RURAL WELLBEING

Climate Change

HIGHLIGHTS

- By the end of this century, most communities in Ontario will experience a longer growing season, a shorter winter season, more days of extreme heat, more precipitation, and an increase in overall temperatures.
- Changes in climate could increase risks from flooding, extreme heat, insect-borne illnesses, and the introduction and establishment of invasive species.
- Communities can develop and implement adaptation actions to build resilience and manage climate change impacts.

Overview

Ontario's climate is changing. Temperatures are rising and patterns of precipitation are different. Changes in climate are leading to more frequent and more severe weather events, such as heatwaves, forest fires, drought, and floods. Reducing greenhouse gas emissions can help to limit how much the climate will change and minimize negative impacts. However, it is just as important to understand how much the climate is expected to change between now and the near future so that communities can make plans to adapt to these changes and improve resilience. Information about climate change can be used to develop adaptation plans that help communities take real-world actions to build resilience.

This factsheet presents information about climate change indicators from ROI's Community Wellbeing Dashboard. Explore the dashboard to view interactive maps and data visualizations for most communities in Ontario.

Date source:

Indicator data were obtained from ClimateData.ca May 2024.

Values represent averages calculated for each of Ontario's census subdivisions. The data consists of climatological averages for a simulated historical period (1971-2000), a modelled current period (2011-2040), and a modelled future period (2041-2070) to allow for planning into the 21st century. These projections reflect median values (p50) of a multi-model ensemble based on a moderate emissions scenario (SSP2-4.5).

The climate model projections are from the CanDCS-U6 dataset using models from Phase 6 of the Coupled Model Intercomparison Project (CMIP6) that have been bias adjusted and downscaled for Canada. See www.ClimateData.ca/about for more information.

Definitions:

Rural: Any non-Indigenous municipality outside of census metropolitan areas.

Urban: Any non-Indigenous municipality within a census metropolitan area.

Community: Census subdivisions, municipalities, and areas treated as municipal for statistical purposes, including unorganized territories and Indigenous reserves and settlements.

See the Indicator Definitions website for more information.

Changes in climate for Ontario communities

By the end of this century, most communities in Ontario will experience a longer growing season, a shorter winter season, more days of extreme heat, more precipitation, and an increase in overall temperatures (Table 1). The magnitude of change for communities depends on where a community is located.

Table 1. Maximum, minimum, and median changes in community climate values by 2041–2070, compared to the historical average from 1971–2000 across Ontario.

	Change in length of growing season	Change in length of winter season	Change in number of humidex days	Change in temperature of the hottest day	Change in temperature of the coldest day	Change in total precipitation
Maximum change	42 days	-32 days	40 days	3.4 °C	6.8 °C	102 mm
Median change	30 days	-24 days	21 days	3.1 °C	6.2 °C	85 mm
Minimum change	23 days	-18 days	1 day	2.7 °C	4.7 °C	30 mm

Growing season length

Growing season is the number of consecutive frost-free days in a year. Longer growing seasons can increase agricultural yields or enable the diversification of crop types. The change in growing season length will be greater for communities in the north. For example, in the northern community of Moosonee, the historical growing season is 90 days, but this will increase to 130 days (+40 days) by the end of the century. Further south, in Kingston, the future growing season will increase from the historical length of 174 days to 196 days (+22 days). For many communities such as Orillia, the growing season will increase by about 30 days.

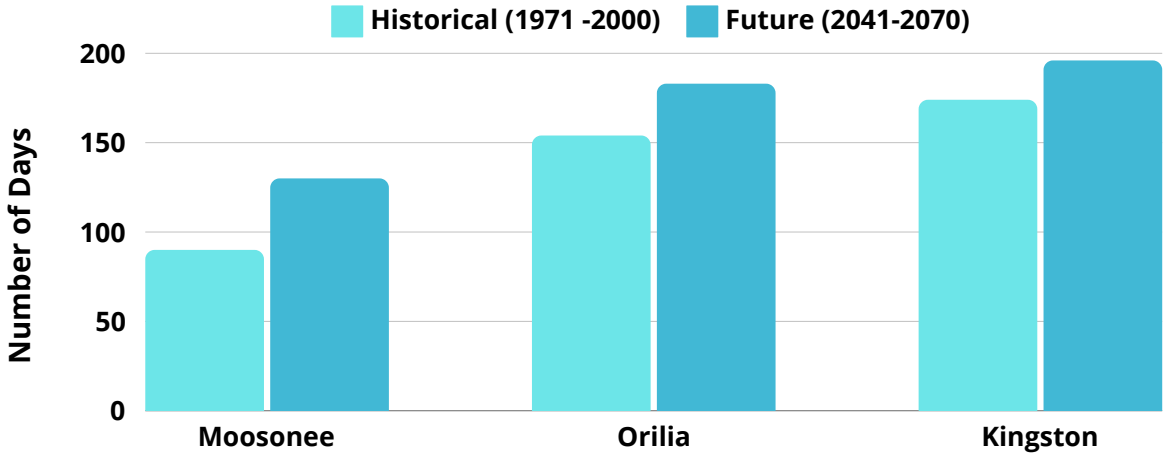

Figure 1. Changes in growing season length for select Ontario communities.

Winter season length

Winter season length is the number of days where the temperature is below 0ºC for the entire 24-hour period. Shorter and warmer winters could make it easier for invasive species to survive and become established. Communities in the south will experience much shorter winters. For example, winter in Northern Bruce Peninsula will decrease by almost 50%. In contrast, winter in the northwestern community of Red Lake will only shorten by 18 days (or 15%) from the historic season length of 128 days. The length of the winter season will decrease by about 24 days for many communities in Ontario, such as Trent Lakes.

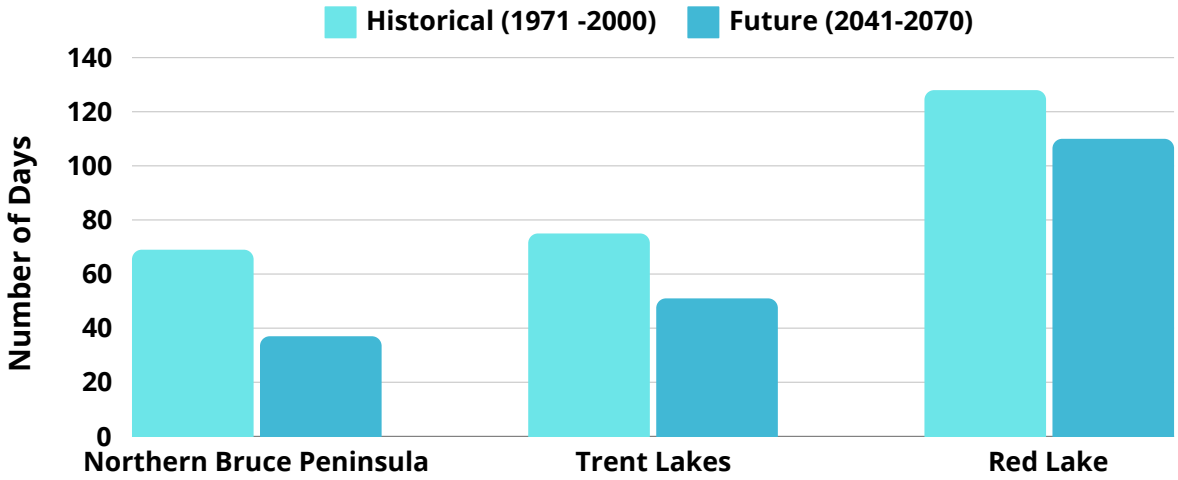

Figure 2. Changes in winter season length for select Ontario communities.

Number of humidex days

Humidex days are days where the Humidex rating is greater than 35ºC. More days of extreme heat and humidity could mean an increase in energy use for cooling buildings. People without air conditioning may be at risk of experiencing heat-related illnesses.

Southern communities will experience significantly more days of extreme heat by the end of the century. For example, the number of humidex days will increase from 25 to 65 for the

community of Pelee. Northern communities are not expected to see changes on this scale. For example, historically, the community of Terrace Bay might not experience any humidex days in a year but may experience 1 humidex day in the future. Almost 40% of communities in Ontario will see an increase of 20 humidex days or more, compared to their historical average, such as the community of Pembroke which will experience an increase of 21 days.

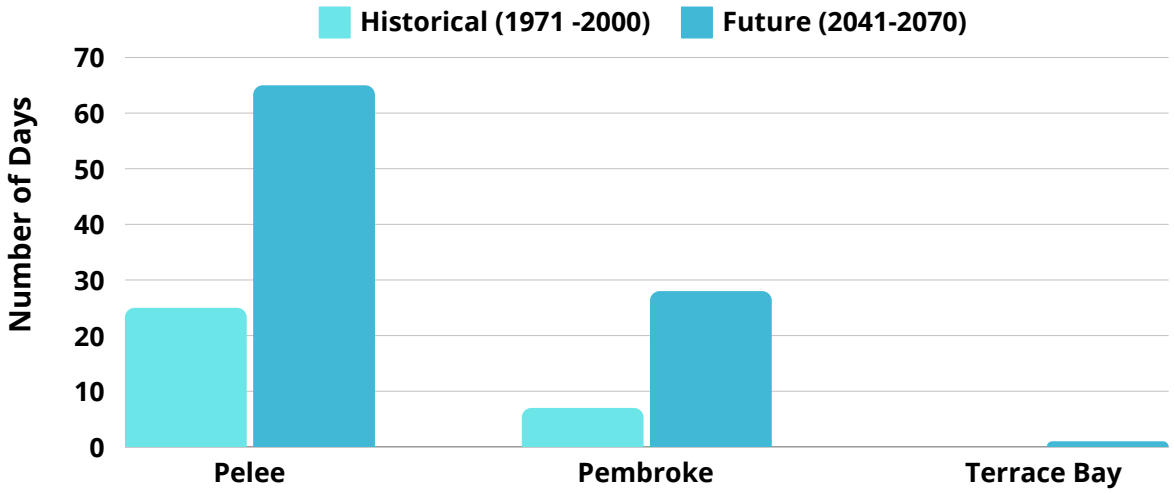

Figure 3. Changes in the number of humidex days for select Ontario communities.

Temperature of the hottest day

Hotter summer temperatures will increase the risks of heat-related illnesses and may influence the growth patterns of plants. The hottest day of the year will be about 3ºC hotter compared to the historical average. This change will be experienced in communities across Ontario, with only slight variations as shown in Table 1. For example, the hottest day of the year in Dryden will increase from 32ºC to 35ºC. Similarly, the hottest day of the year in Matawa will increase from 33ºC to 36ºC.

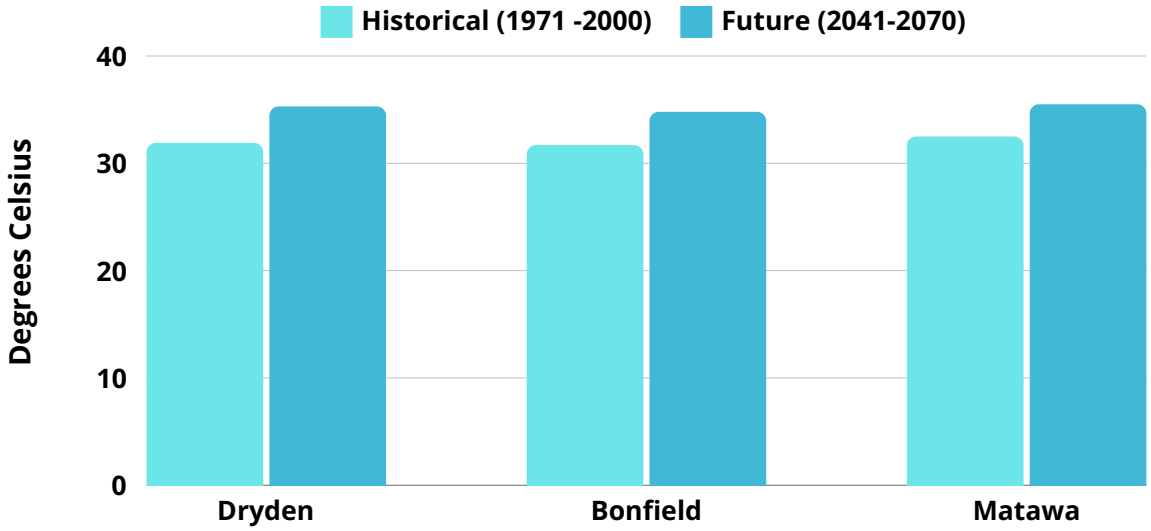

Figure 4. Changes in the temperature of the hottest day of the year for select Ontario communities.

Temperature of the coldest day

Warmer winters could increase the risk of illnesses caused by insect-borne diseases, such as Lyme disease. The coldest day of the year will be around 6°C warmer for most communities in Ontario, such as Midland. However, there is a bit more variation in this change compared to changes for the hottest day indicator. Northern communities like Moosonee will see the most warming of nearly 7°C, while communities in northwestern Ontario like Atikokan will see the least warming with an increase of about 5°C.

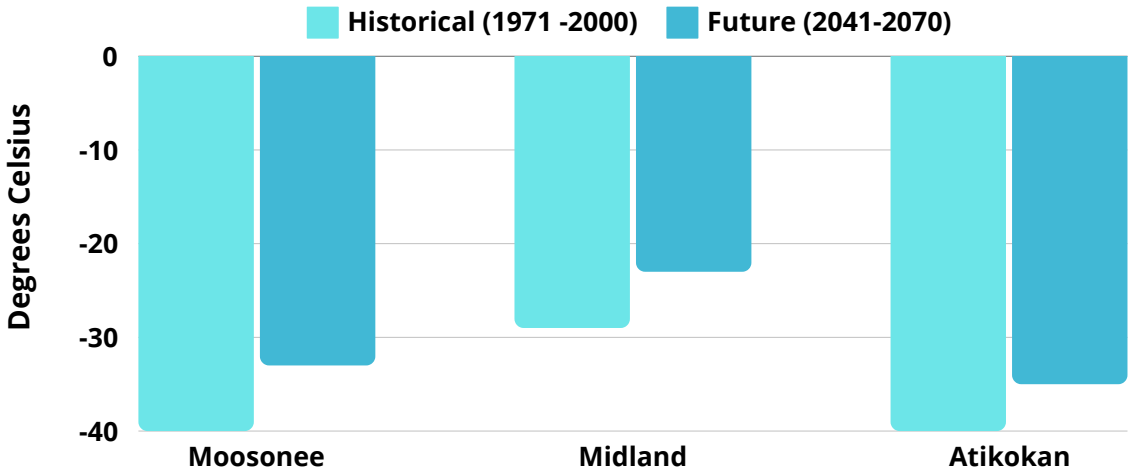

Figure 5. Changes in the temperature of the coldest day of the year for select Ontario communities.

Total precipitation

Total precipitation refers to the total amount of rain and snow that falls in a year. Higher amounts of precipitation could increase risks of flooding and make extreme weather events more severe. Communities in the south will experience a larger increase in precipitation. For example, precipitation in the community of West Grey will increase from 990mm to 1089mm (+99mm). The magnitude of increase is smaller for communities in northwestern Ontario, such as Ear Falls where the increase is just 37mm. Most communities in Ontario will see an increase in precipitation of about 85mm, such as the community of Moonbeam.

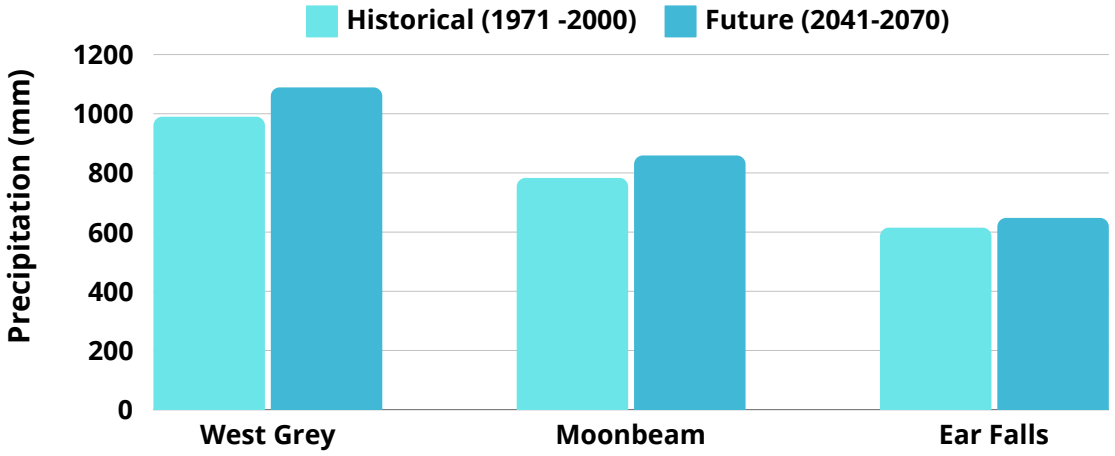

Figure 7. Changes in the amount of total precipitation for select Ontario communities.

Summary

Communities in Ontario are likely to experience climate change impacts from shifting seasons, flooding, and from extreme heat including increased incidences of insect-borne illnesses, and the introduction and establishment of invasive species. The scale of climate change impacts will depend largely on where people live. The risk and vulnerability of residents will also differ between communities. However, communities can identify and implement adaptation actions to reduce impacts and improve resilience. Actions can build community resilience, such as developing an emergency evacuation plan, encouraging the planting of heat and drought-tolerant plants, improving surveillance practices for insect-borne illnesses and invasive species, and naturalizing areas near waterways that are prone to flooding. Such adaptation actions should be undertaken in tandem with actions that reduce greenhouse gas emissions to help mitigate climate change.

Thank you to the Ontario Resource Centre for Climate Adaptation (ORCCA) for their support with mobilizing knowledge of the climate change indicators from ROI's Community Wellbeing Dashboard.

Learn more about ORCCA's climate change adaptation services here: https://orcca-craco.ca

This factsheet was prepared by Danielle Letang, Manager of Data Strategy for the Rural Ontario Institute. Questions about data sources and comments or feedback can be directed to **facts@ruralontarioinstitute.ca.**

This factsheet complements ROI's Community Wellbeing Dashboard. Factsheets provide insight and analysis of rural facts and trends featured in the dashboards.

FOLLOW US