



Institute for Catastrophic
Loss Reduction

Building resilient communities

Institut de Prévention
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Construction de resilient communities

Protecting Canadian homeowners and communities from wildfire in a changing climate



ICLR

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Executive Summary

The March 20, 2012 ICLR workshop held in Toronto to discuss challenges in protecting homeowners and communities from wildfires (<http://www.iclr.org/wildfireworkshop2012.html>) elicited strong interest from the insurance industry, wildfire agencies and researchers. Events in British Columbia in 2003 and Alberta in 2011 have raised concerns that catastrophic wildfire events may be increasing, with combined insured losses from these two events approaching \$1 billion. Although climate change is cited as the likely major factor in escalating wildfires, growing use of wildlands and forest flammability increasing with advancing age are also of concern. Several speakers warned of escalating wildfire losses, however there were opinions from some in the insurance sector that claims from these two events in-and-of itself may not be enough evidence. Still, general consensus developed that wildfire activity will increase and that initiatives such as FireSmart and Structure Protection should be strongly supported.

As a follow-up to the workshop, ICLR expanded the discussion in the background/context section. It discusses how increasing demands on wildfire organizations are creating risks to property, livelihoods and even the safety of Canadians. The Canadian Wildland Fire Strategy was developed to chart a path forward, but recent lessons have emphasized the need for more research, strong partnerships, expanded training, comprehensive risk assessments, enhanced media communications, and responsive funding. Importantly, the role of the insurance sector in response to wildfires is also worthy of discussion.

Workshop participants made the following presentations:

- Mike Flannigan - the role of climate change in future wildfire seasons and its contribution to the 2011 wildfires.
- Peter Fuglem - the impact of climate change, expanded use of wildlands and increasing forest flammability on the 2003 and 2011 wildfire seasons.
- Karl Brondell – State Farm experience with wildfires in US and Canada and corporate strategies in responding to major claim events.
- Bob Dorian, Ian McKay and Troy Bourassa – a panel presentation on their experiences in dealing with claims in Slave Lake in 2011 in the context of other events and expectations for the future.
- Jamie Coutts and Mark Missal – personal accounts of their experiences as key responders during the 2011 Slave Lake event.

- Adam Gossell and Kelly O'Shea – the FireSmart Canada initiative by Partners in Protection, including the pending announcement of a Community FireSmart Recognition Program.
- Paul Gray – climate change adaptation strategies being implemented in Ontario
- Kim Connors – role of the Canadian Interagency Forest Fire Centre and the current state of the Canadian Wildland Fire Strategy.

Afterward, Alan Westhaver facilitated an open discussion that revealed the following themes:

- General agreement that hundreds of communities are at increasing risk across Canada;
- The insurance industry still views wildfire impacts as small in comparison to other losses;
- The insurance industry has a key role to play in community protection;
- Major fire events have a short shelf-life in public and political minds;
- Fire impacts on residents are deep and long-lasting;
- A national FireSmart program is required to mitigate future fire impacts; and
- The insurance sector needs a system to evaluate the risks and threats to communities.

Problem

*Mike Flannigan, University of Alberta/Canadian Forest Service
Future Canadian fire regimes under a changing climate*

Mike outlined the wildfire regime in Canada as experienced to date. The average 9,000 fires per year burn 2 million hectares, cost \$800 million and result in the evacuation of 5,500 people. However, individual seasons vary widely around the average affected by four factors: the amount of fuel available to burn, topography, sources of ignition and weather/climatic conditions. With linkages between temperature, precipitation and fire activity, there is a correlation between recent climate change that can be extrapolated to future seasons. Recent research indicates that projected climate change impacts on wildland fire activity will include more extreme fire danger conditions, increases in lightning and human-caused fires, more severe, intense and larger fires, increases in area burned, and longer fire seasons. Importantly, extreme fire behavior associated with wind events such as the 2011 Alberta fire season, is also likely to also be an increasing factor.

Experience

*Fuglem, Director, B.C. Protection Program (Retired)
Lessons learned from 2003 and 2011*

Peter outlined the key similarities and differences between the 2003 fires in British Columbia and the 2011 fires in Alberta. Both seasons resulted in unprecedented insurance losses in the context of a large number of communities under threat from extreme fire conditions. 2003 came about as a result of months of drought across wide areas of BC, while 2011 came up suddenly after a wet winter shifted to persistent warm gusty dry winds that covered large areas of Alberta for 5 days. Key lessons learned are that wildfires will always be a part of rural Canada, wildfire seasons will continue to overwhelm agencies on occasion, communities and fire departments must engage, and we need investment and strategies to deal with wildfires under climate change and other challenges.

*Karl Brondell, Assist. Vice President, Claims, State Farm, Bloomington, Illinois
Preparing for the unexpected: pre, during and post-wildfire event strategies*

Karl provided a synopsis of State Farm operations in the US and Canada. As well, he described their catastrophe response team, one of the largest in the industry. Although wildfire claims only represent 0.3% of all claims, fire loss has a more personal effect on people than tornadoes or hurricanes. Linkage between insurance and FireWise (US) and FireSmart (Canada) is increasing, and State Farm is being proactive by creating grant programs for wildfire training, protective equipment, and public fire prevention education, and developing partnerships (i.e. with Red Cross sharing data for prompt response) as well as donations to affected communities.

*Bob Dorion, Vice President, Claims, Peace Hills Insurance
Ian McKay, Dir. Claims Prop. Appraisal Field Ops, Northbridge Insurance
Troy Bourassa, Director, Claims, Albert Motor Association*

With this panel, the audience was able to hear a range of views on wildfire insurance issues. Bob presented on behalf of a small insurance company. His research indicated that the impact of wildfires on public and insurance industry attitudes does not last long after major events and that Kelowna and Slave Lake were “one off” events. Rebuilding after fires is affected by many factors;

insurance is just one, and release of sites, permitting, new bylaws and other factors are also important. Ian presented his views and experiences on the ground in Slave Lake as well as Kelowna. His company launched a quick response effort near Slave Lake and experienced challenges such as access, lack of official information, client frustrations, etc., but also some positive support between communities and with support services. Troy provided his perspective from working with clients at the evacuation centre with concerns such as the lack of information, and delays getting access. Solutions included social media, cell communications, etc. This wildfire event was an opportunity to provide a very positive service and support to the community.. Challenges included accurately valuing properties, combining efforts between insurance companies, dealing with floods after the event, waiting for infrastructure, and winter-dictated timelines. There is an opportunity to engage with clients and communities to present a positive image of the insurance industry in these events.

Jamie Coutts, Fire Chief, Slave Lake, Alberta

Mark Missal, Town Councillor, Slave Lake, Alberta; Independent Air Attack Coordinator

May 15, 2011: Response and recovery

Jamie and Mark provided the audience with a very personal account of their experiences during the Slave Lake events and following activities. Mark outlined the progression of events from his aerial perspective including graphic photographic coverage. The extreme fire behavior associated with the wind gusts on May 15 was a major challenge. Jamie provided details of the ground efforts including descriptions of the fire department actions in coordination with Sustainable Resource Development fire crews and the safe evacuation of 14,000 people in spite of all exits being closed at various points. The resulting encroachment of the fire into the communities of Slave Lake, Widewater and Canyon Creek resulted in major challenges for the Emergency Operations Centre, complicated by the centre burning. With 389 structures lost, 700 families were displaced, and key services were lost including the library and government centre with all municipal records. The monumental efforts to rebuild the community are ongoing, supported with almost \$300 million in provincial funds and \$700 million in insurance claims.

Solutions/Answers

Adam Gossell, FireSmart Unit Leader, Government of Alberta

Kelly O'Shea, Executive Director, Partners in Protection Association

Fire-resilient communities and an empowered public

Adam Gossell (Alberta Sustainable resource Development) and Kelly O'Shea (Partners in Protection) gave a joint presentation "Fire-resistant communities and an empowered public", which focused on the progress of the FireSmart program, created by Partners in Protection (PIP) in Alberta in 1999. Largely regional in scope at first, the Firesmart program has produced a technical manual which has become a national standard for community wildfire protection, and has received broad in-kind support from industry and numerous fire management agencies. Recently PIP developed a FireSmart Canada initiative, aimed at facilitating community protection nationally, and has been lobbying federal and provincial governments, without success to date, to support this initiative.

Paul Gray, Senior Program Advisor, Applied Research and Development

Branch, Ministry of Natural Resources

Climate change adaptation strategies

Paul Gray (Ontario Ministry of Natural Resources), a member of the Climate Change Task Force under the Canadian Council of Forest Ministers (CCFM) spoke on "Climate Change Adaptation Strategies" dealing with forest impacts at a broader ecosystem scale. Key messages focused on the fact that, while the level of impacts is difficult to predict, there is a broad consensus that decision makers need to plan for a range of impacts with a range of solutions and adaptation strategies. In addition, making medium to longer-term decisions assuming a stable climate is dangerous, as these decisions may require new robust governance tools and techniques. Climate change also poses new and potentially increased threats to human health and well-being. Finally, a commitment to civic duty and participation is critical to the development of the sound climate change adaptation strategies.

*Kim Connors, Director, Canadian Interagency Forest Fire Centre (CIFFC)
National Wildfire Response Plan/Canadian Wildland Fire Strategy (CWFS)*

Kim Connors (Canadian Interagency Forest Fire Centre) discussed the Canadian Wildland Fire Strategy (CWFS), emphasizing progress made since the approval of the CWFS in 2005. He stressed the increasing fire load across the country, and the increase in resource sharing among fire management agencies to address regional fire problems. While sharing has increased, he emphasized the need to do more in order to address future fire regimes. In the absence of federal funding, Canadian fire management agencies have begun working closely together to foster more efficient resource sharing and conduct an evaluation of its effectiveness, and the implementation of fuels management programs (through FireSmart).

Group discussion

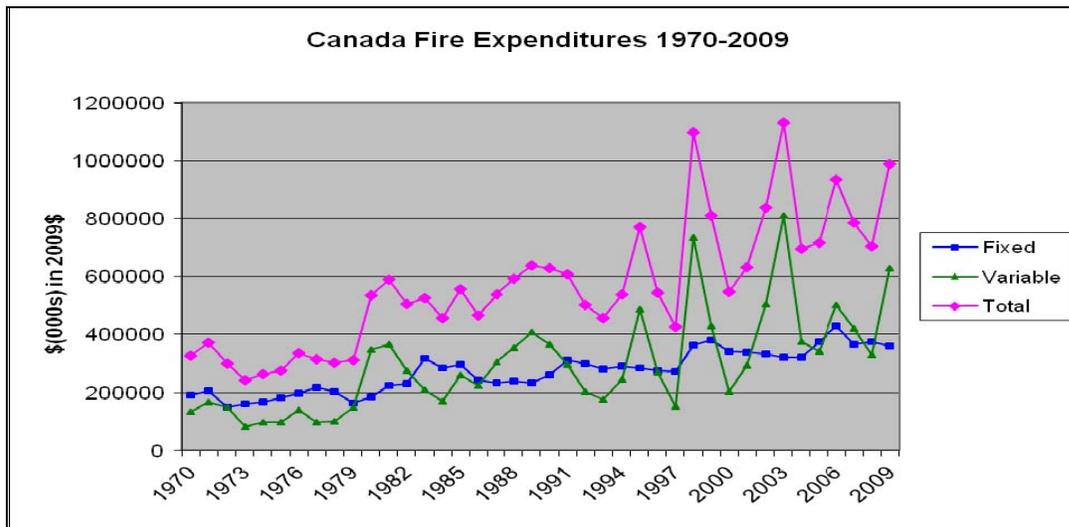
A group discussion session, facilitated by Al Westhaver (Parks Canada), was held after the presentations to capture thoughts and proposed actions from the audience. The most pertinent points from this discussion follow:

- General agreement that hundreds of communities are at risk across Canada, and that this risk will increase in future years due to both climate change impacts, increasing expansion of resource development and communities in wildfire-prone landscapes and increasingly flammable forest ;
- The insurance industry still views wildfire impacts as small in comparison to other losses, although climate change and the growing number of communities under threat could change this;
- A sense that the insurance industry has a key role to play in community protection, in advocating and supporting fuels mitigation programs, in public education, and in educating governments;
- An awareness that even major fire impacts like Kelowna and Slave Lake have a short shelf-life in public and political minds, due to numerous competing life issues and an "it can't happen here" mentality;
- Fire impacts on the mental health of community residents are deep and long-lasting, and are not considered by the insurance industry at this time;
- A national FireSmart program, with the involvement of communities, governments, and the insurance industry is required to mitigate future fire impacts - the cost of prevention being much less than the cost of suppression and recovery;
- The industry would benefit considerably from a system to evaluate the risks and threats to communities.

Climate Change, Wildfire and Community Protection: Expanding on Workshop Themes

Background/Context

Across Canada an average of 9000 fires burn an average of 2 million hectares annually, although the area burned is highly episodic inter-annually, varying from a low of 400,000 hectares to a high approaching 7.5 million hectares. Sophisticated provincial/territorial fire management programs have been quite successful for many decades, with 97% of fires being controlled before reaching 200 hectares in size. However, the 3% of the fires that grow larger than 200 hectares account for 97% of the area burned in Canada, a statistic exacerbated by the fact that fires in large areas of northern Canada do not threaten values and are not actively suppressed and are allowed to burn naturally. Canadian fire management expenditures have been rising steadily since the 1970s, most particularly since the late 1990s. Current costs are averaging \$800 million annually, but have exceeded \$1 billion in some years. Canadian fire management agencies face a complex challenge in attempting to balance the need for natural fire to maintain ecosystem health with the need to protect life, property and other values at risk.



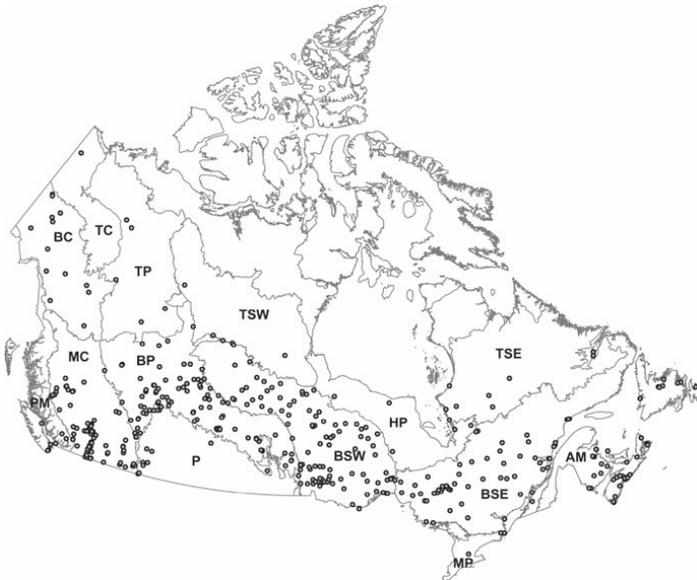
Total Canadian fire expenditures (all provinces, territories and Parks Canada) for the 1970-2009 period. Fixed costs are those associated with maintaining a fire management program, while variable costs reflect the additional fire suppression costs associated with each fire season.

In the 19th and early 20th centuries wildfires associated with logging and expanding settlement caused significant loss of life and property, a factor that stimulated in large part the development of organized fire suppression. As a result fire impacts on communities have been reduced across Canada during the remainder of the 20th century. However, during the first decades of the 21st century significant fires in British Columbia and Alberta have now burned into communities, resulting in the loss of hundreds of homes at a cost and loss well over one billion dollars.

The Kelowna and Barriere fires in the summer of 2003, which followed an extensive drought, destroyed 334 homes, with insurance claims in excess of \$200 million. The Slave Lake Fire in

the spring of 2011, driven by extreme winds, burned over 400 homes and businesses in Slave Lake and surrounding communities, resulting in an insured loss of \$700 million. The Alberta fires of 2011 were significant enough to temporarily affect Canada's Gross Domestic Production (GDP) by slowing oil and gas production within the province. Although no residents died in these fires, many experienced significant personal loss and long-lasting psychological impacts as a result of losing valued homes and experiencing last-minute evacuations. Governments are in the early stages of recognizing the enormous, and as yet poorly understood, social impacts on citizens and communities, and it is expected they will factor these considerations into the way in which they view future wildfire threats. Evidence indicates that losing homes to wildfire has a more devastating effect on people than losses through many other natural disasters. For example, the hidden costs of the 2011 Slave Lake Fire may be just starting to emerge.

In contrast to other wildfire prone parts of the world, such as Australia and California where significant numbers of civilian deaths are well documented, such fatalities have been not been experienced of late in Canada. Although good fortune may play a part, the practice of early evacuation in Canada has been successful. Evacuations of communities ahead of fast-spreading forest fires has also become a more common practice in recent years across Canada, as Canadian fire management agencies recommend evacuations when public safety is in question. A recent study revealed that, between 1980 and 2007, 209,121 people were evacuated during 547 evacuation events. The homes of evacuees survived in more than 99% of cases. Many evacuations have occurred in the boreal region and involve other forest dependant communities, where population densities are often low but area burned is substantial. Evacuations were less common in the more heavily populated southern regions of Canada, but individual wildfires in these areas had significant impacts.



Locations of evacuation events in Canada between 1980 and 2007.

The costs of evacuations are very difficult to accurately identify. There are a number of agencies involved ranging from regional and local government, police etc. as well as significant costs to individuals.

In addition to the direct threat of destruction from wildfires, many evacuations are carried out due to health concerns associated with exposure to forest fire smoke. Studies show that exposure to fine particulates in forest fire smoke has a wide range of cardiovascular, respiratory and reproductive health effects. The economic costs of smoke-related health effects can be substantial - fire smoke from a 2001 fire in central Alberta affected air quality in Edmonton and Red Deer, resulting in health effects estimated at \$10-12 million over two days, with over 90% of this estimate attributed to increased mortality.

Across Canada there has been a growing awareness that fire management strategies of the past will not be as effective in a future world in which wildland fire is more frequent and severe, and that increasing fire management expenditures and resources alone will not prevent a major increase in future impacts. This reinforces the need to mitigate future risk through expanded programs that emphasize fire prevention and community protection. As well, as a result of increased threat due to forest aging and fuel buildup, the natural role of fire is being discussed, with significant implementations carried out by Parks Canada.

In 2004 the Canadian Council of Forest Ministers (CCFM) commissioned the development of the Canadian Wildland Fire Strategy (CWFS). This initiative was driven by the increasing impact of wildfires on people and property, particularly the 2003 fire season in western Canada, along with the recognition within the wildland fire management community of a declining suppression capacity, and a growing public awareness of wildland fire issues and impacts. There was also a growing consensus that a number of factors affecting Canadian fire management programs were changing, challenging the sustainability of past and current approaches, and raising the probability that continued adaptation to evolving fire issues would be required to achieve future fire management objectives. These factors included:

- a general recognition that fire activity and severity was increasing, particularly in west-central Canada, that forest health in many regions was declining, and that climate change would further exacerbate fire impacts across Canada in the near future;
- an expanding wildland-urban interface (WUI) with more people choosing to live in flammable wildland landscapes, resulting in increasing threats to communities, and;
- steadily rising fire management expenditures (currently averaging \$800 million annually), and growing evidence of diminishing marginal returns associated with increasing expenditures alone.

The CWFS was developed and received ministerial approval from federal/provincial/territorial forest ministers in 2005. The goals of the CWFS are social, ecological and economic in nature and envision resilient communities and an empowered public, healthy and productive forest ecosystems, and modern business practices. Fulfilling these goals requires:

- a national FireSmart initiative to enhance mitigation, preparedness, response and recovery within Canadian communities at risk;
- a wildland fire preparedness and response capability involving three levels of government (federal, provincial/territorial, and municipal) adapting to growing challenges through increased sharing of knowledge and resources, along with improved capacity and infrastructure;
- a public education and policy initiative to educate citizens and policy-makers about the natural role of fire and associated risks, and the need to be adaptable to evolving future fire regimes and impacts under a changing climate and;

- an innovation strategy that addresses the increasingly complex sociological, economic, and biophysical challenges of wildland fire.

In a recent undertaking that buttresses the timeliness and relativity of the CWFS, wildfire management agencies in the United States have recently undertaken the development a National Cohesive Wildland Fire Management Strategy, which has a number of goals that bear a remarkable similarity to those outlined in the CWFS. These include creating fire-adapted communities, restoring and maintaining resilient landscapes, and responding to wildfires through increased cooperation through all levels of government.

Despite the support for the CWFS concept shown by all forestry ministers in 2005, implementation of the CWFS has been limited, with some investment by Provinces and Territories in firefighting capacity and prevention, and occasional consideration of CWFS activities in federal issues funding such as the Infrastructure Program and Community Development Program. However, in the absence of sustained support, provincial and territorial agencies have begun discussion of a number of CWFS recommendations, under the auspices of the Wildland Fire Management Working Group (WFMWG) of CCFM. This includes work addressing fuel load and resource sharing capacity challenges, the development of a multi-agency approach to community protection from wildfires ("FireSmart Communities"), and the development of a coordinated fuels management strategy.

Climate Change and Future Canadian Fire Regimes

The latest Intergovernmental Panel on Climate Change (IPCC) projections indicate an increase of 1.4 - 5.8 °C in global mean temperature by 2100 AD, with the largest increases occurring at higher latitudes, over land, and during the winter/spring period. These temperature increases will cause projected increases in extreme weather events, including heat waves, droughts, floods, and wind storms. Major winter and spring warming has already been measured across west-central Canada, Alaska, and virtually all of Siberia over the past four decades, resulting in temperature increases of 2-3°C over this period.

Temperature is a key variable relative to forest fire activity for three reasons:

- It affects the amount of moisture the atmosphere can hold, which in turn drives the moisture content of forest fuels;
- It is strongly positively correlated with lightning with higher temperatures resulting in more lightning, and;
- Warmer temperatures result in longer fire seasons, particularly at high northern latitudes.

Since the early 1990s, fire researchers in Canada have been using the most recent climate change model projections to predict the impact of future climate change on future fire regimes, updating these projections as new models become available. Results to date can be summarized as follows:

- Fire danger conditions are expected to become more extreme, most significantly in west-central Canada;
- Both lightning and human-caused fire occurrence will increase across Canada, particularly in the boreal zone where increases of 50-100% are expected by the late 20th century;
- Area burned expected to increase, primarily across west-central Canada;
- Fire seasons will become longer, with earlier springs and later falls;
- Forest fire severity and intensity will increase;

- Terrestrial carbon loss, caused by more severe fires and fuel consumption, will be accelerated particularly in peatlands and areas with melting permafrost, and;
- Positive feedbacks between fire and weather (with warming causing more fire, followed by more fire increasing greenhouse gas emissions leading to more warming) are a strong possibility.

Research results thus strongly suggest that climate change will greatly increase fire impacts across Canada. Governments must acknowledge this reality, anticipating and moving to mitigate these impacts where possible. The most prudent form of adaptation would involve moving towards increased protection of communities at risk. At the same time, both governments and the insurance industry should be aware that increased fire risks associated with both climate change and expanding communities and resource development will create conditions conducive to more impacts similar to those experienced at Slave Lake in 2011.

Enhancing Community Protection - the FireSmart Canada Initiative

In 1999 Partners in Protection (PIP) created FireSmart and published a comprehensive technical manual "*Protecting Your Community from Wildfire*" which is now the national standard for community wildfire protection (40,000 copies in use). PIP receives in-kind support and funding from more than fifty representatives from industry and numerous provincial, territorial and federal fire management agencies.

The CWFS recognized the increasing vulnerability of people, property and natural resources to wildfire, and envisioned the need for an expanded program of community protection as a strategic objective. Subsequently, PIP developed the FireSmart Canada Initiative (FCI) in 2009, and has been pursuing financial support for the Initiative, without success, since that time. The FCI is designed to complement existing provincial and municipal fire prevention and suppression programs by raising awareness and motivating individuals to adopt effective wildfire risk reduction activities, and has three core elements:

- The FireSmart Canada Communications Program, which provides information, awareness and training resources for residents, firefighters, planners and municipal managers in a variety of formats;
- The FireSmart Canada Community Recognition Program, which encourages self-organized groups of residents in hundreds of communities to work collectively, and is based on the National Fire Protection Association's Firewise Communities program in the United States, and;
- The FireSmart Canada Northern and Boreal Program, which specifically targets First Nations communities, mining and petroleum industries, and remote recreational facilities where suppression resources and prevention programs are scarce.

The FCI will encourage private citizens to accept the responsibility they share with fire management and emergency services for wildfire readiness and risk mitigation, empower individuals and communities to directly reduce wildfire losses through proven actions undertaken in or near populated areas, and increase the resiliency and recovery ability of communities impacted by wildfire. In addition, the FCI will:

- raise awareness and acceptance of FireSmart principles across Canada, complementing ongoing provincial and federal efforts;
- encourage community involvement in public safety, reducing the inappropriate burden currently placed on fire and emergency services during interface fires, and;
- reduce the costs of protecting communities and developed areas from wildland fires.

The FCI remains the most likely means to adapt to future fire regimes in a manner that most effectively protects Canadian lives and property, and yet this Initiative remains largely unfunded. There is a recognition that there are literally hundreds of Canadian communities, particularly in northern Canada, that are even more at risk than Slave Lake was in 2011. Protecting these communities will require large investments, on the order of those recommended in the CWFS.

While not directly responsible for wildland fire management over most of Canada, the federal government could assume a strong leadership role in protecting human health and safety by supporting the FCI and offering financial incentives to communities to mitigate risk. It is clear from the CWFS recommendations (which were supported by the federal government) that large investments will be required, and that this is a shared responsibility among governments, communities and citizens. It is also clear that PIP and the FCI are well-prepared to use increased investments wisely, should they materialize.

Economic Realities and Critical Challenges

Wildfire budgets, along with many provincial programs, are under significant pressure, especially during years of reduced wildfire activity. Only when wildfires create significant public impact are budget increases considered, and generally the increases recover budget losses in terms of inflationary costs to contracts and collective agreements as well as austerity measures and staff reductions. Rarely do budgets account for capital asset degradation and lost programs. A key example of austerity has been the virtual elimination of federal research programming into wildfire, in spite of an international reputation for excellence in wildfire danger rating, equipment development and decision support systems.

Pressures on funding for preventing and preparing for wildfires are even more concerning in face of expanding development in and near flammable forest environments, increasing fire behavior due to aging forests and forest pests, and climate change which may already being experienced through longer wildfire seasons and extreme weather.

Most wildfire organizations have developed as branches within resource management agencies and their budgets have developed based on needs to protect forests. Due to a long period of limited community threats from wildfires in the 70s, 80s and early 90s coupled with major advancements in aircraft use, firefighter standards, equipment, systems and technology, a level of complacency developed. As a result, programs that support and deliver wildfire management have not always been supported. In some cases resourcing has dropped to levels below economic efficiency, namely the resulting increase in suppression costs exceed the savings in preparing for wildfires.

In general budgeting for wildfire resource management agencies does not account for the broad economic impacts of wildfire. A warning of the economic impact was seen in 2011 with the measureable impact of the Alberta wildfires on the Canadian GDP. Additional to the economic impact is the current and potentially escalating damage to property and insurable assets, both private and commercial. The losses in 2003 and 2011 appear to be having limited impact on long term budgeting for wildfire. It is expected that if wildfire threats continue to increase, communities and local fire departments will need to escalate their efforts to prevent and respond to wildfires. It is also likely that insurance brokers will need to consider the increasing threat in underwriting policies.

If area burned is expected to double over the next 20 to 30 years, it is clear that the damage and economic impact will more than double due to increased investment and population. As well, under such conditions, it is very unlikely that we will continue to have such good fortune with safe evacuation of civilians in advance of wildfires. Starting in 2003 the federal government has included payments to provinces and territories for extraordinary fire season expenditures necessary to protect communities. That year a payment of \$200 million as well as forgiveness of major costs was made to British Columbia. Those costs will continue to mount in addition to economic impacts and damage. In that regard, the federal government will have an escalating interest in addition to overall national security.

During busy wildfire activity, control of fires during the critical initial attack phase when fires are generally small cannot generally be guaranteed. This is a result of the significant range in the number of fires that can start on any given day. Funding to prepare for wildfires is based on historical experience not necessarily the extremes (let alone projections of increasing workload) and therefore capacity is often overwhelmed during heightened fire activity. Canadian wildfire agencies have adapted by sharing firefighting resource (crews, equipment, aircraft and expertise) across Canada and with other countries including the US, Australia, New Zealand and others. A good example was 2003 when the 800 British Columbia firefighters were supplemented by over 6000 staff and contract firefighters from across the country and US and over 900 troops from the Canadian military. In 2011, as local resources became fully committed in Alberta orders for shared resources were placed, however, other than aircraft, critical ground resources could not be marshaled and shipped quickly enough to arrive before the fires at Slave Lake had done their damage.

Both the 2003 and 2011 wildfire situations call for new thinking in terms of Canada's capacity to defend itself from the increasing threat of wildfires. With regard to 2003, it is clear that the Canadian military cannot commit to consistently providing support. However, in the interests of national security and stability in the face of increasing threats from wildfire, the federal government should consider formalizing its role, especially in the face of reliance of federal land management agencies on the provinces and territories for support.

As a result of the recent wildfire disasters, it is clear that communities and local fire departments must be empowered and supported to defend themselves from wildfires that can threaten on very short notice. Two key tools have been developed that must be adopted locally - FireSmart and Structural Protection Systems (description needed). Lastly, local governments, especially in areas of current and upcoming risk from wildfires must take responsibility through appropriate bylaws for FireSmart principles for new development, control of wildfire hazard creation and accumulation and control of use of open fire. To be successful, appropriate education and firm enforcement are needed given the potential social, economic and environmental impacts of disastrous fires. It is also clear that any community with subdivisions at risk to wildfire must practice their response and recovery through emergency training and practices. Information on the increasing wildfire threat such as increasing fire season length and intensity as well as expanding wildland development and use must be made available to communities and the planners to ensure awareness.

To facilitate appropriate investments in wildfire prevention measures such as FireSmart and a clearer understanding of the risks for insurers, a framework for risk assessment is needed. Detailed threat assessment methods have been developed and applied in a number of areas in Canada, however, identification of high risk areas through a cursory methods will speed up prioritization of efforts. The most recent estimate of costs to implement FireSmart nationally, compiled in 2005 is \$877 million, is now considered a significant underestimate.

Appropriate Actions

The following summarizes key actions that were discussed at the workshop and will contribute to community and homeowner safety in the wildland urban interface:

1. Support research and development in key areas to protect homes and communities from wildfire. This includes:
 - a. Development and testing of wildfire sprinkler systems for fire departments, industry, homeowners, and remote facilities.
 - b. Effectiveness evaluation of fuel treatments in protecting communities from wildfire
 - c. Extension of the CFFDRS to deal with fire behavior aspects critical to public safety
 - d. Expanding the natural role of fire in wildland fire management
2. Support local fire departments in a more active role to protect communities, especially:
 - a. Expanded cross training with wildland fire organizations
 - b. Deployment of exterior sprinkler systems by supporting equipment acquisition, training, engagement through mutual aid networks, etc.
 - c. Active engagement in FireSmart activities including participation in development of Community Wildfire Protection Plans, FireSmart Community Plans, encouragement of Homeowner FireSmart, involvement in treating fuels surrounding communities including burning of grass hazard, removal of vegetation, etc.
3. Develop emergency management training exercises based on wildland fire examples like Slave Lake, Kelowna and Barriere for all levels of response (local, P/T, federal)
4. Develop wildfire risk/threat maps for the Canadian landscape to support risk assessments for communities and industrial development. A cursory analysis of historical risk can be used to quickly identify communities most at risk, followed by more detailed assessments based on local fuel conditions, FireSmart treatments and fire response capabilities.
5. Provide information of the escalating threat to community and planning associations nationally and regionally to ensure they are aware and take appropriate measures to mitigate.
6. Engage the insurance industry nationally, regionally and locally to ensure coordinated response in the event of a major wildfire event.
7. Encourage appropriate budgets at federal, provincial, territorial and local government levels for FireSmart, wildfire prevention/preparedness, and emergency response to ensure
8. Expand support for the Canadian Wildland Fire Strategy – particularly those areas that improve community protection and public safety.
9. Ensure the public and commercial operators aware of the risk and encouraged to acquire appropriate insurance coverage.

Role of Insurance

It is clear from recent wildfire disaster examples, particularly Barriere, Kelowna and Slave Lake, that insurance can play a very positive role in the recovery of a community but doesn't always succeed in that role. Largely as a result of the high rate of insurance, efforts to smooth the claims process and a very responsive community, Kelowna was able to recover very quickly and fairly

completely from the Okanagan Mountain Park fire. In fact, as a result of the positive image and recovery activities, Kelowna experienced the highest growth in real estate values in Canada in 2003. It is the belief of many in the wildfire community that there is a strong mutual interest between themselves, communities and the insurance industry to increase subscription rates of homeowners and work together on recovery approaches to create winning conditions for all involved. Wildfire agencies cannot guarantee the safety of those choosing to live in the interface and need to work with the insurance industry and other interested parties to communicate with communities and individuals on sensible approaches on where and how to live in the interface.