Editorial: Special Issue on the Port Hills wildfire

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Abstract

In February 2017, two wildfires in the Canterbury region of New Zealand merged to form a devastating, extreme wildfire event which threatened hundreds of properties within the rural-urban interface on the fringe of the city of Christchurch. Fourteen houses were destroyed or significantly damaged and over 450 households fled the blazes while hundreds of firefighters, military and other emergency personnel responded. Fourteen helicopters equipped with monsoon buckets and three fixed wing aircraft were deployed in what became a major operation for the region's emergency services. The current special issue focuses on lessons that can be learned from this wildfire event, to help authorities and communities to better prepare for, respond to, and recover from future wildfire threats. Climate change is further raising the stakes for at-risk regions in Australasia in the future. After providing a brief summary of the wildfire event, this editorial outlines how each of the special issue papers contributes to knowledge about different aspects of these and other comparable wildfires.

Keywords: *Port Hills, Canterbury, wildfire, emergency management*

This special issue focuses on wildfires experienced in the rural-urban interface of the Port Hills adjoining the city of Christchurch, Canterbury in February 2017. It broaches topics from urban and wildfire planning and legislation contexts to provide lessons for the future. Spatial patterns of peri-urban development may provide a particularly powerful way to mitigate wildfire risks. Many unmitigated risks nonetheless continue to affect residents living on the urban fringe, and continue to affect the animals they care for. This means that local populations need to be better informed and prepared for wildfire risks—risks that will only increase in the face of global climate change and associated trends being experienced in many parts of New Zealand and Australia.

Overview of the Port Hills wildfires

The scene was set in February 2017 with climatic factors and the fire environment aligned for a devastating wildfire in Canterbury. Although historically the risk and extent of wildfires in New Zealand is not in the league of those experienced in some parts of the world, such as Australia, North America, and the Mediterranean, the risk was particularly high throughout wildfire prone areas on the drier east coast of both the North and South Islands. An unusually high number of wildfires had already impacted rural and rural-urban interface communities throughout January and the start of February 2017, resulting in the loss of, or significant damage to, over 20 homes and causing the evacuation of many residents. These included wildfires on Kawau Island near Auckland, with one house destroyed; near Whitianga, Coromandel, with six houses and other buildings destroyed along with a further three damaged and many evacuations; near Hastings, with one house destroyed, another badly damaged and others threatened; on the Mahia Peninsula, Wairoa, with one house destroyed, others threatened and twenty 20 homes evacuated; and on the Karikari Peninsula, Far North, with two houses evacuated and a campground threatened (Scion, unpublished 2016-17 fire season data).

By mid-February 2017, the Port Hills, which lie immediately to the south of the city of Christchurch and north of the port of Lyttelton had a fire danger

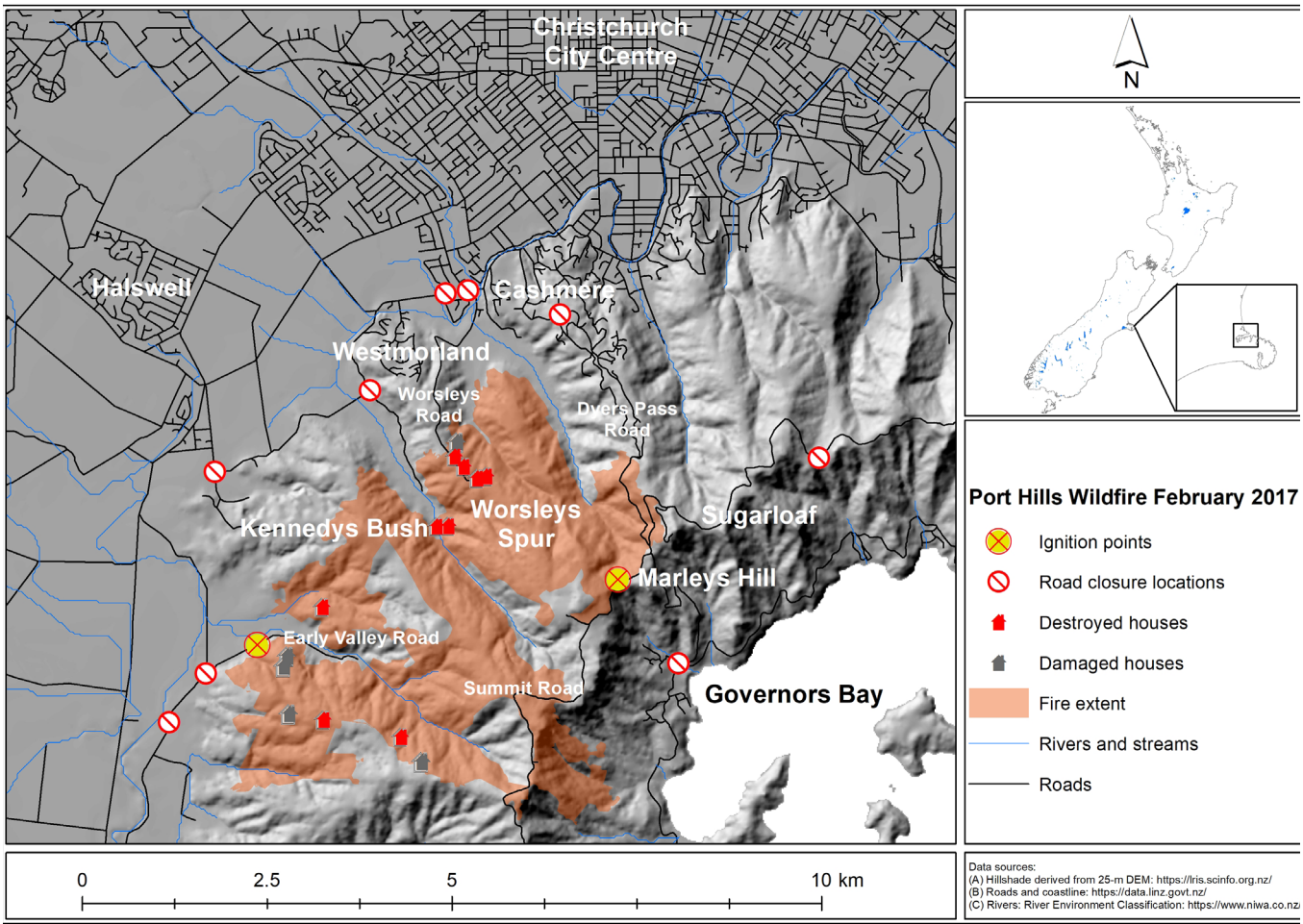

Figure 1. Extent of Port Hills Wildfire, February 2017 showing fire ignition points, damaged houses, road closure locations and proximity to the urban fringe of Christchurch.

rating of between high and extreme. The notable Port Hills topography is best described as having a north to northwest facing aspect, with moderate to steep ridges and gullies running predominantly northwest to southwest from near sea level to around 500 metres at the summit. Slopes angle up to 30 degrees with the majority between 10 and 20 degrees. Covered in a mosaic of largely un-grazed grass, conifer plantations, pockets of native forest, regenerating natives and gorse and broom scrub, the Port Hills were particularly susceptible to a wildfire event in midsummer. This followed a short period of below average rainfall and a total fire ban was in place, according to the Australasian Fire and Emergency Service Authorities Council (AFAC) (2017). The most vulnerable Port Hills community residents lived on small rural lifestyle properties[1], but the majority lived within dense suburban areas on the fringe of the city.

1 Lifestyle properties or lifestyle blocks are small rural properties whose owners wish to live a rural lifestyle, often with small-scale agricultural activities, but for whom agriculture is not their primary source of income.

Wildfires were not new to this area, with large historic wildfires known to have taken place over the previous 100 years and at least 13 wildfires recorded since 1973. Although most of the wildfires only burned a few hectares, three exceeded 100 hectares or more (Scion, unpublished data). Four of these either destroyed or threatened homes and two wildfires severely impacted the community. The first was in February 1973 when a wildfire of about 100 hectares destroyed two houses and three outbuildings. It also threatened an additional 117 properties on Clifton Hill to the east of the recent fire. The second fire occurred in December 1988 and was the largest over the 30 year period preceding the Port Hills fire of 2017. This fire burned about 500 hectares, caused minor damage to six houses and destroyed 60 hectares of 10-year-old pine trees on Worsleys Spur, a portion of the same area burned in the Port Hills wildfires.

On 13 February 2017, two separate fires began nearly 90 minutes apart at Early Valley Road and Marleys Hill, about 4 km north. These fires subsequently joined

to burn a total area of 1661 hectares, with a perimeter of 61 kilometres (see Figure 1) and resulted in the loss of nine homes with a further five suffering substantial fire damage. This brought the total loss or significant damage of homes from rural fires during the 2016-2017 fire season throughout New Zealand to over 30. According to AFAC (2017), this was the greatest number lost in 100 years. In addition, over 450 households, with an estimated 1400 residents were recorded as having evacuated mostly for 3 to 9 days (Christchurch City Council, 2017; 2018), although potentially twice the number of households and 2800 residents are thought to have been evacuated following the evacuation of Westmorland. Evacuations were not only from the small rural lifestyle properties where most damage occurred, but also from suburban neighbourhoods on the margin of the city. The threat to these properties was significant as the wildfire came within about 80 metres of the suburban areas of Kennedys Bush, and 550 metres and 700 metres of Westmorland and Cashmere respectively.

Although regarded as a moderately small wildfire in international terms, the 2017 Port Hills wildfires incident was one of the biggest and most severe in recent New Zealand history and met the definition of an extreme fire behaviour event[2]. There were significant losses and threats to infrastructure, such as major power lines, airport radar installation, the Sugarloaf radio and television transmission tower, and the recently opened Christchurch Adventure Park mountain-bike and recreational facility. Significant loss of indigenous flora was also incurred, including 83 hectares of remnant indigenous forest, plus regenerating and recently planted natives in the Ohinetahi Reserve. It was fortunate that other indigenous pockets, such as Kennedys Bush, did not suffer extensive damage. Tragically, a helicopter accident occurred on the second day in which the pilot was killed while fighting the fire. This was the subject of an investigation undertaken by the Transport Accident Investigation Commission (TAIC) (2017).

A complex array of agencies were active in fighting the fire with the principal fire agencies being the New Zealand Fire Service and the National Rural Fire Authority (merged into Fire and Emergency New Zealand since 1 July 2017), Selwyn District Council, the Department of Conservation, Christchurch City Council and the New Zealand Defence Force. Together they deployed hundreds of firefighters, military and other emergency responders, fourteen helicopters equipped with monsoon buckets and three fixed wing aircraft (Christchurch City Council, 2018). The wildfire resulted in the declaration of a state of emergency to support the emergency services on the third day, the 15th of February. Throughout the incident, the evacuation of residents was managed by the New Zealand Police in liaison with the Incident Management Team in the first instance, then the Ministry of Civil Defence and Emergency Management once the declaration was implemented. The fire was not officially considered extinguished until 66 days after its ignition.

The AFAC undertook a review to assess the operations and performance of the fire agencies with reference to their statutory duties, including an assessment of their readiness, initial response, extended response and post incident management. This review focused on leadership and management over the first five days of the fire, to ensure lessons could be learned and applied for future community engagement and incident management (AFAC, 2017). Findings and recommendations of this review were taken into consideration in a broader review of how to improve New Zealand's response to natural disasters and emergencies, undertaken by the Department of Prime Minister and Cabinet (DPMC) (2017). In January 2018, Fire and Emergency New Zealand released final fire investigation reports on the Early Valley and Marleys Hill fires. These reports, by Still and Cowan (2018a, 2018b), stated that the cause of each fire remained undetermined, but that they believe that both were deliberately lit. This investigation has been closed and will not be reopened unless new evidence is forthcoming. However, the New Zealand Police are continuing a criminal investigation into the matter.

Content Summary

This special issue features six papers considering factors relating to the 2017 Port Hills wildfires in varying ways. Although a variety of terminology has been used by authors, it should be noted that the New Zealand term *rural-urban interface* (RUI) is essentially synonymous with the terms *wildland-urban interface* (WUI) and *peri-urban area*. To provide the context for this special edition we follow the definition of the RUI provided by Radeloff et al. (2005) as the area of transition between rural and urban where houses and other buildings are

2 Extreme fire behaviour represents unpredictable fire activity including rapidly increasing fire spread and intensity, or characteristics such as crown fires, fire whirls or ember spotting. It is highly dangerous and cannot be suppressed using conventional fire suppression methods (Werth et al., 2011).

intermixed with, or exist adjacent to, areas of vegetation. The RUI can be divided into two types. In the *intermix,* small residential properties and other urban-associated buildings are interspersed with predominantly rural land uses. In the true *interface or urban fringe*, dense blocks of suburban housing or industrial development adjoin—but are sharply delineated from—large areas of vegetation.

The current special issue starts with a case for improving both urban planning regulation and local community capabilities. This paper looks at how the 2017 Port Hills Wildfires are part of a worrying trend which is rapidly becoming a standard part of Fire and Emergency New Zealand business. According to the paper's author, Pearce (2018), improved mitigation must be fostered from the level of governmental planning policies and practice, to the level of better informing households about their local wildfire risks.

The next paper of this special issue, by Kornakova and Glavovic (2018), is focused on the importance of urban planning to manage wildfire risk. It is based on a systematic review of legislation, policies, plans and other relevant documentation and draws on a study of the 2009 Victoria bushfire experience. This review has been combined with material from interviews with fire service, planning and consulting professionals. The sum of these analyses has highlighted a number of needs which, if met, will help to better manage and mitigate the wildfire risks faced by New Zealand communities.

The following paper, by Kraberger, Swaffield and McWilliam (2018), focuses on urban planning at the periphery of New Zealand's cities and the role which this had to play in the onset, size and severity of the 2017 Port Hills wildfires. Recovery from the wildfires may present an opportunity to improve relevant aspects of urban planning, by changing the spatial patterns of how development is permitted and promoted on the urban fringe.

Issues regarding local risk perception form the focus of the next special issue paper, by Langer and Wegner (2018). Text from media reports and related social media concerning the wildfires were analysed to identify what factors shape residents' responses to the wildfires, including risk perception, together with preparedness, threats and losses, surrounding social norms and conflicts. Other contextual factors such as the allocation of responsibility have also been examined. As concluded in the first paper of this special issue, it seems that affected residents may not be sufficiently aware of their local wildfire risks.

The next paper, by Montgomery (2018), makes the case that at least one of the 2017 wildfires was likely to have been deliberately lit. According to the author, who analysed wildfire reviews, news and social media, this represents a crime that has been overlooked in official reports regarding the Port Hills wildfires. Opportunities to better consider local community engagement, including local community response planning, are outlined.

The final special issue paper highlights the importance of animal welfare during responses to the 2017 Port Hills Wildfires. The authors, Squance, Stewart, Johnston and Riley (2018), analysed a combination of official reports, academic articles and media reports, published in the 13 months following the wildfires event. This analysis identified key themes concerning the actions of Port Hills residents who had a strong bond with affected animals that were in their care at the time.

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