Hurricane Alex (2016)

Hurricane Alex was the first Atlantic hurricane in January since Alice in 1955 , and the first to form in the month since 1938 . Alex originated as an extratropical cyclone near the Bahamas on January 7 , 2016 . The system initially traveled northeast , passing Bermuda on January 8 , before turning southeast . It subsequently deepened and acquired hurricane @-@ force winds by January 10 . Slight weakening took place thereafter , and the system eventually turned east and northeast as it acquired tropical characteristics . On January 13 , it developed into a subtropical cyclone well south of the Azores , becoming the first tropical or subtropical system during January in the North Atlantic since an unnamed storm in 1978 . As it turned north @-@ northeast , Alex transitioned into a full @-@ fledged tropical cyclone on January 14 and became a hurricane . The storm peaked as a Category 1 on the Saffir ? Simpson hurricane wind scale with maximum sustained winds of 85 mph (140 km / h) and a barometric pressure of 981 mbar (hPa ; 28 @.@ 97 inHg) . After weakening slightly , Alex made landfall on Terceira Island as a tropical storm the next day . Concurrently , Alex began transitioning back into an extratropical cyclone ; it completed this cycle hours after moving away from the Azores . The system ultimately merged with another extratropical cyclone over the Labrador Sea on January 17 .

The hurricane prompted the issuance of hurricane and tropical storm warnings for the Azores and the closure of schools and businesses . Alex ultimately brought gusty winds and heavy rain to the archipelago , causing generally minor damage . One person died from a heart attack when the inclement weather prevented a helicopter from transporting them to a hospital .

Background

As currently defined , the Atlantic hurricane season lasts from June 1 to November 30 , the period in which tropical cyclones are most likely to develop across the basin . Occasionally , systems develop outside the season , most frequently in May or December . Activity in January is considered extremely rare , with only five other known instances since 1851 : an unnamed hurricane in 1938 , an unnamed tropical storm in 1951 , Hurricane Alice in 1954 ? 55 , an unnamed storm in 1978 , and Tropical Storm Zeta in 2005 ? 06 . Since Alice originated in December 1954 , Alex is only the second hurricane to develop solely within January , after the 1938 storm . When Alex made landfall on Terceira as a strong tropical storm this marked only the second time that an Atlantic tropical cyclone has made landfall in January , with the other being Hurricane Alice of 1955 which made landfall on Saint Martin and Saba . In addition to forming well outside of hurricane season , Alex developed unusually far north and east , becoming only the second hurricane to form north of 30 ° N and east of 30 ° W.

Unrelated to Alex , Hurricane Pali developed over the Central Pacific in early January , and persisted through the formation of Alex . This marked the first known occurrence of simultaneous January tropical cyclones between the two basins .

Meteorological history

Hurricane Alex originated in a non @-@ tropical weather disturbance that developed over Cuba and the Bahamas on January 6 , 2016 . Moving northeast ahead of the subtropical jet stream , the system acquired a surface vortex the following day . Initial conditions , including strong wind shear , low sea surface temperatures , and dry air , inhibited formation of a tropical cyclone as the storm moved northeast toward Bermuda . The large system featured gale @-@ force winds , with maximum sustained winds of 60 ? 65 mph (95 ? 100 km / h) . On January 8 , the system passed about 75 mi (120 km) north of Bermuda , bringing strong winds and heavy rain to the islands . On January 9 , the system turned east and later southeast , entering a region slightly more favorable for subtropical development . Hurricane @-@ force winds developed around the core of the cyclone the following day , though convective activity near the center remained sparse . The storm 's separation from the jet stream , similar to a cut @-@ off low , allowed it to move southeast and gradually

acquire tropical characteristics . Slight weakening took place on January 11 . Convection began increasing around the storm 's center on January 12 , by which time it was situated 1 @,@ 100 mi (1 @,@ 770 km) southwest of the Azores .

Frontal features associated with the storm dissipated on January 13 and banding features around the defined low increased in coverage and depth . Though relatively shallow , owing to the seasonally low level of the tropopause , convection was deemed deep enough for the system to be classified a subtropical storm at 21 : 00 UTC . Accordingly , the National Hurricane Center (NHC) assigned the name Alex to the storm . Upon its classification , Alex was situated 785 mi (1 @,@ 260 km) south @-@ southwest of the Azores . Situated to the east of a shortwave trough , Alex traveled northeast and gradually turned more to the north , steered by broad cyclonic flow over the central Atlantic . An eye feature soon appeared , marking intensification , within a complex of several banding features . The 20 mi (25 km) wide feature cleared out early on January 14 and was surrounded by a ring of ? 75 ° F (? 60 ° C) cloud tops . The storm remained situated under a cold @-@ core low , though the development of upper @-@ level outflow indicated the system was becoming increasingly tropical . Despite moving over 68 ° F (20 ° C) waters , Alex continued to deepen and transitioned into a full @-@ fledged tropical cyclone by 09 : 00 UTC . The transition was enabled by colder @-@ than @-@ average upper @-@ tropospheric temperatures which created greater instability than would otherwise be expected .

Upon transitioning into a tropical cyclone , satellite intensity estimates ? using the Dvorak technique ? indicated Alex achieved hurricane strength . Forecasters at the NHC estimated maximum winds of 85 mph (140 km / h) and a barometric pressure of 981 mbar (hPa ; 28 @.@ 97 inHg) ; this made it a Category 1 on the Saffir ? Simpson hurricane wind scale and constituted the storm 's peak intensity . As Alex moved north toward the Azores , decreasing sea surface temperatures and increasing wind shear caused it to weaken late on January 14 and into January 15 . The hurricane 's eyewall opened up and its convective structure decayed , indicating the start of its transition back into an extratropical cyclone . Becoming increasingly tilted with height due to shear , Alex weakened to a tropical storm before making landfall over Terceira Island at 13 : 15 UTC with winds of 70 mph (110 km / h) . Hours later the system completed its transition into an extratropical cyclone , with its circulation becoming more elongated and the radius of maximum winds expanding significantly . Furthermore , the overall structure became more " comma shaped " , a feature of frontal systems . Consequently , the NHC issued its last advisory on Alex . Turning northwest , the system deepened slightly as it approached Greenland and re @-@ acquired hurricane @-@ force winds on January 17 . Alex soon merged with another extratropical cyclone over the Labrador Sea , marking its dissipation .

= = Preparations and impact = =

= = = Bermuda = = =

The precursor to Alex brought gale @-@ force winds and heavy rain to Bermuda on January 8 . Gusts to 60 mph (97 km / h) disrupted air travel , downed trees , and left sporadic power outages , while waves as high as 20 ft (6 m) necessitated small craft advisories for the islands . Ferry services to and from Cavello Bay , Dockyard , Belmont , Hodsdon ? s Ferry , and Lower Ferry were suspended . During the three days in which the system impacted the territory , 1 @.@ 33 in (34 mm) of rain fell at Bermuda International Airport .

= = = Azores = = =

Upon Alex 's classification as a hurricane on January 14 , the Azores Meteorological Service issued a hurricane warning for the islands of Faial , Pico , São Jorge , Graciosa , and Terceira . They also issued a tropical storm warning for São Miguel and Santa Maria . A red alert ? the highest stage for meteorological warnings ? was declared for central and eastern islands . Homeowners protected

doors and windows with plywood and sandbags in anticipation of damaging winds and flooding . Officials closed schools and administrative buildings for the duration of the hurricane on January 15 . SATA Air Açores cancelled 33 domestic and international flights for the morning of January 15 , stranding more than 700 passengers . The hurricane and tropical storm warnings were discontinued after Alex 's passage on January 15 .

 The first hurricane to impact the Azores since Hurricane Gordon in 2012 , Alex brought heavy rain and gusty winds to the archipelago . It is the only known hurricane to track within 230 mi (370 km) of the Azores outside of August and September . Rainfall totals reached 4 @.@ 04 in (103 mm) in Lagoa , São Miguel , and 3 @.@ 71 in (94 mm) in Angra do Heroísmo , Terceira . Wind gusts exceeded 50 mph (80 km / h) on Santa Maria Island and peaked at 57 mph (92 km / h) in Ponta Delgada , São Miguel . The strong winds brought down trees , inflicted damage on some roofs , and triggered scattered power outages . Additionally , minor flooding was observed . Six homes in Ponta Delgada sustained flood damage and another had its roof destroyed . Landslides occurred across parts of the central islands , though they caused only limited damage . The overall effects of the storm were less than initially feared . The hurricane indirectly led to one death ? the person suffered a heart attack unrelated to the storm ? when an Island Health Unit helicopter was unable to take off due to turbulent conditions .