

# SANDFORD FLEMING FORUM

---

## Flood Risk



UNIVERSITY OF TORONTO  
FACULTY OF APPLIED SCIENCE & ENGINEERING

# WEATHER GONE WILD: HOW CANADA IS ADAPTING TO CLIMATE CHANGE



Prepared by:  
**Daniel Filippi**  
Intact Centre on Climate  
Adaptation  
[Daniel.filippi@uwaterloo.ca](mailto:Daniel.filippi@uwaterloo.ca)

**May 9, 2019**



**INTACT CENTRE**  
ON CLIMATE ADAPTATION

*Generously supported by*



## **1. Climate Change: A Problem That Won't Go Away**

- Rising costs of extreme weather and flooding
- Record floods increase risk of mortgage arrears
- Mental stress and time off work claims

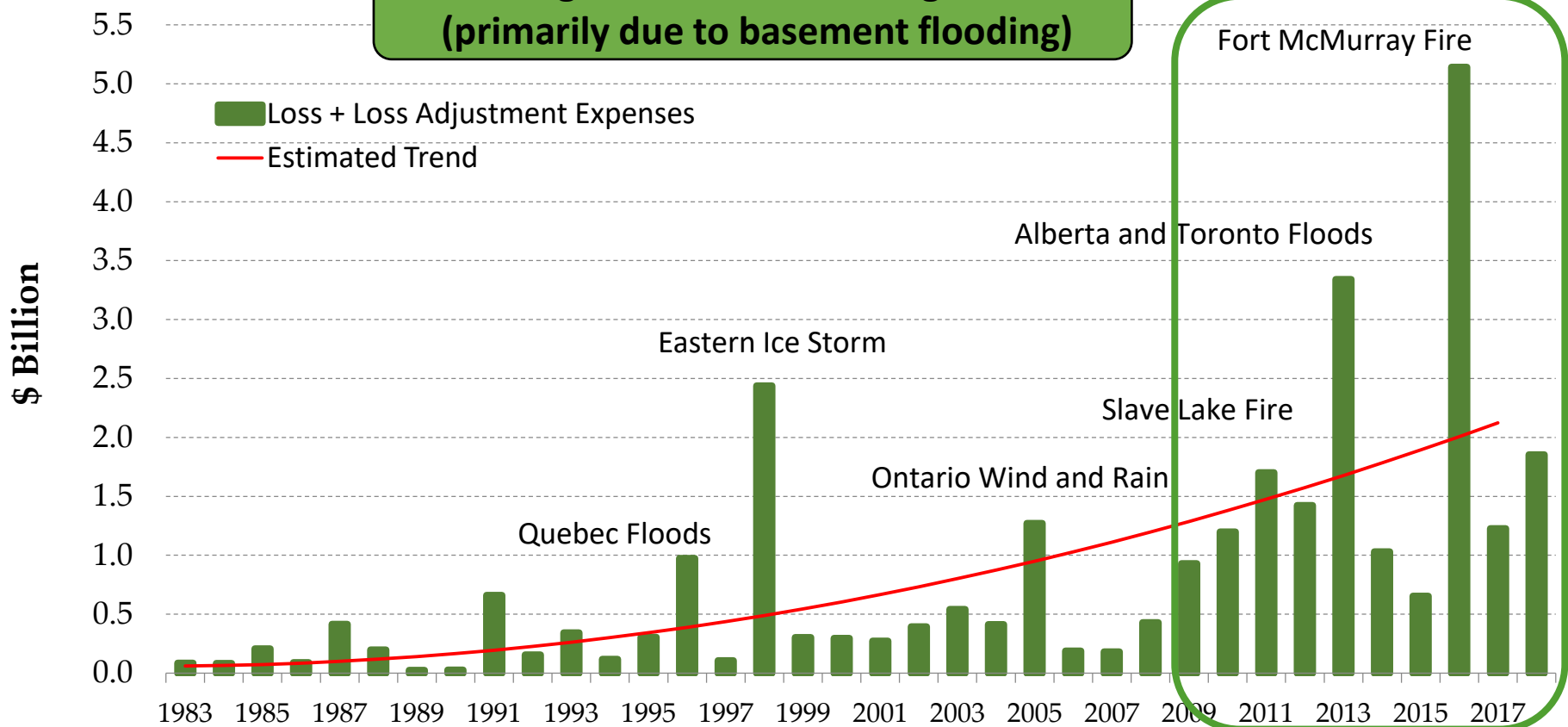
## **2. Adaptation Examples: Guidelines, Standards and Professional Training on Flood-Resilience:**

- Homes
- New Communities
- Existing Communities
- Commercial Real Estate

## **3. Questions**

# COSTS OF EXTREME WEATHER: P&C CATASTROPHIC INSURABLE LOSSES

**Growing Uninsurable Housing Market  
(primarily due to basement flooding)**



Loss + Loss Adjustment Expenses  
 \$2017 - total natural-catastrophe losses normalized by inflation and per-capita wealth accumulation  
 Courtesy: Insurance Bureau of Canada

**Note:** Cost to government and homeowners 3-4X that of private insurers.

# KEY TAKEAWAY: LOSSES ARE ON THE RISE

- Annual average catastrophic insurable losses due to extreme weather
  - from **1983-2008**: \$405 million/yr
  - from **2009-2018**: \$1.8 billion/yr
- Over 50% of costs are attributed to flooding
- Losses to governments and homeowners are 3-4x these costs
- Average cost for homeowners to repair damage caused by basement flooding in Canada is \$43,000 (IBC, 2018)
- With repeated losses this increases the likelihood of an uninsurable housing market



# MAJOR CONTRIBUTING FACTORS OF INCREASED FLOOD RISKS

1. Increased frequency and severity of extreme weather events linked in part to climate change
2. Aging municipal infrastructure
3. Lack of preventive maintenance at the lot level
4. Increased number of finished basement spaces in Canada
5. Loss of Natural Infrastructure

# REPEATED FLOODING ELEVATES RISK OF MORTGAGE ARREARS

7

 Global News

**No timeline for when evacuees can return home in Sainte-Marthe-sur-le-Lac after dike failure**

4 hours ago





**5 things to know for Monday, April 29, 2019**

10 hours ago



 Castanet.net

**Military helps battle flooding - Canada News**

Yesterday



**D** DAWN.com

**10,000 evacuated in Canada floods as rescuers search for pets**

1 hour ago • International



 Global News

**How Canadians can assist flooding victims in Ontario, Quebec and N.B.**

Yesterday



 Castanet.net

**No respite from flood threat - Canada News**

7 hours ago



 Fox News

**Eastern Canada battles flooding after days of rain**

Yesterday • International

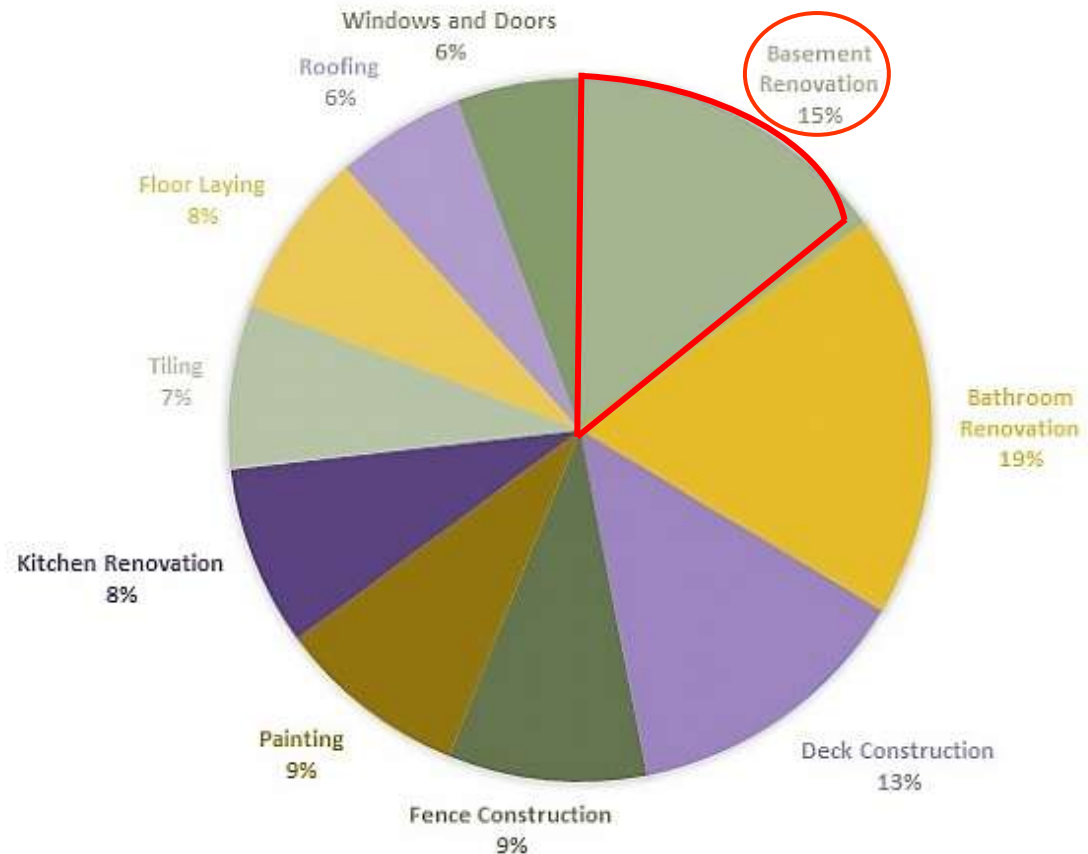


The average cost of a flooded basement is over **\$40,000**



# WHAT'S AT RISK – INC. AMOUNT OF FINISHED BASEMENTS IN CANADA

- Altus Group Ltd. reported that renovation spending in Canada was **\$71.2 Billion dollars** in 2016
- Of this total amount basement renovations made up 15% of renovation projects in Canada (or \$10.7 Billion)



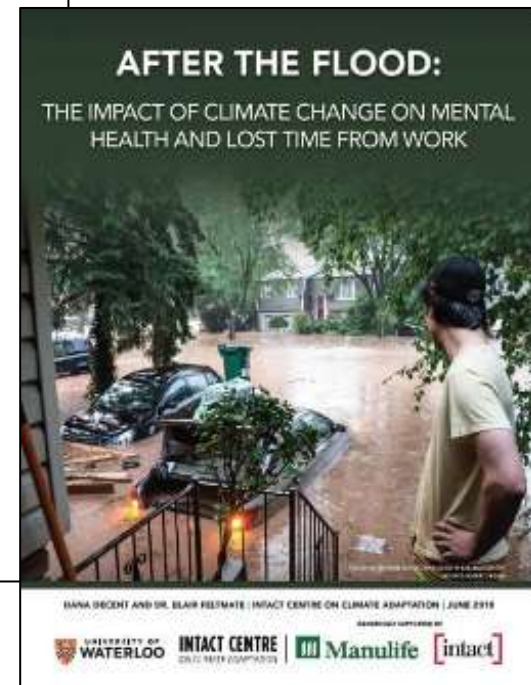
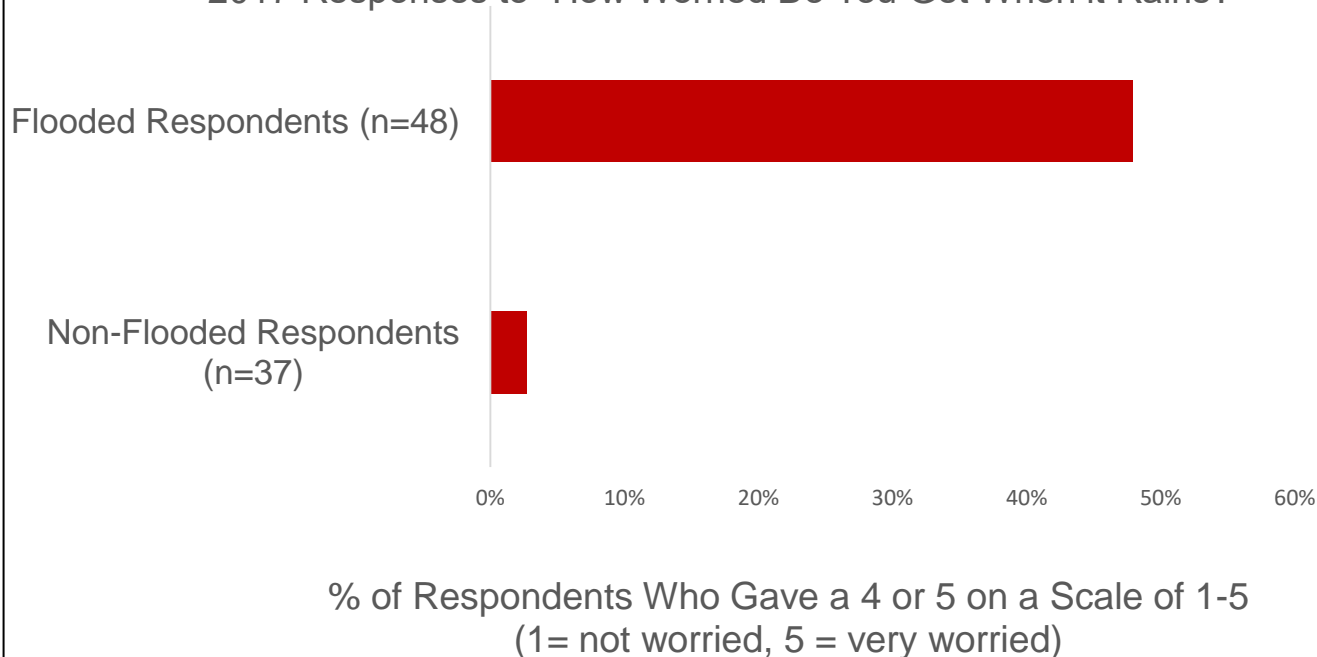
SOURCE: Silver, N., n.d.

SOURCE: Silver, N., n.d.



# MENTAL HEALTH IMPACTS OF FLOODING

3 Years After – August 2014 Burlington Flood  
2017 Responses to “How Worried Do You Get When it Rains?”



56% of flooded households had at least one working member taking time off work. **7 days off work** was the average time off work per flooded household (10x the Ontario average).

# NEW GUIDELINES AND STANDARDS FOR FLOOD-RESILIENCE (EXAMPLES):

## Homes - Flood Protection Guideline

## New Community Design Standard

## Existing Community Retrofits Standard

## Commercial Real Estate Retrofits Guideline



[https://store.csagroup.org/ccr\\_ProductDetails?sku=Z800-18](https://store.csagroup.org/ccr_ProductDetails?sku=Z800-18)



<https://www.intactcentreclimateadaptation.ca/wp-content/uploads/2017/10/Preventing-Disaster-Before-it-Strikes.pdf>

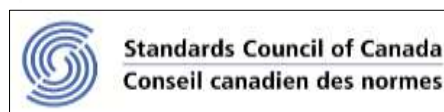


<https://www.intactcentreclimateadaptation.ca/wp-content/uploads/2019/01/Weathering-the-Storm.pdf>



... and experts across Canada, who contribute to research and standards development...

## New Standards Supported by:



# PROFESSIONAL TRAINING ON FLOOD-RESILIENCE

11

## Home Inspector Training on Flood Risk

E.G., Collaboration with Seneca and Fleming Colleges to create home inspector training on flood risk

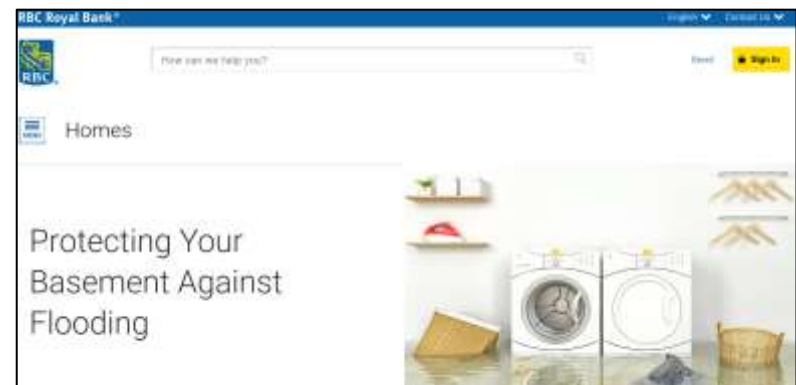
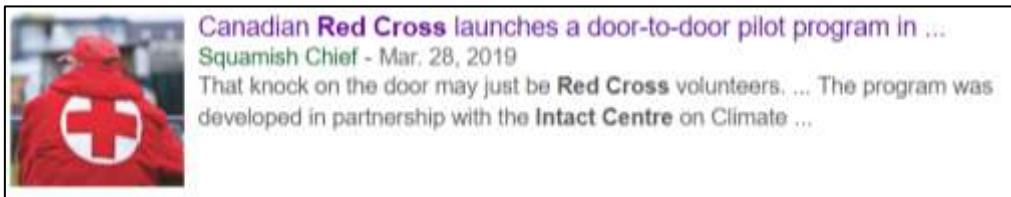


## Insurance, Real Estate and Mortgage Broker Training on Flood Risk:

E.G., Collaboration with the Insurance Broker Association of Canada (IBAC) to create education modules on flood risk



## Red Cross Volunteer Training on Flood Risk (Train the Trainer Program)



# HOME FLOOD RISK ASSESSMENT TRAINING (HFRAT) COURSE

**INTACT CENTRE**  
ON CLIMATE ADAPTATION

## Purpose of Course:

The ultimate goal of the HFRAT course is to empower learners to help homeowners reduce their risk of basement flooding events through the knowledge and understanding of:

1. **Overland/Infiltration/Sewer Backup Risks**
2. **Flood insurance availability**
3. **Proper use of a nationally recognized flood risk assessment tool/app, and;**
4. **How to properly assess risk at the household level and complete a full flood risk assessment at a home of their choosing**



UNIVERSITY OF  
**WATERLOO**



**Seneca**



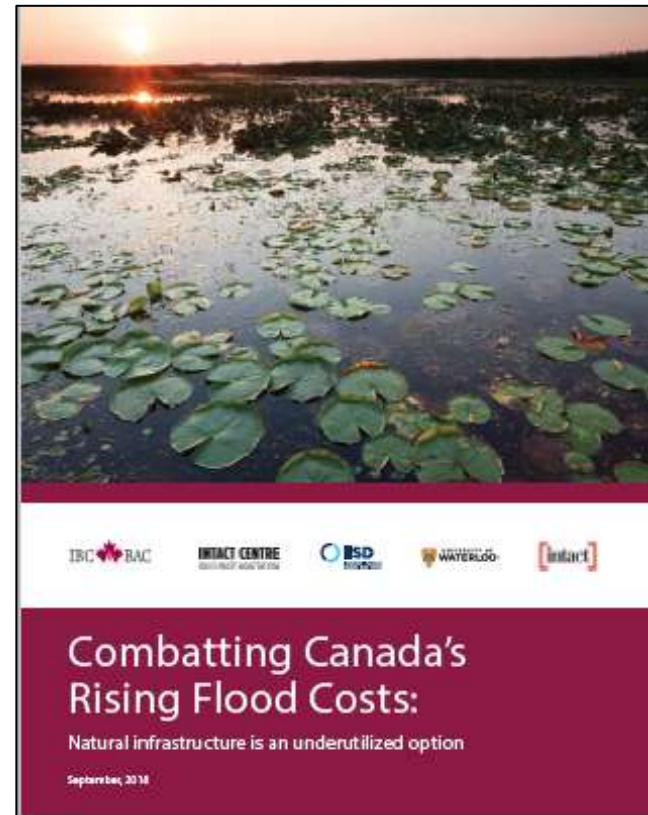
**Fleming College**



# ASSESSING THE VALUE OF NATURAL INFRASTRUCTURE

A [framework](#) was developed for assessing the business case of natural infrastructure for climate adaptation.

**Key finding:** *natural infrastructure can be a strong complement to grey (built) infrastructure for climate adaptation (e.g., flood/drought attenuation), but it's essential to quantify its total economic value for an informed investment analysis.*



# P&C INSURANCE INCENTIVES FOR FLOOD RISK REDUCTION

*"Water damage is now the leading cause of personal property claims. Over the last 10 years, water losses for personal property claims have doubled to 40% (of \$ paid in losses). There are a number of improvements that Canadians can take to better protect their homes and communities against water damage. **By taking these steps, Canadians could lower their annual premiums - anywhere from 5 to 15%.** Those who live in municipalities who make climate resilient infrastructure a priority could also benefit from more affordable premiums, higher coverage limits and enhanced insurance coverage."*

**Intact Financial Corporation, 2017**

# NEW AREAS OF FOCUS: FIRE AND EXTREME HEAT



## Forest Fires / FireSmart

- Wildfire risk in Canada is high – 11 million Canadians are exposed to fire risk
- Intact Centre and **FireSmart** have now committed to working together on:
  - Developing Fire-Resilient standards
  - Promoting **FireSmart** best practices implementation across Canada



## Extreme Heat

- Heat in Canada will get more challenging
  - According to Environment Canada, by 2050, hot summer days in southern Canada exceeding 30°C are estimated to be **4x more frequent than today**
  - 90 heat-related deaths in Quebec in summer 2018
- Intact Centre is working to develop best practices for reducing vulnerability to Extreme Heat

**THANK YOU**

**INTACT CENTRE**  
ON CLIMATE ADAPTATION

---

**Daniel Filippi**

Program Specialist

Intact Centre on Climate Adaptation

University of Waterloo

[daniel.filippi@uwaterloo.ca](mailto:daniel.filippi@uwaterloo.ca)

**ICCA's Website:**

[www.intactcentreclimateadaptation.ca](http://www.intactcentreclimateadaptation.ca)