

= Hurricane Marco (1996) =

Hurricane Marco caused significant flooding in the Greater Antilles and Central America , despite remaining well offshore . The thirteenth tropical cyclone , thirteenth named storm , and ninth hurricane of the 1996 Atlantic hurricane season , Marco developed in the western Caribbean Sea on November 16 after the interaction of a cold front and several tropical waves . Initially a tropical depression , it remained weak as it tracked southwestward and eventually southward . By November 19 , the depression strengthened into Tropical Storm Marco , shortly before slowly curving in a general eastward direction . Marco briefly became a hurricane on November 20 , though upper @-@ level winds caused it to weaken back to a tropical storm later that day . The storm then tracked northeastward toward Hispaniola , but later become nearly stationary and curve eastward , then doubled @-@ back to the west .

After weakening to a tropical depression on November 23 , Marco re @-@ strengthened to a tropical storm on the following day . Marco tracked northwestward while fluctuating in intensity before finally weakening and dissipating on November 26 . Despite not making landfall , Marco produced heavy rainfall in Cuba , Hispaniola , Central America , and Jamaica , which caused significant flooding in some areas . In Honduras , 4 @,@ 000 homes were destroyed , 40 bridges washed away , nearly 50 @,@ 000 acres of banana and fruit plantations flooded , and nine deaths were reported . Flooding also effected other Central American countries , albeit effects were less severe . Heavy rainfall was reported in Cuba , although flood damage is unknown . Marco contributed to an ongoing flood in Jamaica and caused three additional fatalities in the Dominican Republic . Overall , Marco caused 15 fatalities and approximately \$ 8 @.@ 2 million (1996 USD) in damage .

= = Meteorological history = =

On November 9 , a cold front moved into the northwest Caribbean Sea , shortly before an abnormally strong high pressure system entered in the area . The front then became nearly stationary and interacted with several tropical waves over the next week . The Intertropical Convergence Zone became active , causing monsoonal southwesterly flow to enter the system from the eastern Pacific Ocean . On November 13 , surface weather analysis indicated a weak low pressure area had developed north of Colombia . Despite a well @-@ defined low @-@ level circulation , the system did not meet the criteria for a tropical cyclone because convective activity was not organized or concentrated within the vicinity of the center . Several small , weak centers of low pressure formed in the general area , and the entire system drifted northward for a couple days . In combination with a high pressure area over the United States , the system produced gale @-@ force winds on Florida , Cuba , the Bahamas and the Gulf of Mexico .

Convection gradually developed over the broad low pressure area , and post @-@ storm analysis indicated that Tropical Depression Thirteen developed at 1800 UTC on November 16 , while centered about 160 miles (260 km) southwest of Kingston , Jamaica . Operationally , the National Hurricane Center did not issue advisories until 2100 UTC on November 18 . The depression tracked generally southward , soon encountering a more favorable environment for tropical cyclone development . Although environmental conditions were favorable for intensification , the depression initially failed to strengthen further . However , the depression later developed significant amounts of deep convection and intensified into Tropical Storm Marco on November 19 . After intensifying into a tropical storm , Marco then headed slowly east @-@ northeastward and continued to strengthen . By early on November 20 , Marco was upgraded to a hurricane . Simultaneously , Marco attained its peak intensity with maximum sustained winds of 75 mph (120 km / h) and a minimum barometric pressure of 983 mbar (29 @.@ 0 inHg) .

However , shortly thereafter , Marco began to move into a less favorable environment with strong upper @-@ level westerly winds . As a result , it weakened back to a tropical storm later on November 20 , after being a hurricane for only twelve hours . Despite the lesser favorable environment , Marco began to re @-@ strengthen starting on the following day . By November 22 , it

nearly re @-@ gained hurricane status , with winds remaining at 70 mph (110 km / h) . However , Marco subsequently weakened to a tropical depression at 1800 UTC on November 23 while south of Jamaica . A mid @-@ level ridge rebuilt over the Bahamas and Florida , which forced Marco westward , and then northwestward . The cyclone re @-@ organized and thus re @-@ intensified into a tropical storm on November 24 . Tropical Storm Marco reached a third peak intensity with winds at 60 mph (100 km / h) on November 25 at 1200 UTC , before it weakened again . The storm maintained tropical storm status until 1200 UTC on November 26 , when it weakened to a tropical depression once again . Marco then interacted with a cold front , causing it to degenerate into a remnant low pressure system at 1800 UTC on November 26 . Three hours later , the National Hurricane Center issued its final advisory on Marco , stating that the storm was merely a low @-@ level swirl devoid of deep convection . After dissipating , the remnants of Marco drifted southward and produced heavy rainfall over Belize and Honduras .

= = Preparations = =

At 1500 UTC on November 19 , a tropical storm watch was issued for Jamaica and was upgraded to a hurricane warning 24 hours later . However , by 2100 UTC on November 20 , the hurricane warning was downgraded to a tropical storm warning . It was further downgraded to a tropical storm watch and discontinued by November 22 . Other than hurricane / tropical storm watches and warnings , a flash flood warning was also posted on November 20 , and sailors were advised to remain at port . Disaster committees cautioned residents to stock up on supplies such as batteries and canned food . At 1500 UTC on November 20 , a hurricane watch was issued for Haiti and areas east of Camagüey , Cuba , though it was downgraded to a tropical storm watch six hours later . On the following day , the tropical storm watch was dropped . In addition , a tropical storm warning was issued on November 25 for the Isle of Youth and Pinar del Río , Cuba , though it was discontinued about 24 hours later .

= = Impact = =

Although Hurricane Marco never made landfall , it was a large storm with an unusual and erratic path and as a result , caused heavy rainfall throughout Central America and the western Caribbean nations . In the Dominican Republic , three people drowned north of Santo Domingo , while 200 families fled their homes during the flooding . Marco also contributed to an ongoing flood in Jamaica , which had already caused a total of \$ 3 million in damage to roads and left 170 families without shelter . After significant damage from Hurricane Lili in the previous month , minimal effects occurred in Cuba . Large amounts of precipitation also fell across Cuba , especially on the Isle of Youth and in Pinar del Río Province . Heavy rains caused thousands to flee their homes . However , damage in the country , if any is unknown .

Torrential rainfall in Honduras caused flooding , which forced 60 @,@ 000 people from their homes . In addition , 4 @,@ 000 homes were destroyed and 40 wooden bridges were washed away . Roads were significantly affected , with six roads and the national highway damaged in Cortés Department . Damage to the highway infrastructure totaled to approximately \$ 500 @,@ 000 . Television broadcast images from La Lima showed houses submerged to their roofs . Flood waters also inundated nearly 50 @,@ 000 acres of banana and fruit plantations owned by Chiquita Brands International . Other crops that sustained damage were maize , beans , sorghum , and rice . Agricultural losses associated with the storm totaled to approximately \$ 7 @.@ 7 million . Along the Caribbean coastline of Honduras , about 1 @,@ 000 shanty houses were destroyed . Overall , Marco caused nine fatalities in the country . In the Pacific and northern regions of Nicaragua , numerous houses washed away in the floods . In addition , Nicaraguan civil defense authorities reported two fatalities . Further north in Guatemala , at least one death occurred , and flood waters damaged or destroyed hundreds of homes . Swollen rivers in Costa Rica flooded several towns and numerous banana plantations .

During its formative stage , a high pressure area combined with the low pressure of Marco resulted

in a tight pressure gradient which led to beach erosion and gale force winds on the Florida coast . In Broward , Miami @-@ Dade , and Palm Beach counties , heavy surf generated by the combination of those systems caused 15 to 30 feet (4 @.@ 6 to 9 @.@ 1 m) of beach erosion . Additionally , 3 to 4 feet (0 @.@ 91 to 1 @.@ 22 m) of top sand were lost in that region . Further north , severe beach erosion caused the loss of as much as 10 feet (3 @.@ 0 m) of the dune line in Brevard , Indian River , St. Lucie , and Martin counties . Other impact was minimal . Marco was one of few hurricanes to enter the Caribbean Sea and not make landfall . Also , Hurricane Hunter flights recorded volatile center structure with severe turbulence , extreme rainfall , and hail during a flight into the storm . Overall , Marco caused 14 fatalities and approximately \$ 8 @.@ 2 million in damage .

= = Aftermath = =

While Marco was still spinning in the western Caribbean , the Government of Honduras allotted 70 million HNL (\$ 5 @.@ 6 million 1996 USD) in emergency assistance . Following the storm , several countries contributed cash toward the recovery of Honduras , including : Germany , Italy , the Netherlands , Norway , Spain , the United Kingdom , and the United States ; cash donations collectively totaled slightly more than \$ 438 @,@ 000 . In addition , the UN Department of Humanitarian Affairs contributed an emergency grant , worth \$ 10 @,@ 000 . Japan donated 40 tents , 10 water purifiers , 480 soaps , and 3 emergency health kits in lieu of money . Norway donated almost \$ 71 @,@ 000 worth of food , medicines , and clothing . Spain also contributed medicine and transportation , costing \$ 156 @,@ 250 . The United States donated plastic sheeting , water containers , and family food bags . The primary contributor of non @-@ government aid was the Red Cross . After the storm , the Red Cross set up temporary shelters in San Pedro Sula , Puerto Cortés , and El Progreso . Additionally , they distributed 3 @,@ 000 pounds of milk , clothing , 500 sheets , chlorine boxes , 14 @,@ 000 pounds of rice , 15 @,@ 000 pounds of beans and 9 @,@ 000 pounds of maize , sugar , and butter .