

= Hurricane Madeline (1998) =

Hurricane Madeline was the final tropical cyclone of the 1998 Pacific hurricane season . Madeline originated from a tropical wave that emerged off the coast of Africa on September 25 , 1998 . The wave traversed the Atlantic Ocean and crossed over Central America on October 5 or 6 . Gradually , the system intensified and was classified as a tropical depression on October 16 , a tropical storm later that day , and a hurricane on October 17 . The storm reached peak winds of 85 mph (140 km / h) about 95 miles (150 km) southwest of San Blas , Nayarit , and after 18 hours it subsequently began to weaken . Although Madeline never made landfall , numerous rainbands affected the Mexican coast causing no known damage or fatalities . The remnant moisture moved north and contributed to flooding in central Texas , which killed 31 people and caused \$ 750 million (1998 USD) in damage .

= = Meteorological history = =

On September 25 , 1998 a tropical wave emerged off the coast of Africa , producing intermittent concentrated clusters of convective activity . The wave traversed the Atlantic Ocean and the Caribbean Sea before crossing Central America on October 5 or October 6 . After several days , convection increased , and Dvorak classifications initiated . Satellite imagery indicated that the system dissipated on October 11 , although an area of cloudiness persisted off the coast of Mexico . After four days , the system regenerated and under diffluent flow aloft , deep convection became more concentrated ; it is estimated that a tropical depression formed at 0000 UTC on October 16 , about 230 mi (370 km) west @-@ southwest of Manzanillo , Mexico . Initially , due to disorganization , determining the forward movement of depression was difficult , although a few hours later it was estimated that the system was tracking to the north @-@ northwest . With favorable conditions aloft , the deep convection became more concentrated , and 12 hours after first developing , the depression intensified into Tropical Storm Madeline about 170 miles (270 km) southwest of Cabo Corrientes .

During the afternoon , convective cloud tops warmed slightly although the storm continued to intensify . Soon after , thunderstorm activity became limited as Madeline remained generally stationary in movement . An approaching mid @-@ level trough turned Madeline to the northeast . Banding features gradually improved in organization , and late on October 17 the storm attained hurricane status . However , satellite imagery indicated that convective activity was confined to the western portion of the storm , and at the same time an eye began to form . Early on October 18 , data from a Reconnaissance aircraft flight into the storm found a minimum central pressure of 985 mbar (29 @. @ 1 inHg) , as the storm was drifting to the northeast at around 4 mph (6 @. @ 4 km / h) near the western edge of a large @-@ scale east ? west ridge axis . The apparent eye became cloud @-@ filled shortly thereafter , and a slight increase in temperature was discovered near the center . Despite this , upper @-@ level outflow was favorable , leading to predictions of slight intensification .

Shortly thereafter , Madeline attained peak winds of 85 mph (140 km / h) about 95 miles (150 km) southwest of San Blas , Nayarit . The hurricane maintained peak winds for about 18 hours while curving again to the northwest . With evidence of southern wind shear , only a small area of deep thunderstorm activity existed on October 19 , and the system began to appear ill @-@ defined of satellite imagery . The hurricane quickly weakened into a tropical storm , and by later that day , the storm became void of convection due to strong wind shear . On October 19 , the storm was downgraded to a tropical depression , leaving just a swirl of low clouds midway between the southern tip of Baja California and mainland Mexico . By 0600 UTC on October 20 , the remnants of Madeline had completely dissipated .

= = Preparations and impact = =

In anticipation of Madeline , the government of Mexico issued a tropical storm warning for the Baja

California Peninsula southward from La Paz , and a hurricane warning from San Patricio , Jalisco to El Dorado , Sinaloa , including the Islas Marías . The storm was initially forecast to move ashore near Mazatlán , prompting officials to close the city 's port . President Ernesto Zedillo advised potentially affected residents to stay indoors or seek refuge in shelters . Also , the threat of the hurricane canceled a fishing expedition in the Gulf of California due to rough surf . The expedition was to provide a new aquarium in downtown Denver , Colorado with about 8 @, @ 500 fish . Mexican authorities deployed 2 @, @ 000 soldiers in remote areas of the Pacific coast state of Sinaloa to prepare for the hurricane . Several thousand residents and tourists at the resorts of Puerto Vallarta and Mazatlan were put on standby to evacuate their homes . Authorities along the coast in the state of Nayarit went house to house , advising people about the oncoming storm . In addition , ships from Salina Cruz to Acapulco were advised to stay in port .

Although Madeline never crossed the coast , numerous rainbands affected the Mexican coast , dropping up to 9 @. @ 8 in (250 mm) . Despite this , no damage or fatalities were reported in Mexico . After the storm had dissipated , the remnant plume of moisture contributed to severe flooding in central Texas . Rainfall in Texas reached 22 inches (560 mm) in some locations . Thirty @- @ one people died due to the flooding , and damage totaled to \$ 750 million (1998 USD) . A total of 24 of the deaths were drownings , 22 of them were caused by driving vehicles into high water on a road flooded by the torrential downpours . There were 16 different incidents when these types of deaths occurred , four of them involving in multiple deaths . Three others died due to trauma , and one died from hypothermia after the person was submerged in the water . The greatest impact was in Southern Texas , which included the urban areas of San Antonio and Austin , and all of their surrounding suburbs . The counties with the most significant rainfall , damage , and fatalities were Travis County , Bexar County , Guadalupe County , Comal County , and Caldwell County . This area included both the cities of San Antonio and Austin . In a small area in Caldwell County , there was 29 inches (740 mm) of rain estimated by the United States Geological Survey . This included the area of Lockhart , Texas , which was badly flooded by the storm due to its close proximity to the San Marcos River . Most of the county picked up an estimated 20 to 30 in (510 to 760 mm) of rain , including San Marcos , Texas , New Braunfels , Texas , and Kyle , Texas . In all , portions of 60 counties in Texas were flooded and hundreds of people were forced to flee their homes .

Due to the flooding , twenty counties were declared federal disaster areas , clearing the way for assistance such as federal loans . Then @- @ president Bill Clinton promised aid to the victims of the storm and then @- @ governor George W. Bush took a tour of the devastated region with the Federal Emergency Management Agency director .