

# CATtales

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## Pestilence, drought, fires, floods and landslides

### Reflections from B.C.'s 2003 Firestorm

By Peter Fuglem, retired Director, B.C. Wildfire Program

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This year, as part of the 10-year anniversary of British Columbia's 2003 Firestorm, numerous radio and TV specials have covered the events of a decade ago and rekindled questions of how much progress has been made since the "year of fire". For B.C., 2003 was a year of seemingly biblical catastrophes, starting with rapid expansion of the mountain pine beetle (MPB) epidemic, punctuated with extreme drought and wildfires, and followed with floods and landslides made worse by the fires.

As the summer of 2003 approached, the combination of rapid MPB spread and expansive drought created unprecedented challenges for B.C.'s wildfire organization. As the season escalated in July with no relief,

firefighting resources became exhausted. But, as bad as things already were, it was going to get worse. Even before the first major loss when fire destroyed much of the town of Barriere, B.C. had already imposed on Canadian and U.S. wildfire agencies and contractors to lend everything they could spare. Over the next weeks agencies across Canada were requested to recall staff willing to return to support B.C. and requests were made to Australia and New Zealand. The Canadian military dedicated 2,700 personnel, contributing to a total of 7,700 firefighters and other staff working on wildfires, supported by a fleet of over 250 aircraft at a total cost of over \$9 million per day. The 2,500 wildfires in 2003 were not record ►

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Source: B.C. Government

in number, but were most difficult to control and extinguish due to the extreme fire behavior conditions, resulting in over 800 fires having to be fought simultaneously during mid-August. As seen with wildfires in steep terrain elsewhere in the world, B.C.'s drought ended with local downpours which washed fire damaged soils into Kelowna suburbs and other southern B.C. homes.

In spite of the largest wildfire effort ever mounted in Canada, the impacts were shocking. Wildfires in the province burned over 260,000 hectares, many times the 30,000 hectare annual average for the previous 20 years. Over 330 homes and businesses were lost, far exceeding the previous average of four homes per year. Almost 50,000 people were evacuated, some more than once, very fortunately without loss of life. Although the insured losses have been estimated at \$200 million, uninsured losses and economic impacts were many times that figure. Although communities like Kelowna were able to recover significantly, due in part to a high rate of property insurance penetration, others like Barriere are recovering more slowly, impacted by the loss of the Tolko sawmill at Louis Creek, which was not rebuilt.

Significant efforts were made to garner key lessons from the 2003 season. B.C.'s Premier appointed Manitoba's ex-Premier Gary Filmon to conduct a very public and independent review based on input from residents, communities and other interested parties. As well, a broad internal analysis was carried out to ensure staff were able to contribute to improvements at all levels of operation. Both reviews are available at <http://bcwildfire.ca/History/ReportsandReviews/>. As well, a significant national effort to develop a Canadian Wildland Fire Strategy (CWFS) was

undertaken to consider strategic direction for wildfire agencies, communities and governments. See <http://ccfm.org/english/coreproducts-cwfs.asp>)

The 2003 season has left lasting impressions. A key lesson for me was that in spite of any historical successes and advances in organizational capacity, wildfires can conspire to overwhelm any organization. I have a great appreciation for the endurance and efforts of provincial staff, contributions of the Canadian Interagency Forest Fire Centre and its member agencies, the Canadian Forces, contractors, fire departments, emergency organizations and the government of the day in stepping up to what was a massive challenge. The directness in dealing with the day-to-day difficulties and openness in assessing the opportunities for learning and improving for subsequent fire seasons was commendable.

Based on the reviews, strides have been made in B.C. and by other wildfire agencies in Canada to move forward from 2003 with major improvements. However, climate change and an expansion of public, industrial and private investment into Canada's wildlands continues to escalate threatening conditions. This intensifies my concern following 2003 that communities quickly move on to other challenges once the memory of wildfire disasters pass, often within months. Homeowners rebuild in the same areas, often with the same flammable materials and without changes in planning or community preparedness. This is in spite of the lessons learned and freely available *FireSmart* tools for communities, homeowners and industry.

We can wait for another Barriere, Kelowna or Slave Lake wildfire to reinforce the need for action, or work proactively to improve and expand programs

like *FireSmart*, wildfire training for urban fire departments, community wildfire sprinkler systems, and Incident Command Systems. The insurance industry can also play an important role in encouraging communities and homeowners to take effective action to protect themselves and their assets from wildfire. As we watch the 2013 wildfire season pass without major losses in Canada, eclipsed by flood events and the tragic train accident in Lac-Mégantic I think of how responders are expected to be prepared for almost unimaginable situations. We need to support them as well with appropriate tools to deal with emergencies, but also through efforts to prevent disasters.

In closing we cannot forget the inherent dangers presented by wildfires. In 2003 three pilots lost their lives in B.C., the deaths of Ian S. Mackay, William Eric Ebert, Behrnard George von Hardenberg serve as a reminder of the risks our wildfire fighters undertake. And in the 2003 California wildfires 22 civilians died which serves as an important alert to Canadians that public safety must be a factor in decisions regarding wildfire prevention and control. The Yarnell, Arizona fire of 2013, in which 19 fire department personnel lost their lives, has shaken the wildfire and structural fire communities alike and should serve as the clarion call to find appropriate solutions. The danger continues to mount and requires consideration, planning and action from homeowners, communities, industry, provincial, territorial and federal governments to avoid major economic, social and environmental impacts in the future. As a result of climate change and our expanding development and use of Canada's wildlands, wildfires are no longer just a threat to forests and rangelands. **CT**

# Wildland urban fire mitigation in Ontario municipalities

By Dan Sandink

Manager, Resilient Cities & Research, ICLR



Affecting a town of only 6,800 residents, the Slave Lake disaster resulted in \$700 million in insurance payouts—the second highest loss event in the history of the Canadian insurance industry at the time.

Wildland-urban interface (WUI) fire presents a serious risk to communities across Canada—a risk that has been exemplified by the impacts of recent wildfire-related disasters. The 2003 Firestorm event in British Columbia resulted in the destruction of 334 homes, the evacuation of 45,000 residents and a total cost of \$700 million, including \$200 million in insured losses. During this event, the Okanagan Mountain Park Fire destroyed over 230 homes in Kelowna, B.C. alone. The 2011 Flat Top Complex included a wildfire that affected the

community of Slave Lake, Alberta, destroying 454 structures, including 428 homes and resulted in \$700 million in insured damages. The Canadian Disaster Database reported 80 wildfire-related disasters in Canada since 1900, resulting in hundreds of millions of dollars in response and recovery costs, the evacuation of thousands of residents and the destruction of hundreds of homes. Since 1980, there have been 13 wildland fire disasters in Ontario, making wildland fire the second most frequent cause of disaster in the province after flooding.

It is expected that wildland fire risk will increase in Canada over the coming decades as a result of changing climate conditions, changing forest ecology, and the increasing occurrence of development in wildland areas. To address increasing WUI fire risk in Canada, it has been argued that municipalities must engage in risk reduction activities, including measures related to controlling vegetation, land use planning and ensuring that buildings can withstand ignition risk from wildland fires.

Despite the substantial risks associated with wildland fire and the important role of municipalities in controlling this risk, there has been very limited research on this topic in Canada. This article summarizes recent research supported by ICLR that sought to better understand how Ontario municipalities are working to reduce wildland fire risk and what could be done to facilitate this important work in the province.

## Study Results

Municipalities represented in the study included the Cities of ►

**Table 1: Community-Level Wildland Fire Mitigation Options<sup>6</sup>**

Category	Description
Risk assessment	- Identification of buildings, properties vulnerable to WUI fire
Emergency management/WUI-structure fire fighting cross-training	- Emergency planning, preparedness and response procedures - Ensure that urban/structural fire fighters and trained in wildland fire fighting procedures
Public communications, education, engagement	- Development of public education programs, including signage, public meetings, educational materials and school engagement
Infrastructure	- Ensuring appropriate roadway access, water availability, signage, etc. for fire fighting and emergency response
Vegetation/fuel management	- Managing burnable vegetation (fuel) around properties and communities - Includes incorporating defensible space around buildings and fire breaks around communities
Structural/building options	- Application of building materials to reduce fire ignition risk of buildings (e.g., fire resistant roofing and cladding)
Land use planning	- Application of design and locational land use planning measures to control exposure and vulnerability of developments to WUI fire

Timmins, Greater Sudbury, and six municipalities involved in the South Central Ontario FireSmart Committee (SCOFC), a group of fire services and Ontario Ministry of Natural Resources staff that are concerned about wildland fires in Ontario. SCOFC municipalities represented in the survey included the Town of Bancroft, the municipality of Hastings Highlands, and the townships of Carlow-Mayo, Tudor and Cashel, Limerick, and Galway-Cavendish-Harvey.

FireSmart Canada, based in Edmonton, Alberta, provides education and information resources that can be applied by municipalities and property owners to reduce the risk of building ignition from wildland fires. Community-level wildland fire mitigation measures developed by the organization for application in Canadian communities are briefly summarized in Table 1.

**What were case study municipalities doing to reduce wildland fire risk?**

Mitigation measures adopted by the municipalities involved in the study largely took the form of risk assessment processes, emergency management and public education, though some municipal respondents also reported application of infrastructure measures (for example, ensuring road access to vulnerable properties) and some early discussion of vegetation management had taken place in Greater Sudbury. No respondents reported application of structural or building measures to reduce WUI fire risk—for example, through the implementation of by-laws to require fire resistant building materials—or the application of land use planning measures to reduce wildland fire risk. Lack of application of building and land use planning measures is

concerning, as they are considered some of the most effective disaster mitigation measures available to decision makers.

**WUI fire mitigation: challenges faced by Ontario municipalities**

Municipalities involved in the study were asked what major challenges they encountered while developing or implementing FireSmart programs. In general, respondents reported that a lack of regulatory, technical and financial support from higher levels of government, and low residential awareness of wildland fire risk and appropriate mitigation measures served as significant barriers to the implementation of risk reduction programs.

Lack of provincial assistance for the implementation of WUI fire mitigation measures was reported by both municipal and expert respondents involved in the study. A review of key provincial documents, including the Ontario Building and Fire Codes and several acts and strategies related to wildland fire and emergency management, revealed no, or limited support for municipal-level wildland fire mitigation. For example, wildland fire mitigation through the use of wildfire resistant building materials is not mentioned in the Ontario Building Code or Fire Code in any way. Rather, these key provincial regulations focus on structural fire risk to the exclusion of wildland fire risk. Further, wording in the *Building Code Act* that restricts application of local building by-laws that exceed requirements of the Ontario Building Code makes it difficult for municipalities to apply by-laws to control wildland fire risk in new structures. Similarly, key wildland fire management

Measure category	Implemented?
Risk assessment	Yes
Emergency management	Yes
Public education	Yes
Infrastructure	Partial
Vegetation management	Partial
Building options	Not reported
Land use planning	Not reported

documents, including the *Forest Fires Prevention Act*, focus on wildland fire fighting and controlling the ignition of wildland fires by humans, rather than preparing communities for the occurrence of wildland fires.

Several municipal respondents reported that the province provided limited technical support for wildland fire mitigation, in the form of guidance on how to develop and implement risk reduction programs. Limited technical support was especially a concern in several of the smaller municipalities involved in the study, as they are often serviced by small fire departments with limited staff and financial resources. Respondents in the study specifically identified a need for provincial assistance in the identification and application of vegetation maps, which would allow municipalities to identify regions and buildings that are located next to high risk forested and vegetated areas.

Municipal respondents also asserted that low public awareness and concern about the risks associated with wildland fire had hindered their ability to implement strategies to reduce risk. Indeed, several municipal respondents reported that residents had adopted an “it won’t happen to me” attitude about wildland-fire. The fact that a severe, damaging wildland fire had not affected many of the municipalities involved in the study was a specific factor that respondents believed had led to low public awareness and concern related to wildland fire.



### Moving forward with municipal WUI fire mitigation in Ontario

Despite the abovementioned challenges, several of the municipalities involved in the study made significant progress on a number of aspects of WUI fire mitigation. One of the most promising findings of the study was the considerable work that had been undertaken by case study municipalities, despite the fact that few of the municipalities involved in the study had experienced a severe or damaging wildland fire disaster in the past. For example, municipalities involved in the SCOFCA have made considerable progress in the development of a wildland fire risk assessment. When asked about motivators for this work, respondents from the SCOFCA cited the disasters in Kelowna and Slave Lake, potential risks associated with climate change, and their responsibilities for public safety. This kind of coordinated pre-disaster mitigation is rare in Canada, and should be strongly encouraged.

There also exist

examples of wildland fire mitigation in other Canadian municipalities, from which Ontario provincial and municipal governments might draw inspiration. For example, the Cities of Kamloops, Prince George, Vernon and the District of Langford, all in British Columbia, have implemented strategies to reduce wildland fire risk through application of building and land use planning approaches—effective risk reduction measures that were not reported by Ontario respondents in this study. Wildland fire risk has also been incorporated into climate change adaptation plans prepared by the City of Kemberely and the District of Elkford, also both in British Columbia.

Further opportunities exist in Ontario for incorporating structural and community-level wildland fire risk reduction measures into the Ontario Building and Fire Codes, through code review processes. Considering that the greatest vulnerability of homes is rooted in combustible roofing materials, as well as fire-vulnerable siding,

eaves and vents, decks and porches, and the location of homes relative to slopes, incorporating risk reduction measures into new homes and developments through codes and land use planning approaches provides a significant opportunity to limit the vulnerability of Ontario communities to wildland fire. **CT**

### Notes

<sup>1</sup> The Resilience of the City of Kelowna: Exploring mitigation before, during and after the Okanagan Mountain Park Fire. ICLR: Toronto.

<sup>2</sup> Flat Top Complex Review Committee, 2012

<sup>3</sup> Public Safety Canada, Canadian Disaster Database

<sup>4</sup> Canadian Council of Forest Ministers, 2005

<sup>5</sup> Partners in Protection, 2003

<sup>6</sup> Partners in Protection/FireSmart Canada. 2003. *FireSmart: Protecting Your Community from Wildfire*. Edmonton: Partners in Protection.

<sup>7</sup> Greater Sudbury Respondent 3

<sup>8</sup> Sentence 35 (1) of the Ontario *Building Code Act* refers to application of municipal by-laws and state that "this Act and the building code supersede all municipal by-laws respecting the construction or demolition of buildings" (Ontario *Building Code Act*, 2012).

<sup>9</sup> Sarah McCaffrey, 2004. Thinking of Wildfire as a Natural Hazard. *Society and Natural Resources*, 17.

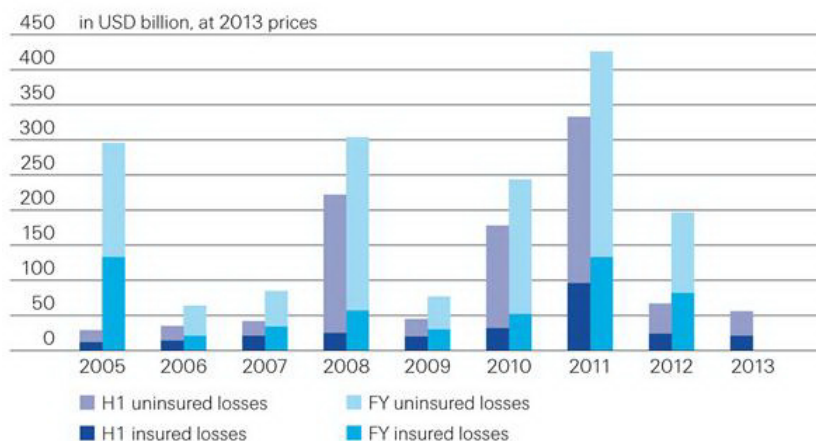
# Swiss Re releases preliminary catastrophe loss estimates for first-half 2013 6

- Total economic losses from disasters reached USD 56 billion in H1 2013
- Insured losses from natural catastrophes totalled USD 17 billion, with flooding a main driver
- Around 7,000 lives were lost as a result of natural catastrophes and man-made disasters

According to preliminary *sigma* estimates released on August 21, total economic losses from natural catastrophes and man-made disasters were USD 56 billion in the first half of 2013. The global insurance industry covered USD 20 billion of the total losses, of which USD 17 billion were caused by natural catastrophes, in large part due to widespread flood events. In the first half of 2013, disasters claimed 7,000 lives.

The overall economic losses to society of USD 56 billion were below the USD 67 billion of H1 2012. Insured losses were USD 20 billion, of which USD 17 billion stemmed from natural catastrophes. This was

**Catastrophe related losses**



Note: Insured losses plus uninsured losses = economic losses  
Source: Swiss Re's sigma catastrophe database

lower than the USD 21 billion in H1 2012 and also below the average of the last 10 years. Man-made disasters triggered an additional USD 3 billion in claims, unchanged from H1 2012.

## Flooding a main driver of natural catastrophe losses in H1 2013

In H1 2013, flooding was a main driver of natural catastrophe-related losses, causing an estimated USD 8 billion in

insurance claims globally. As a result, 2013 is already the second most expensive calendar year in terms of insured flood losses on *sigma* records. In 2011, the Thailand event alone brought record flood losses of more than USD 16 billion.

In June, heavy rains in central and eastern Europe caused massive floods that resulted in economic losses of close to USD 18 billion and claimed 22 lives. The estimated USD 4 billion cost for the insurance industry will make this

## The most costly insured catastrophe losses in H1 2013

	Date	Insured losses <sup>1</sup> (in USDbn)	Economic losses (in USDbn)	Event	Country	
1	June	4.1	18	Floods	Germany, Czech Republic et al.	[2]
2	June	2.0	4.0	Floods	Canada	[2]
3	May	1.8	3.1	Severe thunderstorms, tornadoes	US	[3]
4	March	1.6	2.0	Thunderstorms, tornadoes, hail	US	[3]
5	April	1.1	1.6	Snow storm, ice, tornadoes, heavy rains	US	[3]
6	January	1.0	2.0	Floods	Australia	[4]

<sup>1</sup> Property and business interruption, excluding liability and life insurance losses  
[2] Swiss Re estimate  
[3] With the permission of Property Claims Services (PCS)  
[4] Insurance Council of Australia

the second most expensive fresh water flood event on *sigma* records. This year's flooding in Europe has also been more expensive than the 2002 floods in the same region which cost the industry over USD 2 billion (USD 3 billion at current prices). ►

**Swiss Re releases preliminary catastrophe loss estimates for first-half 2013 cont...**

Rains and subsequent flooding also hit Alberta, Canada, in June. According to Swiss Re, the flood will generate insured losses estimated at USD 2 billion, "the highest insured loss ever recorded in the country."

In January, Cyclone Oswald brought flood damage yet again in Australia, amounting to USD 1 billion in insured losses. Furthermore, India, Southern Africa, Indonesia and Argentina likewise experienced heavy rains in H1, which caused large-scale flooding and the loss of many lives. In India, 1,150 died as a result of flooding in June and many more are still missing. This flood caused the most loss of life from a single event in the first half of 2013.

Jens Mehlhorn, Head of Flood Risk at Swiss Re: "Flooding continues to wreak havoc across all areas of the world. No one is immune from this ever-present disaster threat. Sadly, without insurance, the impact of these events is severe for many. While we cannot stop future floods, we believe that preventative actions can be taken to mitigate the overall impact of extreme weather events."

**Additional losses from tornadoes and associated thunderstorms**

Harsh spring weather spawned deadly tornadoes in the U.S.

Midwest. A tornado outbreak in May caused the loss of 28 lives and insured claims of USD 1.8 billion. The loss of life and property was mostly concentrated in Moore, Oklahoma, hit by a tornado rated 5, which is the highest rating on the Enhanced Fujita scale.

Another USD 7 billion in insured catastrophe losses resulted from other natural catastrophes and man-made disasters across the world in the first half of 2013.

Kurt Karl, Chief

Economist at Swiss Re, says "Though 2013 has so far been a below-average loss year, the severity of the ongoing North Atlantic hurricane season, and other disasters such as winter storms in Europe, could still increase insured losses for 2013 substantially". **CT**

**Definitions and selection criteria for**

Natural catastrophes	Loss events triggered by natural forces
Man-made disasters	Loss events associated with human
Insured catastrophe losses	Losses caused by the catastrophes
Total economic losses	Also includes the uninsured part of the property losses related to the catastrophes

**Minimum selection criteria:**

Total losses	USD 96.2 million
Or: Insured property claims	Shipping: USD 19.4 million Aviation: USD 38.7 million
Or: Casualties	Dead or missing: 20 Injured: 50

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*Mission*  
To reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.

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