

CONFERENCE PROCEEDINGS



CatIQ's Canadian Catastrophe Conference

January 31 - February 2

Hilton Lac-Leamy, Gatineau, QC

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CatIQ's Canadian Catastrophe Conference

Conference Proceedings

January 31 – February 2, 2018

Hilton Lac-Leamy

Gatineau-Ottawa

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Note: All speaker names are linked to their C4 biography.

Note: When available, presentation titles are linked to the presentation PDF.

Note: When available, blog articles are linked to CatIQ’s blog.

DAY ONE

Canadian Disaster Mitigation Interactive Workshop

Developed in partnership with Public Safety Canada

Workshop report produced by Public Safety Canada



Public Safety
Canada

Sécurité publique
Canada



Moderator:
Jim Abraham
C4 2018 Emcee and
Director, Canadian Climate Forum



Moderator:
Deirdre Laframboise
Executive Director,
Canadian Climate Forum



Matthew Godsoe
Manager, Research Unit,
Public Safety Canada



David Diabo
Senior Special Advisor
Emergency Management,
Housing,
Infrastructure & Emergency
Services,
Assembly of First Nations



Alex Kaplan
Head, North America and SVP,
Global Partnerships,
Swiss Re



Eric Tousignant
Senior Water Resources Engineer,
City of Ottawa



Alana Lavoie
Manager, Policy and Research,
Policy and Government Relations,
City of Ottawa

Moderators: Jim Abraham, Deirdre Laframboise

Panelists: Matthew Godsoe, David Diabo, Alex Kaplan, Eric Tousignant, Alana Lavoie

Creation of an EM Strategy for Canada

- In recognition of increasing disaster trends and costs, Public Safety has been mandated to develop an EM Strategy for Canada.
 - This work would align with the Pan-Canadian Framework for Clean Growth and Climate Change, the National Strategy and Action Plan for Critical Infrastructure, and will advance Canada's commitments under the Sendai Framework for Disaster Risk Reduction.

Purpose of the EM Strategy

- Aims to identify priorities and best practices across all sectors of society to strengthen resilience
- Will adopt measures to address weather-related emergencies

- Intended to be implemented over a 15-year period. Federal/Provincial/Territorial partners will review and update the strategy, along with the EM Framework, every 5 years, or as required
- The Strategy is scheduled to launch in Summer 2018

Outcome and Strategic Objectives

Outcome

- Enhance resilience across Canada, by developing whole-of-society capacity and capabilities to assess risks and to prevent/mitigate against, prepare for, respond to, and recover from natural and human-induced disasters, being respective of jurisdictional authorities.

Strategic Objectives

- 1) Enhance whole-of-society collaboration and governance to strengthen resilience
- 2) Improve understanding and awareness of disaster risks to enable risk-informed decision-making in all sectors of society
- 3) Increase whole-of-society disaster prevention and mitigation activities
- 4) Enhance preparedness activities, to allow for better response capacity and coordination and foster the development of new capabilities
- 5) Leverage lessons learned and best practices to enhance resilience, including by building back better

Risk Reduction Challenge Exercise

- The EM Strategy is about informing the work of existing actors in disaster risk reduction, as well as fostering innovation and encouraging collaboration among Canadians.
- As such, the 'Risk Reduction Challenge' is about thinking collectively and creatively about new ways of reducing our disaster risks, as well as starting new conversations and providing opportunities to amplify new ideas (through fora like Canada's Platform for Disaster Risk Reduction).

The Challenge: If you were given the responsibility to develop 3 things most needed to reduce the impact from disasters, what would they be and how would you implement them?

As part of the Canadian Disaster Mitigation Interactive Workshop, Matthew Godsoe presented the 'Risk Reduction Challenge'. The dragon's (Alex Kaplan, Eric Tousignant, Alana Lavoie, and David Diabo) provided their best advice to address the challenge presented by Matthew. Participants in the workshop were split into groups as they took part in the challenge. Each group came up with ideas that were presented to the dragons on how to reduce the impact from disasters.

Dragon Presentations “best advice”

Alex Kaplan (Swiss Re)

- Difference between insured portion and economic impact
- Individual tax payers, business, communities pay for 70% of disaster costs. The insurance industry is taking care of the remaining 30%.
- Risk perception and risk (who is responsible for paying for the risk?). How are we incentivized to deal with risk? If communities are responsible, then their prevention efforts would be different.

Eric Tousignant (City of Ottawa)

- Municipalities used to be reactive – look at ways at fixing communities after the fact
- Ottawa decided to be proactive – don’t wait until a flood happens
- Web weather infrastructure management plan (flood control)
- The City of Ottawa studies priority areas
- We can reach 80% of our goal by doing minor/less expensive things (i.e., retrofitting)
- Flooding needs to be managed on the surface – better than in the basement. We need to educate public.

Alana Lavoie (Federation of Canadian Municipalities)

- Look at things at a national level and how it affects different municipalities
- Need cooperation and collaboration with the community (to build back better etc.)
- There is not one solution or financial bullet

David Diabo (Assembly of First Nations)

- Advocacy group – advocate for EM regimes for First Nations
- AFN takes on an administrative and operational role in ensuring public safety
- AFN deals with issues such as PSBN, and search and rescue
- Talk to First Nations about EM – starting from zero
- Communities are at different levels of EM for their regimes
- Tell them that we are all in this together – need to collaborate
- A risk anywhere is a risk everywhere
- Tell them that you have to know your environment (local, regional, municipal) then the process of mitigation can begin (5 pillars of EM)
- First Nation communities have unique needs – they are rural, remote, isolated = farther away from service centres
- Position of disadvantage = don’t have emergency response services (police etc.)
- Adaptation = resilience = sustainability. But you need to participate in conferences like this

Below is a summary table of all common themes that were presented in each group during the breakout session.

Theme
Communication
Awareness
Education
Technology
Community

Individual group's suggestions that fall under each theme are presented below:

- 1) Risk Information Platform, which would include
 - Mapping (floodplains, sewers, earthquake, ice storms etc.), early warning system and risk mitigation strategies
- 2) Community Empowerment
 - Education, community-designed risk strategies, sharing of best practices, emergency training exercises and simulation (e.g.: National Emergency Preparedness Day)
- 3) National Disaster Response
 - Registry of resources, personnel and supplies, approved/ de-risked technologies, identifying links in the supply chain, real-time updates, strategic resource placement

- 1) Technology – “what’s my risk app” open transparent data which is consistent and includes flood mapping, better alerting for all types of disasters
- 2) Awareness – educating in school, alerting system, training for what to do in an event
- 3) Open data – video game simulation, make data available and updated

- 1) Mandatory Property Risk Assessments for all homebuyers
 - As part of the closing deal, buyers will be required to review, sign and submit the assessment form. The form will include all potential risks in the area/ levels of risk/ previous damage. The form must also be reviewed at the time of insurance policy renewal. It will increase understanding of risk, risk awareness, and will encourage homeowners to take preparedness measures to protect their homes and families from these risks. It is sellers and insurance companies’ responsibility to provide and pay for the form. Standardized information sheet with a standardized national rating, from independent credible sources which is easy to understand is also needed. Should also

include links to improving awareness and understanding of stakeholders not traditionally part of EM (insurance brokers, real estate).

2) Risk Ownership for Municipalities (hybrid Public-Private risk financing)

- Incentives; the rate of DFAA support would be scaled to reflect municipalities' building codes and land use planning.
 - Provides an incentive for risk sharing between municipalities and higher levels of government. Municipalities should be encouraged to take ownership of risk and seek insurance for their portion of the risk.
 - Insurance premiums provide current incentives for further risk reduction
-

1) Risk Communication and Education

- Building trust through engagement with all levels of society, urban and rural approaches, community meetings/ social media campaigns, accessible and simple. Internet portal for home owners to assess risk and educate the public.
- Assist in determining risk ownership, transparency of measures for understanding, include cost and risk example

2) Information and Assessment

- Open data access and transparency, risk assessment tools which are accessible **"Fisher Price the Science"**
- Build capacity and understanding with citizens on cause and effect of mitigation scenarios. Spatial and temporal assessment with climate change adaptation.
- Return on Investments outputs; economic/ social/ cultural, make local municipalities accountable and show all parties that there is a good ROI

3) Cooperation and Collaboration

- A clear approach to understanding level of service, equitable implementation (urban vs. rural social hierarchy) understand who owns the risk, roles and responsibilities.
 - Knowing what practices and services will be provided is essential, knowing what the results will be, as well. Evaluate and adjust, include strong build back better implementation policies. Consider critical uninjured/shared infrastructure.
 - Share good news stories/ examples on a national level, build on strengths of the respect, provide access to required data.
-

1) Establish Federal Body

- With immediate mandate to predict, prepare respond
- With decision making authority at a national level, with clearly defined governance, and to create financial incentives programs, oversight of standards

2) Centralized Collaboration approach

- Across stakeholders for information management to predict risk

3) Awareness and Education Program

- Based on risk information, text alerts can be implemented, emergency response drills, centralized (one version) of individual risk information
-

1) Development in flood-risk area

- There needs to be a consensus between insurance companies and government as to whether the development will be insured, because it may not be

2) Secondary authority

- There needs to be a secondary authority keeping municipalities in check and accountable

3) Mental Health

- Mental health needs to be brought into the equation: quantification of the costs regarding disasters
-

1) Resiliency

- Once risk is understood, need to clearly define resiliency and policy objectives: need all 4 of the following:
 - a) Structural mitigation – need funding for communities that have plans for mitigation
 - b) Nonstructural/ policy/ land use planning, municipalities need incentives to stop development in floodplains (to address competing priorities for increasing tax base, densifying central areas, etc.). Need strong policy from more distanced orders of government. Example of incentive: variable deductible for disaster recovery assistance based on resiliency or strength of floodplain development policy.
 - c) Public risk awareness – risk communication, engagement, put risk on property titles, mandatory disclosure in real estate sales, support development of business continuity plans for businesses in flood plain, community design – visible indications of risk.
 - d) Risk transfer mechanisms. Question: will stopping disaster recovery payments and flood insurance incentivize both municipalities and citizens to stop developing in flood plains?

2) Understand the Risk

- Data (accessible, available, usable). Many need technical capacity building/resourcing support to be able to get and interpret and use data.

- National database and support (travelling tech support a possibility?) of data, maps etc. Municipalities need first to be able to understand and prioritize their risks.
 - Need access to quality, standardized data (ex. decent DEM resolution across Canada) need to fill data gaps. Building inventories for damage curves. Data sharing between government and insurance industry for availability and consistency.
-

1) Communicate risks

- Educational component, sharing the risks for new homebuyers

2) Prevention

- Awareness needs to be main stream, engaging people in what they can do

3) Recovery

- Develop tools and knowledge of what to do in the aftermath of an event, and provide information from a certified source
-

DAY TWO

2017 CATs in Review



Laura Twidle

Director, Catastrophic Loss Analysis,
CatIQ Inc.

Laura Twidle – Director of Catastrophic Loss Analysis, CatIQ Inc.

Presentation

- CatIQ delivers:
 - Detailed analytical, insured loss estimates on man-made and natural catastrophes
 - Meteorological information on man-made and natural catastrophes
- A catastrophe (CAT) is declared when an event causes over \$25M of industry insured losses
 - In 2017, CatIQ declared 15 Canadian CATs and 10 Notable Events (~\$10-25M)
- 2017 insured loss estimates, as of Jan 31, 2018:
 - \$1.17B as a result of CATs
 - ~\$175M as a result of Notable Events (estimated at \$17.5M each)
 - \$36M due to ALAE
 - Ontario resulted in the highest provincial insured loss and Alberta in second

Flood Risk Management All Over the Map: Bringing Some Cohesion



Moderator:

David McGown

SVP, Strategic Initiatives,
IBC



Alain Thibault

Chairman and President & CEO,
CADRI



Bonnie Crombie

Mayor of Mississauga



Honorable Rosa Galvez

The Senate of Canada

Floods are a significant and growing concern and addressing the challenge will require collaboration among different levels of government and the insurance industry. This panel explored the issues surrounding flood risk management and examined possible solutions.

Moderator: David McGown, IBC

- 2017 resulted in billions of dollars globally in economic losses from natural disasters
- Data availability enhances the insurers understanding of risk and municipalities' understanding of how to build effective flood resistance
- Both insurers and people bear the costs when a flood occurs
- Everyone owns a part of the flood risk management issue
 - A whole of society approach – the right way to think about flood risk is a process that brings the federal, provincial, and municipal governments to the table
 - Also bring together private insurers, consumers, business owners and community organizations
- It is critical to have the right incentives in place as the increasing severity of weather becomes more expensive

Panelist: Senator Rosa Galvez, Senator for Quebec (Bedford)

- What is known about climate change?
 - The temperature of the ocean and the earth's surface has increased as a result from greenhouse gasses
 - This is difficult to model at the planetary scale, however, at the planetary scale, it is known that the earth is warming
 - Climate is to weather similar to what character is to mood – character personalities are easy to predict, however, moods are hard to predict
 - More extreme rain events
 - Ocean and river levels are rising
 - Therefore, it is important to build resilient infrastructure
- What do we need to do? Where to do we need to go?
 - Public awareness
 - Need infrastructure built to keep up with the changing climate, in particular for floods as the flood risk in Canada is very high
 - Greenhouse gasses need to be stopped from going into the atmosphere
 - sustainable infrastructure
- Role of government is to be efficient and motivate public and financial sectors to work together
 - The cost of doing nothing is going to be higher

Panelist: Mayor Bonnie Crombie, City of Mississauga

- Municipalities have a role and responsibility in flood risk management

- Mississauga has been impacted by many floods
- Crucial to protect infrastructure – Mississauga has a lot of underground infrastructure that needs to be protected
 - Mississauga has imposed a storm water levee to address this issue
 - Mississauga has also started to address issues like risk-based land use planning by encouraging homeowners to leave flood areas and relocate
- Additionally, Mississauga has continued to do small things such as LED lighting to reduce the carbon footprint, greening their fleets and planting trees

Panelist: Alain Thibault, CADRI

- Times have changed - water damage was never a big concern
 - Homeowners insurance was focused towards wind, fire, hail
- Sewer backup coverage was introduced in 1980s and became widely accepted
- The 2013 Calgary floods raised the awareness level
 - Confusion about coverage – what is available and who handles what? This was not a good experience and was a sign that something had to be done
- Insurance companies have started to offer an overland insurance product; however, the product is not offered on a uniform basis. There are differences in:
 - Approaches
 - Definitions
 - Limits and/or deductibles and coverage
- Important to have cohesion for individuals to know what is available and what they can do to protect themselves
- In Canada, there are two competing systems:
 - Flood insurance offered by the industry
 - DFAA from the government
 - These are competitors, and roles need to be clearly defined to eliminate overlap and confusion

Public Communication in Times of Crisis



Moderator:
Shawna Peddle
Director, Partners for Action,
University of Waterloo



Janice Babineau
Community Manager,
Canadian Red Cross



Jeff Rohrer
Director of Communications
and Events,
IBC



Jennifer Spinney
PhD Candidate,
University of Western
Ontario



Ryan Baker
Director, Public Affairs,
Public Safety Canada

The roles and responsibilities of public communicators in effectively communicating to the public before, during and after disasters.

Moderator: Shawna Peddle, Partners for Action

- Canadians have a poor understanding of natural disaster risks
- The impacts can be very personal
- There are actions people can take before, during and after a disaster to reduce the impacts
- How can risk be personalized and communicated effectively to drive action?

We know that people have diverse beliefs about risk and preparedness. What are our responsibilities in communicating risk and preparedness before a disaster and who should be responsible for driving that pre-event awareness?

- **Panelist: Ryan Baker, Public Safety Canada (PSC)**
 - Communication is on a spectrum (before, during and after an event)
 - PSC advises Canadians on how they can prepare themselves
 - Everyone needs to work together to make progress
 - There is responsibility across the different levels of government and sectors of society

- **Panelist: Jeff Rohrer, IBC**
 - Whole of society approach
 - “Shake-Zone” tour promotes preparedness and action
 - A M8.0 simulator taken to an earthquake prone community
 - During the simulation, participant reactions progressed from something that was fun to serious

How can we develop and communicate watches and warnings that drive action?

- **Panelist: Jennifer Spinney, University of Western Ontario (UWO)**
 - Fisher Price, the science – using language that is relatable
 - Terms users can understand
 - Providing users with information that they can ‘hang their hats’ on
 - Perception of risk – what is considered risky for one person, may not be considered risky for another
 - Factors influencing perception of risk:
 - Location
 - Wealth
 - Access to information
 - Past experiences
 - Sense of place

- Coordination, collaboration and streamlining required when communicating
- Official policy would be helpful to guide decision-making during uncertainty
 - Greater collaboration (i.e. between meteorological experts and on the ground decision-makers)
 - E.g. In one case lightning struck, the competition had ended, and people came off the water and were not at risk. Then there was a medal ceremony and athletes came out to accept their awards. Official policy trumped common sense because the lack of official policy created a situation where decision-makers could use their own discretion

- **Panelist: Ryan Baker, PSC**

- We need to ask, who are the leaders, or people in the community, that people trust?
- Importance of looking past the media channels

Who should be responsible for communicating during an event? How do you talk to people as something is happening?

- **Panelist: Janice Babineau, Canadian Red Cross (CRC)**

- There needs to be communication from everyone during an emergency
 - The Canadian Red Cross (CRC) will help to amplify the message of a leading agency to communicate information, but they will not take the place of the lead agency
- There needs to be collaborative communication
- Mass media can be one means of communicating, however not everyone has social media or cable, especially when there is a power outage or when people are not at home
- Communication happens online and offline

What about communication after an event?

- Let people share their stories on the impacts they faced, what they went through and how they are doing now
- Personal narratives are more powerful than data or statistics
- It is important to have a combination of positive messages with concrete things (as well as narratives). Having negative messages alone can be overwhelming to some people

Keynote Speaker: Maryam Golnaraghi



Maryam Golnaraghi

Director, Extreme Events & Climate Risk,
Geneva Association

Maryam Golnaraghi was the keynote speaker and presented an intriguing talk on the insurance industry's role in addressing climate change mitigation and adaptation goals.

The Geneva Association published a report in January 2018: [Climate Change and the Insurance Industry: Taking Action as Risk Managers and Investors](#)

- Report highlights latest developments (policy and regulators, technology, investing and capital markets, compliance and reporting, related to climate adaptation and mitigation (transitioning to a low carbon economy). It provides insights from interviews with 62 C-level Executives (CEOs, CIOs, CROs, CUOs) of the global insurance industry.
 - The industry is taking a number of measures to build socio-economic resilience to climate risks and support the move to a low-carbon economy
 - There are a variety of external hurdles that hinder the insurance industry from scaling up their contributions as risk expert, underwriters and investors in building climate resilience and transitioning to a low carbon economy
 - Recommendations to help scale up the insurance industry's contribution to address climate change
 - Report take-aways:
 - Building financial resilience to rising costs associated with physical climate risks requires proactive risk management and adaptation strategies. Transitioning to a low-carbon economy needs to be well-planned and to follow a predictable path with alignment across the layers of government and the private sector.
 - Implementation will take time and may take longer in some countries and regions depending on existing policies and political frameworks. This will have profound socio-economic implications spanning many sectors (e.g. energy, water, food and agriculture, transport, finance) involving investments in critical infrastructure, labour training, education and trade.
 - To achieve scale, the key barriers, opportunities and solutions need to be identified through more coordinated dialogue, engagement, and action among key stakeholders.

- The insurance industry is a critical part of the solution. It is neither the polluter, nor the climate policy setter, but it plays a critical role as risk managers, underwriters and investors in enabling economic resilience and entrepreneurial pathways for addressing climate change goals and targets.
- As a global leader in risk management, the insurance industry is already contributing significantly to building socio-economic resilience to extreme events and climate risks. It is also supporting transitioning to a low-carbon economy through its underwriting business, investment strategies and active reduction of its carbon footprint. Yet, it wants to do more.
- The industry wants to continue to contribute, however, there are external hurdles that hinder their contributions
- There are opportunities for the industry, such as climate resilient and decarbonized infrastructure, however, these opportunities come with challenges
- These challenges go beyond the scope to the insurers and need to be addressed in a coordinated way, engaging a variety of stakeholders

Democratizing and Improving CAT and Hazard Models



Moderator:
Dr. Blair Feltmate
Head, Intact Centre on Climate Adaption,
University of Waterloo



Elliott Cappell
Chief Resilience Officer,
City of Toronto



Dickie Whitaker
Chief Executive,
Oasis Loss Modelling Framework

The panel emphasized the need for catastrophic and hazard models to be brought up to date. The panelists discussed current issues and limitations with these types of models and how to make improvements going forward.

Moderator: Blair Feltmate, ICCA

- CAT and Hazard models must be improved for communities to function well against climate change and extreme weather events
 - Models must be updated, made broadly available, and generally interpretable by non-specialists
 - If this does not happen, climate change adaptation efforts will mainly be based on guess work

Panelist: Dickie Whitaker, Oasis Loss Modelling Framework

Presentation – The changing landscape of catastrophe modelling

- CAT and hazards models are opaque
 - key assumptions are not explicit
 - key parameters are generally unavailable
- Limited input from science and academia – there is a big gap between the insurance industry and academia
 - Insurance industry tools are generally not understood or unavailable to academia
- Expensive exposure management process
- Models are costly and used ineffectively
- A worldwide change towards models is gaining momentum
 - Oasis provides software platform and community for flexible plug and play framework
 - Models are developed to global standards
 - Local academics are taught how to use and maintain
 - Cost efficient through the shared service opportunities

Panelist: Elliott Cappell, City of Toronto

Presentation - Toronto's Resilience Strategy + CAT Models

- Toronto is participating in the 100 Resilient Cities initiative to make Toronto more resilient to shocks and stresses
- Shocks: sudden events, such as extreme cold, flooding, heatwave
- Stresses: related to Toronto's growth, such as lack of mobility/congestion, aging infrastructure, and lack of affordable housing
- Shocks and stresses are related
 - A cold spell (shock) in December exposed Toronto's homelessness issue (stress)
- Most of Toronto's shocks are related to climate change and extreme weather
- Resilience officers are clients of CAT modeling, but not widely used in the approach due to access barriers, such as
 - a lack of capacity (technical) to understand the models and how to use them
 - a financial barrier for municipal governments
- Model development needs to consider the potential end-user
- Needed:
 - Open models
 - Data security
 - Capacity building
 - Knowledge of risks
 - Examples from other jurisdictions

Lessons Learned from Emergency Management Plans



Moderator:
Paul Kovacs
Executive Director,
ICLR



Matthew Godsoe
Manager, Research Unit,
Public Safety Canada



Mike LeBlanc
Regional Emergency Management
Coordinator,
New Brunswick EMO



Louise Bradette
Chief Resilience Officer,
City of Montreal

This session delved into the varying roles and perspectives that the local, provincial and federal governments have in disaster response and management. The panel was split into three sections: understanding the risk, governance, and risk reduction.

Moderator: Paul Kovacs, ICLR

Perspectives:

Federal – Matt Godsoe, Public Safety Canada

Provincial – Mike LeBlanc, New Brunswick EMO

Local – Louise Bradette, City of Montreal

1. Understanding the Risk:

Federal perspective:

- Canada is experiencing an increase of extreme events
 - Canada's risk profile changed in mid-1990s, where extreme events became annual occurrences
 - The 1996 Saginaw River flood, the 1997 Red River flood and the 1998 Quebec ice storm
- Another step/acceleration occurred in Canada's risk profile in the late-2000s
 - It is expected that these stepped increases/changes are going to continue
- It is necessary to be prepared to understand and predict when these disasters may occur

Provincial Perspective:

- New Brunswick (NB) severe weather events are evolving
 - The NB EMO has activated an emergency response 8 times in the last 5 years in the south east corner of NB, where it was just once in the 10 years prior
- The Tantramar Marsh is an example of how the province is experiencing change
 - On a normal day, the tide change takes away a meter of the marsh's dikes
 - Severe weather events add pressure to the dikes
 - The loss of the marsh could pose serious consequences for the rest of Atlantic Canada as significant infrastructure has been built through it
 - I.e. The railway connecting Halifax to the rest of Canada

Local Perspective:

- Finding ways to engage citizens to understand their risk
 - Start a conversation and involve citizens in the mitigation process
 - Provide a tool kit to help them contribute

2. Governance:

Federal Perspective:

- The system is bottom-up
 - Individuals are responsible for their own homes; when they exceed their ability to cope, they can reach out to the municipal government
 - Municipalities have their own resources, and should they need to, they will reach out to other municipalities or the provinces and territories
 - Provinces and territories have their own arrangements but can reach out to the federal government, if needed
 - Finally, the federal government can reach out to its international colleagues, if necessary
- Increasing risks are being recognized as a whole of society problem as different sectors are implicated
 - The private, voluntary, and academic sectors
- There needs to be more of a collaborative approach and to develop collaborative relationships

Provincial Perspective:

- The NB emergency measures act dictates that every municipality shall have an emergency measures plan
 - The NB EMO has also set out a template for emergency plan for municipalities to help them evaluate, prepare for, and mitigate risks
- NB has collaborated with Joint Task Forces Atlantic to initiate Brunswick Alpha in June 2018
 - A provincewide exercise to simulate a hurricane impacting NB

Local Perspective:

- The stakeholders involved in the emergency response and mitigation need to be broadened to include individuals from land use and social and economic development
 - Educate the citizens that it is not just the “usual suspects” involved in response efforts

3. Risk Reduction and Resilience

Federal Perspective:

- There are efforts and money put towards disaster mitigation in Canada
 - Canada has a federal/provincial/territorial national disaster mitigation strategy
 - The National Disaster Mitigation Program was launched in 2015
 - In 2017, \$2B was given to establish a disaster mitigation and adaptation fund

- Resilience is complex and should not be dealt with in a conventional way
 - Defense Research and Development Canada mapped out 109 interconnected and intertwined pieces of policy and legislation (at the federal level) that are part of resilience and risk

Provincial Perspective:

- Emergency management addressed in NB by training, contributing to a more resilient province
- Resiliency starts at the grassroots level and individuals need to look after themselves
 - “It’s the oxygen mask in the airplane scenario. You have to put your mask on first and then turn to your neighbors and help them”
 - The government will not always be there for support in an emergency

Local Perspective:

- Resilience has now been accepted as a responsibility in Montreal
 - Host workshops to find out individual priorities and keep people engaged
- After a disaster, it is important to seize the opportunity to promote risk reduction when it is fresh in people’s minds
 - Additionally, scientific evidence is needed to demonstrate the impacts of a risk

Building Back Better (BBB)



Moderator:
Heather Auld
Principal Climate Scientist,
Risk Sciences International, Inc.



Marianne Armstrong
Research Council Officer, Construction,
National Research Council Canada (NRC)



Glenn McGillivray
Managing Director,
ICLR



Emily Stock
Insurance Litigation Lawyer,
Monaghan Reain Lui Taylor LLP

[CatIQ Blog – The Hurdle of Replacement Cost Value \(RCV\) to Building Back Better](#)

In 2017, British Columbia saw its worst wildfire season on record, and catastrophic flooding occurred right in Canada’s backyard; these events resulted in hundreds of millions in insured and economic losses. It is important to be prepared for these disasters and to build back better after a disaster to mitigate future risks and improve resilience.

Moderator: Heather Auld, RSI

- BBB is about the rebuilding phase after a disaster
- When building back after a disaster, it is important to reduce vulnerability and not repeat the same mistakes

- The next time we rebuild, we need to be more resilient and admit that sometimes the best option is to not rebuild at all
- The challenge after a disaster is the need to build back fast when there is not much time to think about the best way. This highlights the importance of planning and being ready ahead of time to build back better after disasters when they occur. This includes preparations to overcome some of the obstacles

Panelist: Glenn McGillivray

Presentation – Building Back Better

- BBB concept comes from the SENDAI Framework
 - There are seven clear targets outlined in the framework and four clear priorities, BBB represents the fourth priority
- Focus of this panel is on:
 - Building codes and standards
 - Voluntary measures taken up by builders
 - Insurers Rebuild Stronger Homes
 - What we (re)build
 - How we (re)build
 - Where we (re)build, if we even rebuild
- Reality:
 - Homes built on floodplains near unstable slopes
 - After the Fort McMurray wildfire, around 300 homes were rebuilt with vinyl siding
 - Some homes in Gatineau are permitted to rebuild in a high-risk flood zone
 - Houston – considering building new houses in a flood plain
- Insurance industry and opportunities:
 - Building codes and standards
 - ICLR working with IBC to incorporate resilience into the Canadian National and Ontario building codes:
 - Backwater valves
 - Hurricane clips
 - Working to have resiliency and property loss reduction a main objective of the code
 - Voluntary measures can be taken by builders
 - Incorporate resiliency measures
 - Incentivizing
 - Dufferin County, Ontario Hurricane Clips program
 - ICLR's Insurers Rebuild Stronger Homes Program
 - Best practices for design and construction of homes to reduce risk of loss and damage from natural hazards

Panelist: Marianne Armstrong, NRC

Presentation – Actions to Help Build Back Better

- Canada looking to BBB and improve climate resilience of buildings and core public infrastructure
 - In the 2nd year of a 5-year project
- Factoring in climate change and extreme events for infrastructure such as:
 - Buildings
 - Bridges
 - Roads
 - Transit
- NRC Projects
 - Funding provided by Infrastructure Canada and the Government of Canada to determine what can be done to help BBB
 - Working closely with Environment Canada and other climate scientists to determine what the future could look like for Canada
 - Design data being developed for all locations in Canada for:
 - Temperatures
 - Precipitation
 - Wind
 - Extreme events
 - Goal: a standardized dataset that can be updated and upgraded throughout the years
 - Another element of this project is to update standards and guidelines to incorporate resilience
 - Also working on the durability of materials
 - How will climate change impact corrosion and what can be done to prevent this?
 - Research on impervious concrete
 - New national guidelines on flooding
 - A guideline for building in flood prone locations
 - How to design for wildfire using the knowledge of the wildland-urban Interface

Panelist: Emily Stock, Monaghan Reain Lui Taylor LLP

Presentation – Legal Challenges – Building Back Better

- There are legal hurdles for BBB
 - Replacement Cost Endorsement and its challenges
 - Actual cash value is less than Replacement Cost Value (RCV)
 - Your insurance should not provide you with something better than what you started with

- Limitations may be put in place for when you can get something back better
 - These limitations are important when thinking about catastrophes and BBB
 - The industry is realizing that this needs to be changed and are becoming more supportive of BBB
- Two requirements to get Replacement Cost Endorsement
 - Same location – rebuild in a flood zone?
 - Homeowners often run into this issue which creates an incentive to build in a location that may not be very suitable
 - Same Like Kind and Quality – use the same type and quality of materials
- Actions to help BBB
 - Think about the coverages in our policies, in light of BBB principles
 - Look at deleting the same location requirement in policies in flood or other risk zones for RCV
 - Flexibility on Like Kind and Quality for catastrophes

Student Delegate Presentations



Rodrigo Costa

Ph.D. Candidate, Department of Civil Engineering, University of British Columbia

Presentation – A Framework for Assessing Disaster Recovery in Communities

- Simulates how communities are affected by and recover from disasters
 - Using a model called “Rts” (developed at UBC)
 - Takes stakeholder information into account
 - Critical infrastructure
 - Government
 - Communities
 - Emergency management plans
 - Private Sector
 - Geological Survey of Canada
 - A focus on BC earthquakes

- The dominant modelling framework in civil engineering is based on the PEER framework that is seen in the HAZUS model
 - Project goal: use the core of the PEER framework but account for decisions made before and after a disaster and find how this impacts the initial loss and the capacity to recover
 - Decisions are affected by a lot of parameters such as risk awareness
- Main questions:
 - What decisions can be made before and after a disaster to mitigate loss and speed up recovery?
 - Beyond infrastructure metrics, what affect these decisions?
 - How effective are these decisions?



Seth Bryant

Engineer and Researcher, University of Alberta

Presentation – ABMRI: An Approach to Dynamic Flood Risk Assessment

- A focus on flood risk management in land use planning
 - Where should the flood hazard zone be?
- Project goal: Investigate how the flood probability used for mapping flood hazard zones affects flood risk
 - A simulation experiment comparing different scenarios for flood hazard zones and the projected damages over time
 - Develop a tool that will quantify the risk reduction of soft, time dependent, mitigation
- Agent based model
 - Links a historical record of how Calgary has developed until now with how Calgary is planning to develop
 - Four main datasets:
 - Calgary building permits
 - Assessment records –changes in property value
 - Survey – understand how homeowners make decisions on flood risk
 - 2013 Calgary flood disaster recovery payments
 - Limited flood damage data in Canada adds to the challenge



Jithamala Caldera

Ph.D. Student, Department of Civil Engineering, University of Calgary

Presentation – Creation of a Universal Disaster Severity Scale (UDSC) for Natural Disasters

- Natural disasters come in a variety of shapes and sizes and are usually described using magnitude or intensity scales
 - However, different types of scales cannot be compared
 - Earthquakes measured on the Richter scale cannot be compared to tornadoes measured on the Enhance Fujita scale
 - Different words are used to describe the severity of disasters
 - Different factors give a different idea about the level of impact
- No current scale identifies the relationship among impact factors
- Solution: Develop a common global scale to measure the impact of disasters – The Universal Disaster Severity Scale (UDSC)
 - Integrates the current measurement system, impacts, size and management
 - Advantages:
 - 10 severity levels that are clearly defined
 - Fatality ranges define each level
 - Historical examples provided for each level
 - Colour coding
 - Everyone, including those who are illiterate, can identify and understand
 - Adaptable to any language, society or culture
 - Compare impacts of all natural disasters

DAY THREE

Coping with Canada's Hottest Peril – Wildfire



Moderator:
Paul Cutbush
SVP Catastrophe Management,
Aon Benfield



Patrick Barbeau
SVP, Claims,
Intact Financial Corporation



Dr. Steve Gwynne
Senior Research Officer,
National Research Council



Kyle Winston
Co-founder & President,
CRU Group Inc.

[CatIQ Blog – Improving Safety Through Simulating Wildfire Response](#)

In 2017, British Columbia and California had their worst wildfire season on record. Wildfires remain a hot topic of concern in Canada. Have there been lessons learned from dealing with these fires? How have Canada's insurers, emergency managers, and claims adjusters responded? Experts on this panel explained what their rolls are when dealing with wildfires and how to minimize the impacts.

Moderator: Paul Cutbush, Aon Benfield

- Wildfires had a big impact in 2017
 - British Columbia (BC) experienced its worst wildfire season ever
 - The province of BC was under a state of emergency for 70 days breaking the previous record of 43 days
 - Luckily, BC dodged a bullet and there was little insured damage, unlike Fort McMurray, AB
 - California broke their wildfire record in the fourth quarter
 - 4 out of the top 11 most destructive wildfires occurred in the fourth quarter
- Wildfires are not going away and must be kept on the radar – wildfire is Canada's hottest peril

Panelist: Kyle Winston, CRU Group

Presentation

- The adjusters' role during wildfires and other natural disasters is to communicate
 - The eyes and ears on the ground for insurance and reinsurance companies
 - scope out the damage using available tools and report back

- Drones are very useful in determining if a house is livable or demolished
- Adjusters help to determine where resources should go
 - Where should temporary stations be set up?
 - Where should information kiosks be?
- Adjusters provide information from the insurance companies to the insured
 - Provide support and guidance
 - Empathy training given to CRU adjusters
 - “Do less but achieve more” – take the time to be supportive

Panelist: Steve Gwynne, NRC

Presentation

- Using sociology and mathematics, the NRC tries to predict what people might do in particular situations, like wildfires
 - A simulation framework
 - Looking at a certain scenario and determining what will happen next
 - Fire development
 - Traffic response
 - Pedestrian movement
- Three scenarios given an initial fire
 - How does it develop? Where does it go? What conditions are produced?
 - 1. Before the fire
 - Where to build structures?
 - Impacts of adding another road?
 - Impacts of changes in population?
 - How do these factors impact the time it takes for people to reach safety?
 - 2. Regulators – how will a regulatory change impact the level of safety?
 - If requirements are changed on a certain building type, how will this impact the survivability of the building and the time it will take for people to reach safety?
 - 3. The fire has developed
 - Simulations can help with the communication process and help inform emergency responders
 - Post incident
 - How can certain incidents be used to simulate what happened?
 - What could happen?
 - What should happen to provide more insight into understanding the outcome of an event?

Panelist: Patrick Barbeau, Intact Financial Corporation

Presentation

- Insurers spend a lot of time trying to plan for big events and natural catastrophes; this involves:
 - Modelling exposures in advance
 - Evaluating insurance coverage
 - Stress testing your capital
- However, there also needs to be planning from an operational perspective
 - Once a disaster hits, an insurance company needs to deploy huge capacity on the phone and ground
 - Different types of expertise involved
- Critical to start planning well in advance
- Wildfires will impact the entire community
 - E.g. Fort McMurray – the community's recovery was impacted by the interruption of key services such as hospitals, public services, grocery stores, gas stations
- Insurance companies need better coordination and collaboration with emergency management and government officials of all levels
 - Insurers are usually first to talk to the evacuees, and it is important to provide people with clear and accurate information
- When a disaster strikes, from an insurance perspective, there are things that should be activated:
 - Quickly increase phone capacity
 - Immediately prepare the field response
 - How many people to send out? Types of expertise needed? How to deploy?
 - Prepare communication with all stakeholders
 - For the above to be effective, the magnitude of the event needs to be understood
 - E.g. in the Fort McMurray wildfire, Intact used satellite imagery to help view parts of the city that were destroyed and parts that were untouched
 - Produced a very good estimate of the event loss

Ensuring the Viability of the Alberta Property Insurance Market



Moderator:
Sean Russell
Managing Director,
Guy Carpenter



Joseph El-Sayegh
President & CEO,
SCOR Canada Reinsurance



Alan Frith
Senior Manager, Consulting
and Client Services,
AIR Worldwide



Brad Geddes
Executive Director,
Recovery Operations,
Alberta Emergency
Management Agency



Keith Hartry
SVP & COO,
Wawanesa Mutual
Insurance Company

[CatIQ Blog – Improving Wildfire and Flood Risk Mitigation in Canada](#)

Alberta is no stranger to extreme events and has received its fair share of severe weather. This has led to the question: Is Alberta even insurable anymore? It is now so important for all levels of government, insurance and reinsurance companies to work together to mitigate against these disasters and minimize the losses that may occur.

Moderator: Sean Russell, Guy Carpenter

Is climate change impacting Alberta more than other regions?

- **Panelist: Alan Frith, AIR Worldwide**
 - No scientific consensus that Alberta is being affected more than other regions from long-term climate change trends. However, it is expected that there will be more extreme events and Alberta is likely to be more impacted by cyclical changes such as the ENSO cycle.
 - The more exposure there is, and the more concentrated that exposure is near urban centers, the more damage can occur from these events
- **Panelist: Keith Hartry, Wawanesa Mutual Insurance Company**
 - Alberta is being impacted by more storms than before
 - Calgary and Red Deer have more than doubled in population
 - These areas are where most of the storm activity takes place

What is the role of government and what is the role of insurance before, during and after a catastrophe? Are we living up to these roles?

- **Panelist: Brad Geddes, Alberta Emergency Management Agency (AEMA)**
 - The insurance industry and government provide service in a very different way
 - The insurance industry's role is to coach families on the next steps

- When looking at recovery it can be viewed as a whole of society approach
 - Ministries take the lead in the different pillars, such as:
 - the people
 - the environment
 - the economy
 - The province tries to create a new normal
 - Different levels of government will try and get a community to understand this new normal

- **Panelist: Keith Hartry, Wawanesa Mutual Insurance Company**

- Need collaboration between the different stakeholders
 - Wawanesa worked closely with the AEMA during the Calgary floods

Alberta is not the only region in the world that has experienced a large number of CAT losses. It would be interesting to hear Joseph's perspective on what happens in other regions:

- **Panelist: Joseph El-Sayegh, SCOR Canada Reinsurance**

- The government is usually heavily involved in other regions of the world that have experienced a large number of CAT losses
 - The government takes care of the first part of the losses and then the reinsurers take care of the next steps
- Canada is unique, amongst the G7 countries, in the sense that there is not a lot of government support
- Reinsurers role:
 - Reinsurance companies are the insurers of the insurance companies
 - Money from insurance companies is ceded out to reinsurance companies who assume part of the risks
 - There is a multitude of reinsurers involved
 - Reinsurers bring stability and diversification into the market

Are there other lessons we can learn from some of the losses that happened elsewhere in the world?

- **Panelist: Alan Frith, AIR Worldwide**

- Although Alberta is not subject to severe catastrophic events like hurricanes, the province is significantly impacted by severe thunderstorms, wildfires, and floods
 - Severe thunderstorm events are subject to some of the same pressures that occur for hurricanes, such as the winds
 - Hail storms: there can be hail resistant roof coverings and wall sidings, which can have a big impact on resiliency

- Wildfires: respond best to whole community-based mitigation
 - If one house is burned down that is located 10 yards away from another house, that house will also likely burn
- Floods: moving away from the flood plain or raising structures or the service equipment
- Models can be leveraged to understand the financial implications of all of these mitigation techniques

- **Panelist: Joseph El-Sayegh, SCOR Canada Reinsurance**

- ICLR has been involved with advising the government on new building codes
 - Do not forget the basics – the mitigation and reduction of risk
 - Building better, updating building codes, and being fire smart

Is Alberta viable as a place to make the business for insurance? Are the rates adequate? Is it possible to get the rates adequate? Is it sustainable? What would it take to make it sustainable?

- **Panelist: Keith Hartry, Wawanesa Mutual Insurance Company**

- It must be – people require insurance, so there needs to be a way to make Alberta viable
- Some people will have to accept more exposure themselves than they are used to
- Governments might end up having more exposure than what they have had in the past
- Solutions are out there, and there are different ways of mitigating the losses

- **Panelist: Joseph El-Sayegh, SCOR Canada Reinsurance**

- The premium of the many pay for the losses of the few
- Alberta must be viable, but how? Need other means than having the rest of the Canadian market subsidizing the area
 - A holistic approach
 - Involving government, insurance and bank industries
 - Mitigation of risk by educating the public

East vs. West – Understanding the Macro-Economic Impacts of Earthquakes



Moderator:
Craig Stewart
Vice President, Federal Affairs
IBC



Pedro Antunes
Deputy Chief Economist,
The Conference Board of Canada



Balz Grollmund
Head Treaty Underwriting,
Canada & English Caribbean,
Swiss Re



Justin Moresco
Senior Product Manager, Model Product
Management,
RMS

It is well known to many Canadians that the west coast is vulnerable to a big earthquake, and the risk is well understood. On the other hand, an earthquake occurring in the St. Lawrence Corridor is very likely but not well understood by the citizens. Experts on this panel reviewed the western Canada earthquake scenario and discussed the impacts should a large earthquake impact eastern Canada.

Moderator: Craig Stewart, IBC

- March 11, 2011, megathrust magnitude 9.1 earthquake struck off the coast of Tohoku, Japan
 - Thousands of buildings collapsed and were damaged
 - Over 18,000 people lost their lives and over 150,000 people remain displaced from their homes
 - This event exceeded all models of how strong an earthquake could occur in the Honshu subduction zone by a factor of 10
- A 2013 AIR Worldwide report projected losses for a major earthquake in the Cascadia subduction zone (BC) and for the Montreal-Charlevoix corridor (QC)
 - The government would face significant financial exposure due to the underinsurance gap in eastern Canada and parts of BC
- Currently, the Conference Board of Canada is working on an eastern Canada scenario

Panelist: Justin Moresco, RMS

Presentation - When it rumbles in Quebec

- Evident that a large earthquake will occur under or near a major city in Quebec
- Not many people understand the potential extent of damage caused by a large earthquake in the east
- Seismicity in Canada from RMS data
 - More earthquakes occur in western Canada than eastern Canada
 - The St. Lawrence Valley corridor has a lot of seismic activity
- 5 main components to the RMS Earthquake model framework

- Stochastic Event Module
 - Contains tens of thousands of simulated earthquake events
- Hazard Module
 - Calculates ground motion for each event
- Exposure Module
- Vulnerability Module
 - Calculates damage and uncertainty for each location and event
- Financial Module
 - Calculates portfolio loss metrics
- Quebec Economic vs. Insured year property loss for a 1-in-500-year property loss
 - ~ \$15B in residential economic losses
 - ~ \$18B in commercial and industrial economic losses
 - Low earthquake insurance take-up in Quebec leads to a big insurance gap
 - ~ 97% residential gap
 - ~ 60% commercial gap
- Seismic risk can also be described by looking at losses should historical events occur today
 - 1663 M7.0 Charlevoix Earthquake (100 km NE of Quebec City)
 - Large area sustained damage, however, due to location of earthquake, most of the shaking did not occur in areas with high exposure value
 - Therefore, RMS estimates today ~ \$4.5B CAD in residential economic losses
 - ~ \$110M CAD today in residential insured losses
 - 1732 M5.8 Montreal Earthquake
 - Sustained damage was not very large, however, intense shaking occurred in an area of high exposure value
 - ~ \$30.7B CAD today in residential economic losses
 - ~ \$1B CAD today in residential insured losses
- Increasing insurance take-up rates can lead to earthquake resilience

Panelist: Balz Grollmund, Swiss Re

Presentation - East Vs. West: Earthquake Underinsurance in Quebec

- Eastern Canada is not ready for a big quake
 - Many residents are not insured, which will negatively impact recovery and government will be financially burdened
 - Quebec is near the bottom of the global list relating to take-up rates for residential earthquake insurance
- Resolving the protection gap is a societal issue
 - Earthquakes cause disruptions in economic activity, particularly in regions that are not prepared and with large uninsured assets
 - The loan to value ratio of Quebecers is one of the highest in Canada

- Earthquake damage will put pressure on mortgages and therefore, banks
- Governments to face large liabilities
 - Government is a central stakeholder
 - Losses impact residential, public and commercial assets
 - A lot of implicit and explicit expectations of government
- Secondary effects after an earthquake
 - Unemployment and reduced business activity
 - This adds pressure to homeowners, banks, and thus governments
- Factors for low take-up rates in Eastern Canada:
 - Optimism bias
 - Unaware of risk
 - Wrong understanding of current insurance protection
 - 58% of Quebecers believe their fire policy covers earthquake damage
 - 77% are unaware that they are not insured for earthquake damage
 - Reliance on government support
 - Product may not meet expectations
 - Too expensive? I.e. large deductibles

Panelist: Pedro Antunes, The Conference Board of Canada

Presentation - Upcoming Study: Measuring the Economic Impact of a Major Earthquake in Montreal

- Generating economic forecasts for the Canadian economy
 - Looking at the levels of GDP, employment, government revenues
 - Try to build risks into the forecasts
- Western Canada study
 - Study was not meant to be alarmist
 - Measuring the cost of destruction of household property, damaged or destroyed infrastructure, and lives lost
 - GDP
 - Business interruption and loss of productive capital will reduce economic activity and lower GDP
 - Cleanup, replacing destroyed property and rebuild will add to GDP
 - Disasters generally reduce productive capacity but add to GDP
 - Economic Impact Analysis
 - Measuring “shock-minus-control” effects
 - Evaluate impacts over time
 - Vancouver earthquake study - simulations conducted over a 10-year period
 - Income flow over 10-years can help determine how long rebuild will take and who will pay
 - Earthquake plus rebuild: Impact on Canada’s GDP
 - Recovery takes time
 - Years 1 & 2: a decline in economic activity

- Year 3: reinvestment coming
- Year 6: all the investment required to rebuild capital stock has returned to the levels prior to the earthquake



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