HOSPITALITY
NEWFOUNDLAND & LABRADOR

Climate Change Summary for Tourism Operators in Newfoundland and Labrador

Photo Credit: Julian Calverley

Coastal & Oceanographic

Sea-Level Rise and Flooding

The global mean sea level is projected to rise 84 cm by the year 2100. Relative sea-level change will significantly vary across the province in part due to vertical land motion, varying from 10 cm in central Labrador to 71 cm in the south of Newfoundland by 2100. Land subsidence (sinking) in the south will increase local relative sea-level rise, while land rebound (rising) in the north will buffer it.

Coastal Erosion/Deposition

Existing rates of coastal erosion are highly variable across the province, with the most change occurring in unconsolidated cliffs and beaches. Increases in erosion rates are anticipated in these areas due to changes in the processes that drive erosion (wind, waves, groundwater, and surface water). For example, the rise of extreme water levels will allow waves to get closer to cliffs, and projected increases in precipitation intensity will accelerate erosion from runoff.

Sea-Water Temperature and Salinity

With climate change, sea temperatures are expected to increase throughout the region, in all seasons, on the surface and at the bottom. Due to increases in precipitation over the ocean and ice melt, coastal salinity is expected to decrease in all seasons (except deep-ocean areas in the south, where it may increase).

Chemical Oceanographic Variables

Reduced vertical mixing is likely to reduce the nutrient supply from deeper waters. Dissolved oxygen will also be reduced, although this may be more localized (e.g., coastal). Acidity is projected to increase.

Icebergs

Projections for icebergs indicate a likely reduced occurrence in the Gulf of St. Lawrence (GSL) as well as the Newfoundland and Labrador Shelf/Slope (NLSS) in the near-term.

Precipitation

Average Precipitation

Mean daily precipitation is expected to increase throughout the province. In Newfoundland, widespread increases are expected by late century. Changes in Labrador are typically smaller but also tend towards an increase. Despite uncertainty in the projections, precipitation is likely to increase in most locations and seasons by mid-century and larger (nearly universal) changes are expected by the end of the century.

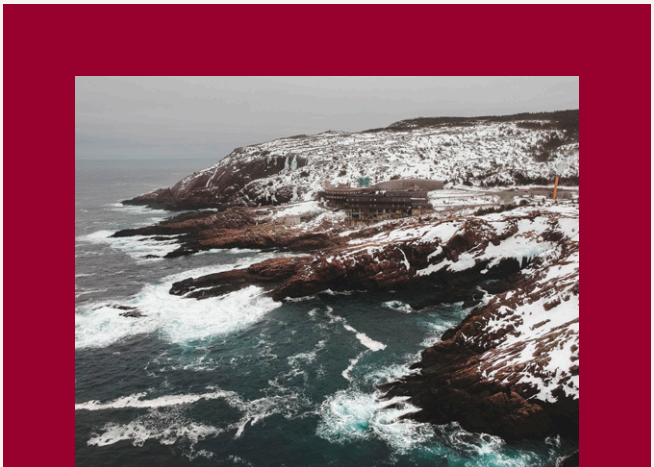
Precipitation Intensity

Precipitation intensity is expected to increase. Models predict intensity increases for all of Newfoundland in all seasons, with the most significant increases in winter and on the south coast. Changes in Labrador are generally smaller. There is notable uncertainty in mid-century projections, but by late century, strong increasing trends emerge.

Freezing Rain

Future projections for freezing rain suggest an increase over most of Canada, based on the northern movement of the 0°C temperature boundary and of freezing rain-related weather systems. Freezing rain will increase over most of the province, but rising air temperatures will lead to a decrease in Eastern Newfoundland. The greatest relative increase is expected in Labrador.

Photo Credit: Erik Mclean



Snow, Winter Rain, and Rain-On-Snow

Less snow and more rain are projected in locations/seasons with average temperatures close to zero. These changes also mean more rain falling in winter on frozen ground, and rain-on-snow days, particularly in southern regions. An increase in total annual snowfall is projected for the Torngat Mountain region. High latitudes are expected to have an increase in snowpack density.

Wind and Storms

Hurricanes, Nor'easters, and Winter Storms

A possible increase in the intensities of tropical (e.g., hurricanes) and extra-tropical (e.g., nor'easters) storms is anticipated, resulting primarily in increased precipitation rates. It is possible that winds and surge may increase, which would have more effect as sea levels rise along the south coast and would be particularly damaging for longer duration storms spanning several tidal cycles, such as nor'easters.

Terrestrial

River Water Quality, Ice Jams, Flooding

Increase in wash-off events from runoff caused by extreme precipitation is likely to negatively impact water quality. Water temperature in streams and rivers is expected to increase.

Flooding from ice jams has become more frequent and unpredictable in Atlantic Canada (Turcotte et al.,2019). Although increasing air temperatures will decrease river ice cover thicknesses, increased flows during freeze-up could allow for thicker ice and more severe ice-jam flooding.

Invasive Species, Pathogens, and Pests

Changing climate conditions will alter suitable habitats and competition dynamics. Among other factors, modified disturbance regimes are conducive to invasive species, pathogens, and pests. Changes to sea temperatures may allow marine invasive species to expand their range northward and deeper into the water column. In addition, changes to ocean currents may affect distribution patterns.

Wildfire

Drier conditions elsewhere in Canada are projected to contribute to an increased number and extent of wildfires. Even if dry conditions were to remain unchanged in Newfoundland, changes to vegetation assemblages and disturbances may affect fire regimes.

Temperature

Averages and Extremes

Daily average temperatures, daytime high temperatures, and nighttime low temperatures are projected to increase, with a steady rate of change through mid-to-late century (2050 to 2100). In general, the coldest temperatures are projected to increase fastest. The most significant change is expected in winter, and projections show the largest increases in the Labrador interior and at high latitudes. Therefore, overall warmer temperatures are expected across Newfoundland and Labrador.

Frost and Freeze-Thaw

The number of days with frost is expected to decrease, with the greatest change in regions and seasons with daytime temperatures projected to rise above near freezing. Changes in Labrador will be less drastic, as cold winter conditions will persist for longer. Changes in winter thaw events and freeze-thaw cycles are likely to follow a similar pattern, with increases in winter.

For more information contact:

Phone: (709) 722-2000 **Email:** hnl@hnl.ca

HospitalityNL **hospitalitynl**

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