



Institute for Catastrophic  
Loss Reduction

Building resilient communities

Institut de Prévention  
des Sinistres Catastrophiques

Construction de résilient communities

# Catastrophic loss trends in Canada

Glenn McGillivray  
Managing Director

Institute for Catastrophic Loss Reduction  
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# ICLR

- Mission - reduce loss of life and property caused by severe weather and earthquakes
- Created in 1997 by the insurance community to confront rising disaster losses
- Multi-disciplinary research and education provides an essential foundation for 'science to action'
- 30 scientists / 100+ students / 12+ universities / 350+ research papers / \$50+ million in research
- Western University affiliated

# In the media

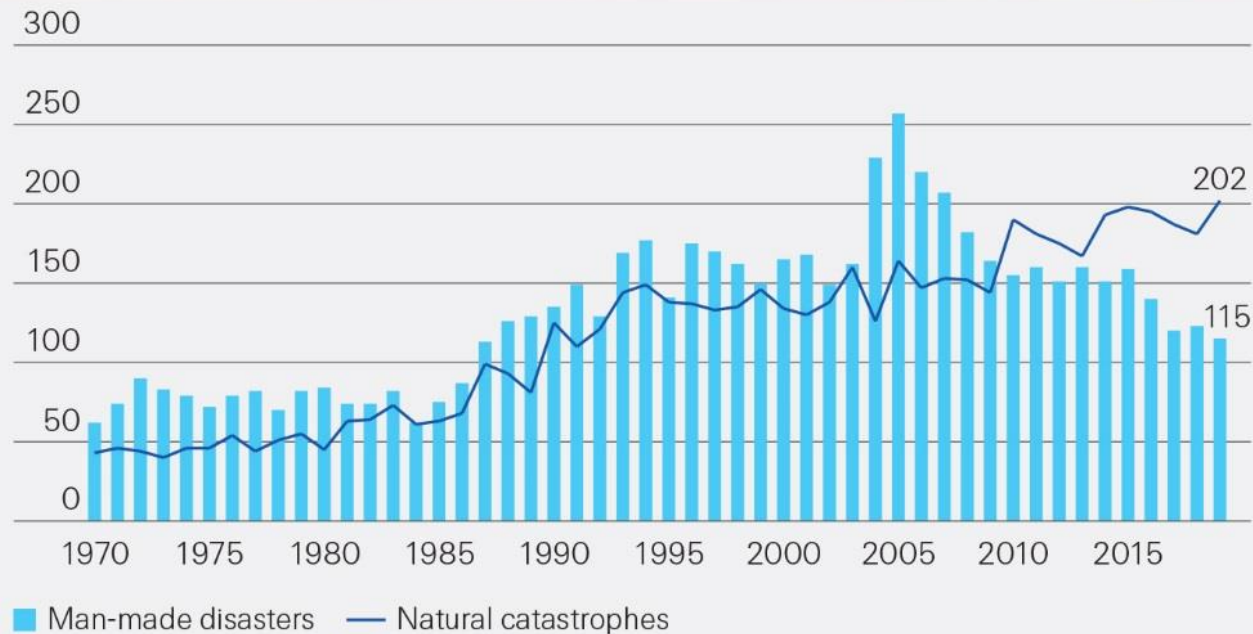


# Considerations

- Disasters are a growing threat
- Losses are rising. Why?
- What can be done about it?

# Number of cat. events 1970-2019

Number of catastrophic events,  
1970-2019

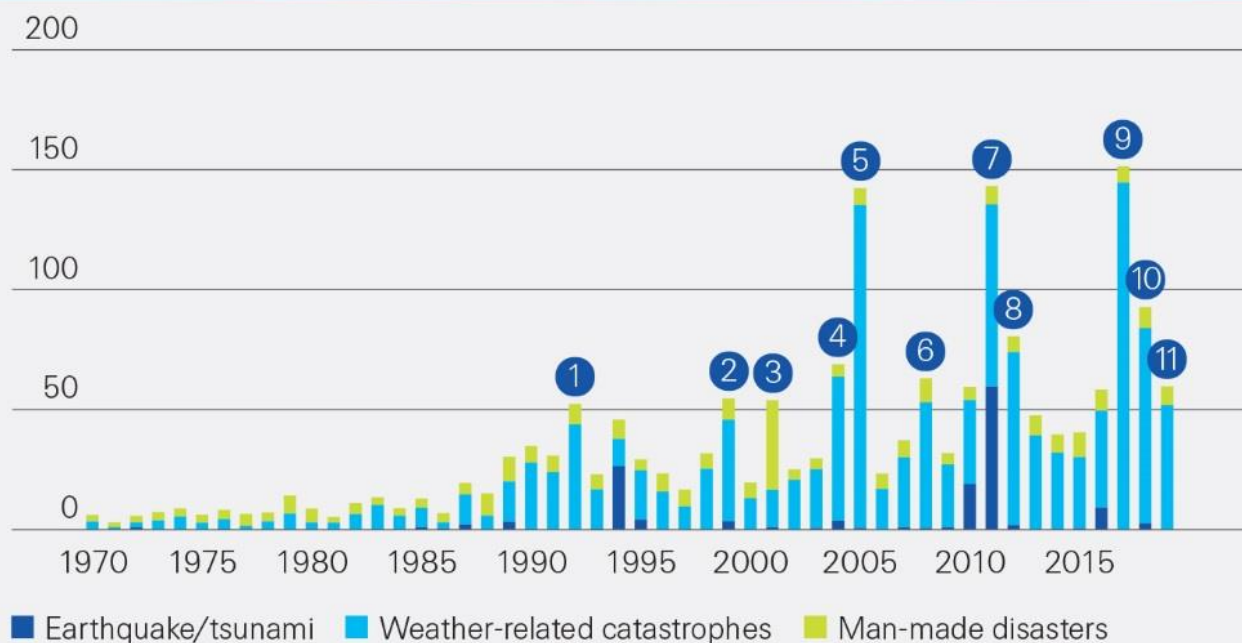


Source: Swiss Re Institute

# Insured losses 1970-2019

## Insured catastrophe losses, 1970-2019, in USD billion at 2019 prices

1. Hurricane Andrew
2. Winter Storm Lothar
3. WTC
4. Hurricanes Ivan, Charley, Frances
5. Hurricanes Katrina, Rita, Wilma
6. Hurricanes Ike, Gustav
7. Japan, NZ earthquakes, Thailand flood
8. Hurricane Sandy
9. Hurricanes Harvey, Irma, Maria
10. Camp Fire, Typhoon Jebi
11. Typhoons Hagibis, Faxai



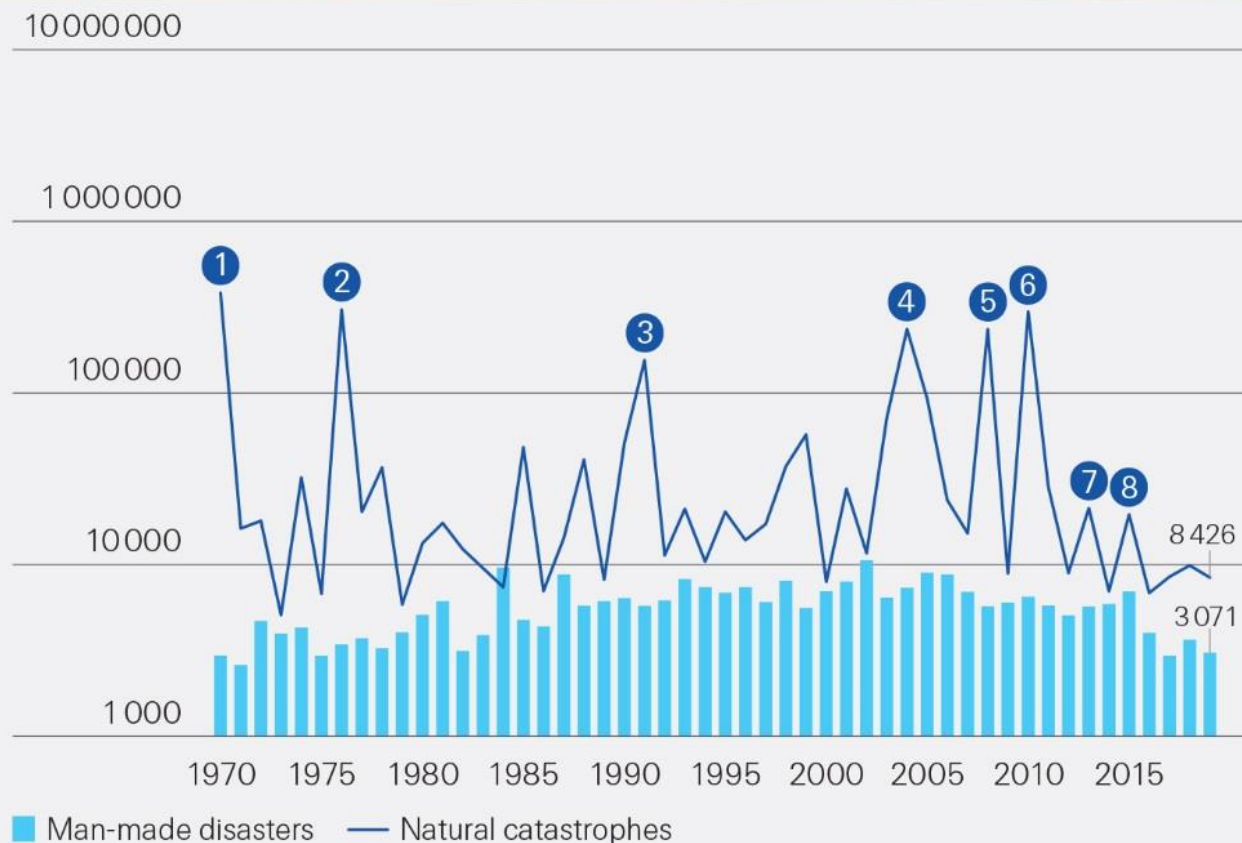
Source: Swiss Re Institute



# Victims 1970-2019

Number of victims, 1970-2019

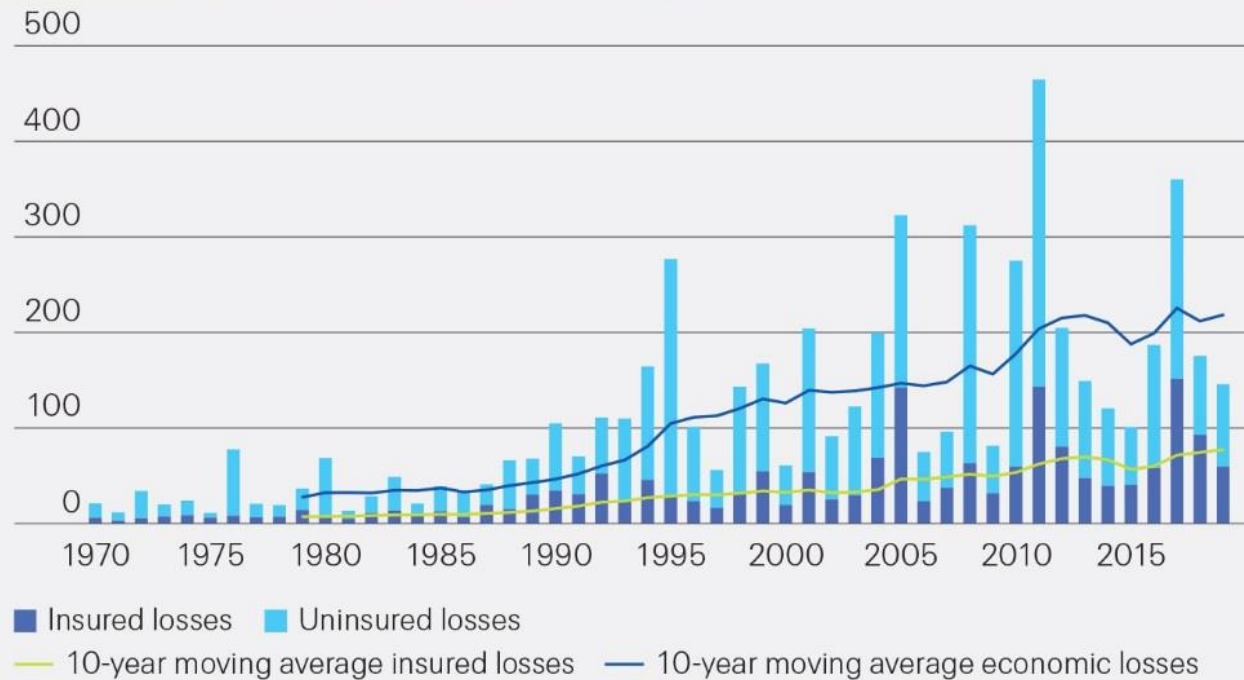
1. 1970: Bangladesh storm, Peru earthquake
2. 1976: Tangshan earthquake, China
3. 1991: Cyclone Gorky, Bangladesh
4. 2004: Indian Ocean earthquake and tsunami
5. 2008: Cyclone Nargis, Myanmar
6. 2010: Haiti earthquake
7. 2013: Typhoon Haiyan, Philippines
8. 2015: Earthquake in Nepal



Note: Scale is logarithmic: the number of victims increases tenfold per band.  
 Source: Swiss Re Institute

# Coverage gap 1970-2019

Insured vs uninsured losses,  
1970-2019  
(USD billion, 2019 prices)



Economic losses = insured + uninsured losses;

Source: Swiss Re Institute



# 2019 in a nutshell

## Total economic losses

**USD 146 billion**

down from USD 176 bn in 2018,  
below 10-year average of USD 212 bn

**USD 137 billion**

of economic losses were caused by  
natural catastrophes, USD 9 bn by  
man-made disasters

**0.17% of global GDP**

below the 10-year average of 0.26 %

## Total insured losses

**USD 60 billion**

down from USD 93 bn in 2018,  
below 10-year average of USD 75 bn

**USD 52 billion**

of insured losses were caused by  
natural catastrophes, USD 8 bn by  
man-made disasters

**3.3% of global property  
direct premiums written**

below the 10-year average of 4.4 %

## Victims



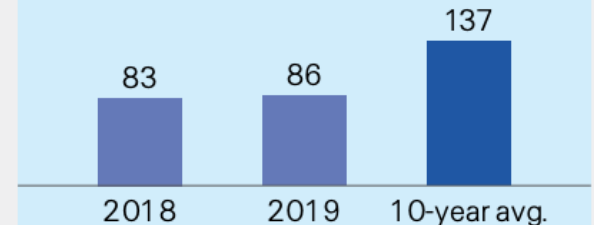
**11 497**

## Number of catastrophe events

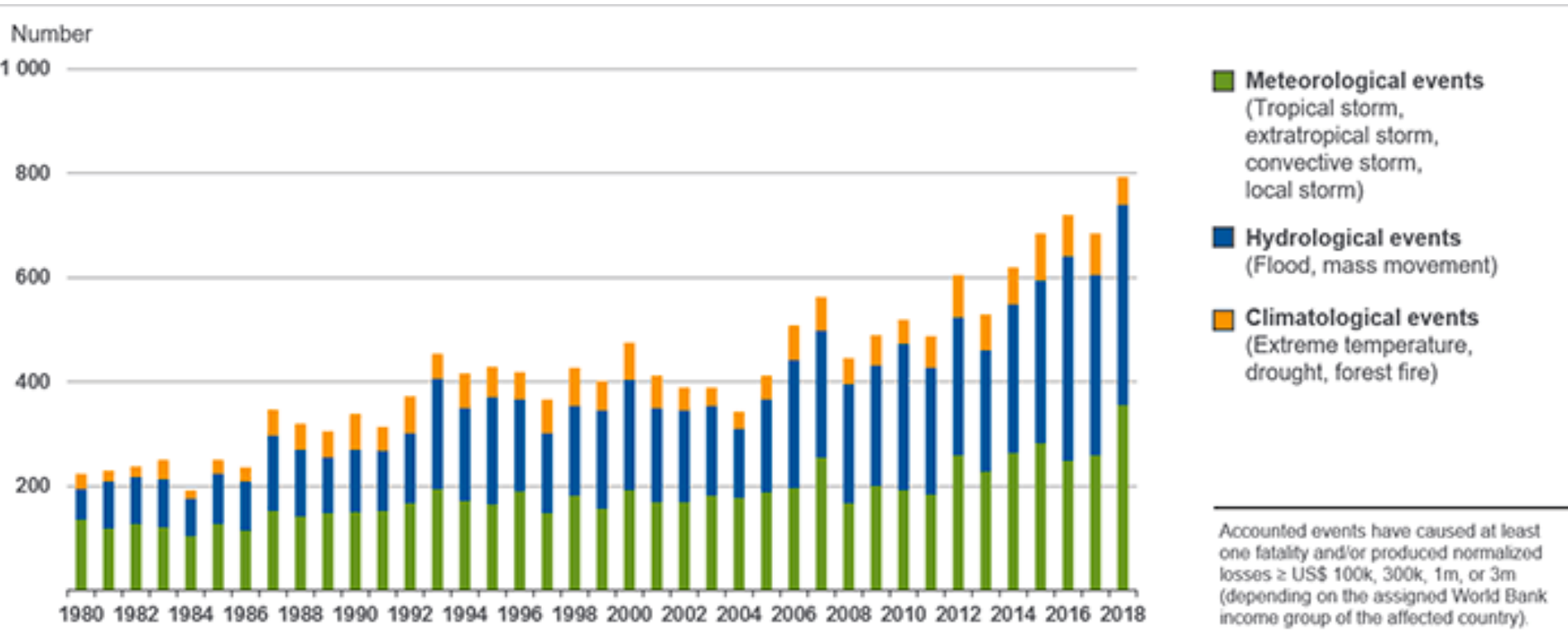


**317**

## The global protection gap little changed and below average (USD bn)

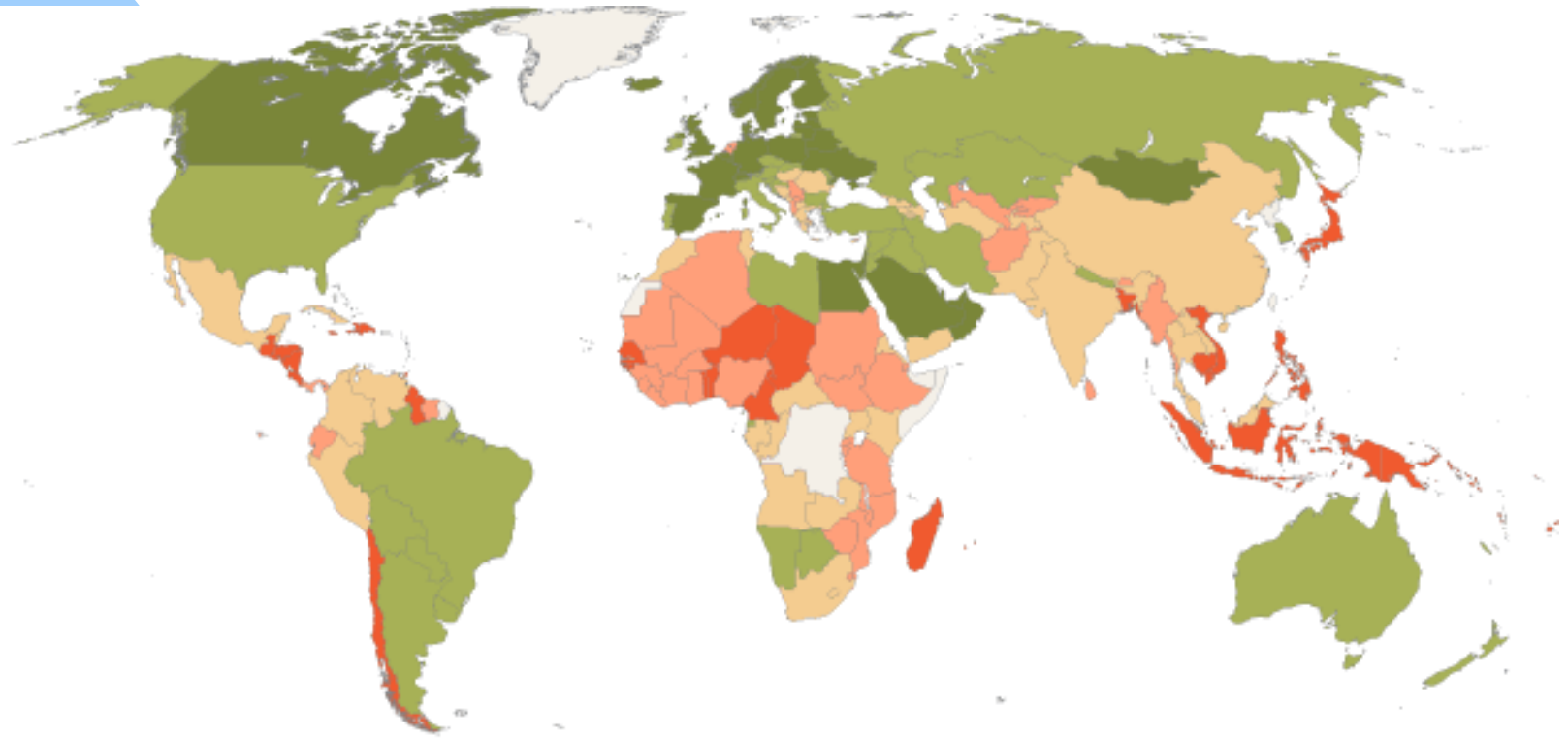


# Insured losses by peril 1980-2018



# Canadian catastrophes

## World risk index



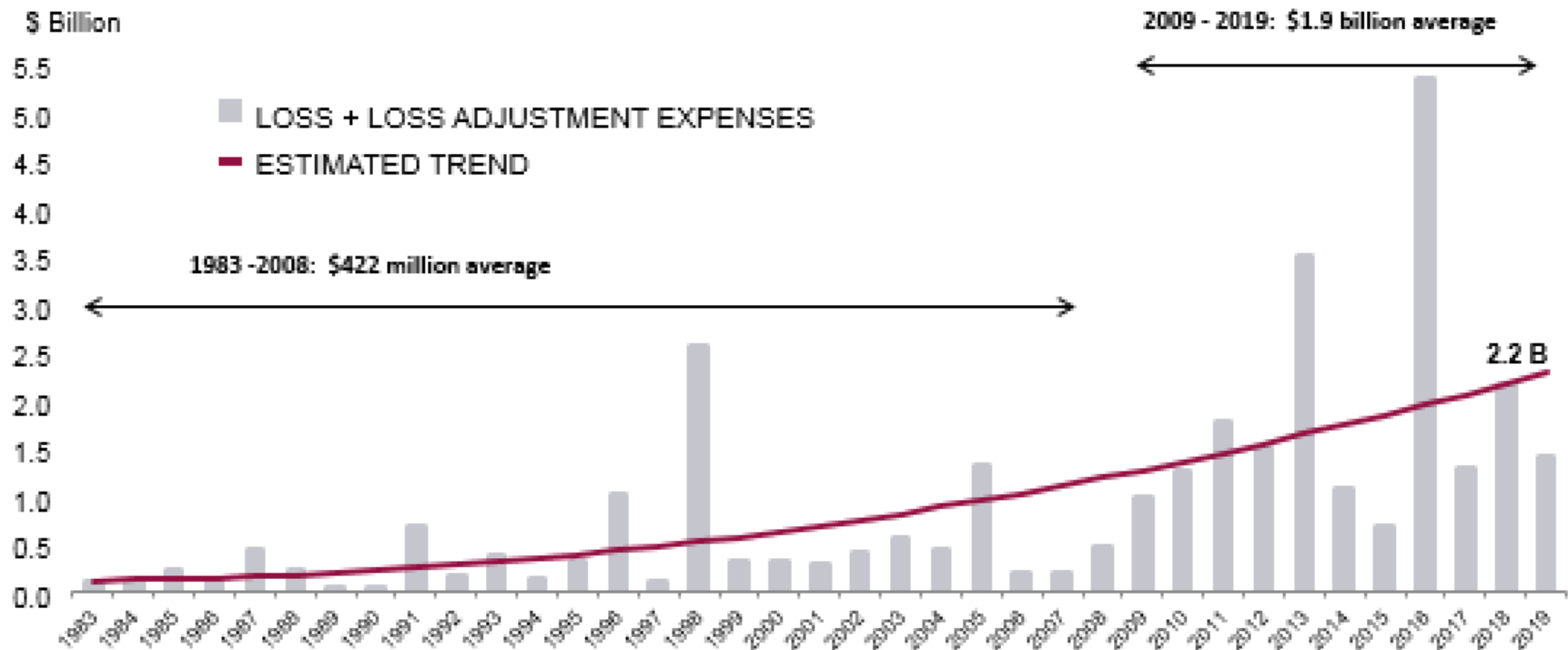
 VERY LOW	0,10 – 3,65 %	 HIGH	7,45 – 10,58 %
 LOW	3,66 – 5,72 %	 VERY HIGH	10,59 – 36,31 %
 MEDIUM	5,73 – 7,44 %	 NO DATA AVAILABLE	

MAX. RISK = 100%

Classification according to the quantile method

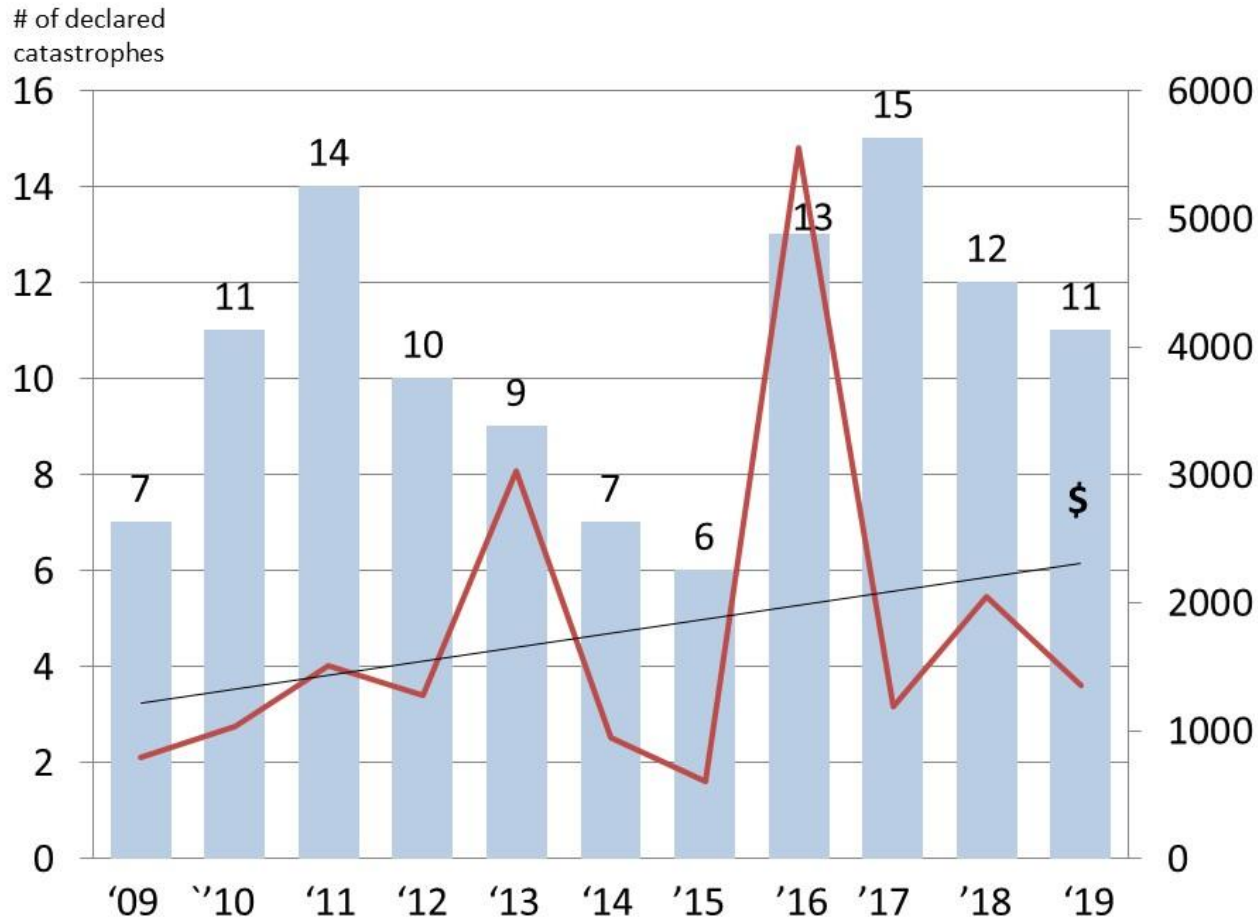
# Canadian disaster damage

\*A catastrophic loss = 1 event costing \$25 million or more in insured damages



Source: IBC Facts Book, PCS, CatIQ, Swiss Re, Munich Re & Deloitte

# Frequency & Severity



Catastrophe = event of  $\geq$ \$25 million in insurance claims  
Data: Catastrophe Indices and Quantification Inc. (CatIQ Inc.)



# Calgary, Alberta

An aerial photograph of Calgary, Alberta, Canada, showing extensive flooding. The city's downtown skyline is visible in the upper left, with numerous skyscrapers. The rest of the city, including residential areas and commercial districts, is heavily inundated with brown floodwater. A large, white, dome-shaped structure, likely a sports arena, is partially submerged in the center. The background shows a vast, flat landscape with some greenery and distant hills under a clear blue sky.

**>\$1.7 billion insured  
damage**



# Toronto, Ontario





A photograph showing a large, thick tree branch that has fallen onto a dark-colored car. The car is partially obscured by the branch and is parked on a street. In the background, there are other trees and a building with some lights on. The ground is covered with snow or ice, suggesting a winter or late autumn setting. The text "Toronto, Ontario" is overlaid in white on the upper part of the image.

**Toronto, Ontario**

**\$225 million  
insured damage**



# Burlington, Ontario

A photograph showing a flooded street in Burlington, Ontario. In the foreground, a red sedan and a dark grey hatchback are driving through deep water, creating splashes. The background features a multi-story apartment building and several trees. The sky is overcast.

▣ August 4, 2014

**\$90 million  
insured damage**



# Aidrie, Alberta hailstorm

**>\$500 million  
insured damage**





# Windsor, Canada

September 28 & 29, 2016



**>\$108 million insured damage**



# Sydney, NS, Canada

October 10, 2016

**>\$100 million insured damage**



# Windsor, Canada

August 28 & 29, 2017



**>\$124 million insured damage**



# Southern Ontario/Quebec

May 4, 2017

**>\$600 million insured damage**





**2008 to 2019 inclusive**

**\$19.1  
billion**

# Calgary, Alberta

June 13, 2020

**\$1.3 billion insured damage**





# Fort McMurray, Alberta

April 2020

**\$520+ million insured damage**



# Billion-dollar years

- 1998 – Due solely to the ice storm
- 2005 – Due greatly to the August 19 GTA rainstorm
- 2009 – Due greatly to back-to-back windstorms in Alberta
- 2010 – Due greatly to large hailstorm in Alberta
- 2011 – Due greatly to Slave Lake wildfire
- 2012 – Due greatly to one large + two smaller hailstorms in AB
- 2013 – Due to the Southern Alberta flood and GTA flood
- 2014 – Due largely to the Aidrie hailstorm
- 2016 – Due almost entirely to Fort McMurray
- 2017 – A year of frequency not severity
- 2018 - \$1 billion from two wind events alone
- 2019 – Another year of frequency not severity
- **2020 - \$2 billion+ year (Alberta, Alberta, Alberta!)**



# Why are losses rising?

- More people and property at risk
- Aging infrastructure
- The climate is changing

# What can be done?

- Loss prevention
- Risk transfer

# Loss prevention

- Structural measures
- Non-structural measures
- Public awareness

# Five-year plan

- Promote best practices to enhance the resilience of **existing homes** to damage from natural hazards
- Work with builders and others to champion resilient design and construction of **new homes**
- Partner with municipalities to advance homeowner **basement flood** risk reduction efforts
- Identify options to expand the role of private insurance

# Hazard research

- Concentration on five main hazard areas
  - Wildfire
  - Earthquake
  - Wind
  - Hail
  - Water

# Loss control information

Institute for Catastrophic Loss Reduction  
Designed for safer living®

Protect your home from  
**Basement flooding**

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



Institute for Catastrophic Loss Reduction  
Designed for safer living®

Protect your home from  
**Severe wind**

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




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ICLR's  
**QuakeSmart™**  
Program

Protect your home from  
**Earthquakes**

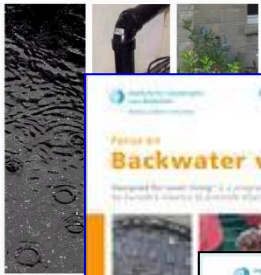
Designed for safer living® is a program endorsed by Canada's insurers to promote disaster-resistant homes.



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Focus on  
**Sump pump systems**

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



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Protect your home from  
**Snow & ice storms**

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Institute for Catastrophic Loss Reduction  
Designed for safer living®

Part of the  
**FireSmart**  
Protection Plan

Protect your home from  
**Wildfire**


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



Institute for Catastrophic Loss Reduction  
Designed for safer living®

Protect your home from  
**Hail**

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



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Focus on  
**Backwater valves**

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



Institute for Catastrophic Loss Reduction  
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Focus on  
**Emergency generators**

One good for safer living® is a program endorsed by Canada's insurers to promote disaster-resistant homes.





# To recap

- Natural disasters are increasing in frequency and severity, both worldwide and in Canada
- Since 2009, Canada has seen unprecedented growth in disaster-related costs and impacts
  - Water damage is seeing the most growth
- Though there are many reasons for the international/national trend, increased urbanization, degraded infrastructure and climate change are the top three drivers
- ICLR is conducting research into resiliency on behalf of the Canadian p&c industry, municipalities and society at large
- ICLR has loss control info that can be used by property owners



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Construction de resilient communities

**[gmcgillivray@iclr.org](mailto:gmcgillivray@iclr.org)**

**[www.iclr.org](http://www.iclr.org)**

**[www.basementfloodreduction.com](http://www.basementfloodreduction.com)**

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