

= Hurricane Felicia (2009) =

Hurricane Felicia was the third strongest tropical cyclone of the 2009 Pacific hurricane season , as well as the strongest storm to exist in the eastern Pacific at the time since Hurricane Daniel in 2006 . Forming as a tropical depression on August 3 , the storm supported strong thunderstorm activity and quickly organized . It became a tropical storm over the following day , and subsequently underwent rapid deepening to attain hurricane status . Later that afternoon , Felicia featured a well @-@ defined eye as its winds sharply rose to major hurricane @-@ force on the Saffir ? Simpson scale . Further strengthening ensued , and Felicia peaked in intensity as a Category 4 hurricane with sustained winds of 145 mph (230 km / h) and a barometric pressure of 935 mbar (hPa ; 27 @.@ 61 inHg) . After reaching this strength , unfavorable conditions , such as wind shear , began to impact the storm while it took on a northwestward path . Henceforth , Felicia slowly weakened for several days ; by August 8 it had been downgraded to a Category 1 hurricane , once again becoming a tropical storm the next day . It retraced westward towards Hawaii on August 10 , all the while decreasing in organization . On August 11 , Felicia weakened to tropical depression status , and soon degenerated into remnant low just prior to passing over the islands .

After weakening into a remnant low , Felicia continued to approach the Hawaiian Islands and on August 12 , the system produced copious amounts of rainfall across several islands . The highest total was recorded on Oahu at 14 @.@ 63 in (372 mm) , causing isolated mudslides and flooding . In Maui , the heavy rains helped to alleviate drought conditions and water shortages , significantly increasing the total water across the island 's reservoirs . In addition , river flooding resulted in the closure of one school and large swells produced by the storm resulted in several lifeguard rescues at island beaches . In all , only minor impacts were caused by the remnants of Felicia .

= = Meteorological history = =

Hurricane Felicia originated from a tropical wave that moved off the west coast of Africa into the Atlantic Ocean on July 23 , 2009 . A weak system , the wave was barely identifiable as it tracked westward . By July 26 , the wave entered the Caribbean Sea before crossing Central America and entering the eastern Pacific basin on July 29 . The system remained ill @-@ defined until August 1 , at which time convection began to increase and the wave showed signs of organization . The storm gradually became better organized as it tracked generally towards the west . By August 3 , the system became increasingly organized and around 11 : 00 am PDT (1800 UTC) , the National Hurricane Center (NHC) designated the system as Tropical Depression Eight @-@ E. Convective banding features and poleward outflow were being enhanced by the nearby Tropical Storm Enrique . The main steering component of the depression was an upper @-@ level low located to the north , causing the depression to track generally west before turning northwest after the low weakened .

By the early morning hours of August 4 , the NHC upgraded Tropical Depression Eight @-@ E to Tropical Storm Felicia , the seventh named storm of the season . Located within an area of low wind shear and high sea surface temperatures , averaging between 28 and 29 ° C (82 and 84 ° F) , the storm quickly developed , with deep convection persisting around the center of circulation . These conditions were anticipated to persist for at least three days ; however , there was an increased amount of uncertainty due to possible interaction with Tropical Storm Enrique . Several hours later , the storm began to undergo rapid intensification , following the formation of an eye . Around 2 : 00 pm PDT (2100 UTC) , Felicia intensified into a hurricane .

Late on August 4 , the intensity of Felicia led to it taking a more northward turn in response to a mid- to upper @-@ level trough off the coast of the Western United States . Early the next morning , the storm continued to intensify and attained Category 3 status with winds of 115 mph (185 km / h) . Maintaining a well @-@ defined eye , Felicia neared Category 4 status and hours later , the storm attained winds of 140 mph (220 km / h) and a pressure of 937 mbar (hPa ; 27 @.@ 67 inHg) during the evening hours , making it the strongest Pacific storm east of the International Date Line since Hurricane Ioke in 2006 and the strongest in the eastern Pacific basin since Hurricane Daniel of 2006 . Around 5 : 00 pm PDT (0000 UTC August 6) Felicia reached its peak intensity with winds of

145 mph (230 km / h) and a minimum central pressure of 935 mbar (hPa ; 27 @. @ 61 inHg) .

After slightly weakening throughout the day on August 6 , Felicia leveled out with winds of 135 mph (215 km / h) and a 23 mi (37 km) wide eye as the storm developed characteristics of an annular hurricane , which would allow Felicia to maintain a high intensity over marginally warm waters . Early the next day , the structure of the hurricane quickly deteriorated as convection became asymmetric and cloud tops warmed significantly . This marked a quick drop in intensity of the storm to a minimal Category 3 hurricane . Several hours later , the mid @-@ level circulation began to separate from the low @-@ level circulation and the overall size of the storm decreased . By this time , the storm began to take a long @-@ anticipated westward turn towards Hawaii . After briefly re @-@ intensifying on August 7 , Felicia weakened to a Category 1 hurricane early on August 8 . Around 11 : 00 am HST (2100 UTC) , the Central Pacific Hurricane Center (CPHC) took over responsibility of issuing advisories as Felicia crossed longitude 140 ° W.

By August 9 , increasing wind shear further weakened the storm , with Felicia being downgraded to a tropical storm early that day . The storm rapidly weakened throughout the day as convection gradually dissipated around the center due to the shear . By the late morning hours , little convective activity remained around the low pressure center of Felicia . A weak cyclone , the storm continued to track towards Hawaii with the only deep convection associated with it being displaced to the northeast of the center . The system slowly weakened before being downgraded to a tropical depression on August 11 as no areas of tropical storm @-@ force winds were found by Hurricane Hunters . Several hours after being downgraded , the CPHC issued its final advisory on Felicia as it degenerated into a remnant low near the Hawaiian Islands . The system dissipated shortly thereafter .

= = Preparations = =

By August 5 , forecasters were discussing the possibility of the storm impacting Hawaii . Residents were advised to ensure that their disaster kits were fully stocked and ready . Governor Linda Lingle made a speech to the state of Hawaii the same day . She emphasized that the storm was not an imminent threat but that residents should be ready and should know where the nearest emergency shelter is . Since forecasters expected the storm to weaken before it reached the islands , only minor effects ? mainly rainfall ? were expected . Hawaii County mayor Billy Kenoi was also briefed on the approaching storm and he advised the county to be prepared . Stores reported an influx of shoppers and posted anniversary sales . Blue tarps for roofs were being sold at \$ 1 apiece . The American Red Cross also reported that sales of the " water bob " , a water container that can be attached to a bathtub and hold roughly 100 gallons of water , increased significantly . On August 6 , the Red Cross stated that it was deploying a disaster recovery team , led by the director of the agency , to the islands of Hawaii .

On August 7 , five Hurricane Hunter planes were dispatched to Hickam Air Force Base to fly missions into the storm . Later that day , the Central Pacific Hurricane Center issued tropical storm watches for the island of Hawaii , Maui , Kahoolawe , Lanai , and Molokai . On August 9 , the watch was expanded to include Oahu . The watches for the Big Island were later cancelled as the forecast track appeared to drift further north toward Maui County and Oahu . The Red Cross opened shelters throughout the islands on August 10 . Twelve were on the Big Island , seven were on Maui , two on Molokai and one on Lanai . The Honolulu International Airport ensured that eight generators were ready for use in case Felicia caused a power outage at the airport . All tropical storm watches were cancelled at 11 a.m. August 11 as Felicia dissipated to a remnant low .

= = Impact = =

= = = Oahu = = =

In Oahu , areas on the windward side of the island received more than 1 in (25 mm) of rain on

August 12 from the remnants of Felicia , causing many roads to become slick . A portion of Kamehameha Highway was shut down around 11 : 00 pm HST when the Waikane Stream overflowed its banks . Flooding near a bridge reached a depth of 4 ft (1 @. @ 2 m) , stranding some residents in their homes . The highway remained closed until around 4 : 00 am HST on August 14 . The rain was also considered helpful in that it helped alleviate drought conditions that had been present for nearly two months . The heaviest rainfall was recorded on Oahu at 14 @. @ 63 in (372 mm) in the Forest National Wildlife Refuge . During a 12 @- @ hour span , a total of 6 @. @ 34 in (161 mm) fell in Waiahole . Some areas recorded rainfall rates up to 1 in / h (25 mm / h) , triggering isolated mudslides . At Sandy Beach , there were two lifeguard rescues and three others were on Makapu'u as waves up to 18 ft (5 @. @ 5 m) affected the islands . There were also five assists at Makapu'u and one at Kailua Beach . Lifeguards issued a total of 1 @, @ 410 verbal warnings about the rough seas to swimmers and surfers during the event . However , winds on the island reached only 15 mph (25 km / h) and gusts peaked at 20 mph (30 km / h) .

= = = Other islands = = =

On Kauai , the Hanalei River rose above its normal level , leading to the closure of the Hanalei School . Several tree limbs and small trees were blown down across the island . Rainfall on Kauai peaked at 5 @. @ 33 in (135 mm) at Mount Wai 'ale 'ale and on Maui , up to 4 @. @ 05 in (103 mm) fell in Kaupo Gap . On the leeward side of the mountains , rainfall peaked at 1 @. @ 3 in (33 mm) in Kihei , an area that rarely records rainfall in August . Throughout the island , the total amount of water in reservoirs increased to 104 @. @ 5 million gallons (395 @. @ 5 million liters) from 77 @. @ 8 million gallons (294 @. @ 5 million liters) prior to Felicia . Rainfall in some areas was heavy enough at times to reduce visibility to several feet . Streets in these areas were covered with muddy water . Localized heavy rainfall fell on the Big Island , peaking at 2 @. @ 76 in (70 mm) in Kealahou . In Wailua Beach , there was one lifeguard rescue that resulted in the swimmer being sent to a local hospital . Three other people were swept away at the mouth of the Wailua River , all of whom were quickly rescued . In Honolulu , runoff from the storm resulted in large amounts of trash and debris along the local beaches . Private contractors were dispatched to the affected coastlines to trap and remove the trash . Officials were forced to close the beaches along Hanauma Bay after swells from Felicia pushed an estimated 2 @, @ 000 Portuguese Man o ' War siphonophorae into the region . The beaches were later re @- @ opened on August 14 .