

= Hurricane Rick (2009) =

Hurricane Rick is the third @-@ most intense Pacific hurricane on record . Developing south of Mexico on October 15 , 2009 , Hurricane Rick traversed an area favoring rapid intensification , allowing it to become a hurricane within 24 hours of being declared a tropical depression . An eye began to form during the afternoon of October 16 ; once fully formed , the storm underwent another period of rapid strengthening . During the afternoon of October 17 , the storm attained Category 5 status on the Saffir ? Simpson hurricane wind scale . Several hours later , Rick attained its peak intensity as the third @-@ strongest Pacific hurricane on record with winds of 180 mph (285 km / h) and a barometric pressure of 906 mbar (hPa ; 26 @.@ 75 inHg) .

After maintaining this intensity for several hours , Rick began to weaken in response to a combination of an eyewall replacement cycle and increasing wind shear . By October 19 , the storm was downgraded to a Category 3 hurricane and the following day to a tropical storm . The long @-@ anticipated northeast turn took place near the end of this phase , also accompanied by a brief decrease in forward motion . On October 21 , Rick quickly moved northeast , brushing the tip of Baja California Sur before making landfall near Mazatlán with winds of 60 mph (97 km / h ; 52 kn) . Several hours after moving inland , the final advisory from the NHC was issued as the storm weakened to a tropical depression and dissipated .

Prior to landfall , the National Hurricane Center (NHC) initially forecast Rick to make landfall in southern Baja California as a high @-@ end Category 2 hurricane , prompting hurricane watches . Officials ordered several hundred residents to evacuate from low @-@ lying areas , although tropical storm warnings replaced the hurricane watches after the storm had weakened . Overall , the damage from Rick was significantly less than initially anticipated . In Mexico , three people were killed by the storm , one in Oaxaca and two in Baja California Sur .

= = Meteorological history = =

Hurricane Rick originated from a strong tropical disturbance wave that moved off the west coast of Africa on October 3 , 2009 . Convective activity was initially sparse as the system tracked westward across the Atlantic Ocean . By October 8 , an area of low pressure developed within the disturbance wave and convection increased . The low eventually moved over South America and dissipated on October 11 . The wave , however , remained well @-@ defined and continued westward , entering the Pacific Ocean on October 12 . By the morning of October 15 , the wave began to regain convection and eventually spawned a new area of low pressure roughly 475 mi (764 km ; 413 nmi) south @-@ southwest of Puerto Ángel , Mexico . By the afternoon , the NHC reported that the system had become increasingly organized and was likely to develop into a tropical depression later that day . Around 11 : 00 am PDT (1800 UTC) , the NHC declared that the low had developed into a tropical depression , the 20th of the 2009 Pacific hurricane season . The storm featured well @-@ developed outflow in all directions . Environmental conditions consisting of low wind shear , high moisture content and above average sea surface temperatures in the path of the system were exceptionally favorable for rapid development . Additionally , the storm was being steered through this region by a low- to mid @-@ level ridge over Mexico .

Six hours after being declared a depression , the system quickly intensified into a tropical storm , at which time it was given the name Rick . Deep convection , an early indication of an eye forming , had begun wrapping around the center of the system . Early on October 16 , a ragged eyewall began to develop and several hours later , Rick intensified into a Category 1 hurricane with winds of 75 mph (121 km / h ; 65 kn) . The rapid intensification was fueled by waters of 30 ° C (86 ° F) , several degrees above average . By the evening of October 16 , microwave satellite imagery depicted a well @-@ defined eye ; however , this feature was not present on infrared images . Despite this , the NHC upgraded Rick to a Category 2 hurricane with winds now reaching 100 mph (161 km / h ; 87 kn) . Early the next morning , the storm intensified into a major hurricane , a storm that ranks as a Category 3 or higher on the Saffir ? Simpson Hurricane Scale . The eye was clearly visible on satellite images and deep , very cold convection surrounded it , signifying a powerful

cyclone . Less than 40 minutes after this upgrade , the NHC issued a special advisory stating that Rick had further strengthened into a Category 4 hurricane .

Continuing to gain strength , Rick attained winds of 145 mph (233 km / h ; 126 kn) several hours later on October 17 . A possible outer eyewall , a second eye larger than the first that often forms at the beginning of an eyewall replacement cycle , was noted at this time . The eye of the storm became very well @-@ defined and nearly cloud free , measuring roughly 11 @.@ 5 mi (18 @.@ 5 km ; 10 @.@ 0 nmi) in diameter . In addition to the rapid intensification , Rick was also growing in size . By the afternoon hours , tropical storm @-@ force winds extended up to 155 mi (249 km ; 135 nmi) from the center of the storm , with a maximum gale diameter of 300 mi (483 km ; 261 nmi) . At 3 : 10 pm PDT (2210 UTC) , the NHC issued its second special advisory for Rick , this time stating that the storm had become a Category 5 hurricane , the first in the basin since Hurricane Kenna in 2002 . Around 8 : 00 pm PDT (0300 UTC on October 18) , Rick attained its peak intensity as the third @-@ strongest Pacific hurricane on record . Maximum sustained winds in the eyewall reached 180 mph (290 km / h ; 156 kn) and the barometric pressure is estimated to have bottomed out at 906 mbar (906 @.@ 00 hPa ; 26 @.@ 75 inHg) . The pressure was not directly measured as reconnaissance missions by Hurricane Hunter aircraft were not done because the storm was too far from land . Lixion Avila , a senior hurricane specialist at the NHC , described Rick 's satellite presentation at this time as " spectacular . "

Rick maintained its peak intensity for roughly two hours between 7 : 00 pm and 9 : 00 pm PDT (0200 and 0400 UTC) on October 17 , before it began to weaken in response to an eyewall replacement cycle and increasing wind shear . By the afternoon of October 18 , the storm had weakened to a low @-@ end Category 5 hurricane , with maximum winds of 160 mph (257 km / h ; 139 kn) . Deep convection around the eye warmed slightly and a combination of dry air and wind shear restrained the extent of the storms ' outflow to the west . Later that day , Rick began to turn towards the northwest as the subtropical ridge north of the system began to weaken . Early on October 19 , Rick was downgraded to a Category 3 hurricane as it began its approach to the southern end of the Baja California peninsula . Wind shear and dry air quickly entered the core of the system , with the eye disappearing from satellite imagery later that morning .

During the evening of October 19 , the center of Rick became devoid of convective activity , resulting in the NHC downgrading it to a tropical storm . According to meteorologists at the NHC , the weakening was " ... almost as fast as it strengthened several days ago . " The first Hurricane Hunter reconnaissance mission into the storm took place during the afternoon of October 20 . During the mission , sustained winds of 65 mph (105 km / h ; 56 kn) and a surface pressure of 990 mbar (990 @.@ 00 hPa ; 29 @.@ 23 inHg) were recorded . Several hours after this , convection rapidly increased , with a large area of deep convection developing northeast of the center of circulation ; however , this was not associated with intensification . Around 7 : 00 am PDT (1400 UTC) on October 21 . Tropical Storm Rick made landfall near Mazatlán with winds of 60 mph (95 km / h) . Following landfall , the storm rapidly weakened to a tropical depression and roughly seven hours after moving inland , the surface circulation of Rick dissipated over the high terrain of Mexico .

= = Preparations = =

Officials in Oaxaca shut down beaches and warned people not to venture out into the water . Residents were advised of potentially heavy rainfall . Along coastal areas of Mexico , specifically around Acapulco , officials closed ports to small crafts due to rough seas . Residents around the city were also warned about the possibility of mudslides from heavy rain associated with the cyclone 's outer bands . Upon Rick 's intensification to a Category 4 hurricane , officials in Mexico raised the alert level in Guerrero , Jalisco and Michoacán to severe . In Sonora , the local government placed 14 municipalities under a blue alert , the pre @-@ storm phase ; the alert was upgraded to a yellow alert for the municipalities of Álamos , Benito Juárez , Navojoa , Etchojoa and Huatabampo on October 18 .

Early on October 19 , the Government of Mexico issued a hurricane watch for areas of Baja

California Sur between Santa Fe and San Evaristo . Following the issuance of the watch , authorities in the region began planning to open shelters and begin evacuating residents from low @-@ lying areas . Later that day , the watch was replaced by a tropical storm warning as Rick weakened to a tropical storm . By October 20 , a new tropical storm watch was issued for mainland Mexico for areas between El Roblito and Altata . Shortly after , officials had opened nine shelters in the region ; however , schools remained open until further notice . Later in the day , the tropical storm warning for Baja California was discontinued while the watch for mainland Mexico was upgraded to a warning . This warning was later discontinued on October 21 as Rick dissipated over the mountains of Mexico . Several cruises were affected by the storm throughout southern Baja California . The Carnival Splendor made a sudden docking as the storm formed and delayed its arrival in Cabo San Lucas by several days . The Carnival Spirit , scheduled to dock in Acapulco on October 21 , delayed its arrival until October 22 . The Sapphire Princess rescheduled its course , remaining near San Francisco , California , for several additional days instead of traveling south . The Norwegian Star skipped its planned docking in Cabo San Lucas and remained at sea until the passage of Rick . Other cruises affected by the storm include Radiance of the Seas , Mariner of the Seas , MS Veendam and MS Statendam .

= = Impact and aftermath = =

= = = Mexico = = =

Schools throughout southern Sinaloa were closed for two days beginning on October 21 due to the arrival of Tropical Storm Rick . Residents in low @-@ lying areas were urged to evacuate due to both storm surge and fresh water flooding from the anticipated 3 to 6 in (76 to 152 mm) of rain . Although several hundred miles from land , wind gusts up to 40 mph (65 km / h) were felt along coastal areas in Mazatlán . Near the coast of Oaxaca , large seas capsized a boat carrying three people . Two of the passengers were rescued ; however , the third was found dead . Large swells killed one person along the southern end of Baja California Sur on October 19 . Another fatality took place in the same region after a boy was swept away from an eroded beach . Roughly 320 people near Cabo San Lucas were evacuated due to the threat of flooding . Reports near the city also indicated that there was structural damage and significant traffic issues from rain @-@ induced mudslides .

In Mazatlán , near where Rick made landfall , high winds downed trees and signs , leaving numerous residents without power . Heavy rain was also reported during the passage of the storm . Throughout Mexico , damage from Rick amounted to 192 million pesos (\$ 14 @.@ 6 million USD) . On December 29 , the Government of Mexico allocated 381 million pesos (\$ 29 @.@ 6 million USD) to assist in recovery from both Hurricanes Jimena and Rick .

= = = United States = = =

Although no longer a tropical cyclone , remnant moisture from Rick enhanced a strong cold front over the Great Plains of the United States . Severe thunderstorms occurred over parts of the southern states , with at least three tornadoes touching down in Louisiana . Further north , the complex brought heavy rainfall to the northeast and parts of southern Canada . In Louisiana , the storm system spawned seven tornadoes , two of which were ranked as EF @-@ 1 . One of these tornadoes damaged more than 10 structures , destroyed a grain silo , flipped a tractor trailer and left numerous residents without power . In all , the tornadoes left nearly \$ 1 million in losses and injured one person .

In Texas , the remnants of Rick produced torrential rainfall , peaking at 9 @.@ 34 in (237 mm) within a concentrated area . Meteorologists did not anticipate the severity of the precipitation in this area . One person was killed after being swept away in her Jeep on a flooded roadway . Several homes were also flooded during the event and an estimated 300 homes were left without power .

Following the floods , numerous roads were closed and some schools had delayed openings . Throughout the state , flood damage amounted to \$ 690 @, @ 000 , with most of this being in Travis County . Heavy rainfall in Louisiana contributed to widespread flooding that resulted in the closure of several major highways . In Union Parish , rainfall exceeding 6 in (150 mm) led to flash flooding that inundated several homes and a local school , inflicting over \$ 100 @, @ 000 in damage .

= = Records and intensity forecasts = =

On October 17 , Hurricane Rick was classified a Category 5 hurricane , becoming the first in the eastern Pacific basin since Hurricane Kenna in 2002 and the first east of the International Date Line since Hurricane Ioke in 2006 . The storm also became the thirteenth cyclone of this intensity east of the International Date Line since official records in the Eastern Pacific began in 1949 . Shortly after being upgraded to Category 5 , Rick attained its peak intensity with winds of 180 mph (290 km / h ; 156 kn) and a barometric pressure of 906 mbar (906 @. @ 00 hPa ; 26 @. @ 75 inHg) , making it the second @- @ strongest hurricane ever recorded in the East Pacific , surpassing Kenna . Only Hurricane Linda of 1997 was stronger than Rick , with minimum pressure of 902 mbar (902 hPa ; 26 @. @ 6 inHg) . Hurricane Patricia in 2015 later far surpassed both Rick and Linda , attaining a pressure of 872 mbar (hPa ; 25 @. @ 75 inHg) . It also became the second storm in the basin to have sustained winds of 180 mph (290 km / h ; 156 kn) or higher , the first being Linda with 185 mph (298 km / h ; 161 kn) winds . Patricia surpassed both with 215 mph (346 km / h ; 187 kn) winds .

Upon being declared a tropical depression on October 15 , computer forecasting models already anticipated the likelihood of rapid intensification due to the unusually favorable environmental conditions ahead of the system . The Hurricane Weather Research and Forecasting model (HWRF) showed the storm attaining a minimum pressure below 900 mbar (hPa ; 26 @. @ 58 inHg) , an intensity not attained by any Eastern Pacific hurricane on record at the time . The Statistical Hurricane Intensity Prediction Scheme (SHIPS) rapid intensification index , a storm 's probability of intensifying by 35 mph (56 km / h ; 30 kn) or more within 24 hours , was set at 60 % . This percentage quickly increased to 82 % several hours later , 11 times higher than the sample mean . The official forecast from the NHC by their second advisory stated that Rick would become a Category 4 hurricane by October 19 ; however , they mentioned that due to the favorable environment , the storm could intensify faster than forecast . Once Rick had become a Category 2 storm on October 16 , the NHC increased their forecast peak intensity to 145 mph (233 km / h ; 126 kn) , a mid @- @ range Category 4 hurricane .

The first mention of Rick possibly becoming a Category 5 hurricane was in the seventh discussion released by the NHC on October 17 . In their advisory , it was noted that the storm had a 10 % chance of reaching this intensity within 36 hours . Several hours after this advisory was released , a special update advisory was issued . This new advisory placed the peak intensity of Rick just below Category 5 status , with maximum winds of 155 mph (249 km / h ; 135 kn) . It was not until the late morning hours of October 17 that the NHC officially anticipated the storm to attain Category 5 status . Upon attaining winds of 180 mph (290 km / h ; 156 kn) , Rick was forecast to peak with winds of 185 mph (298 km / h ; 161 kn) , which would have tied the record intensity set by Hurricane Linda .