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CAT TALES

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Institute for Catastrophic Loss Reduction

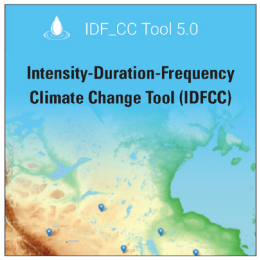
Building resilient communities

Inside this issue

ICLR Board of Directors

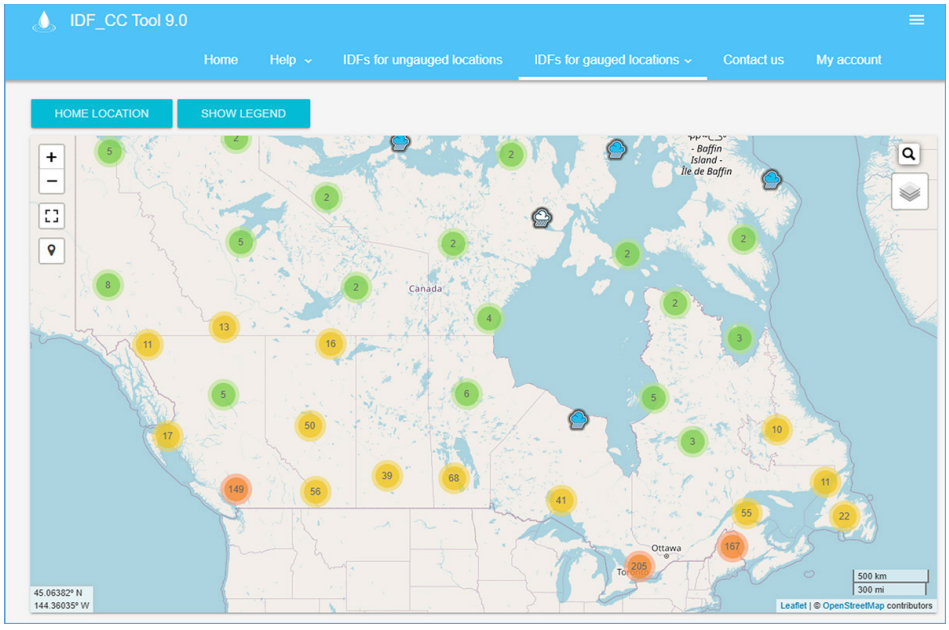
IRDR ICoE
Integrated Research on Disaster Risk International Centre of Excellence

Another important update for the IDF_CC tool



Originally launched in February 2015 with support from the Canadian Water Network and ongoing backing from the Institute for Catastrophic Loss Reduction (ICLR), the web-based Intensity-Duration-Frequency Climate Change (IDF_CC) tool was created to help professionals assess climate change impacts on extreme rainfall events. Surpassing initial expectations, the tool quickly built a broad user base across consulting engineering, government, and academia, celebrating over 8,500 active registered users.

Over the years, the tool has steadily expanded its capabilities, adding features such as support for ungauged sites, updated climate models (including CMIP6 scenarios) and expanded station datasets. Version 8 marked another major advancement by introducing temperature-based scaling via the Clausius-Clapeyron scaling method. >



Screenshot of the IDF_CC tool version 9.0 user interface

Following the trend of continuous improvement, the newly released Version 9.0 introduces critical enhancements to improve the accuracy and applicability of IDF information across Canada:

200-year return period

Added for both gauged and ungauged locations, extending the available design storm options beyond the standard 2, 5, 10, 20, 25, 50, and 100-year return periods.

Updated ECCC dataset

Integrates Environment and Climate Change Canada's (ECCC) IDF Version 3.4 dataset, updating precipitation data through 2024 alongside recent station name and ID revisions.

Recalibrated gridded data

Recalibrates the gridded dataset for ungauged locations using ERA5 reanalysis combined with the updated ECCC Version 3.4 data.

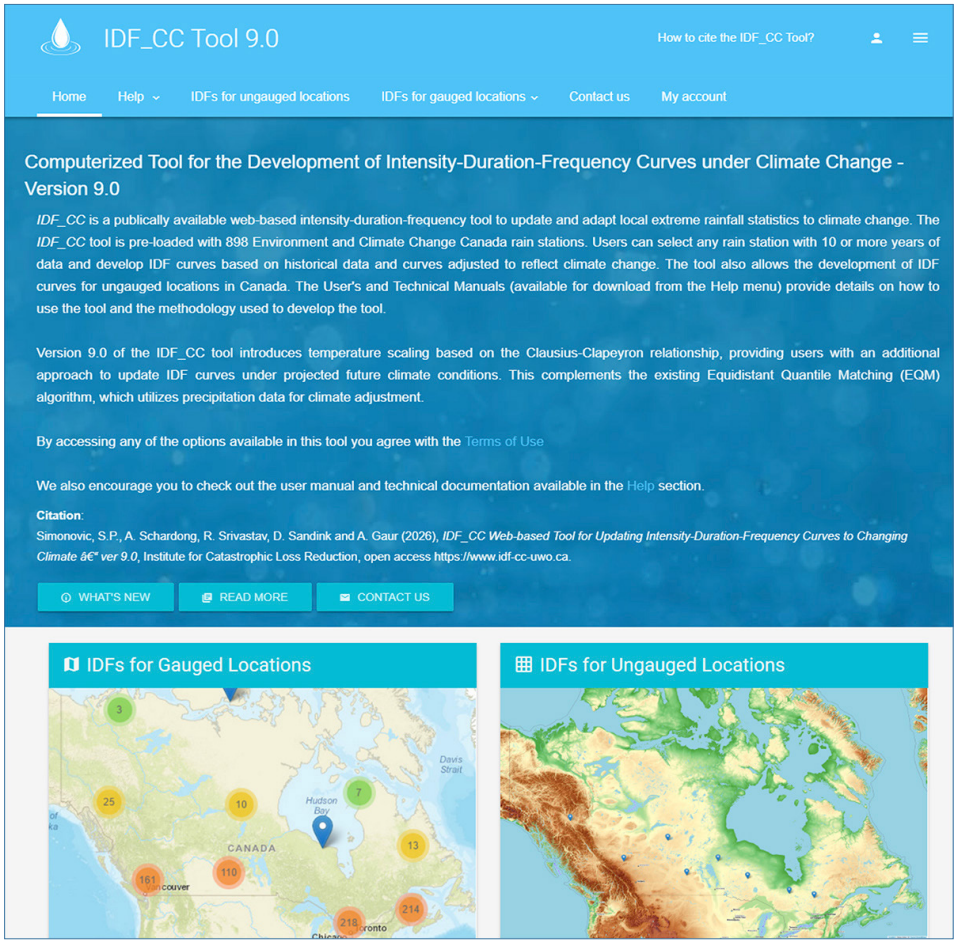
Dual scaling comparisons

Allows users to compare precipitation-based and temperature-based scaling approaches, both enhanced with the latest datasets.

With continued support from ICLR, the IDF_CC tool remains dedicated to providing state of the art and science climate resilience data for engineers, researchers, and decision-makers across Canada.

You can register for the IDF_CC tool for free at www.idf-cc-uwo.ca.

Main page screenshot



Why humans can’t outfight Canada’s boreal fires

Glenn McGillivray, Managing Director, Institute for Catastrophic Loss Reduction

When the wildfires get rolling, the armchair experts get trolling.

Every summer, as smoke from Canada’s boreal forest drifts across North American skies, a familiar chorus erupts online. Amateur fire commanders take to social media with seemingly obvious solutions: Why don’t we just send in more water bombers? Why not just doze a perimeter around the fire? Why isn’t the government building access roads into the woods?

When megafires rage across millions of hectares, it is tempting to view the problem as a failure of policy, preparation or resolve. But this perspective overlooks a fundamental reality: When high-intensity crown fires get going in Canada’s northern wilderness, the sheer physics of extreme fire behaviour renders standard human suppression tactics practically useless.

Understanding why these blazes are nearly impossible to extinguish is not a story of inadequate response. It is a sobering lesson in the unyielding forces of nature, the compounding effects of climate change and the physical limits of fire management.

To understand the wildfire challenge, one must first recognize that the boreal forest is not merely susceptible to fire. It is an ecosystem structurally designed to burn. Spanning over 550 million hectares across Canada – about half of it tree-covered – the boreal landscape is overwhelmingly dominated by conifers, which are needled, and not moist green leafy trees. Under hot, dry and windy conditions, these species essentially act as standing fuel. Ever throw an old Christmas tree into a bonfire?

Far from being a tragedy for the landscape, fire is a vital evolutionary partner. Species like the lodgepole pine are explicitly adapted to fire. Their resin-sealed cones require intense heat to open, release seeds and regenerate the forest. The boreal forest does not just endure fire, it was created by it and relies on it.

Much of the public’s frustration stems from a misunderstanding of how wildland firefighting actually works. Hollywood has popularized the image of the super-scooper dropping thousands of gallons of water directly onto a roaring inferno, instantly saving the day.

In reality, air tankers do not extinguish massive wildfires. Water and red-dyed suppressant drops are used primarily to cool down the blaze, while chemical retardants are laid ahead of a fire’s path to slow its progression and buy time. The actual work of putting out a fire falls to ground crews digging lines and extinguishing hot spots.

In the vast Canadian north, however, ground crews face an insurmountable barrier: access. As a general rule remote wildfires are usually triggered by lightning strikes, while human activity drives many of the fires that are closer to where people live, work and play. Nationally, the breakdown is about an even 50/50.

To construct a massive network of roads and bridges across thousands of miles of boggy wetlands and steep terrain to reach every remote lightning strike would be both financially and logistically astronomical, as well as ecologically absurd.

Even if every fire were accessible, the sheer volume of concurrent blazes creates a crisis of triage. On any given day during a severe season, hundreds of active wildfires burn simultaneously across the country (more than 900 are burning today). >

Managing a challenge of this magnitude quickly exhausts a finite supply of specialized personnel, heavy equipment and aircraft. Transporting crews, gear and fuel into the roadless wilderness creates severe logistical bottlenecks. Furthermore, because climate change is lengthening fire seasons worldwide, neighbouring provinces and international partners are increasingly tied up with their own emergencies, limiting the availability of mutual aid.

When resources are stretched thin, fire management agencies must make tough tactical decisions. They practice strategic triage, directing firefighters and aircraft to protect high-value targets, specifically human lives, critical infrastructure and communities along the wildland-urban interface, while often leaving remote fires to burn unmanaged until weather patterns shift.

Proactive measures like prescribed burns, cultural burning by Indigenous peoples and mechanical fuel clearing are invaluable tools around vulnerable communities. But scaling these interventions across hundreds of millions of hectares to prevent megafires presents insurmountable regulatory, financial and operational hurdles.

The battle against massive boreal crown fires cannot be won through brute force.

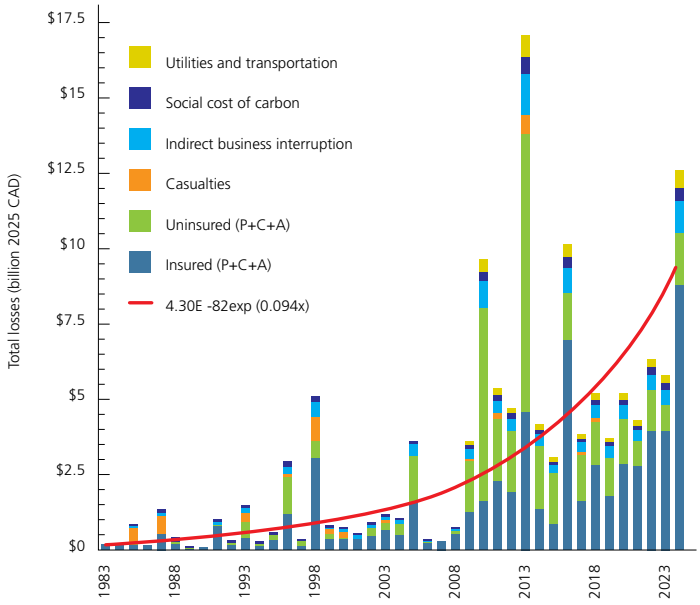
Recognizing the limits of human intervention is not an admission of defeat; it is a prerequisite for sensible policy. Rather than demanding that crews conquer nature's most violent blazes, we must focus our resources strategically where they matter most, safeguarding human lives and communities while allowing the boreal forest to carry out its ancient, necessary cycles.

This essay originally appeared in The Globe and Mail*, July 25, 2026*

ICLR launches interactive Canadian cat loss history app

ICLR tries to persuade people to reduce catastrophe losses by improving new and existing buildings. Our new catastrophe loss history of Canada explains the urgency of those improvements. The chart shows that Canada currently loses an average of $10 billion per year to natural disasters. That's 3% of the country's construction spending. That is, every year, climate disasters wipe out the equivalent of 3% of 52 weeks of construction spending. That's 2 weeks of construction spending. More alarmingly, losses increase about 9.4% per year. That means they double every 8 years. That's 9 times faster than the population is growing, and 5 times faster than the economy is growing. Construction spending, meanwhile, is flat. That should worry Canadians. It means that in 2034, climate disasters will wipe out the equivalent of 4 weeks of construction. In 2042, 8 weeks. In 2050, 16 weeks. Repairing damage from natural hazards will absorb a growing fraction of construction spending, further aggravating Canada's housing crisis. You can examine the loss-history data via ICLR's online app at https://www.iclrcathistory.ca. For data sources and methodology, see the report here.

Total estimated societal losses from catastrophic natural disasters, 1983 to 2024

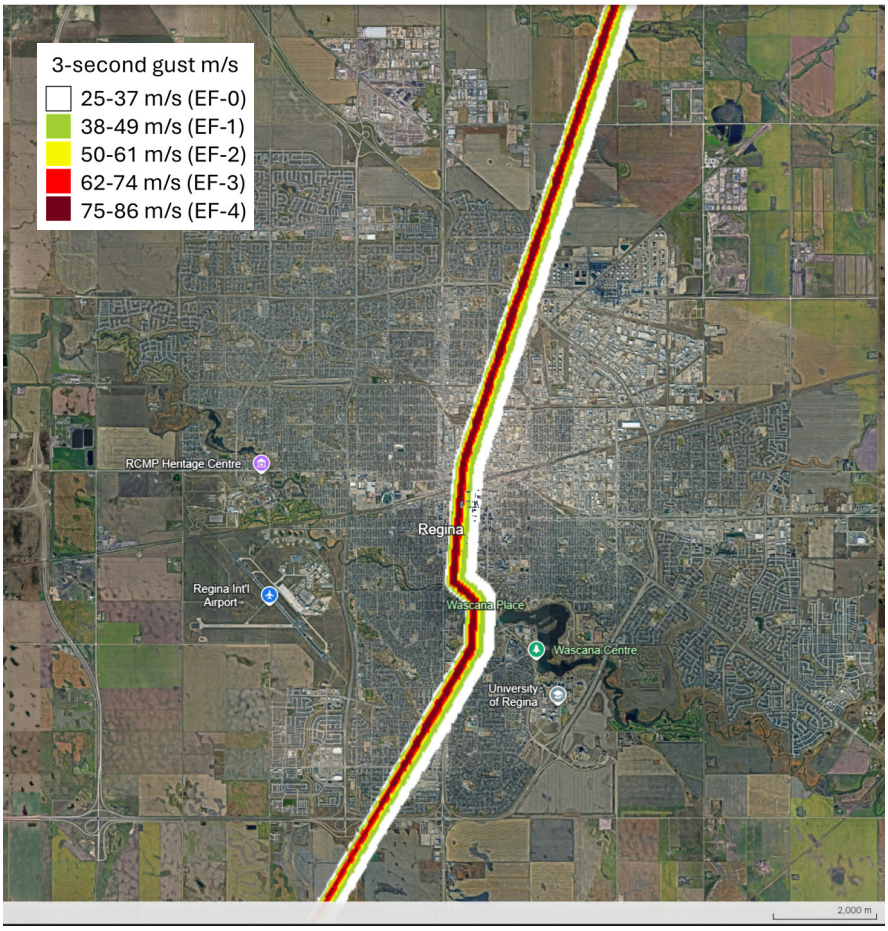


ICLR partners with Regina to plan for next-generation storm scenarios

ICLR is helping Regina and Saskatchewan to create a disaster planning scenario for a hypothetical but realistic severe convective storm. The scenario will help the people of Regina become more resilient to severe weather. The scenario resembles a storm that struck Regina around 5:00 pm on Sunday, June 30, 1912. The 1912 storm produced a tornado with an estimated Enhanced Fujita scale rating of EF-4. It also produced severe rain, over 25 mm in 30 minutes, and hail.

The scenario will help Regina think through what would happen if a similar storm were to strike again. Like other disaster planning scenarios, this one depicts, in granular detail, three aspects of the storm:

1. The weather: The wind, rain, and hail. Figure 1 shows part of an EF-4 hypothetical tornado where it passes through Regina. ICLR is creating analogous maps of rain and hail.
2. The engineering impacts: How the wind, rain, and hail affect buildings, utilities, transportation infrastructure, and other aspects of the built environment.
3. The social and economic consequences: How items 1 and 2 affect people and the economy.
4. Options to reduce the harms: Pre-storm physical modification to the infrastructure such as better new buildings. And response and recovery plans to speed re-occupancy and build back better.



The scenario will tell one story, depicting a single plausible outcome, rather than a probabilistic mix or branching possibilities. The actual future disaster will certainly differ from the hypothetical scenario. But if Regina plans well for a realistic hypothetical disaster, it will fare better in the real one.

As part of the overall scenario, ICLR has published a report titled *Regina tornado scenario track and wind speed map*, which is available here.

“ This scenario will help Regina think through what would happen if a similar storm were to strike again.”

ICLR: Canada urgently needs a corps of volunteer post-earthquake building safety evaluators

Following a major earthquake in British Columbia or Quebec, people will focus on emergency response and safety. However, a secondary crisis lurks in the days and weeks that follow – one measured in empty homes, closed businesses and billions of dollars in preventable losses.

The true cost of delay

Officials project that a major earthquake in BC could damage up to 180,000 buildings. The critical catch? Despite cosmetic damage, most of these buildings will actually be safe to re-enter and occupy. They will not have suffered a significant reduction in their structural strength, stiffness, or stability. But few people can distinguish between cosmetic and structural damage. It takes a building professional to diagnose significant structural or geotechnical impairment and distinguish it from cosmetic harm. Until professionals can perform that diagnosis, residents and business owners must await official clearance before going back inside safe buildings. Or they might re-occupy unsafe buildings if nobody tells them otherwise, or if non-professionals misdiagnose the damage.

Under Canada's current resource levels, conducting these necessary post-disaster evaluations across the province could take 6 to 12 months.

That prolonged waiting period doesn't merely inconvenience owners and occupants; it endangers their safety and carries a staggering economic price tag. Protracted evacuations could generate $10 billion or more in avoidable living expenses, direct business interruption losses, and broader economic consequences. Every week a safe store stays locked or a family remains in temporary housing adds to the compounding financial impact.

CURRENT TIMELINE →	TARGET TIMELINE
[6 to 12 months assessment]	[Completed in a few weeks]
• Up to $10B+ in avoidable loss • Prolonged displacement or unwitting safety risk	• Dramatically reduced losses • Faster community recovery

Learning from global models

We can avoid the bottleneck and safety risk. Nations around the world faced with similar seismic threats have established large, organized corps of volunteer safety assessors:

Targeted training: Like other countries, Canada has tens of thousands of qualified civil engineers, architects, building inspectors and related professionals. Volunteers would complete a standardized 5-hour training course.

Rapid deployment: Once trained, these experts register to be deployed as volunteer safety assessors when disaster strikes. Governments or others maintain the registry.

Massive capacity: With trained volunteers, other countries can evaluate tens of thousands of properties in a fraction of the time.

A turnkey solution for Canada

Despite substantial, localized efforts by individual emergency managers in British Columbia, Canada as a whole has yet to set up a comprehensive, national volunteer safety assessment framework.

The capacity already exists within our borders. Canada boasts a pool of at least 50,000 qualified professionals along with established professional societies, many of whom are eager to volunteer their skills when their communities need them most.

The Institute for Catastrophic Loss Reduction (ICLR) is actively working to bridge this gap. We are building a broad coalition among industry leaders, professional associations and government agencies. We aim to construct and maintain a robust safety assessment program. Such a program will reduce post-earthquake evaluation timelines from months down to just a few weeks.

Paying for past sins: Bygone drainage practices are costing everyone dearly

Glenn McGillivray, Managing Director, Institute for Catastrophic Loss Reduction

Where 2023 was the year of the wildfire, it looks as though 2026 will go down as the year of the basement flood.

Heavy rains across the country have hit several centres, including Edmonton, Calgary, Regina, Swift Current, Winnipeg, Brandon, Dauphin, Windsor, London and Montreal to name but a few. Insured damages will be in the hundreds of millions, total damages a lot more.

CatIQ has declared nine cats so far this year and eight either have "flood" in their title or in the list of perils contributing to the loss.

In many cases, these rains have found their way into basements of homes, either via overland routes, seepage or – in many cases – through floor drains in the form of sewer backup.

One of the main causes of the later, according to ICLR research, is excessive extraneous rainwater making its way into combined or separated sanitary sewer systems, something these systems are not designed to handle. Once full, they surcharge, sending wastewater back up sewer laterals and into basements.

The issue of "I&I" (inflow and infiltration, where groundwater and stormwater enters sewer systems through such conduits as cracks, poor pipe connections, pickaxe holes in manhole covers as well as through direct purposeful connections) can be technically complex.

Here, I wanted to get into the I&I issue without getting too deep into the technical details. Rather, I want to simply illustrate how rainwater often gets into combined and sanitary systems on a practical level, and what might be done about it.

I mentioned "purposeful connections" above. Rainwater doesn't just get into drainage systems due to cracks in pipes and poor pipe connections. It also gets in because it was allowed in.

Two of the biggest issues here are with combined sewers, and with weeping tiles of homes being connected into combined or separated sanitary (not storm) sewer systems, a once common practice ended gradually between the mid-1950s and the 1970s.

There are many places in Canada where combined sewer systems are still in place (mostly in older parts of older cities). Then there is the island of Montreal, with 60% or more of the sewer network being combined.

This means that sanitary sewage and greywater leaving homes and businesses is collected along with municipal stormwater and snowmelt runoff all in a single pipe. These systems can be tenuous at the best of times, but when hit with extreme rainfall (i.e. a lot of rain in a short time, like the recent 175mm in about 90 minutes in Pierrefonds on the west island of Montreal) they can easily be overwhelmed, with sewage-laden water surcharging into basements.

Along with the sewer surcharge/basement flood issue, these systems often mean that raw or only lightly treated water is allowed into public water courses during storms because municipal water treatment plants can't handle the load (aka combined sewer overflows or CSOs). It also means that ratepayers are often paying to have relatively clean rainwater be processed through water treatment plants.

It's a very costly problem all around.

So what are some ways that municipalities and homeowners can work together to limit the amount of rainwater entering combined or separated sanitary systems?

- Local governments need to invest into separated systems where currently there are combined or semi-combined systems. Doing so not only helps prevent surcharge events but also has direct ecological and financial benefits.

- Local governments that currently do not have basement flood prevention incentive programs should join the 42 that do, to help homeowners pay for foundation drain disconnection and the installation of sump systems, backwater valves and other measures. Barring the creation of an incentive program, homeowners should take it upon themselves to get these measures installed.
- Either as part of the above or, if need be, separate from it, local governments should design programs to assist homeowners to disconnect foundation drains from combined or sanitary systems, like London, ON did here.
- Local governments should consider installation of rainwater storage systems, like stormwater retention/ detention ponds, "big pipe" solutions, and underground storage tanks. All allow for the temporary storage of rainwater, "buying time" to allow existing systems to "catch up" during heavy rainfall events.
- Local governments should either incentivize or require via bylaw downspout disconnection where it is feasible (i.e. where doing so doesn't cause water problems for neighbours or slip and fall hazards on sidewalks in cold weather). Homeowners should take it upon themselves to disconnect downspouts from foundation drains and run rainwater at least six feet away from their foundation onto grass or into flower beds etc. This is one of the least expensive and easiest measures a homeowner can take to reduce risk.
- Homeowners should be educated about not using large amounts of water during extreme rainfall events, especially when the home is connected to a combined system or where a home's foundation drains are connected to the combined or sanitary. This means no baths, showers, toilet flushing, or running of dishwashers or washing machines during heavy rainfall events.
- Though usually not specifically intended for flood control, the use of Low Impact Development (LID), rain barrels and green roofs can helping manage rain where it falls, limiting it from entering municipal systems.
- Also not specially germane to the issue of rainwater entering municipal systems, local governments could consider barring the inclusion of reverse slope driveways in new home design, including in in-fill development. Both Toronto and Richmond Hill are examples of local governments that have done so.

Our past is catching up with us. Bygone drainage practices were built for a different era, but today's extreme weather demands a modern response. Whether it's a city investing in separated sewers or a homeowner disconnecting a downspout, every action counts.

We can't stop the rain, but by working together to fix these legacy connections, we can reduce the risk of costly backups.

" In many cases, ... rains have found their way into basements of homes, either via overland routes, seepage or – in many cases – through floor drains in the form of sewer backup."

Institute for Catastrophic Loss Reduction

Mission

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.

150 York Street
Suite 600
Toronto, Ontario, Canada
M5H 3S5
T 416-364-8677
www.iclr.org

Western University
Amit Chakma Building, Suite 4405
1151 Richmond Street
London, Ontario, Canada
N6A 5B9
T 519-661-3234
www.iclr.org