

= Hurricane Hilary (1993) =

Hurricane Hilary was a Category 3 hurricane that caused significant flooding in the Midwestern United States in August 1993 . A westward moving tropical depression gradually developed on August 17 south of the Mexican coast , attaining hurricane status two days later . The storm further intensified into a Category 3 hurricane , attaining peak winds of 120 mph (195 km / h) . By August 23 , the hurricane nearly stalled while interacting with Tropical Storm Irwin . Executing a small counter @-@ clockwise loop , Hilary degraded to tropical storm intensity and took a northerly track for the remainder of its existence . The storm made two landfalls in Mexico , one in Baja California Sur on August 25 and one in Sonora the following day . Tropical cyclone warnings and watches were issued for much of the southern Mexican coastline ; however , they were later discontinued when the threat ended , but were issued again when the system posed a threat to the Baja California Peninsula . Hilary dropped in excess of 5 in (130 mm) rain along its path in some areas , and flash flooding in California and Iowa .

= = Meteorological history = =

Several small areas of convection developed in association with a tropical wave on August 14 near Central America . Over the next two days , the convection migrated across Central America , and then entered the Gulf of Tehuantepec on August 16 . The next morning , Tropical Depression Nine @-@ E formed south of an upper @-@ level low that was located in the Gulf of Mexico . Banding features slowly increased in coverage , and on August 18 , the depression intensified , becoming Tropical Storm Hilary about 100 mi (160 km) south of the Pacific coast of Mexico . Hilary steadily gained strength , but its outflow remained restricted . Moving northwest on a track parallel to the coast of Mexico at around 10 mi (16 km) due to a complex steering pattern , Hilary was initially poorly organized and its low @-@ level circulation was tough to find . The storm failed to intensify further until August 19 , when the storm was upgraded into a hurricane after the cyclone developed very cold cloud tops .

Even though most computer models expected Hilary to remain offshore , meteorologists suggested there was a possibility of making landfall near Manzanillo . The next day , an eye formed ; subsequently , Hilary reached Category 2 intensity on the Saffir @-@ Simpson Hurricane Scale . By the time , the hurricane had grown into a large cyclone with gale @-@ force winds extending out 130 mi (210 km) from the center . Under weak steering currents , Hilary became a major hurricane , a cyclone with winds of 111 mph (190 km / h) or higher , early on August 21 . Shortly thereafter , Hilary reached its peak intensity with winds of 120 mph (155 km / h) . Around this time , Hurricane Hilary developed a 15 mi (24 km) eye . Later that day , however , the eye had shrunk to about 9 mi (14 km) in diameter . The eye , which was very well @-@ defined , was surrounded by a central dense overcast , a large mass of deep convection .

Shortly after its peak , Hurricane Hilary 's motion became unsteady . After nearly stalling , the hurricane turned to the west on August 22 , only to become nearly stationary again the next day . Slowly executing a small counter @-@ clockwise loop , Hilary underwent a Fujiwhara interaction with Tropical Storm Irwin which was several hundred miles southeast . Meanwhile , Hilary began to weaken , by early on August 22 , the eye became poorly defined and convection diminished . The eye dissipated within 12 hours , and the winds quickly diminished to 85 mph (130 km / h) . Later that day , the thunderstorm activity became partially exposed from the center , and on August 23 , Hilary was downgraded to a tropical storm due to lack of organization .

The interaction continued to weaken Hilary , leaving it with little thunderstorm activity and winds of just 40 mph (60 km / h) on August 24 , before resuming a northerly motion . Around this time , Hilary finally absorbed Irwin . While Hilary began to traverse cooler waters , the environment became more favorable . Upon developing a 200 mb anticyclone , Hilary began to revive based on data from satellite imagery and ship reports . Tropical Storm Hilary made landfall in Baja California Sur on two separate occasions as a strong tropical storm on August 25 . Weakening over land , the cyclone regenerated deep convection over the Gulf of California . As a tropical depression , Hilary

made its final landfall on August 26 just west of Hermosillo in Sonora . While most of the mid to upper level moisture associated with the storm got pulled inland by a shortwave trough , the low level center dissipated in the northern Gulf on August 27 .

= = Preparations and impact = =

Due to Hilary 's proximity to Mexico on August 20 , hurricane watches were issued for much of the southern coastline ; however , they were later discontinued . Once the system began its northward track , further watches and warnings were issued for the Baja California Peninsula and the Gulf of California coastline . Heavy rains , with a maximum recorded amount of 11 @. @ 35 in (288 mm) in Derivorda Jale , Colima , were accompanied the storm . Along the Baja California Peninsula , a statewide rainfall total of 4 @. @ 33 in (110 mm) fell in Huerta Vieja . However , no damage or loss of life took place . Winds along the peninsula were strong , though not as strong as Hurricane Calvin , a hurricane which struck the peninsula during July 1993 .

The outer bands of Hurricane Hilary also brought localized downpours to parts of California , resulting in flash floods . In Arizona , 3 @. @ 75 inches (95 mm) of rain fell on Green Valley , and 3 @. @ 50 inches (89 mm) of precipitation was recorded at Organ Pipe Cactus National Monument , resulting in flash flooding . Hilary produced a surge of moisture that dropped over 25 % of the summer rainfall in portions of New Mexico . The remains of Hilary combined with a cold front to produce widespread flooding across the Midwestern United States . About 10 in (250 mm) fell in some areas of Iowa , forcing rivers and streams to overflow its banks . Hundreds of people evacuated their homes .