Australian Government
National Recovery and Resilience Agency

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Australian Institute for Disaster Resilience

POSTER BOOK

#ADRC22

Australian Disaster Resilience Conference 2022

In partnership with AFAC22 powered by INTERSCHUTZ

RESILIENCE IN A RISKIER WORLD: ADAPTING AND TRANSFORMING FOR THE FUTURE

AIDR.ORG.AU/ADRC

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In 2030 Australia, we are enabled and supported to actively reduce disaster risk and limit the impacts of disasters on communities and economies.

Midterm Review

SENDAI FRAMEWORK

FOR DISASTER RISK REDUCTION 2015-2030

The National Recovery and Resilience Agency led Australia's Mid-Term Review of the Sendai Framework.

This review provided insights on achievements to-date in reducing Australia's disaster risk, and identified the transformative actions to be taken to achieve a substantial reduction of disaster risk by 2030.

This poster depicts the end-state we are seeking to achieve.

Shared purpose

As a nation, the shared understanding that **disaster risk reduction is everyone's business** is mainstreamed.

Investing in Resilience

Disaster risk information is incorporated into all investment decisions, resulting in **greater investment** opportunities to **do better**, and **do different.**

Inclusive approach

Diverse cohorts are recognised as **agents of change**, and are **actively and meaningfully involved** in making decisions to reduce their risk.

Data and Reporting

16
38

We have an established **national data ecosystem,** which enables the collection, sharing and use of **data to inform decisions and action.**

Partnerships and Trust

Our robust and **transparent governance** frameworks inspire trust and achieve greater **coordination and collaboration** across **all** levels of Government

Strong Capability

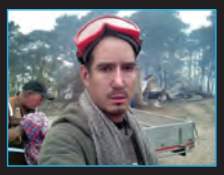
We build and support the necessary **capacity and capability**, at all levels, to take **collective action.**

Australian Government

National **Recovery and Resilience** Agency

DEANS DISASTER RELIEF

RESILINCE IN A RISKIER WORLD



With larger global disaster events occurring more often and on occasion overlapping it is imperative that all agencies must collaborate with government and non-government efforts to adequately address the complexities of disaster needs. Relief and recovery is not about monopolising the response. A more collaborative effort leads to better outcomes for affected communities and allows those most affected to recover in a more holistic, whole and supportive environment leading to better resilience in recovery.

Retaining the knowledge base with experienced staff and then redeploying into future disaster zones mitigates the process of relearning each and every time an event occurs. Additionally, changing policy to allow the mentoring of less experienced personnel in how best to deal with survivors, media, donations and volunteers contributes positively in building confidence, trust, equity, connectedness and expertise.

Resilience in communities can be underpinned prior and post event through educational means, community disaster drills, demonstrations and through the shared experience in high pressure environments. Understanding no one person and not one agency has the complete capacity or mandate to respond in relief and recovery. It is and should be a multifaceted, multi-agency and multi community collaborative response.

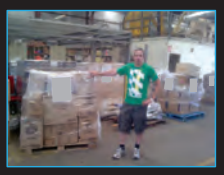
Support for communities in building resilience should be encouraged from a Local, State and Federal Government level. A systemic change in thinking around how we support disaster relief and resilience will utilise the incredible capacity people and communities have to help themselves, neighbours and communities first. We see this time and time again, in those early stages it is so often the community itself that steps up to respond to the emergency and often overwhelming need. A resilient community will mobilise fast and without the constraints of red tape and bureaucracy. They will assist, save and support people impacted by disasters extraordinary quickly and resourcefully. Over and above more formal responses which may be under resourced, often individually impacted themselves or take time to organise to respond in a timely manner to the scale of the disaster.

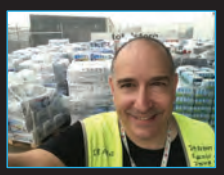
This notion of community resilience also extends to the early period of relief and manifests on the ground by disaster agencies assisting, empowering, supporting and empathising with survivors, rather than dictating "what it is to be resilient". Communities are by nature incredibly connected and through the shared experience of surviving a disaster at any level brings many communities even closer and more so connected. We also see this connectedness across multicultural divides, communities from differing backgrounds and often not directly impacted by disaster coming to the aid of people in distress with food operations, material aid, financial assistance and volunteers.

The advantage of thinking about resilience and relief in these terms recognises and maximises the incredible resource the community itself is. There is a time where the "changing of the guard" will happen with regards to recovery and the community can once again focus on their individual needs and we can think of this as the "anatomy" of relief and recovery.

This notion of resilience will feed into the incredibly powerful dynamic of connectedness. Connectedness means people will naturally gather and be drawn together, they will share meals and stories and help each other with a host of matters. Things such as food, clean up, sharing of information, paperwork and the very important issue of mental health.

Ultimately, communities that are genuinely supported by agencies that are well-resourced, with experienced and empathetic staff, will be empowered to deliver support to themselves and their own communities better. They can be thought of in real terms as a resource to combat the ever increasing challenges faced in this ever increasing riskier world. If we can't bring to future disasters our learned experience from previous disaster then all those learnings are lost and resilience not maximised.





THE 3 C'S MANTRA IN DISASTER RELIEF

Communication Collaboration Coordination

DEPLOYMENT & HISTORY

PRIMARY DEPLOYMENT
* Black Saturday Bushfires, Victoria, Australia 2009
* Grantham & Queensland Floods, Australia 2011
* Christchurch Earthquake, New Zealand 2011
* Dunalley Bushfires, Tasmania, Australia 2013
* Black Summer Bushfires, Victoria, Australia 2019 – 2020
* Kalorama Wind Storm Event, Victoria, Australia 2021
* Lismore & New South Wales Floods, Australia 2022

SECONDARY DISASTER SUPPORT
* Kathmandu Earthquake, Nepal 2015
* Hurricane Irma, Florida, USA 2017
* Camp Fire, California, USA 2018
* Tongan Volcanic Eruption & Tsunami, Tonga 2022
* Paktika Province Earthquake, Afghanistan 2022
* Pandemic Relief & Other Minor Natural Disasters 2009 - 2022

Dean Cerneka is the founder of Deans Disaster Relief (DDR).
A non profit foundation which rose from the 2009 Victorian Black Saturday Bushfire Disaster. The foundation provides volunteer, humanitarian, disaster and emergency relief support across Australia and beyond. Dean, having survived the Black Saturday Bushfires in Victoria, specialises in red zone disaster relief to assist with forward field coordination, human resource assessment, logistics, communications and needs based data gathering. The focus being on the efficient and appropriate distribution of resources, volunteers, donations, material and emergency aid and to support government, non government, community and cultural group responses. Dean has a masters degree in Social Science from RMIT and continues to contribute to the ongoing education and development of more effective, collaborative and resilient disaster relief.

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ENHANCING LANDSLIDE RISK REDUCTION STRATEGIES IN SOUTHEAST BANGLADESH

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1. INTRODUCTION AND BACKGROUND

Landslides become recurrent phenomena by taking over 700 deaths mostly in informal settlement in the southeast region in since 2000 (Figure 1). The 2007 landslide event took 127 deaths in informal settlement in Chittagong. Recently, on 12 June 2017 the landslides occurred in Rangamati took over 150 lives. Both natural and anthropogenic causes are responsible for landslides in the country. These include: excessive and prolong rainfall in a short period; unmanaged slope cutting; loose soil structure in hilly areas; deforestation in the hilly areas and seismic activity (Alam, 2020;Ahammad, 2009; Chisty, 2014; Sarwar, 2008). Hill-cutting areas have been used for formal and informal settlement development, and the increase of these settlements (Figure 2) along the foothills has been contributing to landslide events. Although the Government of Bangladesh claimed that they undertake sufficient risk reduction strategies, the deaths associated with landslides are increasing following disaster occurrence (Alam and Ray-Bennett, 2021). As such, this research aims to investigate how to enhance landslide risk reduction strategy by addressing a number of specific scientific and technical issues related to the diverse disciplinary fields of hazard and risk assessment and emergency response mechanism.

2. METHOD AND MATERIALS

This research consults several key stakeholders of landslide risk management including communities, community leaders, experts and administrators separately between August and December 2018. In total of six focus group discussions (FGDs) were conducted to understand the reasons of recent landslide vulnerability, ways of disaster preparedness, perceptions and attitude towards governmental efforts, evacuation and overall risk reduction strategies (Table 1).
The combined results of this research obtained through face to face interviews with communities, key person interviews (KPIs), and workshop were shared with a wide body of academic, emergency management, disaster and health specialists at an international conference held in Canberra, Australia on 23 October 2019. The findings were also shared with personal contracts in Chittagong and Dhaka. This research reviews and extracts findings from several news reports published after immediately after the 2017 landslide, and reviews policies, plans and institutional response mechanisms which add much value to the findings and support validate findings receive through discussion and interviews. Finally, the results obtained through this process were used to undertake effective landslide risk reduction strategies in Bangladesh.

TABLE 1: PARTICIPANTS

PARTICIPANTS TYPE AND LOCATION	DATE CONDUCTED	NUMBER OF PARTICIPANTS
Communities	August 2018	208
Community leaders/local conscientious people	August 2018	15
Communities	September 2018	6
Elected representatives	October 2018	6
District and sub-district administrators	October 2018	10
Experts	September-December 2018	3

Photos: Field visits, observations, interviews and discussion in SE Bangladesh

3. RESULTS

In the following sections, key findings are provided that should be interest of organisations responsible for landslide risk mitigation strategies and for assisting the Government of Bangladesh determining appropriateness of the government's preparedness strategies.

3.1 CAUSES OF INCREASES IN LANDSLIDE HAZARDS

In consultation with communities, key informants, experts and administrators, through field visits, observations and reviewing policy documents, key natural and man-made factors of landslide occurrence are identified (Tables 2,3 and 4).

TABLE 2: NATURAL CAUSES OF LANDSLIDE OCCURRENCE

NATURAL FACTORS	FREQUENCY	PERCENTAGE
Heavy rainfall	192	52.75
Unstable soil	58	15.93
Thunderstorm	40	10.99
Steep slope topography	38	10.44
Earthquakes	36	9.89
Total	364	100

TABLE 3: ANTHROPOGENIC CAUSES OF LANDSLIDE OCCURRENCE

ANTHROPOGENIC CAUSES	FREQUENCY	PERCENTAGE
Deforestation	64	34.04
Hill cutting	68	36.17
Increases of the settlement in slope area due to migration	24	12.77
Natural increases in population	12	6.38
Road construction	8	4.25
Increases of the settlement in adjacent areas	8	4.26
Changes in the natural drainage	4	2.13
Total	188	100

TABLE 4: POLITICAL ECONOMY OF LANDSLIDE DISASTERS IN BANGLADESH

POLITICAL ECONOMY ASPECTS	DESCRIPTIONS	SOURCES
Policy to rise population in CHT	The strategic action plan during 1978-1984 allowing Bengali population to live in CHT	Documentary sources and expert opinions
Land management	Provision of land ownership to the occupants - The owners of individual land remove traditional forests and plant commercial agriculture	This research and expert opinion
Illegal deforestation	Continuous deforestation by vested groups who use local political power	Newspaper reports and Expert opinion
Plan to set up hydro-electricity in hilly areas	In 1960, the GoB has set up hydroelectricity in Kaptai lake submerging to supply electricity to national grid displacing 100, 000 population	Expert opinions and newspaper reports
Ownership of settlement by political leaders	It is hard to execute any evacuation and relocation of these community due to bad politics involved	This research and expert opinions
Manipulated water, gas and electricity	The residents who live in illegal settlement are regularly receiving electricity, water and gas supply illegally by paying money to middle men.	Documentary sources, news paper reports and direct field observations
Rohingya refugee from Myanmar	Many Rohingya refugees had moved to CHT areas from registrar and non registrar refugee camp.	Media reports

3.2 WAYS TO IMPROVE EARLY WARNING, EVACUATIONS AND LANDSLIDE RISK REDUCTION

In the following sections, the way of improvement in early warning, evacuations and overall landslide risk reduction strategies are discussed (Tables 5 and 6).

Table 5: WAYS OF EFFECTIVE EARLY WARNING
Warning through hand-mike should reach each locality
Warning via television
Spreading warning at risk areas
Spread of warning via hand-mike by police
Awerness buildup by socity
Provision of shelter center in safe place
Warning via mobile SMS
Announcement in mosque

Table 6: WAYS TO IMPROVE POST DISASTER RESCUE AND REHABILITATION
Providing relief to the affected people
Relocation in safe area
Providing medicine to the affected people
Rescue activities should be undertaken quickly
Construction of houses
Awareness generation through training on disaster risk
Improving road transport and communication
Providing cash money to the affected people
Effective monitoring of rescue relief and rehabilitation
Constructing retention walls along fragile hilly areas
Training local people about emergency rescue operation

Photos: Human-induced susceptibility in SE Bangladesh

3.3 STRATEGIES TO BE UNDERTAKEN TO ENHANCE LANDSLIDE RISK REDUCTION

After careful analysis of documentary sources and data gathered through field research, this research has prepared a comprehensive list of work strategies and implementation plans in order to improve landslide risk reduction strategies in Bangladesh (Table 7).

Table 7: STRATEGIES FOR LANDSLIDE RISK MANAGEMENT

STRATEGIES	SOURCES
Identify landslide risk area and prohibit such areas for living	Expert interviews
Undertaking and executing well studied long term plans by considering geological characteristics of the hilly areas (i.e., morphology, slope, angel and characteristics of soil)	Expert interviews
Identifications of existing landslide risk areas and implementing risk reduction strategies in those areas	Expert interviews
Installation of retention wall and wire mesh in high risk areas	Akhter (2017)
Construction of shelter centre adjacent to landslide prone areas	Community Survey and KPI
Educating people about landslide through leaflet and video	KPIs
Continuous monitoring of hills to stop hill cutting, identify high risk areas and stopping of new settlement	Community Survey and KPI
The constructed of houses in CHT region follows the Bangladesh National Building Code	Documentary sources and expert
Strengthening fire service and civil defence (FS&CD) by deploying more manpower and increasing technical capacity	Local communities and KPI
Executing mobile text messaging for early warning	KPIs
The government should arrange alternative livelihood options for *Jhum* cultivation	KPIs and experts

4. CONCLUSIONS

Bangladesh has experiences higher deaths and injuries by landslides in last two one and half decades. By collating and synthesizing reports from newspaper reports, reviews current policies, action plans and preparedness activities and consultation with consults relevant experts, community leaders, administrative staff and local residents who have experience of landslides, this research confirms that community based factors, governance aspect and institutional failure of risk management in Bangladesh. Finally, this research provides a series of recommendations on how effective landslide risk reduction strategies can be undertaken and implemented in SE Bangladesh..

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Growing Adaptive Business Resilience

The Cairns Resilient Businesses Network

> To build a strong, collaborative business community through applying locally relevant disaster risk management and business continuity skills and capabilities.

How the CRBN works

- Webinars and a presence at related events throughout the year with an annual exercise to help build maturity in the sector.
- Partnership with the Cairns Chamber of Commerce – advice, relevance, promotion.
- Free membership however members gain status through levels of:

  Bronze - joining level, participate in webinars

  Silver - complete a summary business interruption plan through a template provided

  Gold - complete a comprehensive interruption plan using a template or their own and participate in a network exercise OR demonstrate success using an existing comprehensive plan.
- Gold members receive a certificate to publicly promote themselves and are listed on Council's website as role models.
- Mutual support developed by putting members in touch with each other for help, advice and assistance.

BACKGROUND

Inspiring holistic continuity planning among the business community is an ongoing challenge for disaster resilience practitioners.

Through implementing the UNDRR's resilience scorecard programme, Cairns disaster managers identified interruption planning as a concerning gap in the region's business sector.

In a region which is an iconic tourism destination, major services hub, home to many vulnerable communities and faces numerous hazards, failing to adequately plan for business interruptions means planning to fail. Launching the network during the COVID pandemic provided an opportunity to highlight "difficult to imagine" scenarios in real circumstances.

The Cairns Resilient Businesses Network – a unique, locally based and focused initiative – is making a significant contribution to building resilient planning processes.

RESEARCH

Several factors contributed to the assessment of business continuity planning maturity. These included an earlier study of the tourism industry's disaster preparedness by James Cook University, ongoing work with the business and tourism sectors to enhance preparedness and discussions with local sector-related organisations.

To (a) validate perceptions and experiences and (b) identify the best ways to grow business resilience, a business continuity expert was contracted to engage directly with individual members of a small local town's chamber of commerce.

This lead to development of a survey piloted in the same geographic community, consequently circulated to members of the Cairns Chamber of Commerce, smaller local chambers of commerce and Tropical Tourism North Queensland.

LOCAL RELEVANCE IS CRITICAL

Based in the local government area and Far North Queensland context.

Accessible – no financial obligation; all activities and content can be tailored to specific audiences; webinars allow for easy participation; all business sectors are included.

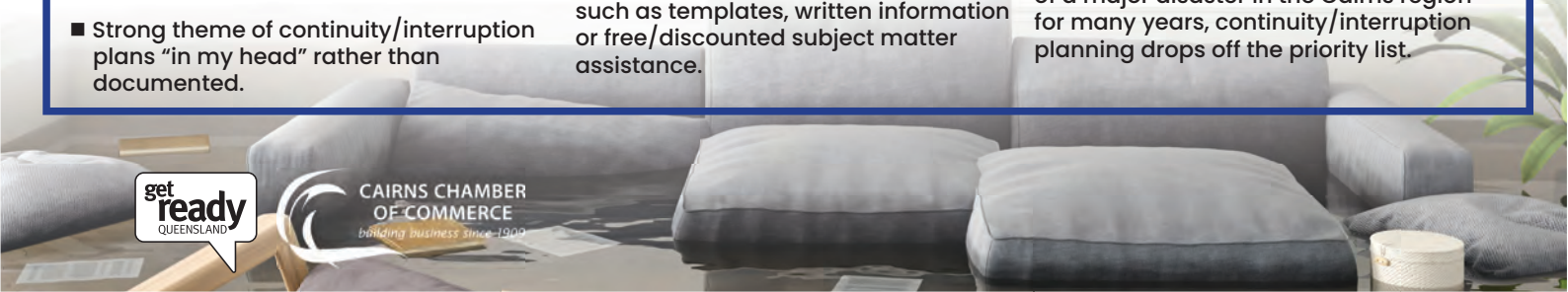
Focus on building capability through expert advice and resource provision. Businesses grow their resilience by working through the membership levels.

Local knowledge and contact allow current topics/issues to be addressed.

WHAT WE LEARNED

- High level of awareness of hazards which are more "commonly known" locally (eg cyclone, flooding) but much lower levels around bush fire, landslide and earthquake.
- Lower level of awareness of hazards pertaining directly to a business location.
- Strong theme of continuity/interruption plans "in my head" rather than documented.
- Businesses with plans (however complete/effective) had taken some actions to limit the effects of a disaster.
- Difficult to find/make time to get through a comprehensive process.
- Many respondents reported they would develop a continuity/interruption plan if specific resources were provided such as templates, written information or free/discounted subject matter assistance.
- "Interruption" was a more captivating term than "continuity".

Although several quality resources are already freely available online, these tend to be generic and often very detailed. Potential users are deterred by the scale of the task and addressing risk management – and in the absence of a major disaster in the Cairns region for many years, continuity/interruption planning drops off the priority list.



Development of a Fine Scale Bushfire House Loss Probability Model

William Swedosh, Alessio Arena
CSIRO, Land & Water

Bushfires are a serious and growing threat to Australian homes. Despite an extensive literature on how building design, bushfire attack mechanisms, and fire management influence the survival of a structure, stakeholders lack a system that combines and consolidates this knowledge. The current project represents a first step in addressing this combined system deficiency through the development of an extensible and modular Python framework (accessible as an ArcGIS Toolbox). This framework, called the Bushfire House Loss Model, aims to provide holistic performance-based risk and structural assessments.

Bushfire House Loss Model Overview

The House Loss Model evaluates the performance of households under bushfire attack by calculating risk to individual buildings. The bushfire attack mechanisms included in the House Loss Model are radiant heat, ember attack, surface fire, and consequential fire. A conceptual diagram of the house loss model is shown in Figure 1.

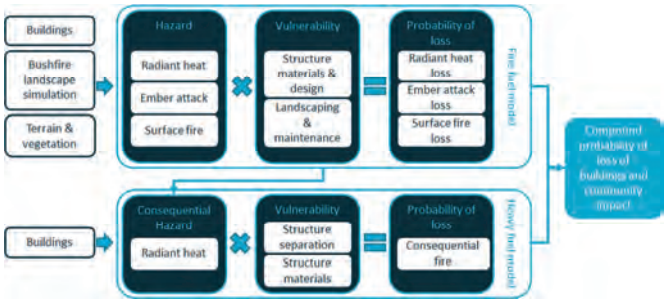


Figure 1: Conceptual diagram of the probability of house loss model.

Radiant Heat Module

The Radiant heat module estimates the probability of house loss due to a failure of the windows and/or timber elements of the building caused by exposure to Radiant Heat Flux (RHF).

- First, the maximum incident RHF on each building was calculated by using outputs from a bushfire simulation (such as flame height) in the BAL methodology (AS3959 method 2).
- A full incident RHF profile was then estimated using rate of spread, approach angle and vegetation attenuation.
- A window failure model was developed from ~100 experiments using survival analyses and depends on frame type, glazing type and thickness (Figure 2).
- A timber failure model was adapted from scientific literature where the total incident RHF profile above the critical heat flux determines whether timber ignites or not.

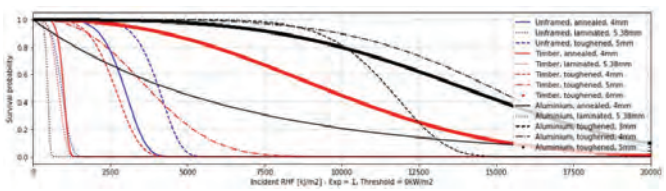


Figure 2: Survival probability curves for windows of different types. Total incident RHF used as failure predictor.

Ember Attack Module

Ember attack is one of the most common ways for a building to be ignited during a bushfire. As a direct threat to buildings, embers can accumulate in or around vulnerable parts of the structure, such as on rooftops, gutters, and in and around doors, vents, windows and against re-entrant or internal corners, where they can ignite the building.

- A physical model for ember transport was implemented so that ember distributions from wildfire simulations could be estimated.
- Post bushfire survey data from Kilmore and Tathra fires was used to develop a statistical model of house vulnerability to embers based on over a dozen house characteristics (cladding, roofing, etc.).

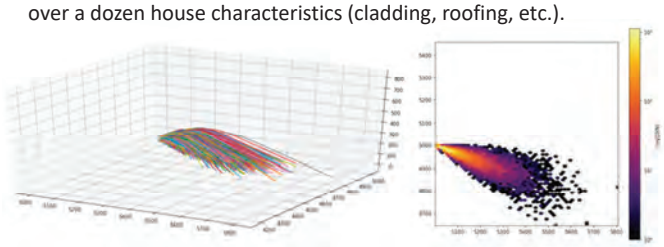


Figure 3: Left, trajectories from an ensemble of ember projection simulations having different physical ember characteristics. Right, resulting ember flux (ember count) at the terrain level.

Consequential Fire Module

Consequential fire (structure to structure) is a very localised fire attack mechanism. Heavy fuels can burn for considerably longer than fine fuels, which exposes the surrounding area to a prolonged heating profile. Such sustained exposure is often the cause of fire spreading to nearby structures, either directly when the distance between buildings is short or indirectly via intermediate ignitable material (e.g., fences).

- Data collected by several radiometers during an experimental house fire (Fig. 4 left) were used to develop a RHF emission curve.
- This was scaled to other houses using inter house distances, burning house footprints and cladding types.
- The incident RHF profile was then used as an input into the timber and window failure functions to calculate consequential fire probability (Fig. 4 right).

Figure 4: Left, experimental house fire and radiometers. Right, consequential fire probability.

FOR FURTHER INFORMATION
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NSW RURAL FIRE SERVICE

NSW GOVERNMENT

BUSH FIRE RISK MANAGEMENT PLANNING
THE BALANCE BETWEEN SCIENCE AND LOCAL KNOWLEDGE

Authors: Susannah Bilous & Melissa O'Halloran (Bush Fire Risk Planning)

The New South Wales Rural Fire Service has worked in collaboration with the University of Melbourne and the NSW National Parks and Wildlife Service to develop a new bush fire risk assessment methodology. The project team tested methods that combine local knowledge with quantitative data and developed a facilitated process that incorporates the latest science and technology, yet enables the development of functional and locally relevant Bush Fire Risk Management Plans.

The new bush fire risk assessment methodology is being rolled out across New South Wales.

The Process

Bush fire risk is quantified by running modelled ignition points through a fire simulator (Phoenix Rapidfire) and using a Bayesian Network model to assess the risk to assets (residential, economic, environmental and cultural). This process provides a consistent and valid approach to risk assessment allowing Bush Fire Management Committees (BFMCs) an objective, tenure blind analysis of risk. The BFMC and local stakeholders are able to add value to the process by validating GIS input data and incorporating local knowledge of assets and risks.

A Bush Fire Risk Management Plan is developed over 4 Workshops.

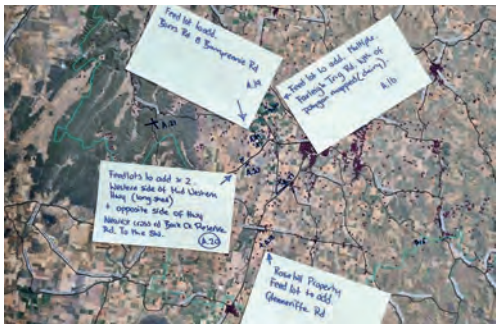
In **Workshop 1**, the BFMC & local stakeholders review and validate the input data (asset locations, land use and fire behaviour).

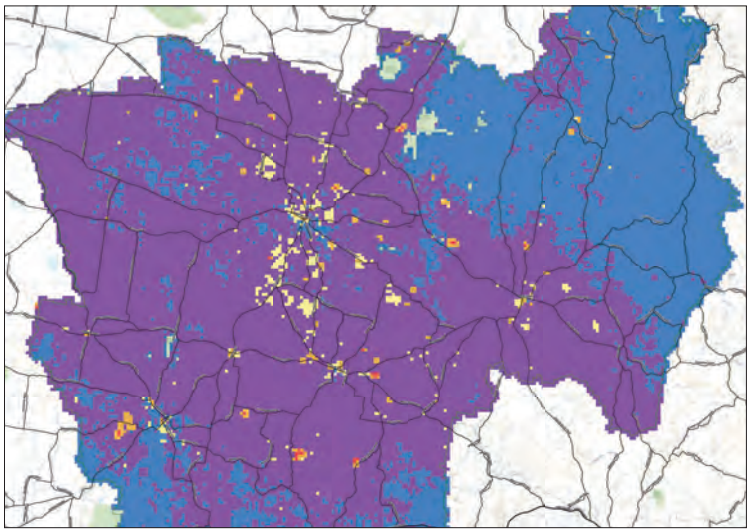
In **Workshop 2**, the BFMC and stakeholders review the quantitative risk data that has been processed and provide input on risks that are not quantified. These include social community risks (vulnerability, behaviour, preparedness) and operational risks (access/egress, building standards). The BFMC identifies areas or groups of assets that have a significant bush fire risk as Focus Areas.

In **Workshop 3**, the BFMC determines Treatment Objectives for each Focus Area including Community Preparedness, Ignition Prevention and Fuel Management. A 5 year Fuel Management Program is mapped.

In **Workshop 4**, the BFMC and stakeholders review the modelled effectiveness of the Fuel Management Program and the Bush Fire Risk Management Plan is finalised.

Quantified risk data alone does not produce a comprehensive Bush Fire Risk Management Plan. Local knowledge and a local understanding of risk provides a valuable perspective and when coupled with the quantified data, it enables the development of a superior, practical and locally relevant Bush Fire Risk Management Plan.





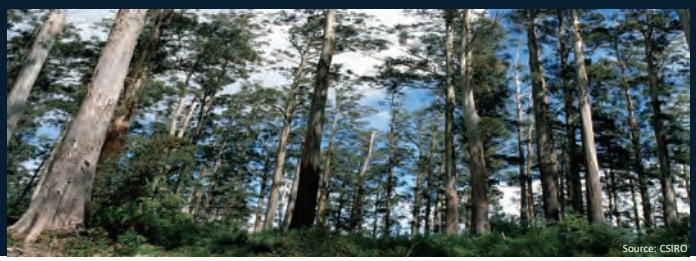
Risk maps are produced for each asset group

For more information contact Susannah Bilous susannah.bilous@rfs.nsw.gov.au

Validating drought factor extreme fire weather assumptions

The influence of default drought factor on extreme dry eucalyptus forest fire behaviour

Kimberley Opie, William Swedosh, Alessio Arena, Durga Lal Shrestha


Source: CSIRO

Modelling fire behaviour across Australia is an important component of land management to mitigate bushfire risks. The level of drought in the landscape can significantly influence fire behaviour and is represented in models as a Drought Factor (DF). Our analysis investigates the impact of assuming the McArthur Drought Factor [1] is its maximum value of 10 for extreme fire weather events across Australia. DF is an input parameter for several fire behaviour models including the Forest Fire Danger Index [2], and the Australian Fire Danger Rating System (AFDRS) versions of the "Vesta" Dry Eucalypt Forest Fire Model (DEFFM) [3] and the Pine Plantation Pyrometrics (PPPY) model [4]. Drought Factor ranges from 0 to 10 (capped at 10) and is used to predict the fine surface fuels available for the outward spread of a fire, with 10 equating to 100% of fuel being available to burn and 0 meaning none is available to burn.

Overview

In this study, we calculate the difference between assuming maximum DF (DF = 10) against 40 years of calculated hourly DF at 31km resolution across Australia using the ERA5 weather reanalysis dataset. We compare the rate of spread (ROS) estimates for dry eucalypt forests and using extreme value analyses (EVA) [5], we can compare this for a 1/50 year extreme event. Areas of forest are where at least 10% of the Australian Bureau of Agricultural and Resource Economics and Sciences National Forest Inventory (NFI) (100m) intercept with weather pixels.

Comparing against maximum calculated DF

A comparison of the maximum of calculated hourly DF factor to DF = 10 results in a maximum of 1.38 times the maximum calculated DF (Figure 1). Maximum hourly DF is equal to 10 across approximately 98% of Australia. Magnitudes of difference are spatially variable across Australia, with the most difference seen in parts of south-east Australia and Tasmania.

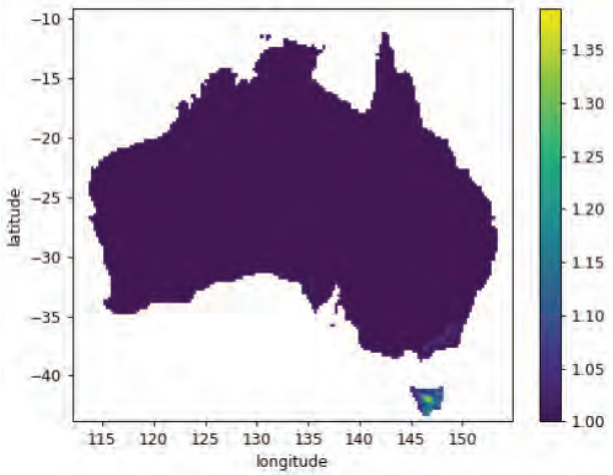


Figure 1: Ratio between assuming drought factor and maximum hourly drought factor over 40 years for all of Australia.

Comparing calculated rate of spread

Given the predominance of dry eucalypt forests in areas where the DF differs the most, we calculated the DEFFM ROS. Default values were used for vegetation parameters as per the Australian Fire Danger Rating System [6]. Maximum ROS ratio (Figure 2) follows a similar pattern to maximum DF ratio. Figure 2 highlights where an overestimation of DF coupled with extreme weather can result in a significantly higher modelled DEFFM ROS.

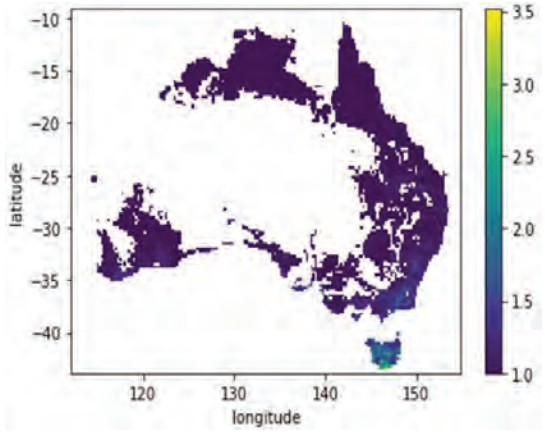


Figure 2: Ratio between maximum hourly modelled DEFFM ROS using DF = 10 and computed DF.

Comparing DEFFM ROS for a 1/50 year event (Figure 3) shows the difference when using DF=10 for extreme wildfire events is variable across Australia and most prominent temperate climates.

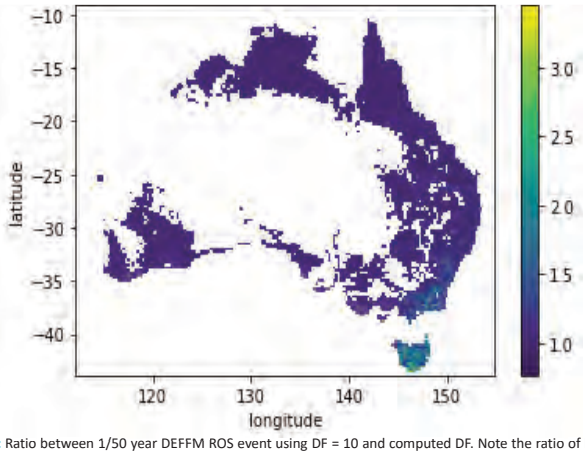


Figure 3: Ratio between 1/50 year DEFFM ROS event using DF = 10 and computed DF. Note the ratio of less than 1 occurs when the values for ROS using DF = 10 asymptote to a flatter line in the EVA, making predictions beyond the last observation less severe.

Conclusion

Using DF = 10 overestimates modelled DEFFM ROS by up to a factor of 3.45 for a 1/50 year extreme event in temperate climates. Assuming DF = 10 is a convenient option when modelling extreme wildfire events but needs to consider how extreme an event it represents for where the modelling is applied in Australia. Further investigation is required to establish what extreme ROS using DF = 10 estimates across Australia for relevant fire behaviour models.

FOR FURTHER INFORMATION

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NSW RURAL FIRE SERVICE

Nature Conservation Council The voice for nature in NSW

HOTSPOTS FIRE PROJECT

EMPOWERING LANDHOLDERS TO UNDERTAKE POSITIVE FIRE MANAGEMENT ACTIONS IN A POST-BLACK SUMMER WORLD.

JENNIE CRAMP[1], HANNAH ETCHELLS[2] AND KATE MCSHEA[2]

[1] NSW RURAL FIRE SERVICE [2] NATURE CONSERVATION COUNCIL OF NSW

About Hotspots

Hotspots is a partnership between NSW Rural Fire Service and the Nature Conservation Council of NSW established in 2005 that provides free workshops to private landholders and other land managers with knowledge and applied skills to actively participate in fire management on their own properties in order to balance life and property protection with protection and maintenance of biodiversity.

Hotspots is evaluated through pre- and post- workshop surveys of participants, as well as metrics related to the number of participants and fire management plans prepared. Masters and PhD research projects have also examined elements of the Hotspots program.

Background

Hotspots has been exploring the breadth of fire impact including indirect impacts on attitudes towards fire ecology and fire preparation. Hotspots received unprecedented levels of demand for workshops following the 2019/20 fire season and wanted to understand what was driving the outreach and attitudes relating to this. Hotspots asked participants of our 2020 and 2021 workshops what they perceived to be the most important local issue related to fire.

Key findings

We noticed a difference in attitudes from landholders impacted by the fires, compared with rural landholders who were not.

Those impacted by the fires were more likely to consider environmental impacts and lack of landholder knowledge to be the most important local issue in regards to fire.

Protecting human life and property was the main concern of landholders who were not impacted by 2019/20, but had experienced fire on their properties in the past.

What next?

These preliminary results suggest an increase in environmental awareness and concern following 2019/20. Hotspots is now collaborating with UNSW to design and conduct landholder surveys to further assess the impacts of the 2019/20 fire season on:

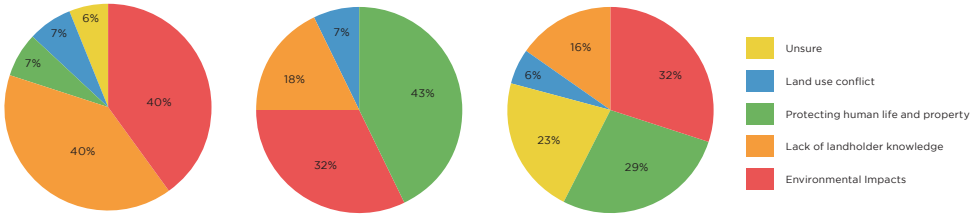
- landholder perceptions of wild fire impacts
- landholder fire management behaviours and actions

It is hoped that key outcomes for Hotspots will:

- Quantify some of these changes and understand the impacts that 2019/20 fire season had on attitudes of rural landholders.
- Further our understanding about what motivates engagement in fire ecology, risk management, recovery and regeneration
- Identify whether knowledge gained from Hotspots workshops made a difference to fire management actions
- Inform decisions around Hotspots training style, content, site selection and support resourcing decisions around delivery expansion

2020/2021 Hotspots workshop participants responses to:

"What do you consider the most important local issue related to fire?"



"I never cared about the trees before"

Pre-workshop survey quote

"[we can now] ... thoughtfully move forward with our post-fire planning and recovery plans"

Post-workshop survey quote

For more information and contacts visit www.hotspotsfireproject.org.au

Mainstreaming Disaster Resilience:

Five principles exemplified by Birdie's Tree

Dr Andrea Baldwin
Service Development Leader
Queensland Centre for Perinatal & Infant Mental Health

1. Disaster Cycles

Natural hazards are occurring with greater frequency and intensity. Building resilience in each phase supports resilience through the other phases of the cycle.

Birdie's Tree focuses on strengthening the disaster resilience of children and the adults who support them:

- in the **Preparedness** phase through building emotional literacy, self-confidence, sense of connection and emotional regulation skills
- in the **Response** phase by enabling calm, promoting connection and supporting a sense of safety
- in the **Recovery** phase by helping children process their experiences and integrate these into the ongoing story of their life

2. All Hazards

Natural hazards and disruptions often occur simultaneously (e.g. heatwave and bushfire) or cumulatively (e.g. drought followed by flood). The impacts of such events may be amplified by other vulnerabilities and stressors at individual, family or community level. Resources are potentially more useful if they can help individuals and communities build resilience across a range of events that may occur.

In 2011, Queensland was severely impacted by cyclones and floods. At that time there were no resources to help babies and young children aged 0-4 cope with natural disasters, so clinicians at Queensland Centre for Perinatal and Infant Mental Health (QCPIMH) set out to create Birdie's Tree. After Hurricane Katrina, some hurricane-specific resources for young children were developed in the US. However, to the best of our knowledge Birdie's Tree is still the only all-hazards, developmental approach to building children's capability to cope with a range of natural disasters and stressful experiences.

3. Whole Community

Natural hazards affect individuals, families, workplaces, organisations and communities. Disaster resilience is most effective when it involves all age groups and sections of the community working together. Social connectedness is one of the most protective factors for people's physical and emotional wellbeing during and after a natural disaster. When pepole work together, responding to and recovering from a disruptive event, individual and community resilience is enhanced.

The Birdie's Tree suite includes resources to support:

- babies and young children
- their older siblings
- parents and carers, including expectant and new parents
- educators and teachers

Capacity-building for the entire community can be provided through training in the use of the Birdie's Tree resources for:

- Councils, including Community Development Officers, Resilience and Recovery Officers and Emergency Management personnel
- Librarians
- Health, disability and other service providers
- Community groups and volunteer organisations involved in supporting families
- Paramedics, police, fire service, SES volunteers and other front-line responders

4. Stepped Care Model

A Stepped Care Model refers to having a consistent and articulated set of resources, principles and approaches to support people's resilience when they are experiencing different levels of challenge.

The Birdie's Tree Stepped Care Model is based on a foundation of Universal Resources for mental health promotion and prevention. Around 80% of children come through natural disasters with no lasting negative impacts on their mental health, so long as they are supported by caring, responsive adults equipped with helpful resources.
The next level is Birdie Cares: early intervention for children and families who need more support to process what they've gone through. Research indicates around 15% of children who have experienced a natural disaster benefit from timely specialist mental health support.
At the top of the pyramid is Birdie Helps: specialist mental health support for children with ongoing post-traumatic stress symptoms (approximately 5%).

5. Evidence-Based

Disaster resilience approaches need to be grounded in the empirical evidence for 'what works'. Three aspects of the evidence-base to consider are:

- existing bodies of knowledge from prior research and practice
- emerging knowledge from new research findings and learnings from practice
- knowledge contributed by the initiative as it is implemented and evaluated

The Birdie's Tree suite of resources and approaches continues to grow, developed by a multi-disciplinary team, drawing on various existing bodies of knowledge. We maintain currency with new research findings and learnings from practice by actively participating in networks and committees, conferences and forums. We are evaluating aspects of our implementation as we go along, both informally through quality improvement activities and formally through practice-led research.

Existing bodies of research

- Impacts of natural disasters and disruptive events on mental health and emotional wellbeing of expectant and new parents, babies and young children, short-term and long-term
- Effective interventions for prevention and treatment of post-traumatic stress symptoms in expectant and new parents, babies and young children
- Disaster resilience education – effectiveness of programs, content, principles and practice approaches

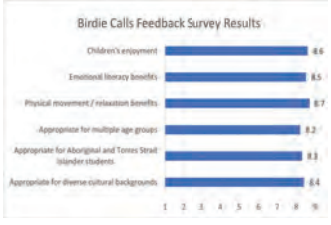
Emerging research findings

- AIDR
- Australian Child and Adolescent Trauma, Loss and Grief Network
- DRANZSEN
- National Infant Child and Adolescent Disaster Mental Health Advisory Committee
- National Mental Health Commission
- Natural Hazards Research Australia
- Other state, national and international bodies and organisations
- Conferences, forums, networks, committees, partnerships

Findings from current project

- Practice-led research into the feasibility, acceptability and effectiveness of the Birdie's Tree resources is ongoing

Birdie Calls evaluation: results



Birdie Calls 2020-2021

32 primary schools, 2172 students

16 early learning centres, 292 children

15 libraries/playgroups, 45 children

Total: 2509 children

Respondents: 98

teachers, educators, librarians, parents/carers

Scan the QR code to visit the Birdie's Tree website or just search Birdie's Tree on the internet

Queensland Centre for Perinatal & Infant Mental Health
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Ph: (07) 3266 0300

Children's Health Queensland Hospital and Health Service
Queensland Government

NSW RURAL FIRE SERVICE

2019/2020 BUSH FIRES REBUILDING COMPLIANCE SUPPORT SCHEME

The 2019/2020 NSW bush fires were unprecedented, causing suffering on multiple levels and resulting in life loss, injury, extensive catastrophic losses to wildlife, agricultural stock and buildings. Rebuilding of homes and communities and direction from the Commonwealth and State levels enabled recovery and resilience for communities.

The NSW Rural Fire Service (NSW RFS), with the support of the NSW Government, developed and rolled-out the 2019/2020 Bush Fires Rebuilding Compliance Support Scheme as a high priority recovery project.

The NSW RFS worked proactively with government to provide an alternate pathway for those who lost their home, enabling them to rebuild.

Rebuilding after bush fire in a Bush Fire Attack Level Flame Zone (BAL-FZ) can be prohibitively expensive (upwards of $150K for a typical dwelling).

To support recovery, a 'Bush Fires Rebuilding Compliance Support Scheme' was implemented to enable rebuilding of homes and communities without the additional burden of increased cost.

This was enhanced by a streamlined compliance process to minimise the suffering of devastated homeowners. It provided a way to strengthen bush fire safety and resilience when they rebuild.

This innovative approach is encapsulated in the 'NSW 2019/2020 Bush Fires Rebuilding Checklist'.

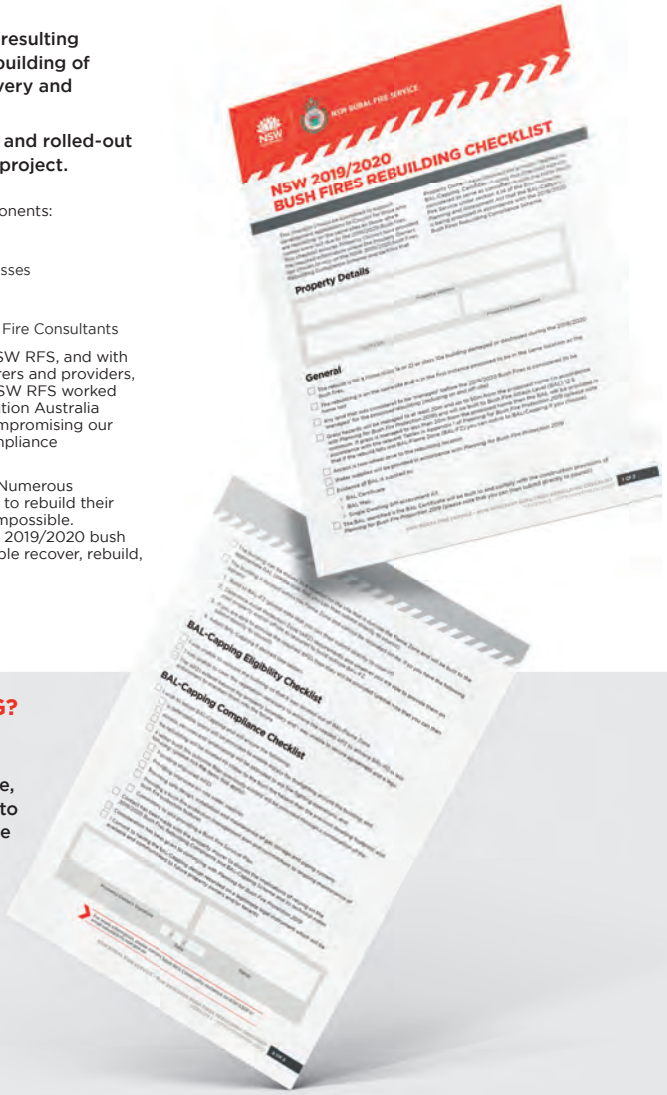
Not only did the scheme support homeowners rebuilding, it also assisted in removing challenges within the intricate consent and approval process for councils, consent authorities, building certifiers and builders

The Scheme consisted of the following components:

- The BAL Capping Scheme
- BAL-Mapping for areas with concentrated losses
- Free BAL Certificates for other areas
- Support service from accredited NSW Bush Fire Consultants

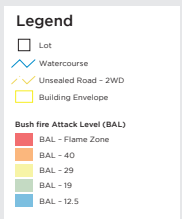
This approach was topical, both within the NSW RFS, and with some bush fire protection system manufacturers and providers, as it varied from traditional processes. The NSW RFS worked with industry, and the Fire Protection Association Australia to alleviate and address concerns without compromising our commitment to the Bush Fire Rebuilding Compliance Support Scheme.

The scheme has been universally successful. Numerous homeowners have been able use this scheme to rebuild their homes where it would have otherwise been impossible. As communities continue to recover from the 2019/2020 bush fires the NSW RFS continues supporting people recover, rebuild, and strengthen their resilience.



WHAT IS BAL-CAPPING?

BAL-capping is the ability to reduce the BAL on a rebuild from BAL-FZ to BAL-40 where, despite all reasonable efforts to rebuild to a lower BAL, the site remains BAL-FZ.



For more information contact David Boverman on 8741 5211

FRRR
Foundation for Rural
Regional Renewal

Evolving our approach to drought

Supporting community led drought resilience

Background

For more than 20 years, The Foundation for Rural and Regional Renewal (FRRR) has believed in the power of people to drive prosperity; that local solutions are central to achieving equality of access to opportunities; and that remote, rural, and regional communities have the knowledge to best respond to the impacts of drought, climate change and other natural disasters.

Throughout that time, drought has remained a central feature of conversations and creative responses to sustain and strengthen the inherent resilience of communities as they navigate uncertain futures and livelihoods.

Through more than 550 community-led projects, FRRR has acted as the conduit of approximately $20 million financial support to rural and regional communities. Over this time, FRRR has amassed significant insights into the outcomes and impact that programs like the award winning, nationally recognised Tackling Tough Times Together Program (in-drought, and drought recovery support), and the Future Drought Fund's Networks to Build Drought Resilience Program (preparedness) provide.

While the future challenges to managing drought are as diverse as the landscapes in which they are located; the people and communities of remote, rural, and regional Australia are actively driving local solutions and decision making to be better prepared, more informed and increasingly connected. At time having to challenge long-held attitudes, communities are sharing their skills and knowledge to strengthen their community and region for future droughts and an increasingly dry and unpredictable climate.

Questions?

To learn more about the FRRR community-led drought resilience building initiatives please visit Foundation for Rural and Regional Renewal www.frrr.org.au

For more information about FRRR's Disaster Recovery and Climate Resilience programs and initiatives Contact Nina O'Brien n.obrien@frrr.org.au

Insights

- Initiatives that are locally determined, demonstrate broad community participation and benefit, as well as build localised capacity for the future are the key to success.
- Balanced investment throughout the drought life cycle is important. A spread of response, recovery, prevention, and preparedness initiatives should be supported, with a preference to encourage prevention and preparedness (investment in preparedness yields multiplied outcomes in the long term).
- Initiatives that are designed to strengthen the capacity of individuals, communities, institutions, and systems exposed to drought will help communities to survive, adapt, and thrive in ways that improve outcomes in the next drought event as well as improving community well-being and connectedness more broadly.
- Investment in collaborative, community focussed planning that builds understanding of local climate risk is critical.
- Other climate related impacts may be present and overlaid with drought conditions. The context is different in each locality and should be accounted for in program design and timing.
- Philanthropy provides an agile mechanism to enable support for communities through hyper-local approaches, where other government funds are limited or do not exist.
- Many community-led projects have piloted new ways of working, promoted confidence and hope, acted as a financial 'seeding-agent' for new initiatives, developed an evidence base for longer term work and leveraged additional funding partners.
- Experience and empirical evidence demonstrates that people and communities need different support, at different times, and different ways in reflection of their local context.

Acknowledgement

Financial support for the Tackling Tough Times Together Program, and Future Drought Fund's Networks to Build Drought Resilience Program has been provided by a wide range of private donors and the Australian Government.

NSW RURAL FIRE SERVICE
BENDOLBA SALISBURY BRIGADE

NSW GOVERNMENT

ASSISTED AGRICULTURAL BURNS

There are two 'camps' within the rural community which often find themselves opposed to the vexed issue of hazard reduction using fire. On one side are land owners, and on the other are the regulators (e.g. Councils, pastoral protection boards, utilities and emergency services).

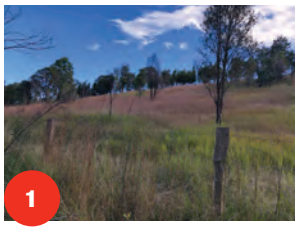
Bendolba Salisbury Brigade covers 1000km² in the Barrington Tops of NSW, with varied landholders such as Hunter Water, NSW National Parks and Wildlife Service and Forestry Commission of NSW whose properties include Chichester Dam and catchment area, Barrington Tops National Park, and Chichester State Forest. There are operational dairy farms, cattle holdings, and eco-tourist attractions. The Brigade is centrally located at Munni and community fire units (CFUs) operate in Chichester and Bandon Grove villages.

Historically, landholders have done most hazard reduction by fire with little intervention from the regulators. As part of building partnerships with the local community, assisted burning was introduced about five years ago and is now entrenched as the preferred option for many landholders. While a 'win/win' solution for both camps, this also brings responsibilities for both sides.

No two burns will ever be identical but some common threads provide a sound planning base. A major goal is to reduce the administrative workload on both camps while ensuring compliance with extant regulations.

Interestingly, in the 2021 pre-season, many landholders applied to do 'agricultural burns' themselves, having studied the methods employed by the NSW RFS during assisted burns, resulting in reduced fuel loadings and fewer 'bush alight' fire calls.

In the lead-up to the 2021/2022 fire season, Bendolba Salisbury Brigade planned, prepared and assisted with the implementation of five agricultural burns.



Salisbury Rd, Salisbury

15 acres of grassed open woodland and Blady Grass *(Imperata cylindrica)*

Aim:

Create an area of open pasture west of Salisbury Rd and adjacent to the residence and home paddocks of property.

Risk assessments

Paddock of volatile native shrub grasses with potential to escalate fire activity towards residence and farm buildings.

Recommendations

Landowners to prepare firebreaks along fence and ridge lines to ensure containment during burn. Three trucks: two CAT 7s and a CAT 9 supplied by NSW RFS for early volatile burn phase.

Results

Burn plan implemented to landholder's satisfaction.

Salisbury Gap Rd, Salisbury

Five acre grassy block (Crown Land) in centre of Salisbury Village

Aim:

To reduce accumulated fuel load and improve the safety of private properties, including a currently unused Youth Camp with six chalets, a mess hall and an ablutions block. There is an active tennis club with courts and clubhouse.

Risk assessments

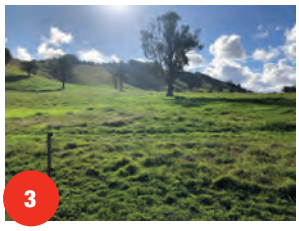
Crown Lands is willing to allow the burn, subject to landholder doing all preparations. Proximity of residences and other buildings was a concern.

Recommendations

Landholder required to slash a double width with boundary fire-break all round. Four trucks: three CAT 7s and one CAT 9 supplied by NSW RFS for duration of burn.

Results

Burn plan implemented with significant assistance from landholders.



Dowlings Rd, Tillegra

Extensive horse-breeding pastures

Aim:

To improve landholder's ability to manage fire risk. Fuel on eastern slopes of Munni Ridge on the western boundary of the property is key to fire-resisitant integrity of the land.

Risk assessments

Threat of fire impinging on pasture over Munni Ridge to the west, endangering valuable horse stock.

Recommendations

Landholder requested 20m extended fire boundary inside paddock fenceline to enable future safe burning using own resources. Three trucks: two CAT 7s and one CAT 9 supplied by NSW RFS.

Results

Burn plan implemented as requested. Very happy landholder.

Mulconda Lane, Bandon Grove

100 acre cattle agistment

Aim:

It is over two years since this paddock has seen fire. there is a significant accumulation of weeds, specifically Blady Grass *(Imperata cylindrica)*.

Risk assessments

Blady Grass burns with significant intensity when lit, landholder supplied water trailers and able assistants.

Recommendations

Due to large size of paddock special care had to be taken to implement tactical lighting. Three trucks: two CAT 7s and one CAT 9 supplied by NSW RFS.

Results

Burn plan implemented. On review one extra truck would have been prudent.

Chichester Dam Rd, Bendolba

Ex-dairy farm and extensive pastoral cattle landholdings

Aim:

Assistance requested with lowering fuel density of ten acre woodland patch in the middle of several hundred acres of pasture. Aim is to make land holdings more fire-resistant.

Risk assessments

Forest has not been burnt for twenty years and has a high fuel load. Inflagration is a risk to the surrounding pasture.

Recommendations

Landholder to slash a perimeter containment line around forest and a tactical lighting line down the middle, from west to east. Four trucks: three CAT 7s and one CAT 9 supplied by NSW RFS. Safety officer present with portable radio in private ute.

Results

Burn plan implemented to landholder's satisfaction.

For futher information contact Nick Helyer of the Bendolba Salisbury Brigade at lower.hunter@rfs.nsw.gov.au

FRRR Foundation for Rural Regional Renewal

THE UNIVERSITY OF SYDNEY

NSW GOVERNMENT

Australian Government

Shifting the frame and sharing decisions:

Supporting community led resilience building on the ground

Background

The Get Ready Disaster Resilient: Future Ready pilots project in NSW was delivered by the Foundation for Rural & Regional Renewal, in partnership with Resilience NSW and the University of Sydney.

The project was part of a national initiative led by FRRR to support and strengthen the capacity and capability of remote, rural and regional communities to thrive and be resilient to the impacts of changing climate, natural disasters, and other disruptions.

As part of the project, FRRR worked with project partners and representatives from Wee Waa, Ocean Shores and North Richmond / Kurrajong to share knowledge, encourage collaboration, and co-create initiatives and actions that strengthen community resilience. Priority initiatives were activated through the project with funding and other support.

The projects' action research processes helped to identify community engagement approaches that enabled effective community-led processes, alongside insights into how stakeholders involved in emergency management and disaster resilience work can adjust their approaches to enable greater community agency, capability and adoption of the shared responsibility philosophy. Particular attention was focused on measuring how community energy and momentum was sustained or blocked.

An alignment between FRRR's DR:FR initiative and Resilience NSW's Get Ready program enabled the project to be piloted and researched in three NSW communities.

Recommendations[1]

- Community led approaches must move to the centre of resilience building efforts.
- Communities should be regarded as equal contributors in disaster resilience work.
- Shared responsibility must translate into increased and shared support for sustained community-led resilience building.
- Disaster resilience building needs to reflect the experiences of communities and recognise that preparedness, response and recovery are fluid, and sometimes simultaneous.
- The times between disasters are an ideal opportunity to engage communities in complex discussions and hear their ideas.
- Communities should contribute to and contextualise disaster information (outside of warnings and alerts) to local needs, building trust and ownership of information and communication.
- Community-led approaches are valuable, and must be matched with sustained cross-sector and cross-community investment, including recognising the value of community time, skill and effort.
- Resilience building programs and projects must be designed and implemented within a systems framework and acknowledge the complex array of relationships involved, and the time required.
- Further work should be undertaken in supporting practical links between local community organisations and self-organising networks and groups in supporting sustained resilience building in local communities.

Questions?

To learn more about the community-led resilience building initiatives supported through the pilot project, refer to the presentation poster titled "Community-driven action for thriving resilient and risk-informed communities – three rural community perspectives".

Full research findings and recommendations can be found at www.frrr.org.au/drfr

For more information about FRRR's Disaster Resilient: Future Ready initiative contact: Jacqui Bell: j.bell@frrr.org.au

Acknowledgement

Funding for the action research component of the pilot project was provided through the Joint State and Commonwealth Natural Disaster Resilience Program.

Summary Report

Full Report

1. Howard, A., Rawsthorne, M., Sampson, D. & Katrak, M. (2020) Supporting community led approaches to disaster preparedness: learnings from three pilot locations. Evaluation of the Get Ready Disaster Resilient: Future Ready pilots for the Foundation for Rural & Regional Renewal and Resilience NSW; University of Sydney and University of Newcastle.

Collaborative research investigating prevalence, incidence, risk profiles and health impacts of Tasmania's residential fires (2010-2020).

Qing Xia[1], Lesley King[2], Sandra Barber[2], Andrew J Palmer[1,3], Barbara de Graaff[1], Thi Thu Ngan Dinh[1], and Julie A Campbell[1]

1. Menzies Institute for Medical Research, University of Tasmania; 2. State Fire Commission, Tasmania; 3. Centre for Health Economics, School of Population and Global Health, Monash University.

Background and Aims

- People spend about half of their day in their homes (their place of residence). Houses are an important interface between lifestyle and health issues and many accidental injuries take place in this residential environment, including residential fire-related injuries.
- Fire-related burns are the fourth most common cause of unintentional trauma worldwide and cost between 0.8-2% of GDP [1, 2, 3].
- In most industrialised countries most fire-related deaths and injuries occur in the home. On average, more than one fire-related death occurs in a residential context every week in Australia and these deaths are overwhelmingly preventable.
- No comprehensive systematic research project regarding the prevalence, incidence, risk profiles and health impacts of residential fires has been undertaken in Tasmania to inform policy.
- We aim to investigate the prevalence, incidence, risk profiles and health impacts regarding residential house fires in Tasmania from 2010-2020.

Methods

- This mixed-methods research project between Tasmania's State Fire Commission (SFC) and the University of Tasmania's Menzies Institute for Medical Research (Menzies) will investigate the SFC's retrospective administrative quantitative/qualitative data namely the Australian Incident Reporting System (AIRS) and Fire Investigation Reports.
- A comprehensive database will be developed from almost n=700 Fire Investigation Reports and over n=4,000 AIRS reports (01-01-2010 to 31-12-2020) to clarify the health and epidemiological profiles.
- Risk profiles will be determined using regression analysis. Capture–recapture modelling techniques will be used to determine to what extent residential fires, and related injuries and deaths are under-reported. The second phase of the project will investigate health economic impacts.

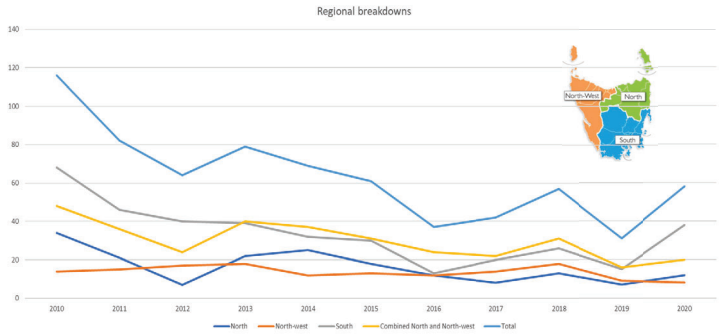
Funding and Acknowledgements

This research poster was prepared for AFAC 2022 and the research is supported by the Tasmanian State Fire Commission and the Royal Hobart Hospital Research Foundation.

Preliminary Work

- Ethics has been approved by the University of Tasmania's Human Research Ethics Committee and preliminary data cleaning is underway.
- In regard to the second source of data (Fire Investigation Reports) the total number of Fire Investigation Reports for Tasmania were n=696 as they relate to the incident and residence with the yearly breakdown of 2010 n=116; 2011 n=82; 2012 n=64; 2013 n=79; 2014 n=69; 2015 n=61; 2016 n=37; 2017 n=42; 2018 n=57; 2019 n=31; 2020 n=58. The regional breakdowns of this raw data into the South, North, and North-west are noted in the Figure 1 below.

Figure 1: Tasmania's regional breakdown of Fire Investigation Reports 2010-2020



Discussion

- This is the first collaborative partnership between Tasmania's SFC and Menzies. From a research policy perspective, this strategic alliance is informed by research concepts including comparative advantage to drive a research team between university researchers and policy experts to address pressing policy needs.
- The establishment of prevalence, incidence and risk profiles of residential fires in Tasmania will provide much needed evidence to assist in the development of government policies to help reduce risks in the Tasmanian community regarding residential fires.
- Benefits of this inaugural project between the SFC and Menzies regarding accidental residential fires in Tasmania from 2010 to 2020 include the opportunity to:
  - systematically investigate key evidence gaps regarding the epidemiology and risk profiles regarding accidental house fires in Tasmania to provide evidence-based recommendations to improve policy and practice;
  - provide the underpinning for a longitudinal database for future research from 2020 and beyond; and
  - further epidemiological and health services and health economics research between Tasmania's State Fire Commission and Menzies.

References

1. World Health O. Burn prevention: success stories and lessons learned. Geneva: World Health Organization, 2011.
2. Tannous WK, Agho K. Socio-demographic predictors of residential fire and unwillingness to call the fire service in New South Wales. Prev Med Rep. 2017; 7: 50-57.
3. Ashe B, McAneney KJ, Pitman AJ. Total cost of fire in Australia. Journal of Risk Research. 2009; 12: 121-36.

Community-driven action for thriving, resilient and risk-informed communities

The Get Ready Disaster Resilient: Future Ready pilots in NSW was delivered by the Foundation for Rural & Regional Renewal, in partnership with Resilience NSW and the University of Sydney.

As part of the project, FRRR worked with project partners and representatives from Wee Waa, Ocean Shores and North Richmond / Kurrajong to share knowledge, encourage collaboration, and co-create initiatives and actions to strengthen community resilience. Local residents co-created priority initiatives that were activated with funding and other support.

The processes, activities, achievements, and outcomes in each community through the DR:FR program were diverse and reflected the history, relationships, and experiences of those communities[1]. Achievements ranged from connecting neighbours and local networks, engaging children as leaders and networkers, celebrating and valuing local culture and knowledge through the development of arts communities and cultural trails, through to local mapping for disaster preparedness and leadership development with young people.

The diversity of the initiatives highlighted an important outcome in relation to supporting community-led approaches to resilience building: while principles remain consistent, one-size-fits-all frameworks and models are not effective. Importantly, the methods employed as part of the project enabled community members to co-design their own approach to resilience building in a local context that contributes to effective preparedness for future climate events.

StreetConnect

North Richmond

StreetConnect focused on local community connection, education and relational work at a neighbourhood level to build disaster preparedness with community members (incl. children, young people and natural leaders). Stage 1 activities included a project where primary school studerts demonstrated their leadership in developing a video about being connected to neighbours during a disaster. It was a timely initiative as it was used at the end of 2019 as fires blazed in the surrounding hills. The StreetConnect model met with overwhelming support from the community and has extended from North Richmond to the wider Hawkesbury region. The initiative has leveraged the support from the DR:FR initiative to secure funding to extend their work and the 'living lab' over 2020-21.

Cultural Arts Hub

Wee Waa

The Wee Waa community developed and enacted the Arts Hub concept and implemented different cultural activities and events including a local cultural tour in collaboration with the Wee Waa Local Aboriginal Lands Council.

They were able to engage a local coordinator and invest in a temporary art space, meaning the Hub had an identity and place to bring people together and keep momentum going on the initiative. Funding and support from the DR:FR pilots in NSW enabled the Wee Waa community to develop local cultural and artistic ideas and build the connections and capacity to implement these. The community have since secured further funding and a long-term affordable and purpose-built premises through another rural economic investment program.

Resilience Hack

Byron Youth Service

Resilience Hack is a unique program responding to extreme weather events, empowering young people by developing their leadership and emergency response skills. A 'Youth Response Team' of students aged 12 to 18 from the north end of Byron Shire developed connections, knowledge and skills to share across generations and community groups. The 'Youth Response Team' met once a week over two terms to participate in activities that built emergency response skills and awareness, team building, leadership, volunteering and community contribution. It was initially delivered through the latter half of 2020, amid many COVID-19 related challenges.

Questions?

The project was part of a national initiative led by FRRR that supports and strengthens the capacity and capability of remote, rural and regional communities to thrive and be resilient to the impacts of changing climate, natural disasters, and other disruptions. Visit www.frrr.org.au/drfr

For more information about FRRR's National Disaster Resilient: Future Ready initiative contact: Jacqui Bell: j.bell@frrr.org.au

Acknowledgement

Funding for the action research component of the pilot project was provided through the Joint State and Commonwealth Natural Disaster Resilience Program.

Full research findings and recommendations can be found on our website.

Summary Report

Full Report

1. Howard, A., Rawsthorne, M., Sampson, D. & Katrak, M. (2020) Supporting community led approaches to disaster preparedness: learnings from three pilot locations. Evaluation of the Get Ready Disaster Resilient: Future Ready pilots for the Foundation for Rural & Regional Renewal and Resilience NSW; University of Sydney and University of Newcastle.

Communicating with Deaf and Hard of Hearing People in Emergencies

SACFS and Deaf Connect online learning module

Background

In 2020 the Cherry Gardens South Australian Country Fire Service (SACFS) Brigade reached out to Deaf Can:Do, which is now operating its services as part of the national organisation; Deaf Connect. SACFS sought support in learning how to confidently and appropriately communicate with Deaf and hard of hearing community members. Deaf Connect ran a bespoke workshop for the brigade during their regular weekly training following the request.
Brigade members reported that because of the workshop they were more confident in their ability to communicate with and support their community.

As a result of the workshop's success Deaf Connect contacted SACFS Headquarters and proposed a collaborative project to develop and deliver similar training across the entire service. Development of an online learning module was agreed upon following Deaf Connect's success in winning a grant from the Foundation for Rural Regional Renewal News Corp Bushfire Fund to be able to undertake the project. This format made the product accessible across a large geographical area and enabled uninterrupted training availability during COVID restrictions.

"The training we received was a great initiative, it was outside of the scope of what we would normally learn. It was interactive and I thoroughly enjoyed it" - Andrew D

Design Process

Deaf Connect and the SACFS worked together to determine priority content with a focus on:

- The experience of a deaf person in an emergency
- Understanding who the Deaf and hard of hearing community are
- Simple strategies for communicating with the d/Deaf and Hard of Hearing community
- Basic Auslan and its history
- Key Auslan vocabulary and phrases to use in an emergency

"The training provided by DeafCan:Do for emergency responders was really beneficial. Not only in how to interact with Deaf or hard of hearing people during an emergency, but also in giving insight into the Deaf community as well as the challenges they face. We are very appreciative of their team for taking the time to train us in using Auslan to better help our community" - Eleanor M

Content

Scenarios where a firefighter's quick, clear and concise communication would ensure community safety informed the phrases and words chosen. The key vocabulary and phrases chosen were:

Vocabulary

1. Shelter (verb)
2. Stay / wait
3. Leave / go
4. People
5. Danger
6. Closed
7. Help
8. Fire
9. Fire Fighter
10. Ambulance
11. Police

Phrases

1. Do you need help?
2. Where are you hurt?
3. How many people are you with?
4. Is there anyone inside the house/car?
5. Leave/evacuate now.

"To this day I still remember some of the sign language. In particular the sign for an ambulance is important on a fire field if no communication was available could be lifesaving. Highly recommend this in brigade training" - Leanne N

Conclusion

The finished product has been hosted on the online learning hub for the SA Country Fire Service, SA Metropolitan Fire Service and the SA State Emergency Service.
This project has contributed to developing a more inclusive and competent emergency service workforce who can better help their communities.
The SA CFS would like to express their gratitude to Deaf Connect and the volunteers of the Cherry Gardens Brigade for their initiative and hard work to make this project a success.

Partnering with Masonic Charities

Background

In December 2020, Masonic Charities sought to assist in preventing future devastation from Bushfires in South Australia, especially following the devastation experienced in South Australia during 2019/20. A funding agreement for $600,000 over a three-year period was established between Masonic Charities and the South Australian Country Fire Service (CFS) in addition to a donation from the Freemason Foundation (SA &NT) for $131,000. In considering bushfire prevention, the Freemason's Masonic Charities have reminded that: Freemasons invest in people; "they matter, and we care".

Masonic Charities Trust Initiative

The Masonic Charities Trust (MCT) is an initiative of the Freemasons of South Australia & Northern Territory which was officially launched by His Excellency, The Honourable Hieu Van Le AC, Governor of South Australia on the 21st June 2019. The establishment of Masonic Charities followed the sale of Masonic Homes not-for-profit retirement villages which had been established by the generosity of Freemasons throughout South Australia and the Northern Territory over generations. The repurposed funds are being used to support research and delivery of health initiatives and other beneficial community activities throughout South Australia and the Northern Territory which have relevance and alignment with Freemasonry's underlying charter of benevolence.

The initiative to assist preventing and fighting bushfires was dubbed "Freemason's Fire-Proofing South Australia". The multi-year donation was set to be distributed over a three-year period, currently with one year remaining. This has provided the CFS the resources needed to address critical fire prevention and response services. The CFS aim has been to strategically place large firefighting water storage tanks in some of South Australia's most vulnerable communities. Furthermore, to ensure to longevity of such assets being established throughout South Australia, the CFS insisted that all tanks be located on land that was either owned by the South Australian Minister for Police, Emergency Services and Corrections or under the long term care and control of the CFS. This project has provided a unique opportunity for CFS to work with local communities across the state and the Freemason's in establishing practical needed assets now and for the future that would not have been possible without the vision, passion and generosity of Freemasons SA /NT through Masonic Charities.

Few people in Australia and across the globe haven't forgotten about the devastation that the 2019/20 bushfires wreaked upon the continent. Masonic Charities been a charitable organisation where one of its goals been community work around assisting fighting and prevention of fires by providing much-needed funds to help avoid another tragedy on the scale of the 2019/20 bushfire season.

As the CFS and the Masonic Charities have a common goal to establish large firefighting water storage tanks across South Australia, a valuable partnership was formed. With the combine attributes of both organisations working together, collectively with knowledge shared, leverage of strengths, resources of each other, which overall benefited both organisations and provided greater outcomes to the wider South Australian community.

Partnership

Through this partnership between the both entities, the CFS had commenced a strategically placing Masonic Charities branded large firefighting water storage tanks across South Australia in areas controlled by the CFS and identified as being high-risk due to their lack of available water sources for both firefighters and farm fire units.

"The Freemasons of South Australia and the Northern Territory were profoundly gutted to witness the absolute devastation of bushfires across multiple areas of South Australia in the 2019 summer," said Neil Jensen, Grandmaster of the Freemasons of SA and NT. "The Freemasons decided to try to help to prevent a recurrence of this catastrophic event in the future and consulted the South Australian Country Fire Service, landing on a project that would help fireproof South Australia in an effort to reassure communities that the mantle of safety is being enhanced."

"The CFS depends upon reliable water supplies, often needing them most when they are least likely to be available," noted Mark Jones QFSM, CFS Chief Officer. "The generous actions of Masonic Charities in undertaking a project to establish a network of strategically placed water tanks across the state will bolster the CFS's resources and access to private and public water supplies. They are an investment in the safety of South Australians for many years for now and into the future."

The first gift of $131,782.82 from the Grandmaster's Bushfire Appeal was presented to CFS officials Lee Watson, Director Operational Infrastructure, and Andrew Stark, Deputy Chief Officer, at the Grand Lodge in Adelaide December 2020. This Freemasons Fireproofing South Australia event was a feature afternoon tea and remarks from Masonic Charities and CFS officials. Following the initial gift, the Masonic Charities donated $200,000 per year over the preceding two years to support CFS's fireproofing efforts.

Results

To date, CFS have successfully installed the firefighting water storage tanks at both Rockleigh CFS and Brukunga CFS Stations. Currently there are installations underway at both the Maitland CFS and Tothill CFS Stations. Works will shortly commence at Cudlee Creek with future installations proposed for Ashton, Marion Bay and Turkey Lane (Kangaroo Island). These three communities have seen consultation between CFS Regional staff with local government and private entities to secure access to land to allow for the placement of the water storage tanks.

The firefighting water storage tanks varied in size to suit the location of installation. These provide a capacity of between 144 to 368 kilolitres of water been a vital resource to our appliances, farm fire units and air support operations in time of need. The firefighting water source not just provides a resource to local firefighters, but for other brigades attending from intrastate and interstate to assist protecting local communities. CFS operate varies types and sizes of firefighting appliances which have an average capacity of carrying up to 3,000 litres of water for fighting fires.

This established partnership gives both organisations the opportunity to deliver and promote each successful outcome by utilising social media, electronic media and print media publishing News Articles in both local and state publications. These promote and identify the new water supply locations and the charity funds invested in each project benefiting the wider communities.

The Freemason's also take the opportunity to speak at Ceremonies and hand over a large symbolic "cheque" for display and photographs opportunities for the promotion in rural and city newspapers. At the same time take the opportunity to meet the local people in regional communities when attending Official Opening Ceremonies.

The CFS would like to remind South Australians that everyone must do their part to help prevent bushfires and mitigate loss of life. Having a survival plan in place should fires impact your local neighbourhood is key, as is keeping up to date with local news and communications about fires.

For more information contact sandy.pope@sa.gov.au.

Government of South Australia

CFS

Using Simulation technology

in ensuring operational staff are ready for the unthinkable

Background

The SA Country Fire Service is embracing simulation technology to efficiently and effectively ready staff to attend to the most serious of incidents.

The SACFS Command structure is like many similar agencies in which professionally trained volunteers attend and resolve most incidents outside the Gazetted metropolitan fire district. Regional Officers, primarily employed to deliver a core business function provide operational oversight and attend the most serious of the incidents to support volunteer crews and liaise with other government agencies. These staff have a good working knowledge of the principles of emergency management and the requirements of being a control agency and being in command in support of other agencies. Some lack exposure to actual incidents and feedback from staff was that exposure to complex incidents was confronting.

The Workshop

To address this, staff participated in a 4 day intensive induction program to be introduced to the role of Regional Duty Officer. The program included lectures, case studies and participation in a number of exercises, some written, some role-play based and 2 intensive scenario-based exercises in a simulation room.

Participants were provided with a briefing where the person playing the role of RDO was broadly briefed on an evolving incident which they had been asked to attend by the on-scene officer in charge. They entered the simulation room to be met a real person playing the role of the Incident Controller or Commander and an on-screen simulation; (1) an escalating structure fire and (2) a serious road crash involving rail.

Participants could "walk" through the scenario using a joystick and interact with the experienced officer providing inputs. The scenarios were designed to be immersive, realistic and have a number of the requirement to ask questions, resolve safety concerns or suggest other corrective actions.

Feedback

Participants were surveyed after the workshop with 81% of the respondents reporting that they had never previously participated in computer simulated training, 40% found the simulation scenarios gave them opportunity to practice the skills with an additional 47% stating it gave them 'comprehensive' opportunity. Feedback from the participants indicated that the realism of the scenario, the constant immersive sounds created a realistic exercise where they needed to recall their training to break complex incidents into small, manageable pieces.

The simulation technology is allowing SACFS to build exercises, not possible in the real world that are engaging and repeatable whilst providing similar benefits in terms of building experiencing and practising operational skills in a safe environment.

More Information

Brenton.Hastie@sa.gov.au, Director Strategic Operations

Mitchell.Fitzgerald@sa.gov.au, Team Leader Digital Learning

SCAN ME

CFS

BUILDING CAPABILITY IN THE CARE SECTOR

Bushfire planning for people at higher risk

Do Emergency Services have a role to play in building capability in the care sector to improve fire planning for people at higher risk?

CFA says, yes

An estimated 15% of the population are at higher risk in an emergency due to factors such as age and disability. CFA has invested in FREE training for the Care Sector:

Bushfire Safety for Workers - focuses on improving the safety of workers

Bushfire Planning – How to support your clients -focuses on improving their client's bushfire planning.

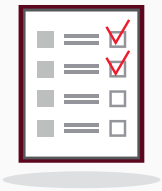
CFA has listened to lived experience.
This has shaped the content and approach to engaging the Care Sector.

Feedback has been overwhelmingly positive:

90%

of people said that they now understand how to apply what they learned and feel confident to apply what they learned.

90% of people felt the training was worth their time



An evaluation in April 2022 found:

- The CFA training is highly regarded
- Very positive feedback is received from trainees, even after implementing knowledge in the field
- 20% of the population (Care providers) have completed the training, with another 35% aware of it but yet to complete it
- Of those that had completed the training 21% had mandated it

Impact of the training

Of those that had completed the training **63%** carried out bushfire planning with their clients, compared with **32%** who had not done the training.

This model of providing free e-learning to the Care Sector has proven effective, for those that undertake the training.

Ongoing investment needed to:

Align the bushfire training with emergency management training more broadly

Increase take-up in the population

Provide a way for people to self-refer for more detailed emergency planning support

Engaging people at higher risk requires a

collaborative approach,

recognising some individuals require additional support to plan for emergencies. CFA is working collaboratively with Carers Victoria, National Disability Services (NDS), Leading Aged Services Australia (LASA) and the Victorian Council of Social Services (VCOSS).

To learn more contact angela.cook@cfa.vic.gov.au

THE **RIGHT GOODS** TO THE **RIGHT PEOPLE** AT THE **RIGHT TIME**

>THROUGH ALL STAGES OF DISASTER RECOVERY

HOW **GOOD360** WORKS

When disaster strikes, Good360 are ready to reach out to our extensive network of business partners for purposeful donations of the brand-new items most needed for disaster affected communities.

Good360 matches the right goods to the right people when they are needed most, via our network of 3,000+ charities and disadvantaged schools. The Good360 model creates much greater impact than a business could have going direct to a single charity.

Our charity members then distribute these goods on the ground in their local communities. Charities and schools save time and money by getting the goods they need, when they need them most, allowing them to have a much greater impact in their communities.

THE SCALE OF THE **PROBLEM**

Of goods donated during disaster end up in landfill or go to waste

Of giving is recieved within the first six weeks of a disaster

Of disaster giving is allocated to long-term recovery efforts

A **RESILENT RESPONSE** TO DISASTER RECOVERY

1. Preparedness : Being prepared in advance helps mitigate the impact of a disaster on communities.

2. Response : In the immediate aftermath, the greatest concern is for the protection of life and property.

3. Recover : This phase focuses on cleaning up and fixing the damage brought on by the disaster.

4. Rebuild : As survivors move beyond the recover phase, focus shifts to rebuilding homes and businesses etc.

5. Refurnish : As displaced families move back, they often need to replace most or all of their household goods.

6. **Relive** : While this is the recovery stage, survivors may still need items to help them get back to life as normal.

Since January 2020 when we started working in **Disaster Recovery** Good360 has connected

$122,362,521
Worth of goods donated by business (RRP value)

15,524,329
New items connected to people in need

1,578
Non-profits and schools supported

Join the Circle of Good at good360.org.au

Good360
BRINGING GOOD TOGETHER

EXPLORING THE POTENTIAL FOR IMPROVING WOMEN'S WELLBEING IN CYCLONES BY STRENGTHENING COMMNUNITY RESILIENCE

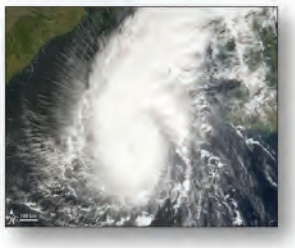
Dr Tazrina Chowdhury[1], Professor Paul Arbon[2], Dr Maliinda Steenkamp[3] , Dr Mayumi Kako[4]

1 Institute for Sustainable Futures, University of Technology Sydney, 2 Torrens Resilience Institute, Flinders University, 3 SA Government, 4 Hiroshima University

Acknowledgement: Professor Kristine Gebbie

Bangladesh has been identified as a country with **high-risk** from natural hazards and the **9th** most vulnerable country to natural disasters. Some common natural hazards include:

- Tropical cyclones,
- Floods,
- Tornadoes,
- Droughts,
- Earthquakes and
- River erosions.



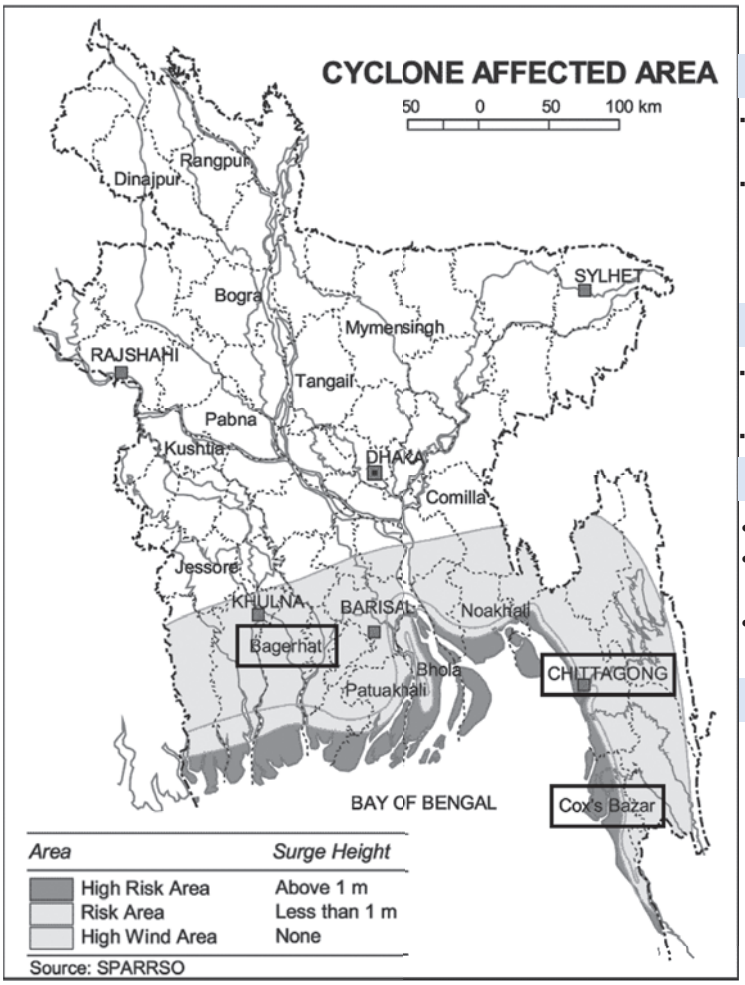
Bangladesh has faced no less than **100 cyclones** over the last three decades

Over the years the mortality rate among women caused by cyclone events remains higher than the rate for men in Bangladesh –

- In 1991, women made **93%** of the 140,000 casualties fro cyclone Gorky,
- During cyclone Sidr in 200 **83%** of the total death toll we women,
- In 2013, **17 out of 50** victim from cyclone Mahasen we women and the rest we children.

Women are less likely to evacuat their land during emergencies -

- Unavailability of separate toile and washroom for women,
- Unfair relief distribution,
- Access to necessary resources for pregnant & adolescent,
- Sexual abuse and violence.



Method

Participation selection

- Women over the age of **18 years**.
- Women who stayed in the cyclone shelters during and after **cyclones from 2000 to 2018**.

Selection Technique

- Convenience sampling method
- Snowball technique

Data collection

- Semi-structured interview
- 2 sessions (50 minute each)
- Personal reflections of the researcher

Data analysis

van Manen's three-stage approach -

i. The wholistic reading approach
ii. The selective reading approach
iii. The detailed reading approach

Key Findings

Theme 1: Being understood (as a woman)

Theme 2: Being a woman during crisis
- Not being recognised as an individual
- Being helpless
- Being overwhelmed

Theme 3: Being in a hostile situation
- Experiencing challenges (to face the shelter facilities)
- The experience of struggles

Theme 4: Being fearful
- Existential fear
- The what ifs- fear of the unknown

Theme 5: Being uncertain
- Being in dilemma- despair or hope
- Longing to hear from kin and loved ones
- The sense of anticipation of returning to usual lives

Theme 6: Being faithful
- Optimism- finding peace in prayers
- Hoping for a normal death

Theme 7: Being against the odds
- Being compassionate
- Being outside the square

Because all the women were together, we had our occasional laughs and gossips.

Usually, all the women wanted to keep other women safe.

One of the women helped my sister to deliver her baby in the shelter. It was horrible but my sister and the baby survived

Learning outcomes

• Understanding the benefits of encouraging leadership and community engagement especially among women concerning disaster response.
•Identifying the need for future interventions to mobilise the female population in effective disaster preparedness and risk reduction activities while restoring their socio-cultural values.

BLUE SHIELD
Australia

Assessing & addressing risk to cultural property and heritage

CULTURAL AND COMMUNITY CONNECTION

Cultural heritage enriches our lives providing links to cultural identity, place and past. It is irreplaceable and protected under international law. In disaster situations, protection and preservation of life is primary. Protection of property and infrastructure is usually the second priority. Part of the infrastructure affected during emergencies provides cultural connection for a community – museums, libraries, archives, galleries, heritage buildings and sites.

Museums and libraries are community centres. Archives and records contain key identity documents from government-citizen interactions such as registration of life events, immigration, citizenship, and property ownership. Cultural institutions and their collections provide a focus for community identity, resilience and recovery.

The professionals and volunteers responsible for care of collections and places must plan for prevention, preparedness, response and recovery to ensure resilience for the collections themselves as well as the communities they serve.

BLUE SHIELD INTERNATIONAL

It is a non-governmental, non-profit, international organization committed to the protection of heritage across the world. National committees are coordinated by Blue Shield International.

BLUE SHIELD AUSTRALIA

- Facilitates access to information resources about disaster prevention, response, recovery and resilience for cultural heritage
- Promotes risk preparedness in Australia's cultural heritage sector, including development of prevention, preparedness, response and recovery plans
- Assists UNESCO and the Red Cross in promoting ratification and implementation of the Hague Convention for protection of cultural property both inside and outside Australia

"Blue Shield is committed to the protection of the world's cultural property, and is concerned with the protection of cultural and natural heritage, tangible and intangible, in the event of armed conflict, natural- or human-made disaster." *Article 2.1, Blue Shield Statutes 2016*

HAGUE CONVENTION PROTECTION OF CULTURAL PROPERTY

The Blue Shield's work is founded in international law, particularly the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict and its Protocols (1954/1999). Australia was an original signatory to the Convention and is obliged to protect its own cultural property as well as that of countries where its military is deployed, but is yet to adopt the Protocols which guide implementation. The Blue Shield emblem is established under the Hague Convention as a symbol of protection in the event of armed conflict.

Essendon Historical Society Museum
Moonee Ponds, VIC, 2016
EHS Collection (01661)

Historic telescope at Mount Stromlo Observatory
Canberra Bushfires, ACT, 2003
Photo: Andrew Meares

Queensland Museum flooded during
the Brisbane floods, QLD, 2011
Photo: Rae Allen

BLUESHIELDAUSTRALIA.ORG.AU

@BLUESHIELDAUS BLUESHIELDAUSTRALIA

ICA International Council on Archives / Conseil International des Archives · ICOM international council of museums · ICOMOS international council on monuments and sites · IFLA International Federation of Library Associations and Institutions

#DRRday

On Disaster Risk Reduction Day 13 October each year, archives, galleries, libraries, museums, historical societies and cultural heritage sites across Australia are urged to take a step forward in disaster risk assessment and preparation for cultural heritage protection.

Blue Shield Australia coordinates and sponsors information campaigns such as the 2019 disaster bin competition and 2022 Disaster Preparedness calendar from the Australian Institute for the Conservation of Cultural Material.

A causal systems model for understanding how and why environmental changes impact mental health outcomes among rural Queenslanders

Craig Jacobson[1,2], Fiona Charlson[1,2], Russell Richards[3]

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[3]School of Business, The University of Queensland, Brisbane,, Australia

Background and study setting

Mental disorders such as post-traumatic stress, depression, and anxiety, are highly prevalent globally and increasing as climate change causes more frequent and extreme environmental disasters. New knowledge is desperately needed to address the inherent complexities of this enormous public health challenge and to inform agencies about where, when, and how to intervene at a community level to optimise mental wellbeing.

This study aimed to use systems thinking to conceptualise the mental health impacts of changing environmental conditions and extreme weather events in a rural community.

This research was focused on the rural region of Stanthorpe, Queensland – a location impacted by compound extreme weather events, including long-lasting drought, intense bushfires, and periodic flooding.

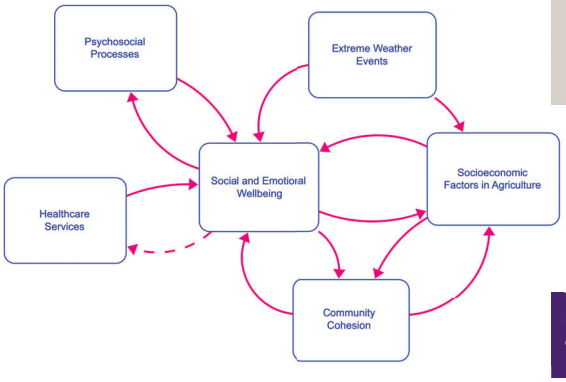

Figure 1: Top level causal themes

Methods

System dynamics is an approach to analysis that seeks to better understand complexity by examining behaviour over time via the endogenous perspective. Understanding the system structure is paramount to understanding how the system is generating problems. However, to ultimately change the system structure and resulting problematic outcomes, one needs to identify the foundational mental models present within the system operation.

Paradigm shifts of mental models have been identified as the single greatest leverage points within a complex system. Once identified, the chance to enact meaningful and lasting change improves, developing new system structures that support positive and desired outcomes.

The systems approach, as outlined by Sterman, 2000 provides an iterative formal framework for developing a systems understanding of a problem.

Participants were invited to contribute to the study via a participant information sheet with informed consent. Participants represented a diverse selection of gender and ages and came from local government, health services, community leaders, and community members interested in helping with the project.

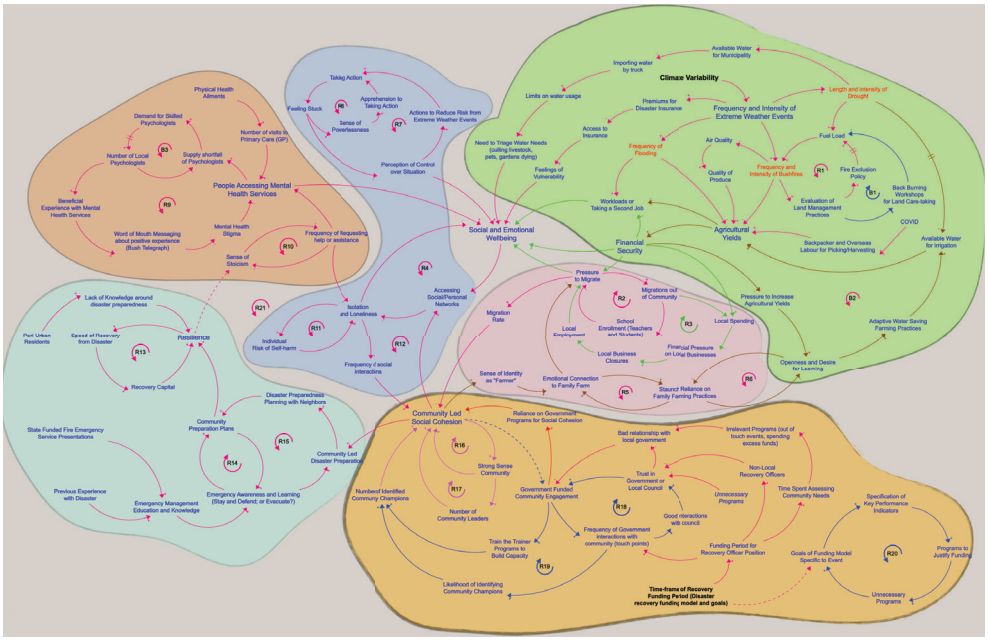

Figure 2: Full causal loop diagram

Causal Loop Diagram Primary Themes

Participants expressed various viewpoints of the interconnected nature of climate variability and social and emotional wellbeing. The stories told through interviews and group model building workshops lead to the creation of a causal loop diagram representing the many interdependences and interactions present in the systems affected by climate variability that may impact on SEWB (Figure 2). Six broad themes and subloops arose: agriculture, healthcare delivery, psychosocial, migration and local spending, disaster preparedness and resilience, and community cohesion and government engagement.

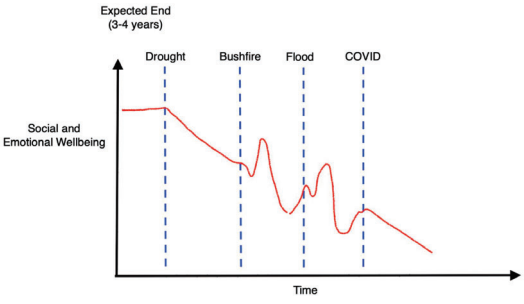

Figure 3: Reference modes depicting the participants' consensus of behaviour over time.

Reference modes

Figure 3 shows a qualitative representation of the impact of compound extreme weather events, as well as the COVID-19 pandemic, on social and emotional wellbeing. The x-axis shows time, and the y-axis depicts the starting point of social and emotional wellbeing (SEWB) for their society. Longer duration disasters, such as drought, were described as a persistent and steady decline in SEWB.

Shorter duration extreme weather events like floods and bushfires were described as different in terms of SEWB impacts in their tendency to unify communities in the immediate aftermath of the disaster. After a bushfire or flood, this increase in SEWB is shown as a comparatively quick increase in SEWB following a sharp decrease after the onset of the disaster is realised.

Conclusion

Demonstration of contributing factors and intervention targets for poor mental health outcomes in the community may represent a major paradigm shift for mental health prevention programs. This new understanding may allow for the consideration of interventions not previously conceived in sectors external to the health system.

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School of Public Health

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

SES Natural Disaster Lectures To Migrant English TAFE Students Needed Something Extra …

Multi Lingual Advice Lists

Bushfire Management Reform In South Australia

Impetus for Reforms

The Bushfire Management Planning Unit (BMPU) in the South Australian Country Fire Service (CFS) supports the delivery of bushfire management planning and governance at the state and regional levels, which are key functions for CFS mandated by the Fire and Emergency Services Act 2005 (SA). This includes providing executive support to the State Bushfire Coordination Committee (SBCC), and assisting CFS Regions to do the same for nine Bushfire Management Committees (BMCs) around the State.

The BMPU was expanded following the Government's response to the Independent Review into South Australia's 2019-2020 Bushfire Season, recognising the need to increase resourcing of risk reduction activities in the agency.

The BMPU supports the implementation of the key actions in the State Bushfire Management Plan developed by the SBCC in 2021. This includes the substantial task of supporting the development of the next generation of Bushfire Management Area Plans (BMAPs), which will wholly replace the existing plans.

The bushfire management planning and executive governance functions of the BMPU will shortly be separated, with the BMPU focusing upon the planning functions moving forward.

State Bushfire Coordination Committee (SBCC)

State Bushfire Coordination Committee

The SBCC and BMCs involve over 120 external agencies and organisations, and have 306 members in total. The SBCC is appointed by the Governor of South Australia and reports to the Minister for Police, Emergency Services and Correctional Services. The BMCs are appointed by the SBCC. All of the committees include emergency and land management agencies, critical infrastructure providers, and organisations with a policy interest in bushfire management. The role of the committees is to support collaboration and coordination of bushfire risk management activities.

1 State Bushfire Coordination Committee

36 Members

4 Annual meetings

9 Bushfire Management Committees

306 Members

27 Annual meetings

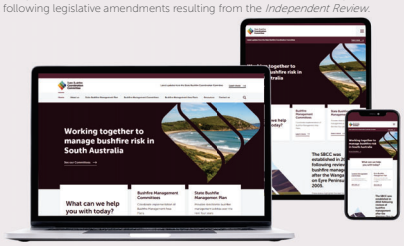
State Bushfire Management Plan Published

The *State Bushfire Management Plan 2021-2025* is the first approved plan for management of bushfire risk to be developed in South Australia. It provides a roadmap supporting the delivery of reforms contained in the Government's Response to the *Independent Review* that are the responsibility of the SBCC. To commence that process, the key actions for the SBCC in the life of this Plan include:

- Undertake analysis of key existential risks to the State from bushfire, to support understanding of the often deep and long-lasting impacts of bushfires on communities, economies and the environment;
- Review governance arrangements for the SBCC and BMCs, including the development of an implementation assurance and reporting framework, and
- Develop the second iteration of Bushfire Management Area Plans, incorporating consistent risk management frameworks across fire and land management agencies for the management of bushfire risk in the landscape, addressing integration of environmental approvals process, and incorporating risk treatment reporting to capture implementation activities.

New SBCC Website and Branding Launched

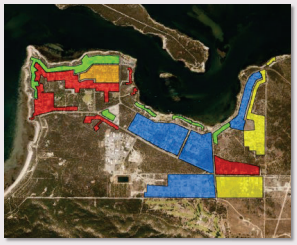
To reflect their broad stakeholder base, new branding and a stand-alone website have recently been developed for the SBCC and BMCs. The new SBCC website was recently launched. The site provides a focus for communication for both the SBCC and BMCs, and an access point for stakeholders and the community to obtain information about the work of the committees, including the State Bushfire Management Plan and the BMAPs. Annual bushfire risk reduction plans will be published on the site, and it also contains the SBCC Annual Report to the Minister. This report was prepared for the first time in 2020-2021 following legislative amendments resulting from the *Independent Review*.



Existing Bushfire Management Area Plans (BMAPs)

South Australia's existing Bushfire Management Area Plans focus on site based risk assessment for thousands of assets at risk of bushfire (see infographic).

Note: Environmental asset data is sourced and risk assessed differently to life and property asset data



Assets Assessed | Listed by Asset Type

Cultural — 705 Assets

Human Settlement — 3,865 Assets

Economic — 3,780 Assets

Risk Ratings

- Low
- Medium
- High
- Very High
- Extreme

Bushfire Management Planning and Reporting System

BMPU obtained a grant through the National Disaster Risk Reduction Fund (NDRRF) in late 2021 to commence a project to procure a new software solution to support the next generation of BMAPs (known as BMAP 2.0).

To implement the findings of the Independent Review, the new software solution will seek to: include landscape as well as site-based asset risk from bushfire, incorporate best-available fire behaviour modelling, include reporting on risk reduction actions delivered, and calculate residual risk. A further key element sought for the system is to enable stakeholders implementing activities to report directly into the system, and utilise its functionality to assist their planning and delivery of bushfire risk reduction activities.

A high-level steering committee involving specialist expertise from the Office of Data Analytics and the Office of the Chief Information Officer within Premier and Cabinet, Department of Environment and Water, Department of Infrastructure and Transport, and CFS has been working on this project. An initial Request for Information to the market was issued in early May, the project steering committee have reviewed the information obtained and are planning the next phase in the procurement process.

BMAP Interim Arrangements

As the reform initiatives currently underway will take time to be fully implemented, there are a number of interim measures in place to manage the BMAPs. During 2022 a new meeting format for the BMCs is being implemented, incorporating a post season review, development of an annual Bushfire Risk Reduction Plan based on high risk assets in the BMAPs - to identify the priority assets for treatment in preparation for the coming season – and a pre-season coordination discussion. Until the new software solution is in place, the risk register underpinning the BMAPs will be maintained to reflect assets at risk from bushfire and the and risk reduction strategies proposed to manage the risk.

Government of South Australia

South Australian Country Fire Service

Prepared for AFAC 2022 by SACFS Bushfire Management Planning Unit

Anthea Howard, Andrew Patten, Ali Walsh, Anthony Anderson, Paula Slutzkin, Danielle Drever, and David Phillips.

Australian Resilience Corps

Growing Australia's largest on-call resource of resilience volunteers

The Australian Resilience Corps is a network of volunteers, NGOs, communities and corporates, determined to reduce the devastation caused by fire and flood across Australia.

We connect help to where it is needed most.

Online training & activities

We equip volunteers with free online training developed by experts spanning: Disaster Resilience, Property & Landscape Management and Mental Health.

Community resilience planning

We support local communities in kick-starting resilience planning, using our evidence-based Resilient Communities Framework.

Volunteer muster events

Working with on-the-ground community groups and NGOs, we run muster events that connect our resilience volunteers with at-risk communities to support fire and flood preparation activities.

Our first muster event in Wooroloo, Western Australia

- Resilience planning conducted with community, supported by local community groups and NGOs
- 25 volunteers supported fire prep, clearing fuel from the reserve behind the Wooroloo Fire Brigade's HQ
- 25 trailer loads of fuel cleared, enabling the Fire Brigade to conduct cool burns

Join the Australian Resilience Corps today.

www.resiliencecorps.org.au

Want to partner with us? We'd love to chat.

Nadine De Santis | Project Lead | ndesantis@minderoo.org

Founding Partners:

MINDEROO FOUNDATION | NRMA INSURANCE

Transdisciplinary Research to Address the Mental Health Impacts of a Changing Climate

Fiona Charlson[1,2]

[1] School of Public Health, The University of Queensland, St Lucia, QLD, Australia
[2] Queensland Centre for Mental Health Research, Wacol, QLD, Australia

Background

The University of Queensland's **Mental Health in Climate Change Transdisciplinary Research Network** was established in late 2019 in response to government, industry and community requests for new knowledge about how climate change is likely to impact social and emotional wellbeing through more frequent natural disasters, and for evidence-informed interventions that will build community resilience in the face of these disasters. Climate change-related events are known to be associated with psychological distress, worsened mental health (particularly among people with pre-existing mental health conditions), increased psychiatric hospitalisations, higher mortality among people with mental illness and heightened suicide rates. Our transdisciplinary research network is the first in Australia dedicated to addressing the interconnecting social, mental and emotional health impacts of climate change. Here we present an overview of our research network, including capabilities, objectives, activities, stakeholder engagement, and our current and planned projects aimed at building disaster resilience and risk reduction.

Figure 2: Industry partners and stakeholders

Capabilities

- Epidemiology
- Burden of disease
- Mental health services research
- Program and intervention evaluation
- Mental health policy
- Planning healthy cities
- Social sustainability and community wellbeing
- Urban green space and health and wellbeing
- Nature-based interventions for wellbeing
- Environmental communication
- Climate change beliefs and action
- Qualitative longitudinal research
- Social determinants of health
- Stakeholder consultation
- Community participative research and codesign
- Urbanisation, biodiversity and human quality of life
- Therapeutic landscapes
- Climate change adaptation
- Climate-induced human mobility
- System dynamics modelling
- Statistical modelling
- Health Economics
- Behavioural responses to information
- Unintended effects of environmental policy
- Intervention development
- Syndemics
- Sociology of emotions

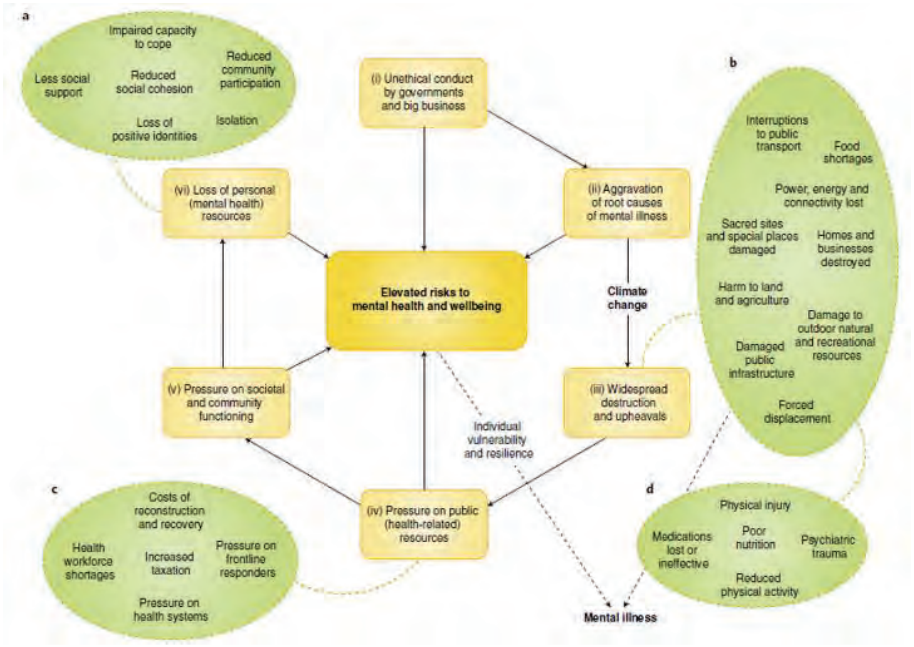


Figure 1: The mental health climate change system (taken from Berry, H.L; et al. The case for systems thinking about climate change and mental health. Nature Climate Change 2018, 8, 282.

Research aims

- To understand the experience, distribution and determinants of mental illness/poor social and emotional wellbeing in the age of climate change.
- To conceptualise the systems underpinning social and emotional wellbeing in the age of climate change.
- To develop interventions to harness the political importance of emotional responses to a changing climate, while optimising the social and emotional wellbeing of communities in the age of climate change.
- To inductively understand and quantify the benefits of addressing the social, emotional, and mental health harms associated with climate change.
- To translate knowledge into policy and practice through research with in-built impact to improve social and emotional wellbeing in the age of climate change.

How we work

Our network is committed to the following activities to add value to members:

- Connect and coordinate partnerships between field experts and academic experts to support applied research about mental health in climate change
- Position members for strategic funding and investment opportunities
- Support development of proposals for research and funding opportunities for network members
- Share knowledge about mental health in climate change
- Promote higher degree research opportunities within the network and beyond
- Shape and influence the national research agenda for mental health in climate change
- Advocate for the importance of research about mental health in climate change
- Translating by using our research to inform policy and service planning

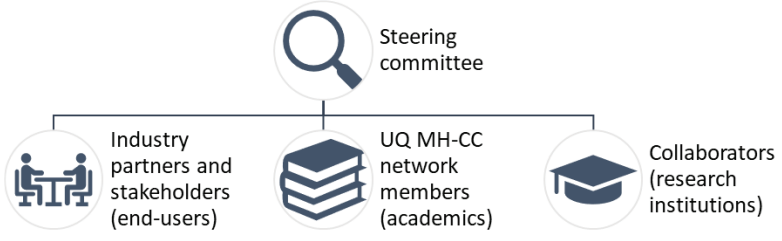


Figure 3: Governance Model

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THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

Self-responsibility for household preparedness: Connecting perception to real-world activity

Michael Carroll & Matt Dyer
Queensland Fire and Emergency Services

While household preparedness plays a key role in the capacity to respond to and recover from a disaster or emergency event, its implementation is reliant on the very same householders that it will ultimately benefit. It is therefore important to understand how this self-responsibility is viewed by members of the community, and the benefits and challenges that may result from those perspectives.

Our examination focused on perceptions of self-responsibility for household preparation for disaster and emergency events and how this translates to actual preparedness as measured by a formal preparedness index.

Method

Preparedness measures were sourced from the *2019*, *2020* and *2021 Queensland Fire and Emergency Services Community Insights Survey*. Queensland adults who completed the online surveys numbered 2,458, 2,100 and 2,176, respectively.

Perceived self-responsibility was gauged from "Thinking of preparing your household for disaster and emergency events, how responsible do you believe you are?" Response options were: 'not at all'; 'slightly'; 'mostly'; and 'completely'.

Preparedness behaviours were measured via a 'Preparedness Index' which was the number of activities an individual had completed to prepare their household for a disaster or emergency event (e.g. developed a fire plan for their property) divided by the total number of activity options available.

Results

The percentages of participants perceiving themselves as 'mostly' or 'completely' self-responsible (i.e. High) were 87%, 88% and 89% respectively over the three years.

Figure 1. Differences in preparedness behaviours as a function of perceived self-responsibility

Implications

Although representing a relatively small subset of participants, those who believed that they were only 'slightly' or 'not at all' responsible for preparing their household for disasters and emergency events had a significantly lower preparedness index score than those who felt they were 'mostly' or 'completely' responsible. This significant difference was evidenced for each of the three years of the survey and strongly suggests that perception of self-responsibility translates into actual preparedness activities and completion, or the lack thereof.

When developing community education, initiatives, and strategies targeting household preparedness, an appreciation of the significant role and potential value of perceptions of self-responsibility is warranted.

Contact: michael.carroll@qfes.qld.gov.au

Laying the foundation for improved educational infrastructure

It's a new world, and we're all finding our way through a new uncharted reality. In this dynamically changing landscape, learning technology is taking an accelerated role in driving us to deploy learning differently and rethink what's possible.

Andrew Chan
Learning Project Manager, SLSNSW

Background

Today, Surf Life Saving NSW (SLSNSW) has members across 129 Surf Life Saving Clubs (SLSCs) and 11 Branches who perform thousands of rescues, preventative actions and first aid treatments each year. Now boasting over 75,000 members in NSW alone it can rightfully claim to be one of the largest volunteer organisations of its type in Australia.

At SLSNSW, we are committed to providing our volunteer workforce the best possible learning environment and experience by fostering a strong learning culture.

Key Focus Areas

Ensuring we have the essential digital infrastructure to support the implementation of our valued added digital learning initiatives, we focus on the following

Being a part of the digital credential ecosystem

Understand the relevant requirements related to digital credentials and how the organisation can be a part of it.

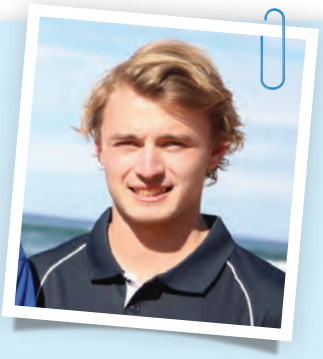
Streamlined administrative processes supported by a digital solution

Invest in a fit for purpose digital solution to enable our volunteers educators deliver training to their peers efficiently.

Engagement with leading Virtual Reality, Mixed Reality, Augmented Reality Strategy and Production agencies

Actively engage and seek partnership opportunities with vendors, academics and digital learning designers

Case Study



"I have studied online many times before, however, the Canvas platform was way easier and much more intuitive than others I have used; making it a significantly more enjoyable learning experience." Liam Drake, Youth Surf Lifesaver of the Year.

At SLSNSW, we endeavour to make our digital learning experience interactive, engaging and practical.

The organisation has recently transformed one of its flagship programs - Training Officer Certificate. This program is specifically designed for members who have been approved by the organisation to deliver its Surf Life Saving awards and education programs to new and existing members.

Powered by ***Canvas***, the learning management platform that makes teaching and learning exponentially better. It provides participants with the opportunity to practice their own skills in session planning, training delivery and course evaluation in a safe and supportive learning environment.

Participants can engage in discussions that unfold over time, giving them the chance to consider, reflect, research, and carefully express their thoughts and ideas. This means everyone has an opportunity to contribute, not just those with the loudest voices or who think fast on their feet.

Meet Our Graduates

SURF LIFE SAVING
NEW SOUTH WALES

RE-BUILDING OF A COMMUNITY WITH RESILIENCE AND CONFIDENCE

Happy Valley; a small community mid-way along the Eastern beach of Fraser Island (K'gari). The village is nestled in two valleys, surrounded by high sand dunes to the North and South, connecting to the beach.

Happy Valley Community Association Inc

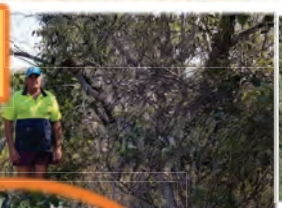
IA58772

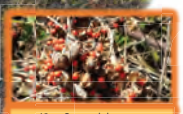
"Our Community, Our Say, Our Voice"

September 2019

Undertaking Hazard Assessment of fuels, defined by the APZ's provided by DNRME (DoR) within the Happy Valley Township Reserve (R14), as per the plans.

(Average levels of consumable fuel were 30-50 tons/ha across all APZ's).





Vine , Commonly known as "Crabeye" (Abrus precatoriuos africanus)

BEWARE POISONOUS SEEDS

(1 Seed can Kill)

A small group of long-term land owners in Happy Valley had concerns for several years regarding the apparent lack of managed, controlled Hazard Reduction Burns and the poor conditions and up-keep of fire breaks, around the township/village and the joining National Park.

Concerns were also raised about the legal status of the Town Reserve (R14) when during the 60's the Government failed to complete necessary process to confirm Happy Valley as a Township. At this time, parcels of freehold title were auctioned and reserves set aside for proposed future infrastructure. (School and Police reserves)

On the 12th of June 2019, the group of residents established a new entity to bring the community back together (Happy Valley Community Association Inc.) This established a combined voice of land owners and interested persons to raise varying issues for the community, with state and local governments to maintain a sustainable future for generations to come.

January 2020

Initially, a fully qualified and experienced, firefighter of the Happy Valley Rural Fire Brigade had discussed the need of Rural Fire Volunteers in order to undertake the required preparation work, prior to any occurrence of Fire activity. The recently retired Sate Manager for Rural Fire Volunteer Training Delivery, came prepared to deliver the basic level (FMS) firefighter training.

A group of 12-15 people volunteered and undertook the theory component of basic level FMS training and engaged in the operational aspects of the hazard reduction process. Many of these volunteers are not permanent residents of the Island.

"Crazy Idea—Nov 2019"

Installation of Firefighting water supply—Aug 2020

Water tanks supplied by FCRC Disaster Management Unit, installed by Happy Valley RFB Volunteers, complete with multi-connection fire hydrants at two locations. (These proved the most useful during the December 2020 Wilfdfire Event, threatening the Township).

After a community meeting with all stake-holders input, the completed Hazard Reduction Plan for Happy Valley Township Reserve was fully supported and approved. (17th February 2020). It was intended to commence in late March. However, due to COVID19 lockdown Fraser Island was locked out to all non-residents, including property owners.

11 weeks later in late May, more challenges became apparent to our plan due to weather and availability of supporting resources. A private fire appliance was then an option due to conditions included in the fire permit. This also changed the expectations of the HRB plan outcomes.

Unfortunately, due to circumstances beyond our control, the HRB plan only reached approximately 70% of intended outcomes.

The HVRFB hazard reduction team with new appliance, delivered mid-August 2020.

Education Reserve inside Dingo Fence HRB - 13th Aug 2020

Education Reserve 300m outside Dingo Fence—27/28th Aug 2020

Dec 2020 Wildfire Front Extinguishing on Education Reserve HRB Aug 2020

Monday 7th December 2020 0900 hrs

Backburn crew lighting edge along prepared North and North-West ridges surrounding Township. (**Left photo**)

North-West break to tie in to previously burnt Education Reserve.

Ignition Point for both North and North-West mulched breaks. (**photo below**)

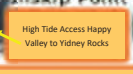
Backburn crew and mop-up unit waiting out from a spotover in previously prepared, mulched safety zone. The crew waited for approximately 2 ½ hours. (**Right photos**)

FCRC Deputy Mayor Turning on water supply -11 Sep 2020

Wildfire Debrief 08/12/2020

HV Community Members and supporting fire crews during preparations for the arrival of the Wildfire, Dec 1st-6th 2020

Example of Northern Fire front arriving at break above QAS



High Tide Access Happy Valley to Yidney Rocks

Arrival of Wildfire to Happy Valley 07/12/2020

Ongoing Community Engagement & Hazard Reduction Planning by Happy Valley Community Association and Happy Valley Rural Fire Brigade (June 2021, Ongoing)

Open Day 01/10/21

Community Meeting 13/03/21

Regrowth over Burn Area 23/07/21

Telstra Ridge 12/09/21

Telstra Ridge 06/08/21

HRB Management 01/05/22

HRB Map Updates

Awards, Achievements and Outcomes of Community Engagement and Volunteering within a Resilient Community

HVCA Presentation of Automatic Wristwatch (engraved) - Winston Williams Sector Commander Happy Valley Township

North Coast Region QFES Assistant Commissioner

Rotary International Paul Harris Fellow Award

HVRFB Volunteer Glenda Williams—**PSO** HVRFB 2nd Officer Winston Williams

$18,000.00 Donation to Happy Valley Rural Fire Brigade

Happy Valley Community Association Inc. & Happy Valley Rural Fire Brigade **State Winners Resilient Community Award and National Runners Up**

Fraser Coast Regional Council **Community Engagement & Volunteer of the Year 2021**

3rd Officer HVRFB—Scott Bell

Connecting our QFES community:
Capturing the voices of our diverse workforce

Our QFES community

5,400 staff

35,000 volunteers

- Fire and Rescue Service
- Rural Fire Service
- State Emergency Service
- Emergency Management
- Corporate Service

Our Strategic Workforce plan recognises that our people are our strength.

The plan commits us to building positive workforce experiences and shared values to foster an inclusive and respectful workplace for all.

How do we capture the voices of our diverse workforce to understand their experiences in the QFES workplace?

Every year, the Queensland Public Service Commission runs the Working for Queensland survey for all Queensland government employees.

Since 2020, we have conducted our own Volunteering for Queensland survey at the same time as the Working for Queensland survey, to give us a snapshot of the experience of our whole QFES workforce—staff and volunteers—at the same point in time.

2021 workforce experience survey participation

2,308 staff

2,333 volunteers

What did the surveys tell us?

There were many common results for what staff and volunteers were most positive about, and what they felt needed improvement.

10 most positive results for staff:

I understand how my work contributes to my organisation's objectives	92%
I understand what is expected of me to do well in my job	91%
People in my workgroup treat customers with respect	89%
People in my workgroup are committed to workplace safety	89%
People in my workgroup are committed to delivering excellent service to customers	86%
I receive help and support from other people in my workgroup	85%
Satisfaction with your ability to work on your own initiative	84%
I enjoy the work in my current job	84%
My manager treats employees with dignity and respect	84%
There is adequate focus on workplace safety at my workplace	83%

10 most positive results for volunteers:

I understand what is expected of me to effectively do my volunteer role	89%
People in my team are committed to delivering excellent service to customers and the community	86%
I am proud to tell others I volunteer for my organisation	86%
People in my team are committed to workplace safety	85%
My volunteering gives me a feeling of personal accomplishment	84%
I understand how I contribute to QFES' objectives	84%
People in my team treat each other with respect	81%
My leader treats volunteers with dignity and respect	80%
I feel strong personal attachment to my organisation	79%
I am able to speak up and share a different view to my colleagues and leader	78%

10 least positive results for staff:

I am confident that poor performance will be appropriately addressed in my workplace	45%
I am overloaded with work*	44%
My organisation is well managed	44%
My commitment to this organisation would be questioned if I chose to work flexibly*	43%
Performance is assessed and rewarded fairly in my workplace	42%
My workplace has undergone significant change in the past 12 months	41%
Recruitment and promotion decisions in this organisation are fair	41%
Disability is not a barrier to success in my organisation	37%
Approval processes at my workplace are excessive*	16%
There is too much 'red tape' in my work (eg regulatory or administrative processes)*	16%

10 least positive results for volunteers:

I am confident that poor performance will be appropriately addressed in my workplace	55%
Disability is not a barrier to success in my organisation	55%
I am overloaded with my volunteering commitments*	55%
I am able to access relevant learning and development opportunities	55%
QFES provides flexible training opportunities e.g. various formats, times and locations	53%
QFES recognises and utilises the skills and experience I bring to my volunteer role	50%
Volunteers are effectively consulted and involved in decision-making at my local area level	48%
There have been positive changes in behaviours over the past year	46%
Approval processes at my workplace are excessive*	19%
There is too much 'red tape' in my volunteering (e.g. regulatory or administrative processes)*	18%

* Scales have been reversed for negative questions. % positive indicates those who have limited to no issues with the matter referenced.

A values-based organisation

Our QFES values, courage, integrity, loyalty, respect and trust are the foundation of everything we do, and ensure a positive workforce experience for all.

Our surveys tell us that our people see those values demonstrated in their workplace.

Workplace behaviour reflects each of the QFES values

Courage	Integrity	Loyalty	Respect	Trust
Staff 79%	Staff 74%	Staff 76%	Staff 78%	Staff 74%
Volunteers 80%	Volunteers 78%	Volunteers 78%	Volunteers 78%	Volunteers 75%

Queensland Government

LiDAR-derived Bushfire Fuel Load Survey of the Adelaide Hills

Landscape- to property-level insights.

Samuel Holt, Fabrice Marre

1. Background

In Australia, active remote sensing techniques such as LIDAR have been identified as critical resources that have the potential to revolutionise bushfire management and response practices following the catastrophic 2019/2020 Australian bushfire season[1,2].

In 2020, Aerometrex developed calibrated methodologies for mapping Tonnes Per Hectare Fuel Load (t.Ha^{-1}) within eucalypt woodlands and forests, using optimised LiDAR capture parameters[3].

Presented here are the results of a bushfire fuel load survey captured by Aerometrex in October 2021 across the Adelaide Hills, centred on some of the region's most densely populated, high risk hills communities.

2. Datasets & Methodology

Bushfire fuel load density and connectivity parameters are derived from Airborne LiDAR data captured using optimised parameters to ensure full canopy penetration, an average point density of 70 pts.m^{-2} and classified to Aerometrex's Type 3 Standard.

All input and output raster datasets are produced at a spatial resolution of 10m.

Spatially continuous t.Ha^{-1} fuel maps (Figure 1) are derived using multivariable generalised linear regression incorporating input parameters of Weighted Cumulative Fuel Density[3], Fuel Vertical Connectivity[3] and aspect with good correlation when compared to ground truths: R^2: 0.89, Adj. R^2: 0.83, P-value: 3.0×10^{-3}, RMSE: 1.5 t.Ha^{-1}. For detailed methodologies, see Holt et al. (2021).

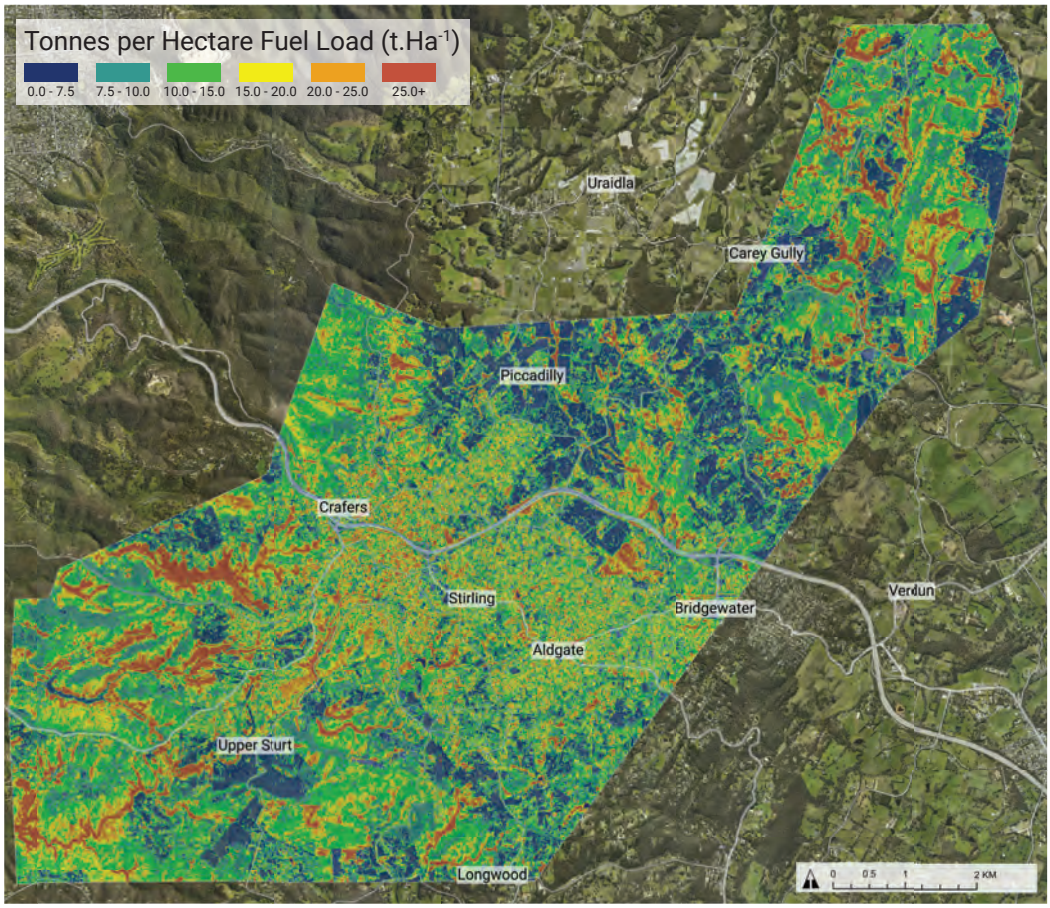


Figure 1 – LiDAR-derived t.Ha^{-1} fuel load map for eucalypt woodlands and forest, Adelaide Hills, SA

Figure 2 – Map showing the average proximal fuel load (t.ha^{-1}) within 100m of structures and dwellings along Sheoak Road in Crafers West.

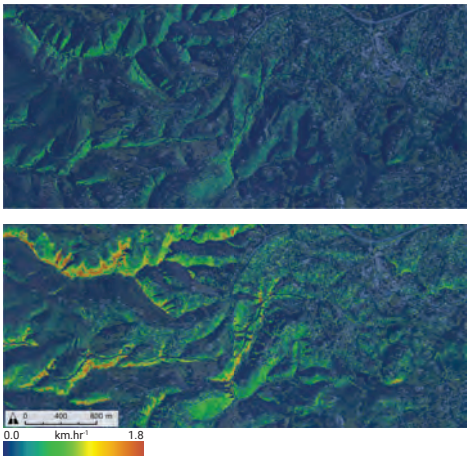


Figure 3 – Leaftlet80 slope-adjusted rate of spread maps for 10:30am (top) and 430pm (bottom) on 22nd February 2022 (FDI 20).

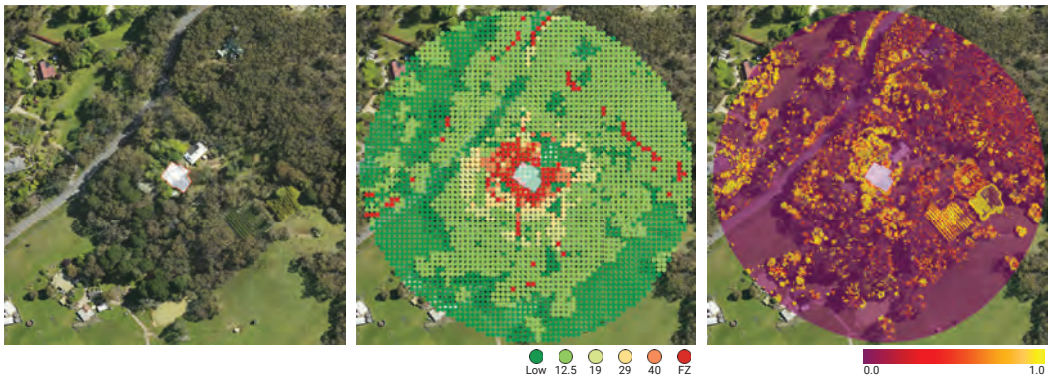


Figure 4 – Left: Reference aerial imagery of a dwelling in the Adelaide Hills. **Middle:** An automatic Bushfire Attack Level (BAL) assessment for that dwelling, for vegetation within 150m, derived from Airborne LiDAR, using methodology outlined in AS3959. **Right:** Proximal elevated vegetation density within 150m of the dwelling.

3. Key Results, Outputs & Next Steps

- Large-scale fuel load density, vertical connectivity and tonnes per hectare (t.Ha^{-1}) fuel load maps (Figure 1) have been produced for the Adelaide hills with the goal of helping state-level bushfire experts plan targeted fuel load management programs.
- Property-level fuel load attributes, such as proximal fuel load (Figure 2) have potential to facilitate effective engagement of the community as active participants in fuel mitigation strategies.
- Regional, continuous t.Ha^{-1} fuel load maps can be utilised in fire behaviour models, such as Leaflet-80[4], for informed planning of prescribed burns.
- Standard Bushfire Attack Level[5] estimates for existing and planned dwellings can now be derived from Airborne LiDAR to help educate landowners about potential bushfire attack (Figure 4).

References

[1] Royal Commission into National Natural Disaster Arrangements: Report; *Royal Commission into National Natural Disaster Arrangements*, 2020.
[2] NSW Bushfire Inquiry Final Report of the NSW Bushfire Inquiry; Sydney, 2020.
[3] Holt, S.J.; Marre, F.; Telfer, S. *LIDAR-Derived Bushfire Fuel Load Metrics for Eucalypt Woodlands and Forests Using Optimised Acquisition Methods, Validated Using Visual and Destructive Measurements*. In Proceedings of the AFAC21; 2021.
[4] McArthur, A.G. *Control Burning in Eucalypt Forests*. Forestry and Timber Bureau, Leaflet No. 80; 1962
[5] AS3959: Construction of buildings in bushfire-prone areas

For more information and to download a copy of this poster, scan the QR code or come visit us at Stand 254 of the expo hall.

aerometrex

Acknowledgements

The Authors would like to thank National Parks and Wildlife Service, South Australia and Department for Environment and Water, South Australia for facilitating access to field sites within Belair National Park.

Acknowledgements

We acknowledge those communities that lived through the Black Summer Bushfire disaster, with each person having their own experiences. We acknowledge the resilience, courage and strength which has been shown by communities and the ongoing efforts to maintain and grow this each day.

We also acknowledge the Traditional Custodians of the land and sea, Aboriginal and Torres Strait Islander peoples. We pay respect to elders past, present and emerging.

Managing risk through partnerships – Case study:

The Royal Far West Bushfire Recovery Program and Birdie's Tree

Services unite to support children in bushfire recovery

Royal Far West (RFW) is Australia's only national charity dedicated to improving the health and wellbeing of country children. In the aftermath of the Black Summer Bushfires of 2019/20, RFW created the Bushfire Recovery Program (BRP). This community-based program, delivered through primary schools and preschools, supports children aged 0-12 years and the key adults around them who have been impacted by the fires.

The program, delivered by multidisciplinary health clinicians, has been rolled out in over 30 communities across NSW. To date the program has supported over 3,000 children, parents/carers, educators, local services providers and community leaders through group programs, individual therapy and capacity-building workshops.

Birdie's Tree is a suite of resources developed by the **Queensland Centre for Perinatal and Infant Mental Health** (QCPIMH), Children's Health Queensland Hospital and Health Service, to support the mental health and emotional wellbeing of expectant and new parents, babies and young children in the context of natural disasters.

Birdie's Tree resources have been used throughout the Bushfire Recovery program to give children a voice in the recovery process.

Investing in partnerships for the long term

The increasing frequency and severity of natural disasters demands additional investments in the preparedness, response and recovery phases. Equally important is co-ordinating these investments to maximise positive outcomes for disaster-affected communities. Partnerships – among organisations, and between organisations and communities – can be highly effective when trust and collaborative processes are built over time, and when service provision in the preparedness phase can readily pivot to support response and recovery.

Collaboration through partnerships

Through tailored training and collaboration, RFW's multidisciplinary health team used the Birdie storybooks and other resources to deliver children's groups and parent/educator workshops. Through the groups, sensitive conversations were conducted with children about their bushfire experiences, emotions and coping strategies. Through the workshops, key adults were upskilled to respond to children's needs.

Drawing on their expertise in child mental health, RFW's multidisciplinary health team implemented Birdie's Tree in creative ways, helping children regulate their bodies and calm their minds. Resources such as 'Birdie and the Fire' were explored with parents and educators as mental health promotion, prevention and early intervention, highlighting therapeutic storytelling as an opportunity to strengthen attachment and attunement between child and adult.

"I never knew my child felt that way after the fires"
– Parent

An illustration from *Birdie and the Fire*. Birdie's Books are used in the Program to build children's emotional literacy around natural disasters, e.g. "How do you think Birdie felt when she smelt the smoke?"

Partnerships in community

Birdie's Tree storybooks promote self-efficacy as children can choose when they want to read the book, with some children choosing to read it over and over again.

1. Community benefits

Importantly, the Program incorporated a whole of community approach, which tapped into local services to aid long-term recovery and sustainability. Wherever possible, partnerships were formed with local professionals to jointly facilitate the children's groups – family support workers, Teachers, Be You / Headspace and Australian Red Cross. Through these partnerships, schools and local services have now started facilitating groups of their own, demonstrating the ongoing benefits of the Program at a local level. Benefits experienced by the children have been found to filter through to adults and the wider community. One community member observed that the Program encouraged children to have conversations with their parents, and as a result the parents felt "supported, and a bit more resourced." The behaviour of some children changed in ways that had positive impacts at home. The observer said:

"So kids are happy, mum's happy, families are happy, and they can share that with their colleagues and their friends, so I think you know it does ripple out to the community."

2. The benefits of connection

Working with children and adults recovering from a natural disaster such as a bushfire is complex and challenging work. Secondary traumatic stress, vicarious trauma, compassion fatigue and burnout are recognized as common occupational hazards for clinicians working in this area. Supportive relationships with colleagues in the field can help support staff well-being.

Brianna (Occupational Therapist) and Chris (Social Worker) read *Birdie and the Fire* with a very engaged group of preschoolers. The book is used to initiate conversations with children about bushfire preparedness, response & recovery.

3. Giving a voice to children

The program team have shared the practical learnings and research outcomes within the academic and professional community, as well as with local service providers, organizations undertaking other recovery and resilience work, government representatives, policy-makers and decision-makers. Important tools through which the project has given children a voice include conference presentations and the UNICEF Australia report After the Disaster.

Recovery is a long journey and support will be required for many years.

Reading a storybook together is a great way for children and adults to strengthen their relationships. Hand puppets can help bring a story to life. Some children used the puppets to share their own experience of the bushfires.

The Birdie's Tree Stepped Care Model

Birdie's Tree works with a stepped care model, in which universal resources for prevention and mental health promotion form the foundation. While RFW has to date only worked with these universal resources, in the long term our partnership with Birdie's Tree may include the Birdie Cares early intervention program, for children who require more support for their mental health after being impacted by a natural disaster. The Birdie's Tree team is also developing Birdie Helps, a treatment program for children who experience more severe or persistent symptoms of trauma.

Royal Far West
Children's health, country-wide

Scan to read our report: *After the Disaster: recovery for Australia's children.*

Royal Far West and QCPIMH have both received Resilient Australia Awards for their work (2020 and 2021).

For further information about the Bushfire Recovery Program, please visit:
royalfarwest.org.au/bushfire-recovery-program

Australian Government
NSW Government

The Bushfire Recovery Program was established and initially evaluated with the support of the Paul Ramsay Foundation and UNICEF Australia. Current and future work is funded by the Bushfire Community Recovery and Resilience Fund, the Bushfire Local Economic Recovery Fund and the Black Summer Bushfire Recovery Grants Program through the joint Commonwealth/State Disaster Recovery Funding Arrangements. Although funding for this Program has been provided by both the Australian and NSW Governments, the material contained herein does not necessarily represent the views of either government.

Scan to visit the Birdie's Tree website or just search Birdie's Tree on the internet.

Children's Health Queensland Hospital and Health Service
Queensland Government

For more information about this poster or Birdies Tree, you can contact Dr Andrea Baldwin, Service Development Leader at QCPIMH **Birdies-Tree@health.qld.gov.au**

Supporting children after a natural disaster

Three important ways we support children's recovery:

Routine

- Maintain structure and consistency
- Have clear expectations
- Provide choice to encourage autonomy

Regulation

- Encourage physical movement
- Practice breathing exercises
- Provide quiet space

Relationships

- Be curious
- Connect before you correct
- Build trust by being reliable and consistent

Find out more

be you | Beyond Blue

With delivery partners

Early Childhood Australia
A voice for young children

headspace
National Youth Mental Health Foundation

Funded by

Australian Government
Department of Health

Helping children recover

A scalable model for building child resilience following bushfires and other disasters

Royal Far West
Children's health, country-wide

The need

The Black Summer bushfires of 2019/2020 were unprecedented in their scale and impact on children, families and communities across Australia. Unfortunately, climate change is increasing the intensity and frequency of these events, and their consequences for communities. The Royal Commission into National Natural Disaster Arrangements (2020) reported that climate change had exacerbated the extreme conditions and warned that Australia must prepare for an "alarming" future of simultaneous and worsening natural disasters.

Children are particularly vulnerable to the trauma of these events and their consequences. Without the right support these consequences can change the trajectory of their lives, reducing education, employment and psychosocial outcomes immediately, and long after the event has passed.

About the Bushfire Recovery Program

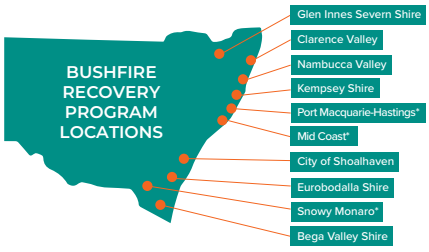
The program is a multidisciplinary community-based model that involves working with both children (aged 0-12 years) and those key adults supporting the children (parents, carers, educators and service providers). The program team includes social workers, psychologists, occupational therapists and speech pathologists. Each discipline brings unique skills to meet the varied needs of the community and their combined wisdom enhances the delivery of the whole program.

The team delivers the program through community visits to schools and preschools with ongoing support and therapy also offered via Telehealth.

The program can easily be modified to assist with trauma resulting from other disasters or large-scale emergencies such as floods, cyclones, storms and drought.

Based on the philosophy that communities are the experts of their own needs, communities are provided with a "menu" of effective support options to choose from.

Scan to read our report: ***After the Disaster: recovery for Australia's children.***



Program foundations

This program is based on the evidence of what works best to support children and young people. It includes five essential elements that should be considered in any natural disaster response (Hobfoll at al 2007):

1. Safety
2. Calm
3. Self and collective efficacy
4. Connectedness
5. Hope

For children this means helping the child to feel safe and calm, to feel they have some control over what is going on around them, to help them feel connected to others and hopeful when they look to the future.

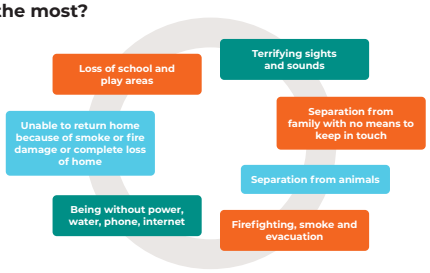
Giving children a voice

Children's voices are important and should play an essential role in helping to shape programs, policies and frameworks to support their recovery.

The BRP team found that much of the impact of the bushfires on children was internal or 'hidden', with families and schools not always aware of the extent of the difficulties children were experiencing.

Children want to talk about their experiences. For many children, sharing their stories in the children's groups was the first time they had spoken about their experience and the ongoing impact. They are interested in learning how their brains and bodies respond to stress, whilst exploring wellbeing strategies to add to their "tool kit".

What factors impacted children the most?



Independently evaluated

The program has been evaluated and refined in response to community needs throughout the delivery period.

Charles Sturt University (CSU) conducted an independent evaluation of the first 12 months of the BRP.

The response by communities to the BRP has been overwhelmingly positive, with requests for the program to be extended to other areas.

Charles Sturt University

Scan to read our report: ***Bushfire Recovery: the Children's Voices***

The author's state:

"This Evaluation demonstrated that the multifaceted, strength-based, community-based RFW Bushfire Recovery Program effectively enabled children to develop their self-awareness and sense of self-efficacy, resilience, and confidence.

"Effective programs, like the RFW Bushfire Recovery Program, will play an important role in improving the resilience and wellbeing, and decreasing the likelihood of long-term adverse reactions, of children impacted by natural disasters."

The future

The program has been awarded both the NSW and the National Community Resilience Award (AIDR). The team continues this important work with funding from the Bushfire Community Recovery and Resilience Fund and the Bushfire Local Economic Recovery Fund.

Recovery is a long journey and support will be required for many years.

For further information about the Bushfire Recovery Program, please visit:
royalfarwest.org.au/bushfire-recovery-program

Examples of support offerings

Children's Groups in School & Preschool

The groups can help children who have experienced grief and loss - this could be following a disaster or other life changes.

The team is trained in disaster support children's programs (*Stormbirds* and *Birdie's Tree* resources) as well as *Seasons for Growth*.

"Now I know that it's OK to talk about how I feel."
- Child

Educator Support

With access to a Speech Pathologist, Occupational Therapist, Psychologist or Social Worker, a variety of support can be offered to Educators. This can include topics such as:

"Supporting the School following Community Trauma"

"Supporting regulation for students in the classroom"

"Educator Wellbeing & Self-care"

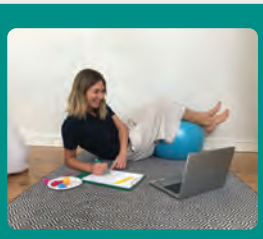
"I learned how to identify students in my classroom who might be experiencing trauma"
- Teacher

Parent/Carer Support

Group and/or individual sessions, focus on covering both parental wellbeing and how parents can support their child.

Parenting support is based on the Tuning in to Kids® Program and gives parents the option of joining an online group.

"We all enjoyed learning about ways to calm down when we are having strong feelings."
- Parent



Telecare Therapy

For children who might need extra support, the program can provide Telecare therapy based on the area of need – speech pathology, psychology or occupational therapy.

"The flexibility of Zoom sessions [meant] my daughter received help weekly. It gave us the tools we need to help us and our child."
- Parent

What did the children learn?

"Everyone is different, and changes and feelings are ok."

"People can help me when things are hard."

"I liked talking and having fun in the group with friends."

"It's alright to be mad or sad and ways to cope with feelings."

"That there are people to help me, to tell someone if something bad is happening."

"To let it out, don't keep it in."

"That I am not alone."

A tree of hope created by the children helps them identify places they can go (trunk), people they can talk to (branches) and things they can do (leaves) to support their wellbeing.

Acknowledgements

We acknowledge those communities that lived through the Black Summer Bushfire disaster, with each person having their own experiences. We acknowledge the resilience, courage and strength which has been shown by communities and the ongoing efforts to maintain and grow this each day.

We also acknowledge the Traditional Custodians of the land and sea, Aboriginal and Torres Strait Islander peoples. We pay respect to elders past, present and emerging.

Australian Government

NSW Government

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Fostering Connectedness and Resilience through Physical Health and Wellbeing Activities: The Ripple Effect

Understanding the Need

First responders are exposed to a broad range of operational and organisational stressors.

- **1 in 3** first responders experience **high levels of psychological distress.**
- **1 in 10** first responders develop **Post Traumatic Stress Disorder.**
- **Social isolation** increases **risk of mental illness**
- Over **2/3** of first responders **resisted seeking support** due to the stigma
- First responders carry **73% greater mortality risk**

Social connectedness is the strongest predictor of mental health and well-being after stress or trauma.

5 Ways to Wellbeing

Based on international research about the modifiable determinants of wellbeing.

CONNECT | BE ACTIVE | KEEP LEARNING | BE AWARE | HELP OTHERS

WELLBEING ACTIVITIES DESIGNED TO ENHANCE BOTH PHYSICAL ACTIVITY AND SOCIAL CONNECTION

Building family and team resilience through the primary lever of social connection. Activities include exercise programs, yoga, kayaking, learn to run, bush walk and more.

The Ripple Effect of Fostering Connection and Resilience

Enhancing Protective Factors

RESULTS

- **95%** Likely to engage in another activity
- **64%** Reported strengthened social network
- **77%** Reported enhanced connection
- **57%** Were encouraged to keep active
- **97%** Reported benefit to health and wellbeing

The Ripple Effect

1. Organised physical/social wellbeing activity
2. Promote social connection
3. Enhanced engagement > enjoyment > commitment
4. Improvements in physical fitness, mood and self-esteem
5. Enhanced wellbeing: long-term benefits of physical & mental fitness

Data Source
Preliminary qualitative and quantitative data from a sample of 975 participants in Wellbeing Programs organised by Fortem Australia, collected via routine quality assurance monitoring.

"Positive social support and physical activity are two ways to increase resilience and ward off trauma psychopathology and enhance protective factors!" - Lowery & Cassidy (2022)

Key Take Home Message

Combined Social & Physical Movement Activities

- Whole-person orientated
- Family and community-focused
- Physical movement
- Social engagement

Enhanced Wellbeing & Protective Factors

- Promotes social connection
- Develops skills and strategies to maintain physical health and wellbeing
- Builds resilience in first responders and their communities
- Protects against the negative effects of work-related stress

Wellbeing Participant Quote:
"I started going to the weekly running group which was a big step out of my comfort zone. After attending for 8 weeks, I had made connections with other group members and we continued to meet on weekly or bi-weekly to continue running. This helped improve my physical health and create a place where I could connect to others."

We support the mental health and wellbeing of first responders and their families – the people who protect and care for our community.

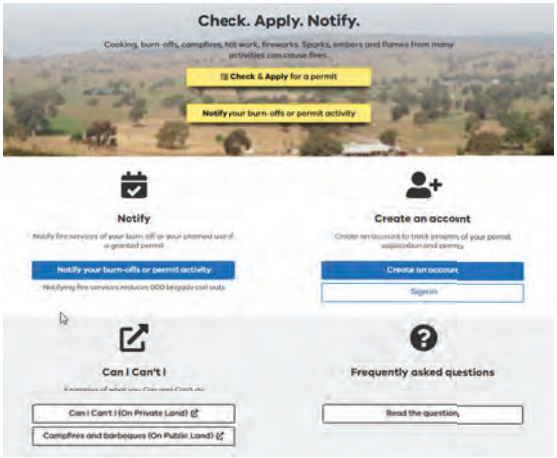
FORTEM AUSTRALIA

fortemaustralia.org.au

DIGITAL FIRE PERMITS

A new way to do old business

Fire Permits Victoria is a joint agency digital system that provides an online fire permit information and application process for safe use of fire in the landscape across Victoria.

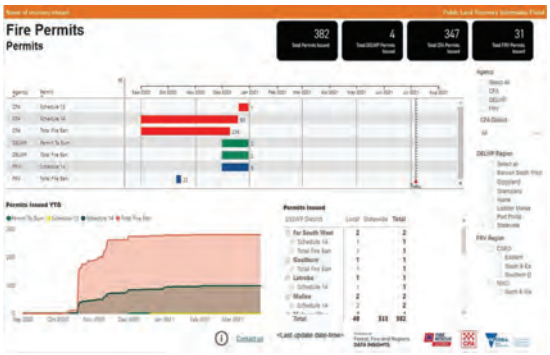


- **Centralises and streamlines** application, receipt, review, notification(s) and management processes
  - 10348 permits issued across Victoria during 20/21 and 21/22 fire seasons
- **Intuitive web-based system** that is applicant driven and profile based by location and activity type
- Uses fire agency legislation to ensure compliance
- **Standardises permit** wordings and conditions across agencies based on location and activity
- **Communicate with applicants** in an efficient and timely manner
  - 8990 accounts created since Dec 2020
- Map based for **accurate visual representation:**
  - Permits granted and activated
  - Burn-offs registered all year

Benefits of the new system

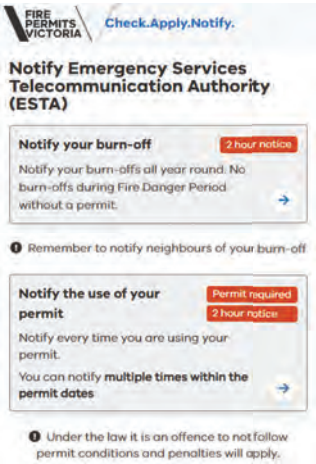
Current data and intelligence about fire risk across public and private land to support:

- Understanding risk of ignition to support strategic fire management planning and preparedness
- Community engagement
- Compliance and risk management
- Improved operational efficiency
- Reduced administration burden on agencies
- Smoke forecasting on private and public land



- Supports Decision Making:
  - Cross agency system integration
  - Centralised data management
  - Analytical reporting capabilities

- **55065 registered burns or permit** uses since Dec 2020 via online notification system



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firepermitqueries@frv.vic.gov.au

VICTORIA State Government

Realistic urban planning with combined urban surface parameters to mitigate extreme heat during heatwaves

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INTRODUCTION

- Extreme heat events adversely influence the urban community & deteriorate the thermal comfort.
- Heat accumulates in cities due to the urban geometry, non-reflective urban surfaces & less vegetative surfaces. [1,2]
- Consequences intensify when urban heat occurs during extreme heat events;
  - increase vulnerability to heat-related illnesses & mortality.
  - Overloading sectors such as energy, economy, environment & critical social infrastructure.
- Therefore, investigating mitigation & adaptation strategies for extreme heat in cities is essential for a changing climate context.

OBJECTIVE

- To identify the most effective & operationalisable cooling strategies in terms of urban heat mitigation.

Green roofs | Cool roofs | Urban trees

METHODS

Study Site — Melbourne metropolitan

- The second-most populous city in Oceania.
- Temperate oceanic climate (Cfb) under Köppen climate classification.
- Maximum (T_{max}) & minimum (T_{min}) temperatures ranged respectively from 24.2 to 26 °C & 13 to 14.6 °C. [3]

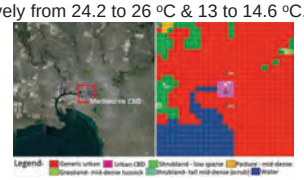


Figure 1: Melbourne CBD from UCM-TAPM (A: Melbourne from Google Earth; B: TAPM default lik-use representation; the black circle represents the point for temperature extraction)

Model details — The Air Pollution Model (TAPM)

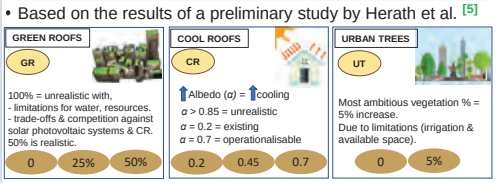
- Mesoscale climate model, developed by CSIRO, Australia.
- Coupled with an urban climate energy model (UCLEM). [4]
- TAPM is nested in NCEP analyses, downscaled to 1km through multiple nests.
- In this study, TAPM runs on high-resolution of 1 km grid cells for 25×25 grids horizontally & 8 km vertically.
- Uses 38 land use types.
- Retrieve data from: U.S. Geological Survey, Geoscience Australia & Australian Bureau of Meteorology. [4]

Time frame

- For every summer day (December to February) for 10 years.
- From 2011 to 2020.
- With 1-month spin-up time.

Choosing realistic surface parameters & scenario testing

- Based on the results of a preliminary study by Herath et al. [5]



Scenario	GR %	CR α	UT %	Scenario	GR %	CR α	UT %
• Control S1 *	0	0.2	0	S10	0	0.2	5
S2	0	0.45	0	S11	0	0.45	5
S3	0	0.7	0	S12	0	0.7	5
S4	25	0.2	0	S13	25	0.2	5
S5	25	0.45	0	S14	25	0.45	5
S6	25	0.7	0	S15	25	0.7	5
S7	50	0.2	0	S16	50	0.2	5
S8	50	0.45	0	S17	50	0.45	5
S9	50	0.7	0	S18	50	0.7	5

Table 1: Scenario design for parameters ground-level vegetation, green roofs, & albedo to represent cool roofs

- Measured: T_{max}, T_{min}, T_{air}, wind speed, latent & sensible heat flux
- From a height of 2m above ground.

MODEL VALIDATION

- The ability of the TAPM to reproduce the meteorological values was verified by model validation.
- Compared the Simulated (SIM) vs. Observational (OBS) data for daily T_{max} & T_{min} for 5 weather stations around Melbourne.

Figure 2: ArcGIS image with 3K grids for Melbourne with CBD centre & weather stations

Weather station (WS)	Temperature bias (°C)		R^2 %		Data availability %	
	T_{max}	T_{min}	T_{max}	T_{min}	T_{max}	T_{min}
Olympic Park	1.52	0.20	79.65	70.76	100	100
Melbourne Airport	-0.59	-0.73	79.17	63.60	100	100
Viewbank	-0.42	0.61	81.93	67.92	100	99.2
Essendon Airport	0.71	-0.39	79.23	64.15	99.8	99.8
Moorabbin Airport	-0.29	-0.50	80.36	57.47	100	98.8
Mean	0.19	-0.16	80.07	64.78	100	99.6

Table 2: Bias of maximum & minimum temperatures (Tmax, Tmin), calculated between the simulated & observed weather station values of the control scenarios from 2011 to 2020

- Model proved a better fit for simulating Melbourne, with a smaller mean bias values for T_{max} & T_{min}.

RESULTS & DISCUSSION

Reducing excess heat during Urban Heat Island effect

- Calculated as UHI = $T_{UP} - T_{RP}$.
- UP= urban point & RP= rural point
- Average values from 2011 to 2020.
- Existing average UHI of Melbourne (2.93°C with a range of 1.63–5.3°C).
- S18 reduce the UHI by 2.19°C.
- The diurnal UHI behaviour of the control was reduced overall in the introduced scenarios.
- Storage heat fluxes drop at night, so UHI reduces with reduced heat emissions.

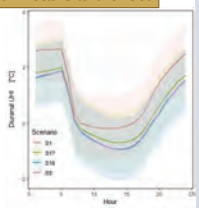


Figure 3: Diurnal UHI reduction by three scenarios. Shaded area represents 1 standard deviation.

Reducing excess heat during heatwaves

- Heatwave → the extreme heat events that persist for three or more consecutive days with high and unusual maximum and minimum temperatures at a particular location. [6]
- There were 2 most distinctive heatwaves in Melbourne in 2009 & 2014.
- The 10-year average maximum (27.02°C) & minimum (13.79°C) temperatures were exceeded during the heatwaves by ~15°C (both years, T_{max}), & for, 11.44°C (2009) & 5.84°C (2014).
- The recorded temperature variables during heatwaves, are mentioned in Table 3.

°C	T_{ave}	T_{max}	T_{min}
2009	34.3	43.0	27.9
2014	34.5	43.1	22.3

Table 3: Average, maximum & minimum temperatures (Tave, Tmax, Tmin) values reported during 2009 & 2014 heatwaves.

- The magnitude of these extreme heat events highlights the need for urgent mitigation strategies to protect vulnerable urban populations.

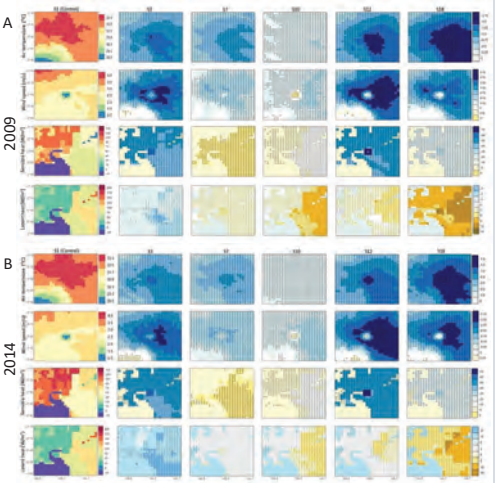


Figure 4: Maps in Melbourne for heatwaves with values of the variables for S1 (control) & the differences of selected scenarios from S1. The difference is calculated as scenario minus the control. (Dark dots indicate the significant change between the control & scenario decided with a paired t-Test between the control and each scenario. CL- 95%), A) 2009, B) 2014

Justification for scenario selection in Figure 4: S3→ 0.7 cool roofs only; S7 → 50% GR only; S10 → 5% UT only; S12→ best performance for T_{max} with UT & CR; S18 → best for T_{min} with all UT, GR & CR.

- S18 offered a reduction metropolitan-wide, especially around the CBD.
- Areas with higher temperatures showed lower wind speeds, higher sensible heat, & lower latent heat fluxes than low temperature areas.
- Roofs with higher albedos → reduce sensible heat & latent heat fluxes.
- This reduction directly affects the energy budget by lowering net radiation, and then reducing the surface temperature.

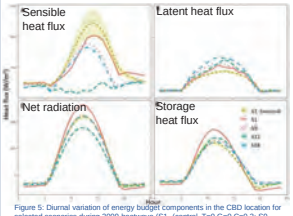


Figure 5: Diurnal variation of energy budget components in the CBD location for selected scenarios during 2009 heatwave (S1- (control, T=0,G=0,C=0.2; S9- (T=0,G=50%,C=0.7); S12- (T=5%,G=0,C=0.7) & S18- (T=5%,G=50%,C=0.7) compared with Seasonal S1)

During the heatwave in CBD,
- higher latent heat,
- high net radiation,
- high storage heat fluxes &
- lower sensible heat

than the seasonal averages.

- S18 → increased latent heat, with a higher vegetative ratio of 50% for green roofs with 20% urban trees.
- S12 → lowest sensible heat & net radiation during the day.
- Excessive heat from net radiation remained in the system as storage heat fluxes.
- S12 & S18 lowered energy budget components with upward curves to almost seasonal averages, so directly show thermal comfort benefits for city occupants.

Limitations towards implementation

- Urban vegetation contributes to heat reduction with cooling via transpiration & shading, it seems higher the greener, higher the cooling.
- But, extreme fractions of GR, CR & UT are unrealistic;
  → constraints in financeability
  → design standards for installation
  → maintenance
  → socio-economic considerations, such as public perception
  → policy & administrative restrictions
  → technology & innovation constraints
  → space availability
  → resources (e.g. water) [7-10]

- It is proved that, increment of urban trees after certain level is disadvantageous & promote heating. [11]
- So the 'right amount' is a key consideration.

Our study used the most affordable & ambitious vegetation fraction for UT (43% in the non-CBD & 20% in CBD - 5% increase in the existing percentages) with 50% green roofs.

CONCLUSION

- When the total roof area was converted to CR with 0.7 albedo & with 5% increased urban trees, S12 achieved the highest reduction for maximum summer temperature (T_{max}).
- S18 with maximum combined surface parameters, 20% UT, 50% GR, & CR with a 0.7 albedo, provided highest reductions for multiple heat indices (T_{ave},T_{min} & UHI).
- Different scenarios proved effective for different heat indices. E.g. higher ratios of cool roofs significantly reduced daytime temperatures, & vegetative surfaces promoted cooling at night.
- Combined strategies seem to deliver the best diurnal thermal performance with practicality & cost.
- The effectiveness of UGI should be defined based on both their thermal performance & operationalisability.
- City planning should be strategically explored to achieve enhanced thermal benefits from a combination of urban surface parameters.
- Establishing UGIs enhance the ecological value of a city while providing multiple ecosystem services.

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Lessons from Black Summer Bushfires inform community-led disaster resilience

Author: Jo Beadle

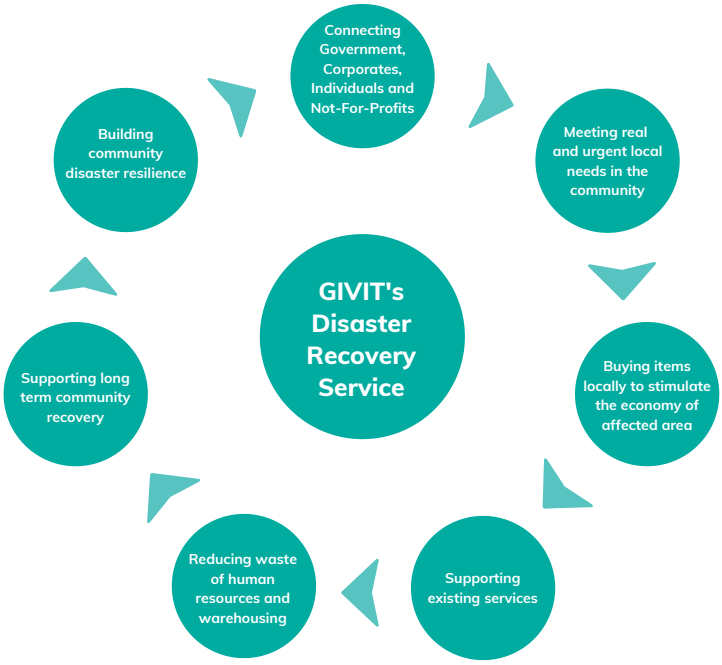
The 2019-20 Australian bushfires highlighted the pivotal role the not-for-profit sector has in community-led recovery and the enhancement of disaster resilience. Charities, local community-based organisations and recovery partners can support community-led disaster recovery and resilience by establishing critical networks, identifying and managing their own risk profiles and developing planning skills.

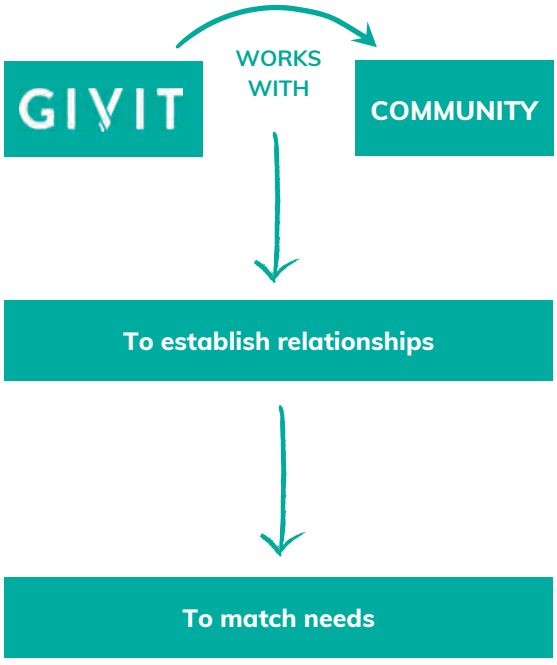
About GIVIT

GIVIT is a not-for-profit donation platform that captures offers of goods and services online, removing the need for charities and services to sort, store and dispose of unrequested donations, saving valuable resources. 100% of publicly donated money received by GIVIT is used to purchase essential items locally, wherever possible. GIVIT has worked with disaster impacted communities all over Australia to assist in the elimination of labour and material inefficiencies and empower communities to determine their own needs, and request exactly what they need, when they need it.

GIVIT is more than a donation platform

- Can be used to establish community networks
- Can inform community profiles of vulnerability and hardship
- Can inform evidence-based recovery and resilience planning
- Can be used to monitor recovery progress and effectiveness





Conclusion

Recovery and resilience strategies that are developed in partnership with communities can account for long-term local needs, providing the support and tools for communities to manage their exposure to and impacts from future disasters. With the incorporation of the COVID-19 pandemic overlay on all disasters, including contactless delivery of goods and consideration of the health and safety of volunteers and residents in disaster impacted regions, these strategies form a critical part of community resilience planning.

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Tracking young people's disaster recovery participation in the Snowy Valleys, NSW

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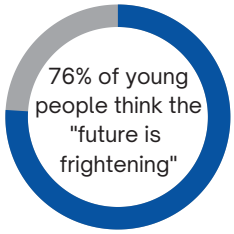
Prof. David Sanderson, Inaugural Judith Neilson Chair in Architecture
Dr. Paul Barnes, Judith Neilson Research Fellow in Disaster Resilience
UNSW School of Built Environment, Faculty of Arts, Design & Architecture

INTRODUCTION AND BACKGROUND

It is well established in the disaster risk reduction (DRR) literature that young people (aged 12-24) are often absent from discussion about recovery initiatives (Hart, 2013). While many reasons are given for this, including a lack of youth interest or a lack of consultation, young people's absence can hinder efforts to build resilient regional communities.

With projected disasters to increase in Australia and young people to bear the brunt of this going forward, it is little wonder 76% of young Australians feel the 'future is frightening' (Hickman et al., 2021). To build regional communities that are resilient, all stakeholders need to be heard and given equal consideration.



By the same token, because the bulk of recovery work is done by adults, understanding young people's perspectives now is important as they will be expected to take on key roles in community recovery in the future, as they come-of-age amid human-induced climate change and disaster.

METHODS

This project will work with young people in the Snowy Valleys LGA (figure 1), an area in southwest NSW affected by the 2019-20 bushfires. Ethnographic methods will be used.

This includes a) interviews with young people participating in, or wishing to participate in, disaster recovery as volunteers or professional tertiary and secondary responders, and b) observations made during recovery training, events and activities aimed at building resilient communities.

Solutions-oriented thinking highlights the bottlenecks young people encounter in participating in disaster recovery, using ethnography. Such challenges can be instructive for thinking broadly about inclusion and exclusion in DRR, and help to identify solutions for government, NGOs and townships.

INDICATORS OF SUCCCESS

1. Gathering insights into how young people understand themselves, their work and place in their local communities to influence disaster recovery, both now and in the future
2. Pairing young people's motivations with the successes and opportunities they encounter in DRR participation
3. Identifying young people's needs as they transition from young community members to emerging leaders, professionals, and decisionmakers

LOCATION

Figure 1: Youth and community events held across the Snowy valleys

RESEARCH AIMS

This project positions young people as a distinct category of DRR actors and uses solutions-oriented thinking to:

1. Understand motivations for volunteering or being professional tertiary and secondary responders
2. Explore young people's participation in 'formal' recovery operations as well as 'informal' ones
3. Track the opportunities and challenges young people face in these endeavours

TIMELINE

2022 —— 2023

PROJECT TEAM

The Resilient Towns Initiative

David Sanderson, Andrew Rae, Chris Blake, Kate Johanson, Joanne Murrell, Paul Barnes, Tim Heffernan, Kathleen Stewart, Marco De Sisto and Clifford Shearing

REFERNCES

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Using a Multi Agency Response Framework During COVID 19

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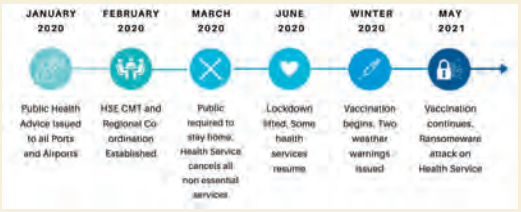
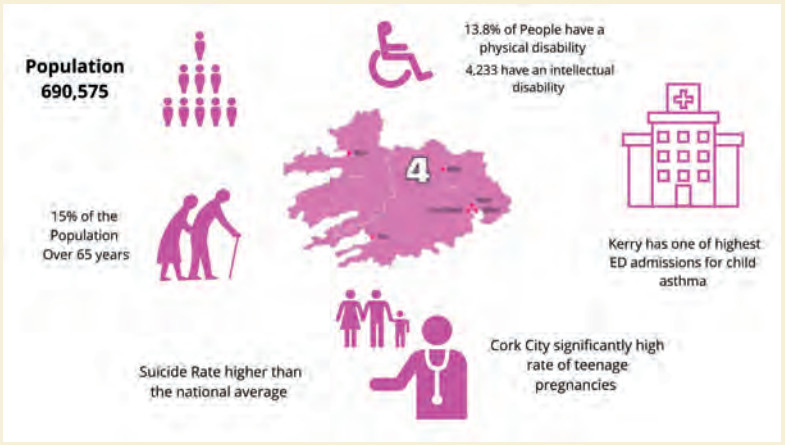
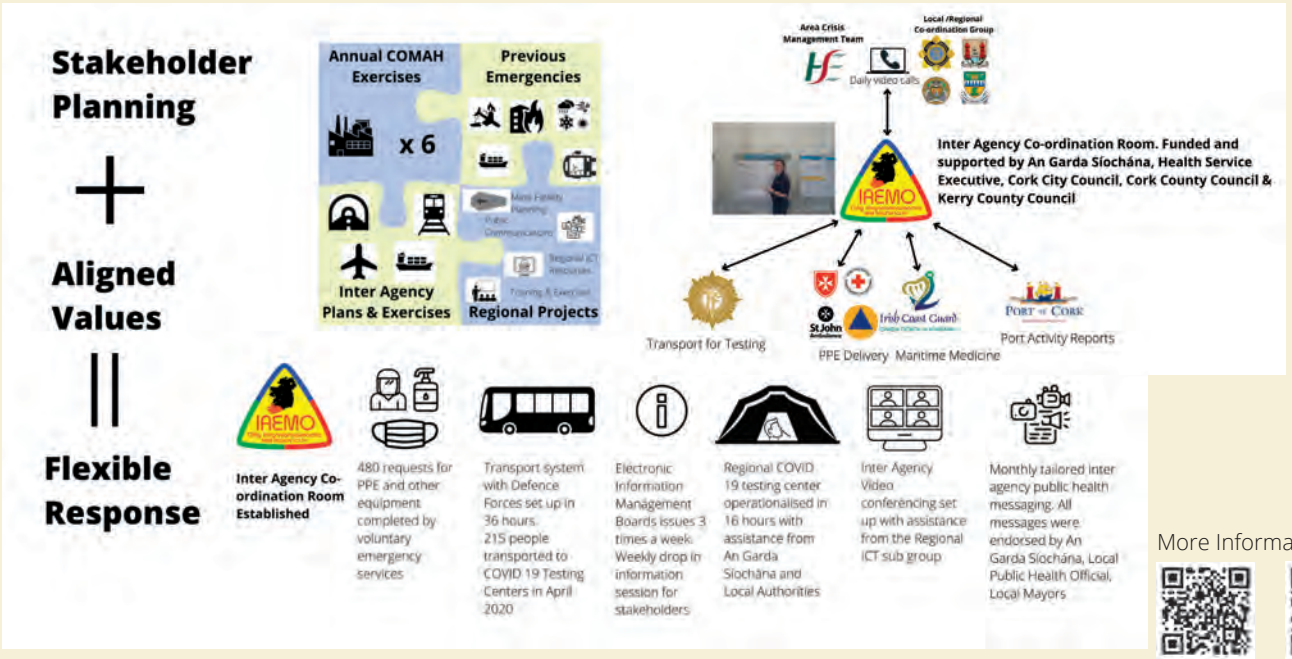




Multi Agency Framework - Ireland

Well established local co-ordination structure. The region has a focus on preparedness and implementation of lessons learned.

COVID 19 Response



More Information

Examining Pathways for Rebuilding Community Resilience in Post-Disaster Settings

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Dr. Paul Barnes, Judith Neilson Research Fellow in Disaster Resilience
Prof. David Sanderson, Inaugural Judith Neilson Chair in Architecture
UNSW School of Built Environment, Faculty of Arts, Design & Architecture

INTRODUCTION AND BACKGROUND

Frameworks for assessing and promoting disaster resilience need to be capable of identifying achievable pathways for developing thriving communities. However, regulatory responses to natural hazards are often guided by narrow frameworks aimed at delimiting and measuring examples of resilience, overlooking the diversity of experience and a community's unique needs. In turn, community-oriented and experience-based perspectives of what it means to build resilience may also be less well developed.

RESEARCH AIMS

- Explore key frameworks through which resilience is assessed and promoted
- Identify strengths and weaknesses of these main frameworks
- Highlight need to consider an area's socio-cultural and historical profile
- Suggest ways local experiences and perspectives can be included in analyses

RESILIENCE FRAMEWORKS

A review of multiple frameworks for assessing and promoting disaster resilience in Australia highlights that:

- Pathways are often thought of as "straight" and "narrow" in terms of being forward-looking, success-oriented and scalable, rarely reflecting hurdles in disaster recovery or diversity in experience
- Measures are used to assess resilience, including indices of community connectedness, governance structures, infrastructure and planning, and information availability. Checkboxes are also used to assess the ability for people to absorb, cope and respond to critical events
- Community-oriented and experience-based perspectives are suggested but poorly operationalised in terms of incorporation into frameworks

Batlow community recovery workshop

BUILDING COMMUNITY RESILIENCE AFTER THE 2019/2020 BUSHFIRES

The Resilient Towns Initiative is a multi-sector project that facilitates the rebuilding of resilience after disaster.

By assessing the difference in emphasis between technical and experiential framings, this research focuses attention on a community-oriented case study of 'bottom-up' actions in the Snowy Valleys in response to the 2019-2020 fires. The region comprises a dozen towns and villages, including Tumbarumba, Batlow, Courabyra, Khancoban and Adelong.

Successes: Ambitions for community-led and locally-driven recovery are high, and most areas have a clear idea of what a resilient town looks like after bushfire. This includes strengthening social connections to develop cohesive and informed communities, developing recovery plans, designing back-up communications, and undertaking skills training.

Hurdles: The 2016 forced local council merger has led to prolonged tensions within and across towns about disaster preparedness and recovery. This has brought politics into recovery initiatives, especially debates over the timeliness of information, communication problems, provision of recovery resources, and recognition of what some towns underwent

Implications: Community-oriented recovery can result in locally owned initiatives for building resilience, showing the importance of returning to everyday community structures, relations and processes after disaster. Further, rebuilding resilience involves hurdles as people negotiate what recovery looks like, often bringing historical fault lines to the fore. Therefore, understanding the diversity of experience and the local community context are important, as these often figure in the ways resilient pathways are identified and pursued, and should be accommodated within frameworks.

PROJECT TEAM

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Situational Awareness:
Laying the foundation for high-risk decision making

The 3-step process for developing situational awareness is similar to the 3-step process for building a house:

Foundation

Perception
Gathering inputs (clues & cues) using sight, sound, feel, taste & smell.

Walls

Understanding
Combining the clues & cues. Forming a picture of understanding - making sense of what is happening.

Roof

Prediction
Anticipating future events based on understanding the clues & cues, combined with observing the speed of changing conditions.

Situational Awareness Barriers block, prevent, or impact perception, understanding and/or prediction.

Dirty Dozen Situational Awareness Barriers

While there are more than 100 barriers that can flaw situational awareness, these are the most challenging for responders working under stress:

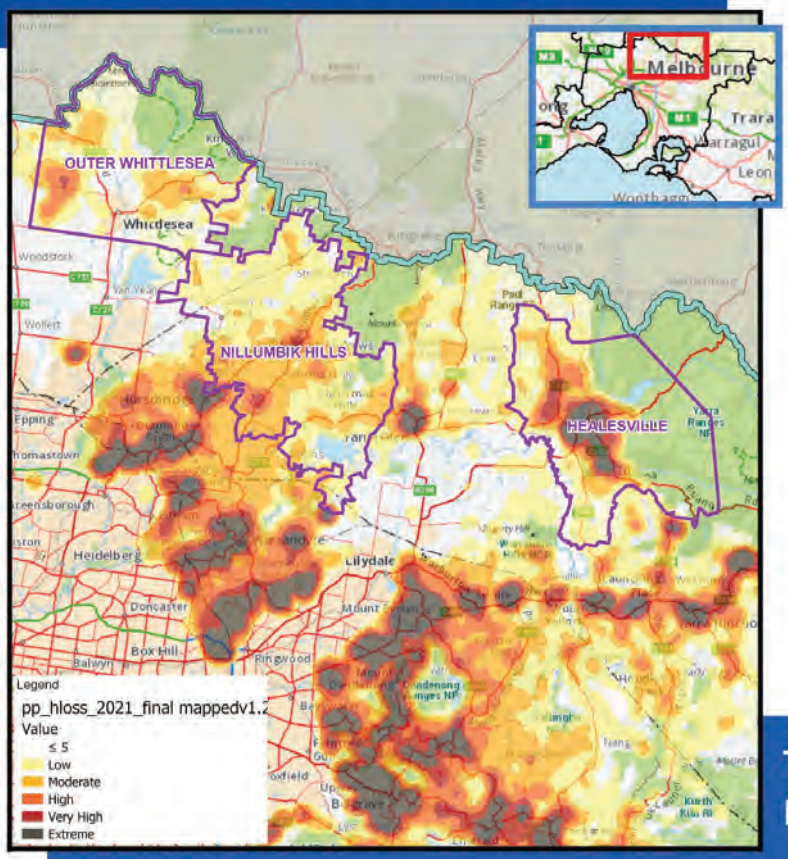
- **Pre-arrival Lens**
- **Sensory Conflict**
- **Mind Drift**
- **Distractions**
- **Interruptions**
- **Task Fixation**
- **Confabulation**
- **Auditory Exclusion**
- **Multitasking**
- **Over Confidence**
- **Complacency**
- **Urgency**

Richard B. Gasaway, PhD, CSP **www.SAMatters.com**

Fire On The Fringe

Elly Hanrahan
DELWP

Fiona Macken
CFA



RISK IS INCREASING ON THE FRINGES

Due to lifestyle and tree changes supported by the adoption of remote working, Victoria has recently seen the largest migration away from city and suburban areas since records began (ABS, 2020)

RISKS ASSOCIATED WITH A GROWING FRINGE POPULATION

More residents are now residing in areas with limited access/egress roads and are prone to being isolated by emergency events.

Many of these newcomers are from areas with low or no risk and have never had to prepare for or recover from a disaster event.

A large proportion still work or go to school in the cities and rely on their previous social connections there. It is difficult to connect with new residents who are rarely home, are not involved in local activities, and don't have many local social connections.

The Community Based Bushfire Management Approach

The Safer Together program is a multi-agency collaboration created following the Lancefield-Cobaw fire in 2015. A post-fire report made recommendations relating to agency interoperability of land and fire management. This included that agencies and local governments work closely with community members in management and planning issues, as well as bushfire risk reduction. (Macken, 2019)

While the Outer Whittlesea, Nillumbik Hills and Healesville communities share a Black Saturday legacy, each has taken a different path to build resilience. The successful CBBM outcomes in these communities demonstrate how there is no "one size fits all" approach when it comes to reducing risk and building resilience.

DIFFERENT APPROACHES FOR DIFFERENT COMMUNITIES

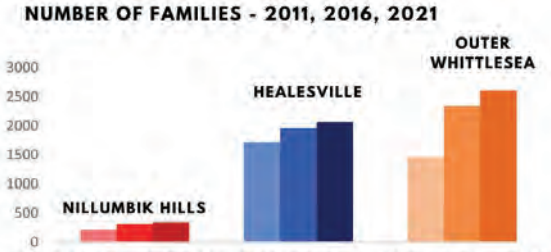
Three communities are highlighted here as urban fringe examples of CBBM in action. Each of these communities faces different social, environmental, demographic and lifestyle pressures.

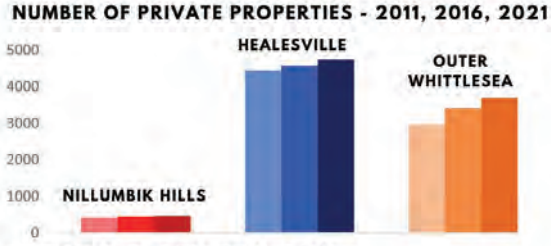
Healesville faces the challenge of an ageing population, while Outer Whittlesea has seen a sharp increase in the number of new families moving to the area. Nillumbik Hills is ageing and stagnating in economic and social growth.

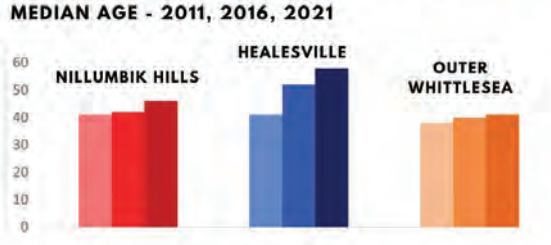
To accommodate the needs of each of these CBBM communities, the activities supported in each community vary greatly. The Nillumbik Hills project focuses on collaborating with the Resilient St Andrews project which aims to increase social connectedness and rebuild community trust in agencies.

Healesville holds an annual bushfire awareness forum and recently began developing the Healesville Community Emergency Hub after experiencing an extended period of isolation after a major storm event in 2021.

The Outer Whittlesea project is the newest CBBM community in the DELWP Port Phillip region and is working with agencies to understand community needs from a grass roots level.







Acknowledgements

CBBM is undertaken on the lands of traditional owners. We pay our respects to their elders, past and present, and we thank them for their care of land and water.

We acknowledge the commitment of communities, agencies, local governments and CBBM Facilitators. We thank all those involved for their commitment to this way of working. Safer Together is funded by the Victorian Government

CBBM is the winner of the Victorian Government 2022 Resilient Australia Award

SAFER TOGETHER · CFA · FOREST FIRE MANAGEMENT VICTORIA

Maps created with Phoenix RapidFire using address point data from 2021. Worst case scenario: FDI 130; maximum fuel loads
Graphics created using Australian Bureau of Statistics Data (2011, 2016, 2021).

Macken, F 2019, "Community-based bushfire management in Victoria", Australian Journal of Emergency Management, vol 1. pp. 9-10

Understand Human Error and Improve Decision Outcomes

The 3-step process for developing situational awareness is similar to assembling a jigsaw puzzle

Gather Clues

Perception

Gathering inputs (clues & cues) using sight, sound, feel, taste & smell.

Assemble Clues

Understanding

Combining the clues & cues. Forming a picture of understanding - making sense of what is happening.

Anticipate Outcomes

Prediction

Anticipating future events based on understanding the clues & cues, combined with observing the speed of changing conditions.

Stress triggers the release of chemicals that change brain function and can contribute to a reduction in situational awareness and errors in decision making.

Impact of stress on brain function

Stressed brains do not function the same as the non-stressed brains.

- **Increase in faster, intuitive (System 1) decision making.**
- **Decline in slower, rational (System 2) decision making.**
- **Increased hyper vigilance leading to sensory overload.**
- **Narrowing of attention contributing to tunneled senses.**
- **Ability to process complex & detailed information impacted.**
- **Mental fatigue slows information processing.**
- **Habit-driven decisions & actions - acting without thinking.**

Richard B. Gasaway, PhD, CSP www.SAMatters.com

Gender and Emergency Management Guidelines

Prior to the work of Gender and Disaster Australia (previously known as the GAD Pod) there was a lack of existing literature and resources on gender and emergency management in the Australian context. To address this gap, the Commonwealth Government funded the GAD Pod to lead the creation of National Gender and Emergency Management Guidelines (GEM Guidelines), a resource that over 500 emergency management workers contributed to from across Australia. With over a decade's experience, Gender and Disaster Australia is unique in bringing in-depth knowledge of gender equality, family violence and gender discrimination in disasters. It also brings a sound understanding of the individual and community impacts of disaster and the context of emergency service organisations.

The Gender and Emergency Management Guidelines were developed collaboratively as part of the 2016 **'All on Board project'**. The initiative sought to address the growing interest in the impact of gender on emergency management and the recognised need for gender to be incorporated into national guidelines. The benefits of the project are far-reaching and include:

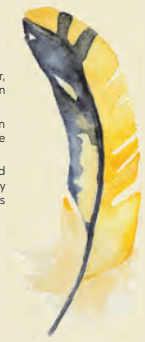
- A shared and improved understanding of the need for the guidelines, and the critical importance of Emergency Management policies and practice that incorporate a gender lens
- A shared and improved understanding of the specific issues (social, structural, psychological, financial, interpersonal, and physical) relating to gender and disaster - and a capacity within the Emergency Management sector, informed by clear guidelines, to respond to these issues
- Changed practices by key emergency management organisations and communities to help identify, prevent and respond to gender-based disaster impacts, such as increased family violence after disasters
- Improved planning, response and recovery for women, men, and people with diverse gender and sexual identities in the midst and aftermath of disaster.

Purpose, audience, and scope

The purpose is to provide guidance to enable a gender sensitive approach in planning for, responding to and recovery after emergencies. The intended audience is agencies involved in emergency management relief and recovery.

This document is limited to the issue of gender. Other guidelines may complement the information provided, including those that exist for children, culturally and linguistically diverse (CALD) people and First Nations people.

The guidelines have been developed specifically for agencies (and their employees and volunteers), involved in emergency management relief and recovery, and for senior Emergency Management policy and decision-makers. They are not targeted directly at communities, families and individuals affected by emergencies.



Why use the GEM Guidelines?

The National GEM Guidelines are high level and strategic guidelines, devised specifically as a gender-sensitive approach to the planning for and delivery of disaster relief and recovery. Examples are provided to indicate ways that States and Territories can operationalise them within their own context.

Using these GEM Guidelines will enhance the current system and improve recovery capacity by:

- Authentically involving women and people of diverse gender and sexual identities.
- Promoting self-care (e.g. by countering gender stereotypes).
- Acknowledging and addressing domestic and gender-based violence in times of emergency.
- Raising awareness of the gender spectrum and the way gender assumptions and gender stereotyping can contribute to trauma.
- Creating awareness of gender or cultural practices which may endanger women and people of diverse gender and sexual identities in times of disaster.
- Ensuring inclusive communication.
- Acquiring gender-disaggregated data.
- Progressing uniformity across jurisdictions, enabling staff to transfer resources and support with ease.

The GEM Guidelines effectively progress the following Principles from the National Principles for Disaster Recovery specifically through use of a gendered approach: 'understanding the context', 'recognising complexity', 'acknowledging and building capacity' and 'employing effective communication'.

Components of the National GEM Guidelines

These guidelines cover three key areas of focus:

1. Supporting community gender equity and diversity
2. Gender-sensitive communication and messaging
3. Addressing domestic violence before, during, and following an emergency
4. Acting on gendered needs in evacuation and relief centres

Overview of the Evacuation and Relief Centre section

In 2019 the GEM Guidelines were expanded to include a section on Gendered Evacuation and Relief Centres. The catalyst was the first invitation to the GAD Pod to attend an emergency evacuation centre simulation at the City of Whittlesea, where observations of processes and procedures were made. Although it was apparent that gendered and LGBTIQA+ inclusion had not been considered, the City of Whittlesea was determined to change their practices to ensure everyone would receive the services needed in a disaster in a relevant and inclusive way. Increased staff awareness of the needs of women and people of diverse gender and sexual identities was needed as a priority.

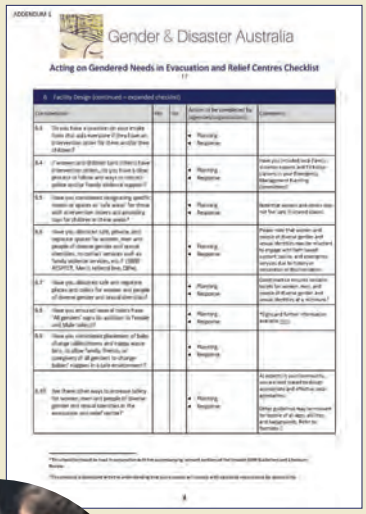
Case study for City of Casey

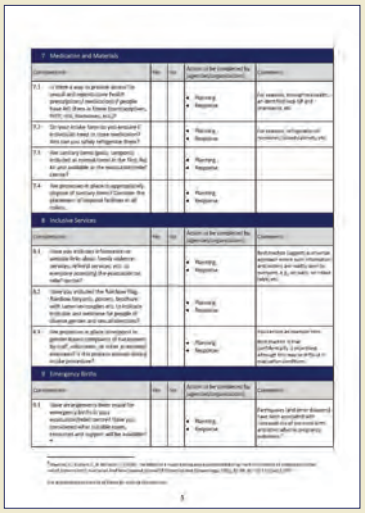
In 2020, the City of Casey contacted the GAD Pod for advice on gendered evacuation and relief centre resources, and we quickly realised the importance of creating this resource. What followed was a collaboration that resulted in a Rapid Review of existing literature, a practical checklist, and a training package. The City of Casey piloted the new resources, undertaking the 'hybrid-model' training – both online and face-to-face - and offering feedback on both the training and the checklist.

To ensure everyone had a foundational knowledge of gender and disaster, participants undertook a 2-hour online session on 'Why Gender is Important in Emergency Management'. Following the online session, participants undertook a 6-hour 'Action Workshop'. A key component of the workshop was the evacuation simulation where participants had the opportunity to practise their roles and explore responses to various gendered situations which may arise in an evacuation centre. For example, participants were challenged to think of ways to ensure the safety of a woman with an Intervention Order who may be in the same evacuation centre as the perpetrator. The last part of the workshop was to create an action plan to ensure a gendered lens is applied to evacuation and relief centres as part of broader emergency management.

Overall, the creation of the new section in the GEM guidelines has been met with positive feedback and continues to strengthen the understanding of individuals and organisation on the importance of gender in all stages of a disaster cycle.

The GEM Guidelines, Checklist and Literature Review are accessible here:
knowledge.aidr.org.au/resources/national-gender-and-emergency-management-guidelines/





Acknowledgements

The GEM Guidelines were funded by the National Emergency Management Project (NEMP), under the *All on Board* initiative.

Sincere thanks to the GEM (NEMP) Advisory Group members, its Chair, Emeritus Professor Frank Archer, and critical friends who gave so generously of their time, knowledge, and wisdom. Particular thanks to Professor Bob Pease, Carole Owen, Associate Professor Dale Dominey-Howes, Dr Andrew Gorman-Murray and Scott McKinnon, Mark Stratton, Lizz Van Den Boogaard and many more. Thanks to external evaluator, Naomi Bailey.

Finally, our appreciation to City of Casey for piloting the new section in the GEM Guidelines looking at 'Acting on Gendered Needs in Evacuation and Relief Centres'.

Gender & Disaster Australia

CONTACT: Jaspreet Kaur, Email: j.kaur@gadaustralia.com.au | **genderanddisaster.com.au**

Australian Government

Busfires and Your Health

Building resilience through an engaging and accessible online short course

Dr Penelope Jones[1], Dr Sharon Campbell[1,2], Dr Duncan Sinclair[3], Mr James Brady[3], Prof Kimberley Norris[4] & Prof Fay Johnston[1,2]

[1] Menzies Institute for Medical Research, University of Tasmania
[2] Public Health Services, Department of Health (Tasmania)
[3] Wicking Dementia Research and Education Centre, University of Tasmania
[4] School of Psychological Sciences, University of Tasmania

Contact: Penelope.Jones@utas.edu.au

Funding: Natural Disaster Risk Reduction Program

What did we do?

We developed the **Bushfires and Your Health** short course, and made it available to all participants in the ISLAND Resilience Initiative (a sub-study of the **I**sland **S**tudy **L**inking **A**geing and **N**eurodegenerative **D**isease (ISLAND) Project). Course participants were Tasmanian residents over 50 years. The course aimed to help people understand and manage the impacts of bushfires and bushfire smoke on their health. The course took four to six hours to complete and comprised five main modules, covering the physical and mental health impacts of bushfires and bushfire smoke, and strategies to reduce bushfire-related health risks.

Why did we do it?

It is widely understood that bushfires and bushfire smoke pose substantial risks to physical and mental health. However, there are few interventions designed to increase bushfire health literacy and resilience. We developed a novel intervention targeted at a vulnerable group, and gathered evidence on its effectiveness.

How did we evaluate it?

We asked course participants to undertake a survey on course completion. We asked them about their understanding of and satisfaction with the course, the accessibility of the course, and how the knowledge they gained helped them to reduce their health risks. Later in 2022 we will ask them if they have taken any actions as a result of the course.

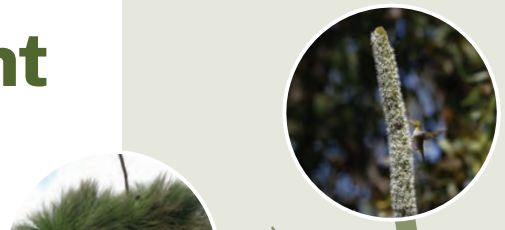
What did we find?

Over 420 people enrolled in the course, and 136 people completed the evaluation (32.2%). Participants reported very high rates of satisfaction (94%) and understanding (93%), while 94% of participants agreed or strongly agreed that the knowledge gained from the course helped them to protect their physical and mental health in a bushfire. Participants reported the most important information in the course was about planning, preparation and making decisions, increased awareness of physical and mental health issues, and risk assessment and risk management.

What's next?

The Natural Disaster Risk Reduction Fund will fund an expansion of the course to all Tasmanians in 2022 and Asthma Australia will fund a national offering in 2023. These will include resources for culturally and linguistically diverse communities. Our evaluation is directly supporting both new versions.

The Environmentally Sustainable Management of Grass Tree Fire Risk



Background

Grass trees (Xanthorrhoea and Kingia species) are commonly found in bushland remnants and reserves, often near development.

Grasstree skirts (the dead leaves that remain attached to the trunks) are highly flammable and are commonly targeted in bushfire mitigation activities.

They are home to many native animals including the critically endangered western ringtail possum, bandicoots, mardos, phascogales, native rodents, pygmy possums, honey possums, microbats, reptile species, frogs, and numerous invertebrate species.

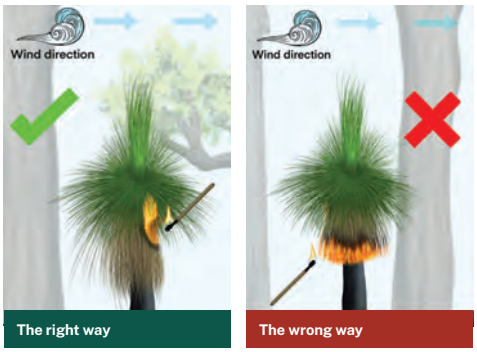
When managing grass tree skirts, it is important to consider the impact that their management, either through burning or trimming, may have on the grass trees themselves and on their value as wildlife habitat.

Objective

Provide guidance for managing both the bushfire hazard and the habitat values of grass tree skirts in a safe and ecologically sustainable manner in both rural and residential areas.

How we went about it

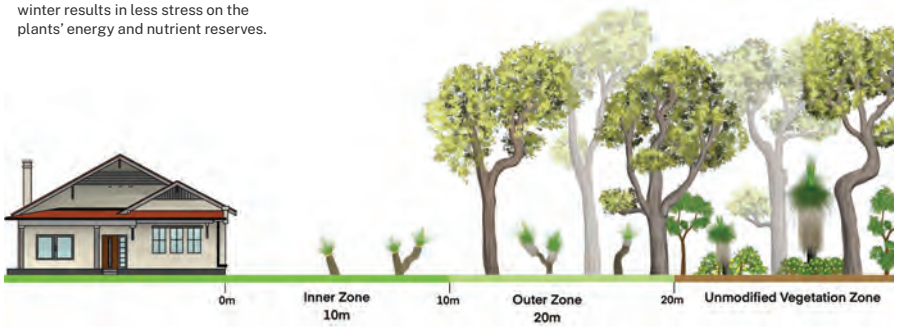
We undertook a comprehensive review of scientific literature in conjunction with extensive consultation with fire practitioners and ecologists.



Key Points

When developing bushfire risk management actions, the following should be considered:

- Grass tree skirts may present a bushfire hazard.
- Burning grass tree skirts frequently or too intensely can result in negative impacts to native fauna and ecosystems.
- There is a right way and a wrong way to burn grass trees.
- Burning grass tree skirts encourages flowering and new growth but it also draws on the plants' energy and nutrient reserves.
- Burning during late autumn or early winter results in less stress on the plants' energy and nutrient reserves.
- The skirts of taller grass trees are often higher than (and therefore separated from) surrounding vegetation.
- Burning grass trees after recent rain can reduce the risk of damage to assets and the probability of 'fire escape'.
- Recently burned grass trees have little habitat value.
- Healthy grass trees can persist for decades without their skirts being burned.
- Trimming rather than burning can be a safe and effective means of fuel management.
- Grass trees can be protected from mild bushfires and excluded from planned burns by raking and removing fuels from around their trunks.
- Treatments undertaken in autumn or early winter reduce the impacts on resident fauna that breed in spring, such as nesting birds, marsupials and reptiles.
- Recommended treatment standards must link to Risk Treatments Zones, i.e. inner zone (<10m from assets), outer zone (10-20m from assets) and unmodified vegetation



Zones within the Risk Treatment Area

Where to from here

The treatment of grass tree skirts in an environmentally sustainable manner informed by asset protection zones, alternative treatments (trimming) and retention targets to optimise both grass tree health and wildlife habitat and sustainability outcomes while still delivering safe and effective bushfire fuel mitigation.

These findings of this research have been condensed into an information sheet and incorporated into the assessment of grant applications, environmental reporting and staff training workshops.

Further information scan here >

Contact: DFES Senior Environmental Officer Dr Shaun Molloy
Email: Shaun.Molloy@dfes.wa.gov.au | Ph: 0427 803 095

Carnaby's Black-Cockatoos perched on grass tree flowering spikes. Photo: Sheila Rowlands. | Silvereye feeding on insects on a grass tree flowering spike. Photo: Sheila Rowlands.

GOVERNMENT OF WESTERN AUSTRALIA

DFES Department of Fire & Emergency Services

FOR A **SAFER STATE**

The ISLAND Resilience Initiative: a prospective longitudinal study of health, stress, bushfire exposure and post-traumatic growth in Tasmania

James Brady[1], Kimberley Norris[2], Sharon Campbell[3], Penelope Jones[3], Larissa Bartlett[1], Rebecca Carey[4], Fay Johnston[3], James Vickers[1] and Duncan Sinclair[1]

[1] Wicking Dementia Research and Education Centre, University of Tasmania; [2] School of Psychological Sciences, University of Tasmania; [3] Menzies Institute, University of Tasmania, [4] School of Natural Sciences, University of Tasmania. Contact: duncan.sinclair@utas.edu.au

Background

- Natural disasters and traumatic events have profound long-term impacts on physical health, mental health and wellbeing, e.g. as risk factors for PTSD and age-related cognitive decline [1-4].
- Increasing emphasis is being placed on psychological coping and resilience factors, which may lead to post-traumatic growth and protect people from adverse outcomes following trauma [5].
- Studies of disasters, trauma and resilience are often retrospective, lacking pre-exposure baseline measures and sensitivity to identify determinants of resilience. To improve long-term health outcomes following disasters, an improved understanding of resilience factors is needed.
- Understanding the links between PTSD, resilience and post-traumatic growth is important for fostering resilience and protecting those vulnerable to adverse outcomes following disaster.

Participants and surveys

- Tasmanian-based participants (n=1333, age 50+) in the ISLAND project (https://island.mooc.utas.edu.au/) completed online surveys of PTG (Post-Traumatic Growth Inventory), PTSD (PTSD Checklist for DSM5), perceived resilience (Brief Resilient Coping Survey), traumatic life experiences (Life Events Checklist for DSM5), and bushfire and health-related demographic information. Sample cohort (n = 977) comprised of those with fully completed surveys.
- Other measures include acute stress (PSS10), chronic stress (TICS9), recent stressors, mindfulness (FFMQ-SF), psychological capital (H-PCQ-SF), self-efficacy (NGSE) , COVID-related stress and bushfire preparedness.
- Biological samples include hair, blood and saliva for genotyping and acute/chronic stress-related proteomics.
- Data were analysed using RStudio (ver. 1.4.1717).

Aims:

1. Establish a prospective longitudinal study of health, stress, bushfire exposure and resilience in Tasmania;
2. Characterise baseline relationships between PTSD symptoms, resilience and prior post-traumatic growth.

Results- baseline resilience, PTSD and post-traumatic growth

The ISLAND Resilience Initiative cohort was established in July 2021 with 1333 participants.

- Participants will continue to participate in annual health surveys and bi-annual cognitive assessments
- In the event of bushfire or other natural disaster, participants will be invited to provide follow-up information about stress, PTSD symptoms, post-traumatic growth and other resilience factors, plus hair/saliva samples for measurement of stress-related biomarkers.

Table 1
Cohort demographics

	Analysis sample (n = 977)	Population sample (n = 1333)
Gender [Female, n(%)]	719 (73.6%)	969 (72.7%)
Age	63.4 (7.38)	64.1(7.62)
IRSAD Decile	5.01 (2.88)	5.12 (2.86)
Remoteness Area		
Inner Regional Australia	695 (71.1%)	963 (72.2%)
Proximity to bushland [yes, (%)]	640 (65.5%)	844 (63.3%)
Bushfire Survival Plan [yes, (%)]	420 (43%)	546 (41%)

Predictors of prior post-traumatic growth

Age, gender, IRSAD decile, resilience and PTSD symptoms explained 16.8% variance in multiple regression analysis (R^2 = .17, F(5, 961) = 38.93, *p* <.001).

- Being male significantly predicted lower post-traumatic growth scores
- Higher levels of perceived resilience and greater PTSD symptoms significantly predicted higher post-traumatic growth scores.
- Socio-economic index did not predict post-traumatic growth scores.

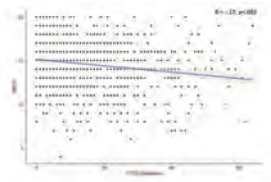
Table 2
Predictors of post-traumatic growth

	B	95% CI	β	t	p
(Intercept)	-6.45	[-20.57, 7.64]		-0.90	.369
age	0.03	[-0.15, -0.21]	0.01	0.31	.760
gender (male = 1)	-3.83	[-6.92, -0.74]	-0.73	-2.43	.0152
IRSAD Decile	-0.18	[-0.65, 0.29]	-0.02	-0.76	.449
BRCS total	3.62	[3.08, 4.16]	0.40	13.20	<.001
PCL5 total	0.30	[0.19, 0.45]	0.17	5.52	<.001

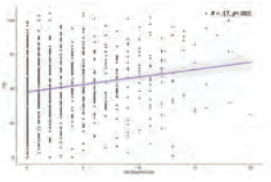
Note. R^2adj = 0.16. *CI = confidence interval for B.*

Relationships between PTSD symptoms and prior post-traumatic growth

Levels of self-reported resilience were negatively correlated PTSD symptoms r(975) = -.17, *p*<.001.



Levels of PTSD re-experiencing symptoms [r(975) = .17, *p* <.001], and to a lesser extent avoidance symptoms [r(975) = .81, *p*<.05], were positively correlated post-traumatic growth.



Conclusions

- Higher levels of perceived resilience were associated with lower PTSD scores. This supports the notion of resilience as a protective "buffer" against cognitively damaging conditions, such as PTSD, in the wake of traumatic instances.
- The re-experiencing subdomain of PTSD symptoms most significantly correlated with levels of post-traumatic growth. This suggests that continual processing of traumatic events may lead to self-reflection and/or attribution of meaning to the events.
- The ISLAND Resilience Initiative will continue exploring impacts of disasters, resilience factors and ways to proactively build resilience.

Acknowledgements

Thank you to our generous ISLAND participants and the Natural Disaster Risk Reduction Grant Program (NDRRGP) for funding.

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2- Nakamura et al (2019), https://doi.org/10.1016/j.jad.2019.08.041
3- Roberts et al (2022), https://doi.org/10.1001/JAMANETWORKOPEN.2022.17698
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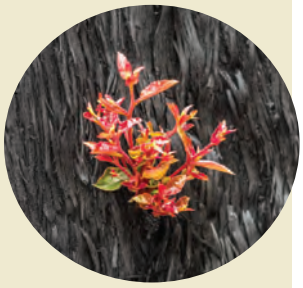
Increased violence against women after disaster in Australia

Gender & Disaster Australia (GADAus), began as the Gender & Disaster (GAD) Pod, with our work beginning in 2009. The legacy organisations behind the original Gender & Disaster (GAD) Pod which operated from 2015-2021 were: Women's Health Goulburn North East (WHGNE), Women's Health in the North (WHIN), and Monash University Disaster Resilience Initiative (MUDRI).

The GAD Pod was formally established in 2015 to promote an understanding of the role played by gender in survivor responses to natural disaster, and to embed these insights into emergency management practice.



The research

Central to our work is the research conducted since 2009 around the intersection of gender and disaster. The first research of its kind in Australia, **'The Way He Tells It – Relationships after Black Saturday'** gave voice to women's accounts of violence in the aftermath of the Black Saturday disaster. Family violence increased in the post disaster aftermath and women reported being ignored and referred to inappropriate services. The men's violence was excused by family, community and services.

The **Men on Black Saturday** research followed on from the critical findings of **The Way He Tells It** and unfolded men's experiences in the disaster context. It explored the ways in which men felt burdened by gendered expectations. The third research report outlined the particular experiences of the LGBTIQA+ community in the preparedness and recovery process.

Each research piece reiterated that in the disaster context:

- Violence against women is excused;
- Men are consistently confined to stereotypical ways of coping and managing stress; and,
- The experiences of LGBTIQA+ people are not understood and need to be addressed in planning, preparedness and recovery.

From research findings to action

GADAus has developed a suite of resources to support increased understanding of the impact of gender on disaster experience, risk and legacy, and to provide practical strategies to incorporate gender considerations into emergency management policy, planning, decision-making and service delivery. Our education and training resources include a comprehensive training package and a Train-the-Trainer package.

1. The **'Lessons in Disaster'** training package is available.
2. **'Train the trainer'** is available for delivery of this package.
3. Unique **'Under Pressure: LGBTI-inclusive emergency services'** training is available.

Aims

Understand how:

- Gendered expectations –particularly of women and men– affect disaster preparation, response, and recovery
- More stringent gendered expectations in disasters, combined with increasing structural inequalities during and after disaster, increase the risk of violence and discrimination against women, LGBTIQA+ people and other marginalised groups

Learn how to:

- Strengthen the capacity of the emergency management sector to challenge damaging gender stereotypes
- Increase awareness of the value of building a gender-responsive and disaster-aware organisation
- Ensure the safety needs of women, men and children are met in disaster planning, response and recovery

Develop strategies for:

- Raising awareness of gender in emergency settings
- Including family and domestic violence in emergency planning, response & recovery

Results

1088 Participants

30 Session face to face

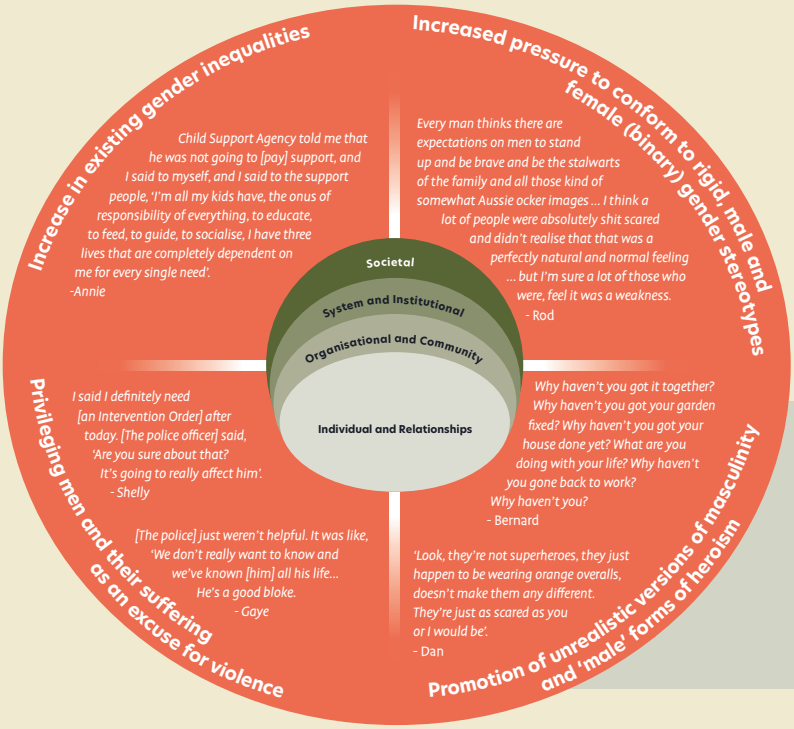
30 Sessions online

60 Sessions in total

Training feedback

- *It was all very informative and revealing and shows how much more still needs to be done. This message needs to be spread wider into the community, to increase awareness, education and understanding.*
- *It was a fantastic and engaging discussion on a very complex and difficult subject. The presenters were extremely knowledgeable and discussed the ways in which we can refocus on our efforts in the emergency management space.*
- *It was all great. It was a holistic and objective view of gender and the role it plays in our socialisation and behaviours.*
- *Well done, great opportunity for debates, education, awareness, and challenging assumptions.*
- *Really fantastic training. Will highly recommend it to others. Thank you very much, your work is very important.*
- *Training was very well run and informative.*

What the research tells us



Contributing Factors

1. Reduced or no employment
2. Grief and loss
3. Financial stress
4. Homelessness
5. Media coverage
6. Drug and alcohol abuse
7. Rebuilding/red tape
8. Trauma
9. Perceived unfairness

Our awards

2019

The Resilient Australia Award for 'Nationally Significant Projects' for "Addressing domestic violence in disasters through implementing National Gender and Emergency Management Guidelines".

2019

The Victorian Resilient Australia Community Award 2019, sponsored by the Australian Government in partnership with the states and territories and managed by the Australian Institute for Disaster Resilience (AIDR) for Long-term disaster resilience.

2017

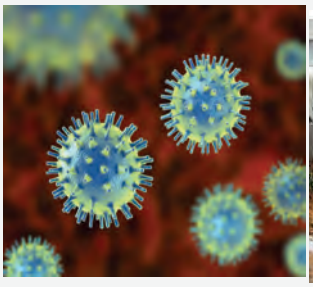
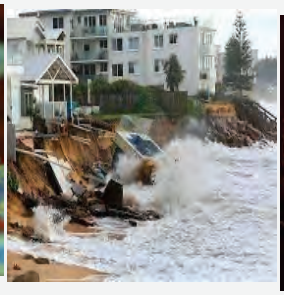
The Mary Fran Myers Award 2017, sponsored by the Natural Hazards Centre in Boulder, Colorado, and the Gender and Disaster Network for our collaborative efforts to reduce disaster vulnerability through advocacy, research and management.

▲ The GADAus Team

Gender & Disaster Australia

CONTACT: Rachael Mackay, Email: r.mackay@gadaustralia.com.au | **genderanddisaster.com.au**

Australian Government



RESILIENCE IN A RISKIER WORLD

1. MUST ADDRESS THE REAL RISKS…

Politicization of CM *–focus on response & Emergency services*

Threats & hazards misunderstood as external to daily life – *return to normal post event*

Inability to think/act differently- *but expecting a better outcome*

Disregard for global initiatives *-Sendai Framework …that's European*

2. MUST CHOOSE INNOVATION OVER ROUTINE…

Deal directly with causes (climate change) not symptoms (floods/fires)

3. MUST BE INCLUSIVE OF…

Many societal systems, functions & disciplines (such as) Governance & public policy Insurance, health & welfare, Planners, Arborists, ecologists, engineers landscape architects, Interdisciplinary river science, Pyro-geography, & education for citizens

IS AN ACT OF COMMITMENT TO A SUSTAINABLE FUTURE

Sponge cities

Water sensitive urban design

Indigenous fire management

Plant based foods

Dr C. Jessup
Crisis Response Journal
ADRC 2022

Innovative community-led recovery powered by partnerships and skilled volunteers

As non-traditional actors in partnership Australian Business Volunteers (ABV) and National Australia Bank (NAB) are successfully engaging with communities to support their recovery priorities using skilled volunteers and mobilising partners with resources.

ABV
Australian Business Volunteers

Disaster Recovery and Resilience (DRR)

ABV's unique integrated planning approach realises existing community priorities through skilled volunteers whilst facilitating a process of community-led visioning and project alignment to plan for the future.

nab

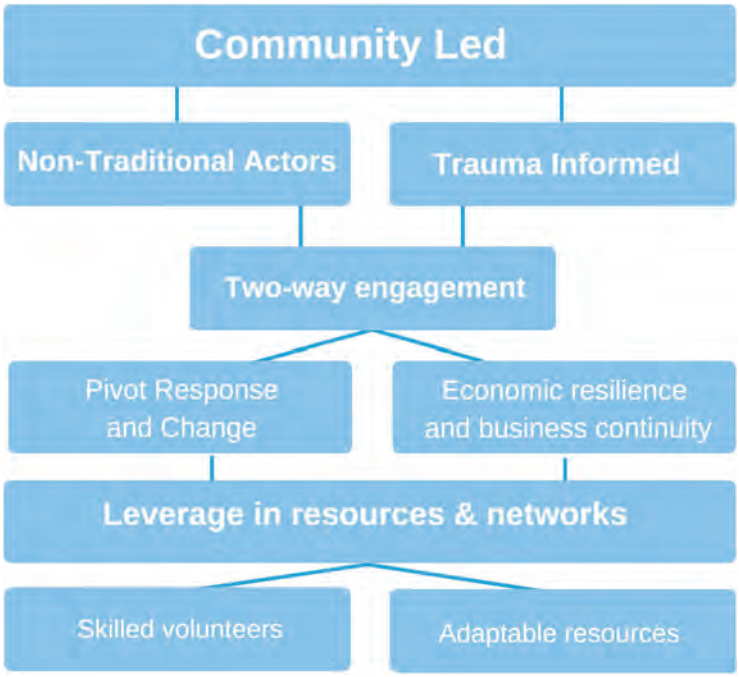
NAB Ready Together (NRT)

NAB is investing in support for Australians before, during and after natural disasters. We exist to serve customers well, especially during tough times. Our customers need more support in the face of increasing natural disasters, and we are investing in making sure they have it.

NAB Ready Together is the bank's flagship community program. It is:

- Investing in Australia's disaster resilience
- Donating where locals tell us it's needed to manage disasters
- Making volunteering and giving easy for our people
- Helping regional communities reduce their climate risk

Our Approach



Lessons

We must be LONG TERM – in our approach, our partnership, our thinking and our outcomes

- **ABV** – Resilience building and recovery are not linear, finite processes. They are iterative, they evolve. The priorities, expectations and engagement of communities and businesses also evolves. To be genuinely community-led, we as an organisation need to be prepared to be there for communities before, during and long after a disaster, particularly with communities experiencing cascading disasters and impacts.
- **NAB** – alignment to strategy and our purpose as a bank means we can be a long term partner in community resilience building and recovery. The complexity of disasters, and the long term investment needed in disaster resilience make long term engagement a necessity to serve customers well and help communities prosper.

We need to LEVERAGE OUR STRENGTHS – cross-sector collaboration requires an understanding of the value each partner brings

- **ABV** – community development principles and practice, trust building, diverse networks and skills, altruism of volunteering
- **NAB** – expertise and deep knowledge of small business and agribusiness operating in regional Australia, ability to address systemic, national economic challenges and to apply lessons and insight across a workforce of 30,000 people.

Together we have unique value to add to local ECONOMIC RESILIENCE AND RECOVERY

- Communities need resilient economies that can adapt to disasters and transform as new opportunities emerge in the recovery phase. Community sector partnerships open up avenues for economic adaptation otherwise unavailable to communities preparing for or recovering from disasters.

Where to from here

- Ongoing Business to business networking, mentoring, capability transfer.
- Person to person connection, support, the use of tried and tested training programs.
- Co-designed, locally informed financial services and products specific to businesses and communities looking to prepare and recover better from disasters.
- Expanded networks and partnerships of non-traditional and traditional actors to support community capacity to respond, adapt and transform in an ever-changing environment.

Contact us: **Liz Mackinlay, *CEO ABV***
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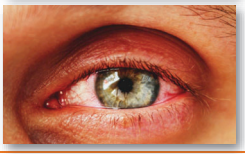
Eye irritation in Australian wildland firefighters

Sukanya Jaiswal[1], Blanka Golebiowski[1], Anthea Burnett[1], Isabelle Jalbert[1]

[1]School of Optometry and Vision Science, University of New South Wales (Sydney)

BACKGROUND

- Eye irritation is commonly reported by wildland firefighters[1,2] but the impact of wildfire smoke on the eye health of firefighters is unknown
- Goggles are recommended to be worn during all wildfire fighting activities[3]. Anecdotally though, they are frequently removed due to sweat and fogging which decreases visibility and comfort
- Airborne particles and gases in wildfire smoke can damage the eye surface, which is critical for clear vision[4,5]



AIM

To determine the impact of occupational wildfire smoke exposure on the eye surface of Australian wildland firefighters

METHOD

- Participants: 248 Australian firefighters from 5 state emergency services (81% male, median age 40- 49 years, median years of experience: >10 years)
- Cross-sectional online survey on eye irritation symptoms during and after wildfire fighting duties, strategies used to manage eye irritation and use of protective eyewear
- Responses were analysed using ordinal regression analysis, with $p < 0.05$ deemed significant and inductive analysis for answers to the free-form question

RESULTS

Figure 1: Eye irritation occurrence and use of protective eyewear (Q1-5, Q8)

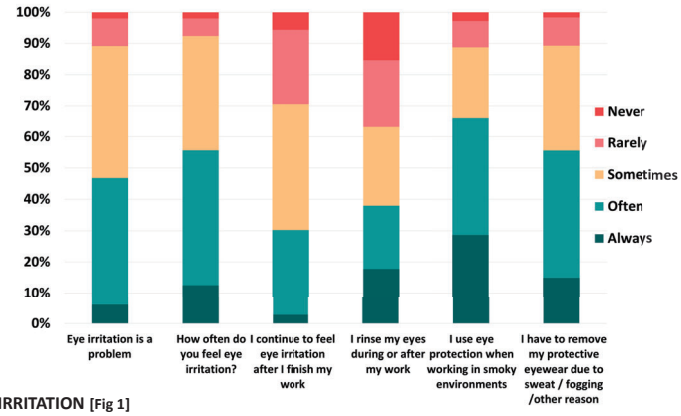


Figure 2: Primary protective eyewear used (Q6)

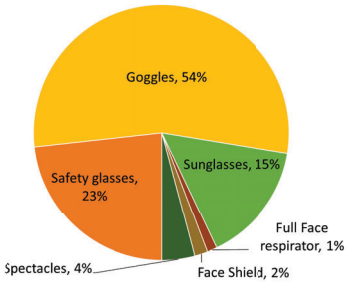
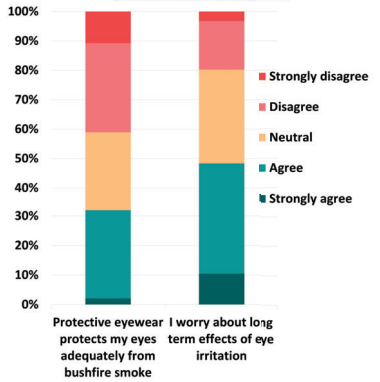


Figure 3: Perceptions of eye irritation and protective eyewear (Q7, Q9)



EYE IRRITATION [Fig 1]

- Reported 'often' or 'always' by 55% during work & by 30% continuing after work
- More likely to be a problem in women and those younger than 40 years
- Not associated with years of working in wildfire management

PROTECTIVE EYEWEAR [Fig 1-3]

- 66% used protective eyewear 'often' or 'always' but 55% removed it 'often' or 'always' due to sweat, fogging or other reason
- Only 30% agreed that their protective eyewear adequately protects their eyes
- Goggles were more likely to be removed (due to sweat, fogging or other reason) than safety glasses or sunglasses
- Those who removed protective eyewear were more likely to experience eye irritation after work (OR 2.5 – 9, $p < 0.05$)

MANAGING EYE IRRITATION [Fig 1]

- 48% worried about long term effects of eye irritation from smoke exposure
- 37% rinsed their eyes 'often' or 'always' either during or after work
- Those who removed protective eyewear in smoky environments were more likely to rinse eyes (OR 2.60 – 6.0, $p < 0.05$)
- Only 17% of respondents sought professional health advice for smoke-related eye irritation
- Women (OR 4.0, $p < 0.05$) and those with >10 years of wildfire experience (OR 3.1, $p < 0.05$) were more likely to seek health care advice for occupational eye irritation

DETAILED RESPONSES (Q11)

Impact of smoke exposure during active duty

Hazards
- severity of ocular symptoms makes it difficult to keep eyes open
- fogging of goggles causes vision impairment

Challenges with protective eyewear
- poor fit of goggles especially with concurrent spectacle use
- inability to use goggles adequately due to fogging and discomfort

Even with goggles, sometimes have to shut eyes for a while, even near active flame'
Visibility is severely compromised
Short term blurriness
Difficult to see what you are doing
Photosensitive … unable to open eyes for short period of time
Hard to keep eyes open
Goggles fog immediately and are impossible for me to work with
Its hard to work with goggles provided so I just run with safety glasses which don't do anything for smoke
Goggles work a bit, but visibility so terrible as they fog and scratch and hold ash
Goggles don't seal properly on my face

Severity of ocular symptoms
- Severity of symptoms can vary between firefighters

Very intense pain, like if acid in the eyes
Eyelids are lined with sandpaper
Itchiness to skin around eyes, develop itchiness
Irritated
Sore
Heavy
Stinging
Raw

Recovery experience
- Dry, tired and sore eyes commonly felt for hours after exposure
- Symptoms resolve within 1-2 days post exposure for some firefighters
- Sometimes symptoms can continue for several days

Feels like particulate stays in my eyes for days
My eyes become very dry and it can be difficult to blink
Almost constant feeling of having something in my eye in day to day life
Eyes can feel dry in evening, but is usually fine the following day
Can take several hours after a wash to feel back to normal after completing work

KEY POINTS

- 50% of Australian wildland firefighters experience eye irritation, especially younger and female firefighters
- 50% need to remove protective eyewear which increases occurrence of eye irritation
- Goggles tend to have poor fit, fog easily and are more likely to removed compared to safety glasses or sunglasses
- Vision can be compromised due to severity of eye symptoms and poor visibility through goggles
- Despite frequent occurrence of eye irritation and concern for long term effects, few firefighters seek professional eye care advice

RECOMMENDATIONS

1. Protective eyewear should be used in conjunction with other strategies such as rinsing eyes and using moisturising eye drops to protect eye surface from wildfire smoke
2. Review of eye protection guidelines for wildland firefighters - acknowledging limitations of protective eyewear and compliant use
3. Wildland firefighters should seek advice from eye care practitioners to manage eye irritation
4. Research on most effective therapeutic strategies to protect eye surface from smoke induced damage

Acknowledgements

afac
Government of South Australia
Department for Environment and Water
FIRE + RESCUE
State Government Victoria
Department of Environment, Land, Water & Planning
METROPOLITAN FIRE SERVICE SOUTH AUSTRALIA

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Scan QR code to email me

GIRLS FIRE & RESILIENCE PROGRAMS BUILD TRUST, EMPOWER YOUNG WOMEN, AND HELP COMMUNITIES BE MORE RESILIENT.

The Cultural Inclusion programs use hands-on learning to empower young women to step up as community influencers and future leaders. The young women build confidence and trust. This transfers into safety, leadership and possibilities to join the emergency services.

The programs are delivered on country, with community, connected to culture, protocols & traditional use of fire.

The National Disaster Resilience Strategy reinforces the key role of individuals and communities to reduce risk, build resilience and strengthen connections with fire and emergency agencies.

The National Disaster Risk Reduction Framework makes Inclusive Engagement a strategic priority. This means using increased skill, capability, and effort to effectively engage with diverse communities facilitate connection to their own prevention and education.

info@girlsonfire.com.au
www.girlsonfire.com.au

NSW RURAL FIRE SERVICE | FIRE + RESCUE | NSW STATE EMERGENCY SERVICE

In partnership with: driven hellodriven.com

HART:
HIGH ADVERSITY RESILIENCE TRAINING

A COMPREHENSIVE PREVENTATIVE APPROACH FOR EMERGENCY SERVICES MENTAL HEALTH

Building psychological resilience and capability for first responders and their families: A Joint Agency Initiative (JAI) following the Black Summer Fires in NSW.

Following the last unprecedented bush fire season **a joint agency collaboration** was formed in 2020 **across NSW Rural Fire Service, Fire and Rescue NSW and NSW State Emergency Service**. With funding from Resilience NSW, the agencies have partnered with Hello Driven to deliver a new and exciting resilience initiative.

The three agencies have collaborated and co-designed a program based on a collective need, to effectively deliver joint implementation and sharing of resources and lessons. The three agencies are excited to be launching HART!

What is HART?

High Adversity Resilience Training, developed by Hello Driven is a **comprehensive approach to building a culture of resilience** in an emergency services setting. The HART program brings together **evidence-based resilience techniques** proven to be effective in emergency services, **centered on the Predictive 6 Factor Resilience Model (PR6)**.

How is HART implemented?

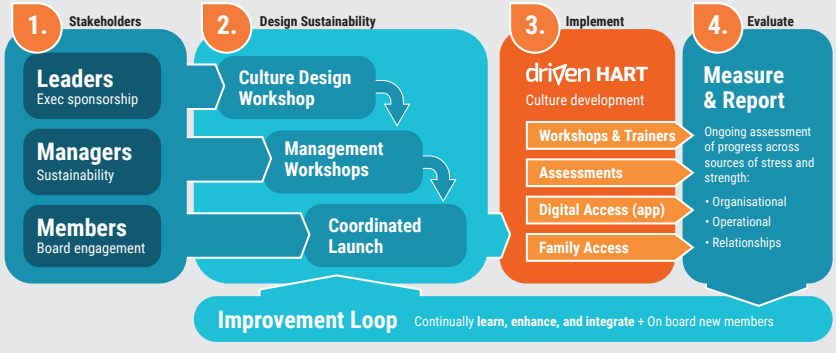
The cultural approach to build resilience is highly inclusive, helping to build resilience not only in members, but also create peer support champions, train-the-trainers, skills for management layers, and also training for families at home to build a broad supportive environment.

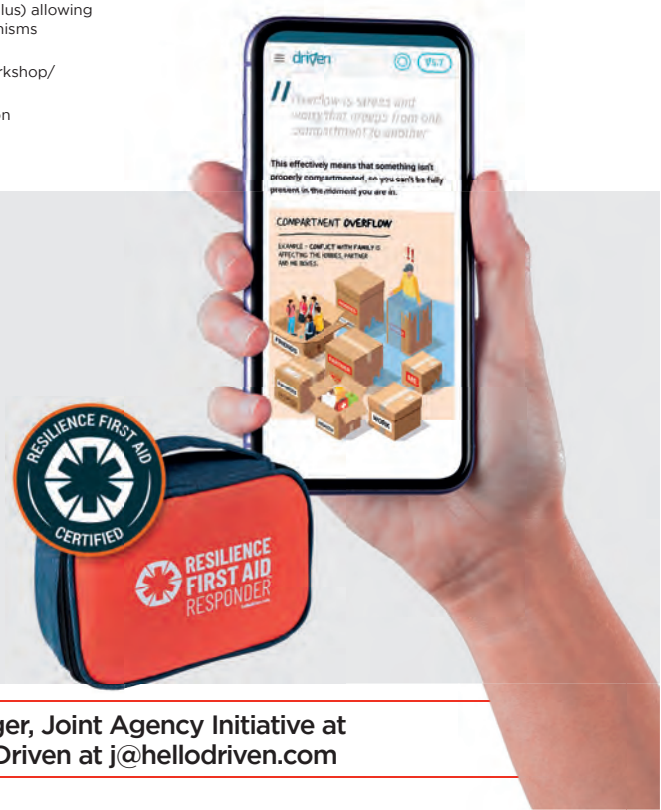
The program includes a cohesive set of resources, such as workshop packs, peer support tools, resilience measurement, and an AI-power digital app to reinforce skills through daily activities and in-the-moment support.

What is the HART difference?

- Designed for first responders and their families
- Builds internal capability through Coaches and Ambassadors for the long term
- Scalable content delivery (10 mins up to 1 day plus) allowing for embedding into existing operational mechanisms (e.g. AAR, existing training doctrine)
- Face to face and online application through workshop/ training, resilience building app
- Evidence-based solution founded on research on neuroscience and resilience

THE **HART** APPROACH





For more information contact Tenneile Manenti, Program Manager, Joint Agency Initiative at Tenneile.Manenti@rfs.nsw.gov.au or Jurie Rossouw, CEO, Hello Driven at j@hellodriven.com

Kaupapa Māori Research:

Māori Firefighter Career Experiences and Expectations

Purpose

This paper presents early findings from qualitative kaupapa Māori research undertaken with Māori volunteer and professional firefighters during June 2022.

To date, the research team has interviewed six Māori firefighters (mostly volunteers), the four Māori Liaison Officers and six national office staff, with around 19 firefighter interviews to complete. These are the preliminary insights.

Background

Fire and Emergency New Zealand has committed to working with Māori as tangata whenua (people of the land) and has acknowledged the important role iwi play as community leaders in relation to the land and environment in Aotearoa. The organisation see iwi as 'significant partners in fire prevention, building community resilience and informing emergency response'.

Fire and Emergency has developed a three-year work programme, Hiwa-i-te-rangi which aims to build its internal capability to engage with iwi and Māori.

a) Embedding tikanga (customs and traditional values) for Fire and Emergency

b) Strengthening internal support networks

c) Identifying gaps and opportunities in policies

Research Objectives

The research objective is to understand the career experience and expectations of both professional and volunteer Māori firefighters to help inform the Hiwa-i-te-rangi work programme. The findings will complement existing research undertaken on the early career experience of professional and volunteer firefighters.

The objectives of the career expectations and experiences of Māori firefighters research project are to:

- Understand what motivates and attracts members of hapori Māori to work and volunteer for Fire and Emergency New Zealand.
- Understand the different career and role progression experiences that our career and volunteer Māori firefighters have during their time at Fire and Emergency New Zealand.
- Understand what influences the satisfaction and engagement of career and volunteer Māori firefighters in their roles.
- Understand the career aspirations and expectations of professional and volunteer Māori firefighters at Fire and Emergency New Zealand.

Early findings

MOTIVATIONS

- Rural volunteers – Joined the service to support the local community and whānau – "its about whānau", strong community and service ethic. Most have numerous, practical skills and are at a stage in their lives where they want to give back to their communities.
- Urban professional - Lifestyle - suits whānau (e.g. flexible shift work), scope to stay active and exercise in the role, and to also serve the community.

RECRUITMENT

- Rural volunteer - Word of mouth, shoulder-tapped in small communities, working with other emergency services to promote the role.
- Urban professional – Recruitment drives Fire and Emergency could better target Māori firefighters with a purposeful marketing approach like police, and defence

EXPERIENCES

- Rural volunteer - These brigades reflect the make-up of their communities, where brigades are majority Māori the integration of a te ao Māori worldview is natural and seamless.
- Urban professional - Māori firefighters are usually the minority in their brigades so cultural shifts are slow, but are happening.
- Positive cultural shifts in the organisation increased use of te reo -greetings, and access to te reo me ōna tikanga courses online. Younger recruits are more open to learning.
- Some firefighters struggle with the lack of cultural understanding from tauiwi colleagues particularly around fatalities.
- An increased number of Māori firefighters are now in leadership positions.

RETENTION

- Most satisfying part of the role is serving the community. It's a passion.
- Most challenging for volunteers is other community commitments and caring for their whanau.
- Urban career firefighters see poor pay as a significant challenge that can leave them feeling devalued.

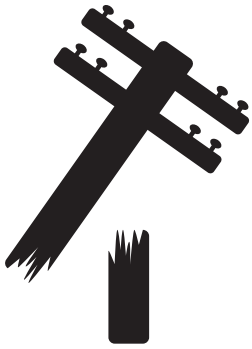
ASPIRATIONS

- Rural volunteer – All firefighters we spoke to are feeling supported and encouraged to upskill and move up the ranks.
- Urban professional - Firefighters said its positive to see more Māori firefighters and women climbing the ranks to reach leadership positions.

Fire and Emergency National Manager Kaupapa Māori - Piki Thomas

Prepare communities for larger, longer duration fires

Residents and holiday makers stranded at Malua Bay. No phone network, road closed, no power, no fuel, no payment services. **Photo:** Alex Koppel



No Power

No Fuel

No Access Roads

No Telecommunications

No Water

For more information, visit the link via this QR code

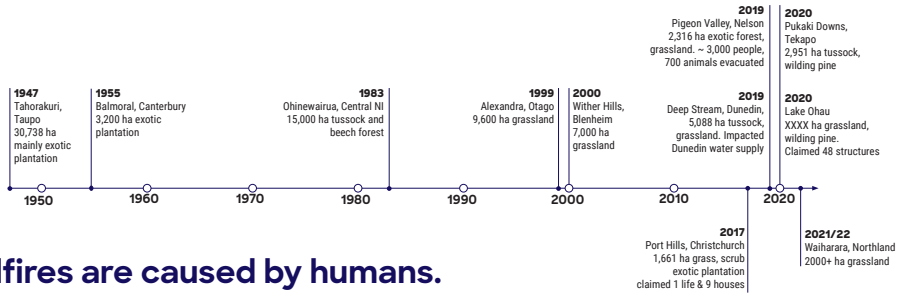
Evolution of New Zealand wildfire social marketing campaign

WHAKARATONGA IWI

FIRE EMERGENCY NEW ZEALAND

The incidence of wildfire is increasing in New Zeland.

With this, significant wildfires like the 2017 Port Hills, 2019 Tasman, 2020 Lake Ohau fires are happening more frequently, resulting in significant impact and losses, with many happening outside the typical summer period.



In New Zealand, 99% of the wildfires are caused by humans.

21/22 Wildfire Prevention Year 3

OUR STRATEGY

- **Used our data & technology to 'push' live fire danger (High, Very High, or Extreme) to local audiences, across editorial, social media and digital banners.**
- Continued messaging for domestic tourists and high-risk property owners.
- Launched Fire Danger and Fire Season information on NZ's most visited weather provider (MetService).
- Introduced TV advertising to increase awareness and incorporated highly recognised fire danger sign visual across all advertising.
- Extended the campaign, with spring and autumn wildfire readiness campaigns

CREATIVE ASSETS

RESULTS & WHAT WE LEARNED

- Prompted Campaign Awareness **50%** (+25p.p.)
- More mindful of outdoor fire safety in summer **91.0%** (+2.2p.p.)
- Claimed behaviour of checking the fire danger before lighting an outdoor fire **56.0%** (+7p.p.)

20/21 Wildfire Prevention Year 2

- **New 'Can I light a fire?' tool brings together Fire Danger, Fire Season data for the user's location and fire type and provides clear advice on the right action to take.**
- Continued to segment messaging for domestic tourists and high-risk property owners.
- Continued to natively embed Fire Danger information into NZ's weather media channels.

- Prompted Campaign Awareness **25%** (+10p.p.)
- More mindful of outdoor fire safety in summer **88.8%** (+6.8p.p.)
- Claimed behaviour of checking the fire danger before lighting an outdoor fire **49.0%**
- New 'Can I light a fire?" tool was well received with **70%** of website visitors using the tool.

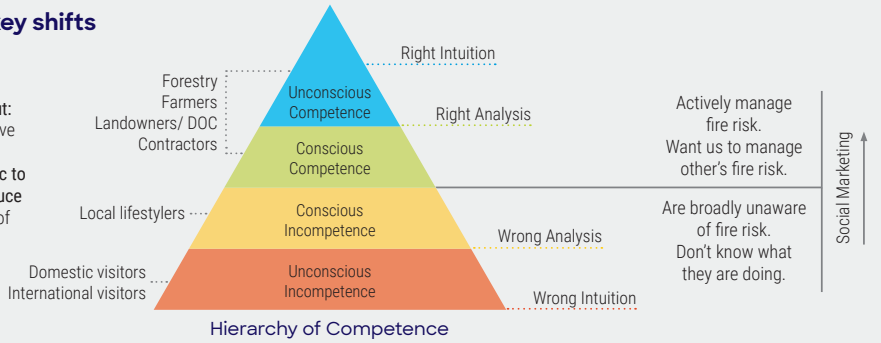
19/20 Wildfire Prevention Year 1

- **Launched emotive new creative featuring NZ's much loved native birds as spokespeople**
- Research validated that the cutest victims of wildfire are best placed to motivate us to keep their homes safe.
- **Developed segmented messaging targeted to less competent audiences.**
- Continue to natively embed Fire Danger information into NZ's weather media channels.

- Prompted Campaign Awareness **15%** (-20p.p.)
- More mindful of outdoor fire safety in summer **82%**
- Claimed changed behaviour as a result of seeing the campaign **59%** (+19p.p.)
- Awareness of the fire danger sign is very high, but the public don't know what action to take.

Strategic Reset: Our research informed key shifts

- **Consistently keep wildfire risk top of mind for the public:** by embedding fire danger reporting into NZ's weather channels and using digital technology to push fire danger information to local audiences.
- **Target audiences based on a competency model:** where our campaign focuses on reaching the 'incompetent' audiences, while also indirectly reminding the 'competent' audiences
- **Frame wildfire risk and impacts in a way that the target audiences care about:** through new emotive creative platform
- **Make it easier for the public to take the right action to reduce risk:** through development of new online tools



Hierarchy of Competence

18/19 'Check it's alright' Summer Campaign

- Single fear-based creative, and a focus on enforcement, i.e. getting farmers to apply for permits.
- One single call-to-action: Go to www.checkitsalright.nz for the latest fire season status and, if needed, apply for a fire permit.
- Partnered with TVNZ to include Fire Danger report in the 1News Weather forecast over summer.

- Prompted Campaign Awareness **35%**
- Claimed changed behaviour as a result of seeing the campaign **40%**
- Single campaign message attempted to cover different audiences with different needs – condescending to some audiences, not understood by others.

Fire and Emergency Marketing Manager – Kelley Toy

BUSHFIRE COMMUNITY LEGAL PROGRAM

WHO WE ARE

The Bushfire Community Legal Program (BCLP) delivers regular outreaches to bushfire high-risk areas. A dedicated Legal Officer supports individuals, community organisations and small businesses with their bushfire preparedness and response.

WHAT WE DO

We provide free legal advice, information, referrals, and legal education. We work across all stages of the disaster life cycle, assisting communities with:

OUR IMPACT

- **Winner: AIDR Community Project Award SA 2021.**
- **Highly Commended: AIDR Community Project National Award 2021.**
- **Positive evaluation by CASPR. Recognised for aligning with international best practice.**

In our first 2 years we have achieved the following...

192	501	35	199	78
Clients	Client Services	Workshops	Referrals Made	Trips
607 Different Legal Issues Identified	83 Free Legal Advices Matters	Est. 707 Attendees at Workshops Delivered	110 To the Legal Profession	246 Days on Outreach

Scan the QR Code to read the Climate and Sustainability Policy Research Group's (CASPR) BCLP report.

CONTACT US:

1300 850 650 | 0428 066 958

www.communityjusticesa.org.au

hmccoy@communityjustice.org.au

Bushfire Community Legal Program

The BCLP is delivered by Community Justice Services SA. Funded by Cth and supported by SA Government.

AIIMS PRODUCTS

FUNDAMENTAL ELEMENTS


PROCEDURAL AND TECHNICAL ELEMENTS

AIIMS COURSES



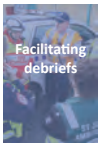
RESEARCH UTILISATION

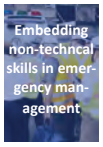




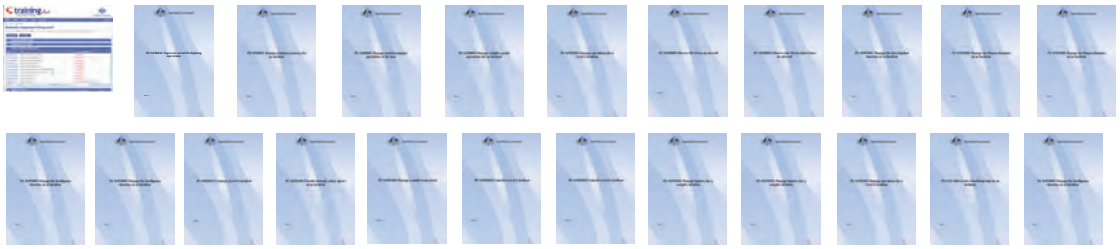


PROFESSIONAL DEVELOPMENT EVENTS





NATIONAL STANDARDS AND TRAINING (20 UNITS IN TOTAL)



SUPPORT TOOLS/AIDES-MEMOIRES



eBook




AIIMS ONLINE COURSES

AFAC HAS TWO NEW ONLINE COURSES AVAILABLE FOR OUR MEMBER AGENCIES AND LICENSED RTOS.

The refreshed and updated **AIIMS 2017 Principles online course** is designed to provide a comprehensive overview of the fifth edition of the Australasian Inter-service Incident Management System (AIIMS). There are 14 modules and 5 assessment tasks in this course. The content covered is developed for organisations that have adopted, or intend to adopt, AIIMS, and for those personnel who may be required to:

- perform a role within an incident management structure
- assist an Incident Management Team in a support capacity
- know the principles and processes which underpin AIIMS.

Further information about the courses, including links to additional resources, the onboarding process and commonly asked questions can be found on our AIIMS online support portal found at: **www.afac.com.au/initiative/courses**

The new **AIIMS 2017 Awareness online course** will develop an understanding of the key concepts that underpin the Australasian Inter-service Incident Management System (AIIMS). There are 7 modules and 3 assessment tasks in this course and all assessments can be completed online. The training will provide students with an awareness of these concepts and is suitable for anyone who might be involved in supporting emergency management processes in their workplace or in support of emergency operations.

AFAC Online Training

For any queries or assistance with the online courses, please email **aiimsonline@afac.com.au**

ADDITIONAL RESOURCES

AIIMS 2017 TRAINING RESOURCES KIT (TRK)

The AIIMS TRK is based on 22459VIC Course in The Australasian Inter-service Incident Management System, December 2017, and is comprised of 13 sessions and meets the requirements of the AIIMS two-day program.

The latest AIIMS TRK incorporates all of the latest updates to AIIMS 2017 and includes:

- a Facilitator Guide (including slide shows for each chapter)
- a Participant Workbook
- assessment guides for both students and assessors
- handouts and a range of robust supplementary resources.

The AIIMS TRK is a robust and comprehensive resource. Its modular design supports flexible delivery, enabling it to meet a range of end user needs. AFAC has designed the course to facilitate the two-day face-to-face AIIMS Principles course, and training in all of the Incident Management Team functions, for which a statement of attainment is awarded.

AIIMS 2017 AWARENESS TRAINING RESOURCES KIT (TRK)

The AIIMS Awareness TRK is based on 22463VIC Awareness Course in The Australasian Inter-service Incident Management System, December 2017, and is composed of five sessions and meets the requirements of an AIIMS awareness single-day program.

The AIIMS Awareness TRK includes:

- a Facilitator Guide (including slide shows for each chapter)
- a Participant Workbook
- assessment guides for both students and assessors
- a full set of classroom presentation slides.

AFAC has designed the course to facilitate the one-day AIIMS Awareness course for which a statement of attainment for the accredited Awareness course is awarded upon successful completion of the assessment requirements.

AIIMS AIDES-MEMOIRE – POCKET-BOOKS AND A4-SIZE LAMINATED CARDS

AFAC has also produced the AIIMS 2017 Aides-mémoire in pocket-book and A4-card formats. The AIIMS 2017 Aides-memoire have been updated to reflect the enhancements made with the release of AIIMS 2017.

Australian Institute for Disaster Resilience

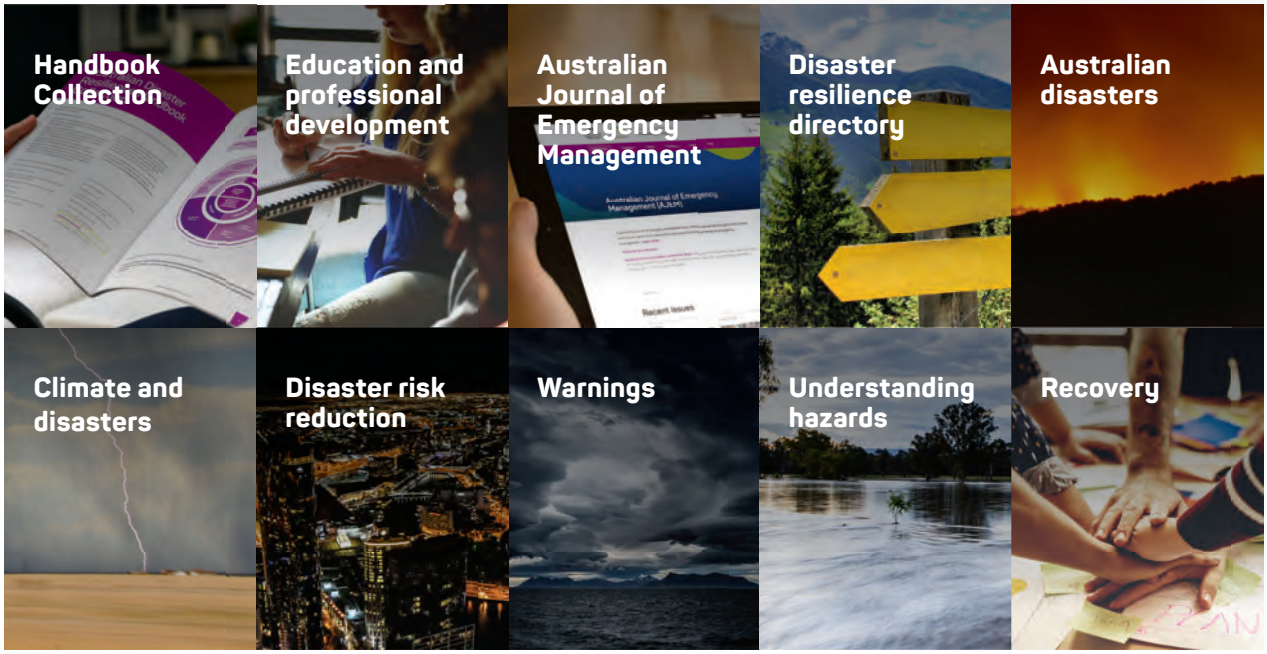
Australian Disaster Resilience Knowledge Hub

A national open-source, platform that supports and informs policy, planning, decision making and contemporary good practice in disaster resilience.

The Knowledge Hub:

- fosters collaboration among leading agencies and organisations
- highlights current and emerging themes in resilience
- links national guidelines with research
- provides information on historical Australian disasters
- is available on desktop, mobile and tablet.

Disaster Mapper



CONTRIBUTE A RESOURCE

Know of a great resilience resource? The Australian Institute for Disaster Resilience welcomes content submissions for the Knowledge Hub – read the guidelines and submit online at knowledge.aidr.org.au/contribute

Scan to explore the Knowledge Hub

www.knowledge.aidr.com.au

KNOWLEDGE.AIDR.ORG.AU

Australian Government
National Recovery and Resilience Agency

Australian Red Cross

afac

HFSC Strategy

HOME FIRE SPRINKLER COALITION AUSTRALIA
A Partnership of AFAC and FPA Australia

Our purpose

The Home Fire Sprinkler Coalition (HFSC) Australia will inform and advocate the benefits of home fire sprinklers to protect Australian communities from the impact of residential fires, and to support the sustainability of the built environment.

Who we are

HFSC Australia is a partnership of AFAC, the national council for fire and emergency services, and Fire Protection Association (FPA) Australia representing the fire protection industry. The coalition is supported by industry members and partners.

Stakeholders

Stakeholders include those working to support public safety and improved resilience in the built environment, from a variety of sectors including:

- Education and research institutions
- Architects/designers
- Fire authorities
- Fire protection equipment industry – manufacturers, suppliers, designers, installers and servicing companies
- Home builders/developers/owners
- Insurers
- Peak community organisations
- Plumbing (retail and installation)
- Water authorities
- Building regulators
- Building certifiers/surveyors
- Housing and planning departments – federal, state and local governments

Influencing change

ADVOCACY

Advocate the cost-effective benefits of home fire sprinklers to influence changes to consumer sentiment, building codes, legislation and industry adoption.

EDUCATION

Educate the community, industry, governments and fire services about the life saving benefits of installing home fire sprinklers.

RESEARCH

Establish a research agenda for home fire sprinklers to better understand consumer behaviour and expectations, building risk and environmental benefits.

CAPABILITY AND CAPACITY BUILDING

Develop and provide training, competencies and incentive schemes to support industry adoption of home fire sprinklers.

TECHNICAL ADVICE

Develop and provide tools, guidance and evidence to support the community, industry, governments and fire services to better understand and adopt home fire sprinklers.

STANDARD SETTING

Support and develop minimum standards for home fire sprinkler systems to ensure product conformity and build consumer and industry confidence.

Priorities

ADVOCACY – to improve public safety through residential sprinklers

- Support the extension of home fire sprinklers to one, two and three-level Class 2 and 3 buildings through a further proposal for change to the National Construction Code 2025.
- Continue advocacy and support for the installation of home fire sprinklers in social housing.

EDUCATION – to improve consumer, industry, fire authorities and government awareness

- Case studies developed for consumer and industry and promotion.
- Increase the 'signed up' supporter base to ensure broad stakeholder engagement.
- Support the installation of home fire sprinkler training props in fire service training facilities.

RESEARCH – to help tell our compelling story

- Undertake cost benefits analyses to provide the evidence to support the expansion of home fire sprinklers.
- Support research to build the evidence base for home fire sprinklers, including the efficacy of home fire sprinklers in bushfire defence.

CAPABILITY AND CAPACITY BUILDING – to ensure industry and practitioners can deliver

- Finalise online training modules for plumbers/sprinkler installers.

TECHNICAL ADVICE – to improve understanding and increase adoption of residential sprinklers

- Promotion of home fire sprinklers to industry, fire services and the community.
- Development of relevant tools, advice and guidance to support market expansion.

STANDARD SETTING – to ensure quality, reliability and safety

- Support the updating of technical specification guides.
- Develop home sprinkler technical specifications for Class 1a/b homes – metropolitan and rural/regional applications.

For further information scan QR code or visit:
www.homefiresprinklers.org.au

The Home Fire Sprinkler Coalition is a partnership of

afac FPA AUSTRALIA

MENTAL HEALTH SUPPORT

FOR SINGAPORE CIVIL DEFENCE FORCE'S CONSCRIPTS

The Singapore Civil Defence Force (SCDF) provides firefighting, rescue and emergency medical services in Singapore. It is made up of regular officers and Full-Time National Servicemen (NSFs). The Emergency Behavioural Sciences and CARE Unit (EBSC) is a psychological unit providing psychological services to support the organisation's operations and personnel. Some NSFs may find National Service (NS) stressful and require additional support[1] from the organisation to adjust to a regimental lifestyle.

ABOUT THE NSF PEER SUPPORT PROGRAMME 1

NSF PEER SUPPORTERS

The NSF Peer Support Programme was introduced in 2020 to enhance psychological support for SCDF NSFs. NSFs are trained in peer support knowledge and basic attending skills to render emotional support to troubled NSFs at their workplace. The programme's **objectives** are:

Creating a **caring culture** amongst SCDF NSFs

Reducing **stigma** and **help-seeking barriers**

Providing **diverse help channels** (e.g. formal and informal sources) for SCDF NSFs

MANAGEMENT OF NSF PEER SUPPORTERS 2

NSF Peer Supporters are conscripts serving their two years of NS. They primarily serve in either frontline (e.g. Firefighters, Emergency Medical Technicians) or support (e.g. Admin Clerk) vocations.

NSF Peer Supporters primarily detect and engage distressed NSFs. Their **roles** are:

Providing troubled NSFs with **relevant resources or information** and encouraging them to seek professional help if necessary.

Engaging and **supporting** troubled NSFs.

Highlighting NSFs who require **urgent attention** (e.g. potential harm to self or others) to **EBSC and/or paracounsellors.**

Peer engagement is typically self-initiated; some NSFs may be approached by their peers or tasked by their supervisors to reach out to others. The Code of Conduct for peer supporters bind them to maintain confidentiality of the information they receive.

The programme coordinator (i.e. EBSC Psychologist) typically supervises peer supporters on an ad-hoc basis. Peer supporters are also encouraged to seek guidance from paracounsellors to foster partnerships within SCDF's support network.

TRAINING OF NSF PEER SUPPORTERS 3

PREPARATORY WORKSHOP

Newly recruited peer supporters attend a one-and-a-half-day Preparatory Workshop conducted by EBSC psychologists. The workshop's adapted content[2] is:

Theory Training	Skills Training
✓ Programme Introduction	✓ Attending Skills
✓ The Helping Relationship	✓ Active Listening Skills
✓ Values and Boundaries in Peer Support	✓ Effective Questioning Skills
✓ Stress Symptoms and Common Issues of SCDF NSFs	✓ The Peer Support Process
✓ Resources	
✓ Self-care	

CONTINUOUS TRAINING

Peer supporters undergo continuous training to remain competent in their role, including a milestone training programme six months after their appointment. The milestone training consists of a new topic (e.g. Suicide Awareness) and a refresher of key topics. Peer supporters also learn from each other by sharing their experiences and reading the materials provided regularly for continuous development.

NSF Peer Supporters role-playing

PROGRAMME IMPACT 4

The **key impacts** of the programme based on several NSF Peer Supporters' qualitative recounts of their experiences are:

NSF Peer Supporters rendered emotional support by providing a **listening ear** and **acknowledging** their peers' concerns.

> *"From what we were taught, I listen to them and try to make them feel heard which is more important. As peer supporters, we're not expected to solve their problems, but we are supporting pillars so that they don't feel so stressed and alone."*

Peer supporters are trained to **manage** highly distraught peers or those with safety concerns.

> *"I tried to calm a recruit down when he started shaking and panicking during training. I did not talk much because I was afraid that something bad could happen at that point in time. So, I brought him to the Medical Centre for further assistance."*

Some peer supporters found their role meaningful as **friendships are forged** and both parties can mutually empower each other.

> *"I found it rewarding to make friends with people you support, and most importantly help each other grow into better individuals."*

NSF Peer Supporters also **faced challenges** such as feeling helpless towards the peer.

> *"Advising is easy, the only challenge is individual stubbornness. There is only so much I can do, but it's their choice to make eventually. So sometimes I feel annoyed but I'm able to control my own feelings."*

Authors

Ms Cheryl Low (Psychologist), Mr Cyrus Chng (Psychologist), Ms Khoo Swee Giang (Lead Psychologist), Ms Toh Shi Min (Senior Principal Psychologist)

Emergency Behavioural Sciences and CARE Unit | Singapore Civil Defence Force

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2. British Columbia Ministry of Health Services (2001). *Peer Support Resource Manual.* Retrieved from https://www.health.gov.bc.ca/library/publications/year/2001/MHA_Peer_Support_Manual.pdf

Have queries or feedback? Get in touch with us!

Scan the QR code to access stories detailing how NSF Peer Supporters have supported their peers.

SCDF The Life Saving Force ...for a safer Singapore

Cliff-top Vorticity-driven Lateral Spread: a new safety hazard for bushfire crews.

Adjunct Professor Rick McRae,
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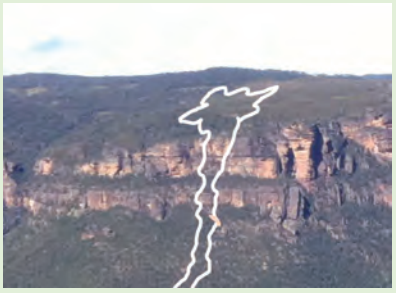
UNSW CANBERRA



Stylised example:

STEP 1: a fire is burning upslope with the wind towards the escarpment.

STEP 2: A fire crew drives into the area as lookouts (orange dot).

STEP 3: A spotfire starts on the clifftop, the fire crew drives up to the flank, maintaining a safe egress route.

STEP 4: The fire starts travelling sideways just above the clifftop. This is cliff-top Vorticity-driven Lateral Spread.

STEP 5: The VLS is established. The diagnostic dark smoke column appears. New spotfires start downwind.

STEP 6: The lateral spread and spotfires are entrapping the fire crew.

Evidence from the Green Wattle Creek Fire during Black Summer shows a new and potentially serious safety hazard for field fire crews. This hazard is a novel form of Vorticity-driven Lateral Spread (VLS), the most common cause of dangerous fire escalations.

The fire burnt around Lake Burragorang, in the Warragamba catchment, west of Sydney. This wilderness area consists of a sandstone plateau dissected by numerous deep, cliff-lined gullies and valleys.

On December 5th, 2019, the fire spotted across the stored water, heading easterly, and burnt up a west-facing slope to the base of, and over, the west-facing cliff. On reaching the clifftop, VLS occurred on a further west-facing but less steep slope, spreading sideways as well as spotting downwind for some kilometres.

Thanks to NSWRFS linescans, this is the first confirmed case of VLS not involving a change in aspect.

A new model for VLS uses second-order differentials to detect the changes in slope that initiate eddy winds and VLS. It provides a greater discrimination of areas that Operations Officers need to keep fire out of to avoid sudden escalation.

Such an escalation could rapidly create sudden loss of egress options and serious burnover conditions. It is likely that some past hallmark burnover case study fires have involved this process, but the awareness of the physics was not then available. This emphasises the need to revisit past fires as new fire behaviour studies are published.

WATCH-OUT

A wind-driven spotfire above a cliff may suddenly spread sideways along the cliff-top while spotting downwind. The wind at the fire needs to exceed 25 km/hr and the fuel must be dry (FMC < 5%).

Safe egress may suddenly be lost. Heavy smoke and dense spotting may cause loss of situational awareness. Lookouts are vital.

Photos of this are not known. These ABC helicopter views show: [TOP] fire spreading laterally on a cliff-top, and [BOTTOM] the dark smoke column on the leading edge of a cliff-top VLS event. In this case the wind was towards the camera, but the watch-out guidance is still relevant.

https://www.abc.net.au/news/2019-12-21/wind-fans-ferocious-flames-in-blue-mountains-np/11821338

DEVELOPMENT OF AN EVIDENCE-BASED PROFICIENCY TEST FOR FIREFIGHTERS

The Singapore Civil Defence Force (SCDF) introduced the **breathing apparatus proficiency test (BAPT)** in 1999 to assess the competency of SCDF firefighters in breathing apparatus (BA) fitness and proficiency. It is designed to simulate the physical rigours of operation with a nine-litre SCBA set for its working duration. Currently, the existing BAPT regime comprises a sequence of six test stations aimed at **assessing the cardiorespiratory fitness, strength, psychomotor coordination and endurance** of test participants. In line with SCDF's transformation efforts to adopt evidence-based practices, the existing BAPT regime was reviewed and improvements were made to the test stations to better reflect firefighting tasks. Monitoring of physiological indicators such as volume of oxygen a body consumes (VO2) and heart rate (HR) were also included to ensure physiological responses elicited are similar to actual firefighting operations.

S/N	TEST STATION		TEST REQUIREMENT
1	BA Donning		Don PPE and SCBA within **1 min 15 sec**
2	Static Stations	Hose Carry	Walk a distance of **50 metres (m)** while carrying **2 x 64mm fire hoses**
3		Stair Climb	Climb **24m** (the equivalent of 8 storeys)
4		Ladder Climb	Ascend **24m** up the ladder
5		Casualty Carry	Perform a backward drag of a casualty weighing **approximately 50kg over 30m**
6	BA Maze		Navigate through **120m** of the BA maze

OBJECTIVES AND METHODOLOGY 1

PARTICIPANTS **116** firefighters (110 males, 6 females), age: **31.37 ± 7.69 years**

Phase 1

Evaluate whether the new stations can elicit **physiological responses** similar to actual firefighting operations of **>80% HRmax and and 60-80% VO2max.** *(Morris & Chander, 2018)*

- Resting HR of each participant is recorded.
- Participants attempt **each static station,** in random order.
- Participants' response measured throughout (*Windisch et al., 2017*).
- Participants are allowed to return to within 10% of resting HR, or rest for 5 mins, before next station.

Phase 2

Assess the **time taken** and **completion rate** of the new BAPT regime.

- Participants undergo full 6-station BAPT test regime with 2 min rest in between each station.
- Time taken for each station and overall completion rate are recorded.

Data Collection

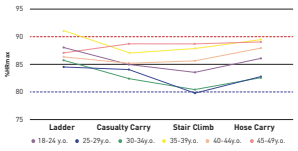
Heart Rate (HR)
Chest-worn HR monitor

Borg Rating of Perceived Exertion (RPE) Scale

RESULTS 2

FINDING 1

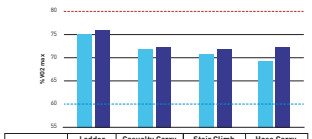
HRmax
(Target Range 80% < HRmax < 90%)



- **No significant difference** in %HRmax between age groups
- Stations were generally **less strenuous for firefighters aged 25–34 years**

FINDING 2

VO2max
(Target Range 60-80% VO2max)

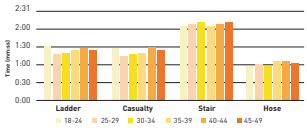


	Ladder	Casualty Carry	Stair Climb	Hose Carry
Avg% VO2 max	75	72.2	71.4	69.6
MAX% VO2 max	76.3	72.3	71.9	72.5

- On average, participants experience the target zone of **60-80%** VO2max for all stations

FINDING 3

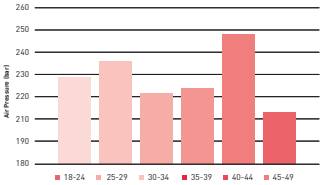
Time Taken
(3 min to complete each static station)



- Average time taken for each static station was **below 2.5 min**
- **No significant difference** in completion timing across the age groups
- Average time taken for BA maze was **below 12min** across all groups

FINDING 4

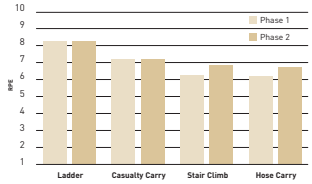
Air Consumption



- Most participants (94.8%) completed the entire BAPT regime with **<240bars** of air

FINDING 5

Perceived Exertion



On average, the stations were perceived as **vigorous intensity activity**

RPE SCALE	RATE OF PERCEIVED EXERTION
10	**MAX EFFORT ACTIVITY** Feels almost impossible to keep going. Completely out of breath.
9	**VERY HARD ACTIVITY** Can barely breath and speak only a few words.
7-8	**VIGOROUS ACTIVITY** Borderline uncomfortable. Short of breath, can speak a sentence.
4-6	**MODERATE ACTIVITY** Still somewhat comfortable, but becoming noticeably more challenging.
2-3	**LIGHT ACTIVITY** Can maintain for hours. Easy to breathe and carry a conversation.
1	**VERY LIGHT ACTIVITY** Hardly any exertion, but more than sleeping, slow walk, etc.

CONCLUSION 3

IMPLICATIONS

Scientific validation of the new BAPT test regime through evidence-based research and monitoring of physiological responses ensures that all test stations are designed to not only **assimilate actual firefighting tasks**, but also **simulate intensities similar to actual operations** while **ensuring firefighters do not over exert themselves during the test**.

RECOMMENDATION

Adopt the new BAPT regime which is scientifically validated with a common pass/fail requirement. The new BAPT regime is age- and gender-neutral; and solely based on one's ability to complete the required fire and rescue tasks since operational circumstances do not differentiate between individuals.

Authors

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Have queries or feedback? Get in touch with us!

Scan the QR code to find out more about SCDF's new BAPT regime

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HTX

The *Pyrolegium*:
Documenting the extraordinary, unprecedented fire dynamics from Black Summer

UNSW CANBERRA

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www.highfirerisk.com.au

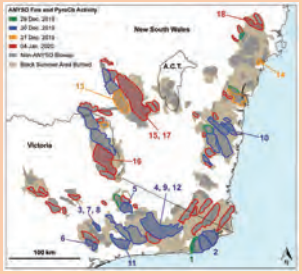
There were many unprecedented events seen and recorded during Black Summer. Many of these are likely to recur, and if they were to do so it is important that fire services are prepared.

The first step towards preparedness is awareness. To that goal, a catalog of these events, called the Pyrolegium, is described. It includes:

1. The Australian New Year Super-Outbreak of extreme wildfires, included 109 blow-up fires events (BUFEs) and 38 pyroCbs.
2. The number of pyroCbs recorded in Australia doubled. This must be considered a key marker of climate change. Their smoke passed 35 km height and formed retrograde rotating lenses in the stratosphere.
3. During ANYSO peak fire activity burnt nearly 100,000 ha per hour, releasing nearly one million MW.
4. The NSW South Coast and its hinterlands have experienced many hot fires over the decades, but not BUFEs, and not dozens.
5. In southeast Australia, fire protection planning assumes fire winds from the N to the NW. During BS, multiple parallel overnight fire runs for tens of kilometres to the NE occurred after a front had passed. Others runs inland, to the NW, happened.
6. There is evidence of multiple, parallel eruptive runs up rills on the side of a ridge, which activated a VLS event of the far side.
7. Cliff-top VLS was seen as a fire burnt uphill from Lake Burragorang near Sydney.
8. The Gospers Mountain megafire was in part due to the routine dry sea breezes that drove intense fire runs inland.
9. Records for foehn-winds driving BUFEs have been scarce, Black Summer provided 50 more.
10. A common situation involved complex intersecting troughlines recirculating smoke-filled air.
11. Black Summer started in February 2019 with a cluster of pyroCb events in March with anvils that moved to the west.

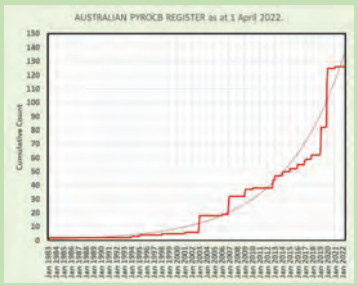
Yes, I used the word "UNPRECEDENTED"

1) AUSTRALIAN NEW YEAR SUPER OUTBREAK OF PYROCBS!



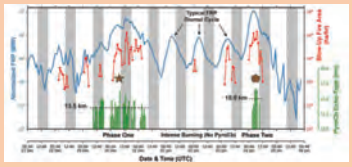
Peterson, D.A., Fromm, M.D., McRae, R.H.D., Campbell, J.R., Hyer, E.J., Taha, G., Camacho, C.P., Kablick, G.P., Schmidt, C.C. & DeLand M.T. (2021). The unprecedented pyrocumulonimbus super outbreak in Australia at the dawn of 2020: cause and perspective. npj Climate and Atmospheric Science, 2021.

2) DOUBLED OUR COUNT OF PYROCBS!



Rare before 2001, Australian fire thunderstorms (pyroCbs) are becoming a lot more common. They are dangerous and can be predicted to some extent (with the BUFO2 tool).

3) 100,000HA/HOUR & 1,000,000 MW!

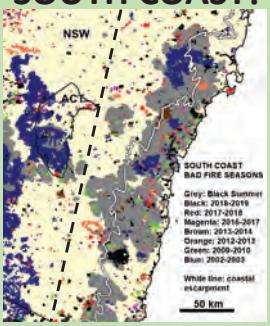


We are all used to talking in terms of kiloWatts per metre of fire front. Here we have a total power of:

1,000,000,000,000 Watts
and
the equivalent of *40% of the area of the ACT (100,000 ha)* burning per hour.

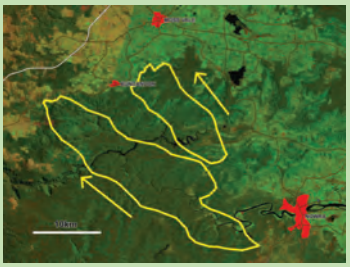
Note that some peaks occurred around midnight.

4) MASSIVE FIRES ALONG THE NSW SOUTH COAST!



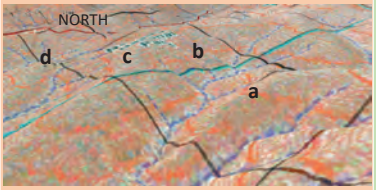
This shows everything picked up by NASA's MODIS sensors in every bad fire season over the last two decades – "not even close" to Black Summer. The high country is very different.

5) HOT FIRE RUNS IN THE WRONG DIRECTION!



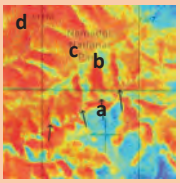
Are your strategic defences based on fires running from N/NW? This is increasingly likely to be insufficient! Your fire trail on the sheltered lee slope may now be facing the full headfire run.

6) PARALLEL ERUPTIVE RUNS!



d) Deep flaming to NW + wind change.

c) VLS off ridgeline, dense spotting to N.



Events of 4 January 2020 near Corin Dam, Namadgi National Park.

a) Fire backs downhill to N off plateau

b) Four eruptive runs to N up steep trough-like gullies

7) CLIFF-TOP VLS!

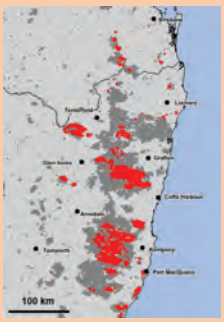
In this example (see other poster for details) a fire has spotted onto a cliff-top. Wind eddies above the cliff create VLS, which spreads sideways and spots downwind. Fire crews at places such as the orange dot could be easily overrun.

8) DRY SEA-BREEZES!

Instead of bringing relief, sea breezes caused major fire runs during BS. Fire sloshed back and forth and defied suppression plans. Dangerous smoke events caused major health problems. The continental air masses were extensive and pushed offshore and were then brought back on shore.

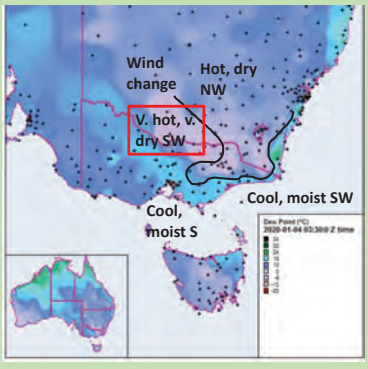
9) LOTS OF BUFEs DUE TO THE FOEHN EFFECT!

Timeline:
2010: published paper showing foehn effect on fires in Australia.
2018: Holsworthy and Tathra fires were first known foehn BUFEs.
Black Summer: perhaps 50 foehn BUFEs.



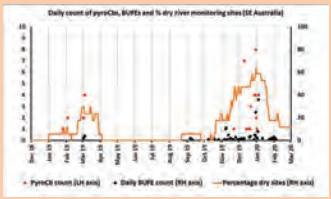
Much of the activity seen here (red dots are VIIRS hotspots) on Nov 8 2019 is foehn driven.

10) COMPLEX TROUGH SYSTEMS!



New playbook for fire operations around troughs and fronts as air gets re-circulated (due to land/ocean interactions) rather than replaced.

11) BLACK SUMMER STARTED IN FEB '19!



Black Summer spanned a winter break. Both sides were "off-scale". River drying events (orange lines) are good predictors.

MODIS image [NASA] 4 March 2019.

UNFORTUNATELY...

Future safe fire suppression operations will require you to know this stuff.

Do you?

ATTITUDES AND PERCEPTIONS OF SINGAPOREAN PARAMEDICS IN MENTORING TRAINEES

A PHENOMENOLOGICAL STUDY

With well-established roles in medicine and nursing, mentors play a critical role in healthcare. Understanding that the dynamic and risk-prone prehospital environment poses an occupational challenge to good mentorship, the Singapore Civil Defence Force (SCDF) conducted a thorough qualitative investigation *(Bell & Whitfield, 2021; Lane et al., 2016).*

We adopted a phenomenological approach to examine the attitudes and perceptions of mentorship in the out-of-hospital emergency care setting from the perspective of the paramedic mentor.

METHODOLOGY 1

The study involved SCDF paramedics with at least two years of working experience as an operational paramedic. They also had some experience in mentoring a paramedic trainee.

Sixteen paramedics were recruited through an online invitation to participate in an individual semi-structured interview conducted via video-conferencing. Subsequently, data were transcribed verbatim. Two of the researchers conducted a thematic analysis using open, axial and selective coding approaches. The research team also identified the key themes in the interviews using a consensus approach.

PARTICIPANTS

16 paramedics from the Singapore Civil Defence Force (SCDF)

With **at least two years of working experience** as an operational paramedic

Experience in mentoring a paramedic trainee

RESULTS 2

Four themes were extracted from the data: desirable traits of mentors, interpersonal and occupational barriers to mentorship, drivers of good mentorship and pedagogical differences. The most desirable traits were patience, supportiveness, possessing clinical competence and the ability to provide trainees with a safe environment to make mistakes. Meanwhile, identified barriers to good mentorship were largely occupational. Such barriers included a lack of choice to be mentors, as well as a lack of organisational direction and provision of training, curricula and resources.

FOUR THEMES FROM THE DATA

Desirable Traits of Mentor

Interpersonal and Occupational Barriers to Mentorship

Drivers of Good Mentorship

Pedagogical Differences

DESIRABLE TRAITS

Patience

Being Supportive

Clinical Competence

Providing Trainees with a Safe Environment to Make Mistakes

BARRIERS TO GOOD MENTORSHIP

Lack of Choice to be Mentors

Lack of Organisational Direction and Provision of Training

Lack of Curricula and Resources

DISCUSSION 3

Mentorship in the out-of-hospital setting is a crucial yet neglected aspect of emergency medical services. Quality mentorship is effective insofar as mentors demonstrate patience as well as clinical acumen, and are supported by targeted organisational training and support. The organisation plays as important a role as each paramedic mentor in the education and moulding of the future generation of lifesavers.

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Are firefighters at risk of occupational exposure to PFAS due to foods grown on Fire stations?

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[2]Envirolab Services

Introduction

- Over 8000 Per- and poly-fluoroalkyl substances (PFAS) have been manufactured and used since 1950s.(1)
- Aqueous film forming foams (AFFF) contain PFAS as active ingredients
- The extensive use, persistence, bioaccumulation and extreme mobility of PFAS leads to environmental contamination and human exposure risk.(2)
- Occupations at high risk of exposure:
  - ✓ Firefighters
  - ✓ Air force
  - ✓ Emergency response
- Firefighters have frequent and prolonged contact with AFFF for emergency response, drills, equipment maintenance, cleaning, and transfer of foam concentrate products to appliances.(3)
- Common exposure pathways for firefighters include:
  - ✓ Inhalation of aerosolised foam,
  - ✓ Incidental ingestion from dust/soil or other contaminated surfaces,
  - ✓ Protective gear made from or extensively treated by PFAS.
- However, elevated PFAS levels in firefighters' blood(4) suggest the existence of unrecognised exposure pathways.

Objectives

- Characterise potential pathways for firefighters' exposure to PFAS.
- Estimate the relative contribution of different exposure pathways.

Methods

- 688 environmental samples
  - ✓ Eggs (8)
  - ✓ Fruits (43)
  - ✓ Vegetables (9)
  - ✓ Dust (26)
  - ✓ Swab (11)
  - ✓ Soil (97)
  - ✓ Water (116)

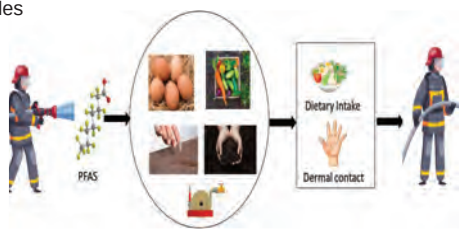

Figure 1. Schematic illustration of firefighters exposure pathways to PFAS.

- 37 fire stations
- 31 PFAS types
- Measured concentrations were combined with exposure factors (such as food consumption, skin and mouth contact rate, exposure duration, skin) to estimate daily PFAS intake levels. (Figure 2)

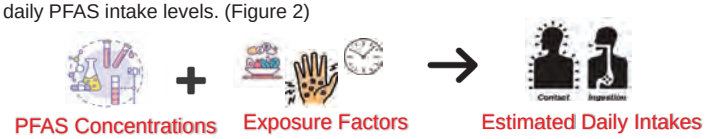

Figure 2. Schematic illustration of daily PFAS intake estimations

Results

PFAS detection

- At least one PFAS was detected in 529 samples (77%) (Figure 3).

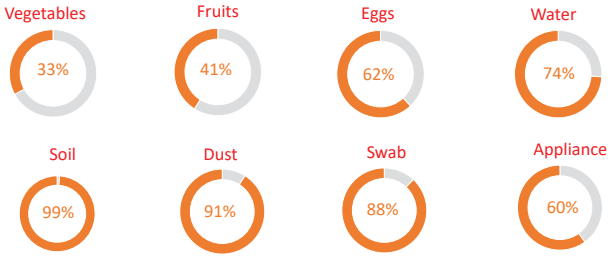

Figure 3. Proportion of samples with at least one PFAS detected.

- Of 31 PFAS analysed, only five were frequently detected in the samples.

- Based on median concentrations, the most frequently detected PFAS were:
  - ✓ PFOS in eggs, fruits, dust, swab, soil, and appliances.
  - ✓ PFHxS in vegetables
  - ✓ 8:2 FTS in water

PFAS concentrations

Table 1. Total PFAS concentrations in different samples.

Sample type	Median	Range
Fruits (ng/g)	6	0.6 – 312
Vegetables (ng/g)	5	2 – 128
Eggs (ng/g)	766	343 – 1800
Groundwater (ng/l)	150	10 – 236000
Appliance (ng/l)	130	10 – 145000
Soil (ng/g)	49	0.3– 1447
Surface swab (ng/swab)	75	2.6 – 9596

Daily PFAS intakes

- Ingestion represents 97.5% of overall PFAS intake. (Figure 4)
- Mean total intakes (ng/day) were
  - ✓ 1060 for PFOS
  - ✓ 21 for PFOA
  - ✓ 189 for PFHxS
  - ✓ 25 for 6:2 FTS
  - ✓ 48 for 8:2 FTS
- ✓ Equivalent mean serum concentrations would be 13 ng/ml for PFOS and 9 ng/ml for PFOA.(4)

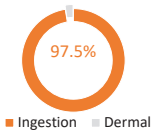

Figure 4. Relative contribution of exposure routes

Exposure pathways

Exposure through consumption of eggs was the predominant exposure pathway followed by eating fruits and vegetables grown on fire stations (Figure 5).

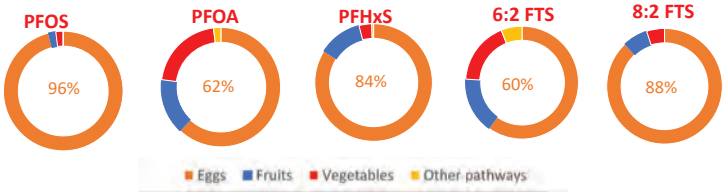

Figure 5. Relative contribution (%) of different exposure pathways to the daily PFAS intakes

PFAS intake from food consumption (ng/day) was significantly higher than intakes from incidental ingestion and contact with dust, soil, and appliance (Figure 6).

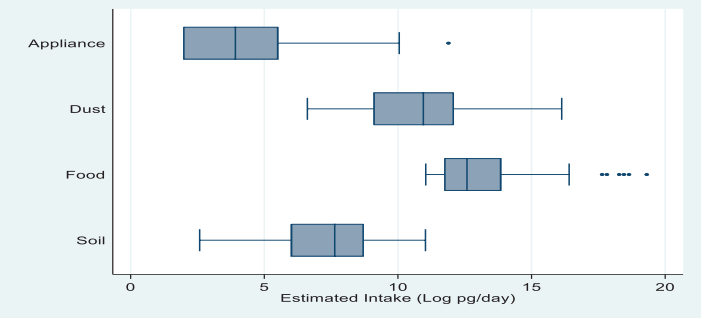

Figure 6. Comparison of daily PFAS intakes through major exposure pathways

Conclusion and Implications

- Multiple exposure pathways relevant to career firefighters were identified and potential intake levels were estimated.
- Consumption of foods grown on fire stations seems to be an important PFAS exposure pathway in an occupational firefighters' context.
- Exposure control strategies that target foods produced on fire stations could substantially reduce firefighters' exposure to PFAS.

For more information contact: ✉ Krystle.Mitchell@sa.gov.au

References

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3. Laitinen JA, Koponen J, Kiviranta H. Firefighters' exposure to perfluoroalkyl acids and 2-butoxyethanol present in firefighting foams. Toxicology Letters. 2014 Dec 1;231(2):227-32. DOI: 10.1016/j.toxlet.2014.09.007.
4. Rotander A, Toms L-ML, Aylward L, Kay M, Mueller JF. Elevated levels of PFOS and PFHxS in firefighters exposed to aqueous film forming foam (AFFF). Environment International. 2015 2015/09/01/;82:28-34. DOI: https://doi.org/10.1016/j.envint.2015.05.005.
5. Egeghy PP, Lorber M. An assessment of the exposure of Americans to perfluorooctane sulfonate: A comparison of estimated intake with values inferred from NHANES data. Journal of Exposure Science & Environmental Epidemiology. 2011 2011/09/01;21(2):150-68. DOI: 10.1038/jes.2009.71.

Acknowledgement

SAMFS provided PFAS measurement dataset and financial support for this work. The authors extend their gratitude to the survey participants who gave up their time to complete the survey.

BUSHFIRE PLANNING

An engaging, map-led platform that explains bushfire risk and Victoria's Bushfire Management Strategies in everyday language

https://bushfireplanning.ffm.vic.gov.au/

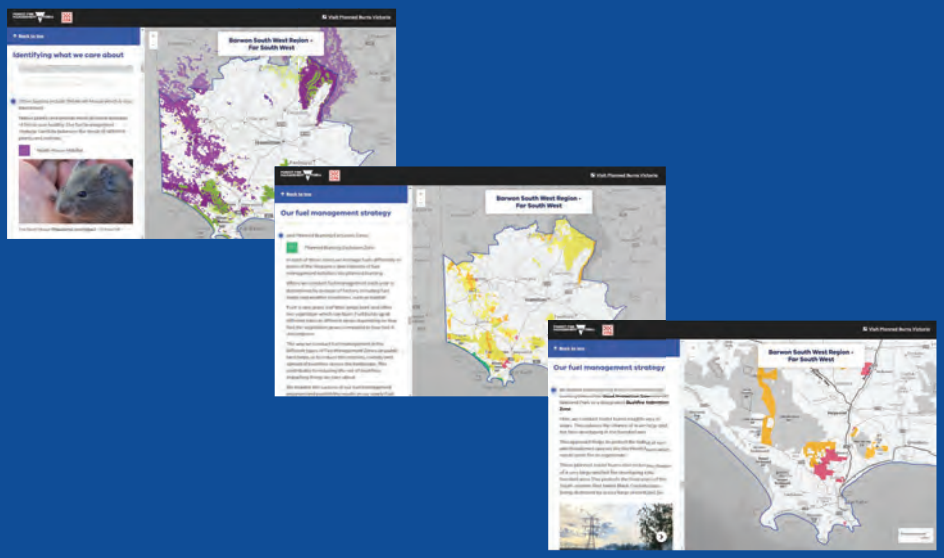
HOW IT WORKS

The interactive map takes users on a journey through:

- The values in their landscape,
- The local bushfire history including case studies,
- Their local bushfire risk,
- Our fuel management strategy on public land, including case studies of why particular zones exist,
- Our Bushfire Risk Engagement Areas (BREAs), which prioritise where to engage with community about managing bushfire fuels on public and private land.

Users can pan, zoom and explore the map at each step along the journey. They can skip ahead to what interests them most.

There are links to further information on our websites for those who wish to learn more.



INDEPENDENT USER TESTING FEEDBACK

100% agreed or strongly agreed that the map is better than a pdf

83% agreed or strongly agreed that the map is easy to use

72% agreed or strongly agreed that the map is relevant

"I would flick through a pdf but I wouldn't take much in as it is not interactive. They can be quite boring. Whereas an interactive site you can choose what you're looking for which means you'll engage with it more."

"The better educated we are, the better we are able to cope. You've got to educate people. The new site is total education."

"Once I realised how it was set out I found it really easy to use. The main headers. Even the photos. That's saying something for me because I'm quite picky."

"I like that it highlights just the bit that you're focussing on in the story"

"Educating the public on what the government is currently doing ... this gives people more faith in what they're doing"

FOREST FIRE MANAGEMENT VICTORIA

EMV EMERGENCY MANAGEMENT VICTORIA

CFA

A holistic 'Resilience Engineering' and 'Deming Cycle' approach toward better hospital decision-makers learning from disasters

Dr Heba Mohtady Ali, MD [1,2], Associate Professor Jamie Ranse, PhD [3,4], Professor Anne Roiko, PhD [1,4] Professor Cheryl Desha, PhD [1,2]

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2. School of Engineering and Built Environment, Griffith University, Gold Coast, Australia
3. Department of Emergency Medicine, Gold Coast Health, Gold Coast, Queensland, Australia
4. Menzies Health Institute Queensland, Griffith University, Gold Coast, Queensland, Australia

Background:

The assessment of hospital disaster planning and preparedness and the identification of hospital performance during disasters could provide decision-makers with valuable lessons and a series of recommendations to enhance future preparedness and resilience.

Aim:

To explore how hospitals' decision-makers can utilise lessons learned from disasters and ensure these insights are translated into action.

Methods:

This integrative literature review used the 'Preferred Reporting Items of Systematic reviews and meta-analysis (PRISMA).

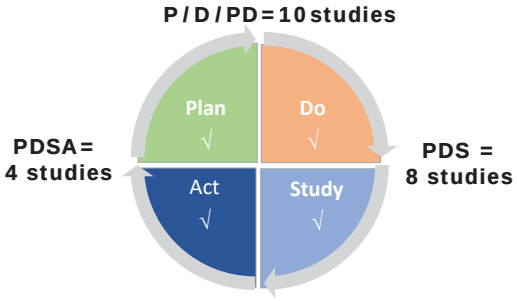

Fig.1.The number of studies that addressed different levels of the PDSA cycle (out of 22 included studies).

Results:

Out of the 420 articles retrieved, 37 remained after applying inclusion and exclusion criteria. Following the descriptive analysis and quality appraisal, 22 articles remained for thematic analysis.

Conclusion:

A holistic *Hospital Disaster Management* model utilising both 'Resilience Engineering' and 'Deming Cycle' approaches was developed to guide future hospital disaster planning. Adopting such a model will ensure organisational learning as a part of hospital resilience in future disasters.

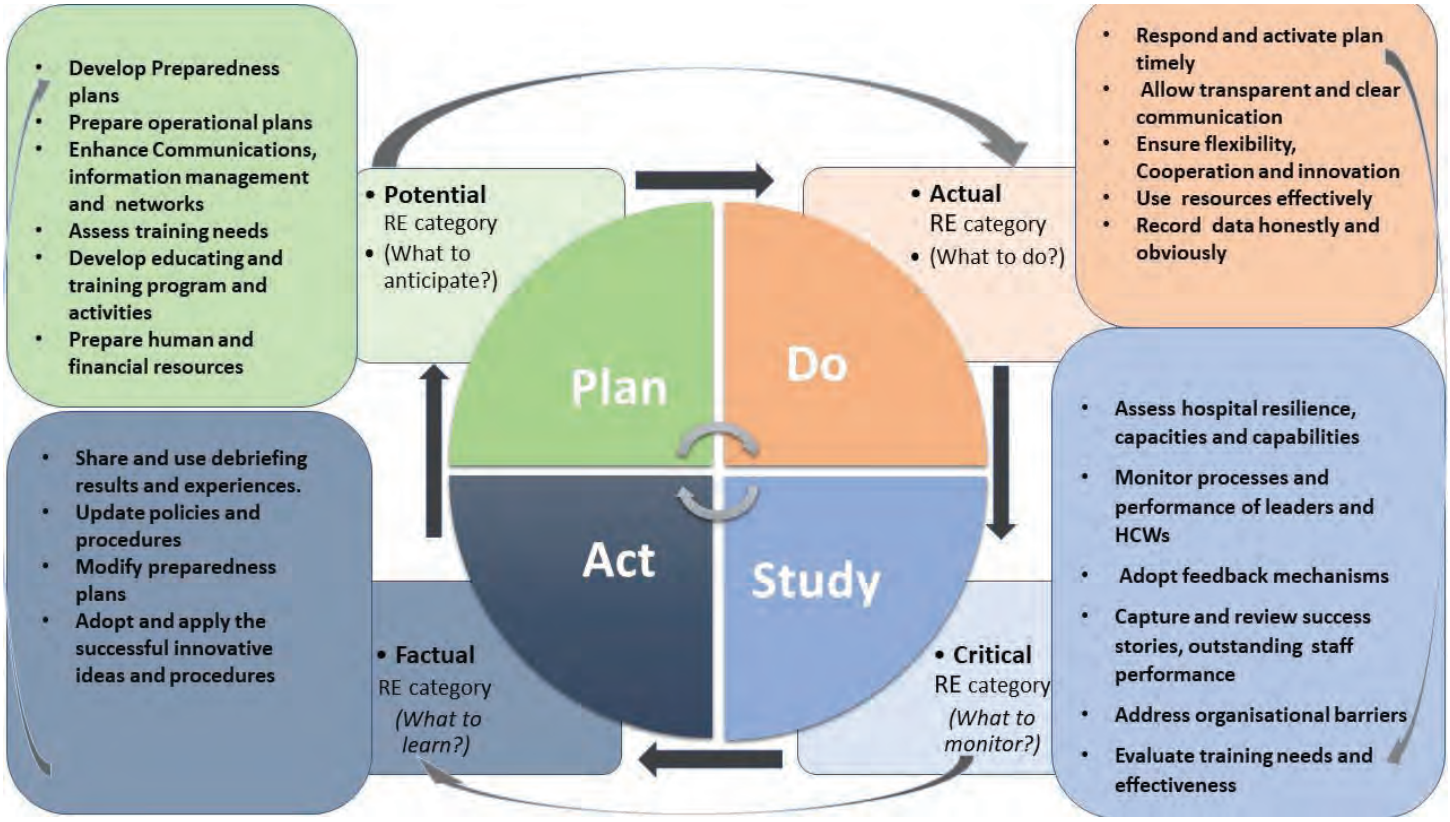

Fig.2. A *Hospital's Disaster Management* model utilizing both 'Resilience Engineering' and 'Deming Cycle' approaches

References:

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Disaster Legal Help Victoria

disasterlegalhelp.org.au

The legal consequences of a disaster can last for years. **Disaster Legal Help Victoria** is a cross-sector partnership that co-ordinates legal assistance for people impacted by disaster and builds community resilience through community legal education around disaster preparedness and recovery.

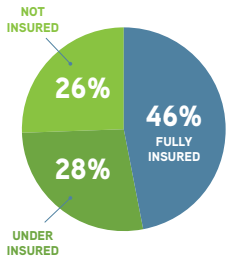
Common legal issues after a disaster include:

- Insurance
- Planning and property law
- Tenancy
- Neighbourhood disputes
- Wills and estates
- Lost paperwork
- Applications for grants and assistance

Disasters may also exacerbate existing legal and related issues including:

- Family violence
- Issues with parenting arrangements, separation or divorce
- Difficulties meeting existing legal obligations

INSURANCE



Many Victorians don't realise that they are under-insured, meaning their insurance payout after a disaster may not cover their costs. Even Victorians who have the right coverage sometimes struggle with the claims process.

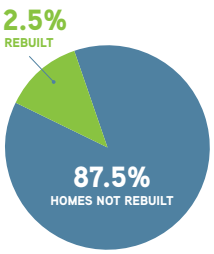
Survey of insurance levels of people in high-risk areas of Victoria

Source: Addressing non-insurance and underinsurance for emergencies in Victoria, (2017), VCOSS and DHHS

DID YOU KNOW: By 2030, it is estimated that approximately **520,940 Australian properties**, or **one in 25 homes**, will be at 'high risk' from extreme weather and climate change, having annual damage so costly that they will be effectively uninsurable.

Source: Uninsurable Nation, (2022), Climate Council

REBUILDING



Navigating planning law can be extremely challenging for Victorians seeking to rebuild their property after a disaster. This is particularly difficult where bushfire overlay or zoning has been changed since a property was originally constructed. In Mallacoota, as of April this year, only 15 homes have been rebuilt out of the 120 homes destroyed during the Black Summer bushfires of 2019-20.

Source: Mallacoota housing crisis deepens two years on from Black Summer fires, (2022), ABC Gippsland

DID YOU KNOW: Australians are **five times more likely** to be forced out of their home by a disaster than someone living in Europe.

Source: Insurance Catastrophe Resilience Report: 2020-21, (2021), Insurance Council of Australia

THERE ARE A NUMBER OF WAYS DLHV CAN CONNECT YOU TO THE RIGHT SERVICE:

Disaster Legal Help phoneline for legal information and referrals

Contact your closest Community Legal Centre and get advice from a local lawyer

Legal information about common disaster-related legal issues can be found on DLHV's website

Online chat for legal assistance and referrals

Disaster Legal Help Victoria's partnership can provide assistance to individuals, small businesses and farmers via local legal assistance services and through pro bono networks.

Disaster Legal Help VICTORIA

We are a public and private legal sector partnership of:

FEDERATION OF COMMUNITY LEGAL CENTRES VIC · justice connect · LAW INSTITUTE VICTORIA · Victoria Legal Aid · Victorian Aboriginal Legal Service · VICTORIAN BAR

Physics based simulations of grassfire propagation on sloped terrain – A parametric study

Jasmine Innocent[1,3], Duncan Sutherland[2,3], Khalid Moinuddin[1,3]

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[2]School of Science, University of New South Wales, Canberra, ACT, 2610, Australia
[3]Bushfire Natural Hazards CRC East Melbourne, Victoria, 3002, Australia

How significant is the combined effect of slope of the terrain and wind velocity on grassland fire behaviour?

HIGHLIGHTS :

- Rate of spread of fire *(RoS)* depends on various topographical, weather and fuel parameters. The topographic feature slope can increase or decrease *RoS*, depending on its inclination to the terrain
- Simulations are performed using a Physics-based model, Wildland-urban interface Fire Dynamics Simulator (WFDS).
- Progression of Fire Isochrones, *RoS*, fire intensity, flame dynamics, and heat fluxes are analysed and compared with widely used empirical models.

OBJECTIVE : obtain an insight into grassfire behaviour that can then be used to improve empirical models, improve prediction of real widlfires and subsequently mitigate the risk of wildfire impact.

MODEL SETUP :

Rectangular domain of 360 x 120 x60 m with burnable grass plot of 80 m long x 40 m wide

Slope is implemented by changing the magnitude of components of gravitational force in the x and z directions.

Finer grid sizes and a straight-line ignition protocol are used.

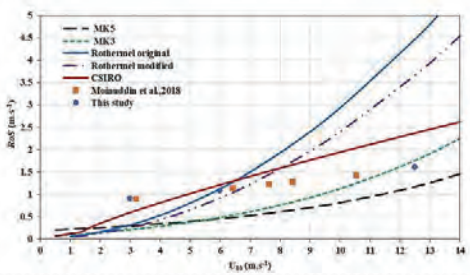

Figure1: *RoS* vs wind velocities at 0° slope

Experimentally measured Thermo-physical, combustion and pyrolysis parameters are used following Moinuddin et al [1].

Set of simulations are conducted at varied wind speeds of 0.1, 1, 3, 6 and 12.5 m/s and slope angles ranging from -30° to +30°.

Figure 1 shows comparison with empirical models on flat surface

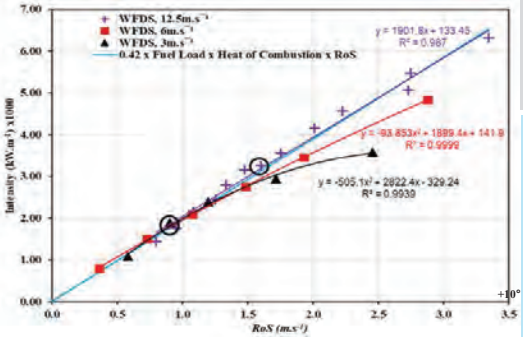

Figure 3: Fire intensity (Q) vs *RoS*

RESULTS AND CONCLUSION :

The relationship between quasi-steady *RoS* (from WFDS) and slope angle can be exponential, polynomial or linear with different R^2 values

Fire does not propagate in some downslopes and low upslopes (depending on wind velocity) due to modelling limitations.

In Figure 2, relative RoS (absolute RoS divided by RoS on flat surface for 3, 6 and 12.5 ms^{-1} driving wind velocities; whereas for other two velocities divided by RoS at 10° slope) vs slope angle are presented.

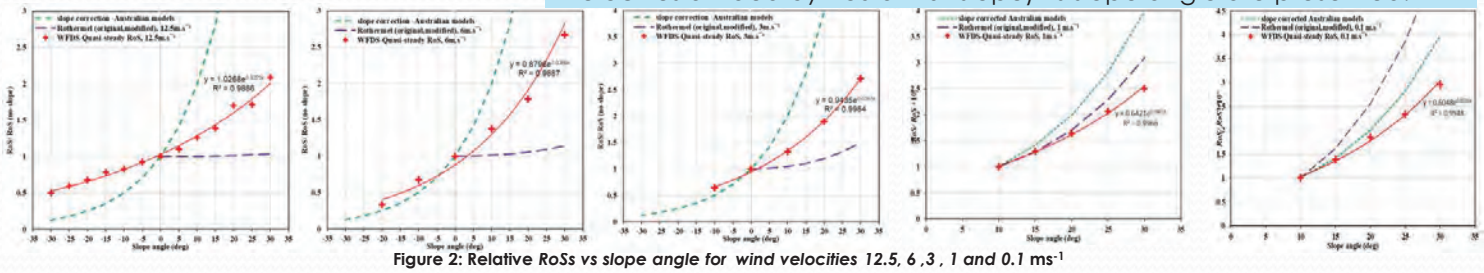

Figure 2: Relative *RoSs vs slope angle for wind velocities 12.5, 6 ,3 , 1 and 0.1* ms^{-1}

As the wind velocity reduces, WFDS relative *RoS* results get closer to the empirical slope factors [2-3].

Rothermel model [2] shows hardly any effect of slope at high wind velocities; the effect becomes prominent at low velocity

Figure 3 shows that a linear fire intensity-*RoS* relationship exists; deviation from the linearity occurs at high upslopes.

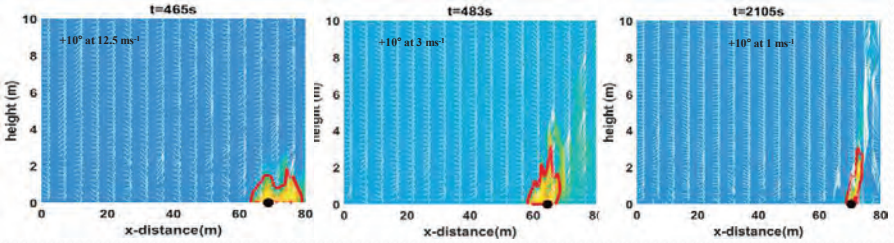

Figure 4: Flame dynamics- +10° slope at wind velocities of 12.5, 3 and 1 ms^{-1}

For higher wind velocities, the flame and near flame appears to be up-rising, even though the plume is attached to the ground. When the fire runs uphill, the flame length is higher with an attached flame. These are shown in Figure 4.

References:
[1] Moinuddin, K.A.M., D. Sutherland, and R. Mell, *Simulation study of grass fire using a physics-based model: striving towards numerical rigour and the effect of grass height on the rate-of-spread.* International Journal of Wildland Fire, 2018. 27(12): p. 800-814.
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[3] McArthur, A.G., *Weather and grassland fire behaviour*. 1966: Forestry and Timber Bureau, Department of national Development, Commonwealth

VICTORIA UNIVERSITY MELBOURNE AUSTRALIA

bushfire&natural HAZARDSCRC

Australian Government | Queensland Government | CQUniversity Australia

Resilience alone will not get us through

Supporting organisations to support staff before, during and after disaster.

Project team: Assoc Prof. Adele Baldwin [2], Dr Robyn Preston[1], Dr Paul Duckett[1], Dr Bree Kitt[3], Dr Naomi Ralph[1], Prof. Clare Harvey[4]

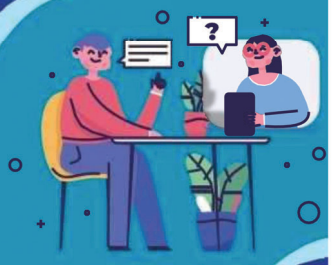
BACKGROUND

In 2019, Townsville and surrounding regions experienced a catastrophic flood event. The impact was swift and extensive, affecting communities across the region.

Our team looked at ways employers could support their staff before, during and after disaster events such as floods. By finding out more about how people experienced the 2019 floods, we aimed to develop guidelines to help organisations provide the best support for their staff.

Our project had two phases:

1. We looked at public social media postings during and aher the flood to gain an insight into how people shared their experiences of the event.



WHAT WE DID

2. We interviewed individuals and some small groups in McKinlay Shire and Townsville to hear about their experiences firsthand.

WHAT WE FOUND

Phase One: The social media analysis highlighted the use of these platforms to 'contextualise' experience, the unifying 'hero' narrative which was at times problematic and the search for accountability through formal leadership 'responsibility'.

Phase Two: The qualitative data revealed three key points related to resilience and coping after the floods that were directly translated into recommendations for the guidelines.

OUTCOMES

The resultant guidelines prioritised the need to recognise and support 'unassumed leaders' (individuals and organisations who play pivotal roles in local recovery over the long term) and to focus on relationships and valuing of local knowledge and history to enable a reflexive, inclusive response. Compassionately 'recognising the impact' cumulative exposure to environmental hazards has on individuals, organisations and communities challenges the narrative of the resilient Queenslander and calls for strength-based and place-based approaches to support far beyond the immediate impact.

The guidelines are publicly available at: **https://apo.org.au/node/313681**

Author affiliations:

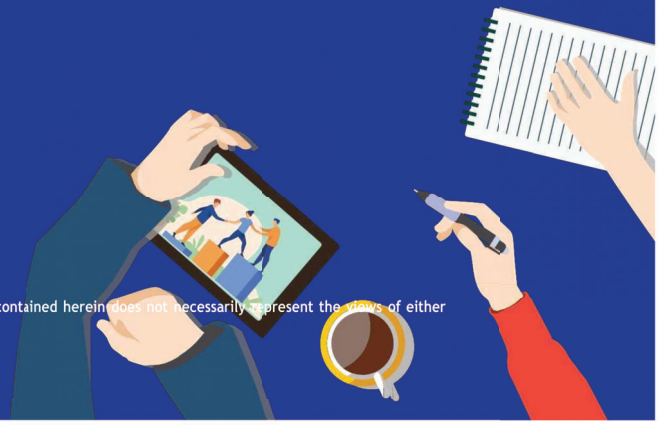
1: School of Health, Medical and Applied Sciences, CQUniversity, Australia

2: School of Nursing, Midwifery and Social Sciences, CQUniversity, Australia

3: School of Education and Arts, CQUniversity, Australia

4: School of Nursing, Massey University, New Zealand

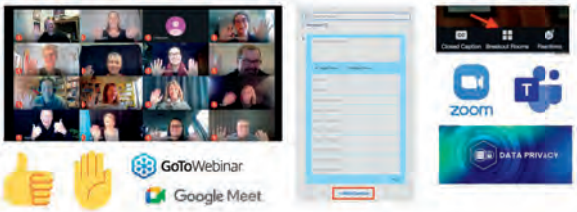
Although funding for this product has been provided by both the Australian and Queensland Governments, the material contained herein does not necessarily represent the views of either Government



EXPANDING TO ONLINE & DIGITAL COMMUNITY ENGAGEMENT

HOW TO START ENGAGING WITH COMMUNITIES ONLINE

PICK A PLATFORM WITH THE RIGHT FUNCTIONALITY



USE COLLABORATION AND ENGAGEMENT TOOLS

MAKE IT FUN, VISUAL AND INTERACTIVE

There are many online tools to help with projects, planning, brainstorming, process mapping etc.
Use tools to get involvement, collect feedback and vote on ideas

IMPROVE MARKETING AND ONLINE RESOURCES

Make sure resources and marketing materials are:

- Interesting & attention grabbing
- Promoted on a range of platforms

2020 - STARTING POINT

- Low capability
- No resources for online delivery
- No platforms in place
- Programs only delivered face to face

2020-2021 Fire Season
194 community engagement sessions delivered online

2021
Retained engagement levels despite significant disruption and the worlds longest lockdown

2022 - WHERE ARE WE NOW?

- 317 programs delivered online since March 2020
- Over 40,000 people engaged (as of Q3 2021-2023)
- Multiple online programs
- Training and governance materials in place
- Enhanced organisational capability ability to connect with communities
- New roles for members
- Leading digital engagement for Victorian Emergency Services

DEVELOP GUIDES & GOVERNANCE

Document:

- Digital Engagement Guidelines
- Zoom User Guides
- Administrator Quick Guides
- Presenter Quick Guides
  - Meeting & Webinars
- Child Safety Risk Assessments
- Privacy Impact Assessments

BUILD CONFIDENCE AND CAPABILITY

CAPTURE PARTICIPANT FEEDBACK

WANT TO KNOW MORE? PLEASE GET IN TOUCH

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03 9262 8782

Small satellite energy-efficient on-board AI processing of hyperspectral imagery for early fire-smoke detection

Stefan Peters[1], Eriita Jones[1], Sha Lu[1], Jixue Liu[1], Jiuyong Li[1], Jim O'Hehir[1], Kai Qin[2], Simon Oliver[3], Norman Mueller[3]

Problem statement

Fire notification systems often integrate satellite-based fire information which are of limited use due to long imagery latency times (hours or days). This project demonstrates onboard processing approach to improve early fire detection.

Background

For Small or Cube satellites with advanced EO sensors capturing numerous of spectral bands, the amount of raw data generated is in excess of what can be transmitted to ground. For specific applications, energy effective on-board data processing could help to significantly reduce large raw data volumes before being downlinked to the ground for further processing. This project will address the challenge of AI processing of Hyperspectral imagery on-board of small satellites for early detection of fire smoke.

Methodology

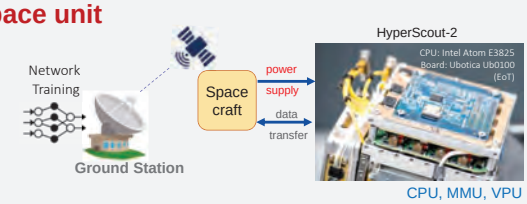
This SmartSat-CRC funded research project aims to provide a solution for energy-efficient AI-based on-board processing of hyperspectral imagery supporting automated early detection of fire smoke. We propose using modified and resampled VIIRS imagery data that emulates spectral, spatial, and radiometric resolution of HyperScout-2 hyperspectral imagery. In doing so, we intend to provide a solution that meets on-board processing limitations and up/downlink data transfer restrictions of the upcoming Kanyini/ HyperScout-2 Earth Observation mission.

Based on a semi-automatically created fire smoke training dataset, our proposed AI processing approach is performed at two levels: a) on-board feature and band selection, and b) ground AI neural network tasks – in order to optimize on-board processing and downlink data transfer.

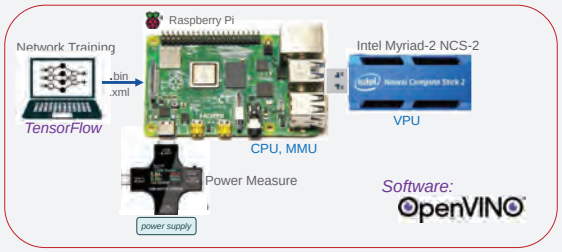
Project aim

Develop AI-based onboard processing strategies to identify fire smoke from HyperScoout-2 imagery while meeting Kanyini onboard-processing and up/down link power and data storage/transfer constraints.

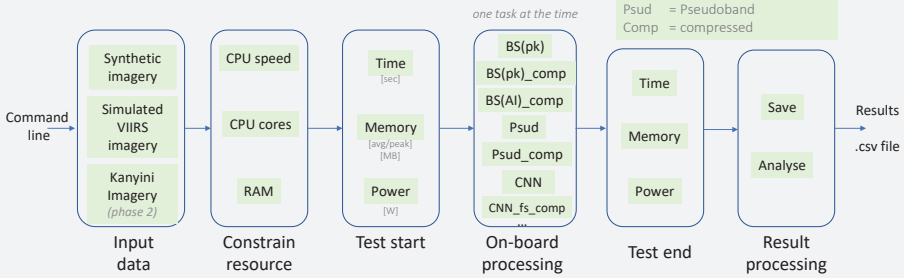
Space unit



Emulation concept



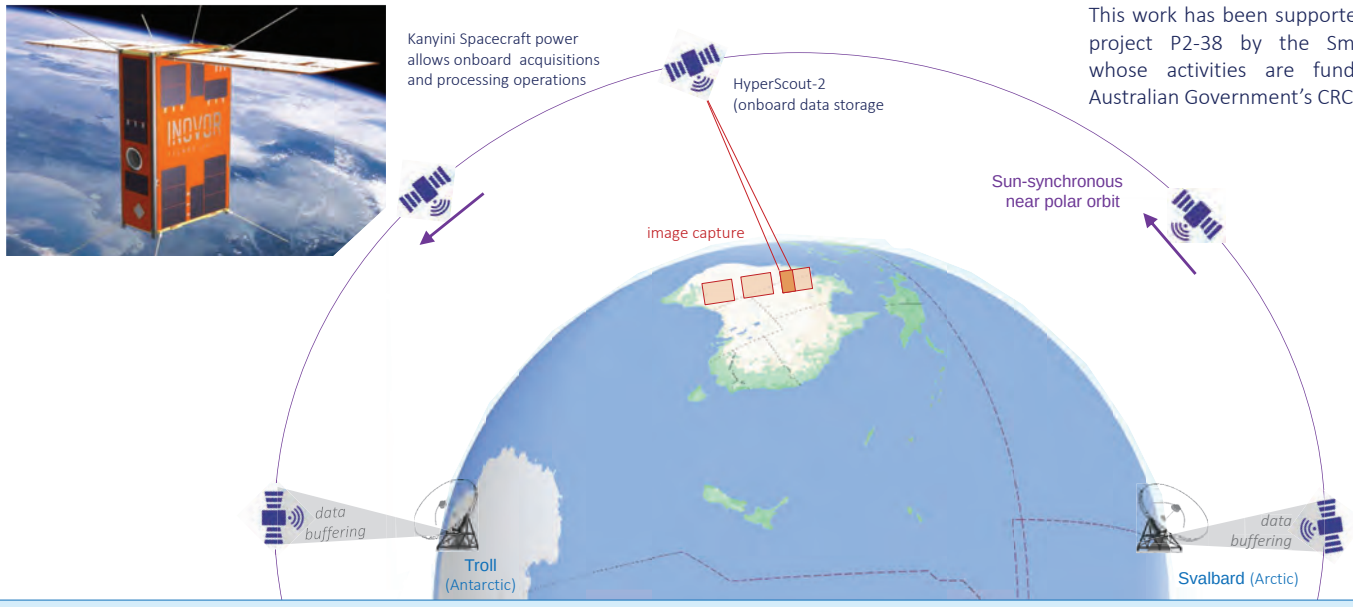
Emulation System - *performance testing*



Solutions and preliminary results

Our emulation consists of TensorFlow based CNN training, and the use of hardware elements: Raspberry Pi and an Intel Myriad Neural Network Compute Stick 2. OpenVINO software was selected to implement on-board imagery processing operations and performance testing. To optimize onboard processing, our methodology and performance testing includes on-board imagery selection; image masking, band selection, imagery segmentation; and on-board CNN-based fire-smoke detection. We developed a light-weight AI model with spatial-attention, channel attention, inception network and residual learning. First results based on Landsat-8 training data showed a fire smoke prediction accuracy of 87.8%.

Kanyini orbit and hyperspectral imaging



Acknowledgement:

This work has been supported under the project P2-38 by the SmartSat CRC, whose activities are funded by the Australian Government's CRC Program.

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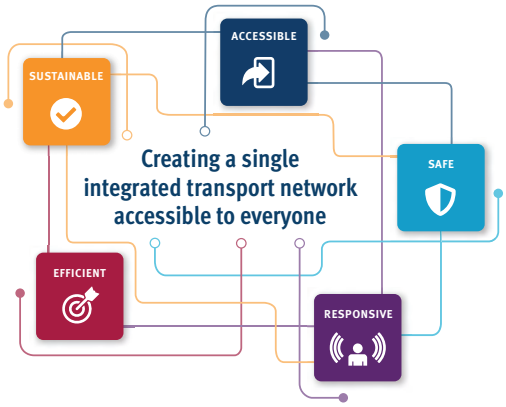
University of South Australia · SWINBURNE UNIVERSITY OF TECHNOLOGY · Australian Government Geoscience Australia · SMARTSAT COOPERATIVE RESEARCH CENTRE

The environment that inspires

As the agency responsible for the roads, transport and maritime network in Australia's most disaster-prone state, Transport and Main Roads (TMR) continues to be challenged by more extreme and frequent distruptive events.

TMR's annual Preseason Program has evolved to address the diverse challenges faced in Queensland whilst maintaining the same exceptional standards to successfully support an all-hazards approach to disruptive event management.

TMR's vision and priorities



Fast Facts:

33,384km
of state-controlled roads including 4996km national network

3145
bridges owned and maintained

147
TMR staff in specific disaster management roles

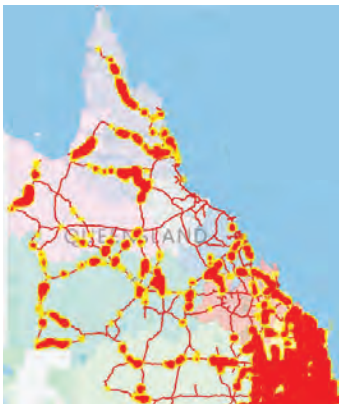
$5.25b
total investments in transport infrastructure program

2.4m
QLDTraffic website visits

296
Disruptive Event Management Team (DEMT) members state-wide

Since 2010, Queensland has been impacted by more than 95 significant natural disaster events including floods, severe tropical cyclones and catastrophic bushfires resulting in loss of life and more than $20 billion in reconstruction and recovery costs – Queensland Reconstruction Authority

The heat map (below) depicts current damage pick-up locations between 1 November 2021 and 31 May 2022. These locations are state roads requiring damage assessments.



The legislation that drives

TMR has the lead for three key areas across Government:

1. Transportation infrastructure, providers and regulation, roads and transport recovery.
2. Hazard specific primary state agency for ship-sourced pollution within scope of the Queensland Coastal Contingency Action Plan (QCCAP) through Maritime Safety Queensland.
3. Administration of the *Transport Security (Counter-Terrorism) Act 2008*.

The program that defines

TMR's Preseason Program has been delivered annually to regions across Queensland since 2010. The Program plays an integral role in the preparedness of TMR staff, systems, and processes ahead of severe weather season and the resilience of Queensland's transport network.

The Program is driven by three core priorities:

- encouraging a sustainable and consistent departmental approach to disruptive event management,
- supporting staff in understanding their roles and responsibilities and
- ensuring TMR is prepared to respond to and recover from disruptive events.

When asked what was beneficial about the Preseason Program exercise, participants offered the following feedback:

"Hearing other people's answers and views on the exercise helped me gain a broader view and expectation of what may happen during a disruptive event"

"The ability to spread knowledge of the disaster space amongst team members that have little to no experience previously to assist in keeping some depth throughout the region"

"The preparedness gained through a trial run, strengthening of networks between and within organisations, and clarity of emergency management roles, particularly my own"

"As an external participant, the operational framework of TMR became clearer. Internally, we identified nine points of continuous improvement (investigation) for our contribution to the effort"

"Excellent engagement from the Disruptive Event Management Team (DEMT) and external stakeholders. Realistic scenario that was well responded to by the DEMT and Transport Management Centre team"

TMR artwork storyline - "Travelling" by Gilimbaa

Meandering pathways wend their way across the land to the sea, opening up country and connecting people. Trade lines are established, knowledge is gained, and new ways of learning and living are passed on to the next generation. We live together in understanding, sharing our cultures, our customs and stories.

The TMR artwork "Travelling" essentially reads as a "road map" of the State of Queensland. Orientated to portrait format with the Rainbow Serpent facing upwards, this artwork explores both the cultural and geographical landscape of Aboriginal and Torres Strait Islander Peoples in Queensland.

Beginning from the bottom of the artwork the Rainbow Serpent slowly meanders it's way northwards creating and forming the landscape. The bold red rectangular motifs represent the built up urban city-scape of the South-East Queensland region. The bright golden dotted strip is indicative of our beautiful coastline and magnificent beaches.

Moving out west over the great divide into dry arid country then up into River country before being engulfed by the Rainforest region of the Cape. Finally arriving at the tip of Queensland to the pristine turquoise waters of the Torres Strait Islands.

The TMR artwork is "Connecting Queensland".

Queensland Government

Australian Red Cross

Telecross REDi

Extreme Weather Response

Heatwaves account for more deaths than all other natural hazards combined in Australia.

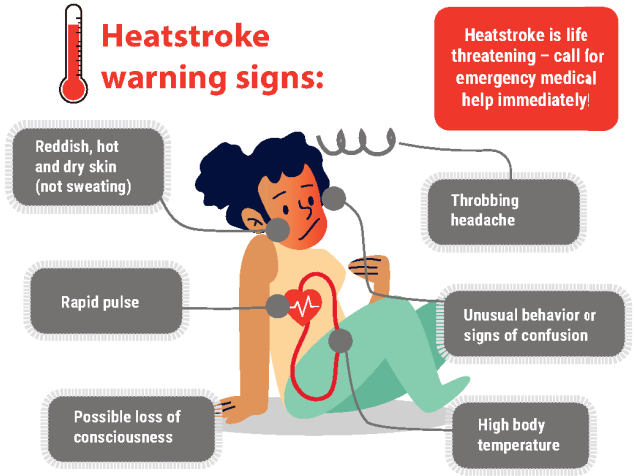
L. Coates, K. Haynes, J. O'Brien, J. McAneney, F.D. De Oliveira, Exploring 167 years of vulnerability: An examination of extreme heat events in Australia 1844–2010, Environ. Sci. Policy. 42 (2014) 33–44.

Program Background

In the summer of 2009, South Australia experienced an extreme heat event that saw an increase in mortality and hospitalisations of vulnerable people across the state. This prompted the development of the Telecross REDi program.

Service Overview

Trained volunteers provide wellbeing phone calls on declared extreme heat days. If a call goes unanswered or if someone is in distress, an emergency procedure is activated to ensure the safety and wellbeing of the client.



Arrighi, J., Singh, R., Khan, R., Koelle, B., Jjemba, E., City Heatwave Guide for Red Cross Red Crescent Branches. 2020. Red Cross Red Crescent Climate Centre

Since 2009

38k calls made

80 active days

5k escalations

168 ambulances called

Authored by Alana Pedler and Eilish Maguire

Swimming in the street: the emergence of sunny-day flooding in Pacific Small-Island nations

Mathilde Ritman[1, 2], Ben Hague, Tauala Katea, Tavau Vaaia, Arona Ngari, Grant Smith and David Jones
[1]Australian Bureau of Meteorology and [2]Monash University
Mathilde.Ritman@bom.gov.au

Motivation

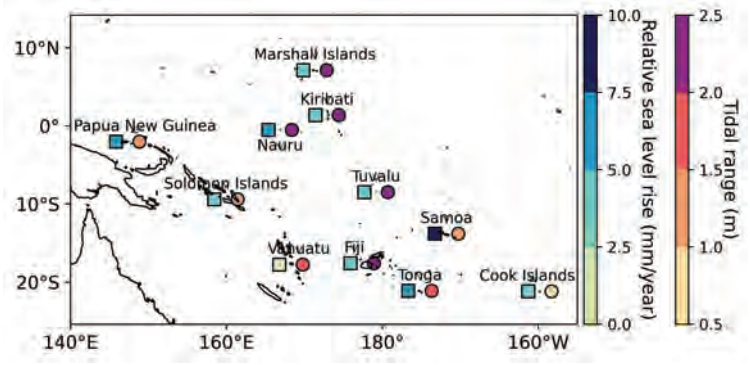
For many low-lying communities in the Pacific, it is increasingly the case that floods can occur under sunny skies and relatively light winds, simply because global sea levels are rising.

Such flooding can be caused by regular high tides alone, thus posing a frequent and predictable threat to property, infrastructure, sanitation and agriculture.

The project

Since 1993, the Bureau of Meteorology and Geoscience Australia have been operating tide gauges in participating Pacific Island nations, as a part of the Pacific Sea Level and Geodetic Monitoring project.

We use the 11 tide gauges with the longest sea level records and assess the past and future changes in tide-driven flooding.



How do we know what sea level corresponds to flood impacts?

- We can use past records of tide-driven flooding
- We need citizen monitoring projects or maintained official records

What does this mean for emergency management?

- In the future, flooding will be more frequent but also more predictable
- Also, compound events, where high tides coincide with extreme weather and wave events, will be more common and more severe

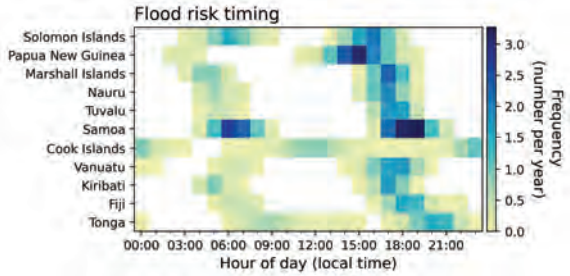
These conditions currently observed in the Pacific, and especially Tuvalu, foreshadow the future of coastal flood hazard globally, including our shores.

(See Ben Hague: The tide is high: new insights into coastal flooding around Australia (and the world) [Weds 24th 16:30–17:00])

Key results

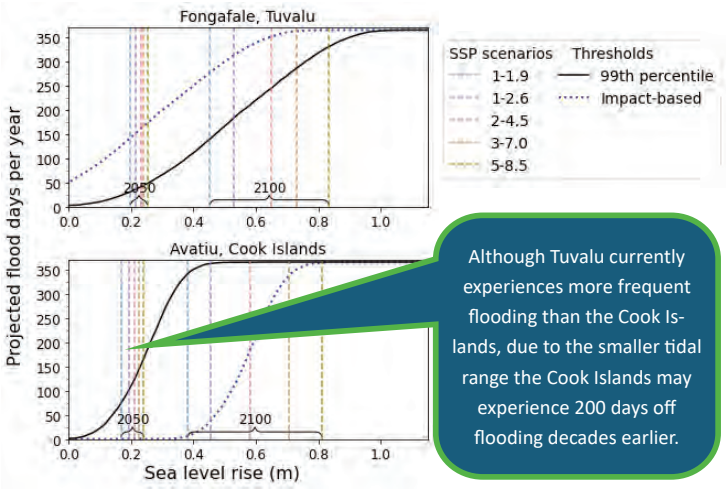
Past changes

- Extreme sea levels have become more common recently
- Food risk is higher in December—April
- Tidal flood risk is controlled by the time of day, due to the 28-day cycle



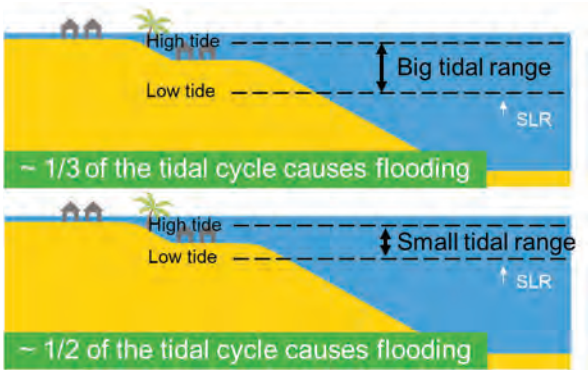
Future changes

- Tidal range controls how rapidly risk changes



Although Tuvalu currently experiences more frequent flooding than the Cook Islands, due to the smaller tidal range the Cook Islands may experience 200 days off flooding decades earlier.

How does tidal range control the change in flood risk?



Mathilde Ritman
@MathildeRitman

STRENGTHENING RESILIENCE:

FITNESS 4 PROGRAMME

FOR SINGAPORE CIVIL DEFENCE FORCE PERSONNEL

As first responders for firefighting, rescue and emergency medical services in Singapore, Singapore Civil Defence Force (SCDF) personnel may experience high psychological distress due to the high-strain work[1]. In a past study which examined 26 high-demand occupations such as police officers and nurses, the job of a firefighter and paramedic were ranked second and third respectively in being the most stressful regarding psychological well-being[2]. As part of the initiative to build **psychological resilience** among SCDF personnel, Emergency Behavioural Sciences and CARE Unit (EBSC), SCDF's psychological unit designed the **Fitness 4 Programme**. It frames personal resilience into **Physical, Mental, Emotional** and **Social Fitness** domains as a way to ease the understanding of mental health and raise awareness of its importance in the workplace.

This study aims to construct **a self-administered and easy to understand checklist with the function of autogenerating a personalised profile and recommendations on building psychological fitness**. This would provide personnel an understanding of their perceived fitness levels, and they could follow the recommendations to improve their fitness and receive relevant intervention. This would potentially strengthen resilience among SCDF personnel[3,4].

METHODOLOGY 1

PARTICIPANTS

241 SCDF personnel aged **18 to 56 years** (234 males, 7 females; M_{age} = 23.63, SD = 6.02)

PROCEDURE

Literature review was first conducted to construct the suitable items to be included into the respective four Fitness 4 domains.

Items were adapted from 6 scales[6–11]. Participants then completed 6 measures[12–17] in March 2021 to examine Fitness 4 Checklist's **internal reliability and construct validity**.

Lastly, **exploratory factor analyses (EFA)** were conducted to assess the best model fit for Fitness 4 Checklist.

As four items from Emotional domain were found to have poor correlation with Fitness 4 Checklist (r < .30), analyses were re-run after removing them.

RESULTS 2

Internal reliability of 40-item Fitness 4 Checklist (α = .95) is high.

DOMAIN	α	CONSTRUCT VALIDITY (r)	
		CONVERGENT	DIVERGENT
Physical *(e.g. If I were to experience a physical injury, I would take extra care of my body to recover from the pain.)*	.84	-.17*	.35*
Mental *(e.g. When I meet with obstacles, I focus on the positive instead of the negative aspects.)*	.90	.66*	-.001
Emotional *(e.g. I can keep my emotions in check when under stress.)*	.77	.63*	.04
Social *(e.g. I can count on my friends when things go wrong.)*	.83	.70*	-.07

*p ≤ .01

The above table generally supports construct validity in Fitness 4 Checklist.

Repeated factor analytic attempts using principal axis factoring extraction with promax rotation have derived the conclusion that there is:

- **1** underlying construct of Fitness 4 Checklist
- with **4** meaningful subcomponents accounted for
- **48.8%** of the variance of Fitness 4 Checklist

IMPLEMENTATION 3

Findings indicate the final 40-item Fitness 4 Checklist to have **good internal reliability** and **strong construct validity** as a single latent construct with four meaningful domains.

For easy access to all SCDF personnel, Fitness 4 Checklist is implemented and uploaded online in **.xlsx** format for download. After completion of the checklist on the first sheet, the personalised profile is automatically generated on the second sheet, which includes:

- the overall and individual domain fitness levels
- the meaning of the profile specific to each domain, and
- what the personnel can do to improve their fitness levels

The personnel can complete the checklist at their own convenience. They are also encouraged to attempt it again after 3 – 6 months to see if their fitness has improved after following the personalised recommendations.

DISCUSSION 4

It is important for emergency responders to understand and improve their fitness in various areas to be able to cope with the needs and challenges of their roles. In this study, a new self-evaluation fitness tool has been implemented to build resilience in the workplace. Further evaluation would help explore the effectiveness of the checklist (e.g. validation analyses and surveying SCDF personnel on how they found it beneficial).

To ensure SCDF personnel understand the importance of mental health and are well-equipped with help resources, SCDF will continue to examine and refine the resilience initiatives for its personnel. In the long run, SCDF envisions developing a well-being index incorporating different health data points for its personnel on an easy-to-access platform such that supervisors and individuals can play an active role in maintaining good personnel health status and seek support if necessary.

Authors

Ng Xin Ying (Psychologist), Toh Shi Min (Senior Principal Psychologist), Khoo Swee Giang (Lead Psychologist)
Emergency Behavioural Sciences and CARE Unit | Singapore Civil Defence Force

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Have queries or feedback? Get in touch with us!

Scan the QR code to receive your personalised profile and view the rest of the references listed.

SCDF The Life Saving Force ...for a safer Singapore

Reflections of providing medical support to a flood affected community in Greater Sydney

Dwight Robinson RN, MACCCN, MAIES (NSW Ministry of Health)

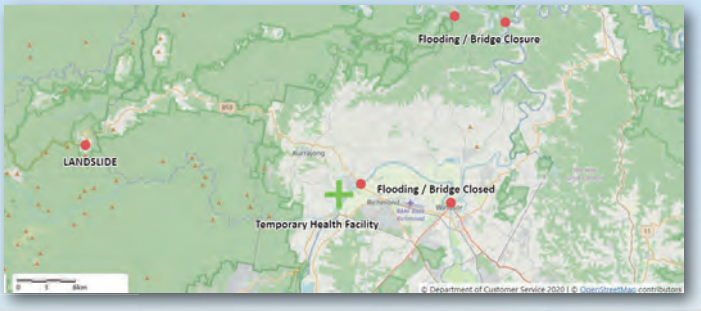
Situation

In March 2021 an extreme widespread rainfall event caused major flooding throughout the Nepean—Hawkesbury catchment, Sydney NSW[1].

Rainfall and flooding resulted in the closure of key bridges across the Hawkesbury River and a major landslide across Bells Line of Road near Mt Tomah.

These incidents resulted in the complete isolation of thousands of people in the region[2].

Whilst NSW Ambulance (NSWA) had pre-deployed additional assets to the community based on previous events, this was the first time that the community had been completely isolated. Utilising NSWA helicopters was the only way that ill or injured community members could be transported to hospital which quickly became very resource intensive.



Mission

Under NSW Emergency Management Arrangements[3,4], the State Health Services Functional Area Coordinator (HSFAC) deployed a Health Response Team (HRT) and the NSW Medical Assistance Team (NSWMAT) cache to North Richmond. The intent of the State HSFAC included the following objectives

- Support existing Triple Zero NSWA response (not to operate as a 'field hospital')
- Provide 24/7 definitive care for patients, or stabilisation and transfer (via helicopter retrieval) of patients requiring hospital admission.
- Response Team to remain in place until flooding recedes and road access is restored.



Execution

- The HRT and NSWMAT cache were deployed to the temporary health facility via helicopter (government and non-government)
- The HRT was comprised of senior doctors, nurses and paramedics
- The health facility remained operational for five days
- Clinical presentations included
  - People across all age groups
  - Obstetrics
  - Medical and surgical presentations
  - Minor trauma presentations
  - Palliative care and end of life

Administration

- The HRT members were all senior clinicians with previous health deployment experience
- Accommodation was provided onsite
- Catering was available through Meals Ready to Eat as part of the NSWMAT cache. However, the local community provided a number of meals to the HRT.


Command & Communications

- Local command was provided by a very experienced Emergency Medicine Physician whilst the State HSFAC provided overall Control
- Communications were maintained via mobile, email and NSWA Government Radio Network methods
- Patient clinical records were created in handwritten form and collected into a mission medical record archive as per NSW Ministry of Health standard procedures
- All patients received either a referral note (when transferred) or a discharge letter with instructions for routine follow-up

Key Learnings

i) The HRT managed a complex array of clinical presentations safely and efficiently.

ii) The HRT deployment provided successful operational support and relief to NSWA teams.

iii) The HRT deployment resulted in a marked reduction in helicopter transfers to hospital.

iv) The maintenance of local general practitioner and pharmacy operations greatly assisted the overall health response.

v) The NSWMAT cache provided an excellent assortment of equipment, medications and consumables to allow a wide range of healthcare interventions.

vi) The location of the temporary health facility, whilst relatively austere, was deemed suitable for future operations.

vii) During 2022, road and bridge closures due to flooding have occurred a further three times. However, Bells Line of Road remained open. To date, a HRT has not been re-deployed to the region.

References

1. Bureau of Meteorology (2021) *Special Climate Statement 74 extreme rainfall and flooding in eastern and central Australia in March 2021.*
2. Infrastructure NSW (2021) *Hawkesbury-Nepean River March 2021 Flood Review .*
3. NSW Government (2018) *New South Wales State Emergency Management Plan*
4. NSW Ministry of Health (2014) *New South Wales Health Services Functional Area Supporting Plan (NSW HEALTHPLAN)*
5. All photos, unless otherwise stated, Robinson, D. (2021)

SCDF'S PROFESSIONAL DEVELOPMENT FRAMEWORK

AN EVOLVING ORGANISATIONAL LEARNING LANDSCAPE 1

The Singapore Civil Defence Force's (SCDF) training philosophy of "**Train as We Operate, Learn as We Innovate**" underpins our technology and evidence-based approach towards organisational learning.

A new progressive learning strategy for the pandemic era lets officers **learn anytime, anywhere**. We co-developed with industry experts 14 hours of E-Learning topics (e.g. Firefighting, Fire Investigation, Rescue and Medical Triaging), with an additional 65 hours planned. Proliferating micro-learning content through mobile platforms (e.g. LEARN and HTLMS) has **decentralised digital-first learning**.

SCDF's officers are **enhancing cross-cutting skills** through **mandatory E-courses** covering topics such as Data Literacy, Digital Literacy (Cyber and Data Security), Behavioural Insights and Design Thinking.

SCDF trainers **constantly upskill** to deliver quality training through **online platforms** such as Zoom.

Link to E-learning courseware.

EXISTING PROFESSIONAL DEVELOPMENT INITIATIVES 2

SCDF's professional development initiatives as well as its training and learning (T&L) landscape **build holistic competency**, transforming SCDF into a **high-performance organisation** with a skilled workforce:

DEPTH OF EXPERTISE

DEEPENING PROFESSIONALISM

- Accreditation/SkillsFuture (SSG) Certification
- SCDF Expert Tracks and Trainers' Competency Development Roadmap
- Memorandum of Understanding (MOU)/Collaboration with Institutes of Higher Learning (IHL)/Small and medium-sized enterprises (SME)

CONTINUOUS EDUCATION AND DEVELOPMENT

- Milestone Courses
- Officer's Core Development Matrix (OCDM)
- General Process Skills (GPS) Courses
- Ad-Hoc Training
- Learning & Development Scheme (LDS)
- Continuous Education Training (CET) Framework
- Upskilling in Cross Cutting Skills (e.g. Digital, AI, etc)
- SCDF Leadership Crucible
- SCDF Pride & Care (P&C) Framework

FOUNDATIONAL PROFESSIONAL TRAINING

- Learning Contracts for foundational courses (RCC, SCC)
- "Digital for Life" Mindset
- Individual Development Programme (IDP)

CAREER PROGRESSION

DEEPENING PROFESSIONALISM

Deepening expertise further **upholds and strengthens SCDF's credibility**. We create **enhanced pathways** in our mission-critical functions through SCDF Expert Tracks and collaborations with Institutes of Higher Learning (IHLs) and professional bodies.

CONTINUOUS EDUCATION AND DEVELOPMENT

We encourage our officers to **continuously maintain, enhance and upgrade** their skillsets. Initiatives such as SCDF's Continuous Education and Training (CET) Framework support continuous informal learning. Additionally, frameworks like the SCDF Leadership Crucible instill key command competencies. The revised SCDF P&C Framework covers SCDF's P&C core values.

FOUNDATIONAL PROFESSIONAL TRAINING

SCDF develops our officers through **upstream engagement**, which begins when a new officer enters the Force. The Civil Defence Academy (CDA) foundational courses teach **digital learning and data-driven research** and **nurture lasting mindsets for lifelong learning**. The Initial Development Programme (IDP) for new officers develops competencies in areas including public administration, writing/communications and personal development.

FUNDAMENTAL APPROACHES FOR SUSTAINED PROFESSIONAL DEVELOPMENT 3

The three key thrusts of SCDF's Professional Development Framework align professional development with SCDF's transformation journey.

DEEPENING MASTERY

SCDF Expert Tracks

SCDF's existing Expert Tracks in Urban Search and Rescue (USAR) and Hazardous Material (HAZMAT) enhance pathways and training roadmaps that deepen expertise and mastery in mission-critical functions.

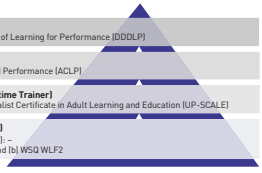
In 2022, two new Expert Tracks have been introduced:

Paramedicine
Supports SCDF's establishment of the National Emergency Medical Services Training Centre (NETC) as the National Authority of Emergency Medical Services (EMS) training.

Fire Science
SCDF is the National Authority for Fire Safety and Fire Investigation, and Incident Manager for all Fire Incidents.

Trainers' Competency Development Roadmap (TCDR)

The Trainers' Competency Development Roadmap (TCDR) equips trainers with essential instructional competencies through a tiered qualification system. The necessary courses were reviewed and updated in 2021:



NURTURING AND SUSTAINING VIBRANT T&L ECOSYSTEMS

Dynamic Continuous Education Training

SCDF's CET Framework involves a **yearly CET Workplan** that combines three in-service workshops with smaller 'pop-up' learning ecosystems. Examples of these ecosystems include:

EMS Week
- Focus group discussions
- "EMS Battleground, Simulation Wars competition" - challenge participants' on-scene EMS response and tests clinical skills, command, control and situational awareness

Data Analytics Upskilling
- Develops Data Analytics skills
- Sustainable ecosystem including traditional training courses for upskilling and interactive activities such as Data Arcade Tournament (DAT) and Data Champion (DC) Bootcamp

Virtual Night Lectures
- Held jointly involving all divisional fire stations
- Leverages digital-first learning capabilities to create an organic system for knowledge and experience sharing

Institutionalising Impactful Learning through Coaching & Mentoring

The **Individual Learning Action Plan (ILAP)** shapes staff and organisational professional development. It upskills individuals, then strategically deploys their newly acquired skills to achieve SCDF's performance goals. Our **supervisory coaching and mentoring** culture promotes personalised continuous learning.

DIGITALISING SCDF'S T&L ECOSYSTEMS

Training & Learning Enterprise System (TALENTS)

SCDF's customised TALENTS engages officers on training, providing real-time **performance feedback**. Its collated T&L data insights **multiply learning outcomes**, boosting talent development. Gamification, through T&L system avatars, makes learning **immersive**. This shift towards digitalisation **strengthens the HR-Training-Operations nexus**.

CONCLUSION 4

A LEARNING ORGANISATION

SCDF's Professional Development Framework creates a supportive learning ecosystem to establish SCDF as a premier Training and Learning Organisation committed to maximising the potential of our workforce.

Authors

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Have queries or feedback?
Get in touch with us!

SCDF
The Life Saving Force
...for a safer Singapore

COMING SEPTEMBER 1

Australian Fire Danger Rating System

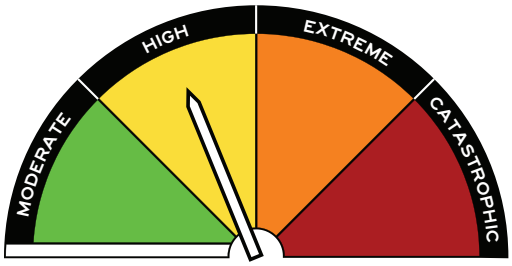
The Australian Fire Danger Rating System

Improving Community Safety

The AFDRS has been informed by social research that found most Australians in Fire Risk Areas do not understand or act on Fire Danger Ratings.

There was overwhelming support for a simpler, action-based system, while maintaining the watermelon and similar colour scheme to maintain familiarity.

The Australian Fire Danger Ratings (AFDRS) levels are:



MODERATE
Plan and prepare

HIGH
Be ready to act

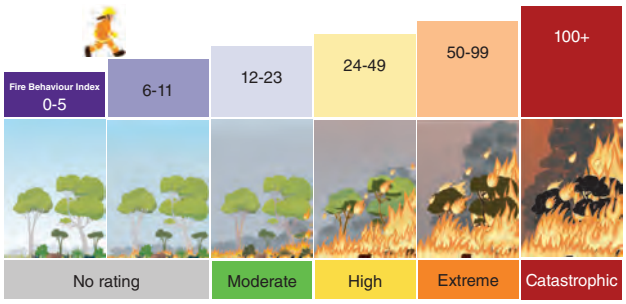
EXTREME
Take action now to protect life and property

CATASTROPHIC
For your survival, **leave bushfire risk areas**

The AFDRS will also include '**no rating**' for those days where **no proactive action is required**.

Improving Operational Decision Making

Introducing the Fire Behaviour Index



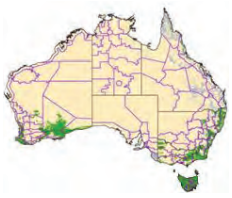
Features of the FBI:

A Fine Scale of Fire Behaviour	An index that provides detailed information that can be used with greater confidence.	The FBI is expressed in whole numbers from 0 to 100+. It uses decades of improved data, technology and science to deliver greater accuracy and confidence in forecasts.
Stepped Categories	Supports operational decision-making.	Links transitions in fire behaviour to implications for fire operations using step-up tables.
Fuel Type Specific	More precise results.	The AFDRS uses eight different fire behaviour models and 22 fuel types and can expand as new knowledge is gained.
Nationally Consistent	Supports cross border operations and resource-sharing.	Designed so that index values express similar operational consequences in fuel types anywhere in Australia.

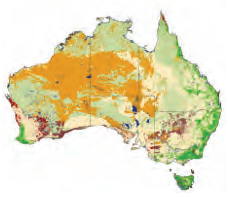
What are the new fuel models?

How does this impact on communities? (old grass/forest v new 8 different fuel types)

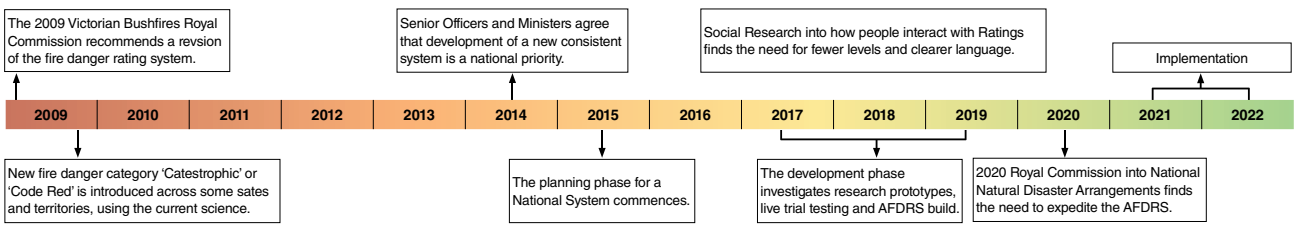
Old grass/forest fuel types



New map as indication of fuel types



How did we get here?



afdrs@afac.com.au
www.afac.com.au/initiatives/AFDRS

Scan for more information and resources
or vist afac.com.au and search 'AFDRS overview'

Australia's warning system is changing

Know the signs in an emergency

An emergency can happen at any time, and you need to know what to do.

The Australian Warning System is a new national approach to information and warnings during emergencies like bushfire, flood, storm, extreme heat and severe weather.

The Australian Warning System uses a nationally consistent set of icons and calls to action. It has been designed based on feedback and research across the country and aims to deliver a uniform approach to these types of emergencies, no matter where you are.

What's changing?

Up until now there has been different warning systems for different hazard types across Australia. The new Australian Warning System aims to provide consistent warnings to Australian communities so that people know what to do when they see a warning level.

If you live in a bushfire risk area, you may already be familiar with the new warnings – they were implemented across bushfire agencies in the lead up to the 2020-21 bushfire season.

Over time, the Australian Warning System will be used for more types of incidents in more places around the country.

Where will you see warnings?

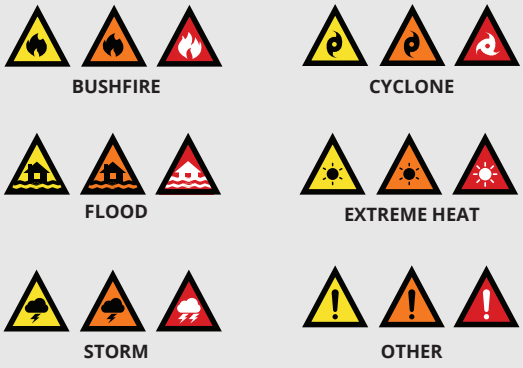
Australia's fire and emergency services aim to provide you with timely and relevant information during emergencies. You may receive warnings on your phone, see them online or hear them on the radio and in your community.

THERE ARE THREE WARNING LEVELS:

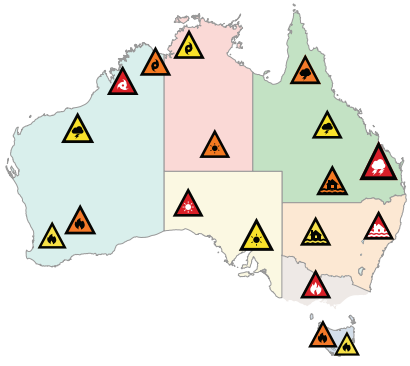
ADVICE (Yellow):
An incident has started. There is no immediate danger. Stay up to date in case the situation changes.

WATCH AND ACT (Orange):
There is a heightened level of threat. Conditions are changing and you need to start taking action now to protect you and your family.

EMERGENCY WARNING (Red):
An Emergency Warning is the highest level of warning. You may be in danger and need to take action immediately. Any delay now puts your life at risk.



When fully implemented, the Australian Warning System will mean that the information being received by the community will be nationally consistent across a range of hazards.



australianwarningsystem.com.au

Australian Government
National Recovery and Resilience Agency

Australian Institute for Disaster Resilience

RESIDENTIAL FIRE FATALITIES PROJECT

On average, more than one person dies in a house fire in Australia every week. Older people, young children, people who smoke, people who live alone, people with a disability and people who live in areas of socio-economic disadvantage are more at risk from house fires.

Residential fires cause more deaths each year than floods, storms and bushfires combined, and the rate has remained steady over the past decade.

Between July 2003 – June 2017 at least 900 people died in preventable residential fires in Australia, averaging 64 deaths per year. This equates to approximately the same number of deaths as occurred during the Black Saturday bushfires every three years.

These alarming statistics have been revealed as part of a landmark study more than 14 years in the making: *Preventable Residential Fire Fatalities in Australia: July 2003 to June 2017.*

RESIDENTIAL FIRE SAFETY POSITION

In 2020, AFAC Council endorsed the *Residential Fire Safety Position*, reinforcing residential fire safety is essential to the protection of human life.

It is the role of AFAC member agencies to engage with community members, both directly and indirectly, to enable them to develop understanding of the risks of fires in the home and identify appropriate actions to minimise these risks. To support this, AFAC has formulated a set of evidence-based principles to reduce the risk of injury and death from residential fires. These principles are:

1. Human life should be valued above all else.
2. The needs of members of the community at higher risk should be prioritised.
3. AFAC members should take a community-centred approach to minimising residential fire risk.
4. AFAC members need to be adaptive, agile and collaborative in addressing risks associated with residential fire.
5. AFAC members should advocate and drive technological change that reduces the risk and impact of residential fire.
6. Activities should be informed by lessons learned, research and evidence.

For further information scan QR code or visit: www.afac.com.au/insight/doctrine/article/current/residential-fire-safety-position

RESIDENTIAL FIRE FATALITY AND INJURY STRATEGY: TOWARDS ZERO FATALITIES

In 2021, AFAC Council endorsed the *Residential fire fatality and injury strategy: towards zero fatalities*. The strategy develops recommendations from the 2019 study across two key areas of action:

- developing and maintaining national fire fatality and injury datasets
- strengthening partnership approaches to reduce residential fire risk.

Better data will enable fire services and other stakeholders to better understand and address the key risk factors for fire injuries and fatalities and to evaluate the effectiveness of fire prevention interventions. Strengthening partnership approaches will highlight good practice that builds on the concept of shared responsibility for the fire safety of those more at risk from fire in their home.

Together these actions will help fire services and other stakeholders, individually and collectively, to focus on actions to reduce the toll from residential fires in Australia.

For further information scan QR code or visit: www.afac.com.au/insight/risk/article/current/residential-fire-fatality-and-injury-prevention-strategy-towards-zero-fatalities

Australian Institute for Disaster Resilience

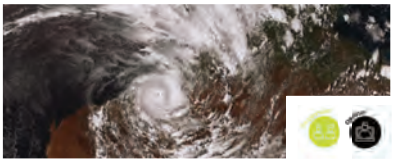
Professional Development

Equipping individuals and groups to achieve improved resilience outcomes in their organisations and communities.

AIDR offers regular professional development and learning opportunities to benefit those working and volunteering in disaster resilience across a range of sectors.

Meteorology for Disaster Managers

Take your understanding of weather and natural hazards to the next level.



Facilitating Successful Debriefs

Debriefing offers a valuable opportunity to review activities undertaken.

Decision Making Under Pressure: New Skills for the New Normal

Enhance your ability to make high consequence decisions.

Volunteer Leadership Program

The Volunteer Leadership Program equips emergency sector volunteers with the skills and confidence to grow as leaders.

Recovery Matters webinar series

This webinar series invites a broad range of expert speakers to share their experience and insights on disaster recovery.

Leading Multi Agency Teams in Deep Uncertainty

This masterclass focuses on enhancing the capability of leaders to launch and manage high functioning interdependent teams to operate effectively in disaster, crisis and adversity.

Australian Disaster Resilience Conference

The Australian Disaster Resilience Conference is the nation's premier event focused on contemporary disaster resilience practice and research.

The conference brings together a diverse and passionate crowd from a range of sectors to share knowledge and build connections for a disaster resilient Australia.

Find out more: aidr.org.au/adrc

Further information

In additional to the public events program, AIDR can customise professional development opportunities to suit the needs of your organisation. Visit knowledge.aidr.org.au/learn to:

- Explore further details about what's on offer
- Plan professional development for individuals and organisations
- Access resources and view proceedings from previous professional development events.

Talk to us about your professional development goals. Email us at events@aidr.org.au.

Explore online

knowledge.aidr.org.au/learn

KNOWLEDGE.AIDR.ORG.AU/LEARN

Australian Government
National Recovery and Resilience Agency

Australian Red Cross

afac

afac.com.au/initiative/nrsc +61 3 9419 2388 afac@afac.com.au AFACnews AFACnews AFAC News

AFAC NRSC

National Resource Sharing Centre

AFAC NRSC coordinates and facilitates international and interstate deployments through its established partnerships and national arrangements, authorised by the Commissioners and Chief Officers Strategic Committee (CCOSC). AFAC NRSC supports CCOSC as an enabler of national capability for fire and emergency services.

Our systems, networks and relationships

AFAC NRSC is continuing to develop systems such as the National Deployment Registry, and nationally consistent tools and resources that support both intrastate, interstate and international deployments.

Interstate

AFAC NRSC supports CCOSC by facilitating and coordinating interstate resource sharing across Australia and New Zealand. In response to significant events and resource requests, the AFAC NRSC provides deployment managers to act in a coordination role, maintain situational awareness, and assist jurisdictions with their resource requirements.

International

AFAC NRSC is responsible for coordinating deployments of Australasian wildfire management resources to and from North America, and maintains our partnerships with the Canadian Interagency Forest Fire Centre (CIFFC) and the National Interagency Fire Center (NIFC) in USA. AFAC NRSC provides critical roles including national liaisons, deployment management, field liaisons and duty officers to ensure the health and safety of teams deployed.

Australian deployment to Canada in 2021

An Australian contingent of 55 fire management specialists deployed to Canada on 27th July for a five-week deployment as part of an international effort to assist with wildlife suppression efforts. The deployment was made up of personnel from fire, land management and state emergency service agencies in New South Wales and Western Australia.

The participating agencies included NSW State Emergency Service, Fire and Rescue, NSW Rural Fire Service, NSW Parks and Wildlife Service, WA Department of Fire and Emergency Services and WA Department of Biodiversity, Conservation and Attractions.

Following the deployment, a number of key lessons and reflections were identified:

> The outcomes of the after-action review and debriefs highlight the overall positive outcome of the international deployment and the experiences gained from those involved, including deployees and support personnel.

> Early planning amongst AFAC NRSC and resource managers to undertake consistent risk analysis to address added challenges presented by COVID was critical, as was jurisdictions making determinations to deploy or not as early as possible.

> There is an ongoing opportunity to improve and invest in systems and processes that better prepare Australian and New Zealand personnel for international deployments, including online systems, tools that support standardisation of roles, and training at home to prepare for prolonged field conditions overseas.

Australian contingent depart Canada. Image: NSW RFS

Anticlockwise from top left: South East Fire and Rescue Victoria Deployment (QFES). Western Australian personnel arrive in NSW Northern Rivers during the flood recovery response (NSW SES), Aerial view of Lismore region on 3 March 2022 (NSW SES)

NSW/QLD flood assistance 2022

Extreme rainfall in late February and early March 2022, caused by the La Niña cycle in south-east Queensland and NSW, resulted in widespread flooding across parts of the eastern seaboard.

AFAC NRSC supported the response to these floods through one of its largest deployments of flood and storm responders to date. On 27 February, 15 swift water rescue specialists from Fire Rescue Victoria, assisted flood response in the Beenleigh area between 28 February and 6 March.

On 1 March, deployments commenced to NSW following a request for assistance from NSW SES. Interstate deployments into NSW concluded on 12 April, with AFAC NRSC supporting deployments of over 770 personnel, supported by all other Australian states and territories. Resources included swift water rescue technicians and flood boat crews, incident management specialists, field crews, command and administration staff, storm crews, and community liaison officers.

NRSC Doctrine published on the AFAC website

To maintain AFAC NRSC's strategic intent and operational support capability on behalf of CCOSC, a robust and clear doctrine framework has been created and organised into a dedicated doctrine repository.

The collection of NRSC Doctrine represents a body of knowledge, made accessible to AFAC members and staff in support of AFAC NRSC's core business, interstate and international resource sharing.

Its purpose is threefold:

1. To ensure consistency in the application of arrangements and procedures, across jurisdictions. This will lead to improved quality and outcomes.
2. To improve interoperability across jurisdictions, partners and stakeholders.
3. To support local needs, reduce duplicated effort and optimise learning.

AFAC NRSC Doctrine has been collected in two main groups: Fundamental, and Procedural and Technical. All of NRSC's Fundamental Doctrine is widely accessible on the NRSC webpages on the AFAC website.

To access NRSC's Procedural and Technical Doctrine, AFAC member credentials are required.

For more information, please visit:

www.afac.com.au/initiative/nrsc

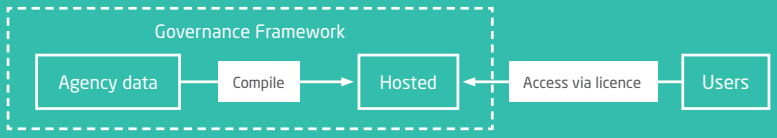
Improving Bushfire Data Layers for Australia

AFAC is partnering with the Australian Research Data Commons (ARDC) through the Bushfire Data Challenges Program to improve access to fuel and fire history data and establish a data sharing framework.

Projects

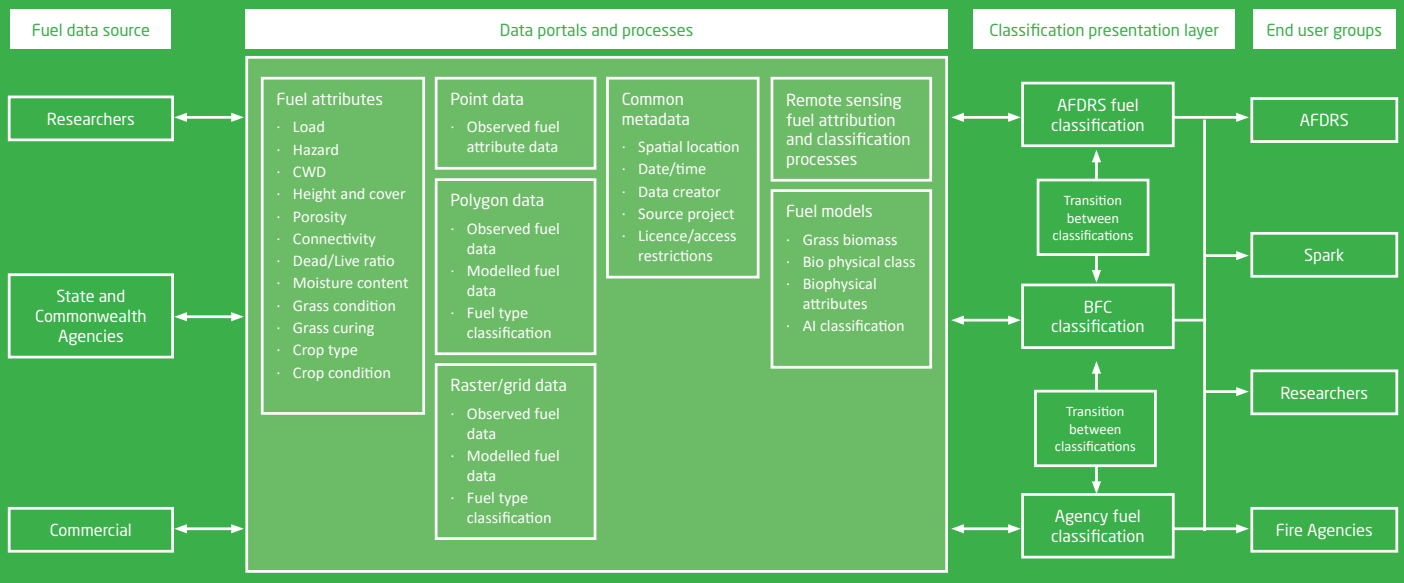
- Bushfire history
- Bushfire fuel
- Data Governance Framework
- Fire behaviour modelling platform

The Data Governance Framework will streamline licencing agreements between agencies and users to improve access to data.



National bushfire fuel data concept

The National Bushfire Fuel Data Concept outlines the complexity of managing, accessing and utilising data.



Stakeholders

ANU	EMSINA	TERN
CSIRO	GA	DAWE

FAIR data principles

Making data more Findable, Accessible, Interoperable, and Reusable (FAIR) to enable maximum use and reuse.

Australian Research Data Commons

This project is supported by the Australian Research Data Commons (ARDC). The ARDC is funded by NCRIS.

AFAC DOCTRINE

ALIGNED TO OUR 6 KEY STRATEGIC DIRECTIONS 2022 - 2026

Our most significant intellectual property asset is our suite of doctrine publications. They are evidence-based and vested as the official view by the AFAC National Council.

Learn more about our doctrine classification and strategic directions.

AFAC.COM.AU/DOCTRINE

1 RESILIENT COMMUNITIES

- Bushfires and Community Safety
- Classifying Bushfire Fuels in Australia
- Fire Risks from the Management of Gamba Grass in Northern Australia
- Fire Safety in the Built Environment
- Flood and Severe Weather Community Safety
- National Position on Prescribed Burning
- Residential Fire Safety Position
- Resilience through Community Risk Reduction
- Wind Farms and Bushfire Operations
- Change Your Clock, Change Your Smoke Alarm Batteries
- Comm Safety Messaging, Catastrophic Bushfires, Black Saturday Lessons*
- Community Safety Announcements for Flood Risk Communication
- Community Safety Messaging: Use of NBN in Emergency Events
- Design, Installation and Maintenance Requirements for Dry Hydrants
- Fire Brigade Intervention Model Manual
- Fire Safety for Impulse (Jet) Fans in Car Parks
- Fire Safety for Road Tunnels
- Fire Safety in Waste Management Facilities
- Fire Safety Principles for Massive Timber Building Systems
- Fire Safety Requirements for Automated Vehicle Parking Systems
- Intervention Programs in Australia for Juveniles Who Display Fire Risk Behaviours
- People in Cars During Bushfires
- Prevention, Preparedness and Response to Buildings w/ Combustible Cladding*
- Principles for Educating Children in Natural Hazards and Emergencies
- Smoke Alarms in Residential Accommodation

2 TRUSTED RESPONSE

- Class A Recycled Water for Firefighting Purposes
- Firefighting Water Point Markers
- Management of Remotely Piloted Aircraft (RPA) at or Near Fire and Emergencies and Prescribed Burning Operations
- Use of Chemicals in Bushfire Control and Prescribed Burning
- Use of Lookouts, Awareness, Comms, Escape Routes, Safety Zones (LACES)
- Use of Personal Fire Shelters in Wildfires
- Acetylene Cylinder Incidents
- Compressed Air Foam Systems (CAFS)
- Emergency Medical Response
- Emergency Planning and Response to Protect Life in Flash Flood Events
- Emergency Services Support Role to Deliberate High Threat Incidents
- First Responders Attending a Swift Water Incident
- Guide to Recognition of Prior Learning for Fire and Emergency Services Organisations
- Incidents involving Electric Vehicles
- Large Animal Rescue Operations
- Managing Bushfire at the Urban-Rural Interface
- Managing Bushfire Smoke Exposure
- Managing Fatigue in Emergency Response
- Managing Heat Stress in Emergency Response
- Managing Hydration in Emergency Response
- Managing Tree Hazards
- Public Safety Mobile Broadband
- PV Arrays Systems
- Responding to Incidents Involving Landfill Gas Leaching
- Use of Temporary Flood Barriers
- Urban Search and Technical Rescue Canine Capability
- Vertical Rescue

3 CREDIBLE INFORMATION

- Classifying Bushfire Fuels and Storing Bushfire Fuels Information
- Bushfire Fuel Classification
- Case Studies: Sharing and Retaining Knowledge by Practice and Research
- Data Quality Assessment Guideline
- Fire History Data Dictionary
- Incidents Involving PV Arrays and Battery Energy Storage Systems
- Landscape Fire Performance Measures Data Dictionary
- National Damage Assessment Data Set and Dictionary, Phase 2 Assessments

4 SAFE, CAPABLE AND DIVERSE WORKFORCES

- Coaching and Mentoring: Research Insights into Good Practice
- Eligibility Criteria for the National Emergency Services Memorial
- Endorsement of Level 3 Incident Controllers
- Fire and Emergency Services and Climate Change
- Role of Chiefs in the Context of AFAC
- WHS Hazard Management Framework for Emergency Responders
- Aerial Appliance Safe Use and Minimum Maintenance
- Aerial Appliance Strategy
- Aerial Ignition Operations
- AFAC Operational Assurance Activities
- Fire and Emergency Aviation Training and Assessment
- Managing Fatigue in Emergency Response
- Volunteer Inclusion Guideline

5 KNOWLEDGE, INNOVATION AND RESEARCH

- All AFAC doctrine is informed by research

AIDR HANDBOOK COLLECTION

The AIDR Handbook Collection is developed through consultation with a broad range of stakeholders from the emergency management and disaster resilience sectors.

- Australian Emergency Management Arrangements
- Community Engagement for Disaster Resilience
- Communities Responding to Disasters: Planning for Spontaneous Volunteers
- Community Recovery
- Disaster Resilience Education for Young People
- Emergency Planning
- Evacuation Planning
- Flood Emergency Planning for Disaster Resilience
- Health and Disaster Management
- Incident Management
- Land Use Planning for Disaster Resilient Communities
- Lessons Management
- Managing Exercises
- Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia
- National Emergency Risk Assessment Guidelines (NERAG)
- Public Information and Warnings
- Safe and Healthy Crowded Places
- Systemic Disaster Risk
- Tsunami Emergency Planning in Australia

6 EFFECTIVE AND TRANSPARENT GOVERNANCE

- Strategic Directions for Fire and ES in Australia and New Zealand 2022-2026
- What Is Operational Success for Fire and Emergency Services?
- Leadership Capability Framework
- Aerial Appliance Maintenance
- Emergency Service Vehicle Warning Devices
- Fundamentals of Doctrine: Best Practice Creation
- Heavy Tanker Cab Chassis
- Identification of Portable Fuel Containers
- Medium Tanker Cab Chassis
- Operational Response Vehicle Tyre Management
- Optimising the Service Life of Operational Response Vehicles
- Rural Firefighting Vehicles Burn-over Protection
- Selection of Appropriate Respiratory Protective Devices During Bushfires
- Selection, Use, Care and Maintenance of Operational Equipment - General Requirements
- Selection, Use, Care and Maintenance of Personal Protective Equipment
- Selection, Use, Care and Maintenance of Operational Equipment - Part 1: Water Delivery

DOCTRINE — CLASSIFICATION

CAPSTONE
FUNDAMENTAL
PROCEDURAL
AIDR HANDBOOK

*Accurate as of July 2022. Some titles are abridged.

afac

CHAMPIONS OF CHANGE
FIRE AND EMERGENCY

Everyday Respect

Start the conversation.

We all have a part to play in creating workplaces that are genuinely inclusive.

Everyday disrespect is the subtle forms of behaviour – inappropriate comments, jokes and assumptions – that play into stereotypes or that exclude people on the basis of gender, race, LGBTQ+ identities, disability or age.

It can impact people's health and well-being and career decisions, as well as workplace culture and performance.

▸ Find out more

www.afac.com.au/initiative/diversity-and-inclusion

Images: ACT ESA, CFA, DELWP, DFES, FENZ, NSW RFS, NTFRES, QFES, TFS and VIC SES

STANDARDS

AFAC play a key role in the development and revision of Australian and International Standards which advance and guide the interests of the broader emergency management sector, these include:

> Standards Australia

> Joint Standards Australia and New Zealand Standards committees (AS/NZS)

> International Standards Organisation (ISO)

> National Fire Protection Association (NFPA)

> Fire Protection Association Australia (FPAA)

> National Association of Steel-Framed Housing Inc. (NASH)

AFAC and its members have a significant voice to drive progress in the sector through the Standards Network of representatives. All AFAC member agencies are consulted when comment is provided in relation to the development or revision of Australian or International Standards, ensuring the collective view of AFAC member agencies is put forward.

Primarily AFAC participation focuses on:

> management of fire related risks

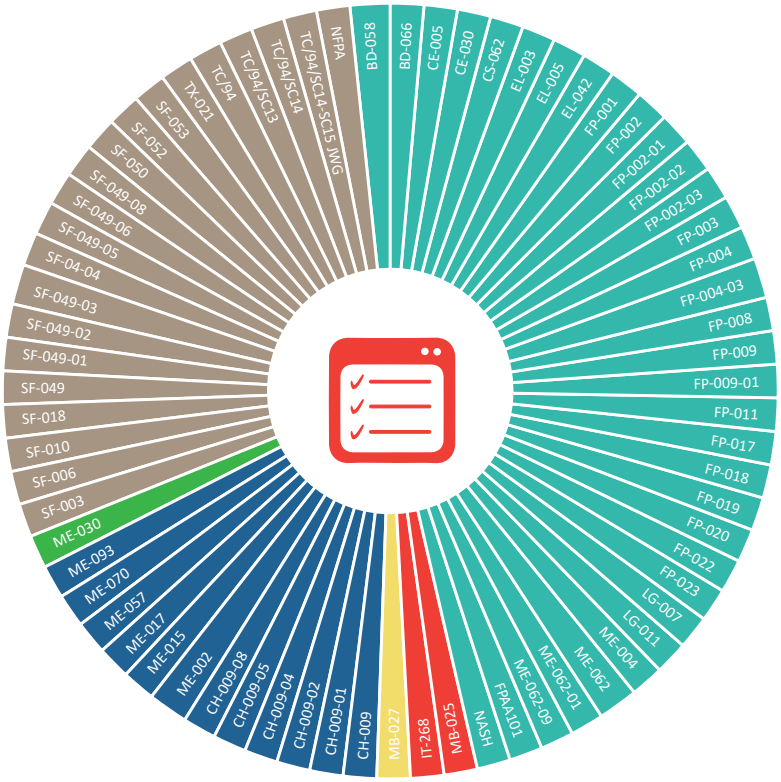
> fire protection and fire safety

> standards for firefighter's personal protective equipment

> fire protection systems and equipment

> fire safety systems and equipment

> storage, transportation and handling of dangerous goods/ hazardous materials.



AFAC is currently represented on the following committees:

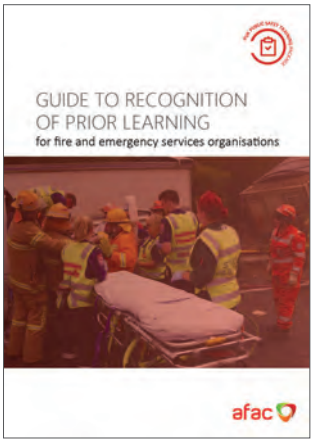
Australian Institute for Disaster Resilience	
IT-268	Smart Cities and Communities
MB-025	Security and Resilience
Built Environment and Planning Technical Group	
BD-058	Thermal Insulation
BD-066	Prefabricated Concrete Elements
CE-005	Explosives
CE-030	Maritime Structures
CS-062	Solid Fuel Burning Appliances
EL-003	Electric Cables and Wires
EL-005	Secondary Batteries
EL-042	Renewable Energy Power Supply Systems and Equipment
FP-001	Maintenance of Fire Protection Equipment
FP-002	Fire Detection, Warning, Control and Intercom Systems
FP-002-01	Installation Standards
FP-002-02	Product/Panel
FP-002-03	Network Monitoring
FP-003	Fire Extinguishers
FP-004	Automatic Fire Sprinkler Installations
FP-004-03	Combined Sprinkler & Fire Hydrant Systems
FP-008	Fire Pumps & Tanks
FP-009	Fire Hydrant Installations
FP-009-01	Drafting Subcommittee AS 2419.1
FP-011	Special Hazard Fire Protection Systems
FP-017	Emergency Management Planning – Facilities
FP-018	Fire Safety
FP-019	Passive Fire Protection (Chair)
FP-020	Construction in Bushfire Prone Areas
FP-022	Fire prevention and protection for mobile and transportable equipment
FP-023	Tunnel Fire Safety
LG-007	Emergency Lighting in Buildings
LG-011	Photoluminescent Exit Signage
ME-004	Lift Installations
ME-062	Ventilation and Airconditioning
ME-062-01	Ventilation and Airconditioning
ME-062-09	Ventilation and Airconditioning
FPAA101	Automatic Fire Sprinkler Systems Design and Installation
NASH	Steel Framed Construction in Bushfire Areas

Community Engagement Technical Group	
MB-027	Ageing societies
Hazmat and CBRN Technical Group	
CH-009	Safe Handling of Chemicals
CH-009-01	Emergency Procedure Guide Working Group 1
CH-009-02	Emergency Procedure Guide Working Group 2
CH-009-04	Emergency Procedure Guide Working Group 4
CH-009-05	Emergency Procedure Guide Working Group 5
CH-009-08	Emergency Procedure Guide Working Group 8
ME-002	Gas Cylinders
ME-015	Storage and Handling - Liquefied Petroleum Gases
ME-017	Flammable and Combustible Liquids
ME-057	Road Tankers for Hazardous Liquids and Gases
ME-070	Liquefied Natural Gas Storage and Handling
ME-093	Hydrogen Technologies
Operational Equipment Technical Group	
ME-030	Pumps
PPE Technical Group	
SF-003	Occupational Protective Footwear
SF-006	Eye and Face Protection
SF-010	Occupational Respiratory Protection
SF-018	Occupational Protective Helmets
SF-049	Firefighters Personal Protective Equipment
SF-049-01	General requirements
SF-049-02	Structural firefighting
SF-049-03	Wildland firefighting
SF-049-04	Hazardous materials
SF-049-05	Rescue
SF-049-06	CBRN
SF-049-08	JWG (SF-010 and SF-049) RPD
SF-050	High Visibility Clothing
SF-052	Personal Safety – Personal Protective Equipment
SF-053	Protective Clothing
TX-021	Sun Protective Clothing
TC/94	Personal Safety - Personal Protective Equipment (Chair)*
TC 94/SC13	Protective clothing*
TC 94/SC14	Firefighters' personal equipment (Chair)*
TC 94/SC14 -SC15 JWG	Respiratory Protective Device (RPD)*
NFPA	NFPA Correlating Committee on Fire and Emergency Services PPE*

*International Standards Committee

LATEST AFAC LEARNING AND DEVELOPMENT GUIDES FOR THE FIRE AND EMERGENCY SERVICES

AFAC continues to work with industry to support the development and delivery of learning and assessment materials for the fire and emergency Services, and with implementation of the Public Safety Training Package. Five AFAC Guides have been developed; the latest release is the AFAC *Guide to Recognition of Prior Learning in the Fire and Emergency Service Organisations*.



This latest Guide provides information about recognition of prior learning (RPL) for AFAC member organisations. It is designed for those who have responsibility for the management of RPL processes in AFAC member enterprise Registered Training Organisations (RTOs), as well as those who conduct and audit RPL assessments.

AFAC member organisations are enterprise RTOs that operate under the *Standards for Registered Training Organisations (RTOs) 2015* and as such, are responsible for the delivery and assessment of vocational education and training (VET) to the fire and emergency services' workforce.

This latest *Guide to Recognition of Prior Learning* provides an overview of the regulatory framework and RPL process. It highlights four approaches being taken by fire and emergency service enterprise RTOs in applying RPL processes. The four case studies included in this Guide show RPL in action and are provided to add to the conversations within and among enterprise RTOs as they continue to respond to and support the VET needs of AFAC member organisations and their workforce. The Guide builds on this and explores different ways that RPL can be implemented and provides templates that can be used.

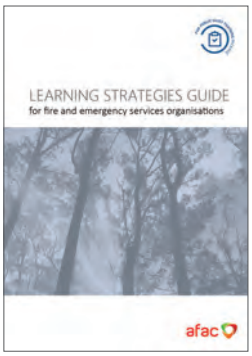
This Guide has been developed with the support and assistance of the AFAC Learning and Development Group and informed by 28 respondents from over 20 organisations that participated in 20 interviews conducted by the authors with practitioners and interested parties from:

- fire and emergency service organisations
- Surf Life Saving
- Defence
- Australian Federal Police.

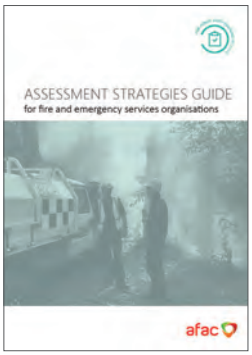
In addition, the authors conducted an extensive literature review of Australian and international RPL policy, procedures and practitioner documentation.

The other four AFAC Guides include:

1. The AFAC Frequently Asked Questions to help RTO managers, trainers and assessors who are required to provide advice on the fire qualifications contained within the PUA Public Safety Training Package. The Guide continues to be updated to include Q&As between ASQA and AFAC member agencies on questions of national interest to members.

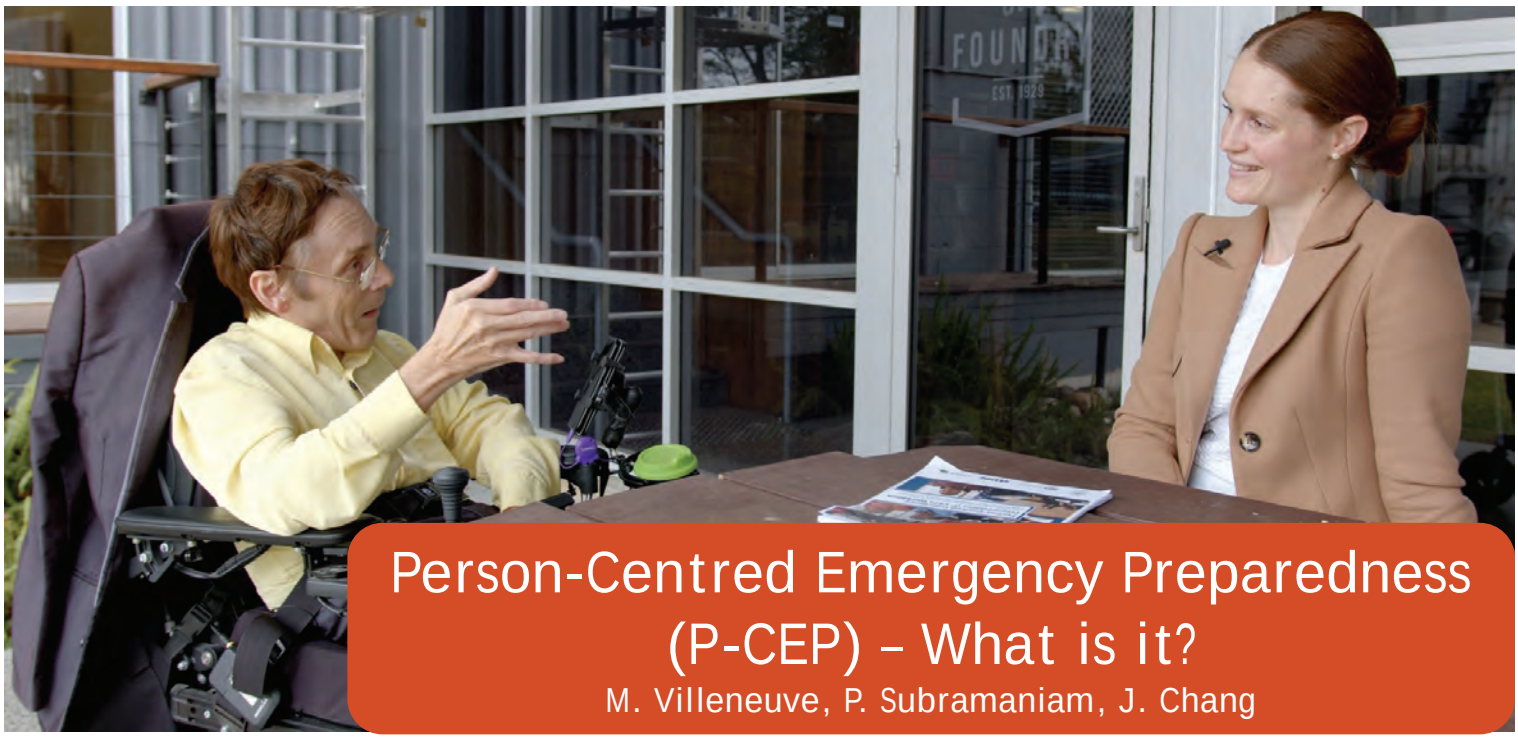


2. The AFAC *Learning Strategies Guide* to help with the development and delivery of learning materials for the fire and emergency services, and with implementation of the Public Safety Training Package.



3. The *Assessment Strategies Guide* to assist people who are designing, developing and conducting assessments in the fire sector.

4. This *Guide to Nationally Endorsed Training* is developed to provide an overview of the nationally endorsed training systems and components suited to trainers, assessors, training designers and developers and training managers. This Guide is supported by a suite of tools to support agencies in their RPL processes.



Person-Centred Emergency Preparedness (P-CEP) – What is it?

M. Villeneuve, P. Subramaniam, J. Chang

An all-hazards tool, P-CEP helps people with disability take control of their own preparedness planning while also ensuring that their rights to protection and safety are met.

P-CEP is a growing suite of co-produced tools being used to advance individual and shared responsibilities for inclusive emergency management in Australian communities through the incremental development of awareness about and responsiveness to the strengths and support needs that people with disability have in emergencies.

Villeneuve, M. (2022). Disability Inclusive Emergency Planning: Person-Centred Emergency Preparedness. Oxford Research Encyclopedia of Global Public Health https://doi.org/10.1093/acrefore/9780190632366.013.343

1	**Identify** your strengths and support needs in everyday life
2	**Know** your level of emergency preparedness and learn about your disaster risk
3	**Plan** for how you will manage your support needs in an emergency
4	**Communicate** the plan with the people in your support network and address gaps through collaboration

Four steps bring emergency personnel together with people with disability and the services that support them to personalise risk information and tailor preparedness actions that keep people safe before, during, and after disasters.

Join our P-CEP Certificate Short Course for emergency personnel (self-paced, online)
Contact: michelle.Villeneuve@sydney.edu.au

THE UNIVERSITY OF SYDNEY

Developing emission factors for residual smouldering combustion of coarse woody debris, filling an important data gap

Facilitating more robust smoke forecasting in Australia

Christopher Roulston, Jennifer Powell, Sally Taylor, Dylan Lynton, Suzie Molloy, Dr. Martin Cope, Dr. Fabienne Reisen
with funding and support by the Victorian Department of Environment, Water, Land and Planning (DEWLP) and Forest Fire Management Victoria (FFMV)

This research aims to improve the quantification of emissions during smouldering combustion of Coarse Woody Debris (CWD). Findings from this research will contribute to the refinement of the algorithms in the AQFx smoke forecasting system.

Purpose and history

A common management practice for reducing the risk of catastrophic bushfires is fuel reduction through low-intensity burning of undergrowth and organic debris of ground-level bush and grasslands. This approach, however, has to be mediated by the need to avoid the harmful effects that smoke can have on communities. In the case of low-intensity planned burns (<500kWm^{-1}) (AFAC 2014), plume buoyancy is often limited, trapping smoke within the boundary layer.

Due to the prolonged smouldering combustion of heavy fuels, the smoke from these low-intensity burns may hug the ground and impact local populations. Using key parameters underpinning Australian national inventory calculations for fire emissions, in a recent review Roxburgh et al. (2015) calculated that fine particulate matter ($PM_{2.5}$) emissions from residual smouldering combustion (RSC) may contribute about 70% of total $PM_{2.5}$ emissions at low-intensity burns (Reisen et al., 2018).

Without specific emission inventories for RSC, emissions are likely to be underestimated in forecasting models and emission inventories.

Sampling at prescribed burns

- Sampled using in-house manufactured portable backpack smoke collectors
- Focus on coarse fuel (d>7.5cm), typically consumed by smouldering combustion
- DustTrak and Q-Trak provide real-time feedback to ensure effective sampling
- Collected filters for mass and speciation, Tedlar bags for gaseous analysis

Figure 1: Examples of sampling from smouldering combustion using portable backpack smoke collectors. Filter holders can be seen in blue. Backpack contains DustTrak-II, Q-Trak, two pumps, gas meter, batteries and a Tedlar bag house within the green box.

Emission factors (EFs) and their implementation

- EFs for CWD remain an important data gap (Prichard et al., 2020)
- Current EFs are based on aerial-based measurements dominated by lofted flaming combustion, and laboratory-based measurements
- North American developed smoke management tools have three categories of modified combustion efficiency (MCE): Flaming (MCE>0.9), smouldering (0.8<MCE<0.9) and residual smouldering (MCE<0.8)
- This study focused heavily on
- RSC, 65% of samples had an MCE <0.8

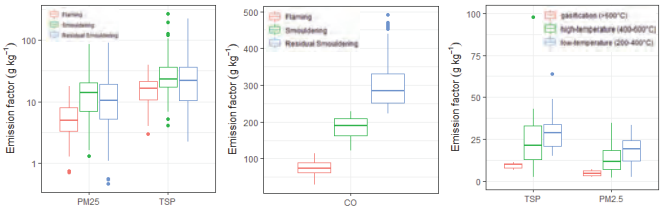


Figure 2: Left – EFs of $PM_{2.5}$ and TSP based on a simplified combustion process, logarithmic scale. Mid – EF for CO based on a simplified combustion process. Right – EF for TSP and $PM_{2.5}$ based on combustion temperature.

- EFs based on smouldering and residual smouldering combustion will improve smoke forecasting models in Australia
- Figure 2 shows the underestimation of smoke loadings that results from using flaming combustion dominated EFs

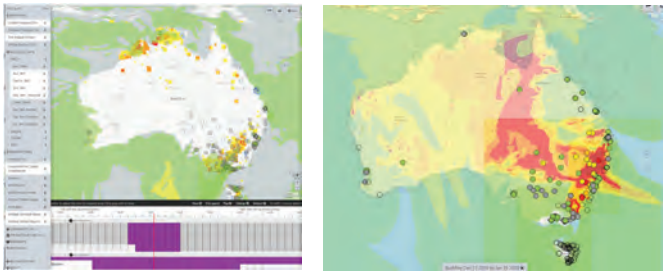


Figure 3: Example of AQFx forecasts show within the AQVX dashboard. Left shows the dashboard including time scrubber bar, right shows an example model run.

- Figure 3, shows a one hour snapshot of modelled smoke plumes from the 2019-2020 bushfires in south eastern Australia
- Updating AQFx's emissions inventories will offer better smoke forecasts, providing experts the tools they need to mitigate the negative effects of prescribed burns
- Come see us in the exhibition hall – CSIRO Stand #251 to see the backpacks and VR plume models in person!

FOR FURTHER INFORMATION

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ACKNOWLEDGEMENTS

We would like to thank the Department of Environment, Land, Water and Planning, Parks Victoria and Forest Fire Management Victoria for their support for the study.

A bottom-up/top down approach to build community resilience models: the case of the South-eastern Pacific

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STUDY DESIGN

PROBLEM: The increase in frequency and intensity of large disasters after tsunamis in Chile, is a call to build more resilient coastal cities. Despite this, research on disaster has not yet fully informed urban planning and policies, taking into consideration the different socio-cultural and geographic conditions of the Chilean territory.

The **OBJECTIVE** of this study is to explore the extent to which the global research on community resilience to tsunami, can be integrated into a model to build more resilient coastal cities in Chile, taking into consideration differences among chilean macrozones.

METHODOLOGY: Journal articles (N=185) on community resilience to tsunami were analysed in the Atlas-ti software to identify themes and indicators related to community resilience (top-down). Interviews with experts in coastal planning and emergency management (N expected =92) indicate the relationship and importance of themes to different macrozones (bottom-up)

TOP DOWN: Systematic Review of the Global Literature

- WoS + SCOPUS
- Key terms: tsunami, resilience, indicators, models (and others alike in english and spanish languages)
- Over 2000 articles found, and reduced to 476 according to the review of abstracts, and then to 185 for not meeting criteria
- 185 articles coded in Atlas-ti, using six resilience dimensions identified for Chile in previous research (Villagra et al. 2017)

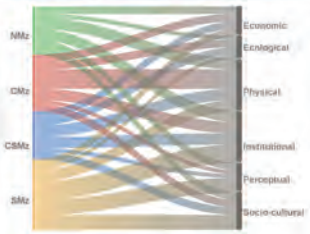
Distribution of themes and indicators found during the Atlas- ti analysis, among six resilience dimensions

Resilience Dimension	% of the total articles reviewed by dimension	Characteristics related to resilience that emerged from the literature review	Emerging Themes	Total of Indicators used to measure
Physical	32,97	Attributes and elements that characterize the infrastructure, facilities, connectivity networks, services and the morphology of a city, considering accessibility, distribution, quantity and quality of resources.	15	105
Ecological	15,68	Condition of ecosystem services and conservation status of its biodiversity to be used as green and blue infrastructure.	9	75
Socio-cultural	34,59	Sociodemographic characteristics, cultural values and social capital. Individual and community skills and abilities to generate leadership, support networks, collaborative links, self-organization, effective communication and inclusion of vulnerable groups	10	76
Perceptual	34,05	Perceptions, experiences, familiarity, knowledge, behavior and psychological characteristics, individual and community. It includes identity, trust, sense of belonging and attachment to place. It incorporates attitudes, decisions and behaviors.	14	87
Institutional	34,59	Government management to support the economy, preparedness and recovery through the generation of human capital, political and social leaders, and education, training and community participation programs.	9	182
Economic	24,86	Individual, community and municipal income,. Ability to access financial services, insurance and savings and investment capacity. Capacity of the economy to innovate, diversify sources of income and employment. Economic vitality.	10	80

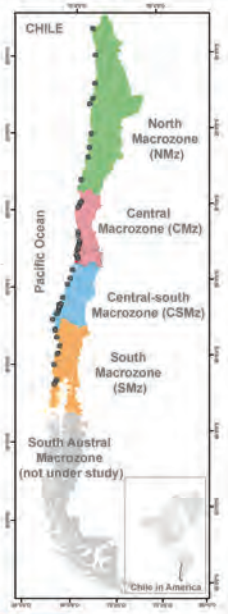
BOTTOM UP: Interviews with experts (in progress / example of the perceptual dimension)

A. SANKEY DIAGRAM showing the themes (left) most and least addressed by the articles (right). The width of the lines indicates the number of indicators found in each article; the greater the width, the more indicators and vice versa. In this example of the perceptual dimension of tsunami resilience, the most addressed theme is the "sense of community belongingness" and the least addressed are "familiarity" and "perceived preparedness".

B. Sankey Diagram showing the Macro zones (left) and dimensions (right). Although all the dimensions are of interest for the different macrozones, they are approached differently. I.e., the ecological dimension is one of the least addressed, however it plays an important role in terms of tsunami mitigation (e.g. protection and planning of dunes and coastal forest and wetlands)



C. Interviews (N in progress = 10) were taken with the National Emergency Office, National Resilience Institute, the Science and Housing and Urbanism ministries, and coastal NGOs. The greater the color intensity, the greater the relationship with or importance of the theme to each macrozone. For the southern macrozone, the perceptual dimension is more important and has a greater relationship with the territory.



Macrozone / Theme	RELATION TO Mz				IMPORTANCE TO Mz			
	NMz	CMz	CSMz	SMz	NMz	CMz	CSMz	SMz
Place attachment								
Psychological characteristics								
Trust								
Knowledge								
Evacuation decissions and behavior								
Post-disaster experience								
Previous disaster experience								
Familiarity								
Social and personal identity								
Interaction and attitudes of togetherness among society								
Perceived preparedness								
Risk perception								
Social representations about disaster								
Sense of community belongingness								

FINDINGS can be used to integrate the different needs, demands and resources of all actors in a community resilience model by assigning different weights among themes according to the results. This approach can make resilience models sensitive to the social, physical and environmental differences of the territory, which in this case, contributes to build community resilience to tsunami along the Pacific Coast of Chile.

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Emergency Management Training:
Pitfalls, Dangers & Opportunities in a Post Pandemic world

Over the past few years, Australian's have learned and embraced new ways to live and work. Specifically, the adoption, use, comfort and preference of using technology to enable remote working has advanced significantly. As our communities' changes, so must we!

Emergency Management Training is a regulatory requirement for property tenants/managers/owners to maintain. Even prior to Covid-19, demand for more efficient and cheaper methods of delivering this training had been growing. This demand has been met by the market providing abbreviated training options and online modules. While these services may provide regulatory compliance, they may not offer best practice in a post-pandemic world.




After years of navigating Covid-19 restrictions and requirements, communities are returning to find the post-pandemic world is different to pre-pandemic realities. Remote and flexible working has increased while building occupancy rates have decreased. Both these trends, while not as extreme as during the pandemic itself are widely accepted as becoming normalized and our new reality is many property managers/owners are being challenged to maintain their Emergency Management obligations (i.e. evacuation drills & fire warden training, etc.). In a world where employees are working more remotely, and workplaces less occupied;

- How do regulators frame future Emergency Management requirements and monitor compliance?
- How do property tenants/managers/owners manage their Emergency Management compliance requirements?
- How do occupants learn and follow Emergency Management procedures?
- How do emergency responders effectively and safely respond to incidents?

Emergency Management Training is crucial in preventing and preparing our communities for emergencies. While abbreviated 'tick the box' training options and online training modules have a place, they don't provide practical (hands-on) training of essential safety measures or provide the time to explore the variables of our post-pandemic world. Therefore, while these types of training may fulfil regulatory obligations, they cannot replicate or provide best practice in preventing and preparing communities for emergencies due to the complexities and strategic solutions required in a post-pandemic world of remote working and partly occupied workplaces.




A post-pandemic world requires greater investment in complex and practical Emergency Management training:

- Property tenants/managers/owners require a deeper pool of trained individuals with greater strategic awareness, training and capability to prevent, prepare and respond to emergency incidents with remote workforces and partly occupied workplaces.
- Face-to-face and practical (hands-on) training provides greater engagement, collaboration, awareness and knowledge (compared to abbreviated or online training) in the use of essential safety measures and fire detection/suppression equipment.

Technology should be leveraged for more than just delivering compliance training:

- Community education on Emergency Management requirements (obligations, responsibilities, complexities)
- Visibility and transparency for property tenants/managers/owners in maintaining compliance
- Refresher sessions between face-to-face practical training for trained individuals
- General awareness for all occupants (induction, refresher, etc.)

As the world changes and continues to adapt in our post-pandemic realities, the emergency services sector must not be complacent and rely upon previously held practices and thoughts. We must be the exemplar in leading the way forward with voice and action in balancing governance requirements, community expectations and market realities in Emergency Management prevention, preparedness, response and recovery.




Development and effect of the ***Costa Resiliente*** video game

Authors: Dr. Paula Villagra (1,5,6), Dr. Cristian Olivares-Rodríguez (2,5,6), Dr. Rodolfo Mardones (3,5,6), Dr. Luis Cárcamo-Ulloa (4,5), Dr. Silvia Ariccio (7), Professor Marino Bonaiuto (7), Master Oneska Peña y Lillo (5)

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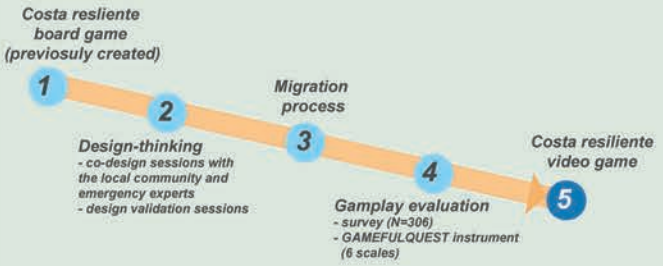
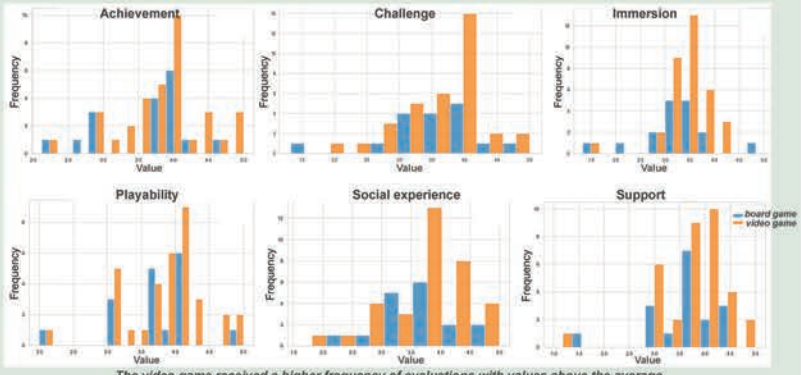
Objective: **To promote and evaluate the development and monitoring of skills and abilities in community resilience (resilience indicators), through the use of the Costa Resiliente Serious Game on the Chilean coast.**

Goal: **Our proposal contributes to improve disaster management by developing a technological tool based on design thinking, gamification and data learning, that will be transferred to key actors in the field of emergency and planning to follow-up changes in community resilience for taking informed decisions .**

STEP 1. The immersion from board game into a video game involved a co-design process based on design thinking, to guarantee playability, cultural relevance and appropriation of the video game by the users.





The video game.received a higher frequency of evaluations with values above the average. The value is the average of the mean values of every item of each scale.

Game description:
Costa Resiliente is a collaborative role-playing game. Its objective is to help a coastal community to face hazard in the best possible way. Different disasters will occur with the passing of the rounds, whether caused by earthquakes, tsunamis, fires or landslides.
Players take on the role of an organization with a certain profile and work as a team by increasing the redundancy and diversity of adaptive resources in the neighborhoods, responding to questions and assessing the disaster after a hazard.

- *Two boards*
- *Five roles*
- *20 different adaptive resources*
- *4 hazards*
- *60 questions*

The appereance of roles, adaptive resources and hazards are the product of the immersion process

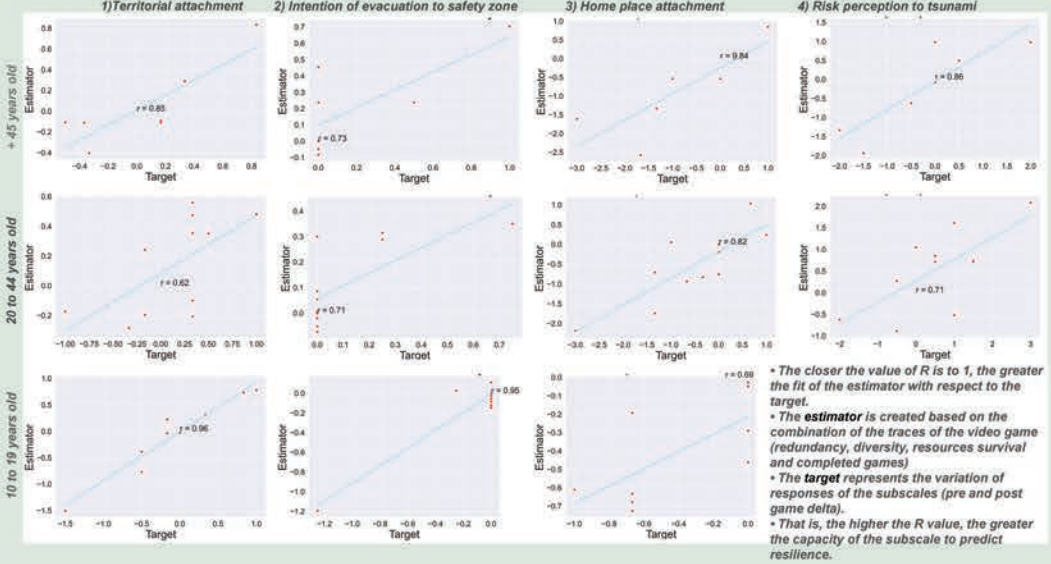
Step 2. We used a socio-psychological approach (quantitative and experimental) to evaluate through surveys, applied pre- and post-game, the resilience skills and abilities that change after playing the videogame among three different age groups.

Factor analysis (N=349 respondants / 141 played the videogame)

Original scale	Relation with resilience	Reference	Subscales (resilience skills and abilities)	Cronbach	
Intention of evacuation (IE)	> IE > Resilience	Ariccio et al., 2020	Intention of evacuation to elevated areas	0.70	0.71
			Intention of evacuation to safety zones	0.54	0.56
Risk percepction (RP)	> RP > Resilience	De Dominicis et al., 2014 ; 2015	Risk perception (earthquakes, landslides and fires)	0.55	0.63
			Risk perception (tsunamis)	-	-
Sense of community (SC)	> SC > Resilience	Sánchez, 2009	Neighbordhood interaction	0.87	0.86
			Belonging and interdependence	0.78	0.84
			Territorial rooting	0.84	0.87
Subjective knowledge (SK)	> SK > Resilience	Ariccio et al., 2020	No change	0.81	0.86
Objective knowledge (OK)	> OK > Resilience	Based on the Chilean National Emergency Office indications	No change	-	-
Home Place Attachment (HPA)	> HPA < IE < Resilience	Fornara et al., 2010	No change	0.81	0.83

Step 3. Resilience indicators for monitoring were detected through correlational analysis implementing statistical models, combining the traces of use of the video game and the skills and abilities in resilience detected in surveys.

Example of resilience skills and abilities (subscales) in which the game has a positive effect towards resilience



- *The closer the value of R is to 1, the greater the fit of the estimator with respect to the target.*
- *The **estimator** is created based on the combination of the traces of the video game (redundancy, diversity, resources survival and completed games)*
- *The **target** represents the variation of responses of the subscales (pre and post game delta).*
- *That is, the higher the R value, the greater the capacity of the subscale to predict resilience.*

The more people play Costa Resiliente, using strategies to build a city with more redundancy and diversity of resources, and the more people finish their games and answer questions, the more resilient is the community with specific variations among age groups

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Conocimiento y Naturaleza

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ONEMI

A Systematic Review of 'Resilience' in Human-Computer Interaction (HCI) Research

INTRODUCTION

Technology design and use has the potential to strengthen community resilience to disasters by supporting disaster preparation, response, and recovery activities. Human-computer interaction (HCI) is a field of computing that addresses the "design, evaluation and implementation of interactive computing systems for human use and [...] the study of major phenomena surrounding them" (Hewett et al. 1992).

HCI researchers have designed for and examined technology use that promotes individual and community resilience across a range of domains and contexts. However, the use of 'resilience' as a concept in HCI research has yet to be systematically examined to identify core activity areas and opportunities for future research and collaboration.

This poster presents preliminary findings from an unpublished systematic review that aims to:

1. understand how HCI researchers are engaging with the concept of 'resilience' and related theoretical perspectives
2. characterise HCI research for resilience in terms of crises, domains, populations, and interfaces
3. identify gaps and opportunities for future research to build a 'HCI for Resilience' (HCI4R) agenda.

METHOD

This systematic review has taken the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach (Liberati et al. 2009). 171 Papers were identified from the Association for Computing Machinery Digital Library (ACM 2022) with "resilience", "resiliency", or "resilient" in the paper title, abstract, or author keywords, and published in SIGCHI-sponsored venues. Duplicates were removed and results were excluded that were not research papers (n = 64).

The remaining results were then scored across the following dimensions (0 = not applicable, 0.5 = somewhat applicable, and 1 = applicable):

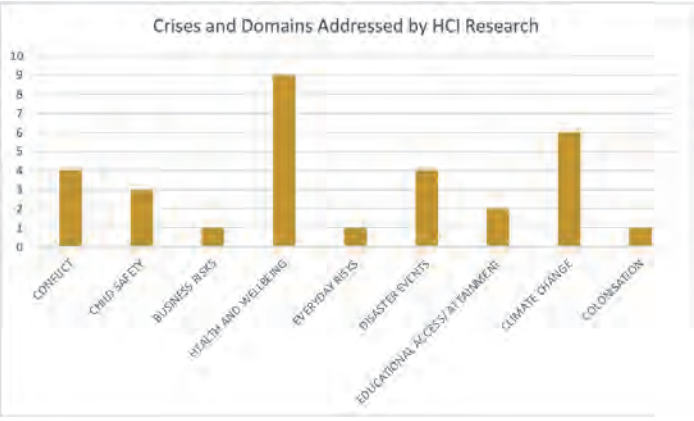
- Paper provides a definition of resilience
- Paper engages with "resilience" at a conceptual level
- Resilience features prominently in the method and findings
- The term resilience is meaningfully used at least several times (e.g., >5)

Papers that scored <3 were excluded on the basis of relevance (n=76), leaving a total of 31 papers included in the review.

PRELIMINARY FINDINGS

Crises and Domains Addressed

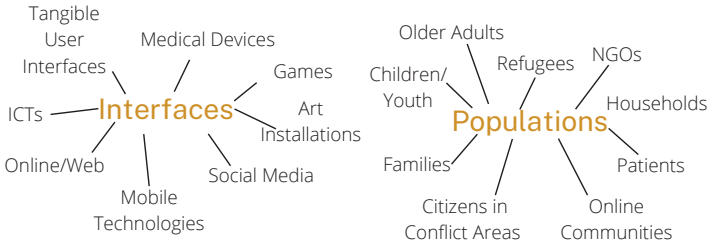
The surveyed papers were classified according to the main crisis or domain that they addressed:



Resilience Definitions and Concepts

A word cloud (https://www.wordclouds.com) was generated demonstrating the frequency of resilience-related terms in the surveyed papers (unique terms were counted once per paper):

Interfaces and Populations



Role of Technology

Role of Technology	e.g., Sources
Use of existing technologies to facilitate and support resilience	1,2,6,8,9,25,31
Designing to establish or grow resilience	4,16,19,30
Technologies undermining resilience by introducing risk	5,7
Designing resilient technologies	11,18

DISCUSSION AND CONCLUSIONS

- Few papers surveyed focused on natural disasters such as storms, floods, and bushfires etc.
- HCI research for resilience frequently addresses interactions between different kinds of systems (involving people, technologies, and practices) at varying scales
- A number of the HCI studies surveyed have taken a practice-oriented perspective
- Technologies have the potential to both contribute to and undermine resilience
- HCI can offer research approaches that use technology design as a method for exploring resilience, and create design products with resilience as the goal.

SURVEYED PAPERS:

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NSW STATE EMERGENCY SERVICE

AEIMN
Animal Emergency Incident Management Network
(Australia & New Zealand)

Animals matter

AEIMN (ANZ) brings Australian and New Zealand veterinarians together with large animal rescue subject matter experts (SMEs) to develop and promote best practice rescue techniques.

www.aeimanz.org

83% of the public will risk their lives to save an animal*

If our emergency service organisations don't rescue domestic animals, members of the public will put themselves and others at risk unnecessarily to try to save an animal

Some ESOs may be concerned about the risk to their workers when working in close proximity to large animals**

Some ESOs don't include domestic animals in their respective legislation and say:
"it's not my problem"

Some ESOs may be concerned about the cost to build a large animal rescue capability.

AFAC Large Animal Rescue Operations Guideline ***

This NEW guideline is for Australian and New Zealand fire and emergency service organisations (ESOs) attending incidents involving large animals and is primarily about the rescue and relocation of large animals and provides guidance on how to manage the risks associated with working in close proximity to large animals.

*www.bartacic.org/wp-content/uploads/2022/03/NON-NFCC-FRS-Initial-Situational-Awareness-Jim-Green-v5-WEBSITE.docx.pdf
**www.ncbi.nlm.nih.gov/pmc/articles/PMC4323423/
***www.afac.com.au/insight/doctrine/article/current/large-animal-rescue-operations

VEHICLE-as-a-NODE (VaaN)
Critical voice and data communications anywhere anytime

CELL-ON-WHEELS
Critical radio and internet where services have been lost or destroyed

MOBILE COMMAND CENTRES (MCC)
Refreshed IT communications and advanced technology providing real-time mission critical data

MOBILE DATA TERMINALS
Across the fleet new data tablets providing critical real-time information.

PAGERS
New integrated paging devices allowing incident calls to be received over both the paging and mobile phone network

COMMAND MANAGEMENT SYSTEM
Real-time intelligence to co-ordinate and collaborate incident response

VEHICLE TELEMETRY
Advanced telemetry sees new-age Automatic Vehicle Location (AVL) improving firefighters' safety

TWO-WAY RADIOS
New Wi-Fi, 4G and satellite capabilities support the latest standards to leverage the expanded NSW Public Safety

REMOTELY PILOTED AIRCRAFT SYSTEM (RPAS)
Live streaming aerial camera with sensor technologies providing safer situational surveillance

Augmented Reality with a Head Mount Display

Personal Area Network. Integrated computing and radio

Glove interface, zero-touch user interface

PREPARED FOR ANYTHING

CONNECTED FIREFIGHTER

SAFER • CONNECTED • AWARE

The Connected Firefighter looks to put the latest information and communications technologies to where it is needed into the hands of firefighters, so they can operate at their best in **protecting the irreplaceable.**

NSW GOVERNMENT

FIRE + RESCUE

000 EMERGENCY

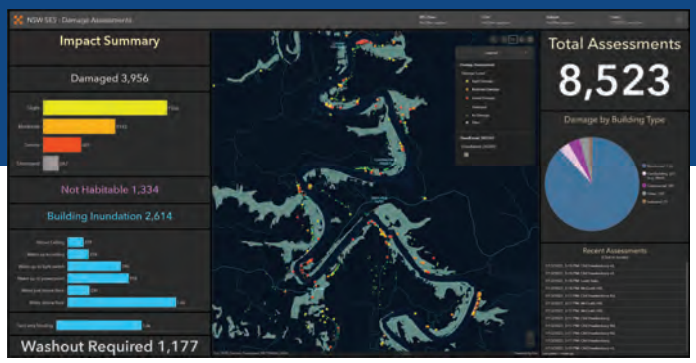
TAKING TO THE SKIES: the role of Remote Piloted Aircraft Systems (RPAS) in NSW State Emergency Service in collaboration with Surf Life Saving NSW

Peter Verwey
NSW SES - Coordinator Planning – Geospatial Intelligence
Peter.Verwey2@ses.nsw.gov.au

Paul Hardy
SLS NSW – Australian UAV Service Manager & Chief Remote Pilot
phardy@surflifesaving.com.au

Collecting field intelligence is critical for the NSW State Emergency Service to understand the impact of storms and floods.

Rapid damage assessments are routinely carried out by teams of ground observers to determine levels of damage to properties, and flood data is collected to inform and update flood intelligence and flood plans.



While this approach works well, roof damage is difficult to assess from the ground, and critical impact flood intelligence of a community can go undetected. Conducting a visual inspection by gaining access to the roof of every property would be impractical and time consuming. High resolution aerial imagery can help, but there are delays in image capture and processing.

Our proposed solution is to use RPAS to provide an overview of community impacts and a top-down view of properties. This will provide a complete overview of damage that is not visible from the ground.

A Proof of Concept using Surf Life Saving NSW to provide RPAS support commenced in early 2022.

Site Scan for ArcGIS

ArcGIS QuickCapture

Teams use Site Scan for ArcGIS linked to ArcGIS Quick Capture to efficiently document critical impacts or rooftop damage, that would otherwise be missed from the ground.

Surf Life Saving NSW has a mature RPAS capability across eastern NSW and has been engaged to provide pilots and platforms to fly missions for our NSW SES field teams.

RPAS offers near real-time data in incident control centres to better inform emergency response.

The outcomes of the Proof of Concept will determine the ongoing role of RPAS and ESRI Site Scan in providing early access to intelligence from the field.

FRNSW HEALTH CHECK PROGRAM
SUPPORTING FIREFIGHTERS DURING SAFETY-CRITICAL WORK

IS THE FIREFIGHTER DUE FOR A HEALTH CHECK?

YES

FRNSW informs Independent Occupational Physician (IOP).

Firefighter provided with information and instructions via @fire.nsw.gov.au email and by post.

Firefighter books appointment with Nominated Medical Practitioner (NMP).

Firefighter attends pathology clinic of their choice for blood test and ECG.

Firefighter attends appointment with NMP, who performs a standardised medical examination.

NMP forwards Health Check report and test results to IOP and to firefighter.

IOP reviews paperwork and determines firefighter's fitness.

IOP determination of firefighter fitness for duty forwarded to FRNSW and firefighter.

The IOP will only share information with FRNSW that they deem necessary for the safe management of the firefighter.

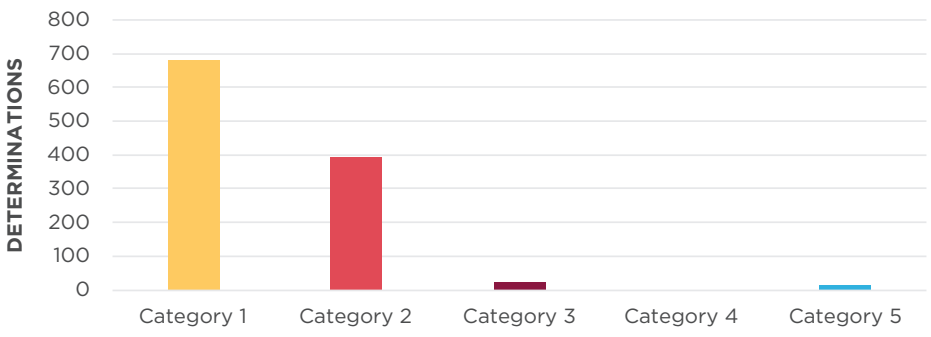
- Fit to perform the firefighter's ordinary duties **without** any requirements or restrictions.
- Fit to perform the firefighter's ordinary duties **with** specified requirements or restrictions.
- Temporarily unfit to perform the firefighter's ordinary duties but fit to perform alternative duties, either with or without specified requirements or restrictions.
- Temporarily unfit to perform any FRNSW duties.
- Permanently unfit to perform the firefighter's ordinary duties.

Health and Safety notify firefighter and line manager of Health Check outcome.

Health and Safety to review with line manager and firefighter.

DETERMINATIONS

The IOPs to date have provided 1,116 health check determinations, allowing firefighters and FRNSW to work together to manage risk.



Category One: Fit to perform the firefighters ordinary duties without any requirements or restrictions.

Category Two: Fit to perform the firefighters ordinary duties with specified requirements or restrictions.

Category Three: Temporarily unfit to perform the firefighters ordinary duties but fit to perform alternative duties, either with or without specified requirements or restrictions.

Category Four: Temporarily unfit to perform any FRNSW duties.

Category Five: Permanently unfit to perform the firefighters ordinary duties.

BACKGROUND:

Since 2001, seven out of ten deaths of our on-duty firefighters related to cardiac episodes. The challenge for Fire and Rescue NSW (FRNSW) is how to manage the health of firefighters who respond to events in environments that are likely to increase their physiological demands. Sudden cardiac death has consistently accounted for the largest share of on-duty firefighter deaths globally since the US-based National Fire Protection Association (NFPA) began collating statistics in 1977.

THE PROGRAM:

FRNSW's The Health Check Program commenced in February 2020 and has seen 2,802 Firefighters initiated into the Program.

The Health Check focuses on the early identification of risk factors or conditions which may present a risk of sudden incapacity in the safety critical firefighting environment.

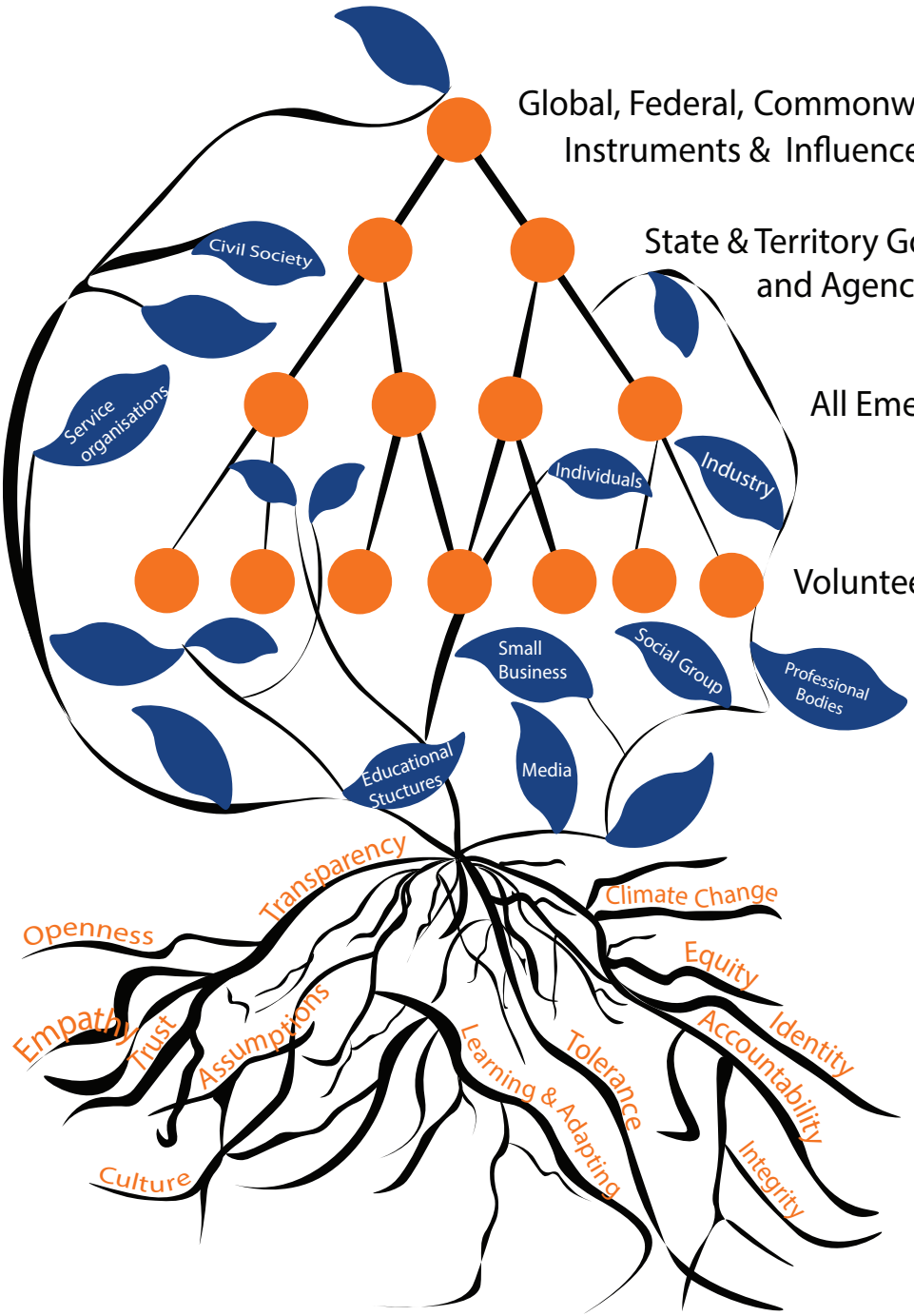
Firefighters are periodically initiated into the program under an age-based schedule, undertaking an ECG, Pathology and initial consultation with their Nominated Medical Practitioner (GP) where they complete a Heath Check Report.

The results and reports are reviewed by Independent Occupational Physicians (IOPs) who have expertise in assessing medical risk in the context of safety critical work.

Monash University have been engaged to independently deidentify, aggregate and analyse all available Health Check data. This analysis will guide the development and implementation health promotion and support programs for our firefighters into the future.

NSW GOVERNMENT

The Roots of Resilience



Resilience for all levels of society essentially means learning and adapting while maintaining cohesive positive values. Shared values create the social algorithms that drive the systems for prevention, response, recovery and repair. Emergency services such as the SES cannot reasonably provide the full range of human and physical resources in the face of rapid and unpredictable climate change. Combining formal and spontaneous self-organisation of civil society as seen in events such as the Brisbane and Lismore floods amplifies emergency efforts. This requires in effect a community 'Take 5' approach that includes:

- attention and support for spontaneous recovery networks
- greater collaboration and public conversations
- simplification of internal communication systems and social media
- fresh approaches to recruitment and participation to attract, skill up and retain a younger generation

The graphic represents how formal hierarchical structures interact with more fluid social and professional networks. The roots indicate underlying values that drive the systems at all levels.

Dr Karin Geiselhart is a volunteer with the Moruya Unit and with a research background in complex adaptive human systems.
Many thanks to Rosalba Fatone for graphic design assistance

Unleash the power of creativity

We are the lead agency linking the creative sector with communities and disaster management, helping people grow and connect through the disaster experience.

Culture and the arts have the power to:

- Connect communities
- Give voice to experience
- Create inclusive spaces
- Make sense of the unimaginable
- Generate new thinking

We can work with you to enhance your disaster management planning through:

Embedding the arts and culture in your disaster management planning

Our Creative Recovery Handbook is the first of its kind in Australia, designed to share practical advice, tools and templates for incorporating creative practices into your work.

Building community capacity through arts-led training programs

We deliver in-room and online training for communities to strengthen their recovery capability through participatory, people-centred programs.

Sharing stories that demonstrate the value of the arts

We share case studies, research and a podcast series about how arts-based programs are supporting and strengthening communities.

Creative Recovery Network acknowledge and pays respects to the First Nations peoples of Australia from the past, present and into the future. Recognising the right for Aboriginal and Torres Strait Islander peoples to have a voice within the journey of healing through a creative recovery model, we strive to listen, connect and advocate for a First Nations perspective to be embedded throughout the arts and disaster management.

creativerecovery.net.au

Creative Recovery Network

Lost In Translation

Radical and Feminist Knowledge in International Disaster Legal Discourse

Louise Baumann, JC Gaillard, *Waipapa Taumata Rau/The University of Auckland, Aotearoa NZ*

Loïc Le Dé, *Auckland University of Technology, Aotearoa NZ*

A Radical and Feminist Approach to Disasters and Disaster Risk Reduction

Radical and feminist disaster scholars have long shown the socio-political origin of disasters and the fact that if some people tend to be disproportionately affected by disasters, it is largely due to existing unequal power relations (Wisner et al., 2004; Yadav et al., 2021). For them, reducing disaster risk thoroughly would require adopting an 'integrative process' (Gaillard & Mercer, 2013) and addressing the root causes of vulnerability and risk (Wisner et al., 2004; Yadav et al., 2021). This research intends to retrace how this radical and feminist disaster knowledge has progressively entered the international disaster legal discourse by conducting a textual analysis of the three main international frameworks for disaster risk reduction (DRR) over the past 30 years. Although findings reveal an increasing use of some key terms over time, it also demonstrates how this mainstreaming process has been slightly altered, resulting in the preservation of some of the root causes of vulnerability and risk and in the creation of new risk. The study suggests that adopting a feminist approach sensitive to the intersectional and structural dimension of vulnerability might give disaster legal scholars and practitioners an opportunity to develop a more holistic and sustainable approach to DRR.

Mainstreaming Process

Radical and Feminist Disaster Knowledge

Political, structural and social dimension of disasters

Disasters are not 'natural' and largely result from unequal distribution of power and resources worldwide (Wisner et al., 2004).

Figure 1: The Pressure and Release Framework. Source: Adapted from Blaikie et al. (2004).

Key terms: Vulnerability, Underlying Risk Factors, Disaster Risk Creation.

Unequal experience of disasters and vulnerability

People already marginalised and exposed to structural violence and harm in 'everyday times' are more likely to suffer the most and recover less easily from a disaster (David & Enarson, 2012; Yadav et al., 2021).

Key terms: Inclusion, gender, women, people with diverse sexual orientation, gender identity and expression, and sexual characteristics (SOGIESC), age, children, elderly, disability, people with disabilities, race, ethnicity, racial minorities, indigenous peoples, migrants, displaced people, class, poor people, intersectionality.

Importance of local knowledge and capacities

Everyone possesses a unique set of knowledge, skills and resources which are key to prepare, cope and recover from disasters (Twigg, 2004).

Figure 2: An integrated framework for DRR (Gaillard & Mercer, 2013)

Key terms: Participation, local knowledge, capacity.

Loss of some Key Elements

Role of some international regulations in disaster risk creation

The focus on domestic DRR measures and 'cooperation' tends to ignore the way in which some non-disaster specific international regulations (e.g. international investment law) might undermine DRR by transmitting and perpetuating historical inequalities and supporting the creation of disaster risk (Aronsson-Storrier, 2020).

Intersectionality (Crenshaw, 1989)

The fact that each person's individual experience of disasters is shaped by a number of intersecting power dynamics and socio-economic factors is eluded (Ryder, 2017).

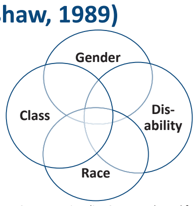


Figure 3: Intersectionality. Source: Adapted from Crenshaw's concept (1989)

Existence of people with diverse SOGIESC

Gender is used to refer to 'cisgender women' – cismen and trans, nonbinary, queer, and other nonconforming gender identities are implicitly excluded from the conversation (Rushton et al., 2019).

Perception of local communities as partners with relevant expertise for DRR

Local communities are treated as "aid recipients" to whom tailored risk information must be transmitted instead of being truly valued as partners with their own expertise and relevant beliefs (Tozier de la Poterie & Baudoin 2015).

International Legal Frameworks for DRR

Increasing use of some key radical and feminist terms and concepts over time…

The textual analysis of the *Yokohama Strategy 1994*, *The Hyogo Framework 2005–2015* and *The Sendai Framework 2015–2030* reveals an increasing use of some key feminist and radical terms over time (see Figure 4).

… but some missing elements

While this could be interpreted as an illustration of 'successful' incorporation of feminist and radical disaster knowledge within the international disaster legal discourse, **the fact that some key elements are missing highlights some of the limits of this mainstreaming process**.

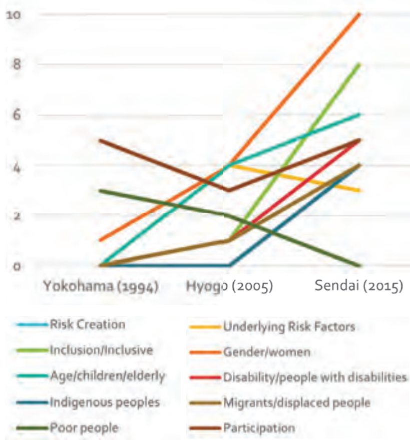


Figure 4: Evolution of the use of some key terms in International Frameworks for DRR. Source: Author's own

Creation of Disaster Risk

Reproduction of simplistic and stereotypical representation of the world → Inadequate and sometimes discriminatory DRR policies and practices → Lack of transformative change and preservation of some of the root causes of vulnerability and risk → **Disaster Risk Creation**

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Yokohama Strategy and Plan of Action for a Safer World 1994

… So what would a feminist approach to disaster law look like?

This is the topic of my PhD research.

Follow-me to know more.

in LOUISE BAUMANN

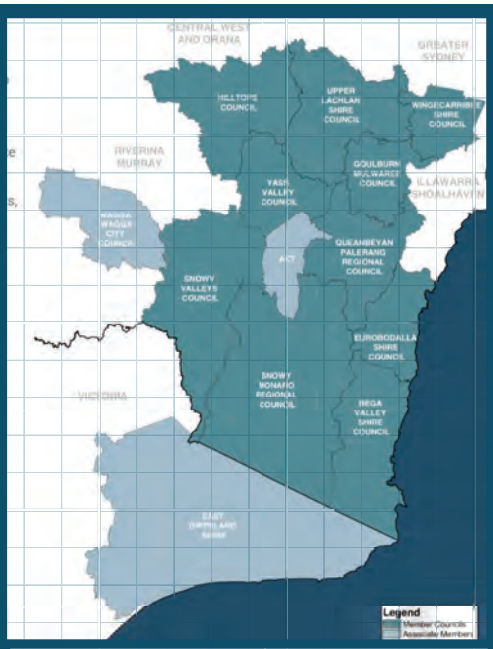
@Lo_Baumann

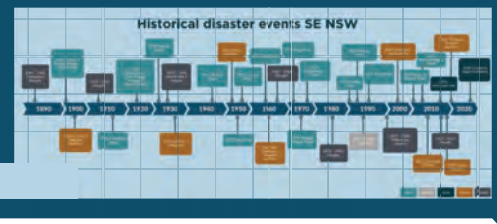
lbau924@aucklanduni.ac.nz

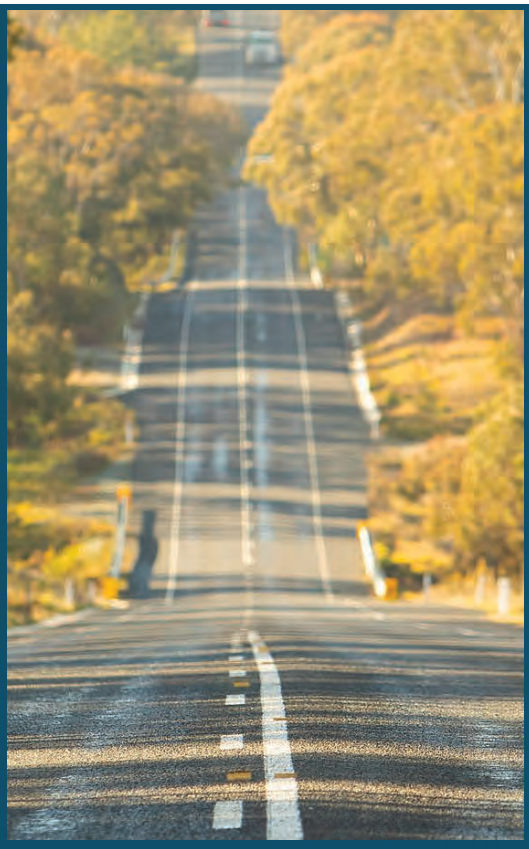
THE UNIVERSITY OF AUCKLAND

RESILIENCE BLUEPRINT

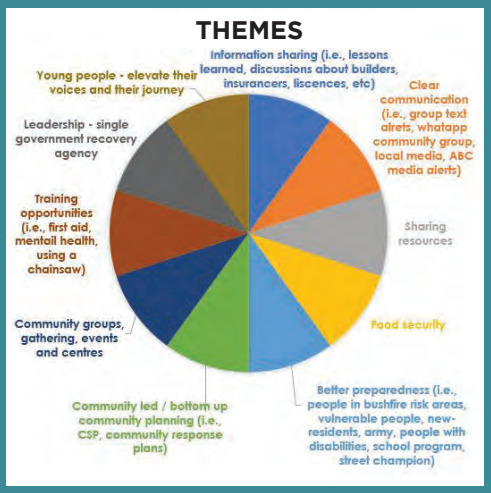
Adapting to a Changing World



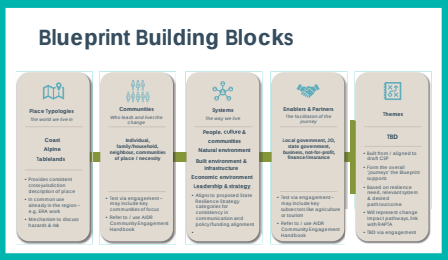


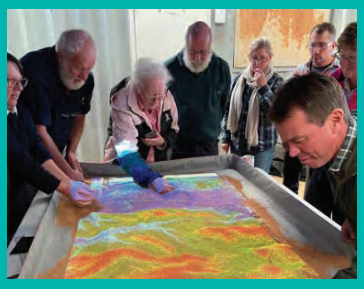


INFORM & INVOLVE | **COLLABORATE** | **BUILD & SHARE**



Walking with councils and community on our resilience journeys





CRJO CANBERRA REGION JOINT ORGANISATION

Australian Government

NSW GOVERNMENT

This project is jointly funded by the Commonwealth and the New South Wales Government through grants awarded under the Bushfire Community Recovery and Resilience Fund and the Bushfire Local Economic Recovery Fund. Although funding for this product has been provided by both the Australian and NSW Governments, the material contained herein does not necessarily represent the views of either government.

New Fire Weather Districts for a safer Western Australia

Background

Fire Weather Districts (FWD) communicate fire danger ratings (FDR) and fire weather triggers for communities. In Western Australia, many districts, particularly large ones, require accurate representation of fire danger to reduce over warning and confusion to the public. Impact to industry, agriculture and agencies subject to regulations linked to ratings thresholds, must also be considered.

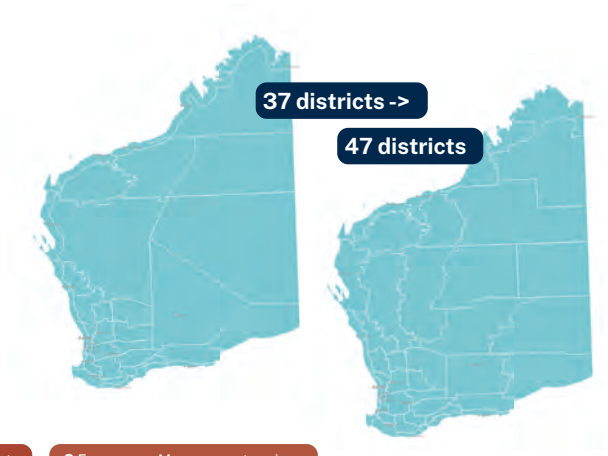
The new Australian Fire Danger Rating System (AFDRS) presented the opportunity to review and update the districts for WA. The review assessed the effectiveness of current districts with detailed research and analyses undertaken for scientific justification of new boundaries.

Objective

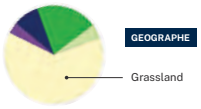
To create new districts with accurate representation of fire danger; to better protect the community and industry, and provide clear messaging regarding fire danger to the public.

The challenge

The size of WA presented a unique problem not likely to be experienced by other states, requiring analysis for, and engagement with 139 local governments, 47 FWDs and 9 Emergency Management regions. WA has two fire seasons, multiple climate zones, and significant variation in vegetation types across the state.



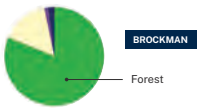
139 local governments | **47** Fire Weather Districts | **9** Emergency Management regions



Methodology

Analysis and alignment of AFDRS fuel types, terrain, climate influence, population and communities formed the basis of the final boundaries. Attempts were made to follow administrative boundaries, to align FDR and Total Fire Ban messaging in the regions. During the analysis process, the importance of having review principles became clear, so that consistent and fair methodology was applied across the state.

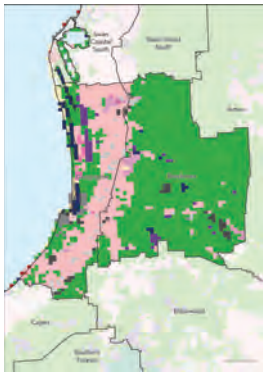
On some occasions, requests for certain boundary alignments from the regions or local governments were supported, where science and systems supported those boundaries. Significant negotiation between DFES and local governments was undertaken to ensure objectives were met.



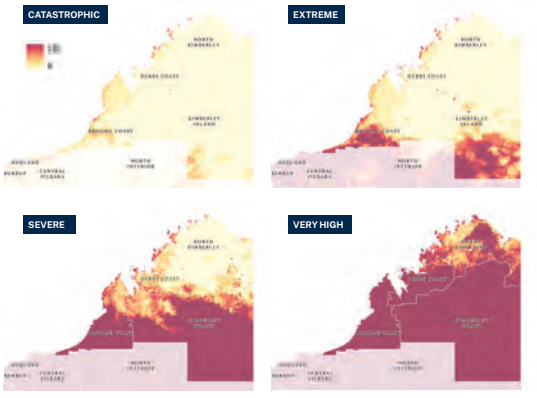
Aligning with AFDRS Fuel Types and Fire Behaviour Models

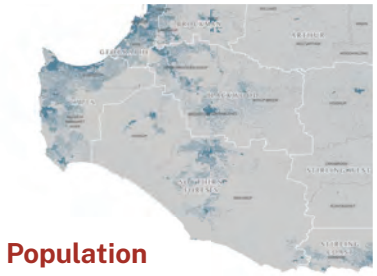
Primary and secondary vegetation types in the new AFDRS will have a significant impact on fire danger ratings.

Boundaries for the new districts took into consideration vegetation and soil differences. In WA, one of seven different fire behaviour models is applied to each AFDRS fuel type, of which WA has 57. With alignment of the districts to predominant vegetation types, the fire danger for that community is more accurately represented.



Fire Danger Frequency





Population

Large districts with large population centres or significant industry were reduced in size to improve fire danger communication. Transient areas with large itinerant holiday making populations such as South West WA were considered in the creation of new districts, particularly those areas with higher risk such as the new Capes district.

Outcomes

Through extensive collaboration, additional districts were identified and multiple districts had boundary realignments based on a combination of empirical and local knowledge, which will result in better representation of fire danger in these districts. The new districts will be in use from 1 September 2022.

Scan to view WA's new Fire Weather Districts

Contact: Natalie Lyons, Bushfire Data Systems Coordinator, Department of Fire and Emergency Services WA

Email: Natalie.Lyons@dfes.wa.gov.au | Phone: 0447 008 427

GOVERNMENT OF WESTERN AUSTRALIA | DFES Department of Fire & Emergency Services | FOR A **SAFER STATE**

Barley crop (Grassland Model). Photo: Natalie Lyons. | Jarrah Forest WA South West (Forest Model). Photo: Dr Shaun Malloy.

FIRE to FLOURISH
Strength through community-led action

paulramsay FOUNDATION
PARTNERSHIPS FOR POTENTIAL

System changes to support community leadership and action

Community knowledge, skills and lived experience are a highly valuable but largely under-utilised resource for building disaster resilient Australian communities. This includes Australia's First Nations peoples whose understanding of Country dates back tens of thousands of years. The experiences of the 2019/20 bushfires and recent floods emphasise the urgent need for emergency response and service provision that is informed by community priorities. This research offers an evidence-based action plan for putting communities in the lead for their disaster resilience.

This work has been led by Monash University's Fire to Flourish program, bringing together insights from evidence reviews and two online workshops with 60 representatives from disaster affected communities, local councils and other government agencies and non-government organisations (NGOs).

Create pathways for direct government investment in local community capability for community-led disaster risk reduction and resilience planning and action.

Support a national community network as critical social infrastructure for strengthening the resilience capacities of Australian communities.

Formalise inclusive community partnerships and involvement in disaster risk reduction and resilience policy and programs.

Our system change recommendations to support community leadership and action for disaster resilience

Invest in an innovation platform that facilitates rapid learning, co-design and scaling of promising community-led disaster risk reduction and resilience models, methods and tools.

Coordinate and streamline information flow across governments and agencies at local, state and national scales, including a 'one-stop-shop' for information on support services and local initiatives.

Formalise Caring for Country as an holistic resilience building practice across Australia.

"Community voices will only be heard when we start and finish with a co-design process that values all voices and acknowledges community contributions"

(Workshop: Local Government Rep)

"...the need for a network among communities is just not given enough emphasis, there are so many things happening in different communities. The ability to link up, share ideas, even share resources, especially for the remote communities, that may not have as much resources, just being part of the that larger group can be so helpful and resourceful for communities"

(Workshop: NGO Rep)

"It isn't about "community voices being heard". It's about at-risk communities being respected and trusted to collaborate in the process and for agencies to modify their processes and expectations to enable community participation."

(Workshop: Community Rep)

For the full report or more information web: firetoflourish.monash email: adriana.keating@monash.edu

Fire to Flourish is led by Monash University, with Paul Ramsay Foundation and The Australian Centre for Social Innovation as foundation partners.

Cornerstone philanthropic funding is provided by Paul Ramsay Foundation and Metal Manufactures Pty Ltd.

Strengthening disaster management through creativity

The National Taskforce for Creative Recovery is a cross-industry collaboration bringing together key influencers in disaster management, mental health, government and the arts to forge pathways for new thinking in response to the unprecedented challenges being faced by communities.

We call on all levels of government and response and recovery organisations to prioritise support for communities to embed culture and the arts into disaster management planning.

When we harness the power of creativity in each phase of the disaster management cycle we:

Prepare & Imagine

- Add value to existing community preparedness activities, deepening a relational, people-centred approach to community management
- Ensure layered and equitable engagement
- Activate civic participation that builds community networks and fosters intergenerational connections
- Bring new perspectives to problem solving and future thinking

Respond & Care

- Create safe and inclusive spaces that cushion the impact of trauma and upheaval during a disaster
- Mitigate the shocks and strains of disaster impact by providing ways to express the unimaginable

Recover & Adapt

- Support wellbeing and identity through creative, participatory practices that bring community members together
- Reduce isolation among marginalised communities and individuals
- Strengthen a sense of belonging to community and environmental landscape
- Develop place-making opportunities that promote happiness, wellbeing and inspiration for a hopeful future

Read the list of recommendations from the National Taskforce for Creative Recovery and sign up to receive the Creative Recovery Handbook.

creativerecovery.net.au

Creative Recovery Network

BUILDING IMPORTANCE LEVEL

The missing link in fire safety documentation

Pelle Zetterström CPEng NER BSc
Technical Director **RED Fire Engineers**

Time and time again, building industry practitioners involved with fire safety, encounter shortcomings in the as-built environment. This is nothing new or unknown.

Sometimes these shortcomings are identified in the process of regular building maintenance or upkeep of essential safety measures (ESMs), sometimes it is due to other circumstances as e.g. renovations, extensions, or rectification work due to identified defects.

For building practitioners then, faced with the problem of having to identify defects and shortcomings, the constant issue is trying to identify what constitutes reasonable rectification work.

This is not aimed at trying to establish or offer an opinion on what should constitute compliance, or 'not-compliant-but-acceptable' level of fire safety. Instead, the difficulty is often to establish what the basic benchmarks are.

The fundamental parameters that strangely enough often go undocumented are:

- Which is the governing version of NCC/BCA applied to the construction?
- Which are the relevant Australian Standards adopted for the building?

At a glance, this may not seem like too big of an issue, but the truth of the matter is significant personnel hours are being spent on trying to identify these matters.

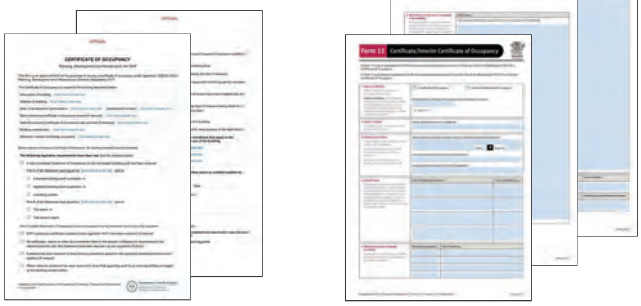
"It's DtS"

"It's been designed to Deemed-to-Satisfy". But what does that mean, when the governing BCA isn't identified? When the referenced Standards applicable aren't listed? When the if-X-then-Y compliance choices made during design and construction are not documented? Where are the compartmentation lines? What active systems should have been installed? What is their maintenance regime? What is the egress philosophy? What is the cause-and-effect and how should the alarm annunciation work? How is the FIP to be programmed?

Remember, the answer cannot be "it's up to the fire engineer to identify and document in the Fire Engineering Report", because there is no regulatory requirement to have a fire engineer engaged. At least not *as of yet*.

So what can be done to change this?

How can we give these buildings their due?



Examples: South Australian Certificate of Occupancy and Queensland Certificate of Occupancy (Form 11) - neither of which identify applicable BCA, Type of Construction, Rise-in-Storeys, effective height, or relevant Standards.

Table B1.2a Importance Levels of buildings and structures

Importance Level	Building Types
1	Buildings or structures presenting a low degree of hazard to life and other property in the case of failure.
2	Buildings or structures not included in Importance Levels 1, 3 and 4.
3	Buildings or structures that are designed to contain a large number of people.
4	Buildings or structures that are essential to post-disaster recovery or associated with hazardous facilities.

All buildings are, in accordance with the Building Code of Australia, assigned an importance level: buildings of little to no consequence in the event of loss or failure are afforded an importance level of 1; buildings designed to contain a large number of people level 3; buildings essential to post-disaster recovery level 4. The rest, the majority of the average building stock, would be afforded an importance level of 2.

The interesting thing is that building importance level only carries through in relation to structural design requirements. It does not carry through to the fire safety requirements for the building.

Importance Levels 03 & 04

Essential buildings

This category includes most hospitals, infrastructure, dangerous goods and hazardous processing facilities, as well as some government and legislative buildings.

A stakeholder discussion should also be held in relation to buildings and structures relating to security, safety, and emergency services such as military, law enforcement, rescue and emergency services and associated stores or shelters.

There is no one, clear-cut number threshold for 'a large number of people', but the Guide implies that stakeholder conversations should start taking place somewhere between 250 (schools) and 300 (assembly), to 5000 (any occupancy). Power, water, and public utilities buildings often fall into this category, as do jails and detention facilities.

Tie importance level to fire safety

Don't leave the interpretation of a hospital's or large, mixed-use building's cause-and-effect and alarm annunciation strategy to the electrical engineer or systems installer with little or no privy to the design choices made.

There is an easy solution to this: All buildings of Importance Levels 3 or 4 to have a consolidated "Fire Safety Documentation" bundle.

Fire Safety Documentation

This Fire Safety Documentation bundle should be prepared by suitably qualified industry practitioner and include everything that's required to interpret the building's fire safety strategy, regardless of building solution (DtS or Performance Solution):

- Building classifications
- Required means of egress
- Active and passive fire safety measures
- External wall design and protection against external fire spread
- Compartmentation and protection against internal fire spread
- Evacuation philosophy
- Detection and alarm annunciation philosophy
- Narrative of active systems' C&E
- Required essential services measures and maintenance
- Stakeholder responsibilities (Owner/Occupier/Easements)

The following is proposed to be appended to the main FSD report:

- BCA report(s)
- Fire Engineering Report(s)
- Compartmentation drawings
- Cause & Effect schedules/matrices
- Fire services drawings
- Commissioning reports
- ESM schedules
- Owner/occupier/easement responsibility split matrix/schedule
- Relevant permits (OP, CoC, CC)

Want to discuss this further? Scan the QR code and get in touch

RED FIRE ENGINEERS

A STRENGTHS-BASED CLIMATE CHANGE RESOURCE **FOR** AND **BY** YOUNG PEOPLE

Phoebe Quinn[1], Dr Katitza Marinkovic[1], Prof Dianne Vella-Brodrick[1], Assoc/Prof Janet Stanley[1], Prof Lisa Gibbs[1], Dr Karen Block[1], Dr Claire Leppold[1]

[1]University of Melbourne

THE PROCESS

The **Young People's Climate Change Capitals** project aimed to support children and young people to share their wisdom and creativity in dealing with climate change.

Approximately 40 children and young people aged 12-25 in Victoria participated in a series of 5 **workshops** to **codesign** a resource along with researchers. Additionally, about 70 young people had the opportunity to contribute with their ideas through a Forum and online.

The resource highlights the **strengths and assets that young people have**, and **how these can be drawn upon and developed** to help young people navigate the climate crisis.

The project also **connected** young people and established an **agenda for future work** on this topic.

DESIGN PRINCIPLES

The young co-designers expressed that the resource should be:

- **Empowering:** making young people feel capable of making a difference by helping them identify their strengths,
- **Inclusive** of young people with diverse backgrounds and experiences,
- **Sustainable** through a digital format,
- **Participatory:** developed with meaningful input from young people,
- **Transparent** about funding and where the resource comes from,
- **Engaging** with clear language, appealing artwork, and interactive elements, and
- **Youth-focused:** tailored to young people and reflecting their experiences.

THE ONLINE RESOURCE INCLUDES:

'WHAT ARE YOUR SUPERPOWERS?' QUIZ

TO HELP CHILDREN AND YOUNG PEOPLE IDENTIFY THEIR STRENGTHS

Social superpower
e.g. supporting family and friends, communicating and connecting

Human superpower
e.g. knowledge, skills, resilience and self care

Political superpower
e.g. advocacy, activism, youth-led law suits

Cultural superpower
e.g. values (e.g. climate justice), traditions, creative expression

Natural superpower
e.g. spending time outdoors, caring for Country, gardening, recycling

Built superpower
e.g. advocating for sustainable buildings at school and at home

Financial superpower
e.g. shopping sustainably, fundraising

ACTIVITIES, TIPS, LINKS AND STORIES

TO HELP CHILDREN AND YOUNG PEOPLE NAVIGATE THREE QUESTIONS:

How do I learn about climate change?

How do I deal with climate change in my everyday life?

How do I advocate and support climate action?

For more, scan the QR code or head to:
go.unimelb.edu.au/8oie

School-based Emergency Services – A model for educating students about Bushfire Awareness, Volunteerism and Resilience.

Andrea Vis[1] and David Wilson[2] **E:** Andrea.Vis@education.wa.edu.au

[1] Gingin District High School, [2] Shire of Gingin and DFES WA

Our story so far...

At the beginning of 2020, the School had experienced its own fire, destroying nearly 25% of the School in September 2019, Woodridge was threatened by a massive bushfire in December 2019 that started in Wanneroo and moved quickly north, and, Australia had been devastated by the bushfires that encompassed the East Coast over the summer of 2019/2020.

Bushfire awareness and resilience was a paramount concern for everyone in our community and only reinforced what we hoped to achieve by providing this course for our Year 10 students.

What we do:

⇒ **Our Year 10 Students complete our 'Emergency Services – Bush Fire-fighting' program as one of their elective subjects. By completing the course, devloped by DFES (Bushfire Awareness and Fire-fighting Skills) - the same as any adult volunteer would need to be complete before becoming an active member of their brigade, they are ready to join their local brigade as an *active member* when they finish Year 10.**

Did any students join Fire Brigades once they finished?

⇒ **One of the advantages of living in the same community as your school is being able to see the results of the School's initiatives and everyone's hard work over the years. Nearly 50% of staff live in the Shire and got to see this marvelous result. At least 6 students from the 14 that completed this course in 2020 have gone on to join their local fire-brigades and have been out to fires - the Red Gully and Wooroloo fires at the beginning of 2021 for example, as well as others, as active fire-fighters.**

⇒ Furthermore, their knowledge, understanding and practical skills as new recruits has been commended by many experienced firefighters in other brigades.

Assisting NSW Police with real-time land search intelligence using NSW State Emergency Service Land Search apps

Peter Verwey
NSW SES - Coordinator Planning – Geospatial Intelligence
Peter.Verwey2@ses.nsw.gov.au

NSW Police is the combat agency for search and rescue in NSW. They are assisted in land search by members of other emergency agencies including NSW State Emergency Service.

Police Search Commanders use a MapInfo based solution called PolSAR to plan and manage their search operations.

Updates from the field are routinely conducted through radio communications, mobile phone and in-person, as teams return to base from the field.

PolSAR does not have any field based app capability at this stage.

A NSW SES LAND SEARCH SOLUTION BASED ON ESRI TOOLS HAS BEEN DEVELOPED THAT ALLOWS FIELD TEAMS TO SEND NEAR REAL-TIME SEARCH INTELLIGENCE BACK TO THE SEARCH FIELD HEADQUARTERS AND TO OTHER REMOTE USERS.
This solution is designed to contribute to information in PolSAR, which remains the primary search software solution.

NSW SES uses Esri software and tools, including ArcGIS Pro, ArcGIS Field Maps, ArcGIS QuickCapture, custom web apps and dashboards.

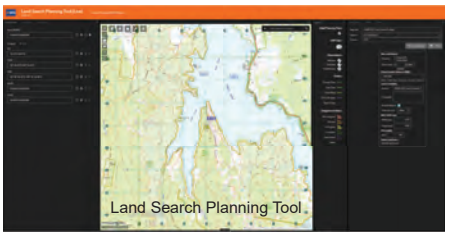
Using ArcGIS QuickCapture team members can send photos of found items of interest and track conditions. They can also record their search progress by tracking the path travelled by foot, vehicle or air.

The data is uploaded regularly when in mobile reception and cached on the device when no signal is available.

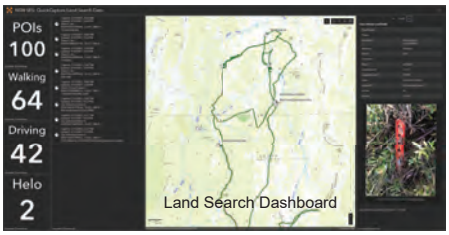
ArcGIS QuickCapture, runs on a tablet or phone

The second tool in this solution uses an ArcGIS web app that allows creation and editing of basic search planning tools.

These features can then be pushed into the field and shown on the QuickCapture map.



The final tool is the Land Search dashboard, which clearly displays search progress and collates the field data into one product.



Building service provider capability in Person-Centred Emergency Preparedness: A Training Evaluation

M. Villeneuve, P. Subramaniam, J. Chang

About the Training Program

Design & Development

- **Co-developed** with people with disability, services, government and emergency personnel. **Pilot-tested** through a series of workshops and online forums. Now, packaged as a **self-paced, online short course** delivered through the University of Sydney Centre for Continuing Education.
- The short-course consists of **6 modules** (Introduction to disability, disasters and P-CEP, one module for each of the four P-CEP steps, and a final Implementation module), and **two opportunities to meet online,** providing opportunities to learn from, with, and about the roles of other stakeholders in P-CEP and inclusive disaster risk reduction practices.

Reach

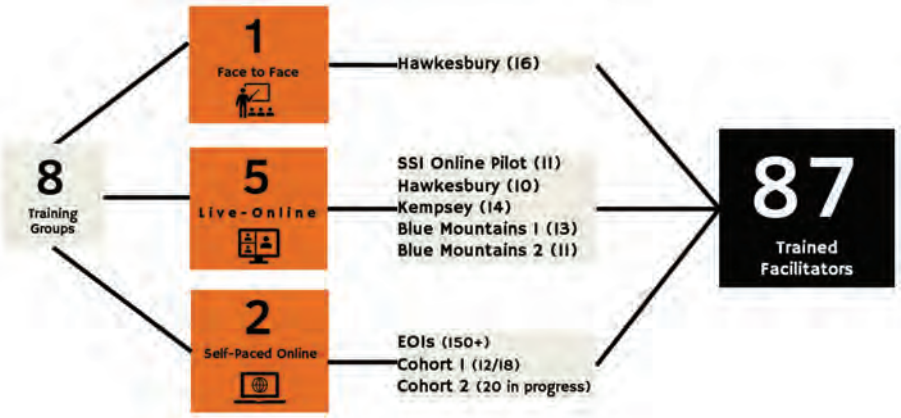
The P-CEP Education Program targets the following stakeholder groups:

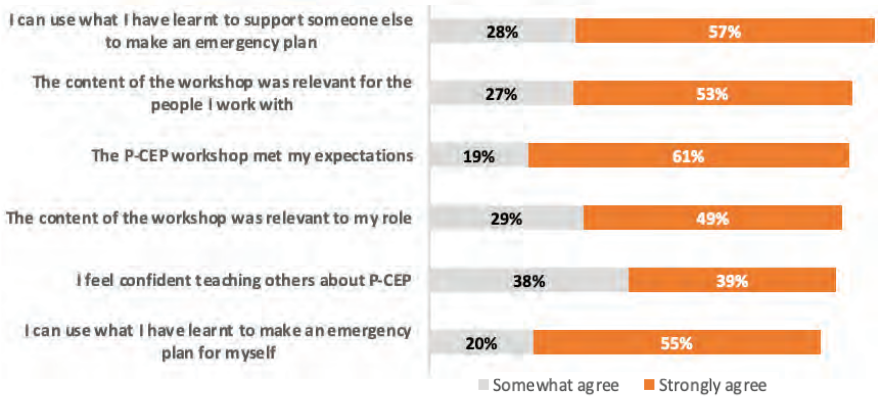
- Community, health and disability service providers;
- Disability advocates;
- Emergency services staff and volunteers, and;
- Council community engagement and emergency management staff, community resilience and disaster recovery workers

Impact & Evaluation

By evaluating the P-CEP Education Program we want to understand:

1. What factors support or constrain P-CEP implementation in practice
2. How are these factors managed?
3. What is the impact of the P-CEP program?





Participants of the P-CEP Education Program have consistently reported high levels of satisfaction with the program, as well as the intent to transfer learning into practice.

Past learners have said:

"Really raised awareness about the stages to be prepared, the capability wheel really made me think about the different parts of my life and the people I provide services to. Great ideas for promotion of the PCEP program and how we can incorporate this into our services already provided"

Live-Online Participant

"I really enjoyed the training. I feel confident in using the resources especially the capability wheel when working with clients in the future."

Face to Face Participant

"The amount of information provided was amazing and the way the course was set up for online work was very suitable for my current workload – the ability to do it at my own pace and time was great. As someone who mainly works with people who are vulnerable or older but not necessarily in the disability community I can see where this can fit right into my current program"

Short-Course Participant

Join our P-CEP Certificate Short Course for emergency personnel (self-paced, online)
Contact: michelle.Villeneuve@sydney.edu.au

THE UNIVERSITY OF SYDNEY

NAFC
National Aerial Firefighting Centre

afac

NAFC's national fleet*

Avro 146-RJ85 (LAT)

Boeing 737-3H4 (LAT)

Lockheed C130Q Hercules (LAT)

Aircrane S64H


Boeing Ch-47 Chinook

Sikorsky S61N


UH-60A Black Hawk


Bell 214B


Bell 412


Cessna 208B


MBB Kawasaki BK117


Air Tractor AT802F


Air Tractor AT802F
Fire Boss B218


Bell 206L


Cessna C182T


Eurocopter AS355


Lear 35A

*stay tuned for the new, total and to scale fleet poster

AFAC as NAFC

Our purpose is to deliver aerial support to Members through national collaboration and cooperation; providing excellence and a safe, effective and efficient aerial capability; supporting and enhancing fire and emergency management in Australia.

Having secured a national Large Airtanker to supplement the States' Large Airtankers in 2022-2024, NAFC turns its attention to:

> securing a nationwide 160+ fleet for aerial firefighting through to 2028
> enhancing ARENA as an effective system to support, record and dispatch the fleet
> developing the Resources To Risk decision support tool
> researching the effectiveness of aerial firefighting

Commonwealth Funding

NAFC manages an allocation of funding from the Australian Government, which provides $30M pa for 2022-23, including $4M to allow a national Large Airtanker to join the fleet. The States and Territories meet the remaining costs which vary annually and were close to $500M in 2019-20.

NAFC Strategic Framework

- Promoting safety
- Delivering increased capability
- Reinforcing governance and national efficiencies
- Promoting research and development
- Informing community and political expectations
- Adjusting to the impact of longer fire seasons

NAFC is responsible for

- Establishing and maintaining a National Resource Sharing Agreement
- Matching capability requirements to service providers
- Developing and maintaining national projects such as ARENA
- Contracting of aerial firefighting services

states and territories are responsible for

- Identification of their aerial requirements
- Operational tasking
- Paying the aircraft operators
- Arranging the sharing of resources

nafc.org.au +61 3 9418 5200 info@nafc.com.au

SPARK Operational

Australia's newest fire spread simulator

Featuring

> Up-to-date fire spread models
> Gridded and customisable weather
> Customisable disruptions
> Ensemble capability

Systems

> Web version
> Desktop version
> API

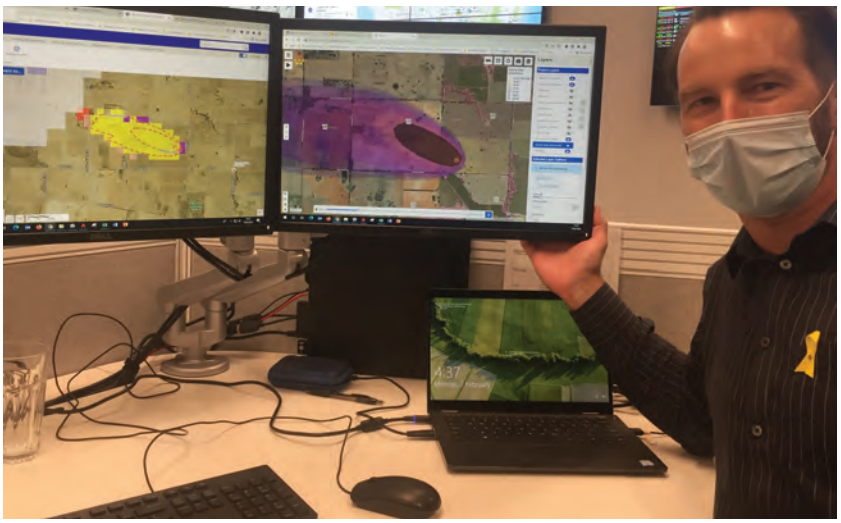
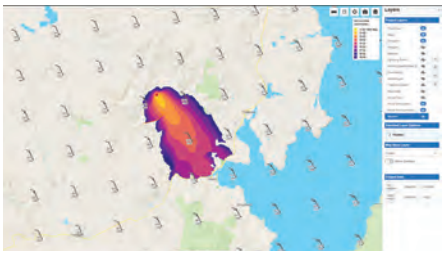


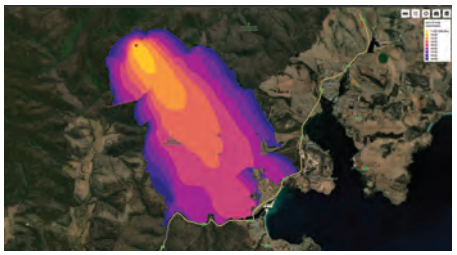
Image: Country Fire Authority

Fire intensity mapping

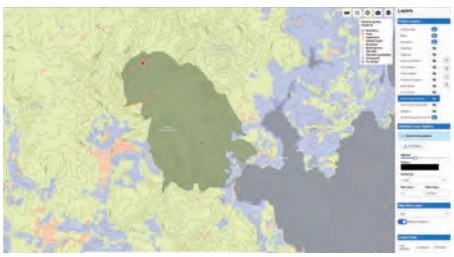
Isochrones and BOM gridded forecast



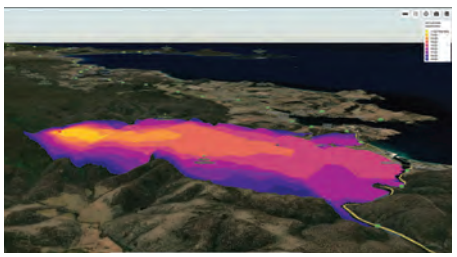
Disruptions (road, water and configurable)



Spread models and contours



3D viewing



MINDEROO FOUNDATION FIRE & FLOOD RESILIENCE

afac

DATA 61 CSIRO

Get in touch
firepredictions@afac.com.au

Australian Institute for Disaster Resilience

Australian Disaster Resilience Handbook Collection

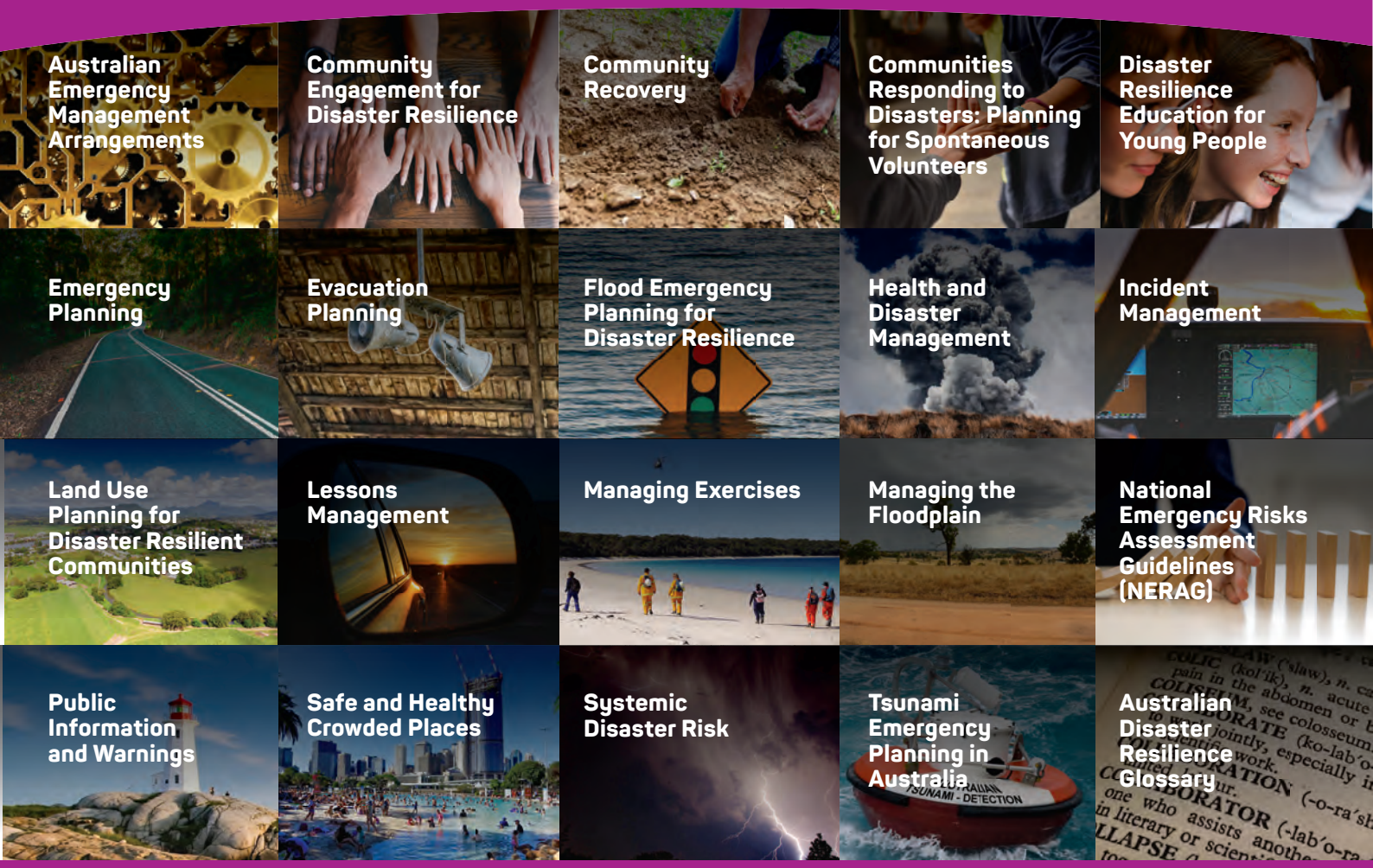
The Australian Disaster Resilience Handbook Collection supports the implementation of the *National Disaster Risk Reduction Framework* by providing national principles and guidance to strengthen the resilience of Australian communities to disaster.

The Handbook Collection:

- provides an authoritative, trusted and freely available source of knowledge about disaster risk reduction and resilience principles in Australia
- aligns national disaster resilience strategy and policy with practice, by guiding and supporting jurisdictions, agencies and other organisations and individuals in their implementation and adoption
- highlights and promotes the adoption of good practice in building disaster resilience in Australia
- builds interoperability between jurisdictions, agencies, the private sector, local businesses and community groups by promoting use of a common language and coordinated, nationally agreed principles.

View the collection online

knowledge.aidr.org.au/handbooks



KNOWLEDGE.AIDR.ORG.AU/HANDBOOKS

Australian Government
National Recovery and Resilience Agency

Australian Red Cross

afac

Australian Institute for Disaster Resilience

Education for Young People

Disaster resilience education: empowering young people to act

The Australian Institute for Disaster Resilience (AIDR) promotes the development of disaster resilience education (DRE) as a vital component in children and young people's learning.

AIDR's Education for Young People program provides strategic support for stakeholders from the education sector, emergency services, and youth-focused organisations and facilitates networks and professional learning and is informed by the *Sendai Framework for Disaster Risk* Reduction, the *Comprehensive School Safety Framework*, and Australia's *National Strategy for Disaster Resilience*.

Young people have an important role to play in raising awareness of the ongoing risk of disaster and working to build safer, stronger communities.

DRE equips young Australians with the skills, knowledge, and confidence to take protective action before, during, and after an emergency or disaster. DRE promotes a vision of young Australians who are agents of change enabled to participate as active members in skilled and resilient communities, working to reduce the risk of disaster.

Disaster Resilient Australia New Zealand School Education Network (DRANZSEN)

- Provides a platform for sharing knowledge, practice, and resources to support learning and teaching about natural hazards and disaster risk reduction in Australia.
- Showcase initiatives which enable young people to develop and apply knowledge and skills to reduce the harmful impacts of disasters in the local context.
- Support and promote partnership approaches to disaster resilience, providing young people with authentic opportunities and audiences for learning, innovation, and action.
- 700 plus members across education, emergency services, and youth focused organisations.
- The DRANZSEN National Forum takes place every year and provides a platform to share experiences, learn from best practice examples and case studies, and consult on national priorities for disaster resilience education.

Disaster Resilience Education Video Case Studies

Scan the code or head to YouTube and search "AIDR Harkaway Primary School"

Winners of the National Large Air Tanker Naming Competition. Clockwise from top left: Christian College Geelong, Bishop Druitt College Coffs Harbour and St Patrick's College Campbelltown.

Naming Australia's Large Air Tanker

AIDR, on behalf of Emergency Management Australia and the National Aerial Firefighting Centre, managed the National Large Air Tanker Naming Competition. The competition invited Australian students in Years 5 to 8 from regional and rural schools to submit entires to name the aircraft.

The competition received entries from every Australian state and the former Minister for Emergency Management and National Recovery and Resilience, Senator the Hon. Bridget McKenzie, selected the name 'The Phoenix'.

The three winning schools, Bishop Druitt College Coffs Harbour, St Patrick's College Campbelltown, and Christian College Geelong, all proposed the name 'Phoenix' . Students from the schools said that is a 'symbol of renewal and rebirth', that the aircraft 'is curing the land with it's tears by putting out fires' and that it will allow 'new life rising from the ashes'.

SCHOOLS.AIDR.ORG.AU

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