

= Hurricane Helene ( 1958 ) =

Hurricane Helene was the most intense tropical cyclone of the 1958 Atlantic hurricane season , as measured by minimum barometric pressure . The eighth tropical storm and fourth hurricane of the year , Helene was formed from a tropical wave east of the Lesser Antilles on September 21 , 1958 . Moving steadily westward , the storm slowly intensified , attaining hurricane strength on September 24 . As conditions became increasingly favorable for tropical cyclone development , Helene began to rapidly intensify . Nearing the United States East Coast , the hurricane quickly attained Category 4 intensity on September 26 , before it subsequently reached its peak intensity with maximum sustained winds of 135 mph ( 215 km / h ) and a minimum barometric pressure of 934 mbar ( hPa ; 27 @. @ 84 inHg ) . The intense hurricane came within 10 mi ( 15 km ) of Cape Fear , North Carolina before recurving out to sea . Accelerating northward , Helene gradually weakened , and transitioned into an extratropical cyclone as it passed over Newfoundland on September 29 . Helene 's extratropical remnants traversed eastwards across the Atlantic Ocean before dissipating near Great Britain on October 4 .

Despite not making landfall on North Carolina , its close proximity to land caused extensive damage across the US East Coast . Strong winds resulted in widespread power outages , cutting telecommunications along the coast . A weather station in Wilmington , North Carolina reported a wind gust of 135 mph ( 215 km / h ) , setting a new record for fastest wind gust reported there . Though mostly concentrated in North Carolina , rainfall was widespread , reaching as far north as Maine . In the United States , damages reached \$ 11 @. @ 2 million and there was one indirect death . After impacting the US , Helene produced strong winds and heavy rain across much of Atlantic Canada . In Cape Breton Island on Nova Scotia , the storm was considered the worst in at least 21 years . Power outages cut most communications from the island to the mainland , and property damage in Sydney , Nova Scotia totaled to C \$ 100 @, @ 000 . At Helene 's landfall in Newfoundland , strong gusts peaking at 82 mph ( 132 km / h ) in Naval Station Argentia were reported , and loss of power severed communications . Damage across there totaled to at least C \$ 100 @, @ 000 . Total damages associated with Helene in the United States and Canada amounted to \$ 11 @. @ 4 million , making Helene the costliest storm of the season .

= = Meteorological history = =

The origins of Hurricane Helene can be traced back to an easterly wave that formed near Cape Verde on September 16 . Moving towards the west due to trade winds associated with the Hadley cell , the disturbance gradually intensified . On September 20 , ships in the system 's vicinity reported widespread shower activity and generally low barometric pressures . Early the following day , a reconnaissance flight reported evidence of a weak circulation , with gusts of 35 mph ( 55 km / h ) in heavy squalls surrounding the circulation center . At 0200 UTC later that day , the United States Weather Bureau office in San Juan , Puerto Rico began issuing bulletins on the system for public interests . In HURDAT , the tropical wave was first classified as a tropical depression at 0600 UTC on September 21 , well east of the Leeward Antilles . At the time , the depression had maximum sustained winds of 30 mph ( 50 km / h ) .

Moving on a west @- @ northwest track at roughly 20 mph ( 30 km / h ) early on September 22 , the storm initially changed little in intensity . However , a large upper tropospheric anticyclone developed over the southern Atlantic coast , producing the favorable wind shear needed for tropical cyclone development . A second reconnaissance flight reported an intensified tropical cyclone , indicating that the storm system had reached tropical storm strength . At 0000 UTC on September 23 , the depression attained tropical storm strength , with maximum winds of 40 mph ( 65 km / h ) and a central minimum pressure of 1013 mbar ( hPa ; 29 @. @ 92 inHg ) . The US Weather Bureau issued their first advisory on the newly developed tropical storm at 1600 UTC later that day , giving the storm the name Helene . Despite the storm 's poor organization , Helene gradually intensified in favorable conditions generated by the large anticyclone . Throughout the day , a second anticyclone moved eastward until it was situated off of the Mid @- @ Atlantic states , while a mean trough in the

lower levels of the atmosphere became situated over the United States East Coast . This would set up a path for Helene to pass very close to the United States . The tropical storm attained hurricane intensity by 2200 UTC on September 24 , while located 425 mi ( 685 km ) east of Fort Pierce , Florida . However , in post season analysis , it was found that Helene reached hurricane intensity earlier that day , by 1200 UTC . At the time , gale force winds extended up to 220 mi ( 355 km ) out from the storm 's center of circulation .

The hurricane steadily strengthened as it moved towards the northwest around the western periphery of the Azores High on September 25 . Encountering the anticyclone situated off of the Mid Atlantic states , Helene began to curve slightly towards the west . The lack of strong steering currents in the storm 's vicinity caused the hurricane to move very slowly throughout the day , giving the hurricane time to significantly intensify . By 0000 UTC on September 26 , Helene strengthened to the equivalent of a modern day Category 2 hurricane , with a minimum pressure of 980 mbar ( hPa ; 28 . 94 inHg ) . Moving slowly towards The Carolinas , the hurricane rapidly intensified . A recon flight reported a minimum pressure of 948 mbar ( hPa ; 28 . 00 inHg ) , a drop of 40 mbar ( hPa ; 1 . 18 inHg ) from the previous day . As the hurricane neared the coast , its eye became apparent on coastal long range WSR 57 weather radar images . By 1800 UTC on September 26 , Helene strengthened to a Category 3 hurricane and then to a Category 4 hurricane the following day . The major hurricane continued to strengthen before reaching its peak intensity on September 27 with winds of 135 mph ( 215 km / h ) . However , Helene 's lowest barometric pressure of 934 mbar ( hPa ; 27 . 84 inHg ) was recorded earlier during the day . Still moving northwestward due to the influence of the Azores High , the hurricane came within 10 mi ( 15 km ) of the US East Coast before recurving towards the northeast out to sea .

As Helene recurved and accelerated towards more northerly latitudes , it steadily weakened . By 1200 UTC on September 28 , Helene was no longer a major hurricane . The hurricane 's wind field also expanded from the storm 's center as it weakened . By midday on September 29 , Helene had weakened to minimal hurricane strength , and later transitioned into an extratropical cyclone by 1800 UTC that day , though it still maintained hurricane force winds . At roughly the same time , Helene passed over Newfoundland , with gale force winds having expanded 500 mi ( 800 km ) from the system 's center , coinciding with the US Weather Bureau 's final advisory on the system . Helene 's extratropical remnants continued eastward across the Atlantic , becoming a dominant synoptic feature , before entirely dissipating by 0600 UTC on October 4 just west of Great Britain .

= = Preparations = =

Upon the storm 's formation , the Weather Bureau cautioned ships in Helene 's path of the impending conditions , and did so throughout the storm 's duration . As the storm moved west on September 23 , advisories specified for small craft in northern islands of The Bahamas to remain in " protected places . " After Helene was forecast to remain north of the archipelago , notifications were lifted except for small craft along the coast of the South Atlantic States . Nearing the US East Coast , the Weather Bureau began to issue special bulletins for press radio and television stations early on September 24 . At the same time , small craft were warned of the storm from The Carolinas southward . The following day , the weather forecast office ( WFO ) in Charleston , South Carolina began to issue local statements regarding the hurricane , while small craft alerts were shifted northward to coastal regions between Cape Hatteras , North Carolina and Daytona Beach , Florida . The first hurricane watch was issued on 1000 UTC on September 26 for the entirety of the Georgian coast to Charleston , South Carolina . A gale warning was posted at the same time for coastal areas from Daytona Beach , Florida to Wilmington , North Carolina . Small craft alerts continued to shift northwards along with Helene .

As the storm began to quickly intensify on September 26 , areas of the watch from Savannah , Georgia to Cape Fear , North Carolina were upgraded to a hurricane emergency area at 1600 UTC . Affected communities were advised to begin precautionary measures immediately and evacuate . Shipping and small craft were told to exercise " extreme caution . " Gale warnings were changed to

warn areas between Fernandina , Florida to Cape Hatteras , North Carolina . The heightened warnings caused WFOs to issue local bulletins regarding the impending hurricane . At the time , the Weather Bureau projected Helene to make landfall in South Carolina . These landfall forecasts shifted further north along the coast over time , before they were stopped after Helene recurved away from the coast entirely . At 0400 UTC on September 27 , hurricane warnings were extended to include areas between Cape Fear and Cape Hatteras , North Carolina . Gale warning issuance reflected the changes and were too shifted northwards to the Virginia Capes area , while hurricane watches covered both warning areas . At 1600 UTC later that day , hurricane emergency and gale warnings were extended north to Manteo , North Carolina , while hurricane watches were continued for coastal regions from Savannah , Georgia to Myrtle Beach , South Carolina . After Helene began recurving away from the coast , all warnings south of Wilmington , North Carolina were discontinued at 2200 UTC on September 27 . As Helene passed certain areas , warnings were discontinued upon the storm 's passage . At 1000 UTC the next day , all onshore hurricane warnings were either downgraded to gale warnings or discontinued . However , offshore gale warnings were still issued for oceanic regions from the Virginia Capes to Cape Cod , Massachusetts . Shortly after , all warnings , with the exception of the offshore gale warnings , were discontinued . Remaining warnings lasted until 2200 UTC on September 28 . Despite not issuing any warnings , the Weather Bureau cautioned interests in Newfoundland , and forecasted hurricane @-@ force winds to effect the island .

Due to the potential impacts from Helene , the Weather Bureau began to advise prompt emergency evacuation in their advisories . Areas between Beaufort , South Carolina and Cape Fear , North Carolina were urged to begin evacuation procedures immediately . The Southeastern American Red Cross sent ten field staff warnings to locations in Georgia and South Carolina in order to assist in setting up emergency shelters . The Red Cross held 27 hurricane preparation conferences to plan preparation procedures . Other civil defense organizations also mobilized hurricane preparation staff and equipment . The Weather Bureau sent a mobile weather station to Charleston , South Carolina in order to monitor weather conditions and alert surrounding populations with short @-@ range radio equipment . Beaches on North Carolina 's coast , including Wrightsville Beach and Carolina Beach , were completely evacuated during the night of September 27 . In Wilmington , North Carolina , 100 members of the United States National Guard were dispatched to monitor waterfront property , while 60 others were kept on standby . Civilian vehicles attempting to enter Myrtle Beach , South Carolina were sent back by highway patrol 15 mi ( 25 km ) outside the city borders , following an order issued by Governor of South Carolina George Bell Timmerman , Jr . The order was issued to minimize casualties and prevent looting . Approximately 100 members of the National Guard and local police were kept to patrol the beach . Despite repeated orders for mandatory evacuation , a few people remained in Myrtle Beach . Civil Defense authorities forcibly evacuated stragglers , but others were permitted to remain .

= = Impact and aftermath = =

= = = United States East Coast = = =

Despite not making landfall , Helene 's close proximity to the United States resulted in impacts along the East Coast . Impacts were most severe in North Carolina , where the hurricane made its closest approach . Wind impacts were felt primarily from South Carolina to Virginia , though a frontal zone aided in bringing precipitation as far north as Maine . In the United States , Helene caused \$ 11 @.@ 2 million in damages and one indirect fatality .

= = = = North Carolina = = = =

Roughly paralleling the North Carolina coast beginning on September 26 , Helene 's slow movement and strong intensity resulted in moderate to heavy impacts in coastal areas of the state .

Despite the hurricane 's Category 4 hurricane intensity , due to its closest approach to land remaining offshore , its storm surge remained less than initially forecast . The hurricane 's track also placed its strongest storm surge in the eastern hemisphere of the storm , away from any landmasses . Surge heights peaked at 6 ft ( 1 @. @ 8 m ) near Marine Corps Air Station Cherry Point . In Wilmington , Helene produced ocean swells at the coast 2 @. @ 5 ? 3 times per minute , indicative of a strong hurricane . There , the cumulative sea level was roughly 9 ft ( 2 @. @ 7 m ) above normal . However , as a result of the storm striking at low tide , damage caused by storm surge was mostly mitigated . Despite this , sand dunes in southern areas of Fort Fisher , were mostly destroyed by waves . On Cedar Island , strong winds produced by the hurricane pushed waves inland , inundating homes . Elsewhere , minor beach erosion occurred .

Further inland , several weather stations reported hurricane @-@ force winds . The Weather Bureau office in Wilmington , North Carolina , reported maximum sustained winds of 88 mph ( 142 km / h ) and a peak gust of 135 mph ( 220 km / h ) , exceeding the previous record for fastest measured wind speed of 98 mph ( 158 km / h ) set during Hurricane Hazel in 1954 . Beach resorts there were heavily damaged . In Wrightsville Beach , located 10 mi ( 15 km ) of Wilmington , 12 houses were flattened by the hurricane . Damage to homes there were estimated by police to cost \$ 300 @, @ 000 , and extensive damage to the water system was reported . In Long Beach , damage was less severe , with only minor property damage . Waves pushing past sand dunes caused cracks in seaside roads . Though surveys made no damage estimates , damage in Holden Beach was reported to have been worse than in Long Beach . A 300 ft ( 90 m ) pier and a pavilion in Ocean Isle Beach were destroyed . In Topsail Beach and Kure Beach , several homes and businesses were either unroofed or destroyed . Yaupon Beach and Shallotte also had similar reports of unroofed homes . Two homes on Topsail Island were demolished , and extensive property damage was reported in Atlantic Beach . At Cape Fear , winds were estimated at 125 mph ( 200 km / h ) , with gusts as high as 160 mph ( 260 km / h ) , well into Category 3 intensity . The powerful winds forced power to be cut off in Wilmington as a precautionary measure . As a result , 7 @, @ 000 telephones were knocked out of service . Damage to the Southern Bell Telephone Company 's offices cost \$ 150 @, @ 000 . Total damages in the city was estimated to cost nearly \$ 2 million . In Morehead City , a roof was blown from a yacht shed and multiple structures . Long @-@ distance telephone services were also cut off . Off the coast on Ocracoke Island , power and communications failed during the storm after the island was battered by winds of 60 mph ( 100 km / h ) . Power outages were commonplace in other areas as well . In Southport , metal debris was scattered across city streets , and the damage there was described as worse than Hurricane Hazel . Half of its pier was swept away by the rough seas , and other buildings collapsed or sustained heavy damage . Numerous trees , including live oak , were uprooted by the winds . The United States Army provided the port with a temporary electrical generator , which provided power for water pumps and light . In Cape Hatteras , Helene caused an estimated \$ 1 million in damages . Although damage to infrastructure tapered off 10 mi ( 15 km ) from the coast , crop damage was observed 40 mi ( 65 km ) inland . Corn was the crop most affected by Helene .

Rainfall associated with Helene was primarily concentrated in coastal regions North Carolina , peaking at 8 @. @ 29 in ( 211 mm ) in Wilmington International Airport . In Hatteras , 4 @. @ 85 in ( 123 @. @ 2 mm ) of rain was measured . Rainfall totals of at least 3 in ( 76 mm ) were commonplace elsewhere along the North Carolina coast . An indirect death occurred when a car skidded off a flooded highway , killing the driver . In the state , damages from Helene amounted to \$ 11 million .

= = = = South Carolina = = = =

Effects from Helene in South Carolina were less severe than in North Carolina . Helene made its closest approach to the state on September 27 , 85 mi ( 135 km ) . In Charleston , sustained winds reached 63 mph ( 101 km / h ) and there was minor damage reported Trees and street signs were blown down , and beach houses suffered shingle damage . Sporadic and small power outages occurred throughout the city . Damage became progressively worse from Georgetown to Little River , with automobile accidents , torn roofs , and damaged piers . On Harbor Island , 50 percent of

structure were reported to have roof damage , causing an estimated \$ 125 @, @ 000 in damages . Elsewhere along the South Carolina coast , beach erosion occurred due to the strong waves , and sections of pier were swept into sea . In Windy Hill and Cherry Grove Beach , three fishing piers were damaged . Damage was minor in Myrtle Beach , and was limited to roof and window damage . Further inland , in Columbia , damage was minimal , with no rainfall reported . Light damage to crops was reported inland , particularly in Marion County . Across the state , damages were estimated at \$ 200 @, @ 000 from the hurricane , though this did not include beach erosion or damage to sand dunes .

= = = Elsewhere in the United States = = =

As a result of Helene recurving away from the United States East Coast , damage in the United States outside of the Carolinas was less severe . In Virginia , damage was relatively minor . A peak gust of 56 mph ( 90 km / h ) was reported in Norfolk . In Hampton Roads , damage was minor , and was confined to downed utility wires and marginal infrastructural damage . Although rainfall was primarily concentrated in the Carolinas , 1 @, @ 434 official rain gauges measured precipitation in coastal areas from South Carolina to Maine . Precipitation was further increased by a frontal zone to the hurricane 's north . In the Mid @-@ Atlantic States , rainfall peaked at 5 @. @ 29 in ( 134 @. @ 4 mm ) in Myerstown , Pennsylvania . Outside of Pennsylvania or the Carolinas , no weather station reported rainfall exceeding 5 in ( 125 mm ) . In the New England region , rainfall peaked at 4 @. @ 11 in ( 104 @. @ 4 mm ) in Hyannis , Massachusetts . Elsewhere in Massachusetts , rainfall totals ranging from 1 ? 4 in ( 25 ? 100 mm ) caused minor flooding and road washouts . The minor floods led to several automotive accidents . Other states in New England reported rainfall peaks of at least 1 in ( 25 mm ) , with the lowest peak occurring at a weather station in Machias , Maine , which reported 1 @. @ 16 in ( 29 @. @ 5 mm ) of rainfall .

= = = Atlantic Canada = = =

As Helene approached Atlantic Canada in the process of transitioning into an extratropical storm , it produced heavy rainfall and strong winds along the islands . Passing just east of Nova Scotia on September 29 , Helene dropped at least 1 in ( 25 mm ) across the entire province , peaking at 3 @. @ 48 in ( 88 @. @ 5 mm ) in Cape Breton Island . Gusts peaked at 50 mph ( 80 km / h ) across Cabot Strait , 70 mph ( 115 km / h ) at CFB Shearwater and 60 mph ( 100 km / h ) at Summerside , Prince Edward Island . The storm damaged power lines on the island but they were quickly repaired . The strong winds uprooted trees in the Halifax and Dartmouth , Nova Scotia area . In Nova Scotia , Helene 's worst effects were felt in Cape Breton Island , where the storm was considered the worst in at least 21 years . Only one communication line from the island to the mainland was effective after the storm passed . Numerous downed power lines resulted in minor fires , and schools were closed throughout the island . In Sydney , Nova Scotia , there was considerable property damage , and as many as 700 people lost power . The lack of sufficient electricity forced the suspension of publications of the Cape Breton Post and disrupted normal restaurant cooking procedures . Damages in the community amounted to C \$ 100 @, @ 000 . Offshore , the Royal Canadian Mounted Police cutter Fort Walsh , measuring 115 ft ( 35 m ) in length , was washed ashore on the coast of Scatarie Island . The fishing wharf in Caribou , Nova Scotia was destroyed by rough seas generated by Helene , and at least 1 @, @ 000 lobster traps were carried into the Northumberland Strait as a result . In New Brunswick , the hurricane 's impacts were relatively minor , and rainfall peaked at 1 @. @ 56 in ( 39 @. @ 5 mm ) .

Quickly accelerating northwards , Helene made landfall on Newfoundland late on September 29 . Rainfall peaked at 3 @. @ 05 in ( 77 @. @ 5 mm ) in northern parts of the island , while rainfall amounts were generally minimal across the Avalon Peninsula . A weather station in Naval Station Argentia reported maximum sustained winds of 60 mph ( 100 km / h ) and a gust of 82 mph ( 132 km / h ) . The winds severed communications in southwestern Newfoundland and cut communications in St. John 's , Newfoundland and Labrador from the mainland . Bell Island was cut

off from the rest of Newfoundland due to rough seas generated by Helene , which resulted in the destruction of piers and lack of boat service . Damage caused by the hurricane on the island were estimated to be in excess of C \$ 100 @, @ 000 .

= = Aftermath = =

Following the storm , Governor of North Carolina Luther H. Hodges and United States Senator from North Carolina B. Everett Jordan requested a disaster declaration for the state . President of the United States Dwight D. Eisenhower designated portions of North Carolina impacted by the storm as a disaster area . According to the American Red Cross , at least 5 @, @ 000 people were kept in shelters after Helene . Following the large @-@ scale evacuation procedures and resulting low loss of life after the storm , the Weather Bureau recommended that certain organizations be awarded the Outstanding Service to the Public certificate due to their cooperation with the Weather Bureau during the hurricane 's duration . The recommended recipients were the radio stations WPTF and WRAL , and the North Carolina State Highway Patrol .