of Lili struck Ireland and the United Kingdom , it produced strong winds and high seas that damaged hundreds of houses , causing \$ 300 million in damage (1996 USD) and six deaths .

= = Meteorological history = =

On October 4 , a tropical wave exited the west coast of Africa with a large associated circulation . Unfavorable wind shear prevented any development , and the wave continued westward , entering the Caribbean Sea on October 11 . Two days later , the wave axis encountered a pre-existing low pressure area in the southwest Caribbean . It quickly developed a well-defined circulation , becoming a tropical depression on October 14 off the east coast of Nicaragua . Due to an upper-level low in the Gulf of Mexico , the system tracked to the northwest , brushing Central America in its path . The depression developed banding features as the pressure gradually dropped , and intensified into Tropical Storm Lili at around 0600 UTC on October 16 . During this time , the storm executed a small cyclonic loop while a few hundred miles north of the Swan Islands . By early on October 17 , Lili had attained hurricane status while it was turning to the north .

Hurricane Lili grazed Isla de la Juventud on October 18 , bringing heavy rains and strong winds to the island . Later that day , Lili made landfall in Matanzas Province , Cuba as a category 2 hurricane , with winds close to 100 mph (160 km / h) . Despite the mountainous terrain , the storm did not weaken , with the same pressure reading of 975 mbar (28.8 inHg) being observed at landfall and when Lili reemerged into the Atlantic Ocean . After reaching warm waters , Lili further strengthened as it approached the Bahamas . The eye of the storm ? reaching a width of over 35 mi (56 km) ? passed over San Salvador Island and Great Exuma on October 19 , and brushed several other islands . That day , a trough in the westerlies caused Lili to accelerate northeastward , reaching a forward speed of almost 29 mph (47 km / h) . On October 19 at 1200 UTC , Hurricane Lili attained its peak intensity for a brief time , reaching 115 mph (185 km / h) winds and pressure of 960 mbar (28 inHg) , both measured by the Hurricane Hunters . This made Lili the sixth major hurricane ? a category 3 on the Saffir-Simpson Hurricane Scale ? of the season .

Within six hours , Lili had weakened below its peak intensity on October 19 . The center passed 150 mi (240 km) to the southeast of Bermuda , and subsequently the winds gradually decreased . A mid-level ridge caused Lili to slow to an east-southeast drift on October 22 . After two

days , the hurricane again accelerated to the northeast , briefly re @-@ intensifying into a category 2 hurricane . Lili again started a weakening trend soon after , and by October 26 , was downgraded to a tropical storm about 345 mi (555 km) northwest of the Azores . On October 27 , it was estimated that Lili became extratropical , which maintained gale @-@ force winds as it approached Europe . The remnants moved across Ireland and Great Britain on October 28 with winds of about 65 mph (105 km / h) . The remnants of Lili were absorbed by a much larger extratropical system in the North Sea on October 29 , which proceeded to cross over the European mainland .

= = Preparations and impact = =

Lili killed 22 people throughout its lifetime . Fourteen deaths were reported in Central America , and six in the United Kingdom . There were two deaths indirectly related to the hurricane in the United States . Damage figures for Central America and the Bahamas are unavailable , but total damages in Cuba and the British Isles were estimated at \$ 662 million (1996 USD) .

= = = Western Caribbean = = =

In its formative stages , Lili produced heavy rainfall in portions of Central America , causing flooding that left thousands of people homeless . In Costa Rica , there were four deaths , and five people drowned in Nicaragua , all due to river flooding . In Honduras , there were five deaths , one of which when a house was washed away .

The storm briefly posed a threat to Mexico , and a tropical storm warning was issued from Chetumal Bay to Cabo Catoche along the eastern Yucatán peninsula . A tropical storm warning and hurricane watch were also issued for the Cayman Islands .

= = = Cuba = = =

While Lili was still a tropical depression , the government of Cuba issued a hurricane watch for Isla de la Juventud and the provinces of Pinar del Rio and Havana provinces . On October 16 , a tropical storm warning was put in place for several provinces , which was upgraded to a hurricane warning the next day for eight provinces , eastward to Camagüey . The threat of the storm caused all flights to and from Cuba to be canceled , and the airport at Havana was closed . Officials set up shelters and ordered about 88 @,@ 000 people in Havana to evacuate from buildings prone to collapsing ; however , only 5 @,@ 000 people had evacuated by the day before landfall , due to fears of their houses being robbed . Ultimately , 269 @,@ 995 people evacuated due to the storm , along with over 270 @,@ 000 livestock . Officials also closed classes and sent workers home in areas along the projected path , and two hospitals were completely evacuated . Power lines in Havana were intentionally turned off before the storm to minimize potential damage . Before Lili , the last hurricane to strike Cuba was Hurricane Kate in 1985 . The country was already experiencing economic difficulties when the storm struck , following the collapse of the Soviet Union in a crisis known as the Special Period .

Crossing through Cuba , Hurricane Lili produced strong winds , affecting 11 of the country 's 15 provinces . The offshore Cayo Largo del Sur reported 92 mph (148 km / h) in 10 minute sustained winds , with gusts to 120 mph (190 km / h) . On the Isla de la Juventud , wind gusts reached 80 mph (130 km / h) , and on the mainland , Santo Domingo reported wind gusts of 112 mph (180 km / h) . Heavy rainfall accompanied the hurricane 's passage through the country , peaking at 29 @.@ 41 in (747 mm) , including a daily total of 17 @.@ 07 in (433 mm) . High waves struck the southern coast of Cuba , estimated at over 20 ft (7 m) .

While crossing Cuba , Lili primarily caused damage from its heavy rainfall and not from the winds . Nationwide , Lili damaged 92 @,@ 542 houses and destroyed another 6 @,@ 369 , mostly in Cienfuegos and Sancti Spíritus , which left thousands of people homeless . Heavy rains caused homes to collapse along the path , many already in poor condition . On Isla de la Juventud , the winds damaged 85 houses and destroyed another 103 . The winds also stripped 16 tons of

grapefruit from their trees on the island . Nationwide , hundreds of thousands of trees fell during the storm . On Cayo Largo del Sur , the strong waves wrecked seaside cabanas . In Villa Clara Province , about 45 mi (75 km) of roads were damaged , and the winds destroyed the roofs of 28 sugar refineries . In Havana , the storm wrecked a dozen buildings and downed several trees . Nationwide , the hurricane downed hundreds of power lines , leaving many towns without power , and power plants were damaged in Sancti Spíritus and Cienfuegos provinces . The hurricane also damaged 21 hospitals and dozens of health clinics , along with 32 schools . Extensive crop damage occurred along the storm 's path , affecting thousands of hectares of arable land , and damaging 105 agricultural facilities . Flooding affected the banana , fruit , coffee , sugar cane , and rice crops . Nationwide , the storm damaged about 25 @, @ 406 hectares of bananas and 686 @, @ 893 hectares of sugar cane , along with 36 @, @ 249 hectares of other crops . In Sancti Espiritu , 28 @, @ 000 tons of rice were wrecked , and in Matanzas , 7 @, @ 500 tons of citrus crops were heavily damaged . Total damages in the country were estimated at \$ 362 million (1996 USD) . There were no deaths in Cuba , and seven injuries .

= = = United States = = =

Tropical cyclone forecast models correctly anticipated that Lili would pass southeast of Florida , despite a potential landfall within 24 hours had the storm maintained its previous track . The National Hurricane Center issued a tropical storm warning for the Florida Keys but not for the Miami metropolitan area . Wind gusts in the Florida Keys reached 38 mph (61 km / h) at Sand Key Light . For several days , a trough extended northward from the hurricane , producing heavy rainfall in the southeast portion of the state . The highest total was 12 @. @ 08 in (307 mm) in Everglades National Park . One person died in Palm Beach County when a farm worker was swept into a canal drainage pipe .

High waves from the hurricane affected the northern coast of Puerto Rico , causing minor flooding .

On October 18 , a low pressure area developed near Norfolk , Virginia , which moved up the coastline and struck New England the next day . The system drew moisture from Lili , which dropped heavy rainfall over portions of the northeastern United States that reached 13 @. @ 03 in (331 mm) in Newburyport , Massachusetts . In the state , the rains flooded hundreds of houses , leaving over \$ 10 million in damage . High rainfall and a storm surge flooded coastal portions of Maine , and Portland lost freshwater access for 24 hours after a water main broke . There was one indirect death when a man tried driving across a flooded road in Cumberland County , and damage in the state totaled over \$ 26 million . Heavy rainfall in New Hampshire also caused flooding , and river flooding occurred in both Pennsylvania and New Jersey due to the storm . Farther south in Delaware , the rains caused flash flooding in northern New Castle County , and roadway flooding occurred in eastern Maryland .

= = = Bahamas = = =

A hurricane watch was issued for the northwestern Bahamas on October 17 , which was upgraded to a warning and expanded to cover the central Bahamas on the next day . A tropical storm warning was later issued for the southeastern Bahamas and the Turks and Caicos Islands . The airport in Nassau was closed before the storm struck , and 40 people in Georgetown on Exuma island evacuated .

While moving through the Bahamas , Lili produced 92 mph (148 km / h) in 10 ? minute sustained winds on San Salvador Island . On Great Exuma island , there was an estimated 15 ft (4 @. @ 6 m) storm tide , mostly on the southwestern portion , which caused beach erosion and some coral damage . At French Bay , waves destroyed the public dock . Effects were worst on the western portion , including damaged houses and sunk boats . Hotels sustained heavy roof damage in Cockburn Town and Victoria Hill . The storm also knocked down trees , and sea spray damaged some crops . On Long Island , the storm damaged crops and a few houses . Overall damage in the Bahamas was described as " scattered " , and not affecting any tourism areas .

= = = United Kingdom = = =

On October 28 , the extratropical remnants of Lili moved over Ireland and the United Kingdom , considered the strongest storm to affect the area since 1961 . Alderney in the Channel Islands reported 52 mph (84 km / h) winds , with gusts to 90 mph (144 km / h) . Swansea in Wales reported gusts of 92 mph (148 km / h) , leaving thousands of houses without power in the region . The remnants of Lili produced 15 ft (4 @. @ 6 m) waves in Bristol Channel , which heavily damaged about 500 cottages in Somerset . 40 ft (12 m) waves in the North Sea removed an oil platform from its moorings , which nearly washed ashore near Peterhead until a line was reconnected . A 4 ft (1 @. @ 2 m) storm tide along the River Thames flooding coastal areas , and high waves washed a sailboat ashore along Chale Bay in the Isle of Wight . The remnants of Lili also dropped about 3 in (76 mm) of rainfall , which alleviated drought conditions . The storm killed six people in Great Britain ? four were related to traffic accidents , and two fishermen were swept into the sea . Damage was estimated at \$ 300 million (1996 USD , £ 150 million in 1996 pound sterling) , making it the costliest storm in the United Kingdom since the Great Storm of 1987 .

= = Aftermath = =

On October 20 , the government of Cuba issued an appeal to the international community for assistance . The Red Cross provided \$ 1 @. @ 6 million to the country , and various departments of the United Nations provided \$ 80 @, @ 000 . The government of Japan sent about \$ 104 @, @ 000 worth of medical equipment , and Italy sent about \$ 526 @, @ 000 worth of medical supplies . The Canadian Red Cross donated a water purification unit , and the Spanish Red Cross sent blankets and cots . The German Red Cross also sent mattresses and blankets . The American Red Cross sent 9 @. @ 5 tons of food . Several other countries sent assistance , including the European Commission which sent \$ 750 @, @ 000 worth of supplies . There were early difficulties in transporting the relief supplies due to fuel shortages . Due to storm damage , 66 @, @ 881 people resided in shelters until their houses were rebuilt , or until they moved elsewhere . By March 1997 , most people had returned to their homes , although some did so without a roof . There was a threat for water @-@ borne diseases due to stagnant waters , although no such outbreaks occurred . The storm decreased the supply of the banana crop in 1997 , coupled with a drought .

Following the shooting down two small private U.S. planes in Cuban airspace in February 1996 , United States President Bill Clinton banned charter flights between the two nations . After the storm , the ban was lifted to allow the Caritas charity to fly a plane with supplies to Cuba . Some Cuban Americans in South Florida donated to help the affected Cuban victims , but others did not for fear it would assist the regime of President Fidel Castro . The plane landed on October 26 with 36 @. @ 5 tons of supplies , carrying about 30 tons of food and the remainder in the form of construction material . Only 23 tons of rice , beans , and milk were distributed . The Cuban government rejected the remaining seven tons due to the parcels containing inscriptions other than " Caritas " or " CRS " , such as " exile " or other messages against the communist party . The rejected aid was sent to the Dominican Republic or back to Miami . Catholic Relief Services later sent \$ 252 @, @ 000 worth of medicine , and sent a second flight of aid in January 1997 with 43 tons of rice , cooking oil , and flour .