

= Hurricane Kate ( 2003 ) =

Hurricane Kate was the second @-@ longest tropical cyclone in the 2003 Atlantic hurricane season . The eleventh tropical storm , fifth hurricane , and third major hurricane of the season , Kate developed from a tropical wave in the central tropical Atlantic on September 25 . Its unusual track included four major changes in direction . The storm moved northwestward until a weakness in the subtropical ridge forced it eastward . Kate strengthened to a hurricane , turned sharply westward while moving around a mid @-@ level low , and intensified to a 125 mph ( 205 km / h ) major hurricane on October 4 . Kate turned sharply northward around the periphery of an anticyclone , weakened , and became extratropical after passing to the east of Newfoundland . The extratropical storm persisted for three days until losing its identity near Scandinavia .

The storm had minimal effects on land , limited to moderately strong winds and heavy rainfall over Newfoundland . Kate threatened Atlantic Canada just one week after Hurricane Juan caused severe damage in Nova Scotia .

= = Meteorological history = =

On September 21 , a tropical wave ? a trough of relatively low atmospheric pressure ? began moving slowly westward from the west coast of Africa , passing near the Cape Verde islands on September 23 . Though the wave was disorganized , a low @-@ level circulation developed on September 24 a few hundred miles to the southwest of Cape Verde . Steady organization ensued , including the development of convection into curved bands around the system . Though it lacked a well @-@ defined center , the system organized enough to be classified Tropical Depression Sixteen on September 25 while located about 920 mi ( 1 @, @ 480 km ) west @-@ southwest of the Cape Verde Islands .

The depression moved northwestward due to a weakness in the subtropical ridge . Despite early predictions of steady strengthening to reach 60 mph ( 95 km / h ) within 48 hours , the depression remained weak due to strong south @-@ southwesterly wind shear . The shear remained strong , and though the National Hurricane Center forecast the system to remain a depression through September 30 , the depression unexpectedly strengthened to Tropical Storm Kate on September 27 , coinciding with an increase in deep convection near the center . Kate turned to the north and northeast , and despite 35 mph ( 55 km / h ) of shear over the storm Kate continued to strengthen . A banding eye developed early on September 29 , and later that day it intensified into a hurricane while located 655 mi ( 1 @, @ 055 km ) southwest of the Azores .

Hurricane Kate maintained hurricane status for twelve hours before decelerating to the north and weakening to a tropical storm . The storm then turned sharply west @-@ southwestward while moving around the eastern side of a mid @-@ level circulation . Passing over progressively warmer waters and into an area with decreasing vertical shear , Kate regained hurricane status on October 1 . Guided by an anticyclone to its north and a cyclonic circulation to its south , the hurricane continued west @-@ southwestward over the subtropical waters of 30 ° N , and presented a well @-@ defined eye on October 2 . On the next day it strengthened to attain major hurricane status , and on October 4 Hurricane Kate reached a peak intensity of 125 mph ( 205 km / h ) while located 650 mi ( 1 @, @ 050 km ) east of Bermuda .

Shortly after peaking , the western portion of the central dense overcast , or the area of high , thick clouds around the eye , began to deteriorate , and Hurricane Kate started to weaken . On October 5 , the storm dropped below major hurricane status . Kate turned sharply northward due to it moving around the western periphery of a powerful anticyclone , and consequently slowed its forward motion . It slowly weakened as it turned to the north @-@ northeast , with an eye occasionally re @-@ appearing on satellite images . On October 7 , however , Kate weakened to a tropical storm while moving over cooler waters . It accelerated to the northeast , and after passing about 260 mi ( 420 km ) east of Newfoundland , Kate became extratropical as cold air clouds entrained the center . The system remained a powerful system , and later on October 8 the extratropical remnant of Kate retained winds of up to 75 mph ( 140 km / h ) while passing south of Greenland . The storm turned

to the east , passed a short distance south of Iceland , and merged with another extratropical storm near Scandinavia on October 10 .

= = Preparations and impact = =

Just a week after Hurricane Juan hit Nova Scotia , the Newfoundland and Labrador Emergency Measures Organization advised the general public to take appropriate actions for the anticipated effects of Hurricane Kate , including high winds and potentially up to 3 in ( 80 mm ) of rain . Such actions include securing loose objects , cleaning debris from storm drains , and owning appropriate hurricane supplies ( such as a charged cell phone and batteries in the event of power outages ) . A cruise ship scheduled to stop in St. John 's bypassed Newfoundland to avoid the storm . The Newfoundland and Maritimes Weather Center issued a storm warning for Newfoundland , while the Canadian Hurricane Centre issued a hurricane @-@ force wind warning . Due to the expected combination of moisture from Kate and a cold front , the Canadian Hurricane Centre also issued a heavy rainfall warning for southeastern Newfoundland . Offshore , waves were expected to reach 33 feet ( 10 m ) , while marine wind warnings were issued as well .

From September 28 to October 7 , 33 ships reported winds of over 40 mph ( 65 km / h ) in relation to Kate , though nearly all occurred as the storm was becoming extratropical . The highest wind reported was 59 mph ( 95 km / h ) , while the lowest pressure reported from a ship was 989 mbar . The interaction between Kate and a high pressure area to its north produced 3 ? 4 foot ( 1 m ) waves along the coast of North Carolina and New England . The strongest winds of Kate remained away from any landmasses , though the large circulation produced sustained winds of up to 40 mph ( 65 km / h ) at Cape Race , Newfoundland . The storm also generated strong swells and surf along the southern portion of the Avalon Peninsula , reaching heights of 9 ? 13 feet ( 3 ? 4 m ) . The combination of moisture from Kate and a stalled frontal system produced moderate amounts of rainfall , with some regions in southeastern Newfoundland receiving more than 4 inches ( 100 mm ) . St. John 's reported 1 @.@ 8 inches ( 45 mm ) on October 6 , a record for the date . Due to dry conditions in the preceding weeks , the ground easily absorbed the water , resulting in a lack of flooding . The extratropical remnant of Hurricane Kate produced winds of up to 70 mph ( 110 km / h ) in northern Scotland . Overall , there were no reports of damage or deaths associated with Kate .