

= Hurricane Isis ( 1998 ) =

Hurricane Isis was the deadliest tropical cyclone and only hurricane to make landfall during the 1998 Pacific hurricane season . The ninth tropical storm and sixth hurricane of the season , Isis developed on September 1 from an interaction between a tropical wave and a large surface circulation to the southwest of Mexico . It moved northward , striking the extreme southeastern portion of the Baja California peninsula before attaining hurricane status in the Gulf of California . Isis made landfall at Topolobampo in the Mexican state of Sinaloa on September 3 , and quickly lost its low @-@ level circulation . The remnants persisted for several days before dissipating in the U.S. state of Idaho .

In Mexico , Isis destroyed over 700 houses and killed 14 people ; this is primarily due to its heavy rainfall which peaked at over 20 inches ( 500 mm ) in southern Baja California Sur . The rainfall caused widespread damage to roads and railways , stranding thousands of people . Moisture from the remnants of Isis extended into the southwestern United States , resulting in light rainfall , dozens of traffic accidents , and power outages to thousands of residents in San Diego County , California .

= = Meteorological history = =

A tropical wave moved off the coast of Africa on August 14 , 1998 . It traveled westward , and on August 19 spawned the tropical depression that eventually became Hurricane Bonnie . The wave continued westward across the Atlantic Ocean and Caribbean Sea , and crossed Central America into the eastern Pacific Ocean on August 25 . The wave decreased its forward speed while approaching a large low @-@ level circulation over southern Mexico . A broad area of disturbed weather formed in association with the wave and the low @-@ level circulation , and after persisting for several days developed a smaller low @-@ level circulation on August 29 about 575 miles ( 925 km ) south @-@ southeast of Cabo San Lucas . On August 31 , the two primary areas of convection were well @-@ removed from the center . By early on September 1 , despite a lack of convective organization , the low @-@ cloud circulation was sufficiently well @-@ defined that the National Hurricane Center designated it as Tropical Depression Ten @-@ E , or the tenth tropical depression of the season , about 350 miles ( 565 km ) south of Cabo San Lucas . In real time , the National Hurricane Center first upgraded the system 21 hours later .

The depression initially tracked slowly north @-@ northwestward and gradually strengthened . Late on September 1 it intensified into Tropical Storm Isis while located about 200 miles ( 320 km ) south of Cabo San Lucas . Upon becoming a tropical storm , the deep convection was not organized , causing one forecaster to describe Isis as a large monsoon @-@ like system . A mid @-@ level trough extending southward from the Arizona / California border caused the storm to accelerate northward . The storm quickly strengthened ; six hours after Isis became a tropical storm it reached winds of 70 mph ( 115 km / h ) . Very deep , symmetrical convection developed over the poorly defined center of circulation while banding features began to form , although ill @-@ defined outflow and land interaction with the Baja California Peninsula initially prevented further strengthening . At 1200 UTC on September 2 , Isis made landfall on extreme southeastern Baja California Sur as a strong tropical storm , and subsequently turned to the north @-@ northeast .

After entering the Gulf of California , an eye began to become apparent on visible satellite imagery , and it is estimated Isis attained hurricane status late on September 2 . Continuing northward , it struck Topolobampo in the state of Sinaloa early on September 3 as a minimal hurricane . Isis weakened to a tropical storm a few hours after landfall , and subsequent to turning to the north @-@ northwest the low @-@ level circulation dissipated over Sierra Madre Occidental . The remnants entered southern Arizona on September 4 and tracked around an upper @-@ level low . After entering Nevada on September 5 , the remnants of Isis passed into Oregon before dissipating in Idaho on September 8 .

= = Preparations = =

Coinciding with the National Hurricane Center 's first advisory on Isis , the government of Mexico issued a tropical storm warning from Dolores to Puerto Cortés along the Baja California Peninsula . This helped some of the residents get an early start.Early on September 2 , the warning was extended from Santa Rosalía to Punta Abreojos , while an additional tropical storm warning was issued from El Dorado to Guaymas . After Isis became a hurricane , officials issued a hurricane warning from Dolores to Punta San Gabriel on the Baja California Peninsula and from El Dorado to Bahía Kino on the mainland .

In Baja California Sur , 2 @, @ 500 residents were evacuated to emergency shelters . Officials closed the port at Mazatlán and recommended fisherman along the coast of the Gulf of California to remain at port . Officials set up 49 shelters on the mainland to provide evacuees with food , clothing and medical attention . The Mexican Army assisted residents in evacuation , and the Navy provided medical aid and assistance to boat owners . More than 24 @, @ 000 people were sheltered during the storm .

= = Impact = =

= = = Mexico = = =

Isis first affected Baja California Sur on September 2 as a tropical storm . Shortly after making landfall , a weather reporting station at San José del Cabo recorded sustained winds of 26 mph ( 42 km / h ) , and gusts reaching up to 46 mph ( 74 km / h ) . A station on the Islas Marías also reported sustained winds of 54 mph ( 87 km / h ) . The winds left widespread areas without power or telephone . The storm produced heavy rainfall in the southern portion of the peninsula , including a 24 ? hour total of 12 @. @ 99 inches ( 330 mm ) at Los Cabos and a peak rainfall total of 24 @. @ 02 inches ( 610 mm ) at Santiago . A married couple was killed after attempting to cross a flooded stream in Los Cabos . Initially , reports indicated a family was missing in La Paz , though they were later proven false . Flooding from the storm closed all roads to the north of Los Cabos and caused damage to the roads in the area . Mudslides from the rain buried at least 120 cars in the area .

Rainfall reached over 10 inches ( 250 mm ) in the coastal region of Jalisco , and lighter amounts of precipitation extended further to the southeast and northeast . One person was reported missing in Jalisco . The heaviest 24 ? hour rainfall total in the state of Sinaloa was 8 @. @ 66 inches ( 220 mm ) , whereas in Sonora a maximum of 4 @. @ 72 inches ( 120 mm ) of rain were recorded . Strong waves from the hurricane struck the Mexican mainland , with four people injured at Mazatlán when their boat washed onto rocks and was destroyed . Rainfall from the storm flooded 15 communities in and around Mazatlán , and the Army assisted residents in emergency evacuations . At Los Mochis , near the point where Isis made landfall , the hurricane resulted in the destruction of 300 homes , as well as in seven fatalities . Throughout the city , strong winds from the hurricane downed street posts , tree limbs , and power lines , with one person seriously injured from a downed power line . Additionally , the roof of a gas station collapsed from the winds . More than 1 @, @ 200 bus passengers in Sinaloa were stranded due to road closures from the hurricane , including the closure of the coastal highway in the southern portion of Sinaloa as it had been washed out due to floodwaters . Rainfall from the storm caused severe river flooding in some locations , and authorities advised those living along the Fuerte River to be prepared for a possible evacuation . The winds from Isis left about 120 @, @ 000 people in the municipality of Ahome without power .

Throughout Mexico , the passage of Hurricane Isis resulted in 14 deaths and the loss of 769 homes , with property damage estimates totaling over \$ 5 million ( 1998 USD , 50 million 1998 MXN , \$ 6 @. @ 3 million 2007 USD ) . According to a speech by President Ernesto Zedillo , Isis damaged the water systems in 173 localities ; it also damaged 154 primary schools and nine high schools , minor in most cases , causing most schools to be closed for around a week . A total of 730 miles ( 1175 km ) of railroad track was damaged by mudslides or flooding , with one bridge entirely destroyed and another four damaged .

= = = United States = = =

Thunderstorms from the remnants of Isis dropped more than two inches ( 50 mm ) of rainfall across southern Arizona , resulting in some flash flood warnings and flooding on roadways . The heaviest precipitation fell across the Santa Catalina and Rincon Mountains near Tucson , which saw precipitation amounts of up to three inches ( 75 mm ) . Otherwise , no flooding was reported in the Tucson area , and the Tucson International Airport reported only 1 @. @ 1 inches ( 28 mm ) as a result of the storm .

The moisture extended into southern California and produced moderate precipitation across the region . Bakersfield reported a one @-@ day rainfall record on September 4 with 0 @. @ 23 inches ( 5 @. @ 8 mm ) of precipitation , breaking the previous record of 0 @. @ 17 inches ( 4 @. @ 3 mm ) set in 1963 . Rainfall amounts at Frazier Park peaked at 1 @. @ 53 inches ( 39 mm ) . Agricultural losses , primarily from vintners and raisin growers , rose up to \$ 5 million in damage ( 1998 USD , \$ 6 @. @ 33 million 2007 USD ) , either directly due to rain or indirectly due to the additional steps to treat the increase in fungus activity on produce . Slick roads from the rain resulted in nearly 80 traffic accidents in San Diego County , ranging from fender benders to moderate injuries . Thunderstorms from the remnants of Isis damaged a San Diego Gas & Electric substation at Kearny Mesa , leaving 10 @, @ 000 customers without power ; the outage was short lived and completely restored within two hours . About 1 @, @ 000 homes and businesses were temporarily without power in Escondido , and another 2 @, @ 700 customers lost electricity in Rancho Bernardo . Rainfall in and around San Diego reached a maximum of 0 @. @ 5 inches ( 13 mm ) at La Mesa . Heavy clouds from Isis produced scattered rainfall and temporary relief to severe heat conditions in the Los Angeles area .

Moisture from the remnants of Isis spread across the southwestern United States , and rainfall reached over 0 @. @ 75 inches ( 19 mm ) in Nevada and Utah . Low @-@ level moisture dissipated as it continued inland , due to dry air , although upper @-@ level moisture produced light rain across the Northwestern United States ; Pocatello , Idaho recorded 0 @. @ 59 inches ( 15 mm ) , while Missoula , Montana recorded 0 @. @ 39 inches ( 10 mm ) .

= = Aftermath = =

Aid programs began immediately after Isis moved ashore and dissipated to provide support to the affected population . The Comisión Nacional del Agua distributed 1 @. @ 6 million U.S. gallons ( 1 @. @ 3 million imp gal / 6 million L ) of water and provided repair equipment to the 173 localities whose water systems were damaged . More than 650 health workers worked to combat the spread of diseases , including monitoring sanitary conditions of water and foods , and sprayed nearly 9 @, @ 900 acres ( 40 km<sup>2</sup> ) of land to prevent the breeding of mosquitoes . The force also disinfected more than 6 @, @ 600 latrines and removed more than 850 short tons ( 770 t ) of sewage to prevent the spread of epidemic . No medical @-@ related deaths occurred as a result of this attention .

Twenty @-@ four hours after the passage of the hurricane , workers had restored power to 70 % of the affected residents in Sinaloa , and by six days after the storm , electrical service was completely restored . The damage to the federal highway between Culiacán and Los Mochis along the coastal region of Sinaloa was restored about 48 hours after the passage of the hurricane . The rehabilitation of the agricultural infrastructure began immediately , and most of the drainage networks were repaired by about two weeks after the hurricane . About half of the damaged railways were repaired by about a month after the storm . The total cost for reconstruction and aid amounted to about \$ 18 @. @ 5 million ( 1998 USD , 175 million 1998 MXN , \$ 23 @. @ 3 million 2007 USD ) , about 94 % from federal funds and the rest from state funding . A portion of the funding was allocated to assist the reconstruction of destroyed houses .