

Natural Catastrophes:

Preparing your business for extreme weather events



01	Introduction	3
02	Impacts of Climate Change	5
03	Wildfires	7
04	Floods	9
05	Ice, Snow, and Winter Storms	11
06	Windstorms and Tornadoes	13
07	Business Continuity and Disaster Planning	15





Extreme weather and natural catastrophes cause billions of dollars of damage in Canada every year. That number is expected to increase with the impacts of climate change and no business or industry is immune. From ice storms and wildfires to flooding, tornadoes, and other catastrophic events, natural disasters can't be predicted — but you can prepare for them.

The costs are high: Insured damage from floods, rain, snow, and windstorms reached \$1.3 billion in 2019, according to the [Insurance Bureau of Canada](#) (IBC).

“Like 2018, no single event in 2019 caused the high amount paid out for losses,” IBC said, citing data from Catastrophe Indices and Quantification (CatIQ). “Instead, Canadians and their insurers experienced significant losses from a host of smaller severe weather events from coast to coast.”

Canada's most expensive natural catastrophe on record is the Fort McMurray wildfire of 2016, costing almost \$4 billion. But it's those smaller severe

weather events that start to add up — and can happen to any business, small or large, in any industry.

At \$250 million, the Halloween storm in eastern Ontario and Quebec ranked first on a list of 2019 severe weather events, [according to IBC](#). This was followed, at \$208 million, by spring flooding in Quebec and New Brunswick, and a series of hail storms, at \$181 million, that hit Western Canada in summer. Two winter storms, in the Greater Toronto Area and eastern Canada, ranked fourth at \$114 million. And Hurricane Dorian in Atlantic Canada ranked fifth on the list, at \$105 million.

Canada's climate has warmed in response to global emissions of carbon dioxide from human activity, according to [Canada's Changing Climate Report \(CCCR\) 2019](#), a national assessment led by Environment and Climate Change Canada on how and why Canada's climate is changing.

CCCR reports that warming in Canada is, on average, about double the magnitude of global warming. "Since 1948, when nation-wide records became available, Canada's annual average temperature over land has warmed by a best estimate of 1.7°C, with higher temperature increases observed in the North, the Prairies, and northern British Columbia. Annual average temperature over northern Canada increased by 2.3°C since 1948," according to the report. This widespread warming is projected to intensify in the near future, resulting in thawing permafrost and rising sea levels.

A warmer climate is expected to intensify weather extremes. "Extreme hot temperatures will become more frequent and more intense. This will increase the severity of heat waves and contribute to increased drought and wildfire risks. While inland flooding results from multiple factors, more intense rainfalls will increase urban flood risks," says the report.

That means the average annual severe weather claims paid by insurers in Canada could more than double over the next 10 years, increasing from \$2.1 billion a year to \$5 billion a year, according to [Climate Risks: Implications for the Insurance Industry in Canada](#) by the Insurance Institute of Canada (IIC). "Severe weather and climate risks have replaced fire to become the most important peril for property insurance in Canada," according to the IIC.

To handle these growing risks, it's critical to have a business continuity plan. We take a look at some of the top natural catastrophes that will be exacerbated by climate change — including wildfires, flooding, severe wind and snow and ice storms — and how to be prepared for a future of unknown risks.

\$1.3 Billion

Insured damage from floods, rain, snow, and windstorms in 2019.

\$4 Billion

The 2016 Fort McMurray wildfire, Canada's most expensive natural catastrophe.

\$5 Billion

The average annual severe weather claims paid by insurers, doubling over the next 10 years.



02 IMPACTS OF CLIMATE CHANGE

Climate change is no longer a future consideration; we're already seeing the impacts of extreme weather and natural catastrophes in the form of damage and destruction. The World Economic Forum's 2019 [Global Risks Report](#) lists extreme weather events — along with the failure of climate change mitigation — among its top three business risks.

In the Bank of Canada's 2019/2020 [Business Outlook Survey](#), which examined the macroeconomic impacts of climate change, more than half of affected respondents noted negative impacts of climate change. Several suffered financial losses or damage related to floods and wildfires, while changing seasonal patterns and unpredictable weather disrupted operations or sales — particularly in agriculture, transportation, and construction.

In Canada, some of the key challenges that businesses will face due to climate change include disrupted construction or logistics,

unavailable resources or raw materials, and increased or unpredictable energy costs, according to a [brief by CPA Canada](#).

"Storms can mean flooding, ice, fallen trees and lightning strikes — cutting off power supplies or shutting the roads that people use to get to work. In the retail trade, not only will employees stay away but so will customers," warns CPA's brief. "Whatever the business, extreme weather — influenced by climate change — can mean lost productivity and thus lost revenue."

But there's another aspect, too. Architects and builders need to start thinking about where they're building — whether it's in the middle of a floodplain or in an area that gets regular snow squalls every winter. "We need to look at our urban footprint and what we need to do to protect those buildings going forward," says Fred Muldowney-Brooks, who leads Federated Insurance's risk services program nationally.

Downtown Fort McMurray, for example, is located on a known floodplain. Wildfires are a regular (and normal) occurrence in the West and Vancouver is located in an earthquake zone. Residents and businesses should consider what they can do to mitigate these risks, which are happening on a more frequent basis, says Muldowney-Brooks.

In the Prairies, for example, having hail blankets on hand can help to reduce damage from hailstorms. Properties located on a floodplain could benefit from flood gates; builders can also consider constructing a property 12 inches higher off the ground to protect it from flooding.

But another component is building for resilience and rethinking construction, according to Muldowney-Brooks. For example, wood is flexible and is ideal as a building material for construction in Vancouver, since it can better withstand earthquakes. "What we use to construct these buildings will make them more resilient to flooding, windstorms and other weather-related events," says Muldowney-Brooks.

Each province has its own building code and each municipality has its own bylaws, but they don't necessarily take climate change into consideration — such as installing residential sprinkler systems in homes located within a wildfire zone. Yet, bylaws could make a big difference. "Many homes that survived the Fort McMurray fire are the ones that had an irrigation system in the front lawn, kept vegetation away from their houses, and kept gutters free of combustible material," he says.

Muldowney-Brooks recommends that residents and businesses owners stay abreast of the weather and take proactive action when necessary. Technology can help, too. In Quebec, a Federated Insurance pilot project uses lasers to monitor snow depth on roofs. When the snow gets to a certain depth, it triggers an alarm that indicates the snow needs to be shovelled off the roof. "We need more proactive thinking," he says. "After all, you can't install a roof alarm system for snow when you've already got snow on top of it."

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Fred Muldowney-Brooks, Vice-President of Risk Services at Federated Insurance



Wildfires are a natural occurrence in Canada, thanks to our many forested and grassland regions. Each year, about [8,000 wildfires](#) burn across 2.5 million hectares of land in Canada. Some are caused by lightning (45 per cent), while human-caused fires represent 55 per cent of all fires.

The total area burned by wildfires has more than doubled over the past 50 years, and the number and average severity of large fires has increased, according to the [IIC's Climate Risk report](#). An increase in hot, dry, and windy conditions in forested zones could result in an increase of extreme fire weather conditions, the number of fire spread days, and the overall length of the fire season.

Typically, wildfires occur from early spring through to fall and occur just about everywhere in Canada. Businesses are at highest risk if they have wildland within 30 metres of their building, according to the [Institute for Catastrophic Loss Reduction](#) (ICLR).

Having the right information at the right time can make the difference in helping you react before it's too late. Monitor your local news, stay up-to-date on weather developments, and check weather alerts frequently. Follow local weather stations on social media to get the latest updates in real time.

Natural Resources Canada offers a [Canadian Wildland Fire Information System](#) with daily fire weather and fire behaviour maps, as well as hot spot maps, throughout the duration of the forest fire season. Federal, provincial, and territorial governments also provide up-to-date reports on the fire situation across Canada via the [Canadian Interagency Forest Fire Centre](#).

There are several ways to protect your property and operations in the event a wildfire does occur. Do you have fire protection equipment, such as fire extinguishers and smoke alarms, installed on your property? Are your employees properly trained on handling and operating equipment and fuel that may cause fires, property damage, or serious injury? Other preventative measures include:

- **Creating a fuel reduction area:** This safety zone can help to protect your property from fire by maintaining a separation between buildings, vehicles, fuel tanks, storage areas, and high-grass or wooded areas. If trees on your property are primarily deciduous, such as oak or maple, this safety zone should be at least nine metres. If the trees are primarily coniferous, such as pine or fir, the safety zone should be at least 30 metres.
- **Regularly clearing debris:** Clear dry or dead brush, trees, grass, and other debris within 15 metres of all buildings, or within 60 metres of buildings on slopes. Trees should be trimmed so branches are a minimum of two metres from the ground.
- **Providing a safe smoking area:** Some wildfires are caused by an easily preventable accident, such as a cigarette butt that wasn't properly extinguished. Establish a safe outdoor smoking area and provide appropriate containers for discarding smoking materials.
- **Ensuring safe fire practices:** Combustible and flammable materials located outdoors should be stored in approved containers at an acceptable distance from buildings, fences, and vehicles. If your building is on a slope, these should be stored lateral to the building, not uphill or downhill.
- **Providing adequate property access:** Properties should have well maintained, adequately sized, and properly graded driveways and access roads. Roads and parking areas should be designed to accommodate fire department vehicles, with a turning radius of 14 metres.
- **Upgrading your infrastructure:** Roof coverings should be made of fire-resistant materials, and roof vents should be covered with fire- and corrosion-resistant screens. Install spark arrestors on chimneys to prevent sparks and embers from escaping. Exterior openings, including windows and doors, should have at least a 20-minute fire resistance rating. Overhangs, eaves, and balconies should also have at least a one-hour fire resistance rating.

Preparing for a wildfire should be part of your disaster recovery and business continuity plan, which should include appropriate insurance coverage.



Canada is surrounded by three oceans and has more lakes than any other country in the world, including four of the Great Lakes, so it's no surprise the country is prone to flooding. Many Canadian rivers have flooded at some point, particularly where there's development on low-lying lands.

Even heavy rainfall can result in flooding, particularly when the ground is already saturated or still frozen. Flash flooding, which occurs when the ground can't absorb the water quickly enough, can be caused by violent storms or torrential downpours. Flash flooding is unanticipated and there's little time to prepare.

Snowmelt runoff floods are the most common type of flooding in Canada, [according to the Government of Canada](#). While this typically occurs in the spring, it can also happen during sudden winter thaws. Flooding also takes place along lake and coastal shorelines, when higher water levels inundate low-lying areas, such as the Red River Valley in Manitoba.

Ice jams are another major cause of flooding, which result from the accumulation of ice fragments that obstruct water flow. The flooding that occurred this year in Fort McMurray was related to ice jams, for example. In the Saint John River basin in Atlantic Canada, more than two-thirds of provincial flood damage costs are due to ice-related events. In April, [an ice jam developed on the Athabasca River](#), leading to the flooding of Fort McMurray, Alberta. About 13,000 people were displaced and 1,200 properties were damaged.

Climate change is likely to increase flooding. More intense rainfall will increase urban flood risks, and coastal flooding is expected to increase as sea level rises, according to the [CCCR 2019](#) report. Increased frequency and severity of extreme rainfall could occasionally overwhelm aging sewer systems and flood basements, [according to the IIC](#).

Summer flooding in concrete jungles like Toronto, for example, is becoming more commonplace due to aging or inadequate infrastructure to handle surface runoff, particularly during a flash flood.

CatIQ Inc. reports that insured losses in Canada topped \$1 billion five times in the past seven years. A significant portion of that \$1 billion is the result of water damage and flooding, according to the Insurance Bureau of Canada. Being proactive can help to mitigate losses related to water damage and flooding.

MONITOR YOUR FLOOD RISKS

Understanding the potential for flooding — such as river flooding, coastal flooding, surface water flooding, and sewer flooding — and the impact on your operations. Keep in mind, surface flooding and sewer flooding are two different perils and two different insurance coverages. Understanding this is the starting point to developing a flood plan, which should be part of your business continuity plan. Are you in a high-risk area? Do you know the history of the area? City planning departments are a good starting point for basic information.

Flooding can occur at any time of year, usually caused by heavy rainfall, rapid melting of snow packs, or ice jams. Flood warnings can come from various sources; it's helpful to designate a person in your organization to be responsible for monitoring reports from reliable sources and providing updates to senior management or the disaster planning team.

Each province and territory responds to floods in co-operation with local authorities, and the majority have information online about the flood situation in their area. There are also [regional flood forecasting centres](#) across Canada that provide flood warnings.

PROTECT YOUR PROPERTY FROM FLOODING

If your business is in a flood-risk area or a concrete jungle, make sure that staff know what to do in case of a flood, and make a list of employees' contact details in the event of an evacuation. As part of your flood plan, identify evacuation routes and organize emergency drills for staff. Other considerations include:

- Installing backflow prevention check valves to stop floodwater from entering at vulnerable points where utility and sewer lines enter the facility;
- Installing permanent sump pumps with solar and backup power;
- Adequately sealing walls to prevent or reduce seepage and, if necessary, reinforcing walls to resist water pressure;
- Installing flood shields to prevent the passage of water through doors, windows, ventilation shafts, or other openings;
- Having backup systems available for use during emergencies, such as portable pumps to remove flood water, alternate power sources such as generators or gasoline-powered pumps, and battery-powered emergency lighting, located well above the high water mark.

Ensure that your business is adequately insured for flood damage. Property damage, business interruption, and liability insurance are critical coverages if your business is to bounce back, but you may need other coverage too, depending on the nature of your business.



Canada has one of the most severe winter climates in the world, and Canadians are accustomed to a wide range of weather conditions. Despite this familiarity, businesses can't predict how much damage will result or how long operations could be sidelined by a weather-related event.

A big winter storm could knock out electricity, heat, and communications for hours, even days, as evidenced by the devastating 2013 ice storm in central and eastern Canada. Climate change could make these [winter storms more frequent](#) and intense, since warmer air holds more moisture.

Environment Canada has [four types of severe winter weather alerts](#), including special weather statements, advisories, watches, and warnings. Understanding your risks, and having a contingency plan in place, can help you weather the storm. Designate someone in your organization to monitor weather warnings and keep an eye on notices from [Environment Canada](#) for wind chill warnings and cold alert notices.

When it comes to winter storms, as with all peril-based risks, it's best to be prepared for the worst-case scenario. As part of your business continuity plan, there are a few points to consider:

- **Prepare for power outages:** Make sure you have emergency power, such as backup generators, available, as well as a supply of flashlights and batteries to ensure employees can continue to move safely through the work space. Use heating sources only in well-ventilated areas to avoid buildup of lethal carbon monoxide gas. Keep a fire extinguisher close by, and install a smoke detector and battery-operated carbon monoxide detector near the area to be heated. Test monthly.

- **Winterize your property:** Perform regular maintenance before, during, and after the winter season. Heavy snowfall can damage roofing or even cause it to collapse, while excess snow and ice can create ice dams that prevent drainage of the roof covering. As a preventative measure, inspect your roof twice a year. During winter, remove snow and ice from the roof when it's more than 20 cm high as excess weight on the roof can cause it to collapse. To keep track of your snow removal activities, download our [snow removal log](#).
- **Prevent frozen pipes:** Accidental bursting of plumbing pipes is common during extreme cold and the damage can be costly. Indeed, frozen pipes are a leading source of property damage during severe winter weather, according to the [Insurance Institute for Business & Home Safety \(IBHS\)](#). To reduce risks, seal all windows, doors, and wall cracks on exterior walls with caulk or insulation, and insulate and seal partition walls, vents, plumbing stacks, and electric and mechanical chases. Reduce your chances of a burst pipe by using our [water damage checklist](#) as a jumping-off point for your own inspection routine.

Your business insurance coverage can help if a winter storm causes damage or destruction, but every business is unique, so make sure your coverage extends far enough to cover your needs.

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Canada experiences all types of extreme wind events, [according to the ICLR](#). Violent winds are often a component of natural catastrophes, causing power outages and damage to roofs and properties — and turning loose items into dangerous projectiles.

In 2018, more than half of insured catastrophic losses were caused by wind, tornado, and hurricane events, according to the Insurance Bureau of Canada's 2019 [Facts of the Property and Casualty Insurance Industry in Canada](#). In previous years, from 2009 to 2017, the average amount was less than a quarter of catastrophic losses.

Once again, climate change is expected to increase the frequency and intensity of severe thunderstorms that come with severe wind, hail, and tornadoes, [according to the IIC report](#). It expects to see an increase in the number of tornadoes over the next 10 years and possibly a larger increase through the rest of the century.

TORNADOES

Canada experiences the second highest number of tornadoes in the world, after the U.S., with about 80 tornadoes on average per year, [according to the Institute for Catastrophic Loss Reduction](#). Southern Ontario, southwestern Quebec, and the Prairies, as well as the British Columbia interior and western New Brunswick, are most prone to these events, although one of the largest tornadoes in Canadian history hit Edmonton in 1987. Known as the Black Friday Tornado, its winds reached 400 km/h and killed 27 people.

In Canada, tornado season typically runs between March and October, with activity peaking in late June or early July. These rotating columns of wind tend to move up to 70 km/h, leaving a wide path of destruction in their wake — uprooting trees, flipping cars, and demolishing buildings.

Warning signs include severe thunderstorms with frequent lightning, a dark greenish sky, and a funnel cloud at the base of a thundercloud, often behind a curtain of heavy rain or hail. They're also typically accompanied by a whistling sound.

Environment Canada is responsible for [warning the public](#) of a potential tornado; if you live in one of Canada's high-risk areas, check for updates online or on the radio during a severe thunderstorm.

For those on the Atlantic coast, hurricanes are another consideration — less frequent, but still a possibility. A hurricane is a tropical storm with a minimum wind speed of 120 km/h. Hurricanes tend to cause more widespread damage than tornadoes because they're much larger, sometimes stretching 1,000 kilometres, and storm surges can cause widespread flooding. Hurricanes originating in the Atlantic or Pacific oceans often have their classification downgraded to post-tropical storms by the time they hit Canada, but can still cause significant damage.

BE PREPARED

You can help reduce damage to your property from tornadoes and other wind-related weather events by taking simple precautions:

- **Perform routine maintenance:** Inspect and repair loose or damaged building components such as siding, shingles, roofing and brickwork, and remove trees and branches that could fall on the roof or on power lines.
- **Retrofit your property:** Retrofitting could include bracing and strapping the roof; adding fasteners, ties and reinforcements; and making entry doors more wind resistant. When replacing your roof, choose wind- and hail-rated shingles (a wind rating is the force of wind required to blow the shingle off the roof).

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"There certainly is a geography to Canadian risks," says Kim Court, director of catastrophe exposure analysis with Fedrated, who works closely with underwriting teams who investigate potential risks. "What I don't think people understand about Canada is we are exposed to just about every natural catastrophe possible: earthquakes, hail, flooding — we even have volcanoes in British Columbia."

But there are commonalities among natural catastrophes, so it's always a good idea to have a preparedness kit specific to the peril you're concerned about. Environment Canada and Red Cross both have recommendations for preparedness kits.

"The more preparatory steps you take, the better. It doesn't guarantee you won't have a claim, but it can reduce the magnitude," says Court. "The goal is to keep people as safe as possible whether at home or work."

The Government of Canada has a weather app, which allows you to receive all weather alerts issued by Environment

and Climate Change Canada for any saved locations in the country.

[These alerts can be especially useful if there's a severe weather warning, like a tornado, flood, or excessive heat.](#)

"Tornadoes are not predictable and while there are factors that strongly indicate you'll have one, it's not until one touches down that we know where it's going to go. Even when it touches down they can make a 90-degree turn," says Court.

"Just because it's not hitting the news doesn't mean it's not happening. Seven per cent of the world's renewable water and 11 per cent of world's water in general is in Canada — we are going to flood. We have more trees than most countries, so we will have forest fires," she says. "Climate change is a contributor, but so are our urban environments. We have more people than our infrastructure can sustain."

Disasters can happen anywhere, without warning. Without a plan, your business

could be sidelined for a lot longer than anticipated, and the costs could be debilitating. Business continuity planning is about preparing your business for the worst, including unforeseen natural catastrophes.

To mitigate these risks, do a business risk analysis. You need to understand your vulnerabilities, which will depend on your geographic location and your industry, and improve infrastructure where possible, such as with better roofing or natural drainage to protect against severe storms. This should be part of an overall business continuity plan that includes appropriate insurance coverage.

A significant part of your risk management program should be dedicated to ensuring business continuity and resumption of normal operations as quickly as possible. Having a step-by-step plan greatly increases your ability to resume operations after a severe weather-related event.

This plan should answer some key questions, including: If you can't immediately return to your business facility after a natural catastrophe, where could you temporarily set up? Is your staff trained on the proper protocols during an emergency situation? Do you have data stored in a safe place to retrieve after a natural disaster? Do you have a communications statement ready for your customers if you're unable to fulfill commitments?

You should also determine how much a natural catastrophe could cost your business. Insurance is sometimes a low priority, especially for small business owners, due to time, resources, and money. Unfortunately, those without a plan are left unprepared in emergency situations and, if they aren't properly insured, they could be on the hook for the entire amount.

Having insurance coverage is a central part of an effective business continuity strategy. If you already have insurance, take the time to know exactly what's covered by your policy — if you see gaps, it may be time to update your insurance coverage. [Business interruption insurance](#) is particularly important, since it's designed to help your operations continue after a crisis.

Having a plan in place can save time and money when severe weather strikes. Knowing in advance what your insurance policy covers is a great first step — but pair that knowledge with preparation to weather any storm that comes your way.

Federated Insurance offers a detailed guide to business continuity planning, [Open For Business: Business Continuity Planning Guide](#), which provides step-by-step instructions and helpful checklists.

The more preparatory steps you take, the better. It doesn't guarantee you won't have a claim, but it can reduce the magnitude.

Kim Court

Director of Catastrophe Exposure



Knowing
your business
matters.

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