

Extreme wildfire: Our new reality – are we ready?



Are we ready for extreme wildfire?

Extreme fires are difficult to predict and behave erratically. They exhibit hard to control fire behaviours such as fire whirls, spotting and rapid fire spread.



Background

The occurrence of extreme wildfire is accelerating much faster than predicted. The changing climate is increasing the frequency and severity of wildfires, and escalating the risks, not just in the rural areas but also at the rural-urban interface and overseas we are seeing risk increase well into the suburban zones.

The direct cost of wildfire on NZ's economy in 2020 was \$142M, with indirect costs estimated to be at least 2-3 times greater, plus social impacts and losses of ecosystem services up to 30-60 times direct costs. We predict that by 2050, direct costs could increase by 400% (\$547M/annum) with a changing climate.

Aims

Predicting the physical processes driving fire-spread is key to fire readiness. Without that knowledge it is not possible to develop effective tools and strategies to keep firefighters and communities safe. The Extreme Wildfire Programme aims to increase the understanding of wildfire spread and extreme fire behaviour in order to improve fire prediction and reduce fire hazards. This research will improve the preparedness of New Zealanders (and address the Government's investment priorities for the environment) to ensure that extreme wildfire occurrence is not a surprise.

This research builds on the past 28 years of rural fire research in New Zealand including the recent MBIE 'Preparing New Zealand for extreme fire' programmes. The outstanding, proven, and internationally recognised collaborations between the research team and operational firefighters and end-user agencies mean the work will be relevant and applied.

This programme is funded by the Endeavour Fund, Ministry of Business, Innovation and Employment with co-funding from Forest Growers Research, Fire and Emergency New Zealand, Department of Conservation, and New Zealand Defence Force and will run from October 2021 to September 2026.

Outcomes

- We will develop globally applicable knowledge embedding the new convection fire spread theory into practice by validating the theory for crown fires and understanding how convection is coupled to atmospheric conditions to drive transitions to increasingly extreme fire behaviour.
- We will improve wildfire predictions in the mixed vegetation and building landscape of the rural-urban interface by increasing knowledge of fuel flammability and by coupling an atmospheric model (PALM) with a fire spread model (WFDS).
- We will improve New Zealanders understanding of how to learn to live with wildfire by connecting national to household-scale planning and preparedness.
- Future threats and risks to NZ forests (both planted and indigenous), ecosystems, and biodiversity will be reduced by increasing the understanding of wildfire risk and potential fire spread in indigenous forests.
- Mātauranga Māori and indigenous approaches are respected and complement/contribute to the developing (ngahere) fire science knowledge.
- An end-user guided process to identify smart tool opportunities and requirements. These prototypes will be used to develop and improve smart firefighting both during and prior to fire events.



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About Scion

Scion is the Crown research institute that specialises in research, science and technology development for forestry, wood and wood-derived materials, and other bio-material sectors.

Scion's purpose is to create economic value across the entire forestry value chain, and contribute to beneficial environmental and social outcomes for New Zealand.

