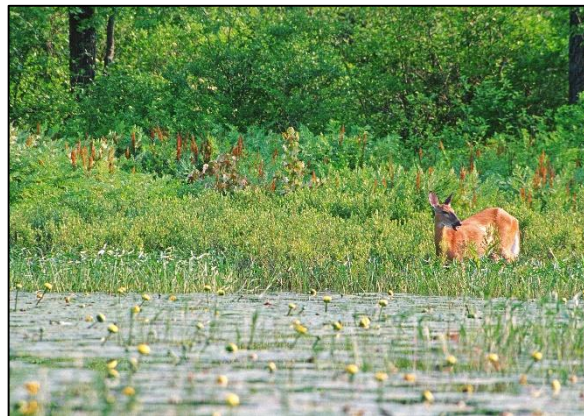


# COMBATTING RISING EXTREME WEATHER COSTS: CONSERVING NATURE IS GOOD BUSINESS



## WORKSHOP: ADVANCING NATURAL INFRASTRUCTURE IN CANADA

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(Winnipeg, November 14, 2018)



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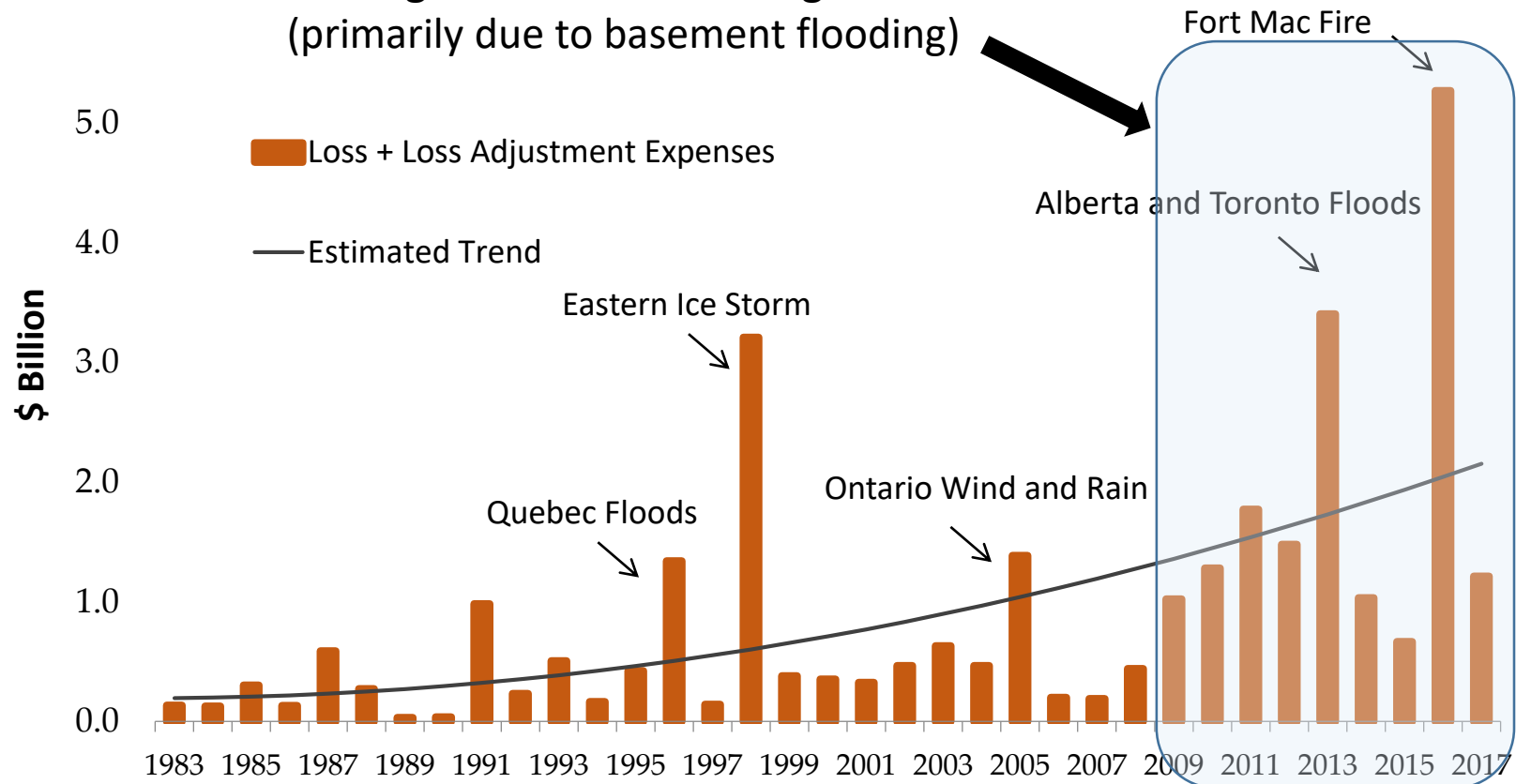
1. Costs of extreme weather and flooding continue to rise
2. Examples of flood-resiliency guidelines and standards under development:
  - Homes
  - New communities
  - Existing communities
  - Commercial real estate
3. Natural infrastructure can be a strong complement to grey (built) infrastructure solutions for climate adaptation

# COSTS OF EXTREME WEATHER: P&C CATASTROPHIC INSURABLE LOSSES (\$CAD)

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## 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.

## Historic flooding hits British Columbia after record snowpack starts melting, Canada

Posted by TW on May 14, 2018 in categories [Featured articles](#), [Floods](#)



## Southwestern Ontario's worst flooding in decades triggers an emergency, an evacuation and aggravation

## Churchill residents reeling from rail closure after unprecedented flooding

By [James Wilt](#) in [News](#), [Energy](#) | June 13th 2017

CANADA

## Alberta flooding sets records, prompts calls for action on climate change

## Just inches of air left for two men rescued from flooded elevator



## London sops up after record rains, historic flooding



THE LONDON FREE PRESS

Published on: February 22, 2018 | Last Updated: February 22, 2018 2:47 PM EST

## Worst floods in New Brunswick history: how 2018 compares

Flooding a part of recorded history in the province for more than 300 years



Julia Wright · CBC News · Posted: Apr 30, 2018 5:41 PM AT | Last Updated: April 30

## Manitoba floods leads province to declare state of emergency, seek help from military

*Manitoba is declaring a provincial state of emergency, and is asking the Canadian military to help fight a surge in flooding in Saskatchewan.*



**REPEATED  
FLOODING  
ELEVATES  
RISK OF  
MORTGAGE  
ARREARS**



# NEW GUIDELINES AND STANDARDS DRIVE CLIMATE ADAPTATION, FOR EXAMPLE: REAL ESTATE & FLOOD RESILIENCE

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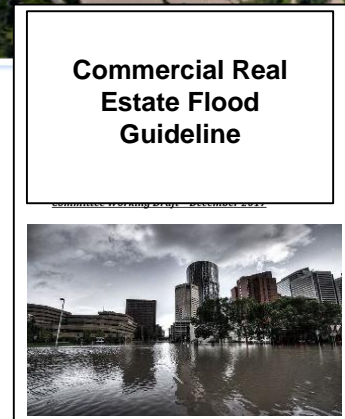
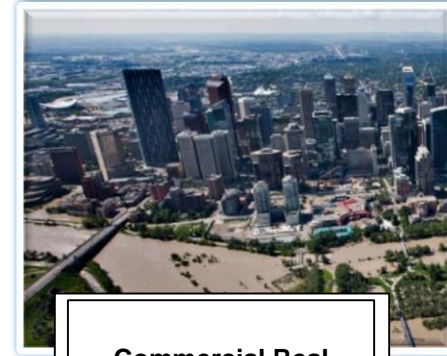
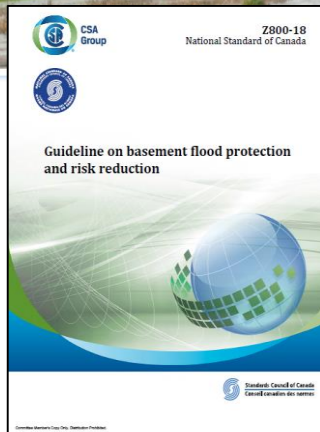
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## Homes - Flood Protection Guideline

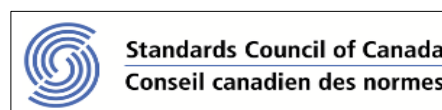
## New Community Design Standard

## Existing Community Retrofits Guideline

## Commercial Real Estate Retrofits Guideline



## New Standards Supported by:



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

*"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**

# NATURAL INFRASTRUCTURE CAN BE EFFECTIVE FOR CLIMATE ADAPTATION

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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.*

IBC  BAC | Insurance Bureau of Canada  
Bureau d'assurance du Canada



 **IISD**  
International Institute for  
Sustainable Development

 **Prairie  
Climate Centre**  
From Risk to Resilience



# CALCULATING THE BENEFITS OF NATURAL INFRASTRUCTURE

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Naturally occurring **wetlands** in Waterloo, ON reduce flood damage costs to buildings in Uptown Waterloo by \$51M (Intact Centre, 2016)

Naturally occurring **ponds** in the coastal town of Gibsons, BC provide \$3.5M - \$4M of stormwater storage services annually (MNAI, 2018)

An **engineered wetland** in Manitoba is valued at \$3.7M for the flood reduction, water quality improvement, carbon sequestration and other benefits it provides (IISD, 2017)





# TOTAL ECONOMIC VALUE ASSESSMENT NATURAL VS GREY INFRASTRUCTURE

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Costs (examples)	Costs	NI	Grey
<b>Pre-Construction</b>			
• Baseline data collection		X	X
• Stakeholder consultation		X	X
• Site identification		X	X
• Assessment of design alternatives		X	X
• Detailed engineering design of selected alternative		X	X
• Land acquisition		X	X
• Environmental assessment		X	X
• Permitting and legal fees		X	X
• Development of construction specifications		X	X
• Development of monitoring program and key performance indicators (KPIs)		X	X
<b>Construction</b>			
• Site preparation		X	X
• Site construction		X	X
<b>Post-construction</b>			
• Infrastructure maintenance activities		X	X
• Infrastructure condition assessment		X	X
• Monitoring against KPIs		X	X
• Evaluation and reporting		X	X
• Carbon cost over project life cycle			X
<b>Administration</b>			
• Project management and oversight			
Benefits (Example)	Benefits	NI	Grey
• Storm water storage		X	X
• Water quality		X	
• Habitat creation / improvement		X	
• Microclimate stabilization (e.g., urban heat island reduction)		X	
• Air filtration		X	
• Recreational amenity and aesthetic services		X	
• Energy savings		X	
• Carbon savings		X	

**A comprehensive assessment of the financial, environmental and social costs and benefits (i.e., a total economic value [TEV] assessment) is required to illuminate otherwise uncaptured benefits of natural infrastructure projects.**

- Water quality improvement
- Habitat creation
- Urban heat island reduction
- Air filtration
- Recreational amenity
- Aesthetic services
- Carbon sequestration

# GENERAL “RULE OF THUMB” FOR NATURAL INFRASTRUCTURE

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In order of preference, the most cost-effective means to utilize natural infrastructure for climate adaptation is to:

1. retain what you have;
2. restore what you’ve lost; and
3. build what you must.

**Thank You!**  **@ICCA\_Canada**