

# CONFERENCE PROCEEDINGS

## February 4-6, 2019 Metro Toronto Convention Centre

Bringing Together Industry, Academia and Government to Discuss Canadian Natural and Man-Made Catastrophes

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## February 4

## Interactive Workshop Hosted in Partnership with Federation of Canadian Municipalities (FCM)

Workshop Facilitator: Sara O'Neill, FCM

**Opening Speaker: David Phillips, Environment and Climate Change Canada (ECCC)** 

## **Presentation**

David Phillips discussed trends in Canadian extreme weather events that have occurred over the past 25 years, with 2018 as a focus. He offered direction and insights on mitigating the risk of future weather-related catastrophes.

- 1996 Saguenay flood was Canada's first \$1B flood
- Extreme weather events have been increasing over the past 25 years
  - Insurance costs have increased
    - Insurers spending more on water-related disasters than fires
  - Outdated building codes
- Various factors contribute to the increased occurrence of natural disasters:
  - Aging infrastructure
  - Weather instability
  - Increase in impervious surfaces
  - Loss of wetlands
  - Increasing population in vulnerable areas
- 2018
  - Rain = flooding in Toronto
  - Forest fires in cottage county
    - Poor air quality in AB due to extended wildfire season
  - Eastern ON tornadoes in September
  - Southern ON windstorm Alonsa, MB Tornado
  - o Southern ON May windstorm
- There is a need to recognize risk earlier



The workshop focused on three stages of the disaster management cycle. The three municipal speakers emphasized the importance of better preparation and mitigation measures to improve recovery efforts and reduce losses.

## Disaster management cycle

- Preparation
- o Response
- o Recovery
- Mitigation

## David Chernushenko, Urban Renewal Leader

- Risk vulnerability
  - o Knowable
    - Severe weather threats
  - o Unknowable
    - Where? When? To what degree?
- Preventing future loss through mitigation
  - E.g. Hanover, Germany implemented preventative measures which resulted in reduced costs and destruction in a flood the following year
- Low impact development (LID) naturalization, undoing hardened surfaces

## Adam Davey, City of Prince George/PG Fire Rescue

- The response of the 2017/18 Prince George, BC forest fires
- In large (non-linear) events such as these, command is not unified making it difficult to centralize control
- Need a unified command
  - Horizontal approach (non-chain & command) should be applied
    - Allows everyone to be prepared for a large event

## Mike Carr, Saint John Emergency Management Organization

- Recovery is not well understood
- Holistic approach and greater stakeholder diversity needed for municipalities
- Balance of complexity
- Lessen the impact (improve preparation and mitigation)
  - o Better land use planning policies



#### **Results from Working Groups**

#### **Risk Vulnerability**

- Identify the meteorological and climatological risks for the area
  - Frequency, severity, location
- Examine vulnerabilities for each risk under people and infrastructure and prioritize
  - o Consider insurance availability and ability to evacuate
  - Exposure analysis
  - Failure assessment
  - Stress tests
- Identify data sources and collect information
  - Survey the community discuss the risk and preparedness
    - Use effective visuals, such as mapping and virtual reality
  - Inspections on infrastructure, including emergency services, and map the information

## Response

- Pre-event:
  - o Effective communication, recruit volunteers and provide training
  - Evacuation plans with surrounding communities
  - Connect with other resources and programs
- During event:
  - Coordinate, command, collaborate and control
- Post-event:
  - Data collection, document conclusions

## Recovery

- Form a regional recovery group
- Incorporate various sectors
- Create a hazard-based recovery plan



## February 5

## 2018 CATs in Review

## Laura Twidle – Director, Catastrophic Loss Analysis, CatlQ

## Presentation - 2018 CATs in Review

- CatIQ delivers:
  - Detailed analytical, insured loss & exposure estimates
  - Information on natural and man-made disasters
- A catastrophe (CAT) is declared when an event causes over \$25M of industry insured losses
- A notable event (NE) is declared when an event causes between \$10M and \$25M
- In 2018, CatIQ declared 12 CATs and 9 NEs
- \$1.9B of CAT insured losses in 2018 (as of January 2019)
- Ontario resulted in the highest provincial insured loss

## Translating Climate Change and Extreme Weather into Practical Application for the Capital Markets

This session focused on the disclosure of material risks due to climate change through the Task Force on Climate-related Financial Disclosures (TCFD) as well as the Canadian Securities Administrators (CSA) 51-354. The panelists highlighted the need for communicating and translating climate and extreme weather risks in financial terms.

## Moderator: Blair Feltmate, Intact Centre on Climate Adaptation

## Panelists:

Tania Caceres, Principal Risk Nexus Ian McPherson, CEO, Global RESP Corporation

- Financial services
  - o Standardization of information
    - Challenge for climate change risk to be standardized
    - Another challenge is that disclosure of climate change risks is voluntary
- TCFD
  - o Standardization usable for governments, investors & lenders
  - o Guidance to municipalities, improve their credit risk rating
- Senior business leaders need to make climate change a priority



- Need to quantify:
  - Earnings/share forecast
  - Discount rate
  - Impact on valuation
  - ROI as opposed to risk avoidance need to emphasize investment opportunity
- Timing mismatch and priority level
  - Climate change risks take a long time to play out, uncertainty as to where they will hit
  - Lack of urgency environmental risk ranks 8<sup>th</sup> among all risks
  - Where is investment going to get hurt? action vs. inaction

## **Lessons Learned on Hurricanes**

This session addressed the financial and technical (forecasting) aspects of hurricanes as well as potential threats and communication difficulties in Canada.

## Moderator: Jim Abraham, ClimAction Services

## Panelist: Steven Bowen, Aon

Presentation – Hurricane Losses: Many Challenges. Increasing Risk.

- ~¾ of total insured losses are from hurricanes in the U.S.
  - Outside of U.S., a large majority of losses are uninsured when hurricanes occur
  - Large protection gap when significant impacts occur inland
    - Hurricanes Harvey and Florence
- Population growth and people moving to vulnerable locations (e.g., Louisiana, Florida)
- Retrofitting structures that already exist
- Consistency in building codes

#### Panelist: Dr. Christopher Melhauser, SCOR

Presentation – Lessons Learned on Hurricanes

- Technical aspects of hurricane forecasting
  - Tracking & intensity
- Generally, uncertainties in weather models have reduced and agreement between models have increased
- Track accuracy improvements
- How to improve track forecasts for extra-tropical transitions?



## Panelist: Bob Robichaud, Environment and Climate Change Canada

## Presentation – Challenges of Communicating Tropical Cyclone Threats in Canada

- Threat of unpredictability for post-tropical storms
- Hurricane awareness tours with support from National Hurricane Center
- Many hurricane paths since 1800s have entered Canadian waters
- Hurricanes move slowly westward/northwestward after forming in Atlantic, accelerate as they move northward, and then transition to post-tropical storms
- A post-tropical storm can be stronger than a tropical storm
- Predictability of post-tropical storms can be challenging due to:
  - expanded wind fields
  - o asymmetrical and spread out rain bands

## **Nuclear Emergency – Onsite and Offsite**

Preparing for man-made disasters is important, however, can be overlooked. The panelists discussed the risk of a nuclear disaster in Canada and the role that the province and nuclear plant would play in the response.

## NIAC CatIQ Connect Highlights Video

Session Q&A provided by NIAC

## Moderator: Colleen DeMerchant, NIAC

## About NIAC

- Federally mandated insurance pool and provider/underwriter in Canada under the authority of the Nuclear Liability Act
- Responsible for paying out claims related to nuclear reactors, suppliers of materials
- Inspections, risk transfer and risk management
- Brings together key stakeholders in insurance and nuclear expertise to identify low probability but high severity claims
- Helps ensure Canadian nuclear facilities comply with best practices

Click for a full recap on NIAC provided by NIAC



## Panelist: Steve Thompson, Bruce Power

Presentation – Emergency Management

Click for the video of Steve's presentation provided by NIAC

#### About Bruce Power:

- Ontario's largest nuclear power plant
- Nuclear energy accounts for 60% of power generation in Ontario
- Catastrophe response framework
  - Series of concentric circles analogy the first, Bruce Power, the second, the municipality, third, the Province of Ontario, and finally, the federal government
  - 24/7 on call emergency response teams to respond to a variety of catastrophes
- Several emergency response facilities
- Different kinds of incidents classified by severity in descending order:
  - Reportable events
  - o Abnormal incidents
  - On-site emergencies and general emergencies

#### Panelist: Dave Nodwell, Government of Ontario

Presentation – Provincial Nuclear Emergency Response Plan

Click for the video of Dave's presentation provided by NIAC

Ontario's role in responding to a nuclear emergency:

- The emergency response plan responds to nuclear emergencies such as:
  - o accidents at a plant or while transporting radioactive materials
  - o satellite re-entry
  - nuclear material and radiological dispersal devices as well as nuclear bomb detonation
- The Province of Ontario is responsible for offsite consequences of an emergency (e.g. evacuation)
- Canadian Nuclear Safety Commission (CNSC) responsible for onsite planning and response
- Response objectives are to prevent and minimize effects of ionizing radiation



- Level of activation determined by emergency operations centre 15 minutes post incident
- Precautionary, exposure control and ingestion measures are taken
- Thyroid blockers in conjunction with temporary sheltering and evacuation may be used to help protect people from radiation
- Public notified via TV, radio, social media, emergency broadcast alerts to smartphones (NAADS)

## **Keynote Speaker: Howard Kunreuther**

## The Ostrich Paradox: Why We Underprepare for Disasters

Howard addressed the human tendency to react to catastrophes as opposed to being proactive. Howard provided suggestions on how to influence homeowners to take long-term flood mitigation measures.

- Intuitive thinking vs. deliberate thinking
  - Humans are good at intuitive thinking but not the latter because of a short-term focus
  - Deliberate thinking involves a long-term strategy for preparing for low probability events
- Investment in adaptation requires long-term thinking
- 6 decision biases that influence people's lack of action on disaster preparation
  - o Myopia
  - o Amnesia
  - o Optimism
  - o Inertia
  - Simplification
  - Herding
- Multi-year insurance policies to reduce cancellations and diversify risk over time
- Equity and affordability
  - Vouchers for those who may not be able to pay

## **Climate Change: From Science to Actionable Insight**

This session focused on the science and modeling of various weather and climate hazards, and how data and research can be put to action to help build resiliency to better prepare for and recover from natural disasters in Canada.



#### Moderator: Kimberly Roberts, JLT Re

#### CatIQ Blog – Climate Change and Extreme Weather

- Increased water vapour in the atmosphere due to warming can lead to more occurrences of extreme rainfall and an enhanced greenhouse effect
- Reduced ice coverage causing:
  - o reduced north-south temperature gradient
  - reduced jet stream strength
  - o increased ridging and troughing of the jet stream
  - slower movement of weather systems
  - long-lived weather events (longer droughts, longer precipitation events)

#### Panelist: Pete Dailey, RMS

#### Presentation – Climate Change: From Science to Actionable Insight

- CAT models are needed to understand how severe weather risks are influenced by climate change
  - o CAT models can then overlay risk on exposure
- Sea level rise due to:
  - Higher ocean temperatures
  - Additional volume of water due to melting/ablating ice sheets
- More extreme events
  - Size of distribution is expanding, tails are expanding (more drought conditions, highlevel precipitation events), while mean of distribution may not change at all
- Hurricanes
  - A decrease in frequency and increase in severity expected

#### Panelist: Dr. John Hanesiak, University of Manitoba

#### CatlQ Blog – Future Hail and Severe Weather Environment

#### Presentation – Future Hail and Severe Weather Environment

- Challenging to model hail formation
- Historical data useful for predicting the future based on variations in atmospheric flow regimes
- Climate models unable to replicate small-scale storms
- Hailcast model that simulates hail formation using climate models
  - A decrease in number of hail days but an increase in size



- $\circ$  Seasonal shifting
  - Increase in Midwest U.S. for March-April-May
  - Shift northward to boreal forest in June-July-August
  - Severe hail events one month earlier in Ontario
- Changes mainly due to increases in temperature and humidity

## Panelist: Dr. Adam French, UPEI

- Overall loss of 20 km<sup>2</sup> in PEI from 1968-2010
- CLIVE CoastaL Impact Visualization Environment
  - o Helps communities understand coastal flooding
  - Virtual reality is a powerful tool to communicating and understanding climate change impacts

## **New Technologies and Techniques**

This panel discussed initiatives that are being undertaken to ensure that when it comes to disasters, we are better able to forecast, communicate, and gauge the impact quickly through new technologies.

#### Moderator: Kyle Winston, CRU Group

#### Panelist: Ken Macdonald, Environment and Climate Change Canada

Presentation – Weather Prediction and Alerting (English)

Presentation – Weather Prediction and Alerting (French)

- Environment and Climate Change Canada
  - Runs the Meteorological Service of Canada
  - Compiles and analyzes climate data for modeling
  - o New technologies enable better prediction abilities
  - Better modeling can facilitate better preparation for potential CATs
  - E.g. B.C. Wildfires Natural Resources Canada collects and forecasts wildfires using satellite imagery
  - Remote sensing stations aid in predicting/tracking events, such as severe thunderstorms
  - Satellite, aerial, and ground imaging used to survey damage
  - Different methods of dissemination of weather alerts such as TV, radio, weather.gc.ca, email, Twitter, app, Alert Ready, VHF radio



#### Panelist: Ferdinand Diermanse, Deltares

#### Presentation – New Technologies for Urban Flood Risk

- Specialist consultancy on water, soil, infrastructure
- Uses 3D graphic models to model flooding
- Virtual reality used to show underground infrastructure, flood plains
- Models can show where key infrastructure is located (e.g. waste water, drinking water, transit)
- Adaptation in the urban environment:
  - o green walls, rooftop farming, rain gardens, open water ponds
  - knowledge of local climate and Geography
  - tools can be used for long term planning in cities

#### Panelist: Dr. Lars Dyrud, EagleView

#### Presentation – Remote Sensing and Machine Learning-Cat Response

- Uses drones and artificial intelligence (AI) in imagery and area surveying to help determine risk factors for CATs
- Respond to fires and storms
- Als have several abilities:
  - o triage
  - o first response coordination
  - o virtually assessing damage
  - o manage claim activities

## **Lessons Learned on Recent Events**

This session focused on the increasing prevalence and risk of natural catastrophes in Canada and how the insurance industry and communities are preparing for and responding to disasters such as wind, fire, and flooding.

#### Moderator: Deirdre Laframboise, FCM

#### Panelist: Ron Biggs, RSA Insurance Group

#### Lessons Learned: May 4<sup>th</sup> Wind Catastrophe, An Insurance Provider Perspective

• Holistic insurance approach regarding wind events (high frequency, low severity), particularly the May 2018 windstorm in Ontario and Quebec



- Canada must increase its capacity for dealing with and allocating resources for natural catastrophes
- Flexible capacity plans required
  - o Customers should be aware of their risk factors in certain areas
- Communication needed between vendor partners
- A major challenge in the insurance industry is that homeowners are not reading their home insurance policy
- It is necessary to have an updated customer communication strategy

## Panelist: Tasmin Lyle, Ebbwater Consulting

Presentation - The Flood Story from the Left Coast: Where are we at? How did we get here? Where can we go?

- 2018 flood season in B.C.
  - Flood due to snowmelt in Dawson Creek which had not happened previously
- Currently, about 35,000 people are exposed in a floodplain in the Fraser Valley
  - Sea level rise will have huge impact
  - Exposure (number of people) increasing
- Exposure = opportunity for risk reduction
- Outdated dikes need to be improved

## Panelist: Jim Rook, Municipality of Killarney

## Presentation – Parry Sound 33 Wildfire: My Story, July and August of 2018

- July-Aug 2018 wildfire in northeastern Ontario
- Killarney cottage country
  - Heavily reliant on volunteer support
  - Very little cell phone coverage
  - Hot and dry weather created favourable fire conditions
  - Challenging to deal with due to strong winds
  - Forced evacuation of Key Harbour and Henvey Inlet, but lighter winds allowed fire to be contained
- Key takeaways:
  - Being proactive leads to success in Emergency Management Services
  - Formal evacuation plans needed



## Are Critical Services at Risk and Are They Adapting?

This session focused on the risks to power supply and infrastructure from extreme weather. There was an emphasis on the importance of maintaining and updating critical services and infrastructure, so they can withstand extreme weather events and minimize impacts.

Moderator: Chad Nelson, Infrastructure Canada

Panelist: Scott Davis, International Association of Emergency Management – Canada

Presentation – Are Critical Services at Risk and Are They Adapting?

- Capacity building in municipalities
- Conservation authorities and local university departments should provide severe weather event analytics
- Essentials for making cities resilient to catastrophic events
  - Financial capacity of municipality
  - Uninterrupted power supply for dispatch systems
  - Establishing alliances and building partnerships, both between municipalities and conservation authorities

## Panelist: Catherine Blair, Alectra Utilities

- Improved grid technologies providing better adaption to extreme events
- Relation of extreme weather, particularly extreme cold, to large hydro pole fires due to salt brine
- Microgrid technology
  - Utilizes renewable energy
  - Stores energy in batteries as backup during power outages
- POWERHOUSE pilot (alternate energy solutions) gives homeowners ability to control source of energy (grid vs. on-site) and control energy consumption

#### Marianne Armstrong, National Research Council Canada

## <u>Presentation – NRC's Climate-Resilient Buildings and Core Public Infrastructure Initiative</u> (CRBCPI)

- Climate proofing buildings, such as hospitals and bridges
- Designing resilient buildings through codes and models
- Heat waves account for many deaths



- Critical that cooling systems work, especially in hospitals due to greater volume of people during heatwave
- Bridges
  - Updating the design code to reflect future climate change and CATs
- Stakeholder engagement is critical for climate change adaptation
  - Canadian Centre for Climate Services

## **Student Delegates**

Christopher McCray, McGill University

Presentation – Long-Duration Freezing Rain Events Over North America

- Freezing rain is a leading cause of winter CAT losses in U.S. and Canada
- Freezing rain presents challenges for meteorology
  - o Requires a precise atmospheric temperature profile
- Research question: What conditions help maintain freezing rain events for long periods of time?
- Identifying freezing rain events
  - Data collected from 1979-2016 from 579 surface weather station observations in Canada and the U.S.
  - Freezing rain events happen most often in northeastern US and southeastern
    Canada, however, freezing rain events that occur in the southeast and south-central
    US are more persistent (in terms of duration)

## Maja Kucharczyk, University of Calgary

## <u>Presentation – Pre-disaster mapping with drones: an urban case study in Victoria, British</u> <u>Columbia</u>

- Pre-disaster mapping with drones
- Images of ground and drone disaster assessment used
- Comparing:
  - o the drone's 3D map to Google Earth's
  - o pre-disaster images to post disaster images for better damage assessment
- Equipment challenges:
  - Drone's camera only points down, leading to distorted 3D images
  - However, top images turned out adequate for roof damage detection
- Improvements could be made by using a different drone for future mapping



## **Carlos Herrera, University of Victoria**

<u>Presentation - Evaluating ground motion models calculated for Canada with observations from</u> <u>very large earthquakes</u>

- The southwest coast of Canada (Cascadia) contains a subduction zone between the Juan de Fuca Plate and the North American Plate
  - The Juan de Fuca Plate system subducts beneath the North American Plate
- Similarly, in Chile, the Nazca plate subducts under the South American Plate
  - Studied for comparison to the west coast of Canada scenario
- Four different earthquakes were examined in Chile, but one earthquake in southern Chile is a good comparison for the Cascadia scenario as it presents similar site conditions
- Site effects:
  - Depending on the surface, amplification of earthquake waves can change
  - Ground motion prediction equations and site effects must be considered when constructing buildings



## February 6

## **Fireside Chat**

## Moderator: Jason Thistlethwaite, University of Waterloo

## Keynote Speaker: Henk Ovink, Kingdom of The Netherlands & Rebuild by Design

Action is needed to mitigate the impacts of flooding in Canada. Henk Ovink provided insights on approaches and perspectives towards flooding issues in the Netherlands and around the world. The need for region-specific solutions and collaboration between all stakeholders and decision makers was emphasized throughout the discussion.

- Flooding is currently Canada's most costly natural disaster
- Climate change offers different challenges in different areas
  - $\circ$   $\,$  No global standard for adaptation
- Being proactive vs. reactive requires collaboration, stakeholder engagement and transparency
- Living with water is part of the culture in Netherlands
  - E.g. City of Rotterdam has accepted living with water rather than treating it as a problem
- Comprehensive long-term perspective connected with short-term intervention
- Important to acknowledge complexity of challenge, but also grasp its full impact
- Disasters expose resiliency issues
- Intergovernmental Panel on Climate Change differences between 1.5 and 2°C global increase in temperature is significant
  - Both mitigation and adaptation are important
- Regulatory changes and ground-up approaches needed

## **Risk Communication and Personal Action**

Many Canadians are unaware of their flood risk and, as such, are ill prepared. Different measures and actions to increase resiliency at a personal, home and community level were explored.

## Moderator: Shawna Peddle, Canadian Red Cross

Presentation – Flood Preparedness and Community Engagement

Panelist: Sandy Davis, City of Calgary



Presentation – Calgary River Flood Risk Public Awareness Program

## Panelist: Carrie Baron, City of Surrey

Presentation – CatIQ Connect, Surrey's Risk Communication

- Several barriers are preventing action for flood preparation:
  - o Expensive
  - o Unlikely to occur
  - Ineffective "solutions"
  - Lack of knowledge about flood-proofing
  - Too much effort
- How can we overcome this?
  - Solution oriented messaging
  - Personal action may be the key factor
    - Personalizing the issue helps convey the message
    - Messaging must be delivered in different ways (social media, print, mail, etc.) and in different languages
  - o Engagement and awareness of different stakeholders
    - Push a unified flood prevention message
  - Developers of homes should incentivize the building in of flood-proofing measures
  - Drills should be held so that people know what to do and where to go if a flood occurs
- Communication with the public is necessary for life and property protection (both public and private)
- Plan for the vulnerable population
- People must understand, prepare, and stay informed
- Everyone's role must be defined and emphasized (municipal, provincial, federal, and citizens).
- Graphics and simulations of flooding can be very effective

## **Codes & Standards**

Extreme events and climate change need to be considered in new building codes. This session outlined the Canadian codes and standards network, how standards and guidelines are developed, and examples of real-world solutions being implemented.



## **Moderator: Glenn McGillivray**

Panelist: Philip Rizcallah, National Research Council

## Presentation – Canada's Codes Development System

- National building codes updated every 5 years
- 2015-2020
  - Committees looking at projections of weather patterns rather than historical weather data for future wind, snow, and rain
  - Changes can be very dramatic depending on the climate model
  - Balance between affordability and practicality
- For the first time, national building codes will incorporate standards for flooding, including basement flooding
- Building for the future is new philosophy of the commission

## Panelist: Dwayne Torrey, CSA Group

## Presentation – Standards

- Standard set of rules determined by group of experts
  - Minimum expected requirements
- CSA Canada's oldest and most developed standards organization; independent, not-forprofit organization accredited by the Standards Council of Canada
- Basement flooding standards, if implemented nationwide, can make a big difference in Canada's resiliency towards heavy rainfall events

## Panelist: Barbara Robinson, Norton Engineering

Presentation: Codes, Standards, Flooding, Risk, Costs: An Expert Engineer's Perspective

- New sewer leakage problem
  - Often 10-15 times accepted rate, resulting in greater water use, greater treatment costs, and wasted consumer money
  - o Not performing required testing of new infrastructure
- Leaks at property lines
  - Differential settlement (different times of backfilling on public and private property)
- Additional water that enters sewage system from new developments places additional strain on downstream sewage system (trunks)
- Collaboration and open access needed between municipalities and insurance



## Mortgage Impairment Due to Earthquake Loss in Canada

This session discussed the physical and financial risks should a catastrophic earthquake occur in Canada. Topics of discussion included, the insurance coverage in southern Quebec, evaluation of risk in different regions and buildings, and the impact of an earthquake on investment portfolios and financial institutions.

Moderator: Paul Kovacs, ICLR

Panelists: Phillip Wassenburg, Munich Re Canada Hugo Gomes, CMHC Raza Hasan, HSBC Bank Canada

- Understanding economic impact of earthquakes in British Columbia, Ottawa, and southern Quebec
- Lack of urgency to promote earthquake coverage in Quebec
  - Only 3-4% of homeowners have earthquake insurance
  - There is a 5-15% risk of an earthquake of M7 in next 50 years (southern Quebec)
- Liquefaction can destroy homes & make homes inhabitable
- Classify earthquake risk in different regions and buildings, determine whether it is safe to remain in certain buildings
- What is the projected loss on portfolio in the case of an earthquake?
- What risk is the bank prepared to take?
  - Credit exposure
  - Purchase insurance to cover risk (manage net exposure)
- Awareness education needs to be given to the public to get the take up rate to 50% in a high-risk region
  - It could be mandatory for homeowners to have earthquake insurance when they purchase, but it is hard for banks to monitor later

## Keynote Speaker: Ed Struzik

Ed spoke to the history of fire suppression in North America after European settlement, the recent increase in the number of forest fires as well as ensuing environmental challenges, and the consequences of more frequent forest fires in Canada in the future.

CatlQ Blog – Fighting Historic Wildfires Amid Bad Ideas and No Funding

• Indigenous Peoples considered wildfire as a natural and necessary part of the environment



- Would often start their own burns to avoid a future catastrophic wildfire
- European settlers hadn't experienced forest fires back home
- After Little Ice Age, forest fires occurred more frequently
  - Fire was demonized through advertising
- Fire suppression became the strategy and practices of lighting small fires were considered ineffective
- Pine beetle infestation cause trees to die adding fuel to the forest floor
- Frequency of forest fires have increased and have become more unpredictable into the 21<sup>st</sup> century
- PyroCb (thunderstorm) created from heat (and ash) of forest fire
  - Can cause lightning away from forest fire, igniting more forest fires
- Changes to local ecology (animal migration, water quality)
  - The cost of treating water in Fort McMurray has doubled due to poor water quality and carcinogens; carbon flush concerns in other municipalities
- Recent California forest fire situation is a harbinger of what's to come in Canada
  - California challenges are migrating north
- 14 of the 15 largest forest fires in the U.S. have occurred since 2003
- Better early warning systems needed
- Need better building and landscape codes, and controlled burning
- 118% projected increase in forest fires this century in Canada, which will lead to changes in landscapes, degradation of water quality, and threats to community and company assets

# CatlQ Connect is brought to you by



## **SAVE THE DATE!** 5th Annual Canadian Catastrophe Conference February 3-5, 2020 - Metro Toronto Convention Centre



## **Steering Committee Members**

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> William Belzile Geographic Information System Advisor, Desjardins General Insurance Group

Alister Campbell CEO, PACICC

Claudette Cantin Chief Actuary and CRO, Munich Re Canada

Paul Cutbush SVP, Catastrophe Management, Aon

Esaie Djossou AVP of Reinsurance, CAT Underwriting, International Underwriting and Data & Insights functions, Aviva Canada David Etkin Professor, Disaster and Emergency Management, York University

Blair Feltmate Head, Intact Centre on Climate Adaptation, University of Waterloo

Sean Hobson VP, National Programs, WINMAR (Canada) International Ltd.

> Glenn McGillivray Managing Director, ICLR

**Ryaz Mohamed** Director, Corporate Reinsurance, The Co-operators Group

Shawna Peddle Director, Disaster Risk Reduction, Canadian Red Cross

> Sean Russell Managing Director, Guy Carpenter

Craig Stewart VP, Federal Affairs, IBC

Geneviève Thouin Project Director, MCIP, FCM

Dwayne Torrey Director, Construction & Infrastructure Standards, CSA Group

Laura Twidle Director of Catastrophic Loss Analysis, CatlQ Inc.

Rebecca Wagner Associate Director, MSC, ECCC

Kyle Winston President, CRU Group Inc.

Anna Ziolecki Director, Partners for Action