



TELLING THE WEATHER STORY

EXECUTIVE SUMMARY

PREPARED BY
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FOR INSURANCE BUREAU OF CANADA (IBC)

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1. EXECUTIVE SUMMARY

Public and private sector leaders need information about regional climate trends in order to adapt for the future.

There is increasing evidence around the world that the frequency and severity of severe weather is on the rise. In Canada, the recent spike in extreme weather-related events has resulted in social and economic consequences for individuals, governments, and home and business insurers around the country. Yet little research has been undertaken to investigate historical and projected changes in weather trends in this country at the regional level.

Adaptation

Adaptation refers to initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist (e.g., anticipatory and reactive, private and public, and autonomous and planned).

The purpose of this report is to provide a greater understanding, based on the best available peer-reviewed science, about how weather patterns have changed in the past and how they are expected to change in the future. In doing so, the report aims to provide decision makers with the information they need to better adapt public and private infrastructure to the realities of the changing climate, while allowing home and business insurers to plan for future claims scenarios.

This report has been prepared by Professor Gordon McBean and colleagues at the Institute for Catastrophic Loss Reduction (ICLR). It is mainly based on internationally reviewed climate science as summarized by the Intergovernmental Panel on Climate Change (IPCC). Canada-specific information has been added based on Environment Canada publications, reviewed articles and a special report prepared by James P. Bruce commissioned by ICLR (Climate Change Information for Adaptation). Regional projections are provided within specific ranges due to the varying availability of reliable historical weather data and the challenges associated with projecting future changes in weather at the local level.

Canada's climate is changing.

This analysis reveals that the warming of the world's climate system is unequivocal based on observed increases in global average air and ocean temperatures. The year 2010 ranked, together with 2005 and 1998, as the warmest on record.

In Canada, on average, temperatures warmed by more than 1.3°C between 1948 and 2007, a rate of warming that was about twice the global average. The national average temperature for the year 2010 was 3.0°C above normal, which makes it the warmest year on record since nationwide records began in 1948. Canada has also become wetter during the past half century, with mean precipitation across the country increasing by about 12%. On average, Canada now experiences 20 more days of rain compared with the 1950s. These changes to the climate are likely responsible, at least in part, for the rising frequency and severity of extreme weather events in Canada, such as floods, storms and droughts, because warmer temperatures tend to produce more violent weather patterns.

These weather trends are already affecting Canadians.

People around the world, including Canadians, are already seeing the impact of severe weather in terms of lost lives and injuries, families displaced from their homes, and towns that are devastated. The personal and social costs of these losses are incalculable.

Insurers have seen first-hand the financial impacts of severe weather, as insured losses from natural catastrophes have ranged between \$10B and \$50B a year internationally over the past decade. In Canada, catastrophic events cost roughly \$1.6B in 2011 and almost \$1B in each of the two previous years. The majority of these insured losses were caused by extreme weather events, but Canada's home and business insurers are also seeing an increase in claims resulting from smaller weather events that nevertheless result in significant property damage for consumers. These losses are driven in part by Canada's aging sewer infrastructure, which is often incapable of handling the new, higher levels of precipitation, while the fact that homeowners are investing more in costly basement upgrades also has an impact on claims. As a result, water claims have now surpassed fire as the number one cause of home insurance losses in many parts of the country.

The climate will continue to change, with varying impacts across Canada's regions.

The earth is projected to warm by another 1.5°C by 2050. This change in the climate is expected to have varying impacts on temperature, precipitation and extreme weather trends throughout Canada, depending on the region of the country and the season.

By 2050, northern Canada is expected to warm the greatest amount during the winter, while southwestern Canada is likely to warm the most during the summer. Over this same period, seasonal average precipitation is projected to decline over parts of western and Atlantic Canada in the summer, while average precipitation is likely to increase over all of Canada in the winter. Region-specific information on the projected weather trends is provided in the Regional Syntheses section of this report.

Severe weather is projected to increase over the next 40 years.

Future trends in the frequency and severity of extreme weather will have a significant impact on the ability of individuals, governments and insurance companies to prepare for future catastrophic events. This is a concern given that the IPCC has concluded that it is very likely that extreme weather such as hot extremes, heat waves and heavy precipitation events will become more frequent over the next 50 years.

The frequency with which Canada experiences events such as heavy rainfall of a given intensity (known as the return period), is projected to increase such that an event that occurred on average once every 50 years will be likely to occur about once every 35 years by 2050. Even in regions of the country where average rainfall is projected to decrease in the summer, the frequency at which severe precipitation events occur is expected to increase over the next 40 years.

Changes to Canada's climate will also have implications for climate effects other than changing precipitation patterns. The occurrence of forest fire activity is projected to increase by 25% by 2030, with major regional variations as certain parts of the country become hotter and drier than others. Recent observations have led to projections of global mean sea level rises of 1 metre or more over the next century, with tangible impacts for Canada's coastal regions. Where information is available, this report also provides projected changes to severe wind/thunderstorms, hail, and freezing rain events.

Canada must adapt to this new reality.

These historical and projected trends point to the need for Canada to adapt its existing infrastructure now in order to minimize the social and economic costs associated with severe weather. Given the real threat of climate change, governments, communities, and individual home and business owners can use the information contained within this report to help make targeted decisions about how to adapt existing public and private impacts to manage the risks associated with these events.