

= Effects of Hurricane Ivan in the Lesser Antilles and South America =

The effects of Hurricane Ivan in the Lesser Antilles and South America in September 2004 included 44 deaths and over \$ 1 billion in damage (2004 USD) , primarily in Grenada where it was considered the worst hurricane in nearly 50 years . Hurricane Ivan developed from a tropical wave on September 2 and rapidly intensified to become a major hurricane , passing through the southern Lesser Antilles on September 7 with winds of 125 mph (205 km / h) . At the time , its typical storm force winds extended outward up to 160 miles (260 km) with hurricane @-@ force winds outward to 70 miles (110 km) , and the northern portion of the eye passed over Grenada .

In the region , the worst damage occurred on Grenada , where the damage total of \$ 1 @.@ 1 billion (2004 USD , (\$ 1 @.@ 38 billion 2016 USD)) represented 200 % of its GDP . The hurricane damaged more than 14 @,@ 000 homes and destroyed 30 % of the houses , leaving about 18 @,@ 000 people homeless . A total of 39 people were killed by the hurricane on the island . Elsewhere , Hurricane Ivan caused at least three fatalities and moderate damage in northern Venezuela . One person died each in Trinidad and Barbados . The name Ivan was later retired .

= = Preparations = =

Early in the duration of the storm , the National Hurricane Center consistently forecast Ivan to track further to the north than it eventually did . Late on September 5 , the government of Barbados issued a hurricane watch for its territory . Shortly thereafter , Saint Lucia was put under a hurricane watch and Grenada and its dependencies were put under a tropical storm watch . As the hurricane approached the southern Lesser Antilles , more watches were issued , and by 24 hours prior to Ivan passing through the island chain a hurricane warning was in effect for Barbados , Saint Vincent and the Grenadines , Saint Lucia , Tobago , and Grenada , and a tropical storm warning was in effect for Trinidad . With the path of Ivan more southerly than predicted , the hurricane warnings were downgraded to tropical storm warnings for the northern islands , and by late on September 7 when the eye of the hurricane passed near Grenada , hurricane warnings were in effect for Saint Vincent and the Grenadines , Trinidad and Tobago , and Grenada . Subsequently , a tropical storm warning was issued for the northern coast of Venezuela through the Guajira Peninsula of Colombia .

In Venezuela , citizens in coastal areas of Falcón , Sucre and Isla Margarita were moved to safer areas , and several thousands were evacuated due to the hurricane . The Simón Bolívar International Airport , as well as three other mainland airports , were closed . Petróleos de Venezuela S.A. temporarily closed its oil refinery in Curaçao , and two ports were briefly shut down ; this caused a delay in two oil deliveries . The Valero Energy Corporation shut down its largest oil refinery in Aruba . Prior to the arrival of the hurricane , oil companies in Trinidad and Tobago ceased production and removed workers from offshore rigs ; the Atlantic LNG company closed exports . Seven shelters were opened on Tobago , where about 560 people evacuated for the storm . Two people died : one man trying to save his car , and one girl sleeping in her bed , when a tree fell on the roof above her room . Most evacuees were from low @-@ lying areas , and on the day of the storm 's passage most schools and businesses were closed . The two main airports in the country were closed , with one airline canceling all of its flights .

Over 1 @,@ 000 people evacuated to emergency shelters on Grenada , including hundreds in low @-@ lying areas in the capital city . Some shelters were damaged during the hurricane , forcing the evacuees to go elsewhere . Overall , the population responded little to the official advisories and recommendations , which potentially contributed to the death toll on the island . More than 1 @,@ 000 residents of Saint Vincent and the Grenadines evacuated to 28 emergency shelters . On Barbados , officials closed schools and government buildings and prepared shelters prior to the arrival of the hurricane . To minimize danger , the island power grid was shut down . Four shelters opened on Saint Lucia , where many people sought safety during the storm .

= = Impact = =

= = = Venezuela , Trinidad and Tobago , and the ABC islands = = =

Along the northern coastline of Venezuela , the hurricane produced heavy precipitation and a storm surge of about 13 feet (4 m) , which damaged 60 homes . Sustained winds on Isla Margarita peaked at 26 mph (42 km / h) , and the most affected states were Falcón , Vargas , Aragua , Carabobo , and Anzoátegui . Rough waves capsized 10 boats and closed several beaches , and one person drowned due to the surf . Further inland , two people drowned when a river overflowed its banks , and near Caracas a man died after strong winds toppled a wall . The combination of rainfall and winds destroyed 21 houses and blew off the roof of several others , affecting 1 @, @ 376 people , of whom 80 were left homeless . Power outages and lack of water were reported . In the country , the hurricane caused 127 injuries , and a death toll reported between three and five . An initial news story reported 28 people missing offshore on three boats .

Moderate wind gusts of up 46 mph (74 km / h) were reported in Tobago , which downed several trees and caused power outages in seven villages ; power was cut to more than 30 % of the island . Twenty villages on the island suffered various forms of damage , and at least 45 homes lost their roofs . The hurricane left 22 people homeless and directly impacted about 1 @, @ 000 people . The hurricane caused one death when a falling tree killed a woman . Wave heights were estimated at 65 feet (20 m) , and at least one home collapsed and fell into the ocean . Rainfall from the storm 's passage unofficially peaked at 16 @. @ 2 inches (411 mm) on the island , which caused some mudslides . Some crop damage was also reported , and overall damage on Tobago was estimated at \$ 4 @. @ 9 million (2004 USD , (\$ 6 @. @ 14 million 2016 USD)) ; damage in neighboring Trinidad was minimal .

As Ivan continued to strengthen , it proceeded about 80 mi (130 km) north of the ABC islands on September 9 . High winds blew away roof shingles and produced large swells that battered several coastal facilities . A developing spiral band dropped heavy rainfall over Aruba , causing flooding and \$ 1 @. @ 1 million worth in structural damage .

= = = Grenada = = =

Passing just to the south of the island , Hurricane Ivan produced strong winds in Grenada , with sustained winds reaching 120 mph (195 km / h) and gusts peaking at 133 mph (215 km / h) at Point Salines International Airport . The airport recorded 5 @. @ 26 inches (134 mm) of precipitation during the hurricane 's passage . Of the nation 's six parishes , the four southernmost ones were most severely affected , constituting 80 percent of the total population .

The strong winds impacted more than 14 @, @ 000 homes on Grenada with 90 percent of the nation 's houses damaged and of which 30 percent were destroyed . The capital city of St. George 's was severely damaged , where every major building was either damaged or destroyed . Ivan 's passage either damaged or destroyed 85 percent of the structures on the island , including the nation 's emergency operations center and a 17th @- @ century prison , which allowed many inmates to briefly escape during the height of the storm . The hurricane damaged or destroyed 75 primary or secondary schools , with only two left in working condition . All of Grenada was left without power or running water .

Tourism was adversely affected ; an estimated 60 percent of hotel rooms were damaged . The winds downed 80 percent of the nutmeg trees on the island , with other crop losses varying between 60 ? 90 percent . An estimated 18 @, @ 000 people were left homeless by the hurricane , and about 700 people sustained injuries from the storm . Ivan was considered the worst hurricane to strike the nation since Hurricane Janet in 1955 ; its passage resulted in 39 fatalities and \$ 1 @. @ 1 billion in damage (2004 USD , (\$ 1 @. @ 38 billion 2016 USD) , about 200 % of its GDP and of which about 45 % resulted from housing damage .

= = = Saint Vincent and the Grenadines , Barbados , and northward = = =

Wave heights from the hurricane reached 20 feet (6 m) along coastline portions of Saint Vincent and the Grenadines , which washed away 2 homes ; the storm surge destroyed 19 homes and damaged 40 more . On Union Island , the winds damaged the roof of a hospital , while the northern portion of the island sustained heavy damage from the waves . Moderate damage was also reported on Palm Island and Carriacou and Petite Martinique . The winds left more than two @-@ thirds of the island without power , and also damaged the island 's banana crop . Damage in the country totaled \$ 40 million (2004 USD , (\$ 50 @.@ 1 million 2016 USD) .

On the island of Barbados , sustained winds peaked at 69 mph (112 km / h) while gusts reached 92 mph (149 km / h) , which damaged many trees and roofs . A total of 531 houses were damaged , of which 43 were completely destroyed . Additionally , four hotels sustained some damage . The winds left most of island without electricity , though officials worked quickly to restore the power . Rainfall from the storm was light , with less than 1 inch (25 mm) in most areas . Storm surge and wave action caused beach erosion that severely damaged most coastal roads . One death was reported on the island , and damage was estimated at more than \$ 5 million (2004 USD , (\$ 6 @.@ 26 million 2016 USD) .

Strong winds and rough surf caused moderate coastal damage to southern portions of Saint Lucia ; the combination impacted houses near the coast and also led to losses in the banana crop . Minor roof damage was also reported , and damage totalled \$ 2 @.@ 6 million (2004 USD \$ 3 @.@ 26 million 2016 USD)) on the island ; three serious injuries were reported on the island due to the hurricane , though no fatalities were reported . In Dominica , winds reached 43 mph (69 km / h) . High waves from Ivan caused light damage to southwestern Martinique and Guadeloupe .

Cayman Islands

Damage Sustained by the System . Contrary to what was done in other places , electricity was not shut down in Grand Cayman before arrival of the hurricane . Total system failure came at around 01 : 40 hours on 12 September . Slight damage was sustained by the North Sound Road power plant , and more extensive damage occurred in transmission lines and several substations as well as in distribution grids . Furthermore , it was found that the submarine cable in the North Sound was damaged 1 @,@ 500 feet offshore .

= = Aftermath = =

The government of Barbados created a Hurricane Ivan Housing Recovery Project , which repaired or rebuilt 190 houses for people without the available funds ; around 90 homes required minor immediate repairs , while the rest required significant reconstruction . The project finished in early 2006 for a total of \$ 5 million (2004 BBD , (\$ 6 @.@ 26 million 2016 USD) .

Several nearby countries assisted Grenada in its aftermath . The government of Guyana shipped about \$ 250 @,@ 000 (2004 USD , \$ 40 million 2004 GYD) worth of sugar , as well as 100 members of the Guyana Defense Force to assist in restoring order and reconstruction . The government of Trinidad and Tobago sent 190 policemen , and the government of Anguilla sent 1 @,@ 230 cases of water . A committee of Caribbean nations realized the local governments could not provide the support that Grenada needed in its aftermath , and thus turned to international assistance . Within a day of Ivan passing to the south of Grenada , the United States Agency for International Development (USAID) deployed 67 @,@ 600 gallons of water , 500 rolls of plastic sheeting , four 10 @,@ 000 liter water bladder kits , and a water treatment kit ; assistance from USAID totaled \$ 6 million (2004 USD) within a few weeks of the storm 's passage , primarily in aid for reconstruction and rehabilitation . In the weeks subsequent to the hurricane , the European Commission Humanitarian aid Office (ECHO) provided ? 3 million (2004 EUR) . By a year later , housing redevelopments and disaster preparation problems continued after being impacted by Hurricane Emily ; as a result , the ECHO provided ? 1 @.@ 2 million (2005 EUR) to Grenada in September 2005 . Nine months after the hurricane , Chinese officials provided assistance in reconstruction and handling foreign debts after meeting with the Grenadian Prime Minister ; in 2007 , Chinese officials funded the construction of a new \$ 40 million (2007 USD) cricket stadium near St. George 's . The Caribbean Development Bank approved a \$ 10 million loan (2004 USD)

requested by the government of Grenada in July 2005 , which was intended to assist in long @-@ term development of the housing , business , and environmental sectors . Emergency operations in Grenada in coordination with the Pan American Disaster Response Unit ended in July 2005 .

Within a few days after the hurricane passed , the Grenada Emergency Operations Center temporarily prevented relief supplies from entering the country to ensure the safety of the incoming items ; the decision was reversed shortly thereafter , and planes flew supplies during daylight hours into the reopened airport . Severe looting occurred in the immediate aftermath of Ivan , prompting police officials to enact a curfew for the night hours . In the first week following the hurricane , aid was slow to the affected residents , due to the lack of an efficient aid distribution system . 30 official shelters and 17 prepared ones housed over 5 @,@ 000 people in the aftermath of the storm . Thousands of people lost their jobs due to the hurricane , with all businesses shut down following the hurricane . By two months after the hurricane struck , 65 schools were opened , some of which serving as shelters ; water and power were gradually restored to the island . By a year after the storm 's passage , all schools were reopened , and most buildings enacted provisional repairs . Officials determined around 10 @,@ 000 houses on the island required complete reconstruction , while a further 22 @,@ 000 needed repairs . The government of Grenada initially planned to rebuild 1 @,@ 000 houses in the year after the hurricane struck ; by June 2005 , 260 families were provided houses , with a further 85 under construction . The government also established a Material Assistance Programme , which provided \$ 5 @,@ 000 (2004 XCD) of free materials to more than 5 @,@ 000 families , as well as a total of \$ 4 @.@ 3 million (2004 XCD) in low interest loans to 148 families . Several indirect fatalities occurred in the aftermath of the hurricane , primarily senior citizens .