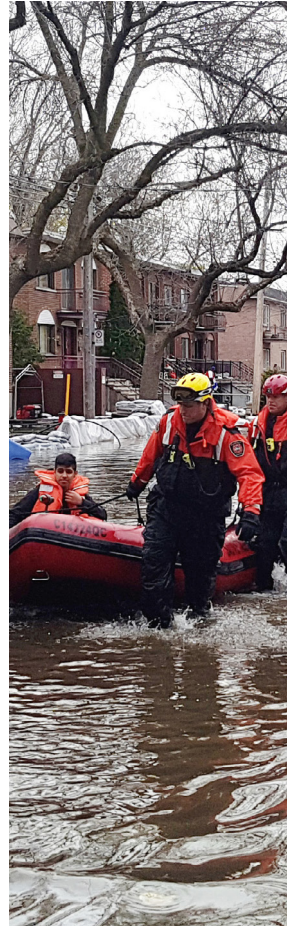




Focus on

Types of flooding

*Designed for safer living® is a program endorsed
by Canada's insurers to promote disaster-resilient homes.*



About the Institute for Catastrophic Loss Reduction

The Institute for Catastrophic Loss Reduction (ICLR), established in 1997, is a world-class centre for multidisciplinary disaster prevention research and communication. ICLR is an independent, not-for-profit research institute founded by the insurance industry and affiliated with Western University, London, Ontario.

The Institute's mission is to reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.

ICLR's mandate is to confront the alarming increase in losses caused by natural disasters and to work to reduce deaths, injuries and property damage. Disaster damage has been doubling every five to seven years since the 1960s, an alarming trend. The greatest tragedy is that many disaster losses are preventable. ICLR is committed to the development and communication of disaster prevention knowledge. For the individual homeowner, this translates into the identification of natural hazards that threaten them and their home. The Institute further informs individual homeowners about steps that can be taken to better protect their family and their homes.

Waiver

The content of this publication is to be used as general information only. This publication does not replace advice from professionals. Contact a professional if you have questions about specific issues. Also contact your municipal government for information specific to your area. ICLR recommends that measures taken to address the concerns outlined in this booklet be handled by professionally licensed and insured experts.

ICLR accepts no responsibility of liability for:

- Any loss or damage that any person may sustain as a result of the information in, or anything done or omitted in reliance on, this pamphlet; and
- Any personal injury or bodily injury, including death, and any loss or damage caused to insured or uninsured structures and /or property as a result of actions outlined in this document.

Focus on types of flooding

Flooding is the most common hazard experienced in most industrialized economies around the world, including Canada. Indeed, it could very well be the most common hazard in all countries. One of the reasons why flooding is so prevalent is because, unlike most other natural hazards, there are many causes and types of floods.

A wildfire is a wildfire, regardless of whether it was started by lightning or a carelessly discarded cigarette. An earthquake is an earthquake, regardless of whether it was caused by a subducting plate or a crustal fault. But a flood is not a flood is not a flood, though this matters little to the average property owner.

When a homeowner gets water in the house, they call it a flood. It doesn't matter to them how it happened (pipe or municipal water main break; toilet, water heater, dishwasher or washing machine failure; groundwater seepage; sewer backup; river; storm surge) it just matters that it happened and that the damage get fixed right away.

Exactly how the water damage happened, on the other hand, matters a great deal to insurers.

What is a flood?

Flood has been defined variously as:

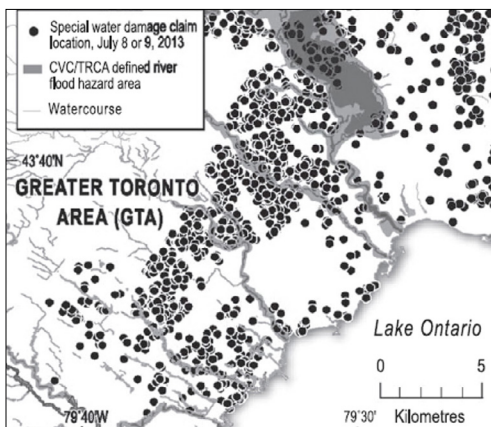
- Water that has overflowed to a place where it normally is dry
- An overflowing of water beyond its normal confines
- Water where it is not wanted

First of all, depending on the cause of the water damage, an insurance policy may or may not respond, often depending on the type of insurance policy and optional coverages purchased (or not purchased).

Second, the nature of the advice that would be given to prevent or mitigate a repeat of the loss would depend on the cause of the occurrence. For instance, the advice that would be given to prevent damage from a river flood is very different from the advice that would be given for a sewer backup that happens as a result of a heavy rainfall event.

How a flood occurs is also of great interest to governments (most often local, but also provincial and, sometimes federal, depending on the type and location of flooding experienced), first responders, emergency managers, realtors and others.

This booklet will explain the various types of flooding most common in Canada. It will also provide information on homeowners insurance as it relates to flooding and water damage.



Insured damage from flooding doesn't just occur near rivers, creeks and streams. A sample of water damage insurance claims (largely sewer backup) in the western Greater Toronto Area filed on July 8 and 9, 2013 after a major rainstorm July 8.

Dan Sandink, Paul Kovacs, Greg Oulahen & Dan Shrubsole (2015): Public relief and insurance for residential flood losses in Canada: Current status and commentary, Canadian Water Resources Journal/ Revue canadienne des ressources hydriques, DOI: [10.1080/07011784.2015.1040458](https://doi.org/10.1080/07011784.2015.1040458)

Types of flooding

It is important to note that while the following types of flooding may occur exclusively and be the sole cause of a given flood event, it is common for several types of flooding to occur simultaneously, with their combined effects contributing to an occurrence. For instance, heavy rainfall-related flooding that impacted the City of Toronto on July 8, 2013 caused considerable damage to properties located away from bodies of water, because urban flooding most often occurs where it rains very hard over a short time frame. However, the heavy rainfall also caused creeks and streams to overflow their banks and damage nearby properties, and triggered sewer backup into basements of homes. Flooding in Southern Alberta just three weeks prior to the Toronto event had elements of river flooding, urban flooding, groundwater and possibly other types of flooding. Spring flooding in Canada often has elements of heavy rainfall, snowmelt, ice jam and groundwater flooding.

Flooding is sometimes broken down into three main varieties: Fluvial (aka river or riverine flooding, when levels in a river, creek or stream rise, allowing water to flow onto surrounding land); Pluvial (heavy rainfall-related flooding that is independent of an overflowing body of water); and, Groundwater.

Coastal flooding is also often included as a fourth type if the entity defining the types of flooding has coastlines along oceans or large inland lakes. So, for instance, British Columbia may define four main types of flooding, but Alberta or Saskatchewan may only define three main types.

Attempting to 'pigeon hole' flooding into these three or four main categories is often problematic because several different types of flooding often occur simultaneously or close to simultaneously, contributing to the overall flood event. Also, it can sometimes be unclear what phenomenon lead to a given flood. For instance, it is often difficult to determine if a basement flooded from overland flows coming in through windows and doors, or whether it flooded due to seepage of groundwater through cracks in the foundation.

The flooded town of Ste. Agathe, Manitoba is shown on April 30, 1997, after flooding of the Red River.



The Canadian Press/Tom Hanson

For this reason, we will only define the various types of flooding without attempting to force them into main categories – or types – of flooding.

Snowmelt runoff

River flooding from snowmelt (also known as freshet or spring freshet flooding) often occurs in late winter or spring when increased temperatures trigger the melting of snow and ice. Runoff-related floods can be of differing strengths and durations depending on the amount of snow and local average rates of warming. Such floods can last for weeks.

Freshet flooding occurring at times when the ground is frozen can lead to rapid flooding because little water is able to infiltrate the surface. Early-season freshets can also result in low flow conditions later in the summer or fall.

Runoff-related flooding can also be worse in late spring, as the days are moderately longer and temperatures higher. Much depends on the depth of the snowpack.

Freshet flooding can be greatly exacerbated by rainfall, particularly extreme rainfall, as this speeds up melting – often rapidly. Additionally, rain serves as an additional source of water. The combination of rain and snowmelt can easily overwhelm both natural and engineered drainage systems.

According to *Canada's Changing Climate Report* (NRCan, 2019) "The seasonal timing of peak streamflow has shifted, driven by warming temperatures. Over the last several decades in Canada, spring peak streamflow following snowmelt has occurred earlier, with higher winter and early spring flows (high confidence)... Projected higher temperatures will result in a shift toward earlier floods associated with spring snowmelt, ice jams, and rain-on-snow events (medium confidence)."

Storm/rainfall

Extreme downpours often lead to localized flooding, particularly if heavy rains occur over a relatively short time frame, overwhelming drainage systems, both natural and engineered.

Heavy rainfall-related flooding can also result in flash flooding, when the peak of the flood occurs within six hours after rainfall.

Storm-related flooding (commonly associated with convective storms and tropical storms) often figures into urban flooding (see below). However, it may also lead to (or exacerbate) other types of flooding, including floods caused by snowmelt, ice jamming, structural failure (both natural and engineered) and groundwater.

Ice jams

Ice jam floods are caused by the temporary blockage of river flows from the build-up of floating ice (sometimes called ice dams). Often they occur around natural features, such as where rivers narrow or have sharp bends, or human-made features, such as bridges, causeways or railroad embankments.

Ice jam flooding can occur both during ice formation in early winter and during break-up in the spring. Ice jams may result in flooding upstream, as well as downstream flooding when the ice dam suddenly fails.



Keyano College and Fort McMurray Composite High School surrounded by flood waters from the Clearwater River on Tuesday, April 28, 2020, after a 25-km ice jam caused major flooding and forced 12,000 people from their homes.

The Canadian Press/Greg Halinda

This type of flood, which usually is quite localized, is less predictable and often more destructive than open-water flooding because it can produce deeper and faster inundation.

If ice jam flooding is projected to occur, the phenomenon can sometimes be prevented by weakening river ice (by cutting or drilling holes in the ice), using ice breaking watercraft or excavators on barges, or with the use of explosives (usually in uninhabited or sparsely inhabited areas). Once ice jams have already formed, options to relieve the jam are limited. For localized jams, mechanical removal may be an option.

Natural dams

This type of flooding is caused by the failure of natural structures, including those created by landslides, moraines and glaciers, which can block natural water flows. Natural dam flooding also includes glacial outburst-related floods (aka jökulhlaups). Natural dam-related flooding can occur upstream of the blockage (just as would be experienced with an engineered dam), as well as downstream when the structure fails. Like ice jam flooding, natural dam-related floods tend to be highly localized in nature.

Structural failure

Similar to natural dam-related flooding, except the failed structures are engineered and not natural. Engineered structures can include dams, levees and dykes. Also known as reservoir flooding, this type of

Debris from a landslide caused by a failed dam is shown from the air near Testalinden Creek, just south of Oliver, B.C. on June 13, 2010.



The Canadian Press/Greg Halinda

flooding occurs either when engineered structures are overwhelmed by excessive flows, or fail in part or altogether due to such issues as poor design, poor construction, operation errors, lack of maintenance, earthquake/landslide, or other extreme conditions that exceed design specifications. While rare, floods resulting from failures of engineered structures can be very severe because of the high velocity of floodwaters.



The Canadian Press/Geoff Robins (top) and Andrew Vaughan (bottom)

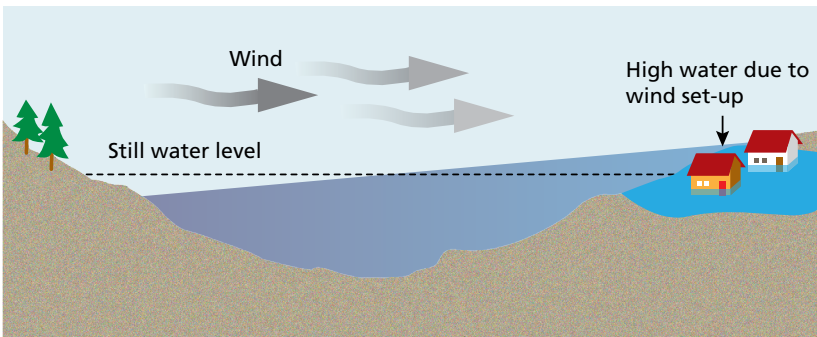
Coastal flooding

Coastal floods generally arise as a result of the combinations of four main factors: wave setup, tides, storm surges and, where applicable, changes in sea level.

(Top) The front lawn of a home near Chatham, Ont. remains underwater after a seiche-related flood on August 30, 2019. (Bottom) Reuben Schwartz stands on the remains of his deck at his cottage in Brule, N.S. after a storm surge on December. 22, 2010.

Coastal flooding can happen both along ocean coasts as well as lake shorelines, such as along the Great Lakes. Causes of coastal flooding include high wind (and subsequent wave action); storm surge (such as that which accompanies tropical storms); the combination of high estuarine flows and tides; seiches; and, tsunami caused by such phenomenon as submarine seismic activity and undersea landslides.

Seiches: Lake profile showing wind set-up





A bench sits in water on Ward's Island, near Toronto, on June 5, 2019, with high water levels in Lake Ontario.

With lake-based flooding, coastal flooding can also be driven by seasonal rises associated with the differences between inflows and outflows.

As with other types of flooding, often several factors can work in unison to cause (or worsen) coastal flooding. For instance, high winds occurring at high tide can combine to exacerbate coastal flooding.

Sea level rise caused by climate change will worsen ocean coastal flooding in the decades ahead.

According to Canada's Changing Climate report (NRCan, 2019) "Coastal flooding is expected to increase in many areas of Canada due to local sea level rise. Changes in local sea-level are a combination of global sea level rise and local land subsidence or uplift. Local sea level is projected to rise, and increase flooding, along most of the Atlantic and Pacific coasts of Canada and the Beaufort coast in the Arctic where the land is subsiding or slowly uplifting. The loss of sea ice in Arctic and Atlantic Canada further increases the risk of damage to coastal infrastructure and ecosystems as a result of larger storm surges and waves."



The November 18, 1929 Grand Banks tsunami killed 28 and caused about \$1 million in property damage on Newfoundland's Burin Peninsula.

Photo from the 334 Matilda Kelly Collection, courtesy of the Queen Elizabeth II Library, Memorial University



A woman gets back into her flooded car in Toronto on July 8, 2013, after heavy rainfall caused widespread flooding.

The Canadian Press

Urban flooding

Urban flooding is a complex form of flooding that is about much more than simply “a flood that occurs in a city”.

Closely tied to storm/rainfall related flooding (see above), urban flooding is defined as inundation caused by overland flows (such as stormwater runoff and riverine flooding) and infrastructure flooding (including sewer backup). Essentially, urban flooding is caused by excessive runoff in developed areas where water has no place to go, overloading both engineered and/or non-engineered drainage systems.

Urban flooding is exacerbated by impervious surfaces most often found in built-up areas (like concrete, asphalt and large roofs) and by the overall concentration of development.

This type of flooding often costs Canadian society (including insurers) millions of dollars each year. Communities hit by costly urban flooding disasters in recent years include Windsor, Ontario (September 2016 and August 2017), Sydney, Nova Scotia (October 2016); Chestermere, Alberta (July 2015); Burlington, Ontario (August 2014); Toronto, Ontario (July 2013); Calgary, Alberta (June 2013); and Binbrook, Ontario (July 2012).

Groundwater

Flooding from groundwater (water that is present beneath the surface of the Earth) can occur both at a neighbourhood/community level and at an individual structure level.

While groundwater flooding is often associated with basement flooding, it can occur at a broader community-based scale, particularly in areas where water tables are high, where soils are chalky or sandy, and in places that experience prolonged soaking rain events.

Groundwater flooding is also often common where large aquifers are located below river beds.

Groundwater flooding is often exacerbated in spring, when snow and ice melt can contribute greatly to groundwater levels.

In relation to individual structures, groundwater flooding often occurs when groundwater levels rise to a point where they are higher than the lowest part of a building. Water may then enter basements through cracks in foundation walls and floors. Saturated soils around homes may also lead to flooding.

Please refer to comments about seepage in the discussion about insurance below.

Plumbing/infrastructure

Individual structures may flood due to failures of water pipes/supply lines, household appliances that use water (such as hot water tanks, washing machines and dishwashers) or plumbing fixtures (such as sinks and toilets). Flooding from such sources are almost always limited to the individual property, and usually do not pose risks at the neighbourhood or broader community level.

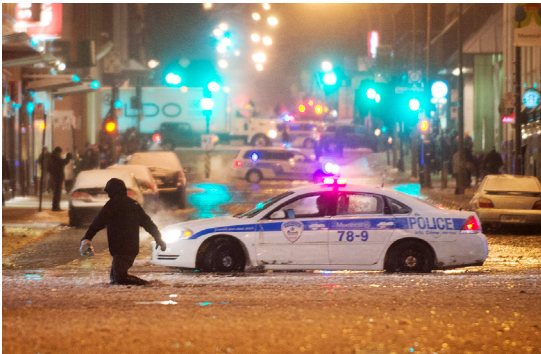
Flooding may also be caused due to the failure of public water infrastructure, such as large water mains, which can cause flooding at a wider neighbourhood or community level. Though such failures can occur at any time, water mains in Canada most often break in the winter months due to such issues as ground heaving.

Basement flooding and/or sewer backup can also be caused by failure at the public infrastructure level, though post-event engineering inspections often determine the causes of such events to be from issues at the individual lot-level (such as clogged sewer laterals and collapsed foundation drains).

According to ServiceMASTER, A burst pipe can cause a lot of water to spill out into your home or building.

“A water line to the back of your refrigerator will flow at ½ to 1 gallon [almost two to almost four litres] per minute depending on your water pressure. That is 700 – 1,400 gallons of water [almost 2,700 to almost 5,300 litres] in 24 hours spilled into your home. One toilet supply line will flow at 2-3 gallons [about 7.5 litres to over 11 litres] per minute, resulting in 3-4,000 gallons [about 11,300 to over 15,000 litres] spilling out in a 24-hour period. The washing machine hose will leak up to 10-12 gallons [almost 38 to more than 45 litres] per minute, causing more than 12,000 gallons [more than 45,000 litres] to spill into your home within 24 hours.”

Again, different types of floods may contribute to infrastructure-related flooding. For instance, a river may overflow its banks, inundating part of a community’s sanitary sewer system, leading to sewer backup some distance from the river. Such flooding may also occur as the result of another natural hazard. For instance, public water mains and private water pipes may break as the result of an earthquake. Private water pipes may burst due to a winter storm with severe freezing temperatures.



A man crosses a street in Montreal, Monday, January 28, 2013, following a water main break.

The Canadian Press/Graham Hughes

Insurance considerations

Homeowners insurance in Canada is available at several levels ranging from coverage that is quite basic to that which is fairly comprehensive.

Depending on the type of policy purchased (“Broad” or “Basic/Named perils” on the low end, to “Comprehensive” or “All perils” on the premium or deluxe end), homeowners insurance policies in Canada often provide coverage for a range of both weather- and non-weather-related perils. Damage from wind, lightning, hail, and winter storm is often covered. Damage from falling trees and water damage caused by such things as burst pipes, failed municipal watermains and malfunctioning appliances may also be covered. Much depends on the main policy and optional coverages purchased. Fire, whether urban structural or in the wildlands, is always covered regardless of the type of policy purchased (barring, of course, criminal arson by the policyholder).

Regardless of whether a homeowners insurance policy is basic or deluxe, coverage for sewer backup must be purchased separately and added to the policy via an endorsement (aka. a rider). It is key that homeowners understand the coverage they have (whether it is basic or deluxe) and whether they are protected for sewer backup as any home connected to a municipal drainage system is at risk of experiencing damage.

Some insurance policies in Canada (typically those provided by Quebec companies) include coverage for infiltration of groundwater in optional sewer backup insurance protection. Generally speaking, however, damage from seepage is usually not covered. Again, it is important that homeowners understand the coverage they have and whether they are protected for seepage of groundwater.

Since February 2015, many Canadian homeowner insurers have been offering coverage for overland flooding. This product must be added to policies (both basic and deluxe) as an endorsement, though some companies bundle coverage for sewer backup and overland flood together. Coverage for overland flood is widely available for low and medium risk properties in Canada. At writing, only one insurer offers

Type of flood	Basic insurance	Optional (endorsement)	All perils (i.e. deluxe)	Optional (endorsement)
Home plumbing/appliance failure	✓		✓	
Municipal watermain break	✓		✓	
Sewer backup		✓		✓
Seepage		✓ ¹		✓ ¹
Overland flow		✓ ²		✓ ²

1 Usually called ‘infiltration’ in Quebec, typical for Quebec-based insurers. Normally not covered elsewhere. Insured must purchase optional sewer backup coverage to be covered for infiltration (if offered by insurer). Also may be covered under optional overland flood insurance policies. Check with your insurance provider.

2 Relatively new in Canada (2015). Often must have sewer backup coverage in order to purchase overland flood coverage. Some companies bundle sewer backup and overland flood into a single endorsement. Widely available for low and medium-risk properties only. Check with your insurance provider.

protection for homes at high-risk of flooding. The Canadian insurance industry, through leadership provided by Insurance Bureau of Canada, is currently working with the Federal Government and others to come up with a flood insurance solution for homes at high risk in the country.

It is imperative that Canadian property owners understand that proximity to bodies of water (like rivers, creeks and streams) is only one cause of overland flooding. One of the major causes of overland flooding in Canada is from heavy rainfall (i.e. heavy rain occurring over a short timeframe). Over the last decade alone, heavy rainfall-related flooding has cost Canadian society billions of dollars in losses. Canadian property owners are best advised to consider purchasing overland flood insurance coverage, even if they do not reside near a body of water.

Overland flood insurance policies tend to offer coverage for “freshwater flooding” only, excluding flooding which occurs on ocean coasts, such as by storm surge, high tides and tsunamis. At writing, only one private insurer in Canada offers protection for salt water coastal flooding.

Differences between insurance companies can be significant enough that it is best to contact your insurance provider (i.e. broker, agent or direct insurer) to obtain information about flooding and water damage, and to determine which coverages you have and may need.

Glossary

All perils/All risks insurance: See Comprehensive insurance

Aquifer: An underground layer of permeable rock, rock fractures or loose materials (gravel, sand, or silt) that bear water. Groundwater can be extracted from aquifers via wells.

Coastal flooding: Submerging of low lying ocean or lake shorelines that are normally dry due to high water levels. Coastal flooding may occur due to high tides, high winds, seiches, storm surge or tsunami, singularly or in combination.

Comprehensive insurance: “Deluxe” insurance coverage for homeowners that covers a building and contents for all risks, except for those specifically excluded (such as earthquake or overland flooding). Unlike basic, named perils or no-frills policies, which only cover perils that are specifically listed in the policy.

Dam: A barrier, either engineered or natural, which prevents the flow of water or other loose materials, such as mud. An engineered structure built across a watercourse to intentionally impound water for various purposes (eg. flood control, electricity generation, industrial processes, recreation, collection of potable water etc).

Dike: A long wall or embankment erected to prevent flooding from large bodies of water (oceans, seas, lakes).

Endorsement: Also known as a ‘rider’, endorsements are contract language used to add, delete, exclude, or otherwise alter insurance coverage. Endorsements can be used to add optional coverages, like sewer backup or overland flood coverage, to a homeowners policy, for example.

Engineered drainage system: A human designed and constructed system used to route, collect/store and/or drain water, including stormwater, such as a concrete culvert, stormwater detention pond or storm sewer system. Opposite of a non-engineered system.

Engineered structure: In relation to water and flood management, a human designed and built feature like a dam, levee or dike.

Flash flood: The rapid inundation of normally dry low-lying areas, usually by heavy rainfall. Flash floods differ from regular floods in that they occur in fewer than six hours between rainfall and the start of flooding.

Flood insurance (residential): In Canada, an endorsement added to a homeowner insurance policy to provide protection for direct physical losses associated with the overland flow of water. Available in Canada only since February 2015.

Fluvial flooding: Also known as riverine or river flooding, inundation which occurs when levels in a river, creek or stream rise, allowing water to flow onto surrounding (normally dry) land. Fluvial flooding can be caused by a singular phenomenon (like an extreme rainfall event) or by several phenomenon occurring simultaneously (like heavy rainfall, snowmelt and ice jamming).

Foundation drain: Also known as weeping tiles, weepers, perimeter drains or footing drains, a series of tiles or a perforated pipe located along the bottom of a building's foundation that is used to collect and drain groundwater away from the building.

Freshet: Also known as the spring freshet, river flooding in northern portions of North America occurring from runoff of melting snow and ice, usually during the spring thaw. The length of freshet flooding depends on the depth of the snow pack and rates of warming, though it is common for freshet flooding to last several weeks.

Groundwater: Water located under the surface in soil pore spaces and in the fractures of rock formations. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the water table.

Groundwater flooding: Occurs when underground water deposits or the water table rises high enough to allow water to seep into the lower part of a structure through cracks in the foundation, cracks in pipes and other openings. Groundwater flooding can occur at both the individual structure and broader neighbourhood/community levels, where areas can be inundated by water rising through permeable ground and pooling.

Homeowners insurance: A type of property insurance that covers a private residence. Such insurance typically provides protection for structures and contents against a range of perils (both natural and technical in nature). It also protects the policyholder from certain liability issues and provides living expenses in the event of loss of use of the property.

Hydrostatic pressure: Refers to the pressure that any fluid in a confined space exerts. In relation to basement flooding, water collecting around a home's foundation or being forced through laterals, floor drains or weeping tiles, can cause basement floor slabs to heave and/or walls to leak and even collapse.

Ice jam: Sometimes called 'ice dams', the build up of floating ice debris causing the temporary blockage of river flows and subsequent flooding. Ice jams often occur around natural features, such as where rivers narrow or have sharp bends, or human-made features, such as bridges, causeways or railroad embankments.

Impervious surface: Usually artificial surfaces (like paved roads and large commercial roofs) which do not allow for the effective absorption or infiltration of rainwater runoff.

Jökulhlaups: See Natural dam

Levee: An embankment erected to prevent the overflow of a watercourse, such as a river.

Natural dam: See Dam

Non-engineered drainage system: A natural system that serves to route, collect/store and/or drain water, including stormwater, such as a natural dam, swale or embankment that may store or route water without human intervention. Opposite of an engineered drainage system.

Overland flow: Also known as surface runoff or runoff, the movement of water over land downslope toward a surface water body or other collection area (like a swale). Occurs when excess stormwater, meltwater or other water cannot rapidly infiltrate into the surface, usually due to soil saturation or impervious and/or frozen surfaces.

Overland flood insurance: See Flood insurance

Pluvial flooding: Inundation independent of an overflowing body of water caused by heavy rainfall. Related to overland flow (see definition above), pluvial flooding is greatly dependent on the amount and timing of precipitation, ground and soil conditions (i.e. whether the ground is dry or saturated, pervious or impervious, frozen or thawed etc) and the existence and state of natural and engineered drainage infrastructure.

Reservoir flooding: See Structural failure

Rider: See Endorsement

Riverine (river flood): See Fluvial flooding

Surface runoff: See Overland flow

Sanitary sewer: An underground sewer-pipe that is designed to convey only sanitary sewage.

Seepage: The entry of water into the lowest portion of a building (usually the basement) as a result of rising groundwater. Rising groundwater in soil causes hydrostatic pressure around a home's foundation, forcing water into any cracks in basement floors or foundation walls, as well as into other entry points, like cracks in pipes, through windows, underground utility entry points etc.

Seiche: Limited to enclosed bodies of water such as lakes or bays, a standing wave that oscillates as a result of seismic or atmospheric disturbances creating huge fluctuations of water levels in very short time frames. The standing waves slosh back and forth between shores of the water basin, like water in a bathtub. Most seiches on the Great Lakes result from atmospheric disturbances.

Sewer backup: Also known as sewage backflow, sewage that is forced back through storm and sanitary sewer laterals from sanitary, storm or combined sewers. Sewage typically enters lower levels of a home through plumbing fixtures, including floor drains, sewer cleanouts and basement toilets, sinks and showers. Failure of sewer laterals due to clogs by tree roots, coagulated cooking fat or other obstructions may also lead to sanitary sewage backflow.

Sewer backup insurance: Usually an extension (i.e. added by endorsement) to a regular home, tenant or condominium insurance policy which will pay for damages to your residence from the sewer system backing up or surcharging, normally into basements.

Sewer lateral: A pipe designed to convey sanitary sewage/waste water (i.e. "sanitary lateral") or stormwater (i.e. "storm lateral") from a private property to a respective public sewer system. Usually laterals are owned by and are the responsibility of the owner of the private property.

Spring freshet: See Freshet

Streamflow: The flow (i.e. velocity) of water in rivers, creeks, streams and other water courses. Can be affected by many factors including amount of runoff, temporary obstructions like ice jams, and presence of natural features, like river bends or places where water courses narrow.

Structural failure: The partial or total failure of engineered flood management structures, such as dams and levees.

Tsunami: A series of waves caused by the displacement of a large volume of water, generally in an ocean or a large lake. Submarine earthquakes and landslides, volcanic eruptions, glacier calvings and human-caused explosions above or below the water surface all have the potential to generate a tsunami.

Urban flooding: Inundation caused by overland flows (eg. stormwater runoff, riverine flooding) and infrastructure flooding (including sewer backup). Often exacerbated by impervious surfaces and the concentration of development.