

= Hurricane Kenna =

Hurricane Kenna is tied as the third @-@ most intense Pacific hurricane to strike the west coast of Mexico in recorded history . Kenna was the sixteenth tropical depression , thirteenth tropical storm , seventh hurricane , sixth major hurricane , and third Category 5 hurricane of the 2002 Pacific hurricane season . After forming on October 22 to the south of Mexico from a tropical wave , forecasters consistently predicted the storm to strengthen much less than it actually did . Moving into an area of favorable upper @-@ level conditions and warm sea surface temperatures , Kenna quickly strengthened to reach peak winds of 165 mph ( 265 km / h ) on October 25 while located about 255 mi ( 410 km ) southwest of Puerto Vallarta , Jalisco . Weakening as it turned to the northeast , the hurricane struck near San Blas , Nayarit , with winds of 140 mph ( 225 km / h ) before dissipating on October 26 over the Sierra Madre Occidental mountains .

The name " Kenna " was retired from the list of Pacific hurricane names due to its effects on Mexico , which included US \$ 101 million in damage and four deaths . The worst of the hurricane 's effects occurred between San Blas in Nayarit and Puerto Vallarta in Jalisco , where over 100 people were injured and thousands of homes and businesses were damaged or destroyed . 95 % of the buildings in San Blas were damaged , and hundreds of buildings were destroyed along coastal areas of Puerto Vallarta .

= = Meteorological history = =

The origin of Hurricane Kenna can be traced to a tropical wave moving westward through the Caribbean Sea on October 16 , possibly the same wave that passed near Barbados two days earlier . The wave entered the eastern Pacific Ocean on October 19 , and a tropical disturbance along the wave axis gradually became better organized . Conditions favored continued development , and Dvorak classifications began late on October 20 . Early on October 22 , the system developed into Tropical Depression Fourteen @-@ E while located about 375 mi ( 605 km ) south of Manzanillo , Colima . Initially the depression was disorganized , with little inner convective structure and sporadic deep convection . Computer models predicted an increase in wind shear by 60 hours ; as such the National Hurricane Center forecast the depression to strengthen to a peak strength of 45 mph ( 70 km / h ) before weakening .

The depression quickly became better organized with a great increase in convection near the center , and six hours after forming it strengthened into Tropical Storm Kenna . Upper @-@ level outflow and banding features improved in organization , as well . With warm water temperatures of over 29 ° C ( 84 ° F ) and updated model forecasts anticipating light amounts of vertical wind shear , forecasters predicted Kenna to slowly intensify to reach winds of 85 mph ( 135 km / h ) within 72 hours of October 22 . The storm moved to the west @-@ northwest around the periphery of a mid @-@ level high @-@ pressure system , and initially failed to strengthen further with much of its convection being associated with outer rainbands . On October 23 , the outer rainbands dissipated and convection became more concentrated near the center , which coincided with a steady increase in strength . Late on October 23 , Kenna intensified into a hurricane while located about 380 mi ( 615 km ) southwest of Manzanillo .

Shortly after becoming a hurricane , Kenna began to rapidly intensify with a 17 mi ( 27 km ) wide eye located within its well @-@ defined central dense overcast . Early on October 24 Kenna became a major hurricane , and in a 24 ? hour period the hurricane more than doubled its windspeed from 70 mph ( 115 km / h ) winds to 145 mph ( 235 km / h ) . After turning to the north and northeast in response to the flow ahead of a large mid to upper @-@ level trough , Kenna attained peak winds of 165 mph ( 265 km / h ) early on October 25 while located about 255 mi ( 410 km ) southwest of Puerto Vallarta , the third Category 5 hurricane of the season . A Reconnaissance Aircraft flight into the hurricane while it was near peak intensity recorded a pressure of 913 mbar ( hPa ) , the fourth lowest recorded pressure for a Pacific hurricane .

Quickly after peaking , wind shear from the approaching trough weakened the hurricane , and by six hours after reaching peak intensity , the winds in Hurricane Kenna dropped to 150 mph ( 240 km

/ h ) after the eye nearly dissipated . Despite a 27 mbar increase in pressure in 12 hours , convective activity increased prior to Kenna making landfall . On October 25 Hurricane Kenna struck near San Blas in the state of Nayarit with estimated winds of 140 mph ( 225 km / h ) . The hurricane rapidly weakened over the mountainous terrain of western Mexico , and the circulation dissipated on October 26 over the Sierra Madre Occidental mountains . The remnants continued northeastward into the Gulf of Mexico and southeastern United States .

= = Preparations = =

About 27 hours before landfall , Mexican officials issued a hurricane watch from Mazatlán to Cabo Corrientes , with a tropical storm watch issued further south to Manzanillo . Six hours later when its track became more apparent , the watch was upgraded to a hurricane warning from Mazatlán to La Fortuna , with a tropical storm warning southward to Manzanillo .

Roughly 8 @, @ 800 of the 9 @, @ 000 residents in the landfall location , San Blas , evacuated , which ultimately contributed to a low death toll . Officials ordered for the evacuation of 50 @, @ 000 residents and fishermen along the southwest coast of Mexico , including 3 @, @ 000 in the Islas Marías , 10 @, @ 000 near Mazatlán , and 15 @, @ 000 near flood @-@ prone areas . Civil authorities closed all schools and docks in potentially affected areas . The Mexican Red Cross prepared for the storm by shipping 215 tonnes of relief supplies such as food , water , clothing , and medicine to the Red Cross branch in Jalisco . Assistance from the Yucatán Peninsula delivered 10 tonnes of food and water , as well . The Mexican Red Cross prepared 20 emergency shelters in the state of Nayarit . Officials took security measures in Los Cabos , Baja California Sur , where the Asia @-@ Pacific Economic Cooperation was meeting during the passage of the hurricane . Early forecasts indicated a possible threat to the meeting , causing the government to prepare for a potential alternate site . Officials recommended boats to stay at port due to severe conditions .

= = Impact = =

Few official surface observations are available for the passage of the hurricane . Upon making landfall , Kenna was accompanied with an estimated 16 foot ( 4 @. @ 9 m ) storm surge in San Blas . The surge also affected Puerto Vallarta , with reports of 10 foot ( 3 m ) waves rushing inland from the bay . The hurricane dropped about 1 @. @ 38 inches ( 35 mm ) of precipitation while passing about 60 mi ( 95 km ) east of the offshore archipelago , Islas Marías . There , sustained winds reached an estimated 106 mph ( 170 km / h ) . On land , Kenna dropped heavy rainfall peaking at 18 @. @ 91 inches ( 480 mm ) at San Ignacio , Sinaloa , and 12 @. @ 89 inches ( 327 mm ) near Manzanillo , Colima . The highest recorded sustained wind on land was about 100 mph ( 161 km / h ) at Tepic , Nayarit , with wind gusts at Puerto Vallarta reaching 50 mph ( 80 km / h ) . The hurricane also produced heavy rainfall in Guerrero , Michoacán , Colima , and Jalisco , and hit Baja California Sur with strong winds and rough seas .

In San Blas , strong winds from the hurricane damaged or destroyed 95 % of the homes , with 1 @, @ 540 houses damaged and 8 @, @ 800 people affected . There , large commercial shrimp boats were swept up to 900 feet ( 275 m ) inland from their docks . An elderly woman died in the city when the wall of her house collapsed on her . Large portions of the city were covered with building debris and sand washed from the ocean . Elsewhere in Nayarit , flying debris killed a person in Santiago Escuintla . There , two elderly men drowned , one by falling into a river . Both were believed to have been killed during the storm as they fled their homes . In Santiago Ixcuintla , the hurricane damaged 3 @, @ 770 homes , and throughout Nayarit , strong winds from the hurricane destroyed the roofs of hundreds of houses . Federal authorities lost communications with at least 30 Indian villages due to the high winds of the hurricane . Kenna destroyed the entire banana , tobacco , and tomato crops in the rural areas of San Blas , Tecuala , and Acaponeta , leaving more than 700 subsistence farmers and their families in need of water and food .

In Puerto Vallarta , about 100 mi ( 164 km ) southeast of the landfall location , the storm surge resulted in an estimated damage total of US \$ 5 million , primarily to hotels . The surge flooded the

hotels and other waterfront areas , and extended up to 330 feet ( 100 m ) inland . Waist @-@ deep floodwaters swept away vans and cars , ruining several vehicles . The passage of the hurricane destroyed 150 stores near the ocean and extensively damaged three hotels . Damage to the city 's port was minor .

The hurricane injured at least 52 in Puerto Vallarta and dozens in San Blas from widespread flying glass and other forms of debris , with two people seriously injured due to the hurricane . Ten municipalities suffered substantial damage , with insured damage in Mexico totaling US \$ 96 million . Rainfall from the hurricane spread across northern Mexico , causing minor flash floods and mudslides .

The remnants of Kenna entered the south @-@ central United States , resulting in enhanced rainfall in various locations .

= = Retirement , aftermath and records = =

After the season had ended , the World Meteorological Organization , retired the name Kenna and replaced it with Karina .

The Mexican government declared the region in Nayarit near the landfall of Kenna as a disaster area , allowing for the usage of emergency funds . Immediately after the passage of the hurricane , the Mexican Red Cross prepared 180 technical staff and volunteers from seven states to deliver 125 MT of food , medicine , and clothes to the areas most affected . The Mexican government deployed the Mexican Army to the area to remove fallen trees and establish water treatment plants to assist the affected population . The Mexican Navy was sent to assist to support medical personnel in the San Blas area , and the government Department for Family Development assisted the Mexican Red Cross in delivering food . Grupo Modelo , brewers of Corona beer , sent 6 @, @ 600 gallons ( 25 @, @ 000 liters ) of drinking water and 1000 food sets for the San Blas area .

Backhoes and dump trucks gradually removed the debris and sand from San Blas . Dozens of storeowners , municipal employees , and volunteers in Puerto Vallarta worked to clear the debris caused by the storm . The remaining stores , bars , and shops placed signs on their windows describing they were open in effort to attract the tourists still in the town . By about two months after the hurricane , most hotels , restaurants , and shops were reopened .

Hurricane Kenna is currently tied with a hurricane in 1957 and the 1959 Mexico hurricane as the third most intense Pacific hurricane to strike Mexico . The only Pacific hurricanes to strike Mexico at a greater intensity were Patricia of 2015 and Madeline of 1976 . Kenna is the third most intense October tropical cyclone to have occurred in the East Pacific , and is the fourth most intense East Pacific hurricane on record , behind Hurricane Patricia of 2015 , Hurricane Linda of 1997 and Hurricane Rick of 2009 .