

Session 6: Representing and Reducing Community Vulnerability to WUI Incidents

Wildfires pose an evolving and complex challenge. This challenge becomes more pressing when wildfires interact with urban settlements in the wildland urban interface. This interface is expanding (as it presents a desirable place to live); the nature of wildfires is similarly changing in both nature (weather patterns are favourable for more severe and prolonged wildfire events) and extent (land management and weather patterns produce wildfire incidents in new locations). The consequence of this is that we have new populations who might be experiencing wildfire events for the first time and the size of the population who might be vulnerable to such events is increasing. Currently we do not have an adequate means of quantifying and then managing this challenge.

The Fort McMurray wildfire in 2016 (Alberta, Canada) led to two fatalities and an approximate cost of C\$10billion. This cost was down to the direct damage caused by the incident and the loss of production in nearby tar-sand refineries. Although wildfires are commonplace in British Columbia (e.g. with over 500 occurring in the first half of 2018 and with costs of C\$0.5billion in 2017 alone), the Fort McMurray event produced new insights into the vulnerability of key infrastructure and residential locations across Canada leading to multiple efforts to address the challenges faced. We discuss three of these efforts here.

Firstly, the National Research Council of Canada has been involved in developing guidance for existing and new construction in WUI communities. This is intended to reduce the vulnerability of communities to such events through addressing construction practices/materials, vegetation management and evacuation planning. Prior to this, wildfire was not addressed within the National Building Code of Canada, leaving a gap in the guidance and regulatory framework provided.

Secondly, several academic, government and industrial partners (e.g. NRC / NIST / NFPA / Imperial College London / Lund University / Movement Strategies) have been developing a freely available tool to simulate community evacuation (WUI-NITY). This tool represents pedestrian, traffic and fire components.

Thirdly, an approach has been developed to map community vulnerability using simulation tools. This will allow regulators and planners to quantify the relative vulnerability of different communities to different (historical, projected and hypothetical) events and then use this assessment to inform planning decisions and resource allocation. It is expected that such a vulnerability assessment will form part of future guidance and regulatory efforts. The same incident does not pose equivalent threats to different communities: the capacity of different communities to cope with a wildfire varies significantly. Therefore, such a vulnerability assessment provides useful insights to prioritising response and tying together the guidance and simulation efforts described above.

This discussion will focus on the use of vulnerability assessment to inform planning and resource allocation, and the need for predictive tools to provide evidence of the dynamic conditions that emerge during a wildfire evacuation on which to base the assessment.