= Hurricane Calvin (1993) =

Hurricane Calvin was one of three Pacific hurricanes on record to make landfall along the Mexican coast during the month of July . The fourth tropical cyclone , third named storm , and second hurricane of the 1993 Pacific hurricane season , Calvin developed from an area of convection to the south of Mexico on July 4 . The following day , the system intensified into a tropical storm , which was named Calvin . Continued strengthening ensued as Calvin curved from its initial westward track northward , and was upgraded to a hurricane on July 6 Calvin eventually turned northwest , and became a Category 2 hurricane on the Saffir ? Simpson hurricane wind scale (SSHWS) . By July 7 , Hurricane Calvin made landfall near Manzanillo at peak strength . Calvin rapidly weakened after landfall , and was a tropical storm when it reemerged into the Pacific Ocean on early on July 8 . Despite this , the hurricane did not reintensify , and continued to weaken as it headed rapidly northwestward . As Calvin made a second Mexican landfall near the southern tip of Baja California peninsula late on July 8 , it weakened to a tropical depression . Early on July 9 , the depression dissipated shortly after entering the Pacific Ocean for a third time .

Calvin was only the third July hurricane on record to make landfall on the west coast of Mexico . Throughout the nation of Mexico , Calvin dropped heavy rainfall , especially in the southwestern portion of the country . Heavy rainfall produced flooding , which , in turn , caused mudslides . In the wake of Calvin , 37 fatalities were reported . Most of the casualties were due to flooding or car accidents . In the state of Michoacán , 700 homes were destroyed . In addition , a 15 @-@ foot (4 @.@ 6 m) storm surge was reported . Many boats and shoreline structures from Acapulco to Manzanillo were damaged . Heavy seas near Lázaro Cárdenas in western Mexico caused a ship , which contained sulfuric acid , to leak . The cleanup effort took one month to complete . In all , 30 @,@ 000 people were displaced by the storm . Overall , Calvin caused $ 32 million (1993 US $) in damage .

= = Background = =

A trough steered Calvin northward to hit Mexico as a hurricane in the month of July , making Calvin one of only three Pacific hurricanes to strike the nation since HURDAT started keeping records during the 1949 Pacific hurricane season . The other ones were Hurricane Eugene in 1987 and the third storm in 1954 .

= = Meteorological history = =

Hurricane Calvin originated from an area of disturbed weather , characterized with scattered deep convection , that developed south of the Gulf of Tehuantepec on the second day of July . Despite the lack of concentrated convection , the system was classified using the Dvorak technique , a tool used to measure a tropical cyclone 's intensity . However , during the morning hours of July 4 , banding features formed on the southern semicircle of the disturbance , and it is estimated that the system attained tropical depression status at 1200 UTC while centered approximately 315 mi (505 km) southeast of Acapulco . Initially , the storm was expected to stay offshore and attain winds of 70 mph (115 km / h) . Intensifying within a favorable atmospheric environment , the depression attained tropical storm status at 0000 UTC on July 5 , receiving the name Calvin .

A period of rapid intensification ensued shortly thereafter , and banding @-@ type eye formed in association with Calvin later that day . By July 5 , the National Hurricane Center (NHC) was predicting winds of 80 mph (130 km / h) . Later that day , the NHC reported winds of 65 mph (105 km / h) . Continuing to intensify , the system was upgraded to a hurricane at 0000 UTC on July 6 while becoming the second hurricane of the season , though operationally , it was believed to have become a hurricane three hours earlier . Upon becoming a hurricane , the NHC revised their forecast and was now expecting Calvin to become a Category 3 hurricane on the SSHWS . Around this time , Hurricane Calvin was embedded within the northeastern portion of a large , monsoon @-@ like deep @-@ layer @-@ mean , which stretched from the Intertropical Convergence Zone to

the southwest Mexican coastline . Furthermore , Calvin was a fairly large cyclone as surface winds of 35 mph (55 km / h) were reported over 200 mi (320 km) from the storm 's center .

During the late morning hours of July 6 , Calvin briefly slowed down before quickly accelerating to the northwest , bringing Calvin 's gale force winds 90 mi (140 km) south @-@ southwest of Acapulco . Later that day , the NHC upgraded Calvin into a Category 2 hurricane . At 1200 UTC on July 7 , Calvin reached its peak intensity of 100 mph (160 km / h) and a minimum barometric pressure of 966 mbar (28 @.@ 5 inHg) . Shortly thereafter , Calvin made landfall , approximately 40 mi (65 km) west @-@ northwest of Manzanillo . The storm quickly weakened over land , and by the evening , it had weakened into a tropical storm . After weakening greatly due to land interaction with the mountainous terrain of Mexico , Calvin reentered the Pacific at 0000 UTC on July 8 . Although initially expected to turn west , this did not occur . Instead , Calvin continued northwest , accelerating while emerging into the Gulf of California . Calvin weakened to a tropical depression late on July 8 as it made a second landfall along the extreme southern Baja California peninsula . After crossing the coast , Tropical Depression Calvin dissipated the next day atop of cold sea surface temperatures .

= = Preparations = =

Prior to making landfall , a tropical storm warning and hurricane watch was issued for a portion of the Mexican coast on July 6 . Six hours later , a hurricane warning was issued . By July 8 , all hurricane warnings were discontinued . Six hours later , all hurricane watches were dropped . By 1800 UTC that day , all watches and warnings were dropped . In addition to the watches and warnings , flash floods and mudslides to occur . In Acapulco , hundreds of police and emergency workers were on stand by in advance of the storm . Meanwhile , the city 's airport and ports were closed . Further south , in Oaxaca , the ports of Puerto Escondido , Puerto Ángel , Bahias de Huatulco , and Salina Cruz were closed . As a precautionary measure , the port of Zihuatanejo was also closed . In all , many sea ports were closed and airplane flights were canceled leaving many vacationers stranded . Multiple hotels were closed in the cities of Acapulco , Puerto Angel , and Huatulco . While weakening , the storm also threatened ports such as Mazatlán along the Gulf of California coast .

= = Impact = =

Due to the storm 's large size , Hurricane Calvin was responsible for heavy flooding along much of the coast of Mexico , and after moving onshore as a hurricane , two locations (El Marques , Japala Del) reported as high as 18 @.@ 27 in (464 mm) of rain . The flooding led to mudslides , killing 28 people on land , with 30 @,@ 000 people displaced . Most of the casualties were indirect . In all , 37 people perished due to Hurricane Calvin . Nationwide 42 @,@ 063 people were evacuated from their homes . Numerous seaside restaurants were washed off their respective foundations . Banana , mango , and corn plantations were also destroyed by the strong winds . Coconut trees were reportedly brought down as well .

In Puebla , a peasant died . Inland , 16 persons were killed in the states of Mexico and San Luis Potosí , where heavy rains caused mudslides across higher elevations . In the latter , 11 deaths were reported as two rivers had overflowed their banks while in the former , five people died . Moreover , six people riding in a taxi died in Veracruz during Calvin . Across Nayarit , Calvin brought heavy rains to the state . Later in its duration , Calvin struck the Baja California peninsula , though the storm had weakened considerably by that time Offshore , three ships containing 659 immigrants were intercepted by the storm , but the ship sustained no damage .

In all , the damage from Hurricane Calvin amounted to over 100 million new pesos , or $ 32 million (1993 USD) . Despite the devastation , many vacationers did not alter their plans because of the hurricane .

= = = Oaxaca = = =

Prior to affecting Guerrero , Hurricane Calvin was responsible for heavy rains and widespread flooding across Oaxaca . An estimated 7 @,@ 000 were left homeless along the Oaxacan coast and on the Isthmus of Tehuantepec . In addition , travel from the isthmus was cut off due to mudslides that blocked portions of the Pan @-@ American Highway . Two rivers threatened to overflow their banks while the Benito , Juarez , and Yosocuta dams attained peak capacity and thus the gates were opened to prevent overflowing . A total of 42 communities were flooded . The cities of Tehuantepec , Salina Cruz , Juchtianm , and Tuxtepec were flooded due to extended periods of torrential rains . Across the state , the rains blocked highways and knocked out electrical , telephone , and water services . About 3 @,@ 000 people took refuge to shelters and one person was killed .

= = = Guerrero = = =

In Acapulco , waves of 15 ft (4 @.@ 6 m) moved through the city . In several states , between 5 in (130 mm) to 10 in (250 mm) inches of rain was recorded . However , in Las Pilas , the highest rainfall total was observed , at 16 @.@ 34 in (415 mm) .
Prior to landfall , the storm 's outer rainbands began to spread over the region , resulting in flooding . Throughout Acapulco , the storm uprooted 100 trees and caused some damage to roads . Although the city escaped significant damage , many huts were damaged and 1 @,@ 600 people were left homeless . City @-@ wide six people were killed while two other fisherman were missing . A mudslide killed a man and a son one person was reported dead after trying to save his boat from sinking . In addition , 13 boats sunk due to high waves , which impeded all maritime activity along the coast . In the city of Zihuatanejo , heavy rains flooded streets ; consequently , " waist @-@ deep " water was reported in some parts of the city . As a result , tourists were evacuated to higher ground . A total of 2 @,@ 000 people were forced to abandon their homes . Two people sustained minor injuries when a tree was uprooted . Many neighborhoods throughout Acapulco were flooded . Overall , several beach communities were destroyed , almost 1 @,@ 000 dwellings were destroyed , thousands of people were left homeless , and many areas remained without electricity .
Statewide , the majority of storm damage occurred over a 4 mi (6 km) stretch of road , which was situated about 25 mi (40 km) north of Acapulco . About a dozen small wood @-@ built restaurants were swept away by high waves . At a nearby small beach resort , four cottages were damaged due to the winds and were later swept away . One two @-@ story hotel was nearly destroyed as all that remained undamaged after the storm was a swimming pool . In a resort town situated 18 mi (29 km) northwest of the city , high waves pounded many small resorts .

= = = Colima = = =

Following Calvin 's closest approach to Manzanillo , the Mexican Weather Service station in the city recorded a minimum barometric pressure of 986 @.@ 5 mbar (29 @.@ 13 inHg) , as well as 84 mph (135 km / h) surface winds as the center of Calvin passed a little to the west . The Instituto Oceanografico del Pacifico in Manzanillo reported a minimum central pressure of 994 mbar (29 @.@ 4 inHg) in addition to gale @-@ force winds . Statewide , sustained winds of 60 mph (97 km / h) were observed around 1300 UTC . Shortly thereafter , near 1545 UTC , sustained winds of 35 mph (56 km / h) with gusts up to 45 mph (72 km / h) were reported in Manzanillo . Offshore , several ships reported rough weather during Calvin 's existence , with the Pacific Sandpiper reporting a maximum wave height of 44 ft (13 m) .
Two fatalities occurred offshore when a trimaran capsized ; two fishermen were also reported missing . A pair children were killed by a mudslide . Damage to boats and shoreline structures extended from Acapulco to Manzanillo . Electrical and water services were cut off to the city of Mazanillio . In all , 4 @,@ 000 people were evacuated from their homes throughout the state . Several ports were also closed . Throughout Colima , lime and mango crops sustained $ 4 @.@ 3 million in damage .

= = = Michoacán = = =

 In the state of Michoacán , 700 homes were destroyed . Moreover , many bridges and highways were destroyed due to a 15 ft (4 @.@ 6 m) storm surge . A total of 4 @,@ 000 persons fled their homes in Michoacan , including 3 @,@ 000 alone in Lázaro Cárdenas . Crop damage in both this state and Colima totaled to $ 7 million . Numerous communities were completely evacuated .
 Although initially not expected to pose a threat to the chemicals on the ship Betula , rough seas near Lázaro Cárdenas caused all 4 @,@ 000 t (4 @,@ 000 @,@ 000 kg) of sulfuric acid to leak aboard the previously beached cargo tanker . The tow line snapped when a tug was taking it out to sea . Two of the four tanks broke off by July 7 . The Mexican Navy then decided it would be best to tow the ship to shore and neutralize the battery acid that the ship contained . It was estimated that such project could take two weeks .

= = = Jalisco = = =

 Shortly after making its first landfall , the storm moved over a sparsely populated portion of Mexico near Puerto Vallarta . Throughout the region from Manzanillo to Puerto Vallarta , no deaths were reported . However , phones and power services were disrupted and many roads were blocked due to extensive flooding . However , further details about impact could not be obtained due to lack of communication , though some places sustained waist @-@ high water . However , the resort city of Puerto Vallarta itself was spared , receiving just some rain and light winds . About 60 mi (95 km) south of the city , numerous coastal roads were destroyed due to mudslides . In all , 10 towns were flooded .

= = Aftermath = =

 During the aftermath of the storm , troops were called in to deliver aid to the victims of the storm . A state of emergency was declared in at least ten states in Mexico following Calvin 's passage . Furthermore , Mexican officials implemented emergency measures with assistance of agencies such as the Mexican Army and the local health department in the most of the devastated areas . Civil protection authorities donated food to more than 40 @,@ 000 people for three days . They distributed around 11 @,@ 000 blankets , 5 @,@ 000 mattresses , 8 @,@ 000 sacks of sand to reinforce dikes , and an additional 20 t (20 @,@ 000 kg) of food , medicine , and clothes . Many Los Angeles residents looked for ways to donate aid to the needy . Then @-@ Mexican President Carlos Salinas de Gortari announced that the government would channel $ 11 @.@ 4 million to three of the hardest @-@ hit states . The government channeled $ 2 @.@ 7 million to Guerrero alone (half of which was supplied to Acapulco) for reconstruction efforts . Michoacan was also expected to receive $ 4 @.@ 7 million in aid while Colima was expected to acquire $ 4 million .
 Once the hurricane had moved away from the coast , airports quickly re @-@ opened . Simultaneously , fishermen in Playa Azul protested that their livelihood was endangered due to fishing bans caused by the chemical spill ; consequently , in Lázaro Cárdenas , 28 people were arrested while warrants for 526 others ' arrest were issued for disturbing peace and blocking highways . This sparked protests from two environmental group as a well a group of Mexican artists . Also , the fisherman demanded a $ 1 million compensation . Within a week after the storm , additional rains had moved into the area , leading to further damage and eight fatalities .