Catastrophic loss trends in Canada

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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
Considerations

- Disasters are a growing threat
- Losses are rising. Why?
- What can be done about it?
Number of cat. events 1970-2015

Source: Swiss Re, sigma
Insured losses 1970-2016(1H)

Minimum selection criteria:

Total losses USD 97.6 m
Or:
Insured property claims
Shipping: USD 19.7 m
Aviation: USD 39.3 m
Other: USD 48.8 m
Or:
Casualties
Dead or missing: 20
Injured: 50
Homeless: 2,000

Source: Swiss Re, sigma
Canadian catastrophes

10 killed/100 evacuated/community assistance required/historically significant/community unable to recover on its own

Based on data from the Canadian Disaster Database, Public Safety Canada
Canadian disaster damage

1983 to 2008 = $400m average
2009 to 2013 = $1b average
Canadian cats 2009

- Winter storms in eastern Canada (Feb. 2)
  - $25 million
- Hamilton rain (July 26)
  - $100- to $150 million
- Alberta wind etc. (August 2-3)
  - $500 million
- Mont Laurier tornado (August 4)
  - $6 million
- Manitoba hail etc. (August 13-15)
  - $50- to $75 million
- Ontario tornadoes (August 20)
  - $50- to $100 million
- Tropical storms Bill & Danny (August 23 & 29)
  - $10 & 25 million

Source: Aon Benfield (Canada)
Canadian cats 2010

- Saskatchewan storms (Spring)
- Leamington & Harrow tornadoes (June 6)
- Midland tornado (June 23)
- Calgary hailstorm (July 12)
  - $>400 million
- Hurricane Igor (September 21)
Canadian cats 2011

- Storms in Ontario & Quebec (March)
- Storms in Ontario & Quebec (April)
- Wildfire in Slave Lake, Alberta (May 15)
  - $700 million
- Flooding in Saskatchewan, Manitoba, Quebec (Spring)
- Hail, tornadoes and wind in Alberta, Man. & Sask. (July 18/19)
- Tornado in Goderich (August 21)
- Hurricane Irene (August 28 to 30)
- Alberta windstorm (November 27)
Canadian cats 2012

- Flooding and wind in Ontario and Quebec (May 26 to 29)
- Flooding, wind and hail in Alberta (July 12)
- Flooding, wind and hail in Ontario (July 23)
- Hail and wind in Alberta (July 26)
- Flooding, wind and hail in Alberta (August 12)
Canadian cats 2013

- Two small events early in the year
  - Southern Alberta flood (June 19-21) ◆ $1.7 billion
  - GTA flood (July 8-9) ◆ $940 million
- Ontario/Quebec storm (July 19)
- Ontario/Quebec/Atlantic ice storm (December 22-26) ◆ $200+ million
2013 high water marks

- Canada’s costliest and third costliest insured loss events within two weeks of each other
- Ice storm now the second costliest – took 15 years!
- Two billion dollar natural catastrophes in one year – a first!
- Second place event (Slave Lake) fell not one, but two notches to fourth place
- 5th consecutive year of billion-dollar events
Canadian cats 2014

- Angus tornado (June 17)
  - >$30 million
- Saskatchewan & Manitoba storms (June 28)
- Ontario storms/Burlington flood (August 4)
  - $90 million
- Alberta wind & thunderstorms (August 7 & 8)
  - $500+ million
- Ontario/Quebec windstorm (November 24)
- $880 million
Canadian cats 2015

- Alberta/Saskatchewan storm (June 11 & 12)  
  - $55 million
- Alberta/Saskatchewan storm (July 21 & 22)  
  - $235 million
- Alberta storm (August 4 & 5)  
  - $100 million
- $510 million
Canadian cats 2016 (prelim)

- Fort McMurray wildfire (May 1)
  - More than the 2013 flood and 1998 ice storm combined
    - Currently just under $4 billion insured
  - 12 other ‘catastrophes’ declared so far this year
    - More than $4.5 billion insured
2009 to 2016 (y-to-d) inclusive

$13.5 billion
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
  - Need to be more focused on what we build and how we build it
- Non-structural measures
  - Need to be more focused on where we build
- 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
Hazard research

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

- Only two costly wildfires in recent Canadian memory
- Difficult to get insurers’ attention on the risk
- But it is a growing concern
  - Forest Service cutbacks and downscaling of science
  - Aging wildfire fighting equipment
  - Climate change
  - More people and assets in the Wildland/Urban interface
  - Bringing an urban attitude toward wildland fire
Wildfire

- Two main ways of addressing the risk in an institutionalized manner
  - Building code
  - Planning legislation
- Building code changes would have to relate to
  - Roofing materials (e.g., No untreated wood shakes)
  - Siding materials (e.g., AB requirement for fire resistant ply-board under vinyl siding on side exposures)
  - Building materials for decks etc
  - Venting grate size
Wildfire

- Planning changes through development permits
- 2014 Ontario Provincial Policy Statement (under the planning act) now includes wildland fire
  - 3.1.8 Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire.

Development may however be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards.

- Essentially treats wildfire as we have been treating flood for decades
Wildfire

‘Under Development’
(Canadian Underwriter, November 2014)
‘Risk reduction status of recovering wildfire-impacted communities in Canada’
To what degree, if any, have homeowners adopted FireSmart measures to mitigate future wildfires?
Assessments conducted on nearly 450 homes in Kelowna, B.C. and Slave Lake, AB
Rated 20 hazard factors related to structural, vegetation/fuels, topographic features and ignition potential
Paper at www.iclr.org
And then ‘everything’ changed…

- Horse River Wildfire (May 3-19, 2016)
- Fort McMurray, Alberta
- Human caused (likely accidental)
- ~2,400 structures lost (approx 10% of town)
- ~45,000 claims filed
- Insured damage estimate $3.58b (has since been adjusted upward)
  - Largest insured loss in Canadian history
  - Largest insured wildfire in world insurance history
  - Included in the Top 50 costliest insured catastrophe losses of all time
Why do homes ignite?

- ‘Why some homes survived: Learning from the Fort McMurray wildfire disaster’
- Why did some homes survive this wildland/urban interface disaster with little or no damage, while others were vulnerable to ignition and destroyed?
- “…wind-driven embers were the most probable cause for the majority of early home ignitions…”
- Preliminary findings at www.iclr.org
- Final report due out in 4Q
Why do homes ignite?

[Photo Credits: Bill Bereska] [John Gibbins/U-T San Diego/ZUMA Press]
Wildfire

- As with all hazards, risk and mitigation communication to stakeholders is crucial.
Wind

- Flat line, tornadoes, hurricanes, downbursts/microbursts etc
- Probably the second largest driver of property claims in Canada, after water
- Tornado risk rising, not due to climate change or any other change in the hazard, but due to change in the risk (i.e. development)
Lab work: World-class research
Lab findings

- To date, have completed a great deal of research into
  - Roof type (hip, gable end, complex)
  - Building height (number of storeys)
  - Roof slope
  - Sheathing thickness
  - Fastener (i.e. nail) patterns
  - Fastener type
Field work
Bornham, Ontario tornado

- May 2007
- The team’s first
Elie, Manitoba tornado

- June 22, 2007
- Canada’s first F5 tornado
Vaughan, Ont. tornadoes

- August 20, 2009
- Two F-2s
Goderich, Ontario tornado

- August 21, 2011
- F3 tornado
Angus, Ontario tornado

- June 17, 2014
- EF2 tornado
Wind

- As with all hazards, risk and mitigation communication to stakeholders is crucial.
Water

- Water is the new fire
- Water losses surpassed fire losses a few years ago
- We now have a fire insurance policy that is increasingly responding to water losses
- For a number of reasons, water losses will continue to rise
  - Aging infrastructure
  - Increasing urbanization
  - Climate change
  - Changing usage of basements with no underlying change in how we construct homes with basements
  - Homeowner ignorance
Encouraging homeowner action
ICLR resources
Encouraging homeowner action
Subsidy programs

Basement Flooding Protection Subsidy Program

- Help protect yourself against basement flooding
- Work that is eligible
- Eligibility requirements and information
- How to apply for a subsidy
- Download the Basement Flooding Protection Subsidy Program application form

Our goal is to process applications within 10 weeks from the date the application is received in our office. However, we are currently receiving a high volume of applications which may affect the time it takes to process applications.
Water

- As with all hazards, risk and mitigation communication to stakeholders is crucial
Public awareness
Wind & Water
Building code work
Wind & Water
Building code work

2012 NBC/NPC submissions

- Clarify sewer backflow protection requirement
- Align wall and roof sheathing fastening requirements
- Bracing to resist lateral wind loads
- Clarify connection of foundation drainage to sanitary/storm
- Clarification of requirements for anchoring columns and posts
Showcase Homes

- Retrofit an existing home to make it more resilient to natural hazards which exist in a given area
- May 2008, retrofitted a home in Montreal to make it more resilient to earthquake and winter storm:
  - Installed a diesel generator as an alternative power source
  - Put in surge protection on bigger-ticket electronic items
  - Fit the meter with a natural gas seismic shut off valve
  - Anchored cabinets, office equipment, and bedroom furniture to walls
  - Outfitted the washing machine with armoured water supply hoses
  - Anchored the hot water heater to the floor
  - Secured pictures and mirrors to the walls
  - Applied 3M Scotchshield safety UV film to windows
  - Installed carbon monoxide and smoke detectors and providing a fire extinguisher
  - Installed snow melt cables on roof edges and gutters to prevent the formation of ice dams
  - Provided a disaster preparedness kit.
Showcase Homes

- Vancouver - earthquake (2005)
- Ottawa - winter storm (2006)
- Edmonton - tornado (2007)
- Montreal - ice storm (2008)
- Toronto - winter storm/blackout (2009)
  - North York - basement flooding (Aug. 19, 2009)
- Jasper - wildfire (2010)
- Hamilton - basement flooding (2011)
- Moncton – basement flooding (2012)
- Quebec – earthquake and winter storm (2013)
- Burlington – basement flooding (2014)
- St. Thomas – basement flooding (2016)
Thank you!

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