Institute for Catastrophic Loss Reduction
Building resilient communities

CATtales

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Inside this issue

ICLR supports federal move to include climate change in building codes

Reports that the National Research Council (NRC) will update Canada's National Model Construction Codes to reflect a future of more severe weather have been met with full acceptance and support by the Canadian insurance industry, including ICLR.

NRC confirmed to Global News February 27 that model building codes will be updated over the next five years to "reflect the fact that Canada is seeing more heavy rain, floods, high winds, snow, ice, temperature swings and all-around extreme weather."

According to NRC program director Philip Rizcallah in a Global article "We can see temperature-change trends, we can see higher wind-load trends, we can see evidence of wildfires for example in Fort Mac or Kelowna…in Calgary where we've had these flood situations where they've knocked out entire cities…the codes need to start adapting."

There appears to be two main elements to NRC's plan to include climate change in the Canadian Model Building Code. The first involves including what ICLR calls 'resiliency features' into the code (such as making backwater valves mandatory in all new builds) and the second involves including forecasted or modelled weather data in the code rather than just historical data to ensure that structures are built for the weather we will get and not just the weather we used to get.

According to the report "Technical specifications for a new home will need to reflect the possible environmental conditions that the home will have to withstand in the coming decades." Says Rizcallah: "What we want to do now is…actually take forecasted data. What do we expect the climate, the temperature, the snow, the wind to be like after five years, 15 years, 25 years, even 100 years?"

ICLR has been working on improving building codes on behalf of the Canadian property and casualty insurance industry and Canadian society at large for close to 10 years. The Institute has made submissions to the last round of the Ontario building code, succeeding in changing the way roof sheathing is fastened to joists in new homes and broadening the use of backwater valves in new builds.

ICLR has also made a number of submissions to the National Model Building Code, which are currently under review, and to the latest round of the Ontario building code, which may see hurricane straps be made mandatory in Ontario.

Recently, ICLR has been contracted to work with NRC on identifying international best practices for building new homes and retrofitting existing homes to reduce wildland fire risk. In the weeks ahead, ICLR will publish *State of the art/practice and knowledge gap identification: Structural ignition risk reduction for wildland urban interface fire*. **CT**

Fort McMurray and the protection gap

A preliminary study by an economist at Edmonton's MacEwan University reports that the direct and indirect economic costs from the Fort McMurray wildfire currently sit at about $9.5 billion, and that the estimate will likely go higher as new data becomes available.

The figure includes "the expense of replacing buildings and infrastructure as well as lost income, profits and royalties in the oil sands and forestry industries…early estimates on indirect costs such as environmental damage, lost timber and physical and mental-health treatment," according to lead investigator Dr. Rafat Alam.

Alam said that it can take up to 10 years to get a complete picture of everything that will be paid out by the numerous players that were affected by what is now Canada's most expensive natural disaster by far. Insured damage for the fire currently sits at $3.73 billion, making it the costliest wildfire in world insurance history.

The insured damage figure makes up not quite 40% of the $9.5 billion economic loss figure, which is about par for the course for the insurance protection gap in Canada as events here tend to generally abide by the 40% insured/60% uninsured split. Globally last year, the split was roughly 30/70, according to preliminary figures published by Swiss Re.

But this gap doesn't need to be.

According to information about the study on MacEwan University's website, "Direct impacts of the [Fort McMurray] fire include – private and public property loss, labour income loss, production loss in oil sands, private business revenue loss, evacuation and fire suppression cost, emergency management cost, displacement cost, forest industry loss, public sector production loss, donations, public sector revenue loss, etc. Hardly measurable indirect costs include environmental cost, ecosystem loss and mental health cost."

Not only can most – if not all – of these components of economic damage be theoretically insured, there are many examples throughout the world where they already are.

Let's take a brief look at a few of these:

Public property loss

We already know that private property can be – and, in Canada, largely is – insured, but few seem to know or realize that the same could be said of government assets – federal, provincial and municipal. Governments already commonly insure some asset classes, like buildings and vehicles. But there are entire asset classes that governments do not insure, like critical infrastructure. And while an entire paper can be dedicated to the reasons why this is the case, it is enough to say that coverage for such things as roads, bridges, culverts, drainage and water systems etc. can quite easily be provided, either through traditional (re)insurance or non-traditional solutions, including capital markets instruments.

In Canada, there is not a long tradition of governments working with private insurers and reinsurers to obtain coverage for these and other assets, but that could easily change with a change in attitude (it has much more to do with will than with technical capability).

Production and income loss – public and private

While traditional business interruption cover is commonplace in private enterprise, it was a surprise to many to learn that none of the major oil sands operations in the Fort McMurray area where covered for contingent business interruption. All were covered if their physical operations were directly impacted by the fire but it appears that none were covered for events that did not directly impact their operations but nevertheless made it impossible for them to stay online. In the case of this fire, while virtually no oil production facilities were damaged or destroyed, employees were unable to report to work due to the mass evacuation (and in at least one case due to the loss of a work camp). It is unclear if the lack of this coverage was planned (perhaps due to cost-cutting as a result of the prolonged drop in the price of oil) or if it was just simply missed. But the lack of contingent business interruption coverage exposed a large gap in these companies' risk management programs and proved to be very costly (Suncor alone reported a $735 million net loss in 2Q 2016 largely due to the wildfire). Contingent business interruption is a common product, and purchasing such a cover ►

would have been easy and relatively inexpensive.

Business interruption and contingent business interruption covers are virtually nonexistent in government operations. As noted earlier, there is not a long tradition in Canada of governments going to private (re)insurers to purchase certain coverages for certain assets or risks. Part of this is due to the fact that governments pay for all facets of disaster damage out of public coffers, and don't really consider capital as having a cost. Changing this mindset would be a large undertaking, but not impossible. Indeed, some governments in Canada have already signalled a desire to get out of – or at last curtail – their exposures to certain disaster-related costs, such as disaster assistance.

Expenses related to response and recovery

While many costs associated with evacuation and displacement of citizens are already covered by private insurance (usually under the Additional Living Expense, or ALE, portion of a homeowners policy), virtually all of the government (i.e. taxpayer-borne) expenses associated with response and recovery are not covered. But, again, they could be.

Imagine an insurance product that kicks in if a city's snow removal expenses from a given winter exceed a certain threshold, or one that reimburses a municipality or public utility if storm-related overtime costs or debris removal after a flood or ice storm exceed a certain amount? How about a simple stop-loss cover that kicks in if federal Disaster Financial Assistance Arrangements (DFAAs) exceed a certain amount, or what if the DFAAs were laid off to the private reinsurance industry altogether? What about a parametric cover that kicks in if a rainstorm, windstorm or snowstorm of a certain size affects a community?

On the fire suppression cost side, it is very possible for governments to purchase a traditional reinsurance product such as a stop-loss to cover firefighting costs that surpass a certain level in a given fire season. For several decades the state of Oregon has purchased insurance from Lloyd's of London to help it defray fire suppression costs and several years ago the province of Alberta entered into such an agreement with a number of reinsurers in the Canadian market. The cover was only in place for a year or two (and actually paid out to the province) when it was abruptly cancelled.

For more on this, see *Insuring black holes* (Canadian Underwriter, Nov 1 2015).

Forest industry loss

While forestry companies likely purchase business interruption (and possibly contingent business interruption) covers as many businesses do, they are exposed to a unique threat that few other companies are exposed to: loss of access to marketable product (in this case timber) that doesn't belong to them, but which they have been awarded access to via agreements with the Crown.

While forestry companies in Chile, for example, are able to purchase insurance for loss of marketable timber due to wildfire, it appears that Canadian companies typically do not follow suit. Part of it may have to do with the fact that such companies operating in Canada normally don't actually own the asset, as most forests that are culled for timber belong to the Crown, with access by loggers being provided via leases or licences. This would likely be an obstacle that is easy to surmount by insurers.

Conclusion

Much is being said these days about the need to narrow the protection gap, for good reason. Uninsured damage adding up to 60 or 70% of total damage is not only unacceptable, it is unsustainable. Further, it is largely unnecessary as society now has access to the expertise, products and capital it needs to transfer risk, loss and damage off the backs of governments (read: taxpayers) and place it onto the balance sheets of the world's largest and most capable risk transfer experts. If we can insure a star pitcher's arm or a movie star's smile, we can insure anything, we just need to discard outdated and outmoded ways of thinking.

We must do it for the benefit of all:

- Narrowing the protection gap for companies better ensures continuity of operations, and protects the economy, the tax base and pensions, among other things.
- For individuals, narrowing the gap protects personal assets, livelihoods and health.
- For governments, narrowing the gap protects the economy, removes the cost burden associated with natural disasters from taxpayers, smooths volatility related to costs and provides stability in budgeting, and allows governments to use funds for more productive undertakings.

When we narrow the protection gap, everybody wins. **CT**

Natural catastrophe losses at their highest for four years: Munich Re

A number of devastating earthquakes and powerful storms made 2016 the costliest twelve months for natural catastrophe losses in the last four years. Losses totalled US$175bn, a good two-thirds more than in the previous year, and very nearly as high as the figure for 2012 (US$180bn). The share of uninsured losses – the so-called protection or insurance gap – remained substantial at around 70%. Almost 30% of the losses, some US$50bn, were insured.

"After three years of relatively low nat cat losses, the figures for 2016 are back in the mid-range, where they are expected to be. Losses in a single year are obviously random and cannot be seen as a trend," said member of the Board of Management Torsten Jeworrek. "The high percentage of uninsured losses, especially in emerging markets and developing countries, remains a concern. Greater insurance density is important, as it helps to alleviate the financial consequences of a catastrophe for more people. With its risk knowledge, the insurance industry would in fact be able to bear a much greater portion of such unpredictable risks."

Key nat cat figures of 2016:

- Both overall losses and insured losses were above the inflation-adjusted average for the past ten years (US$154bn and $45.1bn respectively).
- Taking very small events out of the equation, 750 relevant loss events such as earthquakes, storms, floods, droughts and heatwaves were recorded in the Munich Re NatCatSERVICE database. That is significantly above the ten-year average of 590.
- Some 8,700 lives were sadly lost as a result of these natural catastrophes, far fewer at least than in 2015 (25,400), yet within the ten-year average (60,600). The past year was thus the year with the fewest fatalities (after 2014, with 8,050 fatalities) in 30 years (1986: 8,600).
- The high number of flood events, including river flooding and flash floods, was exceptional and accounted for 34% of overall losses, compared with an average of 21% over the past ten years.

Earthquake in Japan most expensive natural catastrophe of 2016

The costliest natural catastrophes of the year occurred in Asia. There were two earthquakes on the southern Japanese island of Kyushu close to the city of Kumamoto in April (overall losses US$31bn; proportion of insured losses just under 20%), and devastating floods in China in June and July (overall losses US$20bn; only some 2% of which were insured).

North America was hit by more loss occurrences in 2016 than in any other year since 1980, with 160 events recorded. The year's most serious event here was *Hurricane Matthew*. Its greatest impact was in the Caribbean island nation of Haiti, which was still struggling to recover from the 2010 earthquake. Matthew killed around 550 people in Haiti, and also caused serious damage on the east coast of the USA. Overall losses totalled US$10.2bn, with over a third of this figure insured.

Series of storms in Europe, wildfires in Canada

North America was also impacted by other extreme weather hazards, including wildfires in the Canadian town of Fort McMurray in May, and major floods in the southern US states in summer. In Canada, the mild winter with less snow than usual, and the spring heatwaves and droughts which followed, were the principal causes of the devastating wildfires that hit the oil-sand-producing region of Alberta, generating overall losses of US$4bn. More than two-thirds of this figure was insured. In August, floods in Louisiana and other US states following persistent rain triggered losses totalling US$10bn, around a quarter of which was insured.

There was a series of storms in Europe in late May and early June. Torrential rain triggered numerous flash floods, particularly in Germany, and there was major flooding on the River Seine in and around Paris. Overall losses totalled some US$6bn (approximately €5.4bn), around half of which was insured.

"A look at the weather-related catastrophes of 2016 shows the potential effects of unchecked climate change. Of course, individual events themselves can never be attributed directly to climate change. But there are now many indications that certain events – such as persistent weather systems or storms bringing torrential rain and hail – are more likely to occur in certain regions as a result of climate change," explained Peter Höppe, Head of Munich Re's Geo Risks Research Unit. **CT**

Friday Forum workshop series

Practical issues in updating IDF curves for future climate: 'Physics' vs climate models

On March 24 ICLR will host a webinar entitled *Practical issues in updating IDF curves for future climate: 'Physics' vs climate models*, with Dr. Slobodan Simonovic of Western University.

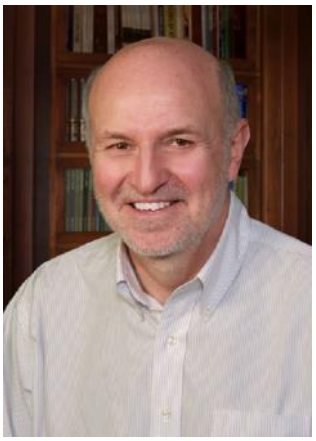
A free, online tool for updating IDF curves for future climate (developed at Western and hosted by ICLR) has been in the public domain since March of 2015. The IDFCC tool has over 700 registered users and averages 7,000 sessions per year.

Direct use of global climate models (GCM) and statistical downscaling procedures results in a range of values for updated IDF curves that immediately raises the question: Which one should be used in practice?

At the same time, various discussions pointed to a 'more robust' alternative approach of using direct scaling of temperature - an approach based on 'physics' (i.e. the Clausius-Clapeyron relationship).

The main objectives of this workshop are (i) to provide comparative analysis of the IDFCC updating tool and 'physics' based approach of direct temperature scaling for Canada; and (ii) to provide more practical (engineering-based) guidance on how to use updated IDF relationships.

Slobodan P. Simonovic is globally recognized for his unique interdisciplinary research in Systems Analysis and the development of deterministic and stochastic simulations, optimization, multi criteria analysis, and other decision-making methodologies for addressing challenging system of systems problems lying at the confluence of society, technology and the environment, with applications in water resources management, hydrology, energy, climate change and public infrastructure, from a sustainable development perspective. His main contributions include modelling risk and resilience of complex systems. **CT**



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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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