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## Loss prevention begins at home

By Randy Van Straaten, M.A.Sc., P. Eng, LEED-AP  
Facility Manager, Insurance Research Lab for Better Homes (IRLBH)

*I recently moved to London to join the Insurance Research Lab for Better Homes (IRLBH) at the University of Western Ontario as facility manager, and to assist with business development. I have been fascinated by the overlap between work at ICLR, our lab and my newly acquired home. I hope this article will serve as an introduction to our ongoing work.*

My biggest concern for my new home is the potential for basement flooding. This concern was reinforced at the February 17 ICLR Advisory Committee meeting, where ICLR Research Manager Dan Sandink gave an excellent presentation and distributed informative homeowner guides on basement flood mitigation.

Needless to say, our house has a few issues.

One of the downspouts from the eavestrough ejects water right against the house (see Figure 1). Another is below grade, which I assume runs directly to the storm drains (Figure 2), and the output from the sump pump is located too close to the house (Figure 3).

A further issue is that our sump pump seems to run as soon as it starts raining. The sump pump does not have a battery backup and, hence, if it rains and the power goes out, the basement would certainly flood. I checked with our insurer, and it is not clear if such flooding would be covered by our homeowners insurance. Regardless of insurance coverage, I intend to implement some of Dan's suggestions.

I would advise readers to take a walk around their house and call a drainage expert if you spot any potential issues.

Our house is a two storey with a finished basement. The walls are all 2x4 wood studs 16" on centre. The wall assembly includes 1½ inch exterior foam insulation board in lieu of typical exterior wood sheathing. I assume the assemblies include diagonal metal T bars to handle the racking forces typically managed by the wood sheathing.

So, is my house structurally sound? Probably, as research being conducted at the Insurance Research Lab for Better Homes will investigate, the house is just less ►



Figure 1: This porch downspout directs water too close to the home's foundation.

### Loss prevention begins at home *cont...*



Figure 2: The roof runoff link is directly connected to the storm sewer.

tolerant to construction defects and extreme weather than a house with 2x6 framing and wood sheathing.

This lends itself to a number of questions, two of which are *How many construction defects could a similar house manage with "Advanced Framing" measures such as studs on 24" centres and other wood saving features?* and *What if the house was exposed to greater storms or contained wood members partially deteriorated by termites or rot?* These are some of the questions that could be investigated through the collaborative studies Dr. Greg Kopp and Dr. Mike Bartlett have been pursuing at IRLBH with the



Figure 3: The sump pump discharges too close to the foundation.

University of New Brunswick's (UNB) Wood Science Research Centre.

Our lab has the unique ability to test full size buildings under real dynamic wind loads, which has already been found to produce different results from the simplified wind loading that is typically specified in current codes such as the Ontario Building Code or the National Building Code of Canada. Our recent testing is also being used to provide validation data for computer models being developed at UNB. We are very excited about the potential for such work to investigate new building products, retrofit technologies, and the impact of weather phenomenon.

Another big housing issue I've been hearing a lot about this winter is ice damming. Our house didn't appear to have any ice damming this winter. I suspect the simple geometry along with good insulation and effective ceiling air sealing did the trick. And, yes, it is covered in our home insurance policy. This issue has been raised repeatedly in the industry and we hope to provide guidance to the industry through future work.

Another concern is whether there is mould in our walls. I have no idea as I don't smell or see any. A team of researchers at our lab is developing sensor technology to detect visible mould growth in building systems that cannot be readily inspected. The "Mould Spy" developed by Dr. Savory (UWO), Dr. Scott (UofT), and Dr. Sabarinathan (UWO) is presently being tested in a building at our laboratory, but the potential in this area seems huge

considering recent public health concerns.

One of the big discussions in the media today regarding housing is energy efficiency and the question whether there is overlap between home insurance (i.e. liability) and environmental efficiency issues. (Remember all the mould growth in air sealed R-2000 houses?) The next energy efficiency steps involving "deep retrofits" or "passive houses" will be incorporating even more drastic and potentially unexpected changes to house construction. Basement water storage for cisterns and thermal reservoirs are all being considered in green designs. A big focus in the energy efficiency movement will be the retrofit of the large stock of existing houses in Canada and the United States. Some of these homes are exposed to severe disaster risks without adequate mitigation measures.

There is an incredible amount of guidance available on home efficiency retrofits but limited resources on identifying disaster risks and appropriate mitigation measures.

I expect these overlaps to be key areas of growth for our research facility in the upcoming years. Indeed, Dr. Panagiota Karava, an expert on energy and ventilation (and a background in wind engineering) has recently joined UWO to lead our building science research team.

There is now, and will continue to be, much to do. 🐾



Randy Van Straaten.

## The resilience of the City of Kelowna

### Exploring mitigation before, during and after the Okanagan Mountain Park Fire

On January 28, the Institute for Catastrophic Loss Reduction (ICLR) released a major study evaluating the measures taken by the City of Kelowna, British Columbia to mitigate the impacts of the September 2003 Okanagan Mountain Park Fire (OMPF) and prevent a repeat of such an event in the future.

According to the study, the City of Kelowna independently developed effective communications strategies and a recovery resource management strategy. Though these strategies cannot be considered mitigation, they provide evidence of an autonomous and adaptable municipal government, thus displaying characteristics of a resilient system.

Further aspects of fire and post-fire hazard mitigation explored in this study include:

- The impacts of the OMPF on various departments in the city;
- City staff learning from the experiences with Wildland Urban Interface (WUI) management in other communities, and research on communities that had experienced similar WUI fire events;
- A fire guard created during the emergency that protected Kelowna communities from the oncoming OMPF;
- A significant evacuation effort;
- Insurance, government relief and recovery resource management;
- Recovery centres to assist those affected by the fire, and;
- A post-disaster policy window (window of opportunity) created by the OMPF.

The study also noted that various barriers and obstacles to the implementation of mitigation strategies were identified by City of Kelowna staff. A window of opportunity was created in Kelowna following the OMPF in which political and public interest in mitigation was high and there was a stronger possibility for the introduction of new mitigation measures or improvements to existing mitigation measures. Those interviewed for the study by author Dan Sandink, manager of resilient cities and research at ICLR, generally estimated that the window of opportunity was two years in length.

Various mitigation measures were developed or improved during this time, including measures focused on reducing post-wildfire flood risk. However, the threat of litigation against the city as a result of the fire, which destroyed close to 240 homes in the city, served to reduce Kelowna's ability to implement new mitigation strategies during the window of opportunity. Further barriers and obstacles identified in the study included jurisdictional issues regarding bylaws and requirements for fire-resistant building materials and fuel management on Crown lands, the cost of some types of mitigation options and the changing nature of WUI zones. Public perceptions of fuel management approaches and public willingness to adopt mitigation approaches on their own property were also identified by Kelowna officials as barriers to effective adoption of WUI fire management practices in the city.

Interviewees identified limited support from higher levels of government for mitigation approaches pursued by the city as an additional obstacle to implementing mitigation

strategies. Specifically, no financial support was provided to the city for several aspects of its post-wildfire flood risk management work. Review of provincial and federal emergency management policies and legislation revealed limited support for mitigation as a component of emergency management.

Interviewees believe that the city's experience with the OMPF, combined with effective mitigation, response and recovery programs, would reduce the impacts of future wildfires in Kelowna. Further, the city applied lessons learned from other communities to Kelowna's own emergency management approaches. The city was also able to adapt to barriers and obstacles presented in various attempts to control WUI fire hazards and postfire hazards. The case study explored in the paper found a municipal staff both willing and able to implement strategies to decrease risk to residents, property and infrastructure. Emergency management in Canada should be altered to allow those cities that are willing and able to pursue actions to mitigate disaster risk. 

For a soft or hard copy of *The resilience of the City of Kelowna: Exploring mitigation before, during and after the Okanagan Mountain Park Fire*, contact author Dan Sandink at [dsandink@iclr.org](mailto:dsandink@iclr.org)

# Can it happen here?

## Preventing a catastrophic wildfire in Canada

By Paul Kovacs, Executive Director, ICLR

Marysville is no more. The town of 800 people was destroyed by wildfire in early February, the deadliest fire in Australian history. The recent trend of large, uncontrolled fires includes unprecedented damage in the United States, Australia and a number of other countries. Will Canada be next? Are we prepared for the risk of a catastrophic wildland fire?

Leading fire experts from Canada, the United States and Australia recently met to assess the challenges facing wildland fire management agencies. The Institute for Catastrophic Loss Reduction hosted the 'Toronto summit'. We explored the changing face of wildland fire, and the growing risk of large, uncontrolled fire events.

Fire is essential to maintain healthy forests and wildland ecosystems. Indeed, the expert community believes that most areas need more small, controlled fires to remove the dangerous build-up of fuels that increases the risk that fires grow out of control.

However, the public expects the immediate suppression of urban fires, and often assumes that this is also the best way to manage wildland fires. Many, for example, oppose prescribed burns, fires set by public officials with the intention of reducing the risk of large, uncontrolled fire by eliminating underbrush, blow down and forest litter.

Wildfire experts seek to establish a new mind-set with greater public awareness of fire risks and benefits.

Canada, the United States and Australia have similar approaches to wildland fire management. Until a few years ago this resulted in little loss of life and only moderate property damage. The vast majority of wildland fires – about 97 percent



Red Lake Fire 7, 1986 (photo courtesy of Brian Stocks)

in Canada – have historically been contained to less than 200 hectares.

But this has changed. California and Australia were among the first to experience more fires that grew out of control. People are dead. Towns have been lost. Thousands of homes are gone, with several fire losses exceeding a billion dollars.

A number of factors, including global warming, have increased the presence of disease, insects and drought. This has increased the frequency and potential severity of large wildland fires.

In addition, more people and property are located in areas where wildfires may strike. Indeed, one study estimates that more than 30 percent of the United States' population now lives in the wildland-urban interface (WUI). Where we choose to live and play is increasing the risk that fires will result in fatalities, injuries and destruction of property.

The remarkable effort of our courageous firefighters has limited the losses that Canadians have experienced to date, yet fire experts are concerned about the quality and quantity of equipment

available to support this important effort.

Large recent fire losses in California, Australia and, to a lesser extent, British Columbia, brought public attention, political direction and increased funding for fire agencies. Nevertheless, significant funding for wildfire management in the United States and Australia is not yet accompanied by a well-defined, national wildland fire strategy.

In contrast, Canada has an excellent national strategy but it is yet to make the long-term investment required to realize our established objectives. In 2005, the Canadian Council of Forest Ministers issued a wildland fire strategy with a bold vision to make Canada's approach to wildland fire management "among the most progressive in the world."

Canada's strategy is built around three core elements: resilient communities and an empowered public; healthy and productive forest ecosystems; and, modern business practices. International experts agree that these are the essential elements that must be addressed. The vision is sound, yet we remain vulnerable. ►

## Can it happen here? cont...

To help Canadians build resilient communities we have *FireSmart*, a program with specific risk management advice for property owners and community leaders. It was developed by *Partners in Protection* and endorsed by all the major governments in Canada. *FireSmart* has been tested and proven, and now requires sufficient funding to come into effect in communities at risk across the country.

*FireSmart* needs support from a social marketing campaign to encourage property owners and community leaders to embrace their responsibility. Managing the risk of large fires should be a shared responsibility that includes fire agencies and property owners. This would include education about the risks and benefits of fire.

We also need healthy forests to prevent uncontrolled fire. The mountain pine beetle, spruce budworm, poor forest management, and prolonged periods of drought add to the risk of large fire. These perils need to be confronted within a comprehensive and appropriately funded plan.

Most importantly, our brave firefighters require the appropriate modern tools and equipment so they can confidently protect us. Funds are urgently needed to replace obsolete equipment. The Canadian Interagency Forest Fire Centre has been a remarkable success in sharing people and equipment across the country, and demonstrates the capacity for co-operation between the federal, provincial and territorial governments. However, the current equipment urgently needs renewal.

Canada is vulnerable to the risk of a large, uncontrolled wildland fire. Horrific fire deaths in Australia and property damage in California are warnings that action is needed now. Canada

has a wildland fire strategy that sets out our shared vision for how we can prepare for the growing risk of catastrophic fires. It is important that we fund and aggressively implement the strategy. Working together we can prevent fires from becoming disasters. 🐾



Paul Kovacs, Executive Director of ICLR.



Red Lake Fire 7, 1986 (photo courtesy of Brian Stocks)

## 2008 third-costliest year for natural catastrophe losses

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According to Swiss Re and Munich Re, 2008 marked one of the worse years on record for natural catastrophe losses, with loss of life being particularly high. According to Swiss Re's sigma No. 2/2009 (released on March 17) and Munich Re's Topics Geo – Natural catastrophes 2008 (released on February 27), the year was the third costliest on record, with insured losses pegged at USD 52.2 billion and USD 45 billion respectively.

Economic losses were put at USD 269 billion and USD 200 billion respectively. According to the number one and number two reinsurers in the world, as measured by premium volume, loss of life due to natural catastrophes last year came in at 240,500 and 163,000 respectively with the disparity in figures likely are due to differences in methodologies.

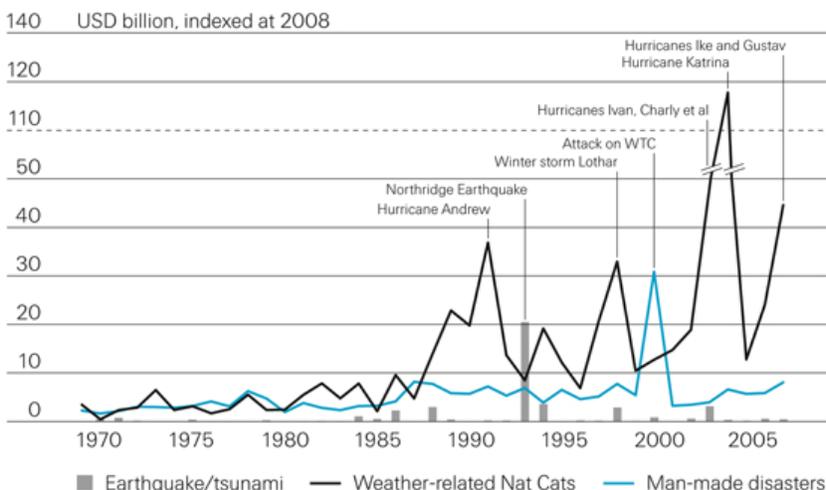
According to Swiss Re: "High catastrophe claims in the U.S. were driven by Hurricanes Ike and Gustav as well as thunderstorms during the first half of 2008. Europe's losses, down from last year [2007], represented slightly more than a tenth of the world total in 2008, largely due to lower storm and flood damages. In early 2008, China suffered losses amounting to more than USD 1.3bn, driven

by an unusually cold winter with record amounts of ice and snow."

Says Munich Re: "The 2008 hurricane season, with 16 tropical storms well above the long-term average of 10.3 (1950–2007), confirms Munich Re's assessment that the current warm phase will probably result in higher loss potential. However, Hurricane Ike also made it abundantly clear to the insurance industry that loss estimates undertaken in the immediate aftermath of complex individual events are particularly fraught with uncertainty. Aggregate losses caused by Ike exceeded initial estimates by modelling firms and the industry. Since insurance companies' first estimates were too low, Munich

Re's final claims burden was also higher than originally anticipated. Munich Re now expects a claims burden of approximately US\$ 680m (after retrocessions). This claims burden is already taken into account in the preliminary figures published on 4 February 2009 for the financial year 2008."

According to Swiss Re, Hurricane Ike will cost insurers and reinsurers an estimated USD 20 billion in claims costs, while Gustav claims are likely to come in at around USD 4 billion. Munich Re puts the numbers at USD 15 billion for Ike and USD 3.5 billion for Gustav. 🐾



Source: Swiss Re sigma 2/2009

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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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