

= Hurricane Michael (2000) =

Hurricane Michael of the 2000 Atlantic hurricane season caused moderate damage in Atlantic Canada . The seventeenth tropical cyclone , thirteenth named storm , and eighth hurricane of the season , Michael developed from a non @-@ tropical system to the southwest of Bermuda on October 15 . The system was initially subtropical , but rapidly acquired tropical characteristics by October 17 . Michael quickly strengthened into a hurricane later that day . By October 20 , Michael peaked as a Category 2 hurricane on the Saffir @-@ Simpson hurricane wind scale at a relatively high altitude of 44 ° N. The storm weakened slightly to a Category 1 hurricane and became extratropical shortly before making landfall in Newfoundland on October 20 .

As the intensity of Michael was equivalent to a Category 1 hurricane during landfall , high winds were reported throughout Atlantic Canada , especially in Newfoundland . Winds from the storm peaked at 172 km / h (107 mph) in St. Lawrence , Newfoundland ; other locations across the island reported winds of 128 to 150 km / h (80 to 93 mph) . High winds caused minor structure damage across Newfoundland , confined to vinyl siding peeled off , shattered windows , and unroofed houses . In addition , sporadic power outages were also reported from Corner Brook to St. John 's . Michael also dropped rainfall across Atlantic Canada and in Maine . The rainfall was generally light , with much of the region reporting between 25 to 51 mm (0 @. @ 98 to 2 @. @ 01 in) of precipitation . Michael also produced high tides , accompanied by waves reported as high as 16 @. @ 9 m (55 ft) by a buoy well offshore of Newfoundland .

= = Meteorological history = =

The system originated out of a non @-@ tropical cold @-@ core upper level low that drifted southward into the subtropics . The low interacted with a cold front , which resulted in the development of a stationary front over the Bahamas on October 10 . As the cold low drifted southward , a surface low developed on October 12 . The surface low remained mostly stationary until early on October 15 as it merged with the upper @-@ level low and deepened while north of the Bahamas and east of the coast of Florida . Later that day , the system gained enough tropical characteristics and became organized enough to be classified as a subtropical depression . The storm remained stationary over warm water , with sea surface temperatures around 28 ° C (82 ° F) , while it continued to gain additional tropical characteristics . Around 0000 UTC on October 16 , it strengthened into a subtropical storm after satellite classifications showed a stronger storm . Later that day , the cyclone continued to develop as more thunderstorms formed and persisted near the low @-@ level circulation .

By 0000 UTC on October 17 , the transition was completed and Michael was reclassified as a tropical storm as supported by satellite classifications via the Dvorak technique . Shortly thereafter , the National Hurricane Center initiated advisories on Tropical Depression Seventeen ; post @-@ analysis later discovered it was actually a tropical storm . A well @-@ defined eye quickly developed early on October 17 as Michael began to strengthen and continued to organize . That afternoon , Michael rapidly intensified further and was upgraded to a hurricane as Reconnaissance flights found winds of 120 km / h (75 mph) . At that point , Michael began to move northward . While Michael was maintaining minimal hurricane status , the eye remained ragged , yet well @-@ defined . Early on October 19 , Michael briefly strengthened to 135 km / h (85 mph) before weakening slightly six hours later . Tracking into cooler water , Michael began its extratropical transition while accelerating to the northeast towards Newfoundland , which prevented significant weakening . The acceleration was caused by a shortwave trough embedded within strong southwesterly mid @-@ level flow .

Unexpectedly , Michael began to rapidly intensify on October 19 while in extratropical transition . Later that day , a ship report in the eastern eyewall reported a minimum central pressure of 965 mbar (28 @. @ 5 inHg) and maximum sustained winds of 160 km / h (100 mph) , making Michael a Category 2 hurricane on the Saffir @-@ Simpson hurricane scale . The sudden intensification was determined to have been as a result of baroclinic effects as it interacted with an incoming trough , which provided additional energy to counter the general weakening of hurricanes while in the high

latitudes over sea @-@ surface temperatures around 16 ° C (61 ° F) . Michael formed a " hybrid " system combining influences of a hurricane with that of a powerful extratropical cyclone . Shortly before 0000 UTC on October 20 , Michael made landfall near Harbour Breton , Newfoundland with winds of 135 km / h (85 mph) . Either simultaneously or shortly thereafter , Michael transitioned into an extratropical storm . The extratropical system gradually weakened as it tracked across Newfoundland on October 20 , and slowed down considerably with the presence of the trough . The storm was absorbed by another extratropical low just north of Newfoundland that afternoon .

= = Impact = =

Because it was unknown that Michael became extratropical before landfall , it was the initially considered the first tropical cyclone to strike Newfoundland since Hurricane Luis in 1995 . Furthermore , Michael was also considered the first hurricane to make landfall in Canada since Hurricane Hortense in 1996 . When the Meteorological Service of Canada and the National Research Council flew a Convair research flight into Michael on October 19 , it was the first successful research flight made into a tropical cyclone by those agencies . Subsequent flights have been made into Tropical Storm Karen , Hurricane Isabel (while inland) , Hurricane Juan , and Hurricane Ophelia .

= = = Newfoundland = = =

In advance of the storm , the Newfoundland Weather Centre posted wind warnings , gale warnings , storm warnings , and hurricane warnings throughout Newfoundland . Rainfall advisories were also issued in portions of the East Coast , Central Newfoundland , the South Coast , and the West Coast . Offshore , storm force wind warnings were declared on October 19 for Newfoundland waters . Several Special Weather Statements were also posted .

Light to moderate damage was reported throughout Newfoundland , primarily as a result of the strong winds . The entire region was affected by Michael , though the majority of the damage was confined to small communities east of where the storm made landfall , including Gaultois , Harbour Breton , Hermitage and English Harbour West . These areas reported significant power outages and minor structural damage ; vinyl siding was peeled off , windows were shattered , and roof shingles were torn off in some localized locations . The most severe damage was in Gaultois , where several roofs were torn off and trees were uprooted . Wind damage also occurred in the St. John 's Metropolitan Area , where a Sobeys store in Conception Bay South had broken windows . Sporadic power outages were reported throughout the island , as far east as St. John 's , and as far west as Corner Brook . As the storm struck at low tide , storm surge was insignificant . However , just prior to landfall , waves on the coast of Newfoundland reached heights of 7 ? 8 m (23 ? 26 ft) . Rainfall near the storm 's track was generally around 30 mm (1 @.@ 2 in) , though further inland , precipitation reached 75 mm (3 @.@ 0 in) . Rainfall from the hurricane amounted to 77 mm (3 @.@ 0 in) at Englee , a small fishing community on the Great Northern Peninsula . Wind gusts peaked at 172 km / h (107 mph) at St. Lawrence , with other reports varying between 128 km / h (80 mph) and 150 km / h (93 mph) . Despite severe winds , damage was relatively light due to high construction standards in Newfoundland , where winter storms routinely result in hurricane @-@ force winds , as well as the sparse population of the area affected .

The tug Atlantic Elm lost its tow to the unmanned barge Portland Star on October 19 . The barge was carrying over 18 @, @ 000 tonnes of cement and diesel fuel and was later reported to have sunk in the Fortune Bay . Damage was reported to numerous pleasure craft around the bay due to the waves ; two sailboats were toppled . Also , ferry service between Newfoundland and Nova Scotia was disrupted . Several offshore buoys and ships reported high winds and low barometric pressure , as well as waves of up to 16 @.@ 9 m (55 ft) .

= = = Elsewhere = = =

On October 14 and October 15 , the frontal boundary associated with the hurricane 's precursor dropped heavy rainfall on Bermuda , amounting to 76 mm (3 @. @ 0 in) . However , as a tropical cyclone , Michael remained far from the island . Impact outside Newfoundland was generally light . However , rainfall was greater in some areas of Nova Scotia than in Newfoundland , where precipitation reached 95 @. @ 7 mm (3 @. @ 77 in) over North Mountain . Light rain was also reported in New Brunswick , Prince Edward Island , and Quebec . Effects from the storm in the United States were minimal , limited to light rainfall in the state of Maine which totaled less than 51 mm (2 @. @ 0 in) .