

= 1987 Atlantic hurricane season =

The 1987 Atlantic hurricane season was a below @-@ average hurricane season that was limited by an ongoing El Niño . The season officially began on June 1 , 1987 , and lasted until November 30 , 1987 , although activity began on May 24 when a tropical depression developed 400 mi (640 km) east of the central Bahamas . The June through November dates conventionally delimit the period of each year when most tropical cyclones form in the Atlantic basin . The first cyclone to attain tropical storm status was an unnamed tropical storm which formed on August 9 , nearly a month later than usual . The final storm of the year , Tropical Depression Fourteen , merged with a weak extratropical low on November 4 . The season marked the first year tropical storm watches and warnings were issued ; previously , gale watches and warnings were used for tropical storms , and this season was one of only a few seasons with no deaths in the United States ; the last time this happened was in the 1981 season .

During this season , 14 tropical depressions formed of which seven attained tropical storm status . One tropical storm was operationally classified as a tropical depression but was reclassified in post @-@ analysis . Three tropical cyclones reached hurricane status of which only one became a major hurricane , which is a Category 3 or greater on the Saffir @-@ Simpson Hurricane Scale . Hurricane Emily was the costliest storm of the season , causing \$ 80 @. @ 3 million in damage (1987 USD) as it ravaged the Dominican Republic and Bermuda . Tropical Depression Fourteen was the deadliest storm of the season , causing six deaths as it passed across Jamaica . Of the seven cyclones that attained tropical storm status , three did not affect land .

= = Seasonal forecasts and activity = =

Forecasts of hurricane activity are issued before each hurricane season by hurricane expert Dr. William M. Gray and his associates at Colorado State University . An average season , as defined by NOAA , has 6 to 14 named storms , with 4 to 8 of those reaching hurricane strength , and with 3 hurricanes becoming major hurricanes . The June 2 , 1987 report suggested that eight tropical storms would form during the 1987 season , five of them becoming hurricanes .

The forecast anticipated more tropical activity than what ultimately occurred . During the season , 14 tropical depressions formed from May 25 to November 5 . Seven of the depressions strengthened into tropical storms , six of them named . Tropical Depression Two was upgraded into a tropical storm in post @-@ season analysis , and as a result has no name . Tropical storms Arlene , Emily and Floyd all reached hurricane status during their durations , of which only Emily reached major hurricane status .

The United States was affected by four tropical cyclones in 1987 , of which three struck Florida . The unnamed tropical storm struck Texas and affected much of the Gulf Coast of the United States .

The season 's activity was reflected with a cumulative accumulated cyclone energy (ACE) rating of 34 , which is classified as " below normal " . ACE is , broadly speaking , a measure of the power of the hurricane multiplied by the length of time it existed , so storms that last a long time , as well as particularly strong hurricanes , have high ACEs . ACE is only calculated for full advisories on tropical systems at or exceeding 34 knots (39 mph , 63 km / h) or tropical storm strength . Subtropical cyclones are excluded from the total .

= = Storms = =

= = = Tropical Depression One = = =

A low @-@ pressure area was observed by a Reconnaissance Aircraft and declared the first tropical depression of the year on May 25 ? one week before the official season began . Moving at about 8 mph (13 km / h) , the depression was located 400 miles (640 km) from the east central

Bahamas . It moved towards Florida and stalled off the coast , with a prediction to cause thundershowers across the state on May 28 . The Bahamian government released a storm warning for its northern islands as the system grew stronger . The tropical depression weakened on June 1 , the official start of the hurricane season .

== Tropical Storm Two ==

The second tropical depression of the season formed in the northwestern Gulf of Mexico from a tropical wave on August 9 . It quickly strengthened into a tropical storm , though the strengthening was not known until post season analysis . Based on lack of significant organization or reports at the time , the storm remained unnamed . It traveled northwestward and neared the coast . The tropical storm made landfall near High Island , Texas on August 10 , and quickly weakened to a tropical depression as it moved northeastward . It turned to the southeast and reached the Gulf of Mexico . The weakening system accelerated to the northeast , and dissipated over Georgia on August 17 . Just over 21 inches (0 . 53 m) of rainfall was associated with the storm , causing flash flooding and water damage amounting to \$ 7 . 4 million (1987 USD , \$ 13 . 3 million in 2008 USD) .

== Hurricane Arlene ==

A low pressure system on the tail end of a stationary cold front organized into a subtropical depression on August 8 near the South Carolina coast , and drifted southward . Convection became more organized , and the storm was classified Tropical Depression Three on August 10 over the Bahamas . It executed an anticyclonic loop to the northeast , and was estimated to have attained tropical storm status on August 11 , based on reports from Hurricane Hunters . Small cells in the ridge of high pressure caused Arlene to take an unusual track to the east , with two southward jogs in its path . A trough of low pressure near Bermuda initially inhibited strengthening . However , after high pressures to its east forced the storm northward , more favorable conditions allowed Arlene to intensify into a hurricane on August 22 . Operationally , it was upgraded two days earlier , based on the appearance of an eye feature on satellite imagery . After becoming a hurricane , Arlene accelerated to the northeast into the cold waters of the north Atlantic Ocean , and on August 23 it became extratropical about halfway between Newfoundland and Ireland . The extratropical remnants turned to the southeast and later to the east , making landfall on the Iberian Peninsula before dissipating on August 28 over Spain .

As Arlene approached , islanders of Bermuda were warned to board up windows , with winds of 50 mph (80 km / h) expected . Ultimately , the island experienced winds of 35 mph (60 km / h) with gusts up to 49 mph (80 km / h) . A blind sailor on a trip across the Atlantic was unable to make it to a harbor in Bermuda due to the hurricane , and rode out the storm in the open sea . The storm produced moderate rainfall to coastal areas of Spain , contributing to a monthly rainfall record at Rota . The 14 . 5 day total between the start of its best track and when it attained hurricane status is the largest on record for a North Atlantic hurricane .

== Tropical Depression Four ==

The fourth tropical depression of the season formed off the coast of Antigua on August 14 . Initially , forecasters anticipated the system to intensify into a tropical storm ; however , a reconnaissance mission into the depression on August 15 revealed that it was poorly organized and was declassified a tropical cyclone . Tropical Depression Four peaked at 35 mph (55 km / h) and dissipated on August 15 .

== Tropical Storm Bret ==

A well organized tropical disturbance formed off the African coast on August 17 and became

a tropical depression the following day , as classified by satellite imagery . Later the same day , the ship S.S. Columbus Canterbury reported 40 mph (60 km / h) winds and a minimal pressure of 1004 millibars , and the depression became Tropical Storm Bret .

The cyclone moved a westward course of 20 ? 25 mph (40 km / h) and reached its peak intensity of 50 miles per hour (80 km / h) winds and 1000 millibars in pressure on August 20 . A ridge of high pressure in the eastern Atlantic Ocean , north of Bret , began to weaken and drift to the east on August 20 . Bret was moving at 17 mph (27 km / h) to the east on August 21 . It was thought that Bret would strengthen at this point . Bret slowed from August 21 until August 23 , moving at only 15 ? 20 mph .

The cyclone soon moved on a northwestward course and encountered wind shear . Bret weakened into a depression on August 23 , due to the wind shear over the system . The next morning , the depression became a tropical wave with no low @-@ level circulation left . The wave was soon absorbed by a trough of low pressure during the next few days .

= = = Tropical Depression Six = = =

A tropical depression formed off the African coast on August 31 , in which forecasters predicted would become the third tropical storm of the season . At 0600 UTC August 31 , the depression was seemingly appeared unchanged , with winds of averaging about 35 mph (55 km / h) . The depression was then located 950 miles (1 @, @ 530 km) west of Sao Taigo in Cape Verde , stirring up 12 @-@ foot (4 m) seas .

The next day , Tropical Depression Six moved westward to a position 1 @, @ 690 miles (1 @, @ 690 km) off the Cape Verde Islands , too far from the Caribbean islands for the National Hurricane Center to send a reconnaissance flight into the depression . Tropical Depression Six was at the time not a threat to land and few ships were in the area . It degenerated into a tropical wave on September 4 , never affecting land or reaching storm @-@ intensity .

= = = Tropical Storm Cindy = = =

On September 1 a tropical wave exited the African coast , and moved westward across the Atlantic Ocean . A trough of low pressure moved southeastward through the tropics , and brought the wave more towards the north . Generally favorable conditions for development allowed the wave to organize into a tropical depression on September 5 , and two days later it attained tropical storm status . Cindy continued northward , and peaked at 50 mph (80 km / h) winds on September 8 before turning to the northeast . Strong upper @-@ level shear weakened the storm , and after two days of struggling as a tropical storm , Cindy became extratropical on September 10 to the northwest of the Azores . Cindy did not affect any landmasses .

= = = Tropical Depression Eight = = =

A tropical depression formed in the Caribbean Sea on September 5 . It tracked westward through the body of water , and reached peak winds of 35 mph (56 km / h) on September 7 . Despite its appearance , Tropical Depression Eight failed to develop further and early on September 8 , the depression made landfall near Puerto Cabezas , Nicaragua shortly before dissipating .

= = = Tropical Depression Nine = = =

An upper @-@ level cyclone in the northern Gulf of Mexico started tropical cyclogenesis offshore the southeast United States . Convection organized around a low pressure area east of Florida , and it was declared Tropical Depression Nine on September 7 . Initially poorly organized , the depression moved generally northward without strengthening , and quickly made landfall along the coast of South Carolina . It maintained its identity as it tracked through North Carolina and the Mid @-@ Atlantic States , and on September 10 the depression merged with a frontal wave over New

England . The cyclone dropped moderate precipitation along its path , peaking at 10 @. @ 23 inches (0 @. @ 260 m) in central Virginia ; stations in Maryland , the Carolinas , and Pennsylvania reported over 5 inches (125 mm) of rainfall . Flash flood warnings were issued in some localities due to the precipitation , and in Virginia over 50 roads were washed out . Slick roads caused three tractor @- @ trailers to jackknife along a 2 mile (3 km) portion of the Capital Beltway . Additionally , four people required rescue assistance after being trapped in swollen creeks .

= = = Tropical Storm Dennis = = =

A tropical depression formed on September 8 off the coast of Africa . It tracked westward , passing to the south of the Cape Verde islands , and based on satellite imagery was estimated to have reached tropical storm status on September 10 . Tropical Storm Dennis continued to gradually intensify , and on September 11 attained peak winds of 50 mph (80 km / h) and a minimum pressure of 1 @, @ 000 mbar (30 inHg) . Subsequently the cyclone weakened to minimal tropical storm status , and by September 14 , Dennis was expected to immediately weaken to tropical depression status . However , Dennis remained a minimal tropical storm for four more days before deteriorating to a tropical depression on September 18 , as reported by a Hurricane Hunters plane . The depression turned abruptly northwestward through a weakness in the subtropical ridge , suggesting a new low pressure area developed . On September 19 it turned to the northeast , and on September 20 Dennis merged with an extratropical low .

= = = Tropical Depression Eleven = = =

On September 14 , a tropical depression developed about 490 miles (790 km) southeast of Antigua . Tracking westward at 5 ? 10 mph (8 ? 16 km / h) , the depression maintained winds of about 35 mph (55 km / h) , and was deemed " no cause for alarm " for the Lesser Antilles . Failing to intensify further , the depression degenerated into a tropical wave on September 16 to the east of Antigua . No damage or fatalities were reported .

= = = Hurricane Emily = = =

A tropical depression , the tenth of the season , formed on September 20 . It soon became a tropical storm that day off the South American coast . Emily quickly strengthened becoming a hurricane less than 48 hours later on September 22 .

The cyclone then slowly began turning north , soon making landfall in the Dominican Republic , where three people were reported dead and there was \$ 30 million (1987 US dollars , \$ 56 @. @ 9 million in 2009 USD) in damage . Emily passed over Hispaniola , turned to the northeast , and eventually made landfall in Bermuda , where it caused \$ 50 million (1987 USD , \$ 94 @. @ 8 million in 2009 USD) in damage , though there were no fatalities . It weakened into a tropical storm after landfall , peaking at 125 miles per hour (200 km / h) in wind speed , a Category @- @ 3 hurricane .

After peaking at winds of 90 miles per hour (140 km / h) , Emily dissipated on September 26 . Thousands of migratory birds took refuge on Bermuda during the storm , including ten thousand bobolinks and thousands of Connecticut warblers . After the storm passed Bermuda , Emily became the second @- @ fastest @- @ moving hurricane of the previous century (behind only the 1938 New England hurricane) , moving at a pace of 65 mph (105 km / h) or 31 m / s . Emily was the first hurricane in the Caribbean Sea since Hurricane Katrina of the 1981 Atlantic hurricane season .

= = = Hurricane Floyd = = =

A broad area of low pressure organized into a tropical depression off the coast of Nicaragua on October 9 . After drifting to the southeast , it turned to the north @- @ northwest and organized into a tropical storm on October 10 . Subsequent to crossing western Cuba , Floyd accelerated to the northeast , and attained hurricane status late on October 12 . It passed through the Florida Keys

before entraining cooler , drier air from a stationary frontal boundary . Its convection became very disorganized , and Floyd weakened back to a tropical storm early on October 13 to the southeast of Miami ; the storm crossed the Bahamas , and becoming an extratropical cyclone before being absorbed by the frontal boundary on October 14 .

Damage in Florida was minimal due to the disorganized nature of the hurricane . Floyd brought up to 10 @.@ 07 in (256 mm) of rain to the state , causing moderate crop damage in the southern portion of the state . In addition , a tornado spawned by the storm damaged portions of the Florida Keys . Overall damage amounted to around \$ 500 @,@ 000 (1987 USD) , with no casualties or injuries reported .

= = = Tropical Depression Fourteen = = =

A broad area of low pressure existed in the central Caribbean Sea in late October . It steadily organized , and was classified as Tropical Depression Fourteen on October 31 . It moved northwestward , and entered a high @-@ shear environment due to an upper level low situated toward the end of a high pressure system . By November 1 , little convection remained as the weak depression turned to the north and crossed Cuba . A burst of convection organized over the depression , and brought strong wind gusts to the Florida Keys as it passed through the area on November 2 . It continued to the north @-@ northwest , paralleling the Florida west coast , and lost all of its convection on November 3 . The system turned to the northeast , and merged with a weak extratropical low over northern Florida on November 4 .

Rainfall was experienced as far north as eastern Georgia and extreme southern South Carolina . Other parts of the United States received high to moderate rains while the aforementioned region received low amounts . Six fatalities were reported from devastating rainfall in Jamaica from the depression .

= = Season effects = =

This is a table of all of the storms that did form in the 1987 Atlantic hurricane season . It includes their duration , names , landfall (s) ? denoted by bold location names ? damages , and death totals . Deaths in parentheses will be additional and indirect (an example of an indirect death would be a traffic accident) , but are still related to that storm . Damage and deaths will include totals while the storm was extratropical or a wave or low , and all of the damage figures are in 1987 USD .

= = Storm names = =

The following names were used for named storms that formed in the north Atlantic in 1987 . This is the same list used for the 1981 season . No names were retired , so it was used again in the 1993 season . Names that were not assigned are marked in gray .