

# CATtales

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## ICLR releases new book 'Cities adapt to extreme rainfall: Celebrating local leadership'

Local governments are confronting one of the most important issues of our time – the alarming recent increase in damage to homes from extreme rainfall. Communities large and small across Canada are now taking action to reduce the risk of basement flooding and damage to property from sewer backup. *'Cities adapt to extreme rainfall: Celebrating local leadership'* describes 20 of the many successful local projects underway or already completed in communities that are adapting to better address the risks associated with extreme rainfall.

Mini case studies showcase successful local actions that can and should be used by communities across the country to confront the dual challenge of waste and stormwater management.

The local policy decisions presented are, in ICLR's opinion, scientifically sound, and provide a sustainable foundation for long-term success.

In recent years, severe rainfall has replaced fire to become the leading cause of damage to

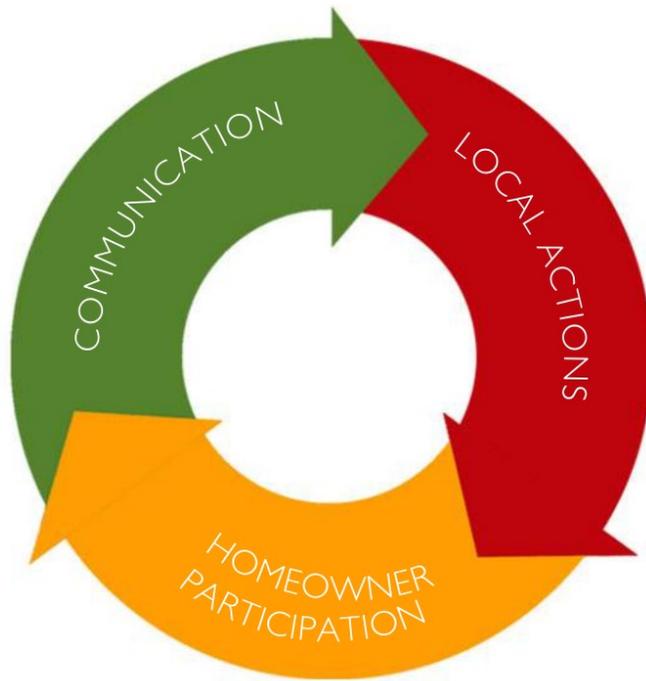
Canadian homes. Damage to homes from sewer backup and basement flooding now exceeds \$2 billion a year, and has been rising at an unsustainable rate for more than 25 years. Moreover, it is inevitable that the frequency and severity of extreme rainfall events will escalate as a result of climate change, threatening to further increase the damage to homes unless we adapt.

"Much of the damage to homes is preventable if local governments and homeowners apply existing knowledge to the design and maintenance of buildings and infrastructure," says Paul Kovacs, Executive Director of the Institute for Catastrophic Loss Reduction and the book's lead author. "Fortunately, local ►

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governments, property owners and other stakeholders are starting to take action. Over the next few decades, it is expected that Canadians will experience more frequent and intense rainstorms. Nevertheless, if we adapt, it is possible that we could also experience reduced stormwater damage to homes.”

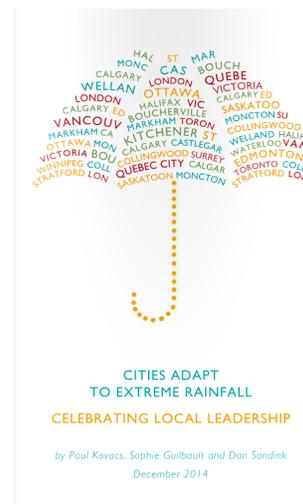
In ‘Cities adapt’, ICLR documents some of the ways local governments seek to influence private behaviour. For example, Ottawa, Ontario regulates the construction of new homes to ensure that builders install backwater valves. Kitchener and Waterloo, Ontario have stormwater fees based on usage. London, Ontario provides incentives for at-risk homeowners to disconnect weeping tiles from the municipal sewer system. Halifax, Nova Scotia provides public information about the options available to interested stakeholders.

ICLR has observed that the trigger for action by most

governments across Canada involves responding to damage from an extreme rainfall event. However some communities have been proactive, seeking to take early action before large losses strike. For example, Collingwood, Ontario has mandated the installation of backwater valves in new homes and Surrey, B.C. requires the replacement of storm laterals when substantial renovations to a home are planned.

“Considerable effort is required to regain control over the risk of damage to homes from extreme rainfall. Nevertheless the direction we must follow is becoming clear,” maintains Kovacs. “All stakeholders are encouraged to share the 20 stories in ‘Cities adapt’ and other stories of successful efforts by local governments, celebrating the actions of progressive communities that have begun to show the way forward.”

The 20 cities profiled include:



‘Cities adapt to extreme rainfall: Celebrating local leadership’ can be downloaded for free in its entirety or by chapter at [www.iclr.org](http://www.iclr.org)

## IDFCC Tool rollout

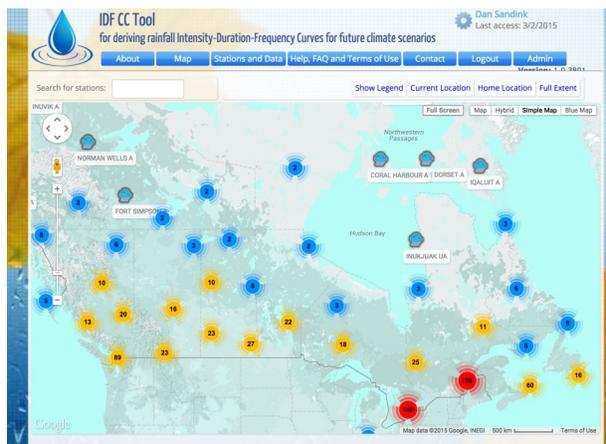
### A free, publicly accessible online tool for the development of IDF curves under climate change in Canada

A research team from Western University and ICLR recently announced the finalization and release of the IDFCC Tool, developed with the support of the Canadian Water Network. The tool is a publicly accessible, on-line utility that allows water management professionals and other interested stakeholders to develop and incorporate climate change impacts into local rainfall Intensity-Duration-Frequency (IDF) curves across Canada.

Municipal water management in Canada is heavily dependent on the use of Intensity-Duration-Frequency (IDF) curves in planning, design and operation of municipal water infrastructure. Many watershed management activities also rely on the use of IDF curves, including those related to water supply, water quality management and flood control. This project focused on updating IDF curves under a changing climate and developing an accessible, web-based tool available to anyone interested in developing IDF curves that incorporate projected climate

change impacts.

While there is a need in almost every Canadian municipality to adapt to changing climatic conditions, there is a lack of necessary expertise within municipalities for implementing current research related to the impact of climatic change on IDF curves. Thus, one of the primary aims of this project was to standardize the IDF update process and make the results of current research on climate change impacts on IDF curves accessible to everyone. The developers and supporting agencies believe that a freely available, computerized IDF update tool will aid in the selection of effective climate change adaptation options at the local level, advancing the decision making capabilities of municipalities, watershed



Sample of map pane with locations of Environment Canada rain stations. Users can also create their own stations and enter their own rain data.

The web-based IDF tool integrates a user interface with a Geographic Information System (GIS). By creating or selecting a station the user will be able to carry out statistical analysis on historical data, as well as generate and verify possible future change based on a methodology using a combination of global climate modeling outputs and locally observed weather data.

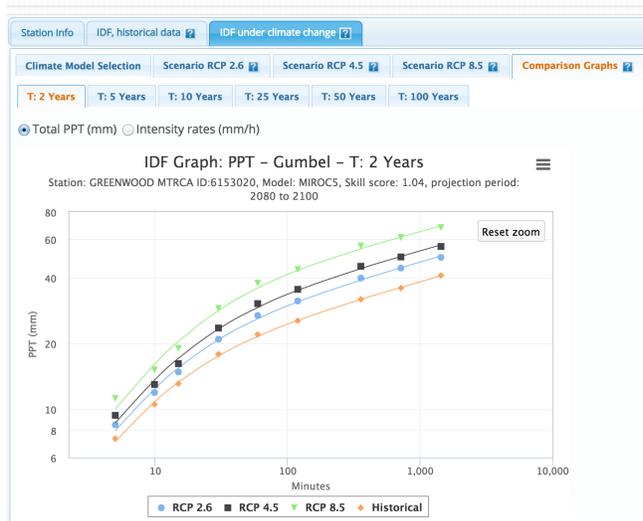
The project development team consists of:

- Slobodan Simonovic, Western University
- Roshan Srivastav, Western University
- Andre Shardong, Western University
- Dan Sandink, ICLR

The tool can be accessed at <http://www.idf-cc-uwo.ca/>

For inquiries about the tool please contact Prof. S.P. Simonovic at [simonovic@uwo.ca](mailto:simonovic@uwo.ca) CT

IDF for: GREENWOOD MTRCA ID:6153020



Sample output from one rain station with historical IDF (orange line) and three future climate scenarios using one of 22 available climate models. Users also have the option of ensemble modelling.

management authorities and other key stakeholders. The tool will also provide a direct link between Canadian municipalities and the research community, creating opportunities for further research and innovation.

# U.S. establishes new federal flood risk management standard to account for climate risks

By Joanna Kyriazis  
Zizzo Allan DeMarco LLP

On January 30, 2015, U.S. President Obama issued an executive order requiring all federally-funded construction projects to adopt more stringent siting and building standards to account for increased flooding risks linked to climate change.<sup>1</sup> The policy is aimed to “improve the resilience of communities and [protect] Federal assets against the impacts of flooding.”<sup>2</sup>

Most agencies currently rely on historical flood data rather than future projections when creating building plans.<sup>3</sup> However, builders must now meet a new standard, which can be achieved by satisfying one of three requirements:

(1) base plans on data and methods informed by the best available, actionable climate science

(2) build two feet above the projected 100-year flood elevation for most projects and three feet above that level for critical buildings (e.g. hospitals, evacuation centres), or

(3) build to projected elevation for 1-in-500 year floods

These more stringent standards could make large areas of low-lying land ineligible for construction by federal agencies or with federal funds.<sup>4</sup>

The President’s executive order was issued two days after the release of a major U.S. Army Corps of Engineers report on coastal storm and flood risk along the North Atlantic coast.<sup>5</sup>

The study explicitly considered the “increased frequency and intensity of storm events and rising sea levels due to a changing climate” and found that “flood risk is increasing for coastal populations and

supporting infrastructure” along the North Atlantic coast.<sup>6</sup> Notably, the report also concluded that “[pre-disaster planning and mitigation can save communities approximately 75 percent of poststorm costs.”<sup>7</sup>

## Notes

[1] The White House, Press Release, “Executive Order – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input” (30 January 2015), online: White House Office of the Press Secretary < [http://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and->](http://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and-).

[2] Ibid.

[3] Coral Davenport, “Federal Construction Projects Must Plan for Flood Risks From Climate Change,” *New York Times* (30 January 2015), online: <<http://www.nytimes.com/2015/01/31/us/federal-construction-projects-must-plan-for-flood-risks-from-climate-change.html?smid=tw-share&r=0>> [New York Times];

Juliet Eliperin, “In major shift, Obama administration will plan for rising seas in all federal projects,” *Washington Post* (30 January 2015), online: <<http://www.washingtonpost.com/news/energy-environment/wp/2015/01/30/in-major-shift-obama-administration-will-plan-for-rising-seas-in-all-federal-projects/>>.

[4] *Supra*, note 2, *New York Times*.

[5] North Atlantic Division, News Release, “U.S. Army Corps of

Engineers releases report on coastal storm and flood risk in the North Atlantic region of the United States,” (28 January 2015), online: U.S. Army Corps of Engineers <<http://www.nad.usace.army.mil/Media/NewsReleases/tabid/4870/Article/562190/us-army-corps-of-engineers-releases-report-on-coastal-storm-and-flood-risk-in-t.aspx>>.

[6] U.S. Army Corps of Engineers, North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (January 2015), online: U.S. Army Corps of Engineers < [http://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS\\_main\\_report.pdf](http://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS_main_report.pdf)> at iii.

[7] *Ibid.* **CT**

Joanna Kyriazis is an associate at Zizzo Allan DeMarco LLP. Focusing on environmental and climate change law and policy, she combines strategic advocacy skills with a strong background in science to identify risks and create solutions for clients. Prior to joining Zizzo Allan DeMarco, Joanna practiced at a premier law firm in New York, where she gained experience handling complex litigation and regulatory matters engaging issues in securities, contract and tort law, as well as corporate governance. There, she also served on the Young Professionals Council of Green City Force and received a Legal Services NYC Recognition Award for her dedication to pro bono work. Joanna obtained her JD at the University of Toronto, where she competed in the Willms & Shier Environmental Moot Competition and received the Barry Nelson Spiegel Award for Best Appellant Factum. She was also an Associate Editor for the Environmental Law division of the U of T Faculty of Law Review. Joanna graduated magna cum laude from Cornell University with a B.S.c. in Natural Resources.



## Best practices guide

### Management of inflow and infiltration (I&I) in new urban developments

This study by Dr. Ted Kesik, Professor, John H. Daniels School of Architecture, University of Toronto, attempts to provide a best practices guide for the management of inflow and infiltration (I&I) in new urban developments. It is intended to serve as a knowledge map of sorts connecting relevant and authoritative sources of information. While the focus of the study is the Greater Golden Horseshoe in Ontario, the findings are extensible to other regions of Canada and particularly relevant to areas experiencing rapid continued growth.

A premise of this study is that I&I in sanitary sewer systems is a barometer of the care and diligence exercised by public works organizations, and a direct reflection of the corporate culture of a municipal and/or regional government. After having put men on the moon and safely bringing them back almost half a century ago, it is not unreasonable to expect fully engineered municipal infrastructure to consistently achieve high performance.

However, it is important to appreciate high performance infrastructure comes at a cost

that comprises the initial expenditure and the ongoing operational and maintenance costs over the life cycle of the infrastructure asset.

Willingness to pay combined with political will are viewed as among the most significant obstacles to delivering sustainable infrastructure to Canadians.

Research conducted by way of literature review and interviews with experts indicates virtually all of the prerequisite knowledge and expertise needed to effectively manage I&I in sanitary sewer systems exists today. However, it is widely dispersed among numerous organizations and has yet to be integrated and consolidated. Without a consistent knowledge base that is readily accessible, not only does each municipality have to develop its own standards, guidelines and protocols, but it is also difficult to effectively conduct training and education of design professionals, asset managers and skilled trades.

It is time for municipal infrastructure to evolve from a collection of local prescriptive measures to an integrated system of performance-based

technologies.

Some jurisdictions have embraced this challenge and are demonstrating considerable success in achieving performance objectives. **CT**



**Best practices guide:**  
Management of inflow and infiltration in new urban developments

By Ted Kesik  
February 2015



Best practices Guide: Management of inflow and infiltration (I&I) in new urban developments' can be downloaded for free at [www.iclr.org](http://www.iclr.org)

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**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.

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